Bonneagar Iompair Éireann
Transport Infrastructure Ireland

NTA
Údarás Náisiúnta Iompair
National Transport Authority

Luas Finglas

Environmental Impact Assessment Report 2024

Chapter 18: Material Assets: Traffic and Transport

BARRY TRANSPORTATION
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Project Ireland 2040
Building Ireland's Future

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GLOSSARY OF FREQUENTLY USED TERMS

Term	Definition
ATC	Automated Traffic Count
CSO	Central Statistics Office
CSMMP	Construction Stage Mobility Management Plan
CTMP	Construction Stage Traffic Management Plan
DCC	Dublin City Council
DCDP	Dublin City Development Plan
DMRB	Design Manual of Roads and Bridges
DMURS	Design Manual for Urban Roads and Streets
DoT	Department of Transport
DTTS	Department of Transport, Tourism and Sport
EPA	Environmental Protection Agency
FCC	Fingal County Council
GDA	Greater Dublin Area
IEMA	Institute of Environmental Management and Assessment
JTC	Junction Turning Count
LAM	Local Area Model
LoS	Level of Service
LRT	Light Rail Transit
NDA	National Disability Authority
NTA	National Transport Authority
NIFTI	National Investment Framework for Transport in Ireland
PCU	Passenger Carrying Unit
RMS	Regional Model System
TII	Transport Infrastructure Ireland

SECTION 18: MATERIAL ASSETS: TRAFFIC AND TRANSPORT

18.1 Introduction

18.1.1 Purpose of this Report

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential traffic and transport impacts associated with the Construction and Operational Phases of Luas Finglas (hereinafter referred to as "proposed Scheme"). This Chapter describes and assesses the likely direct and indirect significant effects of the proposed Scheme 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 provides a description of the existing and future receiving environment within the proposed Scheme, and within a wider study area in the vicinity of the proposed Scheme. This Chapter also describes and assesses the likely direct and indirect significant effects of the proposed Scheme on traffic and transport. As such, the Chapter details the following:

- Methodology followed in carrying out the assessment;
- Description of the receiving environment and a summary of the main characteristics of the proposed Scheme which are of relevance to traffic and transportation;
- Predicted Construction Impact on traffic and transport;
- Predicted Operational Impact on traffic and transport;
- Proposed Mitigation Measures for both Construction and Operational Phases; and
- Predicted Residual Impacts during the Construction and Operational Phases.

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

- Chapter 7 (Human Health);
- Chapter 8 (Population);
- Chapter 9 (Biodiversity);
- Chapter 10 (Water);
- Chapter 13 (Air Quality);
- Chapter 14 (Climate);
- Chapter 15 (Noise and Vibration);
- Chapter 17 (Infrastructure and Utilities); and
- Chapter 24 (Cumulative Impacts).

The assessment is based on a reasonable worst-case scenario with respect to potential impacts arising from the proposed Scheme as described in Chapter 5 (Description of the proposed Scheme) and Chapter 6 (Construction Activities) of this EIAR. The proposed Scheme description is based on the design prepared to inform the planning stage of the proposed Scheme and to allow for a robust assessment as part of the Environmental Impact Assessment (EIA) Process.

18.1.2 Outline Scheme Description

The proposed Scheme comprises a high-capacity, high-frequency light rail running from Broombridge to Charlestown, connecting Finglas and the surrounding areas with Dublin's wider public transport network by providing a reliable, and efficient public transport service to the city centre via Broombridge.

Starting from Broombridge, the proposed Scheme travels northwards, crossing the Royal Canal and the Maynooth railway line adjacent to Broome Bridge. It then runs adjacent to the east of Broombridge Road and the Dublin Industrial Estate. It then crosses the Tolka Valley Park before reaching the proposed St

Helena's Stop and then proceeds northwards towards the proposed Luas Finglas Village Stop. From here, the route passes through a new corridor created within the Finglas Garda Station car park, making its eastern turn onto Mellowes Road. The route then proceeds through Mellowes Park, crossing Finglas Road, towards the proposed St Margaret's Road Stop. Thereafter, the proposed line continues along St Margaret's Road before reaching the terminus Stop proposed at Charlestown.

The proposed Scheme has been designed to interchange with existing and future elements of the transport network including interchange opportunities with bus networks at all the new stops and with mainline rail services at Broombridge, and a Park & Ride facility to intercept traffic on the N/M2. The proposed Scheme will comprise a number of principal elements as outlined in Table 18-1 and Table 18-2. A full description of the proposed Scheme is provided in the following chapters of this Environmental Impact Assessment Report (EIAR):

- Chapter 1 (Introduction);
- Chapter 5 (Description of the proposed Scheme); and
- Chapter 6 (Construction Activities).

Table 18-1: Overview of the Key Features of the proposed Scheme

Scheme Key Features	Outline Description
Permanent Scheme Elements	
Light Rail track	3.9km extension to the Luas Green Line track from Broombridge to Finglas (2.8km of grass track, 700m of embedded track and 360m of structure track)
Depot Stabling Facility	A new stabling facility (with stabling for eight additional LRVs) will be located just south of the existing Broombridge terminus, as an extension of the Hamilton depot area.
Luas Stops	Four Stops located at: St Helena's, Finglas Village, St Margaret's Road and Charlestown to maximise access from the catchment area including the recently re-zoned Jamestown Industrial Estate.
Main Structures	Two new Light Rail Transit (LRT) bridges will be constructed as part of the proposed Scheme: a bridge over the River Tolka within the Tolka Valley Park and a bridge over the Royal Canal and the Iarnród Éireann (IÉ) railway line at Broombridge. A number of existing non-residential buildings shall be demolished to facilitate the proposed Scheme. In addition, the existing overbridge at Mellowes Park will be demolished.
At Grade Signalised Junctions	10 at grade signalised junctions will be created at: Lagan Road, Ballyboggan Road, Tolka Valley Road, St. Helena's Road, Wellmount Road, Cappagh Road, Mellowes Road, North Road (N2), McKee Avenue, Jamestown Business Park entrance. Note: The junction at Charlestown will be reconfigured but does not have a LRT crossing.
Uncontrolled Crossings	13 at grade uncontrolled crossings (11 pedestrian / cycle crossings and two local accesses located at: Tolka Valley Park, St Helena's, Farnham pitches, Patrickswell Place, Cardiff Castle Road, Mellowes Park, St Margarets Road, and ESB Networks.
Cycle Facilities	Cycle lanes are a core part of the proposed Scheme in order to facilitate multimodal "cycle-LRT trips". Approximately 3km of segregated cycle lanes and 100m of non-segregated cycle lanes along the route. Covered cycle storage facilities will be provided at Broombridge Terminus, Finglas Village Stop and St Margaret's Road Stop and within the Park & Ride facility. "Sheffield" type cycle stands will be provided at all stop locations.
Power Substations	Two new traction power substations for the proposed Scheme will be located near Finglas Village Stop behind the existing Fire Station, and near the N2

Scheme Key Features	Outline Description
	junction before St Margaret's Road Stop where the current spiral access ramp to the pedestrian overbridge is located. A third substation is required for the Park & Ride facility.
Park & Ride facility	A new Park & Ride facility, with e-charging substation, located just off the M50 at St Margaret's Road Stop will be provided with provision for 350 parking spaces and secure cycle storage to facilitate multimodal "cycle-LRT trips". The building will feature photovoltaic (PV) panel roofing and is the location for an additional radio antenna. This strategic Park and Ride facility will intercept traffic on the N/M2, before congestion begins to form.
Temporary Scheme Elements	
Construction Compounds	There will be three principal construction compounds, two located west of Broombridge Road and one located at the northern extents of Mellowes Park. In addition, there are other secondary site compound locations for small works/storage. Details can be found in Chapter 6 (Construction Activities) of this EIAR.

Table 18-2: Summary of New Bridges of the proposed Scheme

Identity	Location	Description
Royal Canal and Rail Bridge	Approximately 10m east of the existing Broome Bridge and then continuing north, parallel with Broombridge Road on its east side	The proposed bridge is an eight-span structure consisting of two main parts: a variable depth weathering steel composite box girder followed by a constant depth solid concrete slab. The bridge has the following span arrangement: 35 + 47.5 + 30 + 17 + 3x22 + 17m. Steel superstructure extends over the first three spans. The bridge deck is continuous over the full length of 212.5m and has solid approach ramps at both ends.
Tolka Valley Park Bridge	Approximately 30m west of the existing Finglaswood Bridge	A three-span structure with buried end spans, thus appearing as a single span bridge. End spans as well as part of the main span consist of post-tensioned concrete variable depth girder, the central section of the main span is a suspended weathering steel composite box girder. The overall length of the bridge is 65m with spans 10m, 45m, 10m.

18.2 Methodology

18.2.1 Study Area

The traffic and transport assessment study area was developed during the scoping stage of the assessment and includes the areas likely to be impacted by the construction and operation of the proposed Scheme over its full operational length from Broombridge to Charlestown. The study area is illustrated in Figure 18-1, and was defined based on the area of influence the proposed Scheme has on changing traffic volumes above a 10% threshold in-line with TII's Traffic and Transport Assessment Guidelines (PE-PDV-02045, TII 2014).

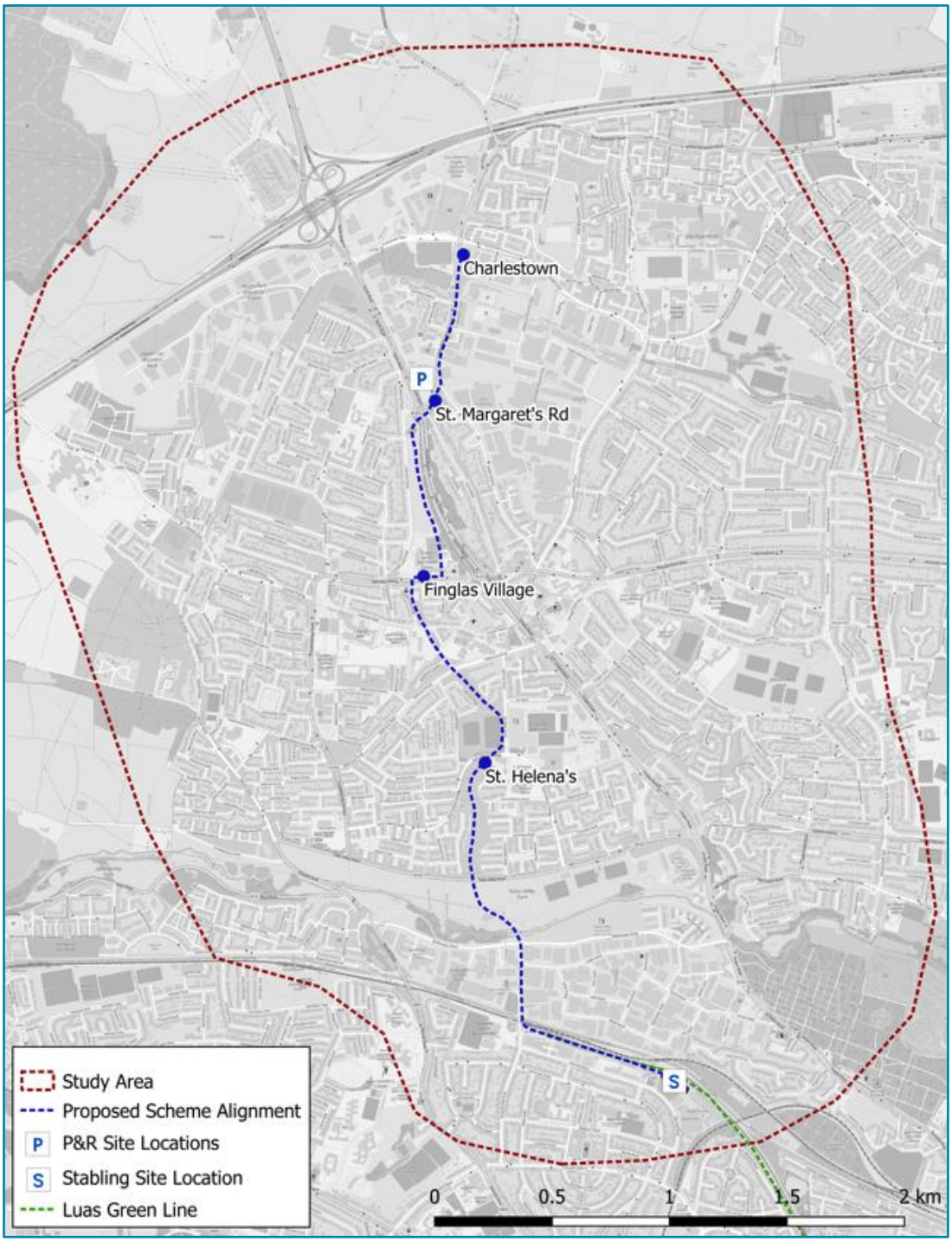


Figure 18-1: Study Area

18.2.2 Relevant Guidelines, Policy and Legislation

18.2.2.1 Policy

The need to invest in measures to address congestion and public transport issues within Dublin's north-west corridor extends from policy at national, regional and local levels. Various policy documents have referenced the potential improvements and expansion of light rail, and even provide specific reference to a Green Line extension to Finglas and the M50. These include:

- Project Ireland 2040: National Planning Framework and National Development Plan (2021-2030);
- National Investment Framework for Transport in Ireland (NIFTI);
- Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031;
- Transport Strategy for the Greater Dublin Area 2022-2042;

- Dublin City Development Plan 2022-2028;
- Fingal Development Plan 2023 – 2029;
- Climate Action Plan 2023 & 2024;
- National Sustainable Mobility Policy 2022;
- Dublin City Council Climate Change Action Plan 2024 – 2029; and
- Fingal County Council's Climate Action Plan 2024-2029.

Further details of the national, regional and local transport policy applicable to the proposed Scheme are outlined in Chapter 2 (Planning and Policy Context).

18.2.2.2 Guidance

The following guidance documents were used to inform the impact assessment of the proposed Scheme:

Traffic and Transport Assessment Guidelines

To determine the traffic and transport impact that the proposed Scheme has in terms of the impact on general traffic flows on the study area, a robust assessment has been undertaken, with reference to Transport Infrastructure Ireland's (TII) most recent Traffic and Transport Assessment Guidelines (PE-PDV-02045, TII, 2014).

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

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

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

Further details on the use of the Traffic and Transport Assessment Guidelines to assess the impact of the proposed Scheme on traffic flows within the study area is provided in Section 18.4.3.8 of this chapter.

Design Manual for Urban Roads and Streets

The Design Manual for Urban Roads and Streets (DMURS) (DTTS 2019a) promotes an integrated street design approach within urban areas (i.e. cities, towns, and villages) focused on:

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

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

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

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

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

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

The proposed Scheme has been designed in accordance with DMURS, and this guidance has been used to inform the qualitative assessment of the planned road network and junction upgrades, in particular, the impacts for pedestrians and cyclists (further detail provided in Section 18.4.3.2).

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

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

Of direct relevance to the assessment of traffic and transport impacts, Chapter 7 – Road Markings outlines the function of road markings, the legalities of road markings and the application of road markings on roads in Ireland. Chapter 8 – Temporary Traffic Measures and Signs for Roadworks outlines the application of temporary traffic management (TTM) at work sites on public roads; this chapter offers instructions and guidance to road users in relation to the use of TTM and outlines the signs to be used at roadworks. This guidance has been referenced when developing mitigation measures for impacts associated with construction activities for the proposed Scheme, along with assessment of these potential Construction Phase impacts. Further details are provided in Section 18.4.2 of this chapter and Chapter 6 (Construction Activities) of the EIAR.

18.2.3 Data Collection and Collation

The following section provides an overview of the data collection exercise undertaken to inform the traffic and transport assessment. Further detail can be found in Volume 5 – Appendix A18.1 (Transport Modelling Report) of this EIAR.

18.2.3.1 Existing Data Review (Gap Analysis)

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

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

Figure 18-2 illustrates the location and spread of the most recent (2019) available data across the model area from the NTA count database. Other datasets were too old to be considered for the proposed Scheme. The data review indicated that additional information was required to robustly assess the impact of the proposed Scheme as limited observations were available within the Finglas urban area along the proposed Luas route.

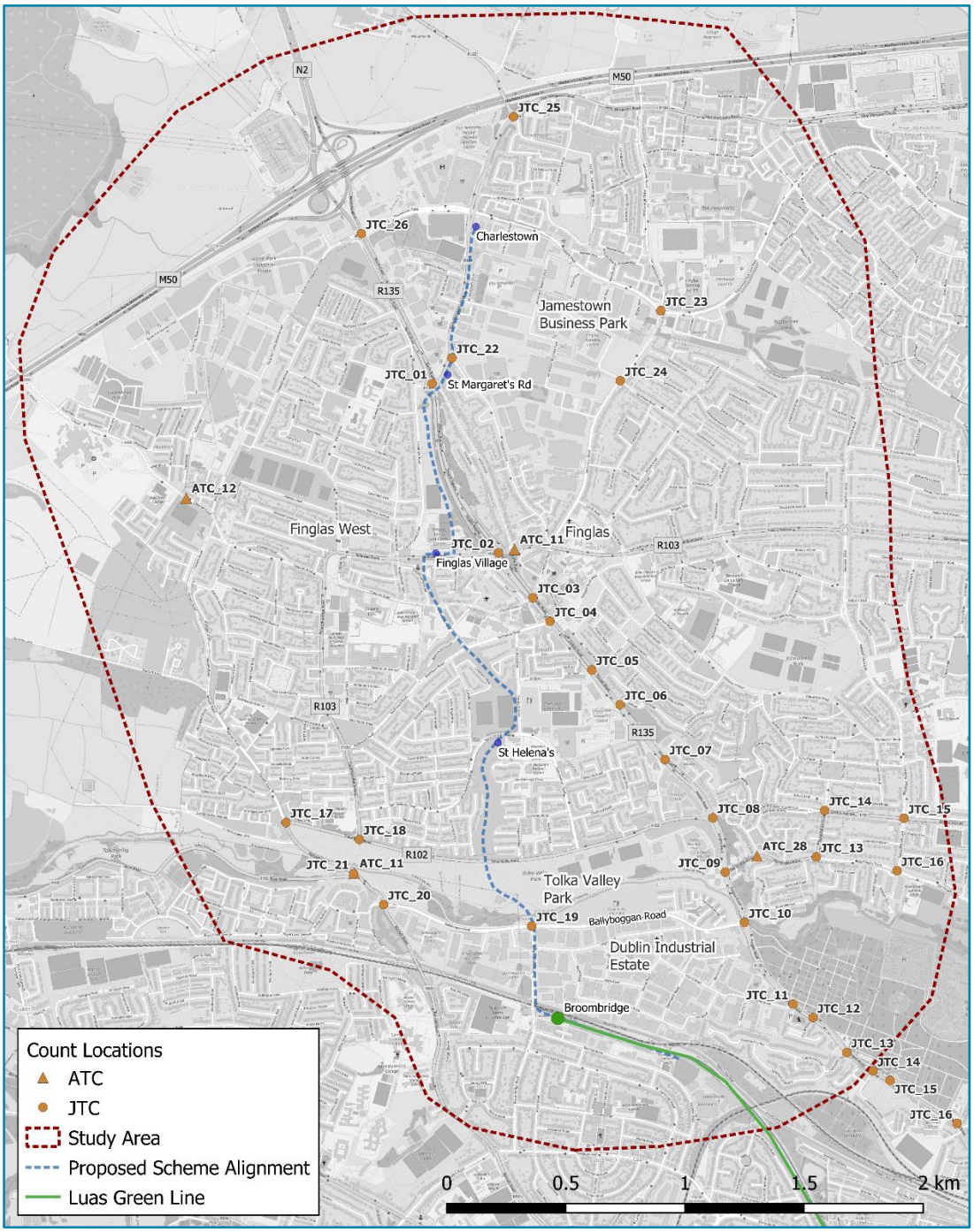


Figure 18-2: Location of Existing 2019 Traffic Count Sites (Source: NTA Count Database)

Therefore, on foot of the above review, a data collection exercise was commissioned to supplement existing traffic counts and provide sufficient information to robustly calibrate and validate a traffic model for the area.

18.2.3.2 Commissioned Traffic Survey Data

Traffic surveys were commissioned to bridge the gap identified from the existing data review. In particular, the following surveys were required:

- One-week Automatic Traffic Counts (ATCs) at key locations to complement the ATC data available from the 2019 survey campaign; and
- Junction Turning Counts (JTCs) at all the main junctions within the model area to capture movement of vehicles during the peak periods.

Automatic Traffic Counts (ATCs)

ATCs were undertaken at 6 locations across the study area road network, as illustrated in Figure 18-3, over a one-week period during the last week in November 2021. This is considered a neutral, representative period for collecting unbiased traffic survey data as outlined in TII's PAG Unit 5.2 – Data Collection. Section 3.1 of PAG Unit 5.2 identifies a neutral period as one which avoids national and local holiday periods, local school holidays, mid-terms and any other abnormal periods or unusual events which may influence travel. Within the guidance, all of the month of November is specifically referenced as a neutral period. The ATC data provides information on:

- The daily and weekly profile of traffic within the study area;
- Busiest time periods and locations of highest traffic demand on the network;
- Any issues on the network during the survey period e.g. accidents, road closures etc.; and
- Typical speed of traffic on the network.

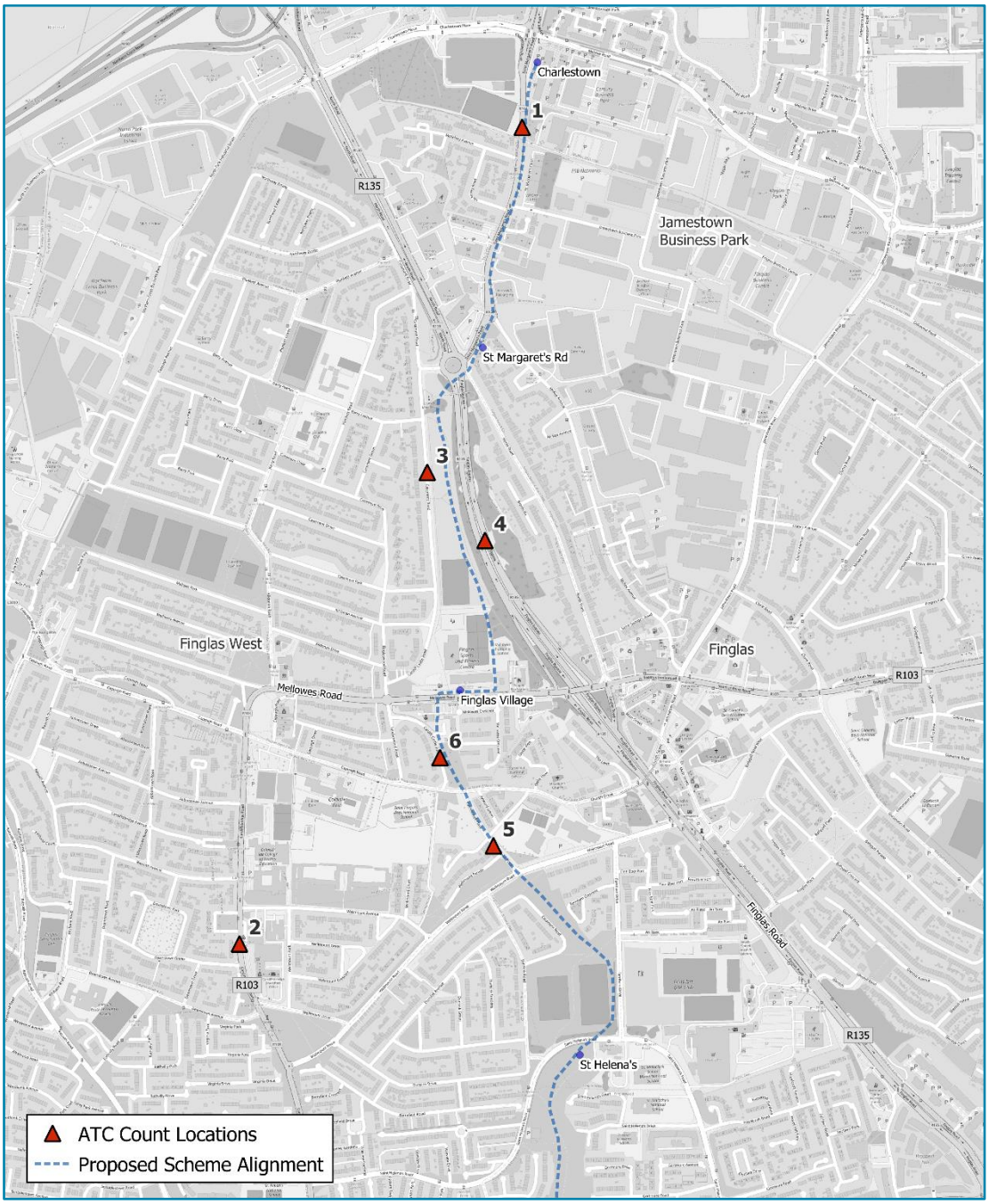


Figure 18-3: ATC Count Locations

Junction Turning Counts (JTCs)

JTCs were undertaken at 14 locations across the network, illustrated in Figure 18-4, during the AM and PM peak periods (07:00 – 10:00 and 16:00 – 19:00) on Tuesday 30th November 2021.

Combined with the existing 2019 traffic data[1], all the main junctions within the study area have been included and provide information on the volume, and types of vehicles, making turning movements at each location. This data is utilised within the Local Area Model calibration to ensure that the flow of vehicles through the main junctions on the network is being represented accurately. Further details on the calibration and validation of the Local Area Model can be found in Volume 5 – Appendix A18.1 (Transport Modelling Report) of this EIAR.

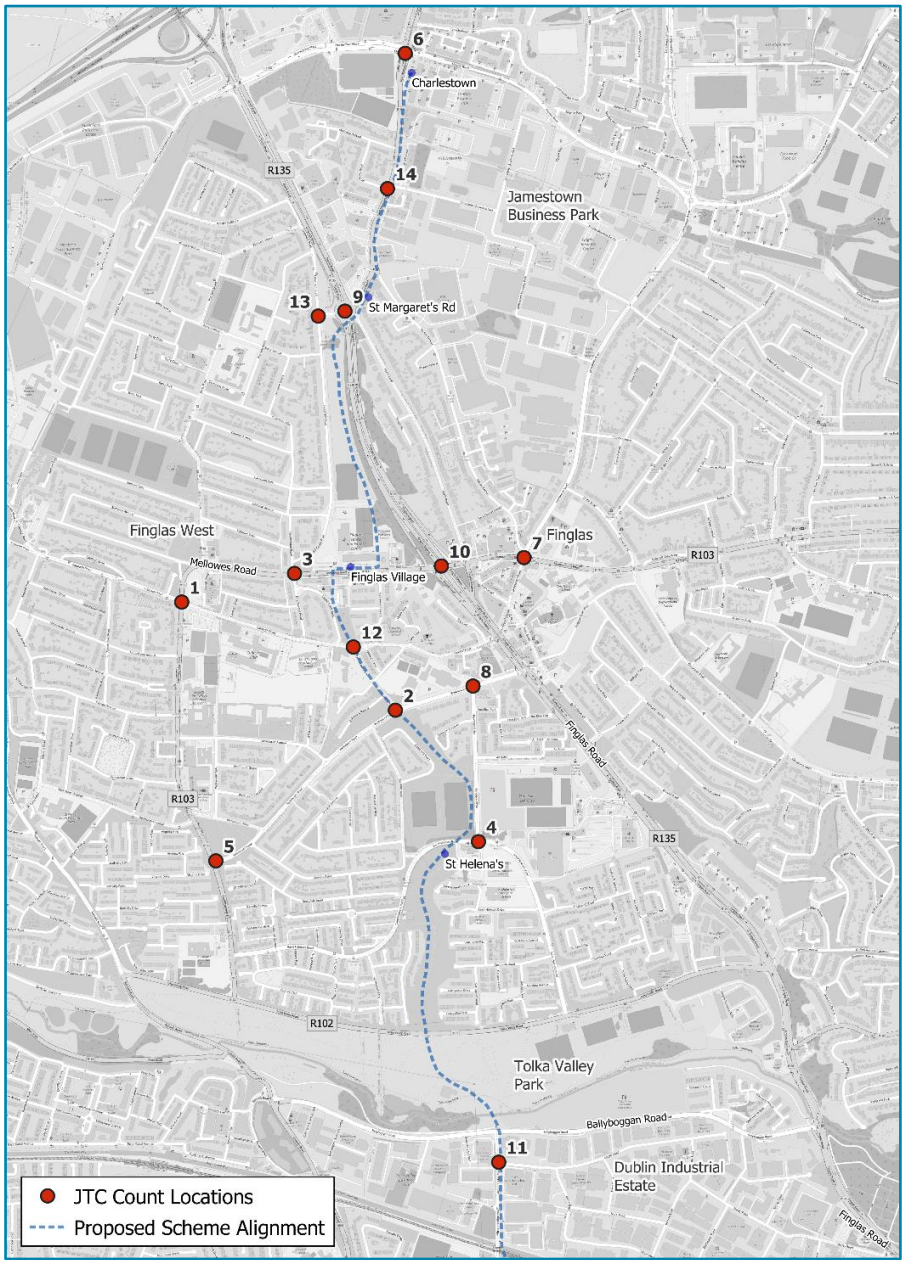


Figure 18-4: JTC Count Locations

[1] Comparisons have been undertaken at a select number of count locations between those carried out in 2019 (pre-COVID) and 2021. The results indicate that the overall traffic levels between the two survey years are comparable, and that the data can be relied upon to provide a robust representation of existing traffic levels within the study area.

TomTom Road Journey Time Data

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

The data is provided in the form of a GIS shapefile and accompanying travel time database file. The shapefile contains topographical details for each road segment, which is linked to the travel time database via a unique link ID. The database file then contains average and median travel time, average and median speed, the standard deviation for speed, the number of observations and percentile speeds ranging from 5 to 95 for each link. Figure 18-5 illustrates the routes for which journey times have been analysed.

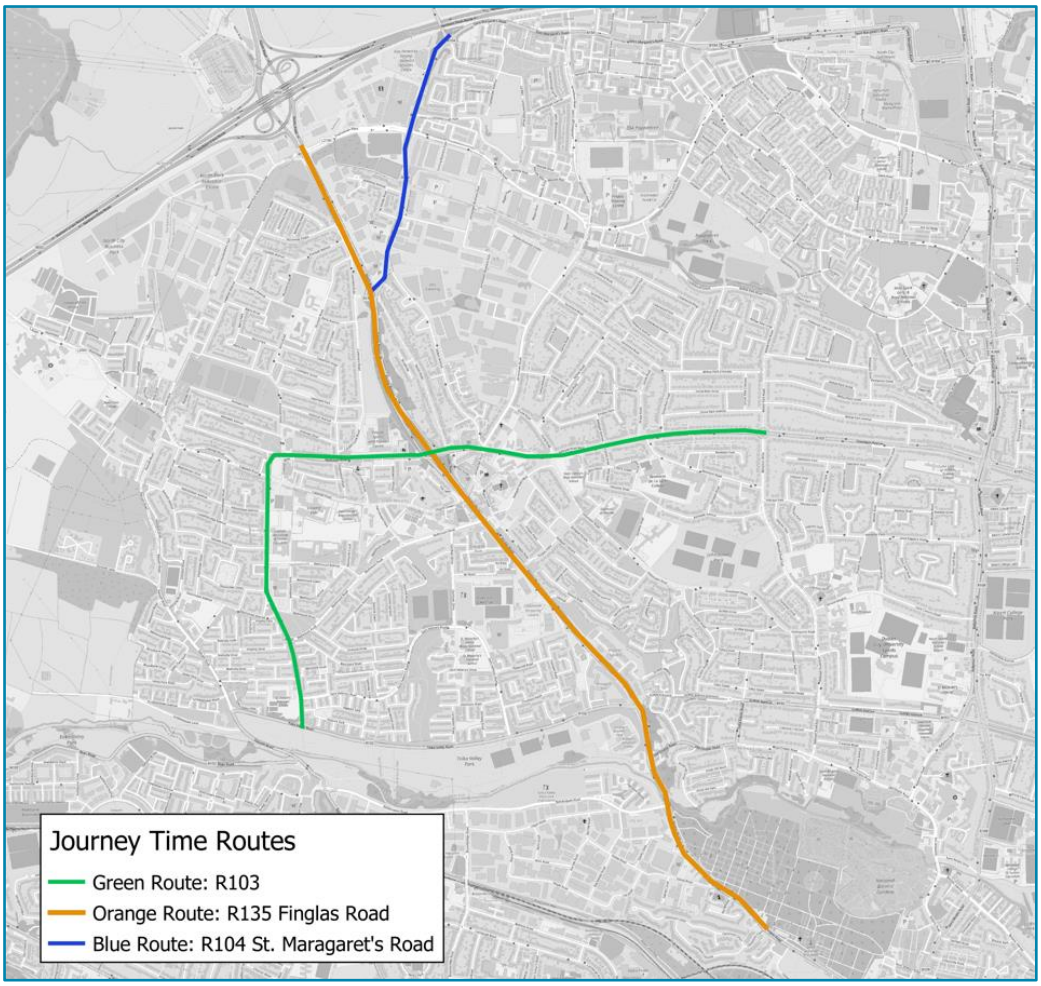


Figure 18-5: TomTom Journey Time Routes

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

Before applying the data to the models, it was checked to ensure that it was fit for purpose. The review included checks of the number of observations that form the TomTom average and median times and checks of travel times against Google Maps travel times. The TomTom Custom Area Analysis dataset was processed to provide observed journey times against which the strategic and micro-simulation models could be validated along the proposed Scheme route.

18.2.4 Proposed Scheme Impact Assessment Modelling Tools

To determine the baseline and future scenarios for the proposed Scheme, and therefore allowing an assessment of its impact to be undertaken, detailed transport modelling has been carried out. The overall modelling framework for the proposed Scheme consists of three levels as outlined in Figure 18-6:

- Level 1 (Strategic Level): The NTA's East Regional Model (ERM) is the primary tool which has been used to undertake the strategic modelling of the proposed Scheme and has provided the strategic multi-modal demand outputs for the proposed forecast years;
- Level 2 (Local Level): The Local Area Model (LAM) has been developed to provide a more detailed understanding of traffic movement within the study area; and
- Level 3 (Microsimulation): A detailed microsimulation model was developed for the area to the northern end of the Luas Finglas alignment where there is likely to be the largest interaction between the Luas and road infrastructure during operation.

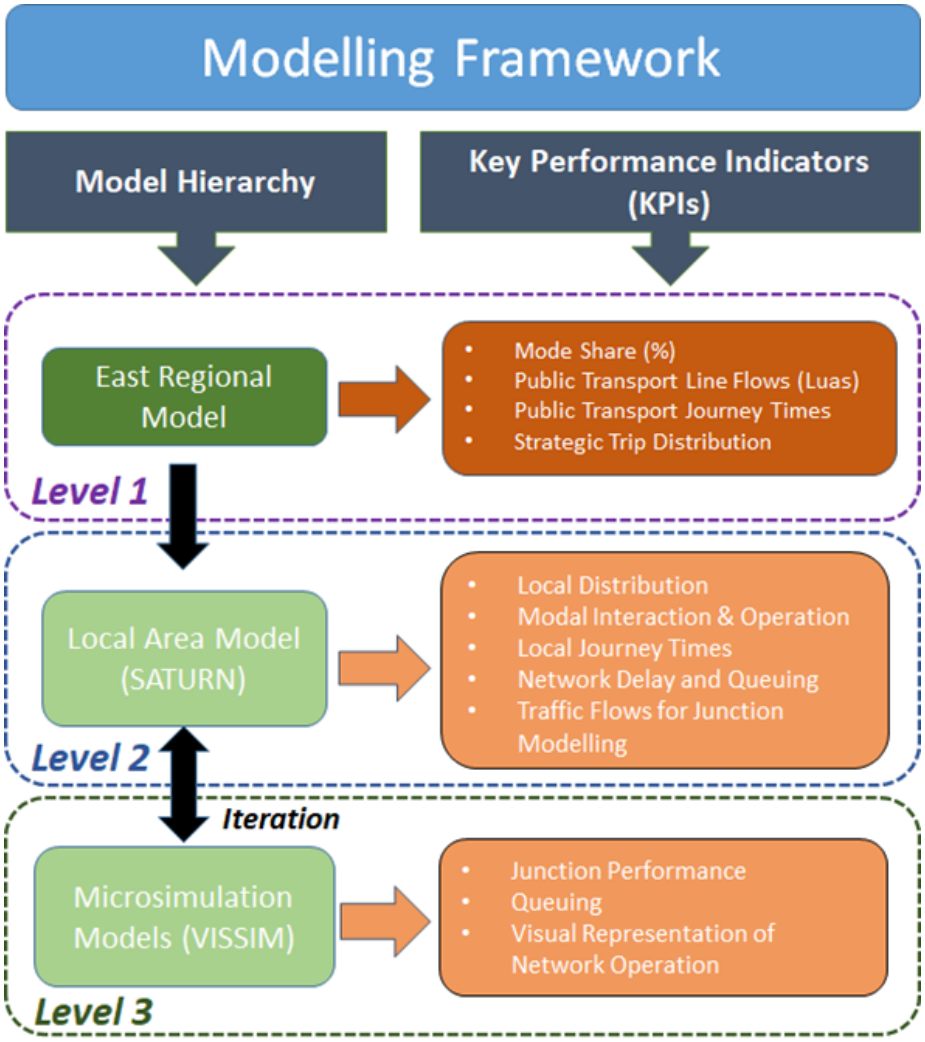


Figure 18-6: Transport Modelling Hierarchy for EIAR Assessment

18.2.4.1 NTA's Regional Modelling System

The NTA Regional Model System (RMS) (Refer to Figure 18-7) comprises the following three main components, namely:

- The National Demand Forecasting Model (NDFM);
- Five Regional Models (including the ERM); and
- A Suite of Appraisal Modules.

The NDFM takes input attributes such as land-use data, population etc., and estimates the total quantity of daily travel demand produced by, and attracted to, each of the 18,488 Census Small Areas in Ireland.

East Regional Model (ERM)

The ERM is a strategic multi-modal transport model representing travel by all the primary surface modes – including, walking and cycling (active modes), and travel by car, bus, rail, LRT, light goods and heavy goods vehicles, and broadly covers the Leinster province of Ireland including the counties of Dublin, Wicklow, Kildare, Meath, Louth, Wexford, Carlow, Laois, Offaly, Westmeath, Cavan, Longford and Monaghan.

The ERM comprises the following key elements:

- Trip End Integration: The Trip End Integration module converts the 24-hour trip ends output by the NDFM into the appropriate zone system and time period disaggregation for use in the Full Demand Model (FDM);
- The Full Demand Model (FDM): The FDM processes travel demand, carries out mode and destination choice, and outputs origin-destination travel matrices to the assignment models. The FDM and assignment models run iteratively until an equilibrium between travel demand and the cost of travel is achieved; and
- Assignment Models: The Road, Public Transport, and Active Modes assignment models receive the trip matrices produced by the FDM and assign them in their respective transport networks to determine route choice and the generalised cost for each origin and destination pair.

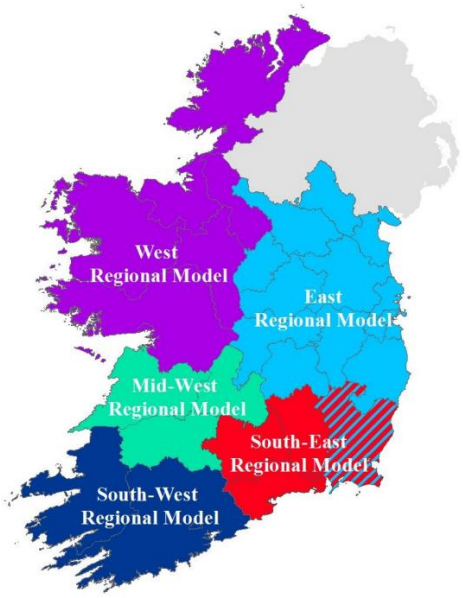


Figure 18-7: NTA Regional Model Boundaries

Destination and mode choice parameters within the ERM have been calibrated using two main sources: Census 2016[2] Place of Work, School or College – Census of Anonymised Records (2016, POWSCAR), and the Irish National Household Travel Survey (2017 NHTS). The NTA's RMS is the most sophisticated modelling tool available for assessing complex multi-modal movements within an urban context. This provides a consistent framework for transport assessment. Therefore, the ERM is the ideal tool to estimate the multi-modal impact of transport schemes such as the Luas Finglas extension.

[2] At the time of undertaking the analysis for this EIAR, the latest version of the NTA's RMS was calibrated to 2016 Census data due to the unavailability of more recent Census 2022 information. Recent traffic survey data has been used in the development of the LAM to ensure a robust representation of the baseline traffic conditions.

18.2.4.2 Local Area Model (LAM)

The LAM is a subset from the ERM developed to provide more detailed information on traffic movements locally within the study area. (Refer to Figure 18-8). The Base ERM road network and zone system were refined to provide a more detailed representation of local road network conditions. The LAM was calibrated and validated to traffic survey data (Section 18.2.3) in accordance with Transport Infrastructure Ireland's (TII) *Project Appraisal Guidelines (PAG) for National Roads Unit 5.1 – Construction of Transport Models (October 2016)*. This is a widely accepted standard in Ireland that provides robust calibration and validation criteria to which certain types of highway models should adhere. Additionally, the LAM development has followed guidance from the UK's Department for Transport's Transport Analysis Guidance (TAG) unit M3-1, particularly in terms of matrix estimation controls. This ensures that it provides a robust representation of the existing traffic network within the study area.

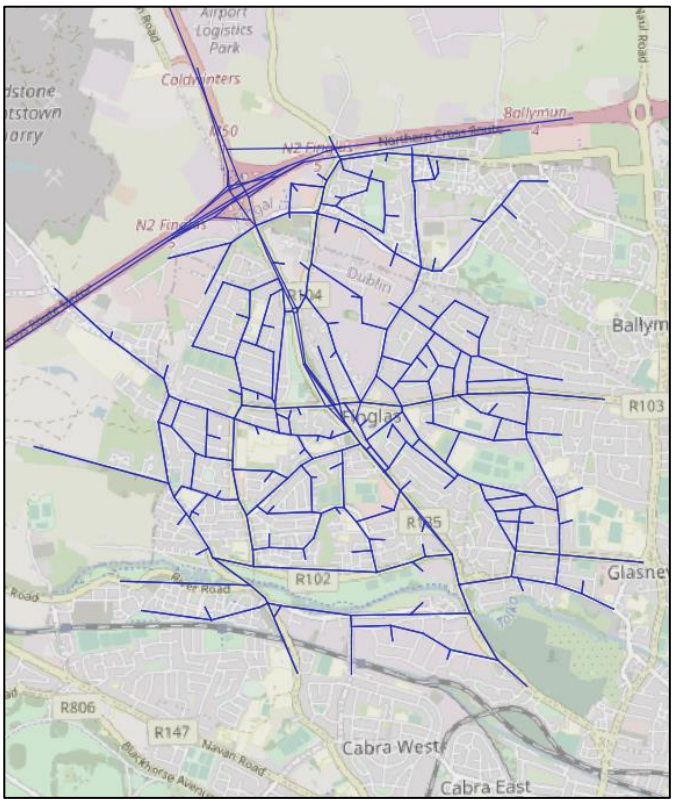


Figure 18-8: LAM Network

The LAM is linked to the ERM with future travel demand extracted from forecast runs of the strategic model. This ensures that the impact of any modal shift due to public transport or active mode interventions are captured in the LAM road network flows. The LAM provides detailed information on network performance, journey times, queueing and delay along with any traffic redistribution due to the proposed Scheme. The LAM also provides traffic flow information for the microsimulation model.

18.2.4.3 Microsimulation Model

A microsimulation model has been developed in the VISSIM software for the area to the north of the Luas Finglas alignment around St Margaret's Road, R135 and Charlestown Place as illustrated in Figure 18-9. During operation, Luas Finglas will have the greatest interaction with the road network at this location with associated junction upgrades. The VISSIM model allows for a more detailed understanding of network performance in this area including aspects such as journey times, queuing and delay. The model also facilitates an accurate representation of the impacts of junctions in close-proximity to each other e.g. queuing blocking-back to an upstream junction impacting on performance.

The VISSIM model takes flows from the LAM and has been calibrated and validated to local traffic counts and journey time surveys in-line with TII Guidance. The VISSIM model was used to support the development of junction designs.

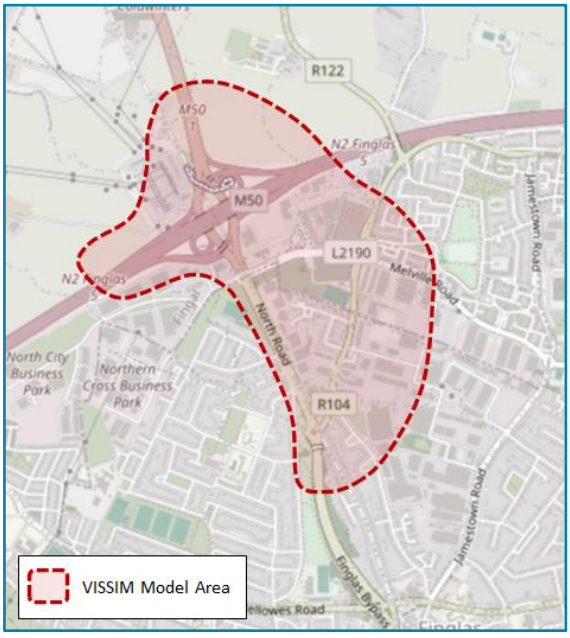


Figure 18-9: VISSIM Model Area

18.2.5 Methodology for the Assessment of Impacts

18.2.5.1 Overview

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

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

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

18.2.5.2 Outlining Assessment of Topics

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

The qualitative assessments:

- Pedestrian Infrastructure: The changes to the quality of the pedestrian infrastructure as a result of the proposed Scheme;
- Cycling Infrastructure: The changes to the quality of the cycling infrastructure as a result of the proposed Scheme;
- Bus Services: The changes to the routing of bus services as a result of the proposed Scheme; and

The quantitative assessments, which have been undertaken using the proposed Scheme modelling tools described previously:

- People Movement: An assessment has been carried out to determine the potential impact that the proposed Scheme will have on the projected volume of people (by mode – Walking, Cycling, Bus and General Traffic) moving along the proposed Scheme during the Operational Phase only;
- Public Transport Performance Indicators: The changes to the projected public transport journey times and boardings as a result of the proposed Scheme; and
- General Traffic: The direct and indirect impacts on general traffic as a result of the proposed Scheme on the surrounding road network.

18.2.5.3 Determining the Predicted Magnitude of Impacts

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

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

- 'Do Nothing' – The 'Do Nothing' scenario represents the current baseline traffic and transport conditions in the study area without the proposed Scheme in place and other proposed schemes. This scenario forms the reference case by which to compare the proposed Scheme ('Do Something') for the qualitative assessments only. As outlined above, the qualitative assessment is focused on the impact of infrastructure changes as a result of the proposed Scheme, and as such, using the 'Do Nothing' as a reference allows for a direct comparison with existing conditions;
- 'Do Minimum' – The 'Do Minimum' scenario (Opening Year 2035, Design Year 2050) represents the likely traffic and transport conditions of the study area, including for any transportation schemes which have taken place, been approved or have significantly progressed through the planning process, without

the proposed Scheme in place. This scenario forms the reference case by which to compare the proposed Scheme ('Do Something') for the quantitative assessments; and

- 'Do Something' – The 'Do Something' scenario represents the 'Do Minimum' scenario with the addition of the proposed Scheme. The 'Do Something' scenario has been broken into two phases:
  - Construction Phase – This phase represents the single worst-case period which will occur during the construction of the proposed Scheme; and
  - Operational Phase (Opening Year 2035, Design Year 2050) – This phase represents when the proposed Scheme is fully operational.

Both the Opening and Design year 'Do Minimum' and 'Do Something' scenarios include all committed transport schemes along with:

- **BusConnects:** Delivery of high frequency bus services from Finglas to the city centre with improved public transport priority due to the creation of a Core Bus Corridor along the R135;
- **DART+ West:** Electrification of the Maynooth Rail line with improved frequencies facilitating interchange with the Luas Finglas extension at Broombridge; and
- **Greater Dublin Area Cycle Network Plan:** Delivery of a high-quality cycle network providing improved accessibility to the Luas Finglas Stops and supporting cycle-LRV trips.

Further details on the modelling assumptions for 'Do Minimum' and 'Do Something' scenarios for the assessment years are provided in the Transport Modelling Report available in Volume 5 – Appendix A18.1.

The differences between the Do Minimum and Do Something scenarios have been presented in either a positive, negative or neutral Quality of Impact as a result of the proposed Scheme, depending on the assessment topic. A high, medium, low or negligible rating has been applied to each impact assessment to determine the Magnitude of Impact. Further details on the Magnitude of Impact derived for pedestrians, cyclists, public transport and general traffic is provided in Section 18.4 of this chapter.

Level of Service Impact Assessment

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

The concept of LoS was originally developed in the United States' Transportation Research Board's (TRB) Highway Capacity Manual (TRB, 2000). Under this concept, potential values for a performance measure are divided into six ranges, with each range assigned a letter grade ranging from "A" (highest quality) to "F" (lowest quality). LoS concepts are applied universally throughout the world, and have their basis in Highway Capacity Manual and, particularly for bus network assessments, in the Transit Capacity and Quality of Service Manual (TRB, 2003).

LoS concepts are not target based nor rigid in their application and bespoke versions are developed to suit the particular receiving environment of the scheme under consideration or the particular user problems that the scheme and / or project is seeking to address. A mix of quantitative and qualitative indicators can be used and summarised as a LoS. The process enables integrated planning and decision making across all modes rather than any specific mode which can create a bias in the assessment process (e.g. focusing on Car Volume over Capacity (V/C)). It is intended that the LoS framework for the proposed Scheme will provide an easily understandable summary of the impact of each assessment topic, where applied.

18.2.5.4 Defining the Sensitivity of the Environment

The impact assessment sensitivities established for the Traffic and Transport Chapter have been informed using the LAM (NavStreets) and Google Traffic data to identify the capability of roads to cater for traffic volumes and existing congested junctions / road links. The sensitivity ratings that have been derived from professional judgement and applied to the impact assessments are as follows:

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

18.2.5.5 Duration of Impacts

The duration of the impact as a result of the proposed scheme can influence its seriousness and required mitigation. For example, a high magnitude negative impact lasting over a very long period of time is likely to be treated more seriously than a similar impact lasting less than a day. For the purpose of this traffic and transport assessment, two main durations of impacts are used which have been adopted from the 2022 EPA Guidelines on EIARs, namely:

- **Temporary Impacts**: Used for Construction Phase impacts which typically last less than a year; and
- **Long-term Impacts**: Used for Operational Phase impacts which could typically last fifteen to sixty years.

18.2.5.6 Significance of Impacts

The Significance of Effects rating has been established using Table 18-3, which was derived from Figure 3.4 of the EPA Guidelines on EIARs. This enables the sensitivities and magnitudes of impact to determine the significance of a particular effect. For example, a section of the proposed Scheme with a high sensitivity and a long-term, medium, positive impact would have a potential 'Positive, Very Significant and Long-term' effect. A section of a proposed Scheme with a low sensitivity and a short-term low negative impact would have a potential 'Negative, Slight and Temporary' effect.

Table 18-3: Significance of Effects Matrix for Traffic and Transport Chapter

	Sensitivity of Existing Environment			
Magnitude	**High**	**Medium**	**Low**	**Negligible**
High	Profound	Very Significant	Moderate	Slight
Medium	Very Significant	Significant	Moderate	Not Significant
Low	Moderate	Moderate	Slight	Not Significant
Negligible	Not Significant	Not Significant	Not Significant	Imperceptible

The definitions for the Significance of Effects ratings for the proposed Scheme ranging from Imperceptible to Profound have been adopted from Table 3.4 of the EPA Guidelines on EIARs and are outlined in Table 18-4.

Table 18-4: EIAR Impact Significances

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

Potential mitigation and monitoring measures have been considered for assessments that result in a negative effect and significant or higher (i.e. significant, very significant or profound). Further details on the sensitivities, magnitude and associated impact significance, and how they've been derived for pedestrians, cyclists, public transport and general traffic is provided in Section 18.4 of this chapter.

18.3 Baseline Environment

18.3.1 Overview

This section provides an overview of the existing active travel, traffic and transport conditions in the area directly impacted by the proposed Scheme and is informed by desk-based research along with data collected for the area. These baseline conditions have been identified so the context of the proposed Scheme and its potential impacts on the local highway and transport network can be fully understood. In describing the baseline conditions, the scheme has been divided into three distinct areas as illustrated in Figure 18-10. Each of these areas are fully described in Chapter 5 (Description of the proposed Scheme) of this EIAR.

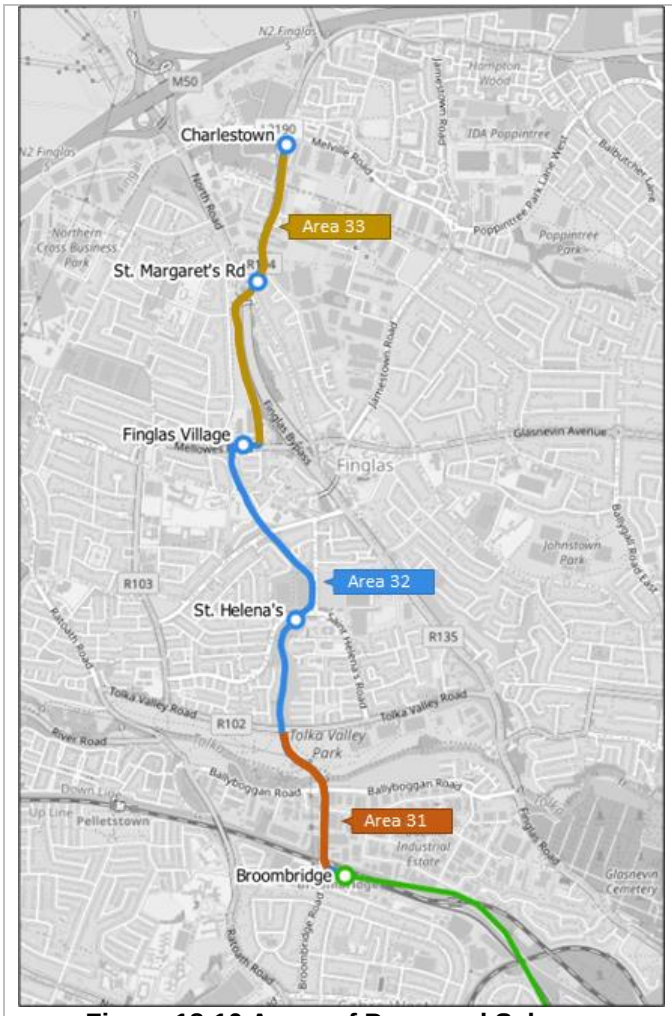


Figure 18-10 Areas of Proposed Scheme

Area 31: Broombridge to Tolka Valley Road:

- Broombridge Road
- Ballyboggan Road
- Tolka Valley Road

Area 32: Tolka Valley Road to Finglas Village Stop:

- St Helena's Road
- Patrickswell Place
- Mellowes Road

Area 33: North of Finglas Village Stop to the terminus at Charlestown Stop:

- St Margaret's Road

18.3.2 Area 31: Broombridge to Tolka Valley Road

This Section outlines the baseline (existing) environment for walking, cycling, bus services and general traffic along Area 31 of the proposed Scheme, between Broombridge and Tolka Valley Road. Area 31 comprises Broombridge Road, Ballyboggan Road and Tolka Valley Road.

18.3.2.1 Pedestrian Infrastructure

There are footpaths along the entire eastern side of the Broombridge Road with minimum widths of approximately 1.8m. Footpaths approximately 3m wide are provided on the western side of Broombridge Road for a distance of 56m south of the Ballyboggan Road junction.

There is one controlled pedestrian crossing on Broombridge Road at the access to the Royal Canal Way north of Broombridge station. Uncontrolled crossings across priority junctions at entrances to Glen Industrial Estate and Lagan Road benefit from dropped kerbs. At the junction with Ballyboggan Road, there is an uncontrolled pedestrian crossing on the eastern arm with tactile paving and dropped kerbs along with a central island.

18.3.2.2 Cycle Infrastructure

There is an advisory cycle lane on the northern side of the Ballyboggan Road which stops to the east of the junction with Broombridge Road. Outside of this, there is no on-road cycle infrastructure along Area 31 of the proposed Scheme. Cyclists are expected to share the traffic lanes in both directions. There is an existing off-road cycle track within Tolka Valley Park which will interact with the alignment of the proposed Scheme.

To the south of the entrance to Glen Industrial Estate, the southbound traffic lane is restricted to buses and cyclists only. Southbound general traffic is banned; however, cyclists have to share the carriageway with buses. There is a shuttle traffic light system in place controlling one-way traffic on the bridge over the canal and rail line.

18.3.2.3 Bus Infrastructure

The southbound traffic lane over the canal and railway bridge is restricted to buses and cyclists only with a shuttle traffic light system in operation. There are currently no bus stops and no bus services in operation along Area 31 of the proposed Scheme. Under the BusConnects network redesign, the following services are planned to operate via Broombridge Road and Ballyboggan Road (Refer to Table 18-5):

Table 18-5: Area 31 Planned BusConnects Services

Service	Route	Typical Peak Headway[3]	
		Weekday	Weekends
N2	Heuston – Broombridge – Clontarf Rail Station	15 mins	30mins – 1 hour
L62	Blanchardstown – Tyrrelstown – Broombridge	15 mins	30mins – 1 hour
L89	Airside - Swords - Knocksedan - Toberburr - Finglas	1 hour	1 hour

18.3.2.4 General Traffic

Broombridge Road

Broombridge Road north and south of Broombridge is a single carriageway with one lane in each direction, with a shuttle movement across the bridge. The southbound traffic lane over the canal and railway bridge is restricted to buses and cyclists only. North of the Royal Canal there are two main entrances off Broombridge Road into industrial parks, including:

- Broombridge Road / Glen Industrial Estate Junction: mini roundabout with a radius of approximately 6m and a single lane entry on each arm; and
- Broombridge Road / Lagan Road Junction: priority junction with a single lane entry on each arm. Traffic exiting Lagan Road gives way to the main movement along Broombridge Road. The Lagan Road arm has wide turning radii designed to accommodate HGV movements.

The Broombridge Road / Ballyboggan Road junction is a priority junction with a single lane entry on each arm as illustrated in Figure 18-11. Also highlighted on Figure 18-11 is traffic survey data for the AM peak hour (08:00 – 09:00) from February 2019 (note the figure in brackets represents Heavy Goods Vehicles with the unbracketed value representing all other traffic). The traffic data indicates:

[3] Timetable information referenced throughout this chapter is correct at the time of writing (8th July 2024)

- The westbound movement along Ballyboggan Road experiences the highest traffic flows in the AM peak with 542 vehicles;
- 286 vehicles turn from Ballyboggan Road to Broombridge Road, including 5 Heavy Goods Vehicles (HGVs); and
- Broombridge Road experiences a two-way traffic flow of 603 vehicles in the AM peak hour.

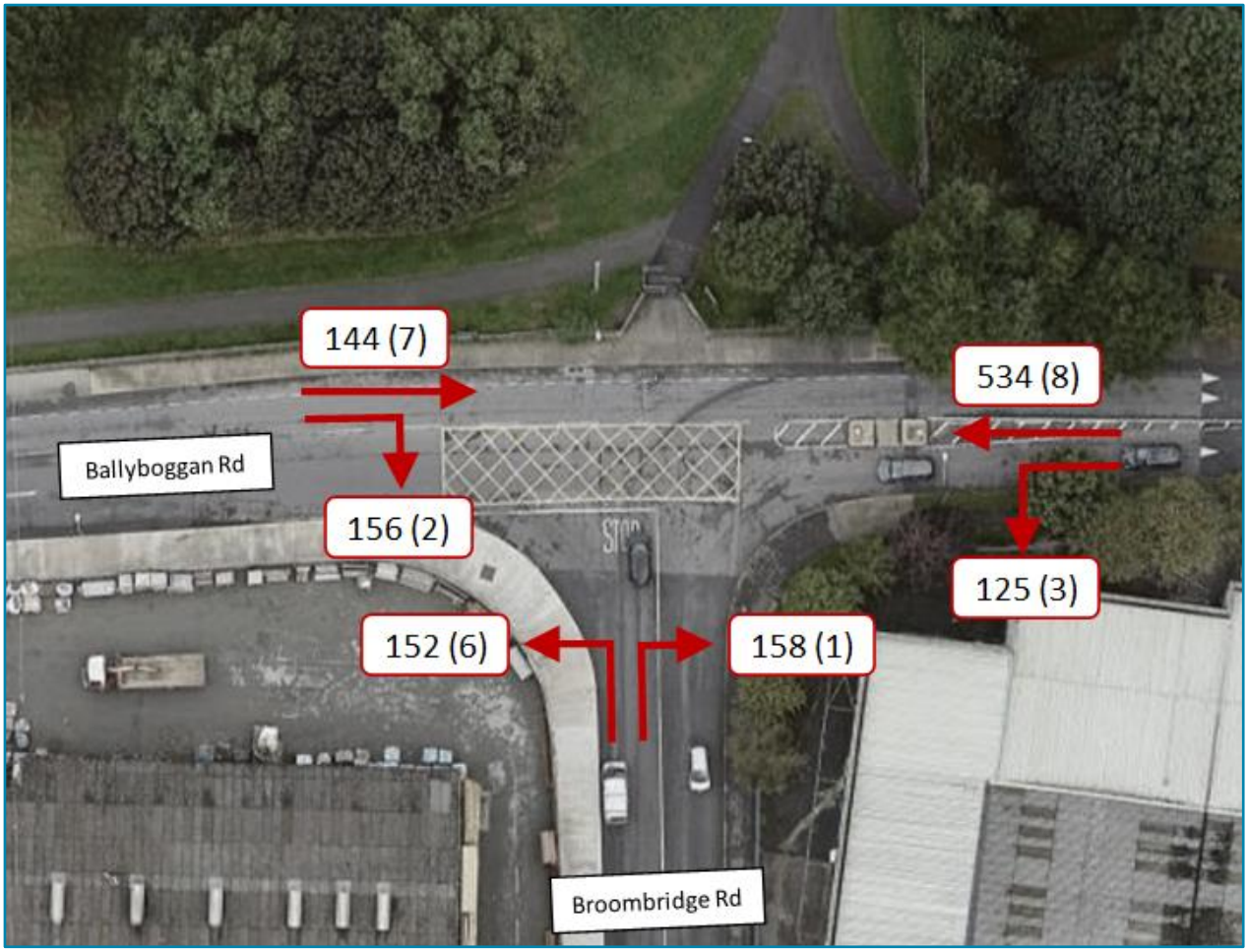


Figure 18-11: Broombridge Rd/Ballyboggan Rd Junction (08:00 – 09:00 Traffic Count)

Tolka Valley Road

Tolka Valley Road is a single carriageway with one lane travelling in each direction running from the R135 to Ratoath Road. It is traffic calmed with speed bumps located at regular intervals along the route.

18.3.3 Area 32: Tolka Valley Road to Finglas Village Stop

This Section outlines the baseline environment for walking, cycling, bus services and general traffic along Area 32 of the proposed Scheme, between Tolka Valley Road and Finglas Village. Area 32 comprises St Helena's Road, Patrickswell Place and Mellowes Road (R103).

18.3.3.1 Pedestrian Infrastructure

There are footpaths, approximately 1.6m wide, and street lighting both north and south of St Helena's Road behind grass verges. There are no controlled pedestrian crossings on St Helena's Road in the vicinity of the proposed Scheme.

There are footpaths both sides of Patrickswell Place which are generally 2m wide along the route. There are dropped kerbs at access to properties along the route, however, there are no controlled pedestrian crossings. There is an uncontrolled crossing on the Patrickswell Place arm of the junction with Wellmount

Road. This connects to a pedestrian footpath leading to St Michael's Holy Faith Secondary School. There are no formalised pedestrian crossings to the north of Patrickswell Place at the junction with Cappagh Road.

There is a pedestrian and cycle only link opposite Patrickswell Ct which connects to Cappagh Road, and which is protected by bollards. This link provides a connection to Finglas Parochial National School, however, there are no formal crossing points at the junction with Cappagh Road.

There are footpaths and street lighting along both sides of the Mellowes Road which are all generally around 2m in width. There is a signal-controlled pedestrian crossing with dropped kerbs and tactile paving close to the entrance of Mellowes Crescent which connects to the Finglas Youth Resource Centre. There is also a signal-controlled pedestrian crossing to the east of Mellowes Road at the slip roads to the R135.

18.3.3.2 Cycle Infrastructure

There is no on or off-road cycle infrastructure along Area 32 of the proposed Scheme. Cyclists are expected to share the traffic lanes in both directions.

18.3.3.3 Bus Infrastructure

There are no bus lanes on the roads along Area 32 of the proposed Scheme. The following bus services currently operate via St Helena's Road (Refer to Table 18-6):

Table 18-6: Area 32 St Helena's Road Bus Services

Service	Route	Typical Peak Headway	
		Weekday	Weekends
40	Charlestown Shopping Centre Towards Earlsfort Terrace	10 – 12 mins	10 – 15 mins
220	DCU (The Helix) – Lady's Well Road via Blanchardstown Shopping Centre	1 service per hour	1 service per hour
BusConnects Planned Services			
F3	Charlestown – Finglas SW – City Centre – Greenhills	10 mins	15 – 20 mins

Under the proposed BusConnects network redesign, the Route F3 will operate via St Helena's Road with a frequency of 10 minutes in the peak hours.

The following bus services currently operate via Mellowes Road (Refer to Table 18-7):

Table 18-7: Area 32 Mellowes Road Bus Services

Service	Route	Typical Peak Headway	
		Weekday	Weekends
N4	Point Village Towards Blanchardstown Shopping Centre	10 mins	15 – 20 mins
40D	Parnell St. Towards Tyrrelstown	15 mins	30 mins
40B	Parnell St. Towards Toberburr	6 services per day	6 services per day
220t	Collins Avenue West to Finglas Garda Station	1 service per day	Weekday only service
BusConnects Planned Services			
F2	Charlestown – Finglas NW – City Centre – Templeogue	10 mins	15 – 20 mins
F3	Charlestown – Finglas SW – City Centre – Greenhills	10 mins	15 – 20 mins

18.3.3.4 General Traffic

St Helena's Road

St Helena's Road is a single carriageway with one lane travelling in each direction. It is traffic calmed by speed bumps located at regular intervals along the route. The proposed Scheme will cross St Helena's Road near the Tusla St Helena's Family Resource Centre and the junction with Farnham Drive. This section of road is illustrated in Figure 18-12 along with traffic count data from the AM peak hour (08:00 – 09:00) taken from a JTC undertaken in November 2021. The results indicate a relatively low volume of traffic using St Helena's Road at this location in the AM peak with 203 vehicles travelling eastbound and 127 travelling westbound.

Figure 18-12: St Helena's Rd (08:00 – 09:00 Traffic Count)

Patrickswell Place

Patrickswell Place is a single carriageway road with one lane travelling in each direction connecting Wellmount Road to Cappagh Road. Along Patrickswell Place there are entrances to the residential estates of Wellmount Parade and Patrickswell Ct.

At the southern end, the junction with Wellmount Road is a mini roundabout with a radius of approximately 6.5m and a single lane entry on each arm. At the northern end, the junction with Cappagh Road is a priority junction with a single lane entry on each arm.

In general, Patrickswell Place is a relatively low trafficked street. ATCs undertaken in November 2021 indicate an average of 196 vehicles travelling northbound and 344 travelling southbound in the AM peak hour (08:00 – 09:00) during the five weekdays surveyed. Figure 18-13 outlines the profile of traffic flows throughout the day in both directions of travel from the ATC data. The results indicate that the AM peak hour experiences the highest 2-way traffic volumes on Patrickswell Place of 540 vehicles. It also suggests that there is a sustained afternoon / evening peak which stretches from 14:00 to 18:00, however, with lower traffic volumes when compared to the AM.

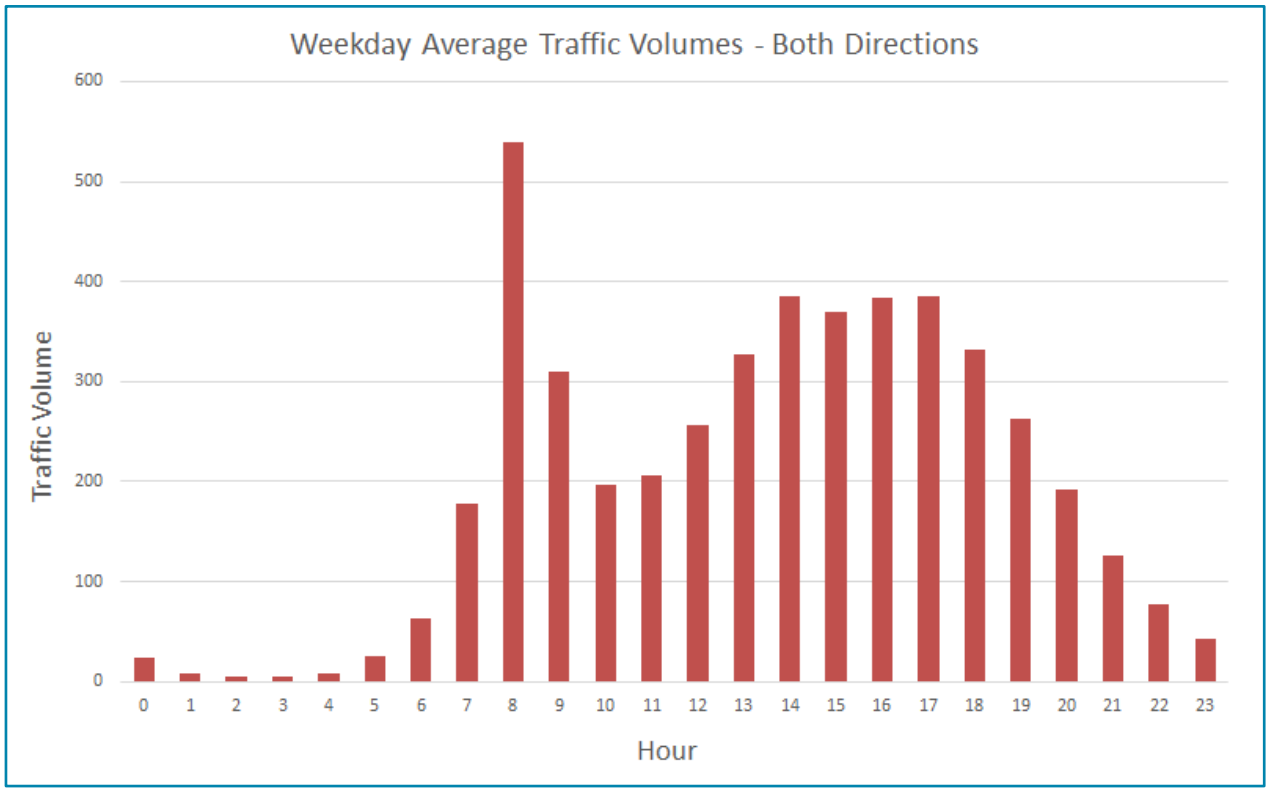


Figure 18-13: Patrickswell Place 2-Way Weekday Average Traffic Volumes

Mellowes Road

Mellowes Road is a single carriageway with one lane travelling in each direction. The proposed Scheme will cut through the Finglas Garda Station car park and cross Mellowes Road via a new signalled control crossing at this location. It will then run parallel along the northern side of Mellowes Road before turning north through Mellowes Park.

The section of Mellowes Road directly impacted by the proposed Scheme is illustrated in Figure 18-14 along with traffic count data from the AM peak hour (08:00 – 09:00) taken from JTCs undertaken in November 2021.

Figure 18-14: Mellowes Road AM Peak Traffic Volumes

The results indicate a two-way traffic volume on Mellowes Road of approximately 960 vehicles in the AM peak, with relatively similar flows noted in the PM peak hour (17:00 – 18:00).

18.3.4 Area 33 North of Finglas Village Stop to the Terminus at Charlestown Stop

This Section outlines the baseline environment for walking, cycling, bus services and general traffic along Area 33 of the proposed Scheme, between Mellowes Park and the terminus at Charlestown. Area 33 mainly comprises St Margaret's Road and the key junctions with the R135, McKee Avenue and Charlestown Place.

18.3.4.1 Pedestrian Infrastructure

Footpaths are provided along both sides of St Margaret's Road. In general, the footpaths are wider than the desirable minimum width recommended by DMURS of 1.8m for the majority of the route. However, there are a number of pinch points where footpaths reduce a width as narrow as 1m.

There is one signal-controlled pedestrian crossing with tactile paving and dropped kerbs along St Margaret's Road located north of the entrance to Jamestown Business Park. Uncontrolled crossings across priority junctions at side roads benefit from dropped kerbs. Further information on pedestrian facilities at key junctions along St Margaret's Road is provided in Section 18.3.4.4 below.

18.3.4.2 Cycle Infrastructure

There is no on or off-road cycle infrastructure for the majority of Area 33 of the proposed Scheme with cyclists expected to share the traffic lanes in both directions. Just south of the junction with Charlestown Place/Melville Road, there is approximately 200m of off-road segregated cycle track to the western side of St Margaret's Road.

18.3.4.3 Bus Infrastructure

There are no bus lanes on the roads along Area 33 of the proposed Scheme. Table 18-8 outlines the existing bus services currently operating via St Margaret's Road, along with those planned as part of the BusConnects network redesign.

Table 18-8: Area 33 St Margaret's Road Bus Services

Service	Route	Typical Peak Headway	
		Weekday	Weekends
N6	Finglas Village – Naomh Barróg GAA	10 - 12mins	10-15 mins
40	Charlestown Shopping Centre Towards Earlsfort Terrace / Leeson St	10-12 mins	10-15 mins
40B	Parnell St. Towards Toberburr	6 services per day	6 services per day
140	Ballymun (IKEA) Towards Palmerston Park	10 mins	15-20 mins
BusConnects Planned Services			
F1	Charlestown – Finglas Bypass – City Centre – Tallaght	10 mins	15 – 20 mins
F2	Charlestown – Finglas NW – City Centre – Templeogue	10 mins	15 – 20 mins
F3	Charlestown – Finglas SW – City Centre – Greenhills	10 mins	15 – 20 mins
L89	Airside – Swords – Knocksedan – Toberburr – Finglas	60 mins	7 service per day

18.3.4.4 General Traffic

St Margaret's Road is a single carriageway with one lane travelling in each direction connecting the R135 with Charlestown Place and Melville Road. The road has a speed limit of 50km/h but is traffic calmed with speed bumps located along the route. There are a number of uncontrolled entrances along St Margaret's Road to business and residences including access to the Jamestown Business Park, McKelvey Avenue and ESB Networks. The existing major junction arrangements along the section are as follows:

- R135 (North Road) / St Margaret's Road / Casement Road 4-arm roundabout;
- St Margaret's Road / Charlestown Place / Melville Road 4-arm signalised junction; and
- St Margaret's Road / McKee Avenue mini roundabout.

The characteristics of each major junction are described in turn below, along with traffic survey data where available (Refer to Figure 18-15 to Figure 18-17).

R135 (North Road) / St Margaret's Road / Casement Road Junction

Figure 18-15: R135 (North Road) / St Margaret's Road / Casement Road Junction

- Large 2-lane roundabout with a radius of approximately 26m and four approach arms;
- 2-lane approaches on the arms from the north and south along the R135 with 2 receiving lanes on both arms also. The southbound lane on the R135 merges from 2-lanes to 1-lane for general traffic approximately 75 m south of the junction with St Margarets Road;
- Casement Road is a single lane approach. The St Margaret's Road arm is also a single lane approach which flares to 2-lanes at the stop line. The junction between St Margaret's Road and McKee Avenue is located in close proximity approximately 100m to the northeast;
- There is a pedestrian footbridge to the south of the junction connecting Casement Road to St Margaret's Road crossing over the R135. There are no other pedestrian crossing facilities on the north, east or west arms of the junction;
- Heaviest traffic volumes in the AM peak (08:00 – 09:00) along the R135 with 1,055 vehicles entering the junction from the south and 1,262 vehicles from the north. There is a similar trend in the PM peak also (17:00 – 18:00); and
- The largest traffic movements through the junction are in a north-south (and vice-versa) direction along the R135, however, there are also significant turning volumes from:
  - St Margaret's Road towards the R135 (South) (313 vehicles);
  - R135 (South) towards St Margaret's Road (244 vehicles); and
  - R135 (North) towards Casement Road (232 vehicles) and St Margaret's Road (205 vehicles)

St Margaret's Road / McKee Avenue

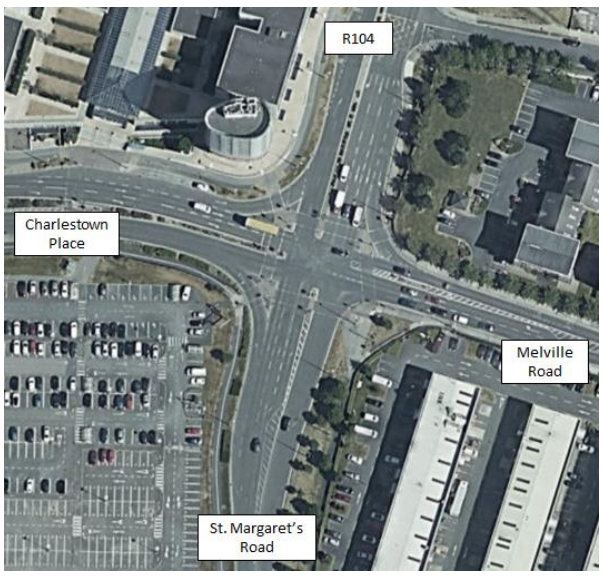
Figure 18-16: St Margaret's Road / McKee Avenue Junction

This junction is a mini roundabout with an approximate radius of 11m and four approach lanes. Each of the approaches are single-lane entries with the western arm providing access to Lidl.

There are no controlled crossings for pedestrians at the junction. There are uncontrolled pedestrian crossings on the St Margaret's Road (North) and McKee Avenue arms with dropped kerbs and pedestrian islands.

The bus routes 140, 40, 40B and N6 operate through the junction. The Go-Ahead Ireland route N6 and Dublin Bus Route 40 both operate every 10-12 minutes via McKee Avenue towards the Seamus Ennis Road in Finglas.

St Margaret's Road / Charlestown Place / Melville Road



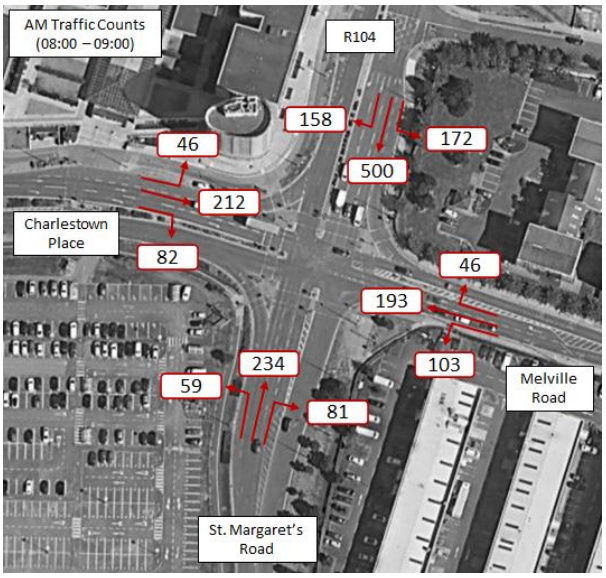


Figure 18-17: St Margaret's Road / Charlestown Place / Melville Road Junction

- Large 4-arm signalised junction;
- St Margaret's Road expands to 4-lanes at the junction approach including two straight ahead lanes, a right-turn pocket approximately 28m in length and a dedicated left-turn filter lane controlled by a separate signal head;
- The Charlestown Place arm has 3-lanes at the approach including a dedicated left-turn slip lane approximately 65m in length. There is one lane for straight ahead movements only along with a separate lane for right-turns only onto St Margaret's Road;
- The R104 approach from the north expands to 4-lanes at the junction including two straight ahead lanes, a right-turn flare approximately 110m in length and a dedicated left-turn filter lane controlled by a separate signal head;
- The Melville Road approach arm includes a single inside lane for straight ahead and left-turn movements, along with a right-turn pocket approximately 45m in length;
- There are signal controlled pedestrian crossing on all arms including dropped kerbs, tactile paving and pedestrian islands. However, due to the size of the junction, crossing widths are quite long and in some cases multiple movements are required to cross the junction – multiple lanes plus filter lanes to navigate;
- The JTC data indicates the largest volume of traffic (830 vehicles) enters the junction from the north (R104) in the AM peak hour (08:00 – 09:00); and
- The heaviest traffic movement is from the R104 (North) towards St Margaret's Road (500 vehicles). However, there are also relatively high volumes turning left on Melville Road (172 vehicles) and right onto Charlestown Place (158 vehicles). On all other approach arms, the highest traffic volumes are observed on the straight-ahead movements.

18.4 Potential Impacts

18.4.1 Characteristics of the Proposed Scheme

The characteristics of the proposed Scheme are described in detail in Chapter 5 (Description of proposed Scheme).

18.4.1.1 Do Nothing Scenario

With regards to this chapter, the 'Do Nothing' scenario means there would be no changes to existing transport infrastructure. Therefore, infrastructure provision for public transport, pedestrians and cyclists would remain the same. The streetscape would continue to be based around the movement and parking requirements of private cars, rather than people. High levels of traffic are associated with discouraging pedestrian and cyclist activity and this activity would be further discouraged as traffic congestion remains the same or increases in line with travel demand growth.

18.4.1.2 Do Minimum Scenario

The 'Do Minimum' scenario represents the likely traffic and transport conditions of the study area without the proposed Scheme in place. This scenario forms the reference case by which to compare the proposed Scheme ('Do Something'). The opening year for the proposed Scheme is 2035, with a 2050 design assessment year (opening + 15 years).

For the qualitative analysis the assessment is undertaken in relation to the conditions of the existing transport network, which have been outlined in Section 18.3 (Baseline Environment) corresponding with a Do Nothing scenario.

For the quantitative analysis, (i.e. the transport modelling elements of the impact assessment), the Do Minimum scenario is based on the 'likely' conditions of the transport network and includes for any known permanent improvements or changes to the road or public transport network that have taken place, been approved or are planned for implementation. A summary of major schemes included in the Do Minimum

scenario is provided in section 18.2.5.3 previously, and the full list of schemes can be found in Chapter 4 of Volume 5 – Appendix A18.1 (Transport Modelling Report) of this EIAR.

18.4.1.3 Do Something Scenario

The Do Something scenario represents the likely conditions with the proposed Scheme in place. The traffic and transport elements of the proposed Scheme are presented in detail in Chapter 5 (Description of proposed Scheme) of the EIAR.

18.4.2 Construction Phase

This section outlines the potential transport and traffic impacts that construction of the proposed Scheme will have on the study area during the Construction Phase.

Chapter 6 (Construction Activities) sets out the approach that will be taken to construct the proposed Scheme, while it also provides an overview of the construction activities necessary to undertake the works, including information on proposed construction compounds, haul roads and construction plant and equipment. This assessment, as outlined herein, provides an overview of the potential traffic and transport impacts of the Construction Phase.

18.4.2.1 Description of Construction Works

The proposed Scheme has been divided into four primary areas covering a length of 3.9km, entailing a new northern extension of the Luas Green Line from its current terminus in Broombridge to a new terminus in Charlestown, with four new Stops, two major bridges, one new Park & Ride (P&R) facility, an extension of the Broombridge Hamilton depot and associated works. The four areas have been sub-divided further into 11 sections. Due to the dispersed nature of the programme, multiple sections will be progressed simultaneously to optimise the programme duration of the overall phasing of the proposed Scheme.

Table 18-9 outlines the four distinct areas and 11 sections of construction works in the overall phasing of the proposed Scheme. The location of these sections is shown in Volume 4 – Map Figure 6-1 of this EIAR.

Table 18-9: Construction Sections and Descriptions

Area	Area Description	Section No.	Section Description
30	Broombridge Hamilton depot	S30.1	Broombridge Stabling Site
31	Broombridge to Tolka Valley Road	S31.1	Broombridge to Tolka Valley Park
		S31.2	Tolka Valley Park Bridge
		S31.3	Tolka Valley Park to Tolka Valley Road [overlapping Section 31.2]
32	Tolka Valley Road to Finglas Village Stop	S32.1	Tolka Valley Road to St Helena's Road and St Helena's Stop
		S32.2	St Helena's Road to Cardiff Castle Road
		S32.3	Finglas Village and Finglas Village Stop
33	North of Finglas Village Stop to the terminus (Charlestown Stop)	S33.1	Mellowes Park
		S33.2	R135/R104 junction
		S33.3	St Margaret's Stop
		S33.4	St Margaret's Road and Charlestown Terminus

18.4.2.2 Construction Programme

The expected construction programme for the construction of the main works including testing and commissioning is approximately 3.5 years. Enabling Works contracts will be progressed in advance of this.

To achieve the overall programme duration, it will be necessary to work on more than one section at any one time. The programme has been prepared with a view to providing as much separation as practicable between sections under construction at any given time. This has been done to minimise traffic disruption and facilitate the ease of movement of sustainable modes, bus services and goods along the proposed Scheme.

The staging of construction and associated temporary traffic management measures has considered the receiving environment when developing the schedule of works.

18.4.2.3 Construction Route

The locations of the construction compounds to facilitate the construction works are provided in Chapter 6 (Construction Activities) of this EIAR. The construction compound locations have been selected based on available lands along the route, distance from the majority of the proposed Scheme major works and access to the National and Regional Road network. Please refer to Volume 4 – Map Figure 6-1 for the proposed construction compound and haul road locations.

The primary construction compounds will contain a main site office, and welfare facilities for the Employer's personnel and Contractor's personnel. An area for materials to be stored for reuse as necessary will be provided. Items of plant and equipment will also be stored within the compound. The secondary construction compounds will contain some local site office and welfare facilities. They will also be used for localised storage for material, plant and equipment within the compound. Limited parking for construction vehicles will also be available within the primary and secondary construction compounds.

Construction vehicles will be directed to access work sections via the proposed Scheme and dedicated construction vehicle routes. It is assumed that all national roads and regional roads in the immediate vicinity of the proposed Scheme would be used by construction vehicles. The following National roads are expected to be used as construction vehicle access routes during the Construction Phase of the proposed Scheme:

- N2;
- N3; and
- M50 Motorway.

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

- Broombridge Road;
- Ballyboggan Road;
- Tolka Valley Road;
- St Helena's Road;
- Farnham Drive;
- Farnham Drive Extension;
- Wellmount Road;
- Patrickswell Place;
- Cappagh Road; and
- Cardiff Castle Road;
- Mellowes Road;
- Finglas Road / North Road;
- St Margaret's Road;
- Charlestown Place;
- R147;
- Nephin Road;
- Faussagh Avenue;
- R131.

Potential construction vehicle access routes for the proposed Scheme are shown in Figure 18-18.

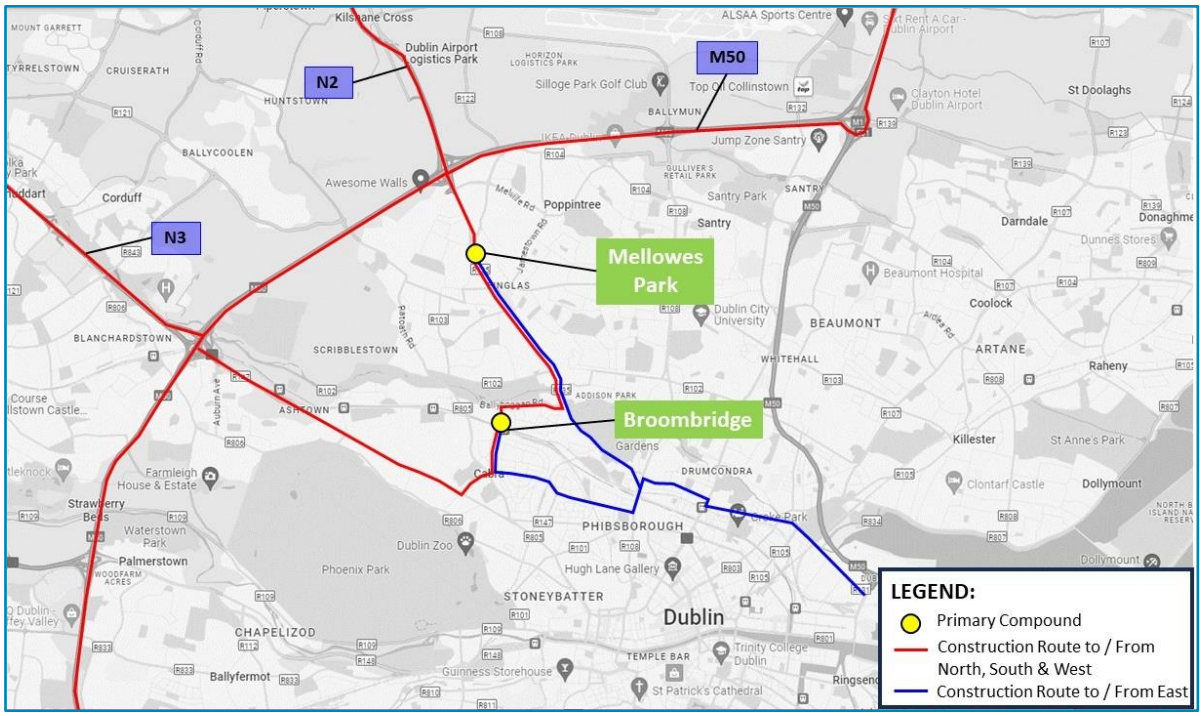


Figure 18-18: Potential Construction Vehicle Access Routes

Whilst the main roads used for construction are strategic routes, a number of local roads will be used as noted above. The area is noted to have a medium level of sensitivity given the residential facilities and infrastructure within the area.

18.4.2.4 Potential Impacts

Construction of the proposed Scheme has the potential to impact people's day-to-day activities at all four sections while the works are underway. Chapter 6 (Construction Activities) and the Construction Traffic Management Plan (CTMP) (Volume 5 – Appendix A6.2) of this EIAR identifies impactful activities, considers their effect, and identifies mitigation measures to reduce or remove their impact insofar as practically possible.

For construction activities on or adjacent to public roads, all works will be undertaken in accordance with DTTS 'Traffic Signs Manual, Chapter 8 Temporary Traffic Measures and Signs for Roadworks' and associated guidance. Chapter 6 (Construction Activities) of the EIAR contains temporary traffic management proposals for the proposed Scheme. These proposals maintain safe distances between road users and road workers, depending on the type of construction activities taking place and existing site constraints. Temporary diversions, and in some instances temporary road closures, will be required where a safe distance cannot be maintained to undertake works necessary to complete construction of the proposed Scheme. Table 1-2 of the CTMP outlines the lane closures and diversions required throughout the Construction Phase. All road closures and diversions will be submitted to Dublin City Council and Fingal County Council where relevant for granting a Temporary Closing of Roads Order. The need for temporary access provisions will be confirmed with residents and businesses prior to their implementation. Access and egress to residents and business will be maintained at all times during construction. As a result, the potential impacts associated with the construction of the proposed Scheme were adjudged to have a low magnitude.

Pedestrians

As described in Chapter 6 (Construction Activities) of the EIAR, pedestrians may be temporarily impacted by construction activities along the proposed Scheme corridor. The CTMP states that the appointed Contractor must implement the relevant measures set out in Section 8.2.8 of the Traffic Signs Manual to ensure the safety of all road users, in particular pedestrians (including able-bodied pedestrians, wheel-chair users, mobility impaired pedestrians, pushchair users). Therefore, where footpaths are affected by construction, a safe route will be provided past the work area, and provisions for matching existing facilities

for pedestrians will be made. Where a footway is closed, pedestrians will be notified at the closest existing crossing point and directed to cross at this point. The route of any temporary footway will be clear of obstacles, trip hazards and overhanging objects and the surface will be to a standard suitable for vulnerable road users to travel upon. Where site conditions do not allow for temporary footways through or around the works, a safe diversion route will be provided. Signing will be placed along the diversion route with temporary lighting and signals where required. Since safe alternative routes will be provided for pedestrians if impacted by construction activities in-line with guidance, it was determined that the sensitivity is low. Therefore, the impact on pedestrians during the Construction Phase is considered to be Negative, Slight and Temporary.

Cyclists

Cyclists may be temporarily impacted by construction activities along the proposed Scheme corridor. The CTMP states that the appointed Contractor must implement the required measures set out in Section 8.2.8 of the DTTS Chapter 8, Temporary Traffic Measures and Signs for Roadworks of the Traffic Signs Manual (DTTS 2019b) and the DTTS Temporary Traffic Management Design Guidance (DTTS 2019c) to ensure the safety of cyclists, including the use of site-based risk assessments. Therefore, where cycle tracks are affected by construction, a safe route will be provided past the work area, and provisions for matching existing facilities for cyclists will be made. The route of any temporary off-road cycle track will be clear of obstacles, trip hazards and overhanging objects and the surface will be to a standard suitable for vulnerable road users to travel upon. Where site conditions do not allow for temporary cycle tracks through or around the works, a safe diversion route will be provided. Signing will be placed along the diversion route with temporary lighting and signals where required. Where cyclists are to be accommodated on the roadway, it will be ensured that the lane widths are adequate to accommodate cyclists as well as vehicular traffic. Since cyclists are more likely to interact with vehicular traffic than pedestrians, and any temporary closures (for example cycle lanes) may increase this interaction, the sensitivity has been defined as medium. As a result, the impact on cyclists during the Construction Phase is considered to be Negative, Moderate and Temporary.

Public Transport

Existing public transport routes will be maintained throughout the duration of the Construction Phase of the proposed Scheme (notwithstanding potential for occasional road closures / diversions as described in Chapter 6 (Construction Activities) of the EIAR).

Wherever practicable, bus services will be prioritised over general traffic. Some existing bus stop locations will need to be temporarily relocated to accommodate the works. In such cases, bus stops will be safely accessible to all users and all temporary alterations to bus services will be determined in consultation with DCC, FCC and the service providers. Therefore, the sensitivity for public transport users has been defined as low, and the impact during the Construction Phase is considered to be Negative, Slight and Temporary.

Parking and Access

When roads and streets are being upgraded, there will be some temporary disruption / alterations to on-street and off-street parking provision, and access to premises in certain locations along the proposed Scheme. Local arrangements will be made on a case-by-case basis to maintain continued access to homes and businesses affected by the works. Details regarding temporary access provisions will be discussed with homes and businesses prior to construction starting in the area. The duration of the works will vary from property to property, but access and egress will be maintained at all times. As a results, the sensitivity has been defined as low, and the impact on parking and access during the Construction Phase is considered to be Negative, Slight and Temporary.

18.4.2.5 General Traffic

The proposed Scheme will be constructed to ensure the mitigation of disturbance to residents, businesses and existing traffic. The roads and streets along the proposed Scheme will remain open to general traffic wherever practicable during the Construction Phase. However, some localised temporary lane closures, road closures and diversions will be necessary to facilitate construction. Table 1-2 of the CTMP (Volume 5 – Appendix A6.2) outlines the lane closures and diversions required throughout the construction of the proposed Scheme.

General Traffic Redistribution

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

A CTMP has been prepared and is included in Volume 5 – Appendix A6.2 of this EIAR, that demonstrate that the impacts to the public road network during the Construction Phase of the proposed Scheme can be minimised and designates appropriate diversion routes in the case where localised temporary closures are required. Further details on the CTMP can be found in Section 18.5.1 and Volume 5 – Appendix A6.2 of this EIAR. Overall, for these reasons, the impact on general traffic redistribution is considered to be Negative, Moderate and Temporary due to the temporary nature of any restrictions.

For the purpose of Air Quality (Chapter 13), Climate (Chapter 14) and Noise & Vibration (Chapter 15) impacts assessments, a worst-case scenario for construction activities was considered for assessment purposes and has been modelled in the LAM based on a notional stage of construction whereby sections of St Margaret's Road and the main R135 / St Margaret's Road junction were under construction concurrently. Further details on the impacts assessment can be found within these chapters.

Construction Traffic Generation

Site Operatives

As described in Chapter 6 (Construction Activities), there is expected to be a peak of 180 staff directly employed across the proposed Scheme. Standard working hours, as set out in Chapter 6, are from 07:00hrs to 19:00hrs on weekdays (excluding Bank and Public Holidays) and from 07:00hrs to 13:00hrs on Saturdays.

A Construction Stage Mobility Management Plan (CSMMP) has been prepared and is included in the CTMP (Volume 5 – Appendix A6.2) which will be updated and finalised by the appointed Contractor prior to the commencement of construction. The CSMMP includes measures to actively discourage personnel from using private vehicles to travel to site, and promote the use of public transport, cycling and walking. Measures will include where appropriate the following:

- Encouraging use of public transport (e.g. to Broombridge Luas Stop);
- Encouraging active travel and having appropriate provisions;
- Encouraging car-pooling;
- Prescribing specific routes for journeys (including access arrangements, compounds, parking and public transport);
- Provision of a minibus around site; and
- Provision of temporary accommodation.

Workforce travel will be managed and controlled by implementing systems to monitor and record travel movements during the works. Private parking at the construction compounds will be limited and vehicle-sharing will be encouraged, subject to public health guidelines, where travel by private vehicle is a necessity e.g. for transporting heavy equipment. A combination of CSMMP measures, as well as work shift patterns, means that fewer than 8 trips by private vehicle are envisaged to and from the primary site compound at Broombridge, and similarly 8 from the primary site compound at St Margaret's Road during peak periods.

Heavy Goods Vehicles (HGVs):

Additional construction traffic will be generated during the Construction Phase of the proposed Scheme, for the purpose of the following:

- Clearance of existing site material and waste;
- Earthworks cut/fill operations;
- Deliveries of construction material; and

- Removal of construction waste material.

Chapter 6 (Construction Activities) of this EIAR, provides a construction programme breakdown of the expected operation for the construction of the proposed Scheme during each subsection. Multiple Work fronts will progress concurrently. It should be noted that the CTMP will control vehicular movement along the construction route, including restrictions on the number of HGVs accessing and egressing the construction works throughout the day to mitigate the impacts to general traffic on the surrounding road network.

Based on the programme and the construction activities associated with the proposed Scheme an estimated maximum of 8 and 6 HGV trips respectively will access / egress the southern section of the construction works during the AM and PM Peak Hours primarily via the M50 / N3. Similar activity would be expected for the northern section of the site with access / egress primarily via the M50 / N2. Overall, this amounts to an expected maximum 16 access and 12 egress HGV trips during the AM and PM Peak Hours.

Overall Peak Hour Impacts:

Table 18-10 identifies the anticipated maximum construction traffic generation by site operatives and HGVs during the AM and PM Peak Hours.

Table 18-10: Anticipated Maximum Peak Construction Traffic Per Hour During AM/PM Peak Hours

Peak Hour	Arrivals (veh)		Departures (veh)		Total Two-Way Traffic Flows (vehicles)
	Car/Van	HGV	Car/van	HGV	
AM Peak Hour	16	16	0	16	48
PM Peak Hour	0	12	16	12	40

Given that the above impacts are minimal and comfortably below the thresholds set out in TII's Guidelines for Transport Assessments (see Section 18.4.3.8 for further details). Likewise, the sensitivity of the area is medium based on the facilities surrounding the construction routes. Therefore, it is considered appropriate to define the general traffic impacts of the Construction Phase to have a Negative, Moderate and Temporary effect.

18.4.2.6 Construction Phase Summary

Table 18-11 below presents a summary of the potential impacts, sensitivity, magnitude and significance of effect of the Construction Phase.

Table 18-11: Summary of Construction Phase Potential Impacts

Assessment Topic	Potential Impact	Sensitivity	Magnitude of Impact	Significance of Effect
Pedestrians	Restrictions to pedestrians along proposed Scheme.	Low	Low	Negative, Slight and Temporary
Cyclists	Restrictions to cyclists along proposed Scheme	Medium	Low	Negative, Moderate and Temporary
Public Transport	Restrictions to public transport along proposed Scheme.	Low	Low	Negative, Slight and Temporary

Assessment Topic	Potential Impact	Sensitivity	Magnitude of Impact	Significance of Effect
Parking and Access	Restrictions to parking / loading along proposed Scheme.	Low	Low	Negative, Slight and Temporary
General Traffic	Restrictions to general traffic along proposed Scheme	Medium	Low	Negative, Moderate and Temporary
	Additional construction traffic flows upon surrounding road network	Medium	Low	Negative, Moderate and Temporary

18.4.3 Operational Phase

18.4.3.1 Introduction

The impact assessment for the Operational Phase has been outlined in terms of a qualitative (walking, cycling, bus infrastructure, Luas improvements) and quantitative (Luas boardings, public transport journey times, general traffic and people movement) impact analysis. These aspects are described in the following sections**.**

18.4.3.2 Qualitative Assessment Methodology

The structure of the qualitative assessment is consistent with the Baseline Environment (Section 18.3) and Chapter 5 (Description of proposed Scheme), whereby the proposed Scheme has been split into three sections. This has allowed for a more detailed analysis of the quality of the infrastructure proposals per section. The approach for each qualitative assessment is outlined below.

Pedestrians

The impacts to the quality of the Pedestrian Infrastructure as a result of the proposed Scheme have been considered with reference to any changes to the existing pedestrian facilities along footpaths and crossing locations. In referring to the overall changes along the full length of the proposed Scheme, the impact assessment primarily focuses only on the pedestrian facilities at junctions to provide a direct comparison between the Do Nothing and Do Something scenarios.

Where the proposed Scheme introduces a change to a junction layout, the impact on pedestrians has been assessed using a set of criteria which has been derived from guidance listed in the references section of this report (Section 18.2). Table 18-12 outlines the assessment criteria for each junction.

Table 18-12: Pedestrian Junction Assessment Criteria

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

The LoS rating demonstrated in Table 18-13 has been applied to each junction for both the Do Nothing and Do Something scenarios based on whether the above indicators have been met.

Table 18-13: Pedestrian Junction Assessment LoS

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

When comparing the Do Nothing and Do Something scenarios for pedestrians, the terms outlined in Table 18-14 have been used to describe the impact, based on the changes in the Qualitative Pedestrian LoS rating.

Table 18-14: Description of Impact for Pedestrian Qualitative Assessment

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

To establish the Significance of Effect for the impacts of the Pedestrian Infrastructure, as a result of the proposed Scheme, a sensitivity rating has been applied to each junction in accordance with the methodology set out in Section 18.2.

Cyclists

The impacts to the quality of the cycling infrastructure as a result of the proposed Scheme have been considered with reference to the changes in physical provision for cyclists provided during the Do Nothing and Do Something scenarios. The NTA's National Cycle Manual, and more recent Cycle Design Manual, have been reviewed and adapted to develop criteria for use in assessing the cycling qualitative impact along the proposed Scheme. The refined cycling facilities criteria are as follows:

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

Table 18-15 outlines the assessment criteria with reference to the corresponding LoS ratings.

Table 18-15: Cycling Assessment Criteria

LoS	Segregation	No. of adjacent cyclists/width		Junction treatment
A+	High degree of separation. Minimal delay	2+1	2.5m	Cyclists get green signal priority at signalised junctions / has priority across uncontrolled junctions/ cyclist priority due to no vehicle traffic

A	Well separated at mid-link with some conflict at intersections	1+1	2.0m	Toucan crossings at signalised junctions for cyclists along junctions not already classified as A+ for junction treatment
B	On-road cycle lanes or carriageway designated as 'quiet cycle routes'	1+1	1.75m	Cyclists share green time with general traffic and cycle lanes continue through the junction, for junctions not already classified as A or A+ for junction treatment
C	Bicycle share traffic or bus lanes	1+0	1.25m	Cyclists share green time with general traffic with cycle facilities (advanced stacking locations / cycle lanes) available up to the junction but don't continue through
D	No specific bicycle facilities	1+0	0.75m	No specific bicycle facilities

When comparing the Do Nothing and Do Something scenarios for cyclists, the terms outlined in Table 18-16 have been used to describe the impact, based on the changes in the Qualitative Cycling LoS rating.

Table 18-16: Description of Impact for Cycling Qualitative Assessment

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

To establish the Significance of Effect for the impacts of the cycling infrastructure, as a result of the proposed Scheme, a sensitivity rating has been applied to each assessed section in accordance with the methodology set out in Section 18.2.

Public Transport

The implementation of the proposed Scheme will result in changes in the quality of bus and Luas infrastructure provision along the route.

The magnitude of impact of the proposed Scheme, applied to the qualitative review of the above factors, is set out in Table 18-17.

Table 18-17: Magnitude of Impact for Public Transport Users Qualitative Assessment

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

To establish the Significance of Effect for the impacts of the public transport infrastructure, as a result of the proposed Scheme, a sensitivity rating has been applied to each assessed section in accordance with the methodology set out in Section 18.2.

18.4.3.3 Potential Impacts – Area 31

Pedestrians

The key infrastructural changes to the pedestrian links along Area 31 of the scheme are the following:

- Removal of existing pedestrian ramp access to norther Broombridge rail platform;
- Converting the Broombridge Road / Speedy Services access from a mini roundabout to an unsignalised junction with a raised table pedestrian crossing on the minor arm;
- Converting the Broombridge Road / Lagan Road unsignalised junction to a signalised junction; and
- Converting the Broombridge Road / Ballyboggan Road unsignalised junction to a signalised junction.

It is noted that the majority of Area 31 comprises Tolka Valley Park, with segregated pedestrian infrastructure present through the park. The scheme provides fully segregated pedestrian and cycling infrastructure to prevent conflict between these modes.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Area 31 of the proposed Scheme are summarised in Table 18-18 along with the accompanying sensitivity for each junction and the resultant significance of effect. A detailed breakdown of the assessment at each junction can be found in Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR. The table below excludes any links that have a negligible impact on the junction and for which no changes are proposed.

Table 18-18: Area 31 – Significance of Effects for Pedestrian Impact During Operational Phase

Junctions	Do Nothing LoS	Do Something LoS	Sensitivity	Magnitude of Impact	Significance of Effect
Broombridge Road / Speedy Services access unsignalised junction (converted from mini roundabout)	D	B	Low	Medium	Positive, Moderate and Long-term
Broombridge Road / Lagan Road signalised junction (converted from unsignalised junction)	C	A	Medium	Medium	Positive, Significant and Long-term
Broombridge Road / Ballyboggan Road signalised junction (converted from unsignalised junction)	D	A	Medium	Medium	Positive, Significant and Long-term
Summary	**D**	**A**	**Medium**	**Medium**	**Positive, Significant and Long-term**

Table 18-18 demonstrates that the proposed Scheme will have a Positive, Significant and Long-term impact on the quality of the pedestrian infrastructure along Area 31 of the proposed Scheme.

The LoS during the Do-Nothing scenario ranges between D and C, with two of the three impacted junctions along this section given the low D ratings. These ratings have been determined using the previously referenced assessment criteria set out in Table 18-13. The LoS will improve to an A rating at three of the impacted junctions and B rating in one of the impacted junctions in the Do Something scenario. This is a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased footpath and crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and the National Disability Authority (NDA) 'Building for Everyone: A Universal Design Approach' (NDA, 2020) with regards to catering for all users, including those with disabilities.

The existing ramp access to the northern Broombridge rail platform will need to be removed to facilitate the Luas Finglas overbridge at this location, with access provided via the main Broombridge station entrance.

This will have a very slight negative impact on pedestrians north of the Royal Canal accessing the northern Broombridge rail platform with increases in walking distances of approximately 200m.

Overall, there will be Positive, Significant and Long-term effect to the quality of the pedestrian infrastructure along Area 31 of the proposed Scheme, during the Operational Phase. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR.

Cyclists

The key infrastructural changes to the cycling links along Area 31 of the scheme are the following:

- Provision of new secure bike parking facilities at Broombridge station supporting Cycle-LRT trips;
- Provision of two-way 3.25m wide cycle track between Broombridge Road / Royal Canal Way junction and Ballyboggan Road;
- Signalisation of the Broombridge Road/Ballyboggan Road junction with cycle lanes brought through the junction in a north / south direction;
- Provision of cycle lanes in a north/south direction across the Tolka Valley Road adjacent to a new signalised pedestrian crossing; and
- It is noted that Tolka Valley Park provides fully segregated cycle paths through the green space. These existing cycle paths are being realigned/reinstated as part of the proposed Scheme.

Table 18-19 below outlines the cycling qualitative assessment along Area 31 of the proposed Scheme, which sets out the overall Do Nothing LoS and the Do Something LoS and the description of impact. Refer to Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR which outlines in further detail the methodology behind each LoS rating given to the Do Nothing and Do Something scenarios.

Table 18-19: Area 31 – Cycling Impact During Operational Phase

Link	Do Nothing LoS	Do Something LoS	Sensitivity	Magnitude of Impact	Significance of Effect
Broombridge Road / Royal Canal Way – Broombridge Road / Ballyboggan Road	D	A	Medium	High	Positive, Very Significant and Long-term
Broombridge Road / Ballyboggan Road – Tolka Valley Road	B	A	Medium	Low	Positive, Moderate and Long-term
Summary	**C**	**A**	**Medium**	**Medium**	**Positive, Significant and Long-term**

Table 18-19 demonstrates that the scheme will have a Positive, Significant and Long-term effect on the cycling environment along Area 31 of the proposed Scheme.

The Do Nothing LoS has been determined using the previously referenced assessment criteria set out in Table 18-15. The LoS rating of the cycling facilities will improve from D and B in the Do-Nothing scenario to A in the Do Something scenario respectively. This is a result of a reduction in traffic speeds and improved cycling infrastructure as part of the proposed Scheme, in particular segregated cycle lanes providing separation from vehicular traffic and improved safety for cyclists.

Public Transport

There are no changes to bus stop locations along Area 31 of the scheme. Broombridge Luas Station is existing but will be connected to the new stops associated with the scheme.

Overall, these changes are considered to have a low impact with no major changes expected and a **Positive, Slight and Long-Term** effect due to the additional Luas connectivity northwards from Broombridge as a result of the proposed Scheme.

18.4.3.4 Potential Impacts – Area 32

Pedestrians

The key infrastructural changes to the pedestrian links along Area 32 of the scheme are the following:

- New signalised crossing at the Tolka Valley Road / Tolka Valley Park entrance;
- Upgraded crossing facilities at St. Helena's Road / Dunsink Road junction, including the addition of a raised table;
- New raised table on Farnham Drive to access the St Helena's Resource Centre;
- Traffic calming on Farnham Drive to the north of St Helena's Road;
- Toucan crossing and pelican crossing on St Helena's Road at St Helena's stop entrance;
- New signalised crossing on Wellmount Road approximately 45m to the east of Wellmount Road / Patrickswell Place junction;
- Converting the Wellmount Road / Patrickswell Place junction from a mini roundabout to an unsignalised priority junction with a raised table;
- Improved crossing facilities at Patrickswell Place / Wellmount Parade junction, including the addition of a raised table;
- Improved crossing facilities at Patrickswell Place / Patrickswell Cresent / Laneway junction, including the addition of a raised table;
- Upgrading the Patrickswell Place / Cappagh Road junction to a signalised junction with pedestrian crossings on all arms;
- New crossing facilities at Cardiff Castle Road / Ravens Court access junction, including the addition of a raised table and tactile paving;
- Pelican crossings at the Finglas Village stop entrance; and
- New signalised crossings on Mellowes Road and relocation of the Finglas Garda Station Car Park Access to Finglaswood Road.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Area 32 of the proposed Scheme are summarised in Table 18-20 along with the accompanying sensitivity for each junction and the resultant significance of effect. A detailed breakdown of the assessment at each junction can be found in Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR. The table below does not include any links which have a negligible impact associated with the junction, with no changes proposed.

Table 18-20: Area 32 – Significance of Effects for Pedestrian Impact During Operational Phase

Junctions	Do Nothing LoS	Do Something LoS	Sensitivity	Magnitude of Impact	Significance of Effect
Tolka Valley Road / Tolka Valley Park entrance	E	A	Medium	High	Positive, Very Significant and Long-term
St Helena's Road / Dunsink Road unsignalised junction with raised table	D	A	Low	Medium	Positive, Moderate and Long-term
St Helena's Road / Farnham Drive unsignalised junction with raised table	C	A	High	Medium	Positive, Very Significant and Long-term
Wellmount Road / Patrickswell Place unsignalised junction (converted from mini roundabout)	C	A	High	Medium	Positive, Very Significant and Long-term
Patrickswell Place / Wellmount Parade unsignalised junction with raised table	C	A	High	Medium	Positive, Very Significant and Long-term

Junctions	Do Nothing LoS	Do Something LoS	Sensitivity	Magnitude of Impact	Significance of Effect
Patrickswell Place / Patrickswell Crescent / Laneway unsignalised junction with raised table	D	A	High	Medium	Positive, Very Significant and Long-term
Patrickswell Place / Cappagh Road signalised junction (converted from unsignalised junction)	C	A	High	Medium	Positive, Very Significant and Long-term
Cardiff Castle Road / Raven's Court unsignalised junction with raised table	E	A	Low	High	Positive, Moderate and Long-term
Mellowes Road signalised crossings (relocation of Finglas Garda Car Park Access)	E	A	High	High	Positive Profound and Long-term
Summary	**D**	**A**	**Medium**	**Medium**	**Positive Significant and Long-term**

Table 18-20 demonstrates that the proposed Scheme will have a Positive, Significant and Long-term impact on the quality of the pedestrian infrastructure along Area 32 of the proposed Scheme.

The LoS during the Do-Nothing scenario ranges between E and C, with three of the nine impacted junctions along this section given the low E ratings and two of the nine impacted junctions given D ratings. These ratings have been determined using the previously referenced assessment criteria set out in Table 18-13. The LoS will improve to an A at all of the impacted junctions in the Do Something scenario. This is a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased footpath and crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and the National Disability Authority (NDA) 'Building for Everyone: A Universal Design Approach' (NDA, 2020) with regards to catering for all users, including those with disabilities.

Overall, there will be Positive, Significant and Long-term effect to the quality of the pedestrian infrastructure along Area 32 of the proposed Scheme during the Operational Phase. A detailed breakdown of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR.

Cyclists

The key infrastructural changes to the cycling links along Area 32 of the scheme are the following:

- Provision of 2m wide cycle lane on both sides of the road on Patrickswell Place and Mellows Road; and
- Upgraded cycle facilities through green space along the route through Area 32, in particular between Tolka Valley Road and St Helena's stop supporting Cycle-LRT trips.

Table 18-21 below outlines the cycling qualitative assessment along Area 32 of the proposed Scheme, which sets out the overall Do Nothing LoS and the Do Something LoS and the description of impact. Refer to Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR which outlines in further detail the methodology behind each LoS rating given to the Do Nothing and Do Something scenarios.

Table 18-21: Area 32 – Cycling Impact During Operational Phase

Link	Do Nothing LoS	Do Something LoS	Sensitivity	Magnitude of Impact	Significance of Effect
St Helena's Road – Wellmount Road	D	D	High	Negligible	Not Significant
Wellmount Road – Cappagh Road / Patrickswell Place	D	A	High	High	Positive, Profound and Long-term
Cappagh Road / Patrickswell Place – Finglas Village Stop	D	A	High	High	Positive, Profound and Long-term
Summary	**D**	**B**	**High**	**Medium**	**Positive, Very Significant and Long-term**

Table 18-21 demonstrates that the scheme will have a Positive, Very Significant and Long-term effect on the cycling environment along Area 32 of the proposed Scheme.

The Do-Nothing Los has been determined using the previously referenced assessment criteria set out in Table 18-15. The LoS rating of the cycling facilities will improve from D in the Do-Nothing A at two impacted areas in the Do Something scenario. This is a result of improved cycling infrastructure as part of the proposed Scheme.

Public Transport

Area 32 involves the relocation of one bus stop and the addition of two new bus stops. An eastbound bus stop is proposed on St Helena's Road, 115m west of Farnham Drive / St Helena's Road junction. Similarly, a westbound bus stop is proposed on St Helena's Road,115m west of Farnham Drive / St Helena's Road junction. The eastbound Bus Stop No. 984 Finglas Garda Station is proposed to be relocated 125m east of its current location, to be situated at the Mellowes Road / Mellowes Crescent junction. Two new Luas Stops are proposed along Area 32 at St Helena's and Finglas Village.

Overall, the bus stop changes are designed to better serve the future catchment and facilities within Area 32 along with improving accessibility/interchange with Luas. The two new Luas Stops provide new services, enhanced facilities and improved connectivity to the wider network via a high-capacity public transport corridor. Therefore, Area 32 of the scheme is considered to have a high impact and a Positive, Significant and Long-term effect for public transport passengers.

18.4.3.5 Potential Impacts – Area 33

Pedestrians

The key infrastructural changes to the pedestrian links along Area 33 of the scheme are the following:

- Converting the North Road / Finglas Bypass / Casement Road / St Margaret's Road roundabout to a signalised junction;
- Converting the St Margaret's Road / McKee Avenue roundabout to a signalised junction;
- New signalised crossing located on McKee Avenue, 25m from the St Margaret's Road / McKee Avenue junction;
- Upgrading the St Margaret's Road / McKelvey Road / Jamestown Business Park 4-arm priority junction to a 3-arm signalised junction with enhanced pedestrian and cycle facilities. This includes the closure of McKelvey Road to vehicular traffic at this location;
- Upgrading the St Margaret's Road / McKelvey Avenue priority junction facilities with the addition of a raised table and pedestrian crossing on the southern St Margaret's Road arm;

- New raised tables on St Margaret's Road; and
- Upgrade of St Margaret's Road / Charlestown Place / Melville Road junction to improve pedestrian and cycle accessibility including reduced and more direct crossings, reduced overall junction footprint and removal of left-turn slip lanes.

The assessment of the qualitative impacts on the Pedestrian Infrastructure for Area 33 of the proposed Scheme are summarised in Table 18-22 along with the accompanying sensitivity for each junction and the resultant significance of effect. A detailed breakdown of the assessment at each junction can be found in Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR. The table below does not include any links which have a negligible impact associated with the junction, with no changes proposed.

Table 18-22: Area 33 – Significance of Effects for Pedestrian Impact During Operational Phase

Junctions	Do Nothing LoS	Do Something LoS	Sensitivity	Magnitude of Impact	Significance of Effect
North Road / Finglas Bypass / Casement Road / St Margaret's Road signalised junction (converted from roundabout)	D	B	High	Medium	Positive, Very Significant and Long-term
St Margaret's Road / McKee Avenue signalised junction (converted from roundabout)	C	A	High	Medium	Positive, Very Significant and Long-term
St Margaret's Road / McKelvey Road / Jamestown Business Park signalised junction (converted from unsignalised junction)	B	A	Medium	Low	Positive, Moderate and Long-term
St Margaret's Road / McKelvey Avenue unsignalised junction with raised table	C	A	Medium	Medium	Positive, Significant and Long-term
St Margaret's Road / Charlestown Place / Melville Road signalised junction	B	A	High	Low	Positive, Moderate and Long-term
Summary	**C**	**A**	**High**	**Medium**	**Positive, Very Significant and Long-term**

Table 18-22 demonstrates that the proposed Scheme will have a Positive, Very Significant and Long-term impact on the quality of the pedestrian infrastructure along Area 33 of the proposed Scheme.

The LoS during the Do-Nothing scenario ranges between D and B, with three of the five impacted junctions along this section given the low C and D ratings and two given a B rating. These ratings have been determined using the previously referenced assessment criteria set out in Table 18-13. The LoS will improve to an A at four of the impacted junctions and B at one of the impacted junctions in the Do Something scenario. This is a result of the proposed improvements to the existing pedestrian facilities in the form of additional crossing locations, increased pedestrian directness, provision of traffic calming measures to reduce vehicle speeds, improved accessibility and increased footpath and crossing widths. All proposed facilities have been designed in accordance with the principles of DMURS and the National Disability Authority (NDA) 'Building for Everyone: A Universal Design Approach' (NDA, 2020) with regards to catering for all users, including those with disabilities.

Overall, there will be Positive, Very Significant and Long-term effect to the quality of the pedestrian infrastructure along Area 33 of the proposed Scheme during the Operational Phase. A detailed breakdown

of the assessment at each impacted junction, including a list of the junctions which experience no change, can be found in Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR.

Cyclists

The key infrastructural changes to the cycling links along Area 33 of the scheme are the following:

- Provision of 2m wide cycle track on both sides of the road from the R135/R104 roundabout to the Charlestown Place/ Melville Road/ St Margaret's Road junction;
- Covered cycle storage facilities will be provided at the St Margaret's Stop, with "Sheffield" type cycle stands provided at the Charlestown stop supporting Cycle-LRT trips; and
- It is noted that adjacent to the R135 Finglas Bypass there is a section of greenspace which has a segregated shared walk / cycle path. This is existing and no further changes are proposed.

Table 18-23 below outlines the cycling qualitative assessment along Area 32 of the proposed Scheme, which sets out the overall Do Nothing LoS and the Do Something LoS and the description of impact. Refer to Volume 5 – Appendix A18.2 (Impact Assessments) of this EIAR which outlines in further detail the methodology behind each LoS rating given to the Do Nothing and Do Something scenarios.

Table 18-23: Area 33 – Cycling Impact During Operational Phase

Link	Do Minimum LoS	Do Something LoS	Sensitivity	Magnitude of Impact	Significance of Effect
R135 / R014 roundabout – Charlestown Place / Melville Road / St Margaret's Road	D	A	High	High	Positive, Profound and Long-term

Table 18-23 demonstrates that the scheme will have a Positive, Profound and Long-term effect on the cycling environment along Area 33 of the proposed Scheme.

The Do-Nothing Los has been determined using the previously referenced assessment criteria set out in Table 18-15. The LoS rating of the cycling facilities will improve from D in the Do Nothing to A in the Do Something along the entirety of Area 33 of the proposed Scheme. This is a result of continuous segregated cycle lanes along the route improving safety for cyclists along with greater priority at signalised junctions.

Public Transport

Area 33 of the scheme will involve the addition of six new bus stops and the relocation of two existing bus stops. A northbound bus stop is proposed on the R135 Finglas Bypass, 50m south of the North Road / Finglas Bypass / Casement Road / St Margaret's Road junction. A southbound bus stop is proposed on the R135 Finglas Bypass, 40m south of the North Road / Finglas Bypass / Casement Road / St Margaret's Road junction. A southbound bus stop is proposed on St Margaret's Road, 25m north of the St Margaret's Road / McKee Avenue junction. A northbound bus stop is proposed on St Margaret's Road, 100m north of the St Margaret's Road / McKee Avenue Road Junction.

The current southbound bus stop No. 1558 McKelvey Avenue is proposed to be relocated 40m north of its current location, 40m south of the St Margaret's Road / McKelvey Avenue junction. The current northbound bus stop No. 1280 is proposed to be relocated 40m north of its current location, 20m south of the St Margaret's Road / McKelvey Avenue junction. A new northbound bus stop is proposed on St Margaret's Road, 30m south of the St Margaret's Road / Charlestown Place / Melville Road junction. A new southbound bus stop is proposed on St Margaret's Road 20m south of the St Margaret's Road / Charlestown Place / Melville Road junction. The St Margaret's Road and Charlestown Luas Stops are proposed along Area 33 of the scheme.

Overall, the bus stop changes are designed to better serve the future catchment and facilities within Area 33, along with improving accessibility/interchange with Luas. The two new Luas stops provide new services, enhanced facilities and improved connectivity to the wider network via a high-capacity public transport corridor (further details on the benefits of the proposed Scheme are outlined in Section 18.4.3.6). Therefore, Area 33 of the scheme is considered to have a high impact and a Positive, Significant and Long-term effect for public transport passengers.

18.4.3.6 Quantitative Analysis

This quantitative assessment has been prepared with reference to the modelling outputs obtained from the modelling approach outlined in section 18.2. The following assessment topics have been considered:

- People Movement
  - Travel Demand and Mode Share;
  - Luas Boardings; and
  - Peak Hour People Movement along the Corridor.
- Public Transport Performance Indicators
  - Public Transport Journey Times.
- General Traffic Network Performance Indicators
  - Redistributed flows and Junction Capacity Outputs on the Study Area.

People Movement Assessment

Overview

In order to understand the benefit of the proposed Scheme with regards to the Movement of People following implementation, a quantitative People Movement assessment has been undertaken using outputs from the NTA ERM comparing the Do Minimum and Do Something peak hour scenarios for each forecast year (2035, 2050).

The assessment of People Movement includes the following metrics:

- The change in overall transport demand and mode share within the study area as a result of the proposed Scheme for each forecast year (2035, 2050);
- Total Passengers Boarding Luas Finglas for each forecast year (2035, 2050); and
- The average number of people moved by each transport mode (i.e., Car, PT, Walking and Cycling) along the corridor towards the city centre in the AM peak hour for the opening year 2035. This metric is compared for the Do Minimum and Do Something scenarios and provides an estimate of the modal share changes and overall transport capacity along the corridor as a result of the proposed Scheme measures.

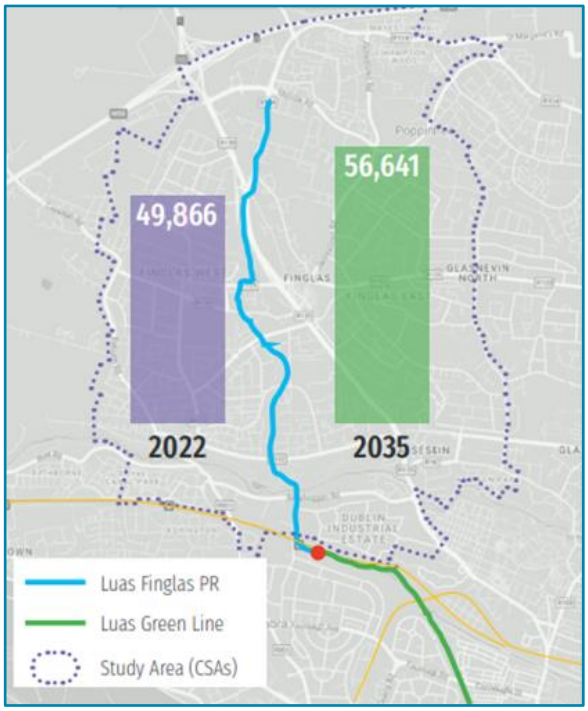


Figure 18-19: 2022-2035 Population Growth Estimate

Travel Demand and Mode Share

Population Growth

Detailed analysis was undertaken to estimate future population levels for the ERM using the NTA's reference case planning sheets. These planning sheets include future population, employment and education numbers aligned with National Planning Framework (NPF)

forecasts as well as the latest planning policy for the Greater Dublin Area (Refer also to Figure 18-19 and Figure 18-20). Further details on the forecast land-use assumptions used in the modelling assessment are provided in Chapter 3 of Volume 5 – Appendix A18.1 (Transport Modelling Report).

The analysis suggests that within the catchment area around Luas Finglas, the population is forecasted to grow by over 6,700 people (23%) by 2035. The total population is estimated to increase to just over 64,000 people by 2050.

Luas Finglas will pass close to a number of significant development areas, including the Charlestown Centre Phase 2 and Charlestown Place SHD with planning permission granted for 967 residential units, and the Jamestown Strategic Development and Regeneration Area (SDRA).

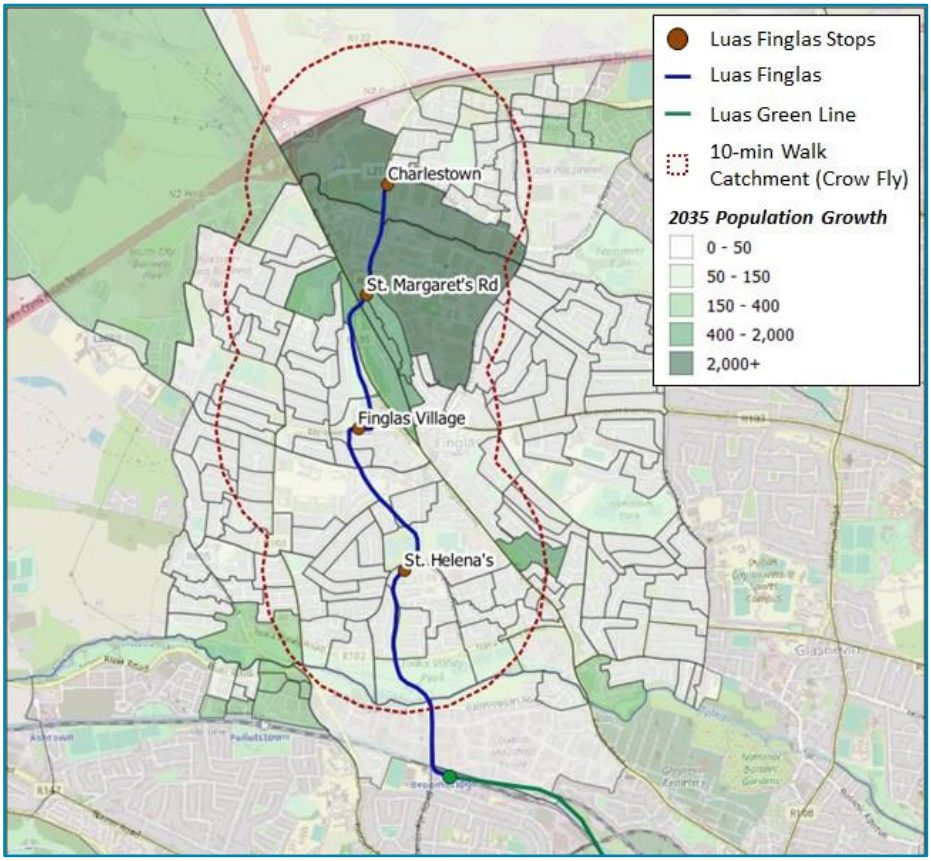


Figure 18-20: Population Growth by CSA in the Study Area (2016 – 2035)

It is expected that 73% of the forecasted population growth in Finglas will be within a 10-minute walk of a Luas Stop. 55% will be within a short 5-minute walk. This shows the success of the scheme in serving these areas of planned major development, contributing to the high level of boardings.

Mode Share

Luas Finglas will lead to a significant reduction in journey times for residents in the area and support an increase in public transport usage. In the opening year 2035, Luas Finglas will deliver an increase of 1.3 million low carbon public transport trips per annum. This represents an 11% increase in public transport trips due to the delivery of Luas Finglas.

In 2050, this increases to an additional 1.8 million public transport trips which represents a 13% increase due to the delivery of Luas Finglas.

Figure 18-21 outlines the mode share for the Luas Finglas Study Area (illustrated previously in Figure 18-1) for the 2035 and 2050 AM peaks. The results indicate that Luas Finglas will lead to an overall decrease in car mode share of around 1% for the north-west of the city. In percentage terms, this might seem modest. However, in absolute trip numbers, it represents a significant increase in sustainable travel.

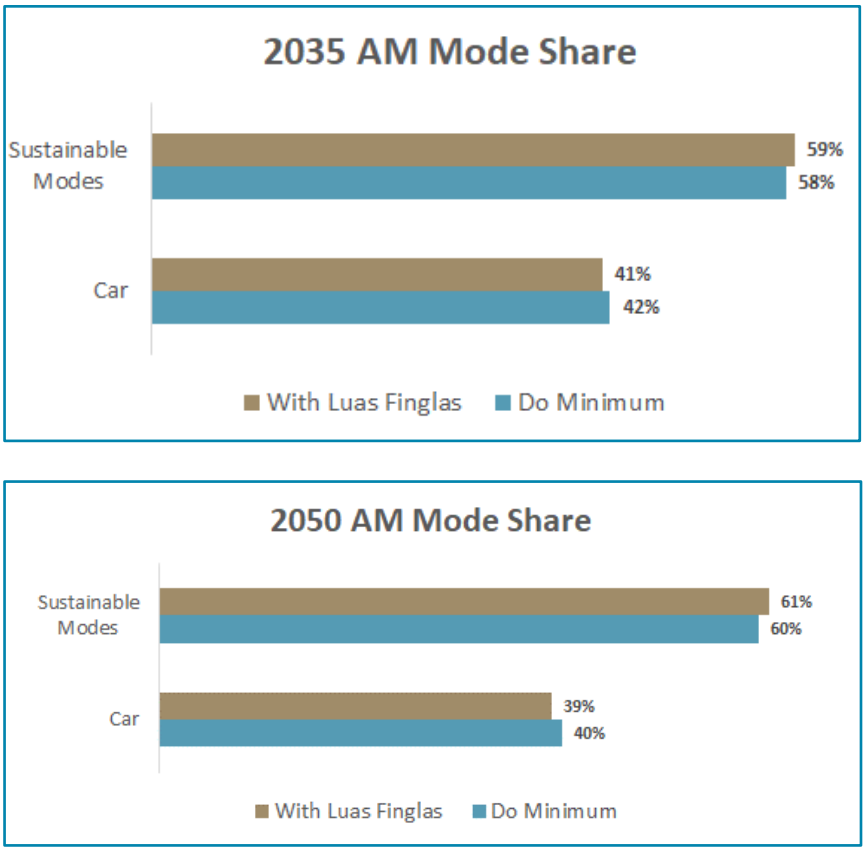


Figure 18-21: AM Peak Mode Share (2035 and 2050)

Figure 18-22 illustrates the impact of Luas Finglas on 2035 AM peak public transport demand. It shows the growth in public transport demand for each of the ERM model zones between the Do Minimum and Do Something Scenario.

The biggest increase in public transport usage is at the northern end of the alignment where significant new developments are proposed. As would be expected, model zones that are further from proposed Luas stops show a lower level of increase and there is less of an impact towards the southern end of the line where the residential areas are much closer to the existing Luas station in Broombridge.

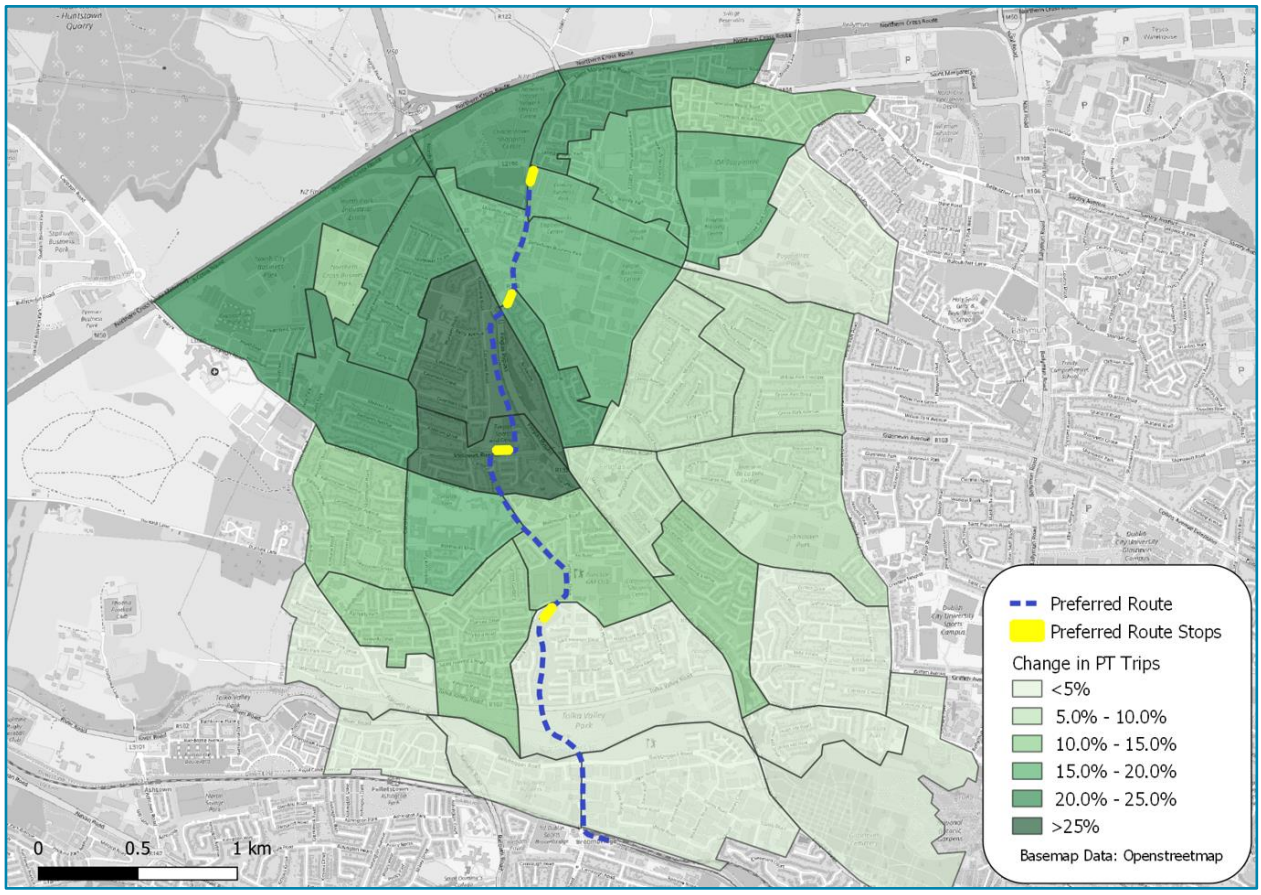


Figure 18-22: 2035 Change in AM Peak PT Demand with Luas Finglas

Passenger Boardings

Luas Finglas will provide a high capacity, frequent and reliable public transport services shortening journey times from Finglas to Dublin city centre and other destinations through direct services or interchange with other services. Luas Finglas will benefit those living or working in walking distance to a stop, in addition to those travelling from further afield and accessing the line via bike, bus or by car through the proposed Park & Ride site at St Margaret's Road.

Table 18-24 outlines the total boardings in both directions at the Luas Finglas stops across the representative modelled peak hours in 2035[4]. The ERM results indicate that Luas Finglas will be well used, with over 3,600 boardings across the four stops in the AM peak. The largest number of boardings are at the Charlestown Place and St Margaret's Road Stops which serve the very large quantum of new and proposed development in the study area. Charlestown has planning for 967 residential units whilst the Jamestown SDRA was initially proposed for 2,200 additional residential units.

Table 18-24: 2035 Peak Hour Boardings, Luas Finglas Stops (both directions)

Stop	Before Noon (AM)	Lunch Time (LT)	School Run (SR)	After Noon (PM)	Off-Peak (OP)
Charlestown	1,291	243	168	341	138
St Margaret's Road	955	184	117	139	93
Finglas Village	782	199	190	326	130

[4] Peak Hours: AM = 08:00-09:00, LT = 12:00-13:00, SR = 15:00-16:00, PM = 17:00-18:00, OP = 20:00-21:00

Stop	Before Noon (AM)	Lunch Time (LT)	School Run (SR)	After Noon (PM)	Off-Peak (OP)
St Helena's	670	174	124	165	88
Total	***3,697***	***799***	***599***	***970***	***449***

Table 18-25 outlines the total alightings in the 2035 modelled peak hours. The relatively tidal nature of usage on the Luas Finglas line can be seen through the concentration of boardings in the AM peak hour and alightings during the SR and PM periods. Compared to the boarding profile, the alighting profile is more evenly spread among the stops.

Table 18-25: 2035 Peak Hour Alightings, Luas Finglas Stops (both directions)

Stop	Before Noon (AM)	Lunch Time (LT)	School Run (SR)	After Noon (PM)	Off-Peak (OP)
Charlestown	257	162	620	783	144
St Margaret's Road	113	110	350	751	126
Finglas Village	319	143	278	503	115
St Helena's	160	132	297	500	124
Total	***848***	***548***	***1,545***	***2,537***	***509***

As would be expected given the projected population growth with the study area in both the short and medium term, modelled boardings are substantially higher in 2050 than 2035. AM peak hour boardings grow to over 5,067 representing a 37% increase (Refer to Table 18-26). This is reflective of the growth in population around the Luas Finglas stops and also the proposed increase in frequency of service.

The pattern of very large numbers boarding at Charlestown Place and St Margaret's Road is magnified in 2050 as all the projected development around these stops come to fruition. Growth is more modest, although still significant, at the other two stops.

Table 18-26: 2050 Peak Hour Boardings, Luas Finglas Stops (both directions)

Stop	Before Noon (AM)	Lunch Time (LT)	School Run (SR)	After Noon (PM)	Off-Peak (OP)
Charlestown	1,700	287	201	506	152
St Margaret's Road	1,549	253	155	199	123
Finglas Village	953	220	208	423	144
St Helena's	865	189	136	225	97
Total	***5,067***	***949***	***699***	***1,352***	***515***

Similarly, when looking at alightings, there is a large increase evident between 2035 and 2050, most notably during the School Run and PM peak hours (Refer to Table 18-27). Growth is relatively evenly split across all four Stops during the school run, while the pattern of higher usage at St Margaret's Road and Charlestown Place is evident in the PM. Luas Finglas is a key enabler of the planned development around St Margaret's Road and Charlestown.

Table 18-27: 2050 Peak Hour Alightings, Luas Finglas Stops (both directions)

Stop	Before Noon (AM)	Lunch Time (LT)	School Run (SR)	After Noon (PM)	Off-Peak (OP)
Charlestown	324	184	765	1,015	161

Stop	Before Noon (AM)	Lunch Time (LT)	School Run (SR)	After Noon (PM)	Off-Peak (OP)
St Margaret's Road	151	150	505	1,223	179
Finglas Village	412	159	325	638	126
St Helena's	231	152	355	639	136
Total	***1,117***	***645***	***1,950***	***3,516***	***602***

Peak Hour People Movement

Do Minimum Transport Network Constraints

Access to Dublin city centre from the northwest corridor is constrained to a small number of bridge crossings over the Royal Canal at Phibsborough, Broombridge and Ratoath Road. These areas are currently over capacity during peak periods. If current rates of car use continue, traffic congestion is likely to increase in the future due to increased demand for transport arising from general population growth and proposed developments in the Finglas area and wider region.

Given the constraints, there is little scope for the capacity of the existing road-based transport network to grow to meet future needs. Analysis was undertaken in the ERM to investigate total person trips crossing the Royal Canal Screenline illustrated in Figure 18-23.

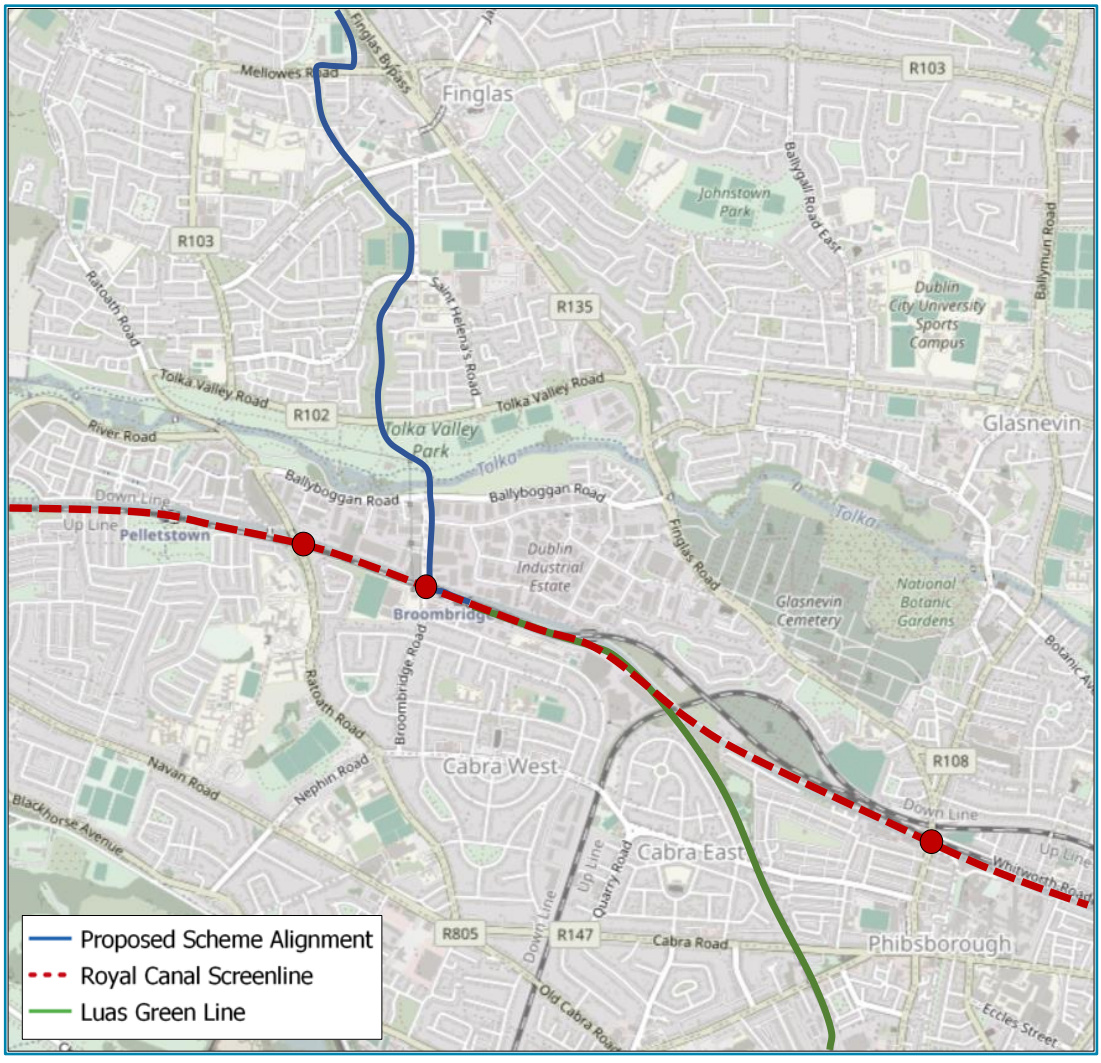


Figure 18-23: Royal Canal Screenline Points

The ERM results forecast an additional 400 person trips crossing the Royal Canal from the northwest in the 2035 Do Minimum scenario AM peak hour (i.e. without the delivery of Luas Finglas) compared to a 2020 base scenario (total person trips illustrated in Figure 18-24). This is including the proposed upgrades to the bus network and infrastructure to be delivered by BusConnects. An additional 400 trips represent a relatively low growth in trips to the city centre given the estimated population increase of around 10,500 persons within the same time period, reflecting the transport capacity constraints.

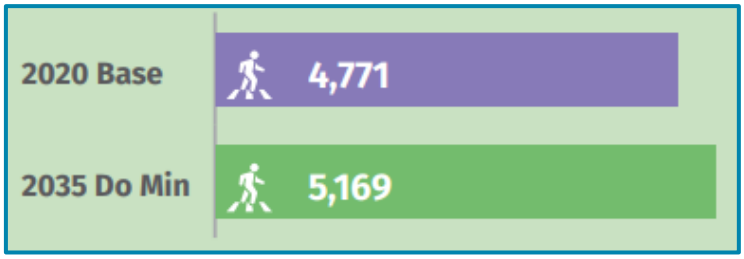


Figure 18-24: AM Peak Hour Persons Crossing the Royal Canal

Increased Transport Capacity from Luas Finglas

Similar analysis was undertaken to compare person trips crossing the Screenline in the 2035 AM peak with (Do Something) and without (Do Minimum) Luas Finglas. Figure 18-25 and Table 18-28 illustrate the person trips by mode crossing each of the cordon points. Note that in the Do Something scenario Luas Finglas is separated as its own crossing.

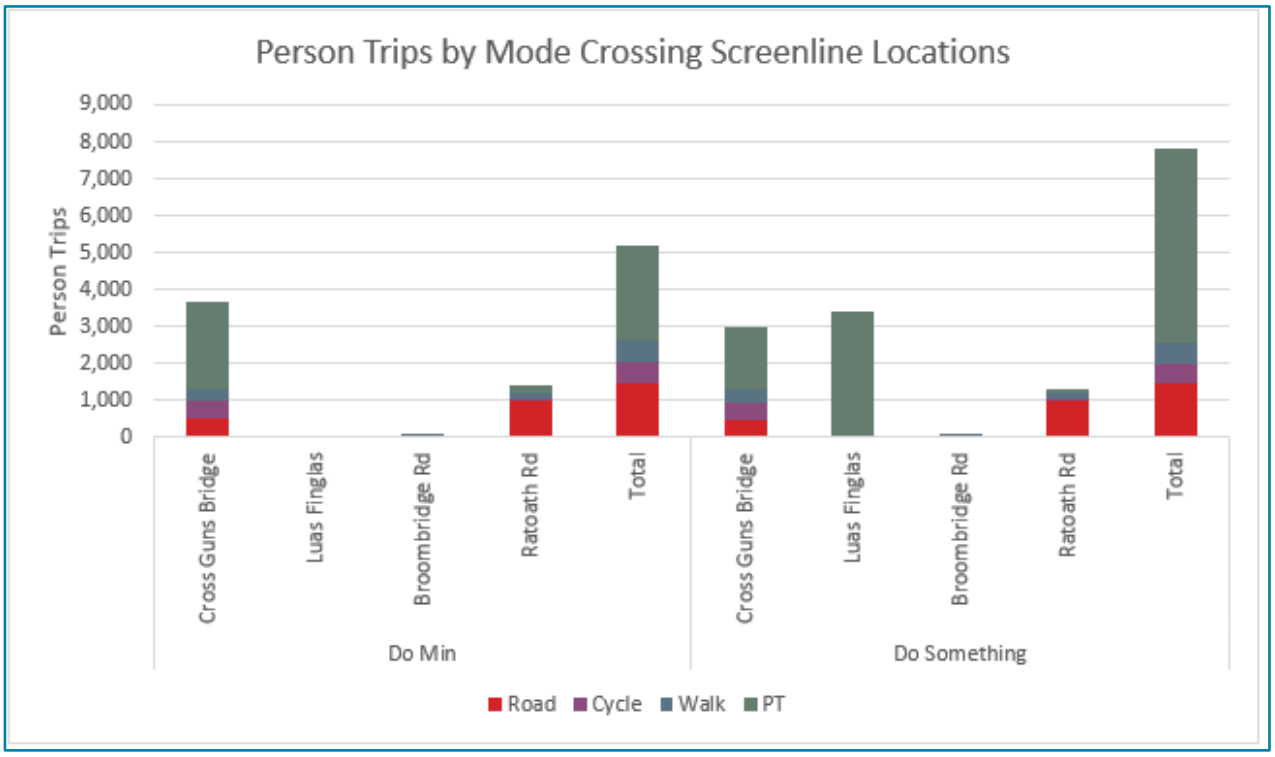


Figure 18-25: Results of Royal Canal Screenline Analysis (2035 AM Peak Hour)

Table 18-28: 2035 AM Peak Person Trips by Mode – Southbound Royal Canal Screenline

Mode of Transport	Do Minimum		Do Something	
	Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)
General Traffic	1,479	29%	1,484	19%
Public Transport	2,534	49%	5,248	67%

Mode of Transport	Do Minimum		Do Something	
	Hourly Trips	Modal Split (%)	Hourly Trips	Modal Split (%)
Walking	609	12%	575	7%
Cycling	548	11%	517	7%
Sustainable Modes Total	***3,691***	***71%***	***6,340***	***81%***

The introduction of transport capacity brought by Luas Finglas enables a step change in public transport trips towards the city centre area (highlighted in green in Figure 18-25) – resulting in a doubling of public transport trips across the Screenline. Overall, the proportion of people travelling via sustainable modes (Public Transport, Walk, Cycle) increases from 71% in the Do Minimum to 81% with the delivery of Luas Finglas (Do Something).

The delivery of Luas Finglas will help unlock potential capacity for people movements to and from the north-west corridor. The modelling analysis indicates that in the opening year 2035, the delivery of Luas Finglas will lead to a 50% increase in transport capacity utilisation for trips travelling south towards the city centre in the AM peak. Without Luas Finglas, travel from the north-west corridor is constrained by pinch points on the road network for both cars and bus-based public transport crossing the Royal Canal at Phibsborough, Broombridge and Ratoath Rd.

Figure 18-26: Modelled Person Trips Crossing the Royal Canal (2035 AM Peak)

People Movement – Significance of Impact

The significance of impact for people movement by sustainable modes with the proposed Scheme in place has been appraised qualitatively using professional judgement, taking into account the changes in mode share, demand changes by mode along the proposed Scheme as well as Luas usage presented above.

The proposed Scheme has been adjudged to deliver a Positive, Very Significant and Long-term impact in terms of People Movement by sustainable modes. The proposed Scheme can be shown to deliver significant improvements in people movement by sustainable modes along the corridor, including:

- Luas Finglas directly serves a number of large sites marked for high-density development. It is estimated that 73% of the new population expected in the Finglas area by 2035 will be within a 10-minute walk of one of the new Luas Finglas stops;
- Luas Finglas will attract high levels of boardings at all four of the Stops along the proposed extension. In total, Luas Finglas will lead to an increase of 1.3 million low carbon public transport trips in 2035, increasing to 1.8 million in 2050; and
- The large level of population growth planned for the study area constrains the transport system in the Do Minimum scenario, resulting in a bottleneck for travel towards the city centre. Luas Finglas relieves this bottleneck and increases the overall carrying capacity of the transport network over the Royal Canal in this area by 50%.

18.4.3.7 Public Transport Performance Indicators

Public Transport Journey Times

The impacts of the proposed Scheme for public transport users have been assessed based on average journey times compared to travel by car, and also public transport with, and without, the scheme in place.

As an extension to the Luas network, Luas Finglas services will, to a significant extent, utilise existing infrastructure. Together with the current Luas infrastructure between Broombridge and the City Centre, Luas Finglas will operate within a 7.5km corridor between Charlestown and the City Centre that is largely segregated from traffic. Luas Finglas will deliver a reliable public transport service offering journey times of 30-minutes from Charlestown to Trinity College.

Analysis was undertaken of the demand weighted average journey time from zones within the Luas Finglas ERM catchment to the city centre[5] by public transport and car in the Do-Something scenario (2035 AM peak). The results of this analysis are illustrated in Figure 18-27 and indicate that the delivery of Luas Finglas will lead to an average reduction in journey times to the city centre of 15 minutes (over 30%) during the congested peak periods when compared to travel via private car.

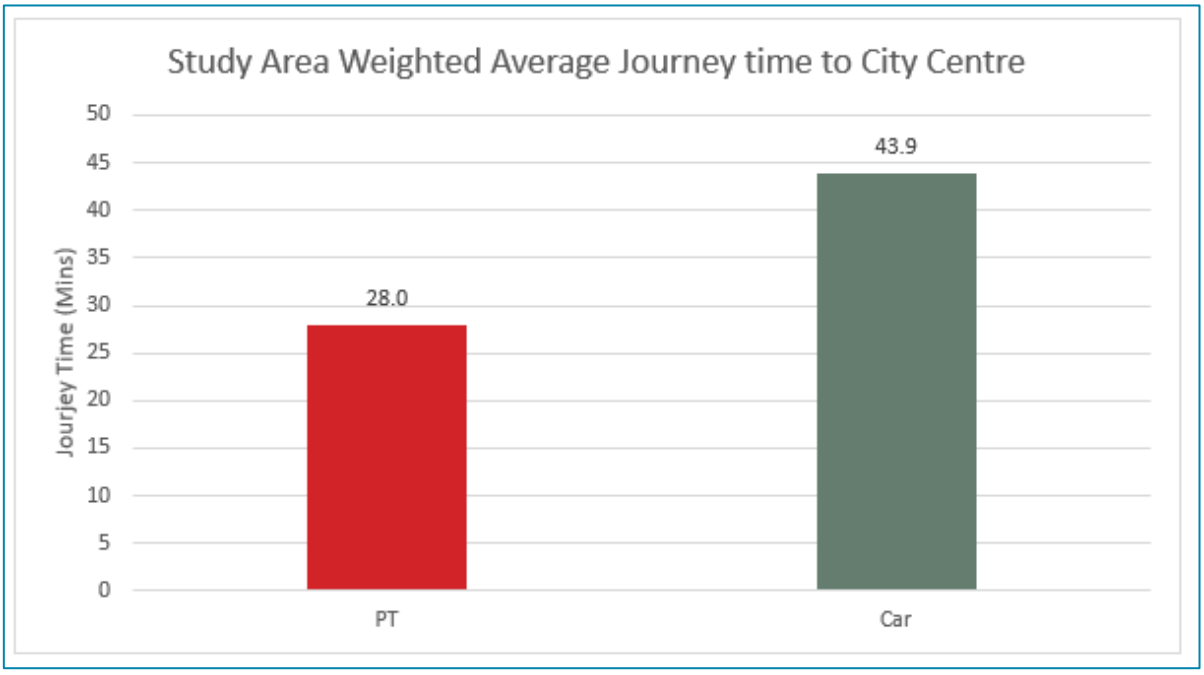


Figure 18-27: AM Peak Hour Average Car and PT Journey Time from Study Area to the City Centre

Taking the journey from Charlestown to Trinity College as an indicative example, journey time by Luas Finglas is expected to be around 30 minutes in the AM peak, whilst the equivalent trip by car in 2035 is estimated to take approx. 47 minutes. Refer to Figure 18-28.

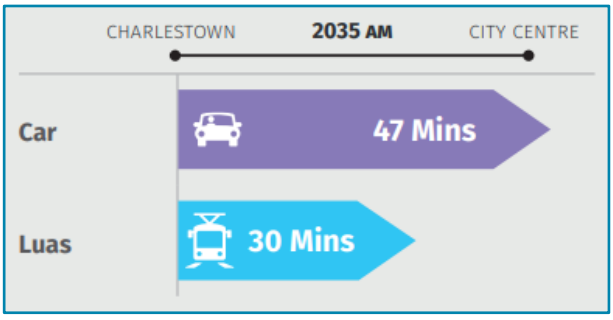


Figure 18-28: 2035 AM Journey Time Comparison

Similar analysis was undertaken for public transport journey times from the Luas Finglas catchment to the city centre in the Do-Minimum vs Do-Something scenario. The results are illustrated in Figure 18-29 for the 2035 AM peak hour and indicate that Luas Finglas will significantly reduce public transport journey times

[5] Taken to be Trinity College for the purpose of this analysis

between the Finglas area and the city centre by an average of 12% (just under 4 minutes) during the AM peak hour.

Luas Finglas provides an off-road light rail link almost completely separated from vehicular traffic. Even with the introduction of the BusConnects Core Bus Corridors, buses will have to contend with traffic on some links at pinch points and delays at busy junctions, particularly closer to the city centre. The segregation provided by the Luas Finglas results in shorter public transport journey times. This reduction in journey time increases the attractiveness of public transport compared to other modes. It also results in quality of life and economic benefits for public transport passengers resulting from travel time savings.

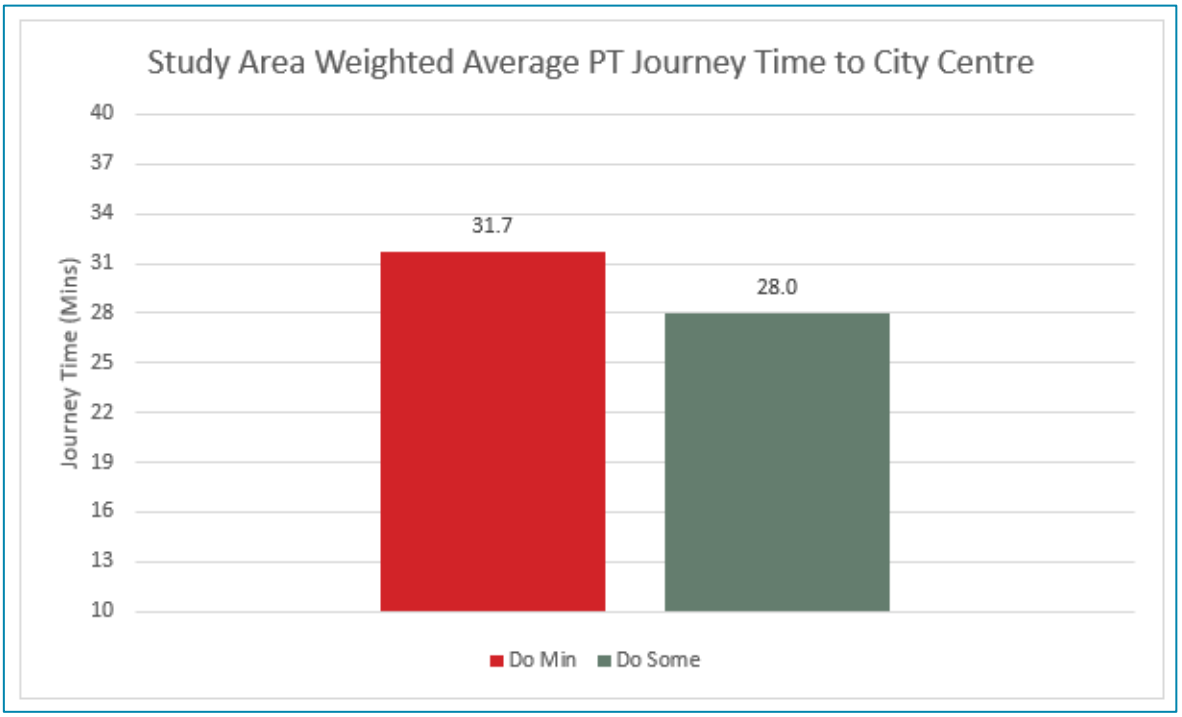


Figure 18-29: AM Peak Hour Change in average PT Journey Time from Study Area to the City Centre

Public Transport Users Assessment Summary

The significance of impact on public transport users of the proposed Scheme has been appraised using a qualitative assessment, taking the changes in journey time presented above into consideration. The proposed Scheme is considered to deliver a Positive, Significant and Long-term impact overall. Luas Finglas will significantly reduce public transport journey times between the Finglas area and the city centre by an average of 12% during the AM peak hour. When compared to travel via private car, the delivery of Luas Finglas will lead to an average reduction in journey times to the city centre of 15 minutes (over 30%) during the congested peak periods.

18.4.3.8 General Traffic Assessment

Overview

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

It should be noted that forecast car demand in the Do Minimum and Do Something scenarios, used for this assessment, represents a reasonable worst-case scenario. It is possible that societal trends in the medium

to long term may reduce car demand further due to the ongoing changes to travel behaviours, further shifts towards sustainable travel and flexibility in working arrangements brought on following COVID-19, which are not fully captured in this modelling assessment. The assessment also assumes that goods vehicles (HGVs and LGVs) continue to grow in line with forecasted population growth and economic activity.

The purpose of this section is to assess the overall impact that any redistributed general traffic will have on the performance of the network within the study area illustrated in Figure 18-1 previously.

Significance of the General Traffic Impact

To determine the impact that the proposed Scheme has in terms of general traffic redistribution on the study area, the LAM Opening Year 2035 model results have been used to identify the difference in general traffic flows between the Do Minimum and Do Something scenarios as a result of the proposed Scheme. The assessment has been considered with reference to both the reductions and increases in general traffic flows along road links.

Significance of a Reduction in General Traffic: For this assessment, the reductions in general traffic flows have been assessed and have a positive impact to the environment. The significance of this positive impact is outlined in Table 18-29.

Table 18-29: Significance of the Reduction in General Traffic Flows

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

The majority of instances where a reduction in general traffic flow occurs are located along or adjacent to the proposed Scheme, and where there are proposed measures to improve priority for Luas, cycle and walking facilities.

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

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

Figure 18-30 is an extract from the guidance which outlines '*Advisory Thresholds for Traffic and Transport Assessment Where National Roads are Affected'.*

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

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

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

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

Figure 18-30: Extract from the Traffic and Transport Assessment Guidelines (PE-PDV-02045, May 2014)

The basis of the guidance is to assess the impacts of additional trips that have been generated as part of a new development (for example, a new housing estate etc.). Noting that the guidance relates to National Roads only, for the purpose of this assessment, the principles of the guidance have been adapted for the assessment of the proposed Scheme. This has been achieved by extending the threshold to cover all road types in the vicinity of the proposed Scheme, not only National Roads. This ensures a robust and rigorous assessment is undertaken and that potential impacts on more localised or residential streets have been captured as part of the assessment.

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

- **Local / Regional Roads:** Traffic redistribution results in an increase above 100 combined flows (i.e. in a two-way direction) along residential, local and regional roads in the vicinity of the proposed Scheme in the AM and PM peak hours;
  - The threshold aligns with an approximate 1 vehicle per minute increase per direction on any given road. This is a very low level of traffic increase on any road type and ensures that a robust assessment of the impacts of redistributed traffic has been undertaken.

- **National Roads:** Traffic exceeds 5% of the combined turning flows at major junctions with/on/or with National Roads in the AM and PM peak hours as a result of traffic redistribution comparing the Do Minimum to the Do Something scenario with the proposed Scheme in place.
  - The guidelines indicate that a 10% threshold may be used; however, to ensure a rigorous assessment in this instance the lower 5% threshold for turning movements has been utilised.

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

General Traffic Flow Difference – AM Peak Hour

Volume 4 – Map Figure 18-1 illustrates the difference in traffic flows on the road links in the AM Peak Hour for the 2035 Opening Year.

Reductions in General Traffic: The LAM indicates that, during the 2035 Opening Year scenario, there are reductions in general traffic noted along the proposed Scheme during the AM Peak Hour, as illustrated by the blue lines in Volume 4 – Map Figure 18-1, which indicates where a reduction of at least -100 combined traffic flows occurs.

The key reductions in traffic flows during the AM Peak Hour are outlined in Table 18-30.

Table 18-30: Road Links that Experience a Reduction of ≥100 Combined Flows (AM Peak Hour, 2035)

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference
Cappagh Road	517	350	-167
Patrickswell Place	638	497	-141
R103 Finglaswood Road	557	362	-195
Casement Road	756	579	-176
R135 North Road	2,896	2,557	-339
R135 Finglas Road (from St Margaret's Road to Wellmount Road)	2,843	2,445	-397
R104 St Margaret's Road (from McKee Avenue to R135)	1,335	838	-497
R104 St Margaret's Road (from Charlestown Pl to R122)	1,520	1,250	-271
R104 St Margaret's Road (from R122 to Jamestown Road)	1,282	1,153	-129
R122	1,415	1,270	-145

Table 18-30 demonstrates that there is a reduction of between 129 and 497 general traffic flows along the study area during the AM Peak Hour. This is attributed to the proposed Scheme including the associated modal shift as a result of its implementation along with signalisation of the R135 / St Margaret's Road junction leading to some localised traffic redistribution. This reduction in general traffic is determined as an overall Positive, Slight and Long-term effect on the study area. The most significant effect occurs on the R135 Finglas Road and R104 St Margaret's Road.

Increases in General Traffic: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the red lines in Volume 4 – Map Figure 18-1. These road links have been identified as experiencing traffic volumes above the additional traffic threshold and therefore require further analysis. The road links and associated flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 18-31.

Table 18-31: Road Links where the 100 Flow Additional Threshold is Exceed (2035, AM Peak Hour)

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference
Ballyboggan Road	994	1,144	150
Glasanaon Road	720	900	180
Charlestown Place	2,030	2,353	323
Finglaswood Road (North of Mellowes Road)	454	620	166
Jamestown Road	1,599	1,699	101
Melville Road	1,226	1,342	117
Finglas Main Street	343	494	151
Jamestown Road (South of Seamus Ennis Road)	50	169	119

Table 18-31 outlines that the additional traffic on the key road links varies between 101 and 323 combined flows during the AM Peak Hour. Further junction capacity assessment has been undertaken along these

road links to determine whether they have the capacity to cater for the additional traffic volumes as a result of the proposed Scheme.

Operational capacity outputs have been extracted from the LAM at the associated junctions along the subject road links to determine whether there is reserve capacity to facilitate the uplift in traffic. The results are presented in terms of the significance of the impact to the V / C ratio for each junction based on its sensitivity and magnitude of impact. (refer to Table 18-38 below for further details).

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

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

TII's assessment methodology indicates that National Roads require further assessment where traffic increases exceeding 5% of the combined turning flows at junctions on or with National Roads as a result of traffic redistribution associated with the proposed Scheme. The only National Road junction within the Study Area is the M50 Junction 5 and flow difference between the Do Minimum and Do Something scenarios during the AM Peak Hour are outlined in Table 18-32.

Table 18-32: National Roads Analysis (2035, AM Peak Hour)

Road Name	Do Minimum Turning Flows (PCU)	Do Something Turning Flows (PCU)	Flow Difference (PCU)	% Difference
M50 Junction 5	8,591	8,593	2	0%

Table 18-32 demonstrates that redistributed traffic from the proposed Scheme will have a less than 5% impact on turning flows at junctions with National Roads. Therefore, this is below the threshold required for further assessment.

General Traffic Flow Difference – PM Peak Hour

Volume 4 – Map Figure 18-2 illustrates the difference in traffic flows on the road links in the PM Peak Hour for the 2035 Opening Year.

Reductions in General Traffic: The LAM indicates that, during the 2035 Opening Year scenario, there are reductions in general traffic noted along the proposed Scheme during the PM Peak Hour, as illustrated by the blue lines in Volume 4 – Map Figure 18-2, which indicates where a reduction of at least -100 combined traffic flows occurs. The key reductions in traffic flows during the PM Peak Hour are outlined in Table 18-33.

Table 18-33: Road Links that Experience a Reduction of ≥100 Combined Flows (PM Peak Hour, 2035)

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference
Cappagh Road	668	526	-143
Patrickswell Place	695	556	-138
R103 Finglaswood Road	560	421	-138
Mellowes Road	1,564	1,459	-105
R135 North Road	3,342	3,190	-152
R135 Finglas Road (from St Margaret's Road to Finglas on/off slip roads)	2,850	2,745	-106
R104 St Margaret's Road	1,245	1,049	-196
Melville Road	1,518	1,375	-144

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference
R104 St Margaret's Road (from Charlestown Pl to R122)	1,301	1,166	-136
Ratoath Road	2,279	2,142	-137

Table 18-33 demonstrates that there is a reduction of between 105 and 196 general traffic flows along the study area during the PM Peak Hour, which is attributed to the proposed Scheme. This reduction in general traffic flow has been determined as an overall Positive, Slight and Long-term effect on the study area.

Increases in General Traffic: The road links which experience additional traffic volumes of over 100 combined flows are illustrated by the red lines in Volume 4 – Map Figure 18-2. These road links have been identified as experiencing traffic volumes above the additional traffic threshold and therefore require further analysis. The road links and associated flow difference between the Do Minimum and Do Something scenarios during the PM Peak Hour are outlined in Table 18-34.

Table 18-34: Road Links where the 100 Flow Additional Threshold is Exceed (2035, PM Peak Hour)

Road Name	Do Minimum Flows (PCU)	Do Something Flows (PCU)	Flow Difference
Glasanaon Road	876	993	117
Charlestown Place	1,350	1,478	128
Jamestown Road (from Melville Road to R104)	541	666	126
Jamestown Road (from Melville Road to Clancy Avenue)	1,017	1,138	120
Wellmount Road	769	971	202

Table 18-34 outlines additional traffic on the key road links that varies between 117 and 202 combined flows during the PM Peak Hour. As described earlier, these road links have been identified as experiencing additional traffic volumes over the threshold for further assessment.

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

TII's assessment methodology indicates that National Roads require further assessment where traffic increases exceeding 5% of the combined turning flows at junctions on or with National Roads as a result of traffic redistribution associated with the proposed Scheme. The only National Road junction within the Study Area is the M50 Junction 5 and flow difference between the Do Minimum and Do Something scenarios during the PM Peak Hour are outlined in Table 18-35.

Table 18-35: National Roads Analysis (2035, PM Peak Hour)

Road Name	Do Minimum Turning Flows (PCU)	Do Something Turning Flows (PCU)	Flow Difference (PCU)	% Difference
M50 Junction 5	8,709	8,609	-100	-1%

Table 18-35 demonstrates that redistributed traffic from the proposed Scheme will have a less than 5% impact on turning flows at junctions with National Roads. Therefore, this is below the threshold required for further assessment.

General Traffic Impact Assessment

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

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

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

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

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

The capacity of junctions within the LAM are expressed in terms of Volume to Capacity ratios (V / C ratios). The V / C ratios represent the operational efficiency for each arm of a junction. For the purpose of this EIAR, operational capacity outputs of a junction have been identified with reference to the busiest arm which experiences the maximum V / C ratio.

A V / C ratio of below 85% indicates that a junction is operating well, with spare capacity, with traffic not experiencing queuing or delays throughout the hour. A value of 85% to 100% indicates that the junction is approaching its theoretical capacity with traffic possibly experiencing occasional queues and delays within the hour. A value of over 100% indicates that a junction is operating above its theoretical capacity and traffic experiences queues and delays regularly within the hour. The junctions have been described in the ranges outlined in Table 18-36.

Table 18-36: Junction Volume / Capacity Ranges

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

When comparing the V / C ratios during the Do Minimum and Do Something scenarios for the key junctions, the terms outlined in Table 18-37 have been used to describe the impact.

Table 18-37: Magnitude of Impact for Redistributed Traffic

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

As indicated in Table 18-37, the changes in V / C ratios between the Do Minimum and Do Something scenarios result in either a positive, negative, or neutral magnitude of impact.

Step 3 – Determination of Significance of Effects: The magnitude of impact has been combined with the sensitivity of the road link to determine the Significance of Effect using the matrix shown in Table 18-3 which is based upon the EPA Guidelines on EIAR. The significance of effect has been assigned as positive or negative in instances where the effect is Slight or higher.

Potential mitigation measures have been considered at junctions where the Significance of Effect is predicted to be Significant or higher. At junctions where a moderate effect or lower is predicted, further mitigation measures are not required.

The above analysis was carried out on the following scenarios:

- 2035 Opening Year – Do Minimum vs Do Something – AM Peak Hour;
- 2050 Design Year (Opening Year + 15 Years) – Do Minimum vs Do Something – AM Peak Hour;
- 2035 Opening Year – Do Minimum vs Do Something – PM Peak Hour; and
- 2050 Design Year (Opening Year + 15 Years) – Do Minimum vs Do Something – PM Peak Hour.

The AM and PM Peak Hour flows are modelled as occurring between 08:00 to 09:00 and 17:00 to 18:00 respectively, which present an overall worst-case scenario.

General Traffic Impact Assessment (2035, AM Peak Period)

Table 18-38 outlines the V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2035 Opening Year and the resultant magnitude of impact and significance of effect at each junction. The location of these junctions along links experiencing an increase in traffic flows of greater than 100 PCUs due to the proposed Scheme are illustrated in Volume 4 – Map Figure 18-3.

Table 18-38: Volume over Capacity at Key Junctions (Do Minimum vs Do Something), AM Peak, 2035

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
Ballyboggan Road	BALLYBOGGAN ROAD / GLASNEVIN WOODS (A.1)	Low	✓			✓			Negligible	Not Significant
Ballyboggan Road	BALLYBOGGAN ROAD / FINGLAS ROAD (A.2)	Low	✓			✓			Negligible	Not Significant
Ballyboggan Road	BROOMBRIDGE ROAD / BALLYBOGGAN ROAD (A.3)	High			✓			✓	Negligible	Not Significant
Charlestown Place	CHARLESTOWN ROAD / CHARLESTOWN SC (A.4)	Low	✓			✓			Negligible	Not Significant
Charlestown Place	R135 / NORTH ROAD (A.5)	High		✓			✓		Negligible	Not Significant
Charlestown Place	ST MARGARETS ROAD / CHARLESTOWN PLACE (A.6)	High		✓			✓		Negligible	Not Significant
Finglaswood Road	FINGLASWOOD ROAD / CARDIFF CASTLE ROAD (A.7)	High	✓			✓			Negligible	Not Significant
Finglaswood Road	FINGLASWOOD ROAD / MELLOWES ROAD (A.8)	Medium		✓			✓		Negligible	Not Significant
Glasanaon Road	BALLYGALL ROAD WEST / CLUNE ROAD / SEAMUS ENNIS ROAD (A.9)	High	✓			✓			Negligible	Not Significant
Glasanaon Road	BALLYGALL ROAD WEST / GLASANAON ROAD (A.10)	High	✓			✓			Negligible	Not Significant
Glasanaon Road	BALLYGALL PLACE / GLASANAON ROAD (A.11)	High	✓			✓			Negligible	Not Significant

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
Jamestown Road	SEAMUS ENNIS ROAD / JAMESTOWN ROAD (A.12)	High			✓			✓	Negligible	Not Significant
Jamestown Road	SYCAMORE ROAD / JAMESTOWN ROAD (A.13)	Medium		✓			✓		Negligible	Not Significant
Finglas Main Street	FINGLAS ROAD / MAIN STREET (A.14)	Low	✓			✓			Negligible	Not Significant
Finglas Main Street	FINGLAS ROAD / MAIN STREET (A.15)	High	✓			✓			Negligible	Not Significant
Finglas Main Street	MAIN STREET / ST CANICE'S CHURCH (A.16)	High	✓			✓			Negligible	Not Significant
Finglas Main Street	MAIN STREET / BALLYGALL ROAD WEST (A.17)	High	✓			✓			Negligible	Not Significant
Finglas Main Street	MAIN STREET / CHURCH STREET (A.18)	High	✓			✓			Negligible	Not Significant
Melville Road	JAMESTOWN ROAD / MELLVILLE ROAD / POPPINTREE PARK LANE (A.19)	High			✓		✓		Low Positive	Not Significant
Melville Road	MELVILLE WAY / MYGAN PARK (A.20)	High	✓			✓			Negligible	Not Significant

The results of the junction analysis illustrated in Table 18-38 demonstrate that the majority of junctions are operating with a maximum V / C ratio of below 85% during the AM Peak Hour in the 2035 Opening Year, and that the proposed Scheme will have a negligible impact on the majority of assessed local / regional road links within the study area.

Capacity issues are noted at the following junctions:

- Broombridge Road / Ballyboggan Road – operates above 100% during both the Do Minimum and Do Something scenarios; and
- Seamus Ennis Road / Jamestown Road – operates above 100% during both the Do Minimum and Do Something scenarios.

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

General Traffic Impact Assessment (2035, PM Peak Period)

Table 18-39 outlines the V / C ratios at the key local / regional road junctions in the PM Peak Hour for the 2035 Opening Year and the resultant magnitude of impact and significance of effect at each junction. The location of these junctions along links experiencing an increase in traffic flows of greater than 100 PCUs due to the proposed Scheme are illustrated in Volume 4 – Map Figure 18-4.

Table 18-39: Volume over Capacity at Key Junctions (Do Minimum vs Do Something), PM Peak, 2035

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
Charlestown Place	CHARLESTOWN ROAD / CHARLESTOWN SC (P.1)	Low	✓			✓			Negligible	Not Significant
Charlestown Place	CHARLESTOWN PLACE / R135 NORTH ROAD (P.2)	High			✓			✓	Negligible	Not Significant
Charlestown Place	ST MARGARETS ROAD / CHARLESTOWN PLACE (P.3)	High			✓			✓	Negligible	Not Significant
Glasanaon Road	BALLYGALL ROAD WEST / CLUNE ROAD / SEAMUS ENNIS ROAD (P.4)	High		✓			✓		Negligible	Not Significant
Glasanaon Road	BALLYGALL ROAD WEST / GLASANAON ROAD (P.5)	High	✓			✓			Negligible	Not Significant

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
Jamestown Road	CLANCY AVENUE / JAMESTOWN ROAD (P.6)	High	✓			✓			Negligible	Not Significant
Jamestown Road	JAMESTOWN ROAD / HAMPTON WOOD ROAD (P.7)	High	✓			✓			Negligible	Not Significant
Jamestown Road	JAMESTOWN ROAD / MELVILLE ROAD / POPPINTREE PARK LANE (P.8)	High			✓			✓	Negligible	Not Significant
Jamestown Road	SYCAMORE ROAD / JAMESTOWN ROAD (P.9)	Medium		✓			✓		Negligible	Not Significant
Jamestown Road	JAMESTOWN ROAD / JAMESTOWN BUSINESS PARK (P.10)	Medium	✓			✓			Negligible	Not Significant
Wellmount Road	WELLMOUNT ROAD / FARNHAM DRIVE (P.11)	High	✓			✓			Negligible	Not Significant
Wellmount Road	R135 FINGLAS ROAD / WELLMOUNT ROAD (P.12)	Medium			✓			✓	Negligible	Not Significant

The results of the junction analysis illustrated in Table 18-39 demonstrate that the proposed Scheme will have a negligible impact on the assessed local / regional road links within the study area in the 2035 PM Peak Hour.

Capacity issues are noted at the following junctions:

- Charlestown Place / R135 North Road – operates above 100% during both the Do Minimum and Do Something scenarios;
- Charlestown Place / St Margaret's Road – operates above 100% during both the Do Minimum and Do Something scenarios;
- Jamestown Road / Melville Road – operates above 100% during both the Do Minimum and Do Something scenarios; and
- R135 Finglas Road / Wellmount Road - operates above 100% during both the Do Minimum and Do Something scenarios.

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

General Traffic Impact Assessment (2050, AM Peak Period)

The same approach used for Opening Year traffic impact assessment was applied to the 2050 Design Year. In-line with TII Traffic and Transport Assessment Guidelines, links were identified where vehicle movements increase by more than 100 PCUs in both directions as a result of the proposed Scheme. The junctions along these links were then assessed to determine the impact of the traffic changes on overall capacity.

Table 18-40 outlines the V / C ratios at the key local / regional road junctions in the AM Peak Hour for the 2050 Design Year and the resultant magnitude of impact and significance of effect at each junction. The location of these junctions along links experiencing an increase in traffic flows of greater than 100 PCUs due to the proposed Scheme are illustrated in Volume 4 – Map Figure 18-5.

Table 18-40: Volume over Capacity at Key Junctions (Do Minimum vs Do Something), AM Peak, 2050

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
Barry Road	BARRY ROAD / CASEMENT DRIVE (A.1)	High	✓			✓			Negligible	Not Significant
Cardiffsbridge Road	MELLOWES ROAD / KILDONAN ROAD (A.2)	High	✓			✓			Negligible	Not Significant
Cardiffsbridge Road	RATOATH AVENUE / CARDIFFSBRIDGE ROAD (A.3)	High	✓			✓			Negligible	Not Significant
Cardiffsbridge Road	WELLMOUNT AVENUE / CARDIFFSBRIDGE ROAD (A.4)	High	✓			✓			Negligible	Not Significant

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
Cardiffsbridge Road	CARDIFFSBRIDGE ROAD / CAPPAGH ROAD (A.5)	Medium		✓			✓		Negligible	Not Significant
Charlestown Place	CHARLESTOWN ROAD / CHARLESTOWN SC (A.6)	Low	✓			✓			Negligible	Not Significant
Charlestown Place	R135 / NORTH ROAD (A.7)	High		✓			✓		Negligible	Not Significant
Charlestown Place	ST MARGARETS ROAD / CHARLESTOWN PLACE (A.8)	High		✓			✓		Negligible	Not Significant
Glasanaon Road	BALLYGALL PLACE / GLASANAON ROAD (A.9)	High	✓			✓			Negligible	Not Significant
Glasanaon Road	BALLYGALL ROAD WEST / CLUNE ROAD / SEAMUS ENNIS ROAD (A.10)	High	✓			✓			Negligible	Not Significant
Glasanaon Road	BALLYGALL ROAD WEST / GLASANAON ROAD (A.11)	High	✓			✓			Negligible	Not Significant
Glasanaon Road	FERNDALE AVENUE / GLASANAON ROAD (A.12)	High	✓			✓			Negligible	Not Significant
Kildonan Road	KILDONAN ROAD / KILDONAN DRIVE (A.13)	High	✓			✓			Negligible	Not Significant
Kildonan Road	KILDONAN ROAD / BARRY ROAD (A.14)	High	✓			✓			Negligible	Not Significant
Finglas Main Street	FINGLAS ROAD / MAIN STREET (A.15)	Low	✓			✓			Negligible	Not Significant
Finglas Main Street	FINGLAS ROAD / MAIN STREET (A.16)	High	✓			✓			Negligible	Not Significant
Mellowes Road	FINGLASWOOD ROAD / MELLOWES ROAD (A.17)	Medium			✓			✓	Negligible	Not Significant

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
Mellowes Road	MELLOWES ROAD / R103 (A.18)	Medium	✓			✓			Negligible	Not Significant
Mellowes Road	R103 / MELLOWES ROAD (A.19)	Low	✓			✓			Negligible	Not Significant
Plunkett Road	CASEMENT DRIVE / PLUNKETT ROAD (A.20)	High	✓			✓			Negligible	Not Significant
Plunkett Road	PLUNKETT ROAD / BARRY AVENUE (A.21)	High	✓			✓			Negligible	Not Significant
R135 Finglas Road	FINGLAS OFF-SLIP (A.22)	Low	✓			✓			Negligible	Not Significant
R103	MELLOWES ROAD / MELLOWES CRESCENT (A.23)	Medium	✓			✓			Negligible	Not Significant
Ratoath Road	RATOATH ROAD / RATHVILLY ROAD (A.24)	High	✓			✓			Negligible	Not Significant
Ratoath Road	RATOATH ROAD / SCRIBBLESTOWN ROAD (A.25)	Medium	✓			✓			Negligible	Not Significant
Ratoath Road	RATOATH ROAD / TOLKA VALLEY ROAD (A.26)	Medium	✓			✓			Negligible	Not Significant
Seamus Ennis Road	SEAMUS ENNIS ROAD / R103 (A.27)	Low	✓			✓			Negligible	Not Significant
St Margaret's Road	CHARLESTOWN SHOPPING CENTRE MINOR ROAD (A.28)	High	✓			✓			Negligible	Not Significant
St Margaret's Road	ST MARGARETS ROAD / MINOR ROAD (A.29)	High	✓			✓			Negligible	Not Significant

The results of the junction analysis illustrated in Table 18-40 demonstrate that the majority of junctions continue to operate with a maximum V / C ratio of below 85% during the AM Peak Hour in the 2050 Design Year. The Finglaswood Road / Mellowes Road junction operates with a V / C ratio of above 100% but this occurs in both the Do Minimum and Do Something scenarios.

Overall, redistributed traffic associated with the proposed Scheme is expected to result in a Not Significant and Long-term effect at all junctions experiencing an increase of more than 100 PCUs in the 2050 AM Peak hour.

General Traffic Impact Assessment (2050, PM Peak Period)

Table 18-41 outlines the V / C ratios at the key local / regional road junctions in the PM Peak Hour for the 2050 Design Year and the resultant magnitude of impact and significance of effect at each junction. The location of these junctions along links experiencing an increase in traffic flows of greater than 100 PCUs due to the proposed Scheme are illustrated in Volume 4 – Map Figure 18-6.

Table 18-41: Volume over Capacity at Key Junctions (Do Minimum vs Do Something), PM Peak, 2050

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
Ballyboggan Road	BALLYBOGGAN ROAD / FINGLAS ROAD (P.1)	Low		✓			✓		Negligible	Not Significant
Ballyboggan Road	BROOMBRIDGE ROAD / BALLYBOGGAN ROAD (P.2)	High			✓			✓	Negligible	Not Significant
Ballygall Road East	BALLYGALL ROAD EAST / FERNDALE AVENUE (P.3)	High	✓			✓			Negligible	Not Significant
Ballygall Road East	BALLYGALL ROAD EAST / HILLCREST PARK (P.4)	High	✓			✓			Negligible	Not Significant
Ballygall Road East	BENEAVIN ROAD / BALLYGALL ROAD EAST / BENEAVIN DRIVE (P.5)	High	✓			✓			Negligible	Not Significant
Ballygall Road East	CREMORE HEIGHTS / BALLYGALL ROAD EAST (P.6)	High	✓			✓			Negligible	Not Significant
Ballygall Road East	FITZMAURICE ROAD / BALLYGALL	Medium	✓			✓			Negligible	Not Significant

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
	ROAD EAST (P.7)									
Church Street	CHURCH STREET / CHURCH TERRACE (P.8)	Medium	✓			✓			Negligible	Not Significant
Church Street	FINGLAS ROAD / CHURCH STREET (P.9)	Medium		✓			✓		Negligible	Not Significant
Hampton Wood Road	HAMPTON WOOD ROAD / HAMPTON WOOD GREEN (P.10)	High	✓			✓			Negligible	Not Significant
Jamestown Road	CLANCY AVENUE / JAMESTOWN ROAD (P.11)	High	✓			✓			Negligible	Not Significant
Jamestown Road	JAMESTOWN ROAD / JAMESTOWN BUSINESS PARK (P.12)	Medium	✓			✓			Negligible	Not Significant
Jamestown Road	JAMESTOWN ROAD / HAMPTON WOOD ROAD (P.13)	High	✓			✓			Negligible	Not Significant
Jamestown Road	JAMESTOWN ROAD / MELLVILLE ROAD / POPPINTREE PARK LANE (P.14)	High			✓			✓	Negligible	Not Significant
Jamestown Road	SYCAMORE ROAD / JAMESTOWN ROAD (P.15)	Medium		✓			✓		Negligible	Not Significant
R135 Finglas Road	FINGLAS OFF-SLIP / R135 FINGLAS ROAD (P.16)	Low		✓				✓	Medium	Negative Moderate
R135 North Road	R135 / N2 SOUTH OF M50 INTERCHANGE (P.17)	Negligible	✓			✓			Negligible	Imperceptible

Road Name	Junction Name (Map ID)	Junction Sensitivity	DM Max V/C			DS Max V/C			Magnitude of Impact	Significance of Effects
			≤85%	85% - 100%	≥100%	≤85%	85% - 100%	≥100%		
R135 North Road	R135 / NORTH ROAD (P.18)	High		✓			✓		Negligible	Not Significant
Sycamore Road	GROVE ROAD / SYCAMORE ROAD (P.19)	High	✓			✓			Negligible	Not Significant
Sycamore Road	SYCAMORE PARK / SYCAMORE ROAD (P.20)	High	✓			✓			Negligible	Not Significant
Sycamore Road	SYCAMORE ROAD / GROVE PARK ROAD / WILLOW PARK CRESCENT (P.21)	High	✓			✓			Negligible	Not Significant
Sycamore Road	SYCAMORE ROAD / MCKEE ROAD (P.22)	High	✓			✓			Negligible	Not Significant

The results of the junction analysis illustrated in Table 18-41 demonstrate that the majority of junctions continue to operate with a maximum V / C ratio of below 85% during the PM Peak Hour in the 2050 Design Year with the proposed Scheme in place.

It is noted that capacity issues arise at the following junctions:

- Broombridge Road / Ballyboggan Road – operates above 100% during both the Do Minimum and Do Something scenarios;
- Jamestown Road / Melville Road – operates above 100% during both the Do Minimum and Do Something scenarios; and
- R135 Finglas Road / Finglas Off-Slip – operates between 85% – 100% during the Do Minimum and above 100% during the Do Something scenario.

At two of the junctions above, the impact is considered to be negligible as performance is similar in the Do Minimum and Do Something scenarios (above 100% V / C). A Negative, Moderate and Long-term effect is predicted at the Finglas Off-Slip entering the R135 in a northbound direction. As outlined previously, at junctions where a moderate effect or lower is predicted, further mitigation measures are not required. This is due to the fact that moderate effects are defined as impacting the 'character of the environment in a manner that is consistent with existing and emerging baseline trends' (as per Table 18-4).

General Traffic Assessment Summary

Luas Finglas will operate in a mainly off-road corridor; however, it will interact with the road network at a number of locations including St Margaret's Road and the R135 North Road, along with crossings of Mellowes Road, Cappagh Road, Wellmount Road, St Helena's Road, Tolka Valley Road and Ballyboggan Road. There will be an overall reduction in operational capacity for general traffic at some of these locations, in particular along St Margaret's Road, and at the junction with the R135 which will be converted to a signalised junction to facilitate Luas crossings as well improved safety for pedestrians and cyclists.

This reduction in operational capacity for general traffic will create traffic redistribution from the proposed Scheme onto the surrounding road network. The LAM Opening Year (2035) and Design Year (2050) model results were used to identify the impact in traffic flows between the Do Minimum and Do Something scenarios. A reduction in general traffic flows along a road link has been described as a positive impact to the environment. The significance of the impact has been described in terms of the loss in traffic flows. An increase in general traffic flows along a road link has been described as a negative impact to the environment. Reference has been given to TII's Traffic and Transport Assessment Guidelines as an indicator for best practice, to determine the key road links that require further traffic analysis due to the increase in traffic. Operational capacities were extracted from the LAM at the associated junctions of the key road links to identify the impact that the proposed Scheme will have on the V / C ratios. The results are presented in terms of the significance of the impact to the V / C ratio for each junction based on its sensitivity and magnitude of impact.

The results of the assessment demonstrate that the surrounding road network largely has the capacity to accommodate the redistributed general traffic as a result of the proposed Scheme. The majority of assessed junctions that required further traffic analysis have V / C ratios that are broadly similar before and after the proposed Scheme implementation, resulting in a Not Significant and Long-term effect. The analysis demonstrates that there will be a level of redistribution of traffic with some increases in volumes on surrounding roads. Across the study area as a whole, it is determined that there will be an overall Negative, Slight and Long-term effect from the redistributed general traffic as a result of the proposed Scheme. This impact is considered acceptable in line with the scheme objectives and the considerable improvements for sustainable modes.

Given that the redistributed traffic will not lead to a significant deterioration of the operational capacity on the surrounding road network, no additional mitigation measures, beyond what is included already in the design, are required to alleviate the impact of the proposed Scheme.

18.5 Mitigation and Monitoring Measures

18.5.1 Construction Phase

Chapter 6 (Construction Activities) sets out the approach that will be taken to construct the proposed Scheme, while it also provides an overview of the construction activities necessary to undertake the works.

A Construction Environmental Management Plan (CEMP) has been prepared and is included as Volume 5 – Appendix A6.1 of this EIAR, which will be updated and finalised by the appointed Contractor prior to construction commencing. The CEMP comprises the construction mitigation measures, which are set out in this EIAR, and will be updated with any additional measures which may be required by the conditions attached to An Bord Pleanála's decision. Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum during the Construction Phase. The CEMP has regard to the guidance contained in the TII Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (National Roads Authority, 2007), and the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 5th Edition (CIRIA 2023).

A Construction Traffic Management Plan (CTMP) has been prepared to demonstrate the manner in which the interface between the public and construction-related traffic will be managed and how vehicular movement will be controlled. The CTMP is presented in Volume 5 – A6.2 of this EIAR. The purpose of this CTMP is to demonstrate that the impacts to the public road network during the Construction Phase of the proposed Scheme can be minimised and that transport related activities are carried out as safely as possible and with the minimum disruption to other road users. The CTMP covers the following aspects:

- Access and egress at construction access points and throughout the live working area;
- Construction compounds;
- Routing of construction vehicles;

- Pedestrian (including able-bodied pedestrians, wheel-chair users, mobility impaired pedestrians, pushchair users, etc.) and cyclist provisions to ensure safety for all road users during the Construction Phase;
- Public transport provisions;
- Parking and access including temporary access provisions, communication with local stakeholders and measures to ensure access is maintained at all times;
- Lighting including the use of temporary lighting as required during construction;
- Construction Stage Mobility Management Plan (CSMMP) including measures to actively discourage the use of private vehicles to the proposed Scheme;
- Traffic management signage to warn road users of the works ahead and to advise of any changes to the carriageway layout;
- Timings of material deliveries to reduce the impact on local communities and residents adjacent to the proposed Scheme during the Construction Phase;
- Traffic management speed limits including the use of special speed limits for construction traffic in sensitive areas, such as 30km/hr at school locations;
- Vehicle cleaning including measures around refuelling of vehicles and plant, wheel washing to remove mud and organic materials, treatment of surface run-off from washing areas etc.;
- Road condition with dedicated construction vehicle access routes being regularly inspected for cleanliness, and the restoration of existing carriageways, footpaths etc. if they are damaged as a result of the works;
- Road closures and diversions outlining measure to limit the impact on road users, residents, businesses etc;
- Enforcement of the Construction Traffic Management Plan measures throughout the Construction Phase;
- Interface with other projects including liaison on a case-by-case basis through DCC and FCC to ensure that there is coordination between projects, that construction access locations remain unobstructed by the proposed Scheme works and that any additional construction traffic mitigation measures required to deal with cumulative impacts are managed appropriately;
- Emergency procedures during construction ensuring that unobstructed access is provided to all emergency vehicles along all routes and accesses;
- Communication including measures to ensure effective engagement with local authorities, the local community, landowners, and strategic stakeholders throughout the Construction Phase;
- Public Notices including advertisement of proposed works, lane closures, temporary road closures, diversion routes, and other traffic management controls; and
- Key Personnel and Organisations, including their responsibilities.

This plan will be updated and finalised by the Project Supervisor for the Construction Stage (PSCS) / Contractor prior to commencing the works. The PSCS shall co-ordinate the implementation of the CTMP during construction of the proposed Scheme. The Works Requirements will require the implementation of all the mitigation measures identified in the EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála.

The CTMP takes consideration of the phasing requirements of the proposed Scheme and will ensure safe construction and minimise the impact on traffic on non-motorised users (NMUs) along the route of the proposed Scheme and maintain flow of all modes of transport.

No further mitigation measures are therefore required as part of the proposed Scheme.

18.5.2 Operational Phase

Given that the proposed Scheme results in a positive impact for walking, cycling, public transport and people movements, mitigation and monitoring measures are not required.

The design development for general traffic, including the measures incorporated into the proposed Scheme to minimise negative impacts, have been outlined in Chapter 5 (Description of proposed Scheme) of this EIAR. As outlined in Section 18.4.3.8, redistributed traffic due to the proposed Scheme will not lead to a significant deterioration of the operational capacity on the surrounding road network. As such, no further mitigation measures are required beyond those already incorporated as part of the proposed Scheme.

18.6 Residual Impacts

Following the implementation of the mitigation measures set out in section 18.5, the Construction and Operational Phases of the proposed Scheme will result in a range of imperceptible to slight adverse residual impacts within the study area. No moderate or significant residual adverse impacts are predicted following the implementation of appropriate mitigation measures.

The proposed Scheme will result in a range of significant to very significant positive long-term residual transport impacts. The delivery of improved pedestrian and cycle infrastructure along the proposed Scheme will provide a safe and pleasant environment to walk and cycle. Each new Luas stop will include cycle parking facilities, making it even easier to undertake Cycle-LRV trips supporting multimodal travel. Junction upgrades along the proposed Scheme have been designed in-line with latest guidance and provide significantly improved safety and accessibility for pedestrians and cyclists including elements such as signalised crossings, raised tables, traffic calming measures etc. The proposed walk and cycle infrastructure will link a number of residential areas, local schools, parks and recreational facilities along the route encouraging sustainable travel, in particular for vulnerable road users and unconfident cyclists. The new active travel facilities will also provide a connection to the Royal Canal Way which offers a mainly off-road link towards Dublin city and is also a great local amenity for recreational trips along with the Tolka Valley Greenway.

The proposed Scheme will deliver a fast and reliable public transport service offering 17-minute savings in journey time in the AM peak from Charlestown to Dublin city centre, compared to the longer and much less reliable expected car travel-time. By 2035, the proposed Scheme will generate an additional 1.3 million low carbon public transport trips in 2035, increasing to 1.8 million in 2050, thereby supporting modal shift.

The proposed Scheme will serve the population of the Finglas study area, which is forecasted to grow by approximately 14% by 2035. Through the substantial increase in public transport capacity and improvements to journey times and reliability, the proposed Scheme will have a significant economic impact, improving the attractiveness of the area it serves supporting the delivery of regeneration and development investment, and providing capacity to enable medium and long-term compact and sustainable growth. Analysis shows that 73% of the new population expected in the Finglas area by 2035 will be within a 10-minute walk of one of the new Luas Finglas stops.

The delivery of the proposed Scheme will also help unlock potential capacity for people movements to and from the northwest corridor. Modelling analysis indicates that in the opening year 2035, Luas Finglas will lead to a 50% increase in transport capacity utilisation for trips travelling south towards the city centre in the AM peak. With the delivery of Luas Finglas, an additional 2,655 person trips are expected to cross the Royal Canal in the AM peak in 2035.

18.7 Cumulative Impacts

The cumulative assessment of relevant plans and projects has been undertaken separately in Chapter 24 of this EIAR.

18.8 Difficulties Encountered in Compiling Information

There was sufficient information available to conduct a robust assessment of the likely significant impacts for this chapter**.**

18.9 References

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