CITY EDGE PROJECT

Prepared by Systra – April 2026

Transport Modelling

SDCC Comhairle Contae Átha Cliath Theas South Dublin County Council

South Dublin 2022-2028 County Development Plan

CITY EDGE 2042 MODELLING

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1. INTRODUCTION

1.1 Background

1.1.1 As part of a national strategy to rejuvenate our cities and large towns, whilst concentrating new housing and employment in existing urban areas, South Dublin County Council (SDCC) and Dublin City Council (DCC) have come together in a joint urban regeneration effort.

1.1.2 Unique in Ireland, the City Edge Project is a transformative initiative, re-imagining the Naas Road, Ballymount and Park West areas at the western edge of Dublin City. Creating a new urban quarter, it has the potential for 40,000 new homes and 75,000 jobs, making it one of the largest regeneration schemes in Europe.

1.1.3 The central aim of City Edge will be to deliver a compact liveable city, providing future residents and visitors with a choice of sustainable travel options. This will be achieved through focussing new mixed-use and urban development on enhanced active travel and public transport corridors.

1.1.4 The work to date has included the production of a non-statutory Strategic Framework, which set out the high-level redevelopment of the City Edge lands, including the significant infrastructural challenges that need to be addressed. The Strategic Framework has been refined by both local authorities into detailed policy, zoning, and infrastructure alignment within statutory development plan processes. This has involved identifying Priority Development Areas (PDAs) and setting out a public transport focussed, walkable urban structure.

1.1.5 This report focusses on modelling work for the PDAs which are expected to be delivered by 2042, ahead of the full project completion in 2070. This work supplements the modelling previously undertaken for the full extent of City Edge in 2070. Figure 1 below illustrates the location of the PDAs within the City Edge boundary.

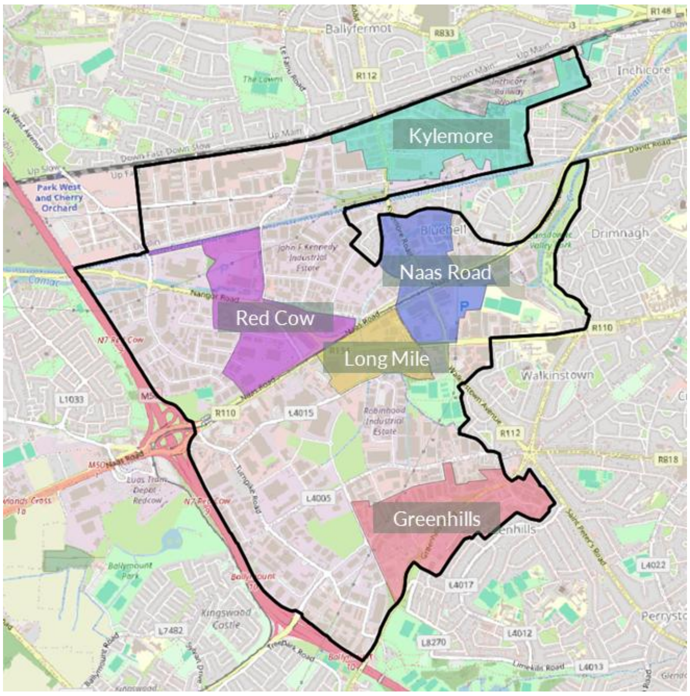

Figure 1. City Edge Priority Development Areas (PDA)

1.2 Objectives

1.2.1 This main objective of the study is to assess the potential impacts of developing the Priority Development Areas (PDAs), with specific regard to travel demand, the adequacy of existing and planned public transport infrastructure, impacts on the road network, and implications for future investment in transport infrastructure. A key objective is to indicate the public transport projects that will be required to support the PDA development and an indication of when they will be required and therefore a potentially prioritisation that can be used in engaging with relevant transport providers in the future e.g. through the review of the GDA study.

Overall Demand for Travel to and from the PDAs

1.2.2 The development of the PDAs as part of the City Edge Project is anticipated to generate significant travel demand, as a result of increased residential, commercial, and recreational activities. The assessment considers projected population and employment growth figures within the PDAs, using modelled trip generation rates to estimate the overall increase in daily and peak-period travel demand.

Capacity of the Existing and Planned Public Transport Network

1.2.3 An evaluation of the current and planned public transport network to determine its ability to accommodate the additional demand generated by the PDAs. This includes a review of key Luas and bus services, vehicle capacities and network coverage. The analysis identifies any shortfalls in capacity during peak times and examines the extent to which future improvements or proposed network enhancements align with the anticipated growth.

Contribution and Impact on the Operation of the Road Network

The proposed development will have direct implications for the operation of the local and regional road network. The impact assessment involves traffic modelling to estimate the incremental traffic volumes attributable to the PDAs.

Future Pressure Points on the Network and Additional Investment or Phasing Considerations

1.2.4 Based on the above analyses, key future pressure points, both within the road and public transport networks, are identified. The findings highlight areas where existing or committed infrastructure may prove insufficient to accommodate demand, therefore indicating a need for further investment in transport infrastructure.

1.2.5 In addition, the assessment outlines options for mobility management, demand mitigation, or phasing of development at City Edge, to ensure that transport impacts are appropriately managed and that critical infrastructure is delivered in a timely manner to support sustainable growth.

1.3 Report Structure

1.3.1 The following provides a description of the contents of each section of the report:

- Section 2 summarises the option development for this study;
- Section 3 provides an overview of the NTA Regional Modelling System (RMS) used to assess City Edge;
- Section 4 summarises the land use assumptions;
- Section 5 provides a summary of the transport assumptions;
- Section 6 presents the outcome of the strategic modelling assessment for both demand and transport; and
- Section 7 concludes the report.

2. OPTION DEVELOPMENT

2.1 Overview

2.1.1 The City Edge development proposals will generate a high demand for movement across all modes, both locally and across the wider Dublin area. A sufficient level of transport provision is required to support this demand.

2.1.2 An evidence-based approach has been used to gain an understanding of the likely demand for travel from City Edge and the necessary transport infrastructure required to meet the demand, with a focus on sustainable travel.

2.2 Scenarios

2.2.1 Scenario 1: Baseline

A 2024 current-year Baseline has been developed to establish the current conditions.

2.2.2 Scenario 2: Committed Transport Schemes

This is to establish a 2042 scenario with full development but with committed transport interventions only. This will identify to what extent the transport interventions as part of the GDA Strategy will support the development. Schemes include

- BusConnects; and
- DART+ West.

2.2.3 Scenario 3: Reference Case

This scenario additionally includes all transport interventions as part of the National Transport Authority's (NTA) Greater Dublin Area (GDA) Transport Strategy as listed below.

- MetroLink;
- Lucan to City Centre Luas;
- Luas Extension to Poolbeg;
- Luas Finglas;
- DART+ South West; and
- DART+ Coastal.

Also included are Schemes as part of the GDA Transport Study including

- Residential Car Availability (Cars per household) - 30%; and
- Reduced Free-work place parking based on parking figures provided.

2.2.4 Scenario 4: Demand Management

This scenario would include wider Demand Management Measures under the GDA Demand Management Strategy.

2.2.5 Scenario 5: Public Transport Enhancements 1

Based on the outcomes of the previous scenarios, this scenario contains additional public transport (PT) and City Edge specific Demand Management schemes

2.2.6 Scenario 6: Public Transport Enhancements 2

Similar to Scenario 5, this scenario contains additional PT and City Edge specific Demand Management schemes based on the outcomes of the previous scenarios.

2.2.7 Scenario 7: Land Use Optioneering 1

This is to establish a 2042 scenario with an alternative land use quantum/mix and would be combined with the most realistic transport scenario arising from the Transport Optioneering scenarios.

2.2.8 Scenario 8: Land Use Optioneering 2

This is to establish another 2042 scenario with an alternative land use quantum/mix.

2.2.9 Scenario 9: Combined Public Transport Enhancements & Land Use Optioneering

Ahead of the Emerging Preferred Scenario Refinement this is to test the combination of public transport enhancements and the most realistic transport scenario arising from the previous scenarios.

2.2.10 Scenario 10: Emerging Preferred Scenario Refinement

Based on the outcomes of all previous scenarios, this is to establish a refined emerging preferred land use and transport solution.

3. NTA REGIONAL MODELLING SYSTEM

3.1 Background

3.1.1 This section briefly outlines the NTA Regional Modelling System (RMS), outlining its scope, extent, components, functionality and its suitability for use in developing the City Edge Project. The information in this chapter is based on the latest version 3 model used in the appraisal of the final strategy.

3.1.2 The national remit of the NTA requires a system of regional models to help it deliver on its planning and appraisal needs. The NTA Regional Modelling System comprises five regional transport models covering the Republic of Ireland and centred on the five main cities of Dublin, Cork, Galway, Limerick, and Waterford and are summarised in Table 1 below.

Table 1. Regional Modelling System

REGIONAL MODELLING SYSTEM	ABBREVIATION	COUNTIES COVERED
Eastern Regional Model	ERM	Louth, Monaghan, Cavan, Longford, Westmeath, Meath, Offaly, Laois, Kildare, Dublin, Wicklow, Carlow & Northern Wexford
South East Regional Model	SERM	Wexford, Kilkenny, Waterford & Tipperary South
South West Regional Model	SWRM	Cork & Kerry
Mid-West Regional Model	MWRM	Limerick, Clare & North Tipperary
Western Regional Model	WRM	Galway, Mayo, Roscommon, Sligo, Donegal & Leitrim

3.1.3 Each regional model has the following key attributes:

- Full geographic coverage of the relevant region;
- A detailed representation of the road network, particularly the impact of congestion on on-street public transport services and include modelling of residents' car trips by time period from origin to destination;
- A detailed representation of the public transport network & services, and can predict demand on the different public transport services within the regions;
- A representation of all major transport modes including active modes (walking and cycling) and includes accurate mode-choice modelling of residents;
- A detailed representation of travel demand, e.g. by journey purpose, car ownership/availability, mode of travel, person types, user classes & socio-economic classes, and representation of four time periods (AM, Inter-Peak, PM and Off-Peak); and

- A prediction of changes in trip destination in response to changing traffic conditions, transport provision and/or policy.

3.1.4 The East Regional Model (ERM), which covers Louth, Monaghan, Cavan, Longford, Westmeath, Meath, Offaly, Laois, Kildare, Dublin, Wicklow, Carlow & Northern Wexford, has been used to support the development of the City Edge Models. Figure 2 illustrates the geographical extent of each of the Regional Models.

Figure 2. Modelling System Regional Model Areas

3.2 Regional Modelling System Dimensions

3.2.1 The regional modelling system features or dimensions are defined in terms of:

- Zone system;
- Modes of travel represented;
- Base year;
- Time-periods; and
- Demand segmentation.

3.3 Zone System

3.3.1 The zone system definitions for each of the regional models were based on Census Small Area (CSA) boundaries and Electoral Districts (EDs). The 2016 CSAs are the core base layer for each zoning system. CSAs are the smallest geographic unit of data available with which to define the model zone system. Each CSA is a defined geographic area associated with demographic data (e.g. population, age distribution, employment status), and the work / school travel characteristics of the population (via Place of Work, School or College - Census of Anonymised Records (POWSCAR)).

3.3.2 CSAs are subsets of EDs. ED boundaries are commonly used as the unit of geographic information in Ireland and as such it was desirable to maintain a transparent relationship between EDs and the model zone system. Regional Model zones can be smaller or larger than either of these units where required. The criteria used for developing zone boundaries for the ERM and other regional models included:

- Population, Employment and Education – maximum values were specified for zone population, number of jobs and persons in education;
- Activity Levels – limits were applied to zone activity levels ensuring that zones with either very low, or very high, levels of trips were not created;
- Intra-zonal Trips – threshold values were applied to the proportion of intra-zonal trips, within each zone, to avoid an underestimation of flow, congestion and delay on the network;
- Land Use – zones were created with homogeneous land use and socio-economic characteristics where possible;
- Zone Size/Shape – thresholds were applied to zone size, and irregularity of shape, to avoid issues with inaccurate representation of route choice;
- Political Geography – as mentioned above, it is possible to aggregate all zones to ED level i.e. zone boundaries do not intersect ED boundaries;
- Special Generators/Attractors – large generators/attractors of traffic such as Airports, Hospitals, shopping centres etc. were allocated to separate zones by Modes of Travel

3.3.3 The regional model system covers all surface access modes for personal travel and goods vehicles:

- Private vehicles – taxis and cars;
- Public transport – bus, rail, Luas, BRT, Metro;
- Active modes – walking and cycling; and
- Goods vehicles – light goods vehicles and heavy goods vehicles.

3.4 Base Year

3.4.1 The base year of each model is 2016 with a nominal month of April. This is largely driven by the date of the Census (POWSCAR) and the National Household Travel Survey (NHTS).

3.5 Time Periods

3.5.1 The model represents an average weekday. The day is split into five time periods considered within each of the regional models, detailed in Table 2 below. The periods allow the relative difference in travel cost between time periods to be represented. Representative peak hours are used in the assignment models, which are based on period to peak hour factors derived from survey data for each time period and mode.

3.6 Eastern Regional Model (ERM) Structure

3.6.1 Overarching Structure

3.6.2 As mentioned above, the ERM is the model used to support the development of the LSMATS. All the regional models, including the ERM, include 3 core modelling processes (i.e. Demand Model, Road Assignment Model and Public Transport Assignment Model) which receive inputs from the National Demand Forecast Model (NDFM) and provide outputs for transport appraisal and secondary analysis. This process is shown in Figure 3.

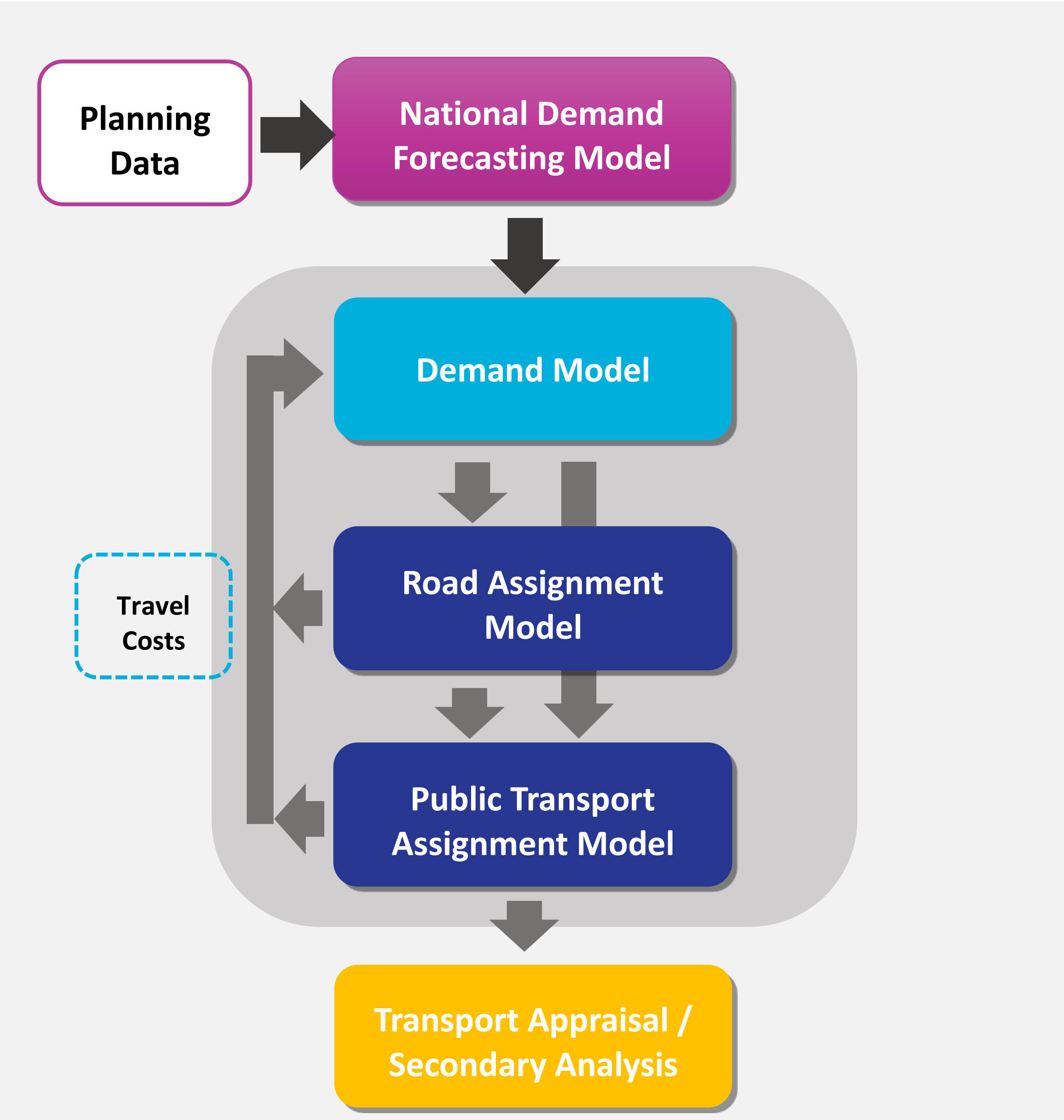

Figure 3. Model Structure

3.7 Planning Data

3.7.1 The Planning Data referred to above is a national database of 99 demographic and spatial variables for each of the 18,642 CSAs in the state. The main categories of planning data are:

- References and spatial definitions;
- Origin-based person types; e.g. age bands, gender, principal economic status (PES), employment type, and various combinations of categories;
- Destination-based person types; e.g. employment type or education type; and
- Households.

3.8 National Demand and Forecasting Model (NDFM)

3.8.1 The NDFM is a separate modelling system that estimates the total quantity of travel demand generated by and attracted to every Census Small Area (CSA) daily. The level of demand from, and to, each zone (referred to as trip ends) is related to characteristics such as population, number of employees and land-use data as outlined in Section 2.

3.8.2 The NDFM comprises the set of models and tools that are used to derive national levels of trip making, for input to each of the regional models. The NDFM outputs levels of trip making at the smallest available spatial aggregation (CSA).

3.8.3 The key components of the NDFM are as follows:

- The Planning Data Adjustment Tool (PDAT) controls the planning data inputs to the core NDFM system. It is used to amend planning data to represent the combination of general changes over time and the relevant land-use planning scenarios;
- The Car Ownership/Car Competition Models estimate the level of car ownership in a CSA, (sub-dividing the number of households in each CSA between 'No Car', 'Cars < Adults' and 'Cars >= Adults' households) i.e. the car competition bands;
- The Car Availability Model classifies the set of individual person trips as either 'Car Available' or 'Car-not-available' using calibrated relationships between the three car competition bands and the trip purpose;
- The National Trip-End Model (NTEM) converts the planning data into person trips, using calibrated trip rates; and
- The Regional Modelling System Integration Tool (RMSIT) estimates the level of trip-making by main mode (car, bus, rail and goods vehicles) between 38 of the main urban settlements in Ireland.

3.9 ERM Demand Model

3.9.1 The Demand Model models travel behaviour and is implemented in Cube Voyager. The demand model processes all-day travel demand from the NDFM through a series of choice models to represent combined mode, time of day, destination and parking decision making. The outputs of the demand model are a set of trip matrices which are assigned to the Road and Public Transport models to determine the route-choice and generalised costs.

3.9.2 The demand model consists of several components that interact in a sequential manner between the trip end model and the assignment models. It includes the following distinct components:

- Macro Time of Day;
- Mode Choice;
- Destination Choice;
- Parking; and
- Tours and One-Way.

3.9.3 A simple representation of the model structure is shown in Figure 4.

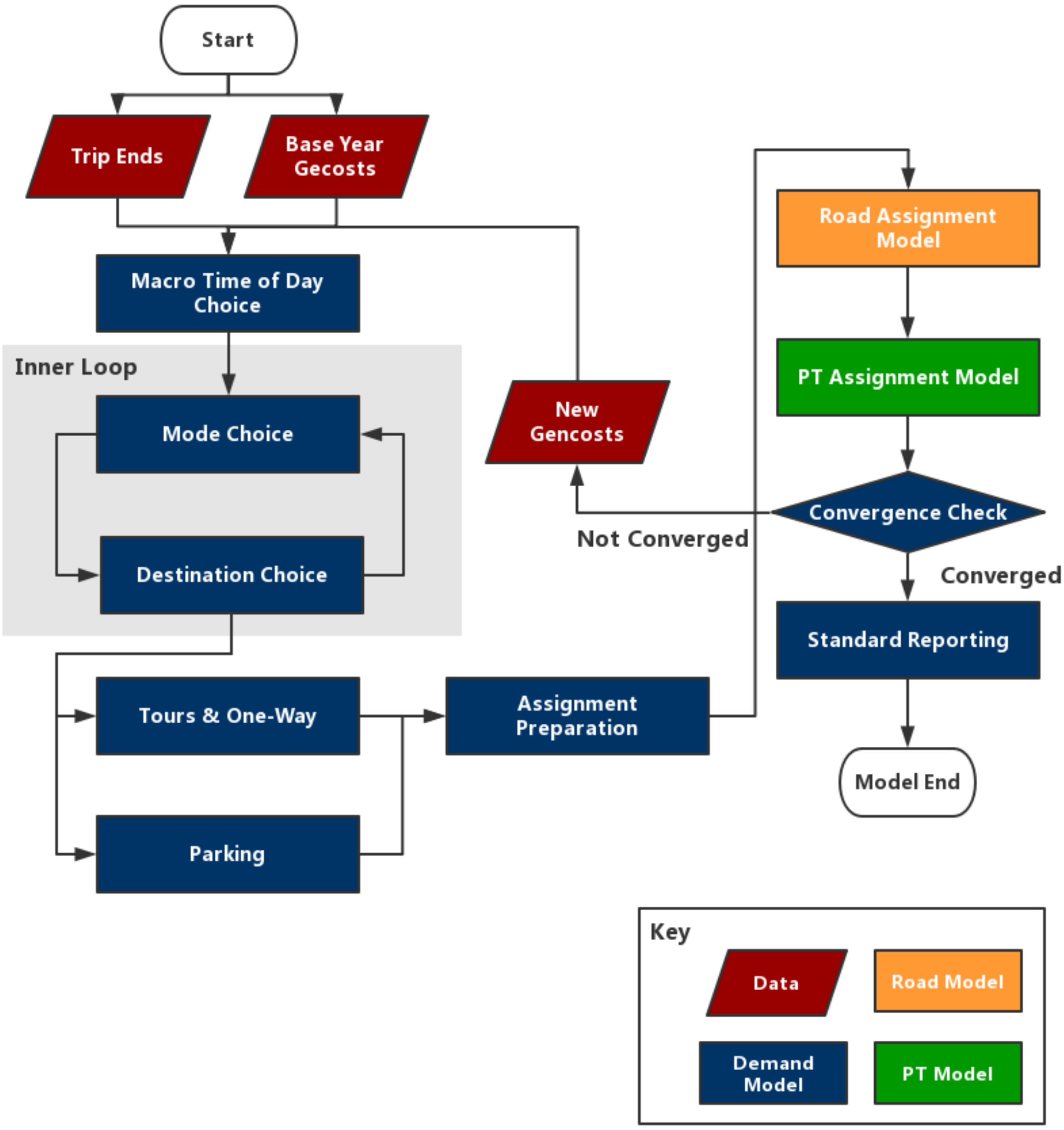

Figure 4. Demand Model Structure

3.10 ERM Road Assignment Model

3.10.1 The Road Assignment Model (RDAM) is implemented in SATURN and includes capacity restraint whereby travel times are recalculated in response to changes in assigned flows. The main purpose of the RDAM is to assign road users to routes between their origin and destination zones. The cost of travel is then calculated by the RDAM for input to the demand model and economic appraisal.

3.10.2 It should be noted that SATURN is a macroscopic model and considers the aggregate behaviour of traffic flows. It does provide detail on junction delay and queueing along links it is a strategic model used to look at impacts across a wider area. Whilst suitable for the purposes of this strategic assessment it is not suitable for detailed junction modelling which consider the interaction of individual vehicles which should be undertaken using a microscopic model such as VISSIM or PARAMICs.

3.10.3 The inputs to the Road Assignment model from the demand model are the road assignment matrices from the assignment preparation stage. The outputs from the Road Assignment model for the demand model processes consist of generalised costs skims by time period and assigned road networks in CUBE Voyager format which are passed on to the PT model.

3.10.4 In addition to these requirements for demand model processes, there are a series of standard SATURN outputs that are produced for use in the specific interrogation of the road networks for scheme and/or scenario assessment.

3.11 ERM Public Transport Assignment Model

3.11.1 To generate costs to update the choice model processes, a PT assignment must be undertaken to establish new generalised costs. The Public Transport Assignment Model (PTAM) is implemented in Voyager and is used to allocate PT users to services between their origin and destination zones. The model includes a representation of the public transport network and services for existing and planned modes within the modelled area. The model includes:

- Rail;
- DART;
- Luas;
- Metro.
- Urban Bus;
- Inter-Urban Bus; and
- Bus Rapid Transit (BRT).

3.11.2 The outputs of the PT assignment model fall into two categories, those required by the demand model, and those produced for reporting and analysis purposes.

3.11.3 The outputs from the Public Transport Assignment model for the demand model processes consist of the assigned networks which are passed on to active mode assignment as the starting point for their network build procedure, and generalised cost skim matrices by user class for each of the assigned time periods that feed back into the main Mode and Destination choice demand model loop. An overview of the PT model process is shown in Figure 5.

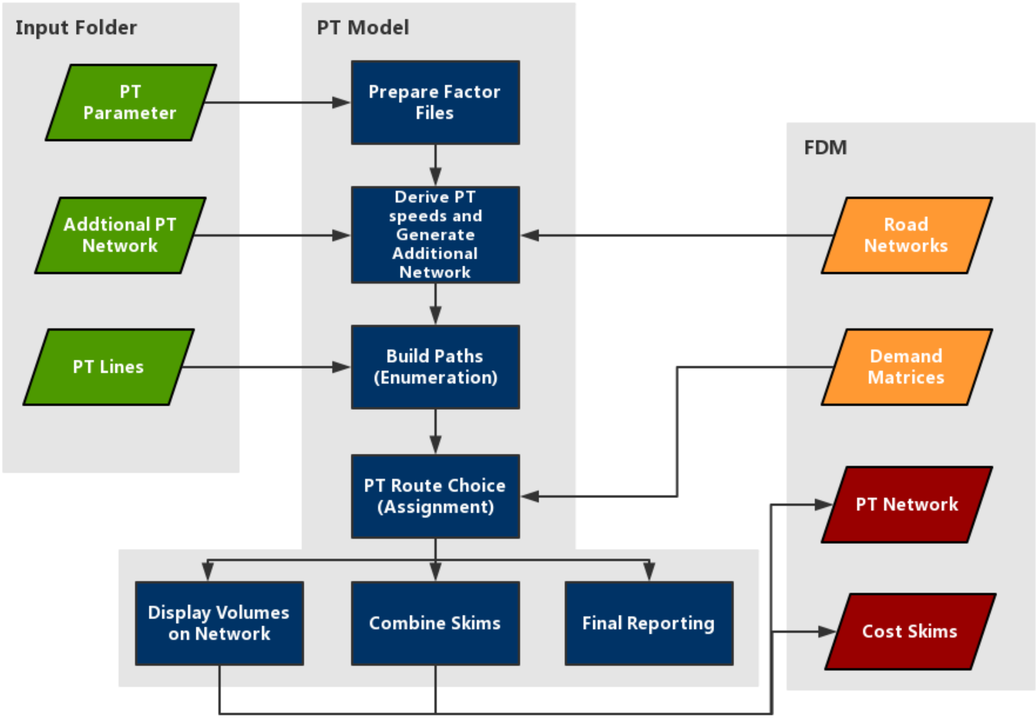

Figure 5. PT Model Process

3.12 ERM Active Modes Model

3.12.1 The Regional Modelling System represents active modes (i.e. walking and cycling) within the demand model to improve the realism of travel choices. To generate costs to update the choice model processes, an active modes assignment must take place to establish new generalised costs. This active mode assignment assumes no crowding or delays.

3.12.2 The inputs for the active assignment model are the output CUBE format PT networks, the demand model produced assignment matrices and separate input pedestrian only links and cycle lanes. The outputs of this process include an assigned network with walk and cycle flows by user class, and a set of generalised cost skims. The active assignment is a CUBE-based lowest cost path assignment model with no junction modelling based purely on distance and a constant speed by mode.

3.12.3 Walk speeds are taken as 4.8 kph for all user classes while cycle speeds are set to 12 kph as default except in specified cases as indicated by the cycle data network input. Improvements to cycling mode provision are included through associating improvements to cycling Quality of Service to increases in service user speeds.

3.13 Summary

3.13.1 The East Regional Model (ERM) provides a comprehensive representation of travel patterns across the Dublin County area and is a suitable tool for the testing and appraisal of the Strategy. The limitations of strategic transport models are recognised and fully understood. The ERM is considered the appropriate tool for fulfilling the NTA's requirements in terms of its planning and appraisal needs.

4. 2042 LAND USE ASSUMPTIONS

4.1 Introduction

4.1.1 This section outlines the land use assumptions employed within the modelling framework. The land use strategy reflects the spatial overlaps between Core Study Areas (CSA), model zones, and Priority Development Areas (PDA) zones. The assumptions draw upon the 2042 NTA Planning Sheets, which already account for some growth within the relevant areas.

4.2 NTA Planning Sheets

4.2.1 The NTA's Planning Sheets for 2042 were used as a starting point for the development of the land use input assumptions for City Edge. A total of 20 CSA Small Areas have been identified within the Priority Development Areas.

4.2.2 0 summarises the population and the number of jobs per CSA within the City Edge area in 2016, 2042 and the difference between the two years. Both population and jobs are expected to grow by about 10,000 between 2016 and 2042.

4.2.3 Whilst some CSA Small Areas only assume minimal growth, others include a substantial growth which is suggesting that some level of City Edge growth has already been assumed in the NTA's Planning Sheets.

4.2.4 The distribution of population and jobs based on the 2042 Planning Sheets is illustrated in Figure 6.

Table 2. Population and Jobs in NTA Planning Sheets

CSA SMALL AREA	2016 POPULATION	2042 POPULATION	POPULATION GROWTH	2016 JOBS	2042 JOBS	JOB GROWTH
267047006	564	2,773	**2,209**	4,738	6,522	**1,784**
267142014	293	2,848	**2,555**	5,127	6,781	**1,654**
267050037	313	1,973	**1,660**	5,498	7,853	**2,355**
268040005	344	454	**110**	4,571	5,862	**1,291**
268154006	296	298	**2**	159	164	**5**
268154008	353	570	**217**	612	908	**296**
268079001	214	215	**1**	938	965	**27**
268079007	378	3,884	**3,506**	949	2,363	**1,414**
267157010	178	484	**306**	723	1,362	**639**
268078001	238	241	**3**	589	777	**188**
268078002	300	302	**2**	483	644	**161**
268095001	390	450	**60**	880	1,157	**277**
268051004	274	311	**37**	3	1	**-2**
268084001	186	187	**1**	36	40	**4**
268051001	300	359	**59**	0	0	**0**
268056011	318	349	**31**	3	1	**-2**
268056008	195	225	**30**	3	1	**-2**
268154005	320	358	**38**	334	384	**50**
268154010	432	445	**13**	0	0	**0**
268154009	332	343	**11**	0	0	**0**
TOTAL	**6,218**	**17,069**	**10,851**	**25,644**	**35,785**	**10,139**

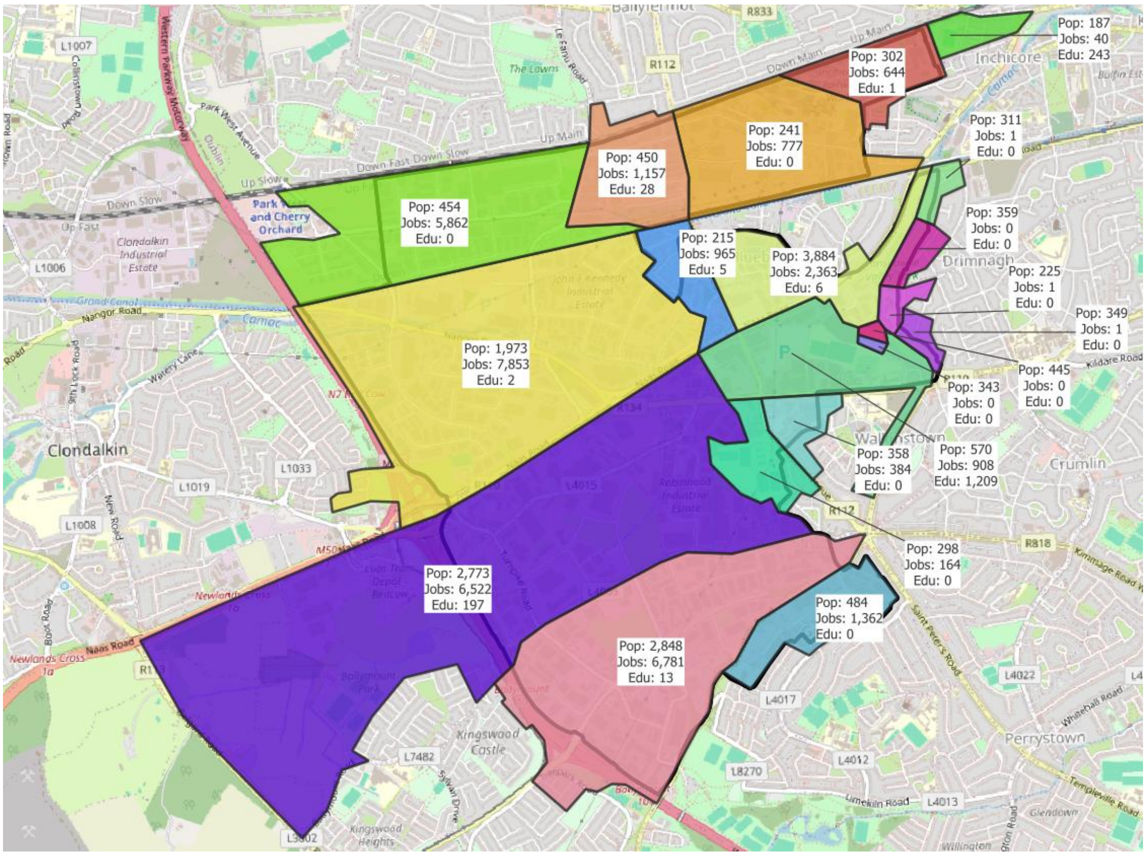

Figure 6. Distribution of Population and Jobs in 2042

4.3 City Edge Forecast Growth

4.3.1 The full delivery of City Edge will result in a significant growth in population to around 80,000 in 2070. By 2042 only the five Priority Development Areas (PDA) are expected to be delivered, namely Kylemore, Red Cow, Naas Road, Long Mile and Greenhills as shown in Figure 7. The total population as part of the City Edge Priority Development Areas will be 50,806 and a total of 26,401 jobs as shown in Table 3 below.

Table 3. City Edge Population and Jobs

PDA	POPULATION	JOBS
Red Cow	9,986	3,762
Naas Road	8,303	8,532
Long Mile	5,448	3,776
Kylemore	13,361	7,697
Greenhills	13,708	2,634
TOTAL	**50,806**	**26,401**

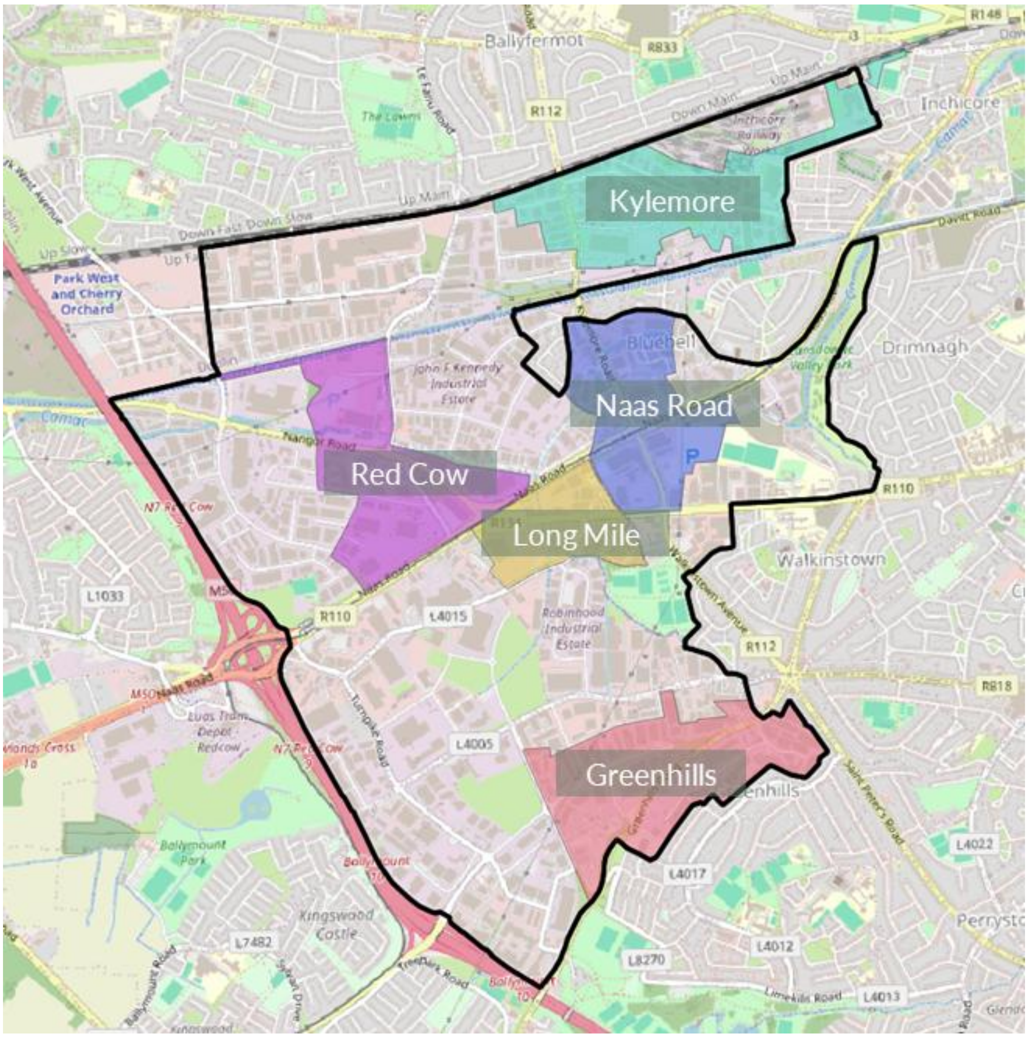

Figure 7. Map of PDAs

4.3.2 Based on the anticipated level of population growth of the Priority Development Areas, the strategic Framework makes provision for 10 primary schools and one secondary school.

4.4 Model Input Assumptions

4.4.1 Overlaps and Growth Allocations

4.4.2 Three types of geographic overlap were considered in allocating future land use:

- **Growth Outside City Edge Boundary:**
  Land use allocations in these areas are assumed to be consistent with the 2042 National Transport Authority (NTA) forecast.
- **Growth Inside City Edge but Outside PDA Areas:**
  As with the areas outside City Edge, growth is based on the 2042 NTA forecast.
- **Growth Inside City Edge, Within PDA Areas:**
  For these locations, we have generally retained the existing 2016 jobs and population values, unless the size of the PDA within a CSA zone dictates otherwise.

4.4.3 This approach is designed to avoid double counting of population and employment growth in the modelling exercise. Table 4 summarises the land use assumptions based on the NTA Planning Sheets as outlined in Section 4.2, the City Edge population and employment assumptions as outlined in Section 4.3 as well as the combined assumptions on the right. This includes a total population of 59,244 and 45,298 jobs.

4.4.4 These land use assumptions ensure consistency across model zones, CSAs, and PDAs, and have been chosen to ensure that growth is not double-counted. This provides a robust basis for the subsequent transport modelling and analysis.

Table 4. Land Use Assumptions Summary Table

CSA SMALL AREA	2042 POPULATION NTA	2042 POPULATION CITY EDGE	2042 POPULATION TOTAL	2042 JOBS NTA	2042 CITY EDGE JOBS TOTAL	2042 JOBS TOTAL
267047006	2,773	5,448	**6,012**	6,522	3,776	**7,923**
267142014	2,848	8,225	**8,518**	6,781	1,580	**4,144**
267050037	1,973	9,986	**10,299**	7,853	3,762	**7,391**
268040005	454		**454**	5,862		**5,862**
268154006	298		**298**	164		**164**
268154008	570	2,906	**3,259**	908	2,986	**3,292**
268079001	215	2,491	**2,706**	965	2,560	**2,653**
268079007	3,884	2,906	**5,106**	2,363	2,986	**3,461**
267157010	484	5,483	**5,661**	1,362	1,054	**1,054**
268078001	241	8,685	**8,926**	777	5,003	**5,062**
268078002	302	2,004	**2,306**	644	1,155	**1,798**
268095001	450	2,004	**2,454**	1,157	1,155	**1,683**
268051004	311		**311**	1		**1**
268084001	187	668	**855**	40	385	**425**
268051001	359		**359**	0		**0**
268056011	349		**349**	1		**1**

CSA SMALL AREA	2042 POPULATION NTA	2042 POPULATION CITY EDGE	2042 POPULATION TOTAL	2042 JOBS NTA	2042 CITY EDGE JOBS TOTAL	2042 JOBS TOTAL
268056008	225		**225**	1		**1**
268154005	358		**358**	384		**384**
268154010	445		**445**	0		**0**
268154009	343		**343**	0		**0**
TOTAL	17,069	**50,806**	**59,244**	35,785	**26,402**	**45,299**

5. TRANSPORT ASSUMPTIONS

5.1 Introduction

5.1.1 This chapter summarises the transport assumptions for the options tested.

5.2 Scenarios

Scenario 1: Baseline

5.2.1 A 2024 current-year Baseline has been developed to establish the current conditions.

Scenario 2: Committed Transport Schemes

5.2.2 This is to establish a 2042 scenario with the full development but with committed transport interventions only. This will identify to what extent the transport interventions as part of the GDA Strategy will support the development.

5.2.3 Committed Transport Schemes include

- BusConnects; and
- DART+ West.

5.2.4 City Edge Demand Management Measures:

- Residential Car Availability (Cars per household) - 30%; and
- Reduced Free-work place parking based on parking figures provided.

Scenario 3: Reference Case

5.2.5 This scenario additionally includes all transport interventions as part of the GDA Transport Strategy.

5.2.6 Schemes as part of the GDA Transport Study include

- MetroLink;
- Lucan to City Centre Luas;
- Luas Extension to Poolbeg;
- Luas Finglas;
- DART+ South West; and
- DART+ Coastal.

5.2.7 In line with the GDA Transport Study, Scenario 3 also includes an increase of cycle speeds to 20kph to reflect segregated cycleways.

Scenario 4: Demand Management

5.2.8 This scenario would have included wider Demand Management Measures under GDA Demand Management Strategy.

5.2.9 Following discussions with NTA, the recommendation was to test this scenario at a later date.

Scenario 5: Public Transport Enhancements 1

5.2.10 The outcomes of previous scenarios show significant demand for orbital public transport services.

5.2.11 Scenario 5 builds on Scenario 2 and includes committed transport schemes plus an indicative Orbital Luas service from Liffey Valley to UCD to replace the current bus service S4. It is important to note that this Luas alignment does not presently form part of the NTA's GDA Strategy and is therefore a theoretical test to derive the demand for a higher capacity service.

5.2.12 The alignment of this orbital Luas service can be seen in Figure 8.

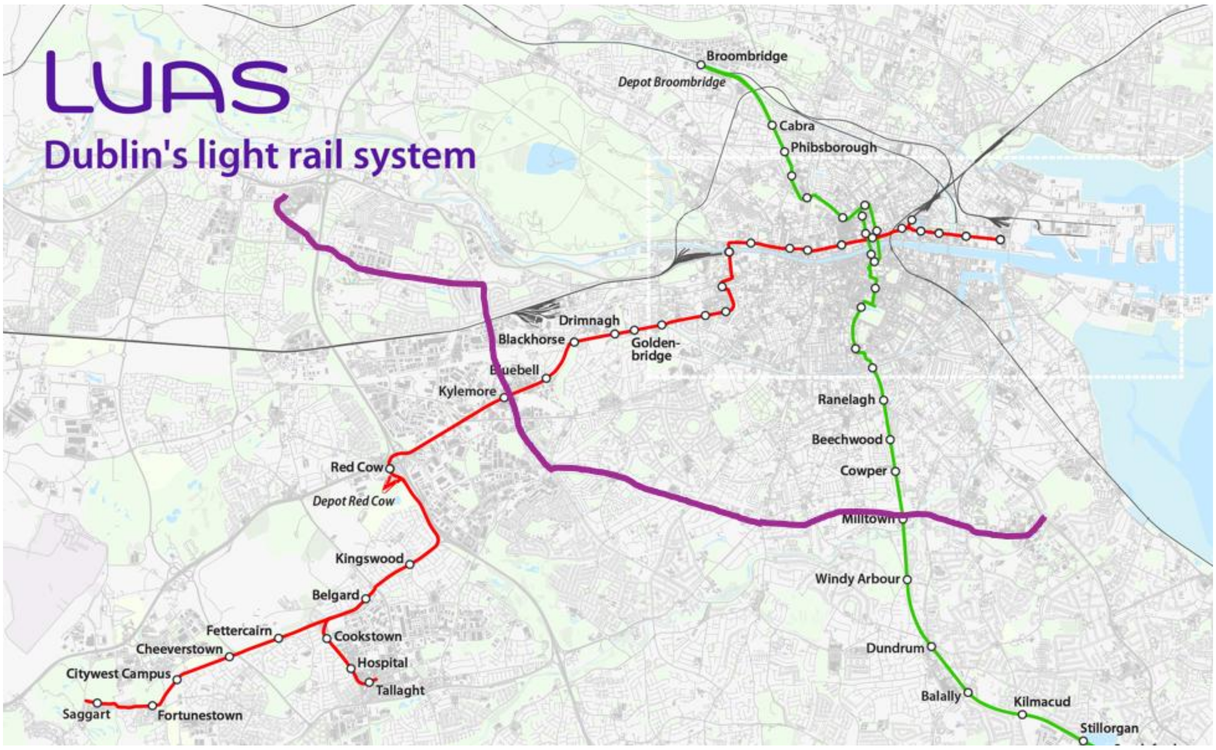

Figure 8. Orbital Luas Map

Scenario 6: Public Transport Enhancements 2

5.2.13 Similar to Scenario 5, this scenario builds on Scenario 2.

5.2.14 Scenario 6 assumes the Kimmage Luas scheme from Kingswood to St Stephen's Green, which is presently a post 2042 scheme in the NTA's GDA Transport Strategy, will be brought forward to 2042.

5.2.15 The Kimmage Luas scheme can be seen in Figure 9.

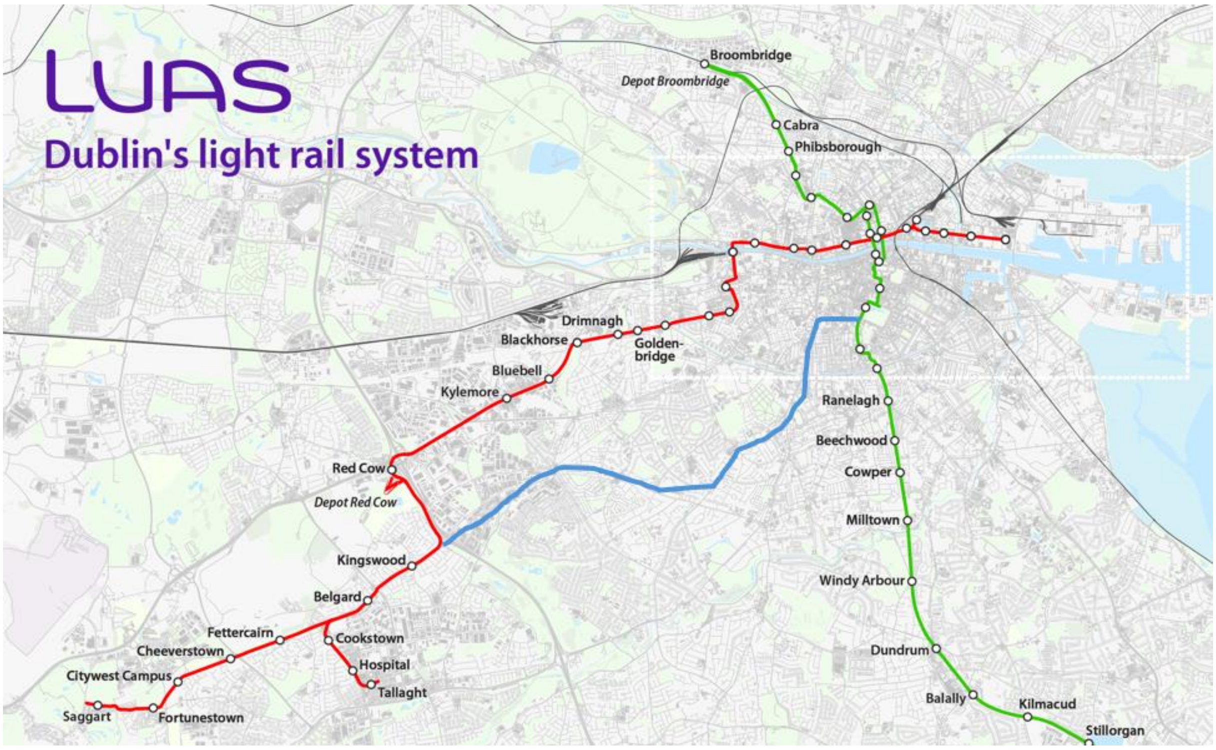

Figure 9. Kimmage Luas Map

Scenario 7: Land Use Optioneering 1

5.2.16 An alternative land use quantum/mix has been tested assuming a reduction of PDA land use assumptions by 50% combined with the transport schemes included in Scenario 2.

Scenario 8: Land Use Optioneering 2

5.2.17 This scenario is similar to Scenario 7 but includes a reduction of PDA land use assumptions by only 25% (i.e. a 75% built out of the PDA).

Scenario 9: Combined Public Transport Enhancements and Land Use Optioneering

5.2.18 Scenario 9 is a combination of the most realistic transport scenario arising from the previous scenarios and the land use optioneering.

5.2.19 The combination tested includes a reduction of PDA land use assumptions by 50% (as per Scenario 7) and the Kimmage Luas scheme from Kingswood to St Stephen's Green as per Scenario 6.

Scenario 10: Emerging Preferred Scenario Refinement

5.2.20 Based on the outcomes of all previous scenarios, the refined emerging preferred scenario refinement includes the following schemes

- Committed Transport Schemes only (BusConnects & DART+ West) as per Scenario 2;
- Kimmage Luas line from Kingswood to St Stephen's Green;
- Orbital bus service S4 with a 5min frequency; and
- Selected schemes as part of the GDA Transport Study: MetroLink and DART+ South West including a new station at Kylemore.

5.2.21 The input assumptions for all scenarios have been summarised in Table 5.

Table 5. Scenario Overview Table

Scenario	Details	Land Use			Transport			
		As per NTA Planning Sheets	Full Build Out of PDAs	Revised	Existing and Committed Schemes	GDA Transport Strategy Infrastructure (committed funding)	GDA Transport Strategy Infrastructure	Additional PT Schemes
Sc1 – Baseline (2024)		X			X			
Sc2 – Committed Transport Schemes			X		X	X		
Sc3 – Reference Case			X		X	X	X	
Sc5 – PT Enhancements 1	Orbital Luas		X		X	X		X
Sc6 – PT Enhancements 2	Kimmage Luas		X		X	X		X
Sc7 – Land Use Optioneering 1	50% build out of PDAs			X	X	X		
Sc8 – Land Use Optioneering 2	75% build out of PDAs			X	X	X		
Sc9 – Land Use Optioneering & PT Enhancements	Kimmage Luas & 50% build out			X	X	X		X
Sc10 – Emerging Preferred Scenario Refinement	Kimmage Luas, MetroLink, S4		X		X	X		X

6. TRANSPORT AND DEMAND OUTCOMES

6.1 Introduction

6.1.1 This chapter presents a detailed analysis of travel patterns for the City Edge area across all scenarios. It summarises key findings on mode shares, trip length distributions, and total trip volumes, providing insight into how travel behaviour evolves in response to changing land use and transport options.

6.1.2 Mode share summaries and trip volume tables are provided for each scenario, illustrating the impacts of infrastructure investments and land use strategies on overall mobility within City Edge. Through visualisations and data analysis, this chapter provides a foundation for understanding the effectiveness of proposed interventions in shaping sustainable travel patterns by 2042.

6.2 Travel Patterns

6.2.1 The following sections outline the key demand figures such as mode shares and trip length distribution per scenario. Figure 10 to Figure 18 show the trip length distribution per mode in different distance bands for each scenario. The mode shares of all scenarios are summarised in Table 6 below.

Table 6. Mode Share Summary Table

SCENARIO		CAR	PT	WALKING	CYCLING
1	Baseline (2024)	61%	18%	15%	6%
2	Committed Transport Schemes	22%	30%	40%	8%
3	Reference Case	14%	35%	38%	13%
5	Transport Optioneering 1 (Orbital Luas)	22%	33%	38%	7%
6	Transport Optioneering 2 (Kimmage Luas)	22%	31%	39%	8%
7	Land Use Optioneering 1 (50% of PDA)	28%	30%	34%	8%
8	Land Use Optioneering 2 (75% of PDA)	25%	30%	37%	8%
9	Transport & Land Use Optioneering	27%	31%	34%	8%
10	Emerging Preferred Scenario	22%	33%	38%	7%

6.2.2 The total number of trips across all distance bands are summarised in Table 7.

Table 7. Total Number of Person Trips

SCENARIO		CAR	PT	WALKING	CYCLING	TOTAL
1	Baseline (2024)	12,983	3,764	3,335	1,317	21,399
2	Committed Transport Schemes	17,235	23,354	30,731	6,104	77,424
3	Reference Case	11,164	27,008	29,355	10,443	77,970
5	Transport Optioneering 1 (Orbital Luas)	17,042	26,058	29,273	5,739	78,112
6	Transport Optioneering 2 (Kimmage Luas)	17,190	24,213	30,087	5,946	77,436
7	Land Use Optioneering 1 (50% of PDA)	12,650	13,909	15,720	3,602	45,881
8	Land Use Optioneering 2 (75% of PDA)	15,243	18,608	22,941	4,829	61,621
9	Transport & Land Use Optioneering	12,610	14,383	15,387	3,511	45,891
10	Emerging Preferred Scenario	17,066	25,411	29,422	5,685	77,584

Scenario 1: 2024 Baseline

6.2.3 In the 2024 Baseline, travel patterns for City Edge indicate a high car mode share across all distance bands. Public transport use is moderate for trips up to 20 km, with mode share ranging from 17% to 19%. Notably, 61% of trips to and from City Edge are shorter journeys under 5 km. However, only 51% of these trips are made by sustainable modes such as walking, cycling, or public transport.

6.2.4 The total number of trips from and to the future City Edge area across all distance bands in time periods is 21,399. The current high level of car use for travel to the City Edge area, is largely reflective of the prevailing current land use in the area, which is light industrial.

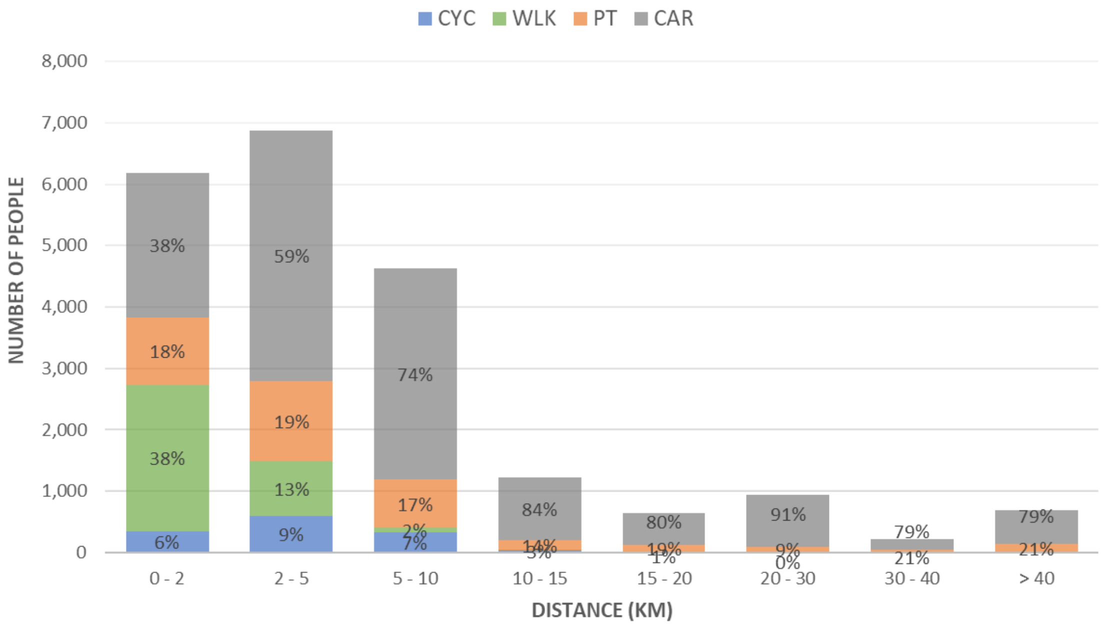

Figure 10. Baseline 2024 Trip Distribution

Scenario 2: Committed Transport Schemes

6.2.5 The 2042 Baseline shows a reduction in car mode share across all distance bands, indicating positive progress towards more sustainable travel behaviours. Public transport usage has significantly increased, with mode shares ranging from 38% to 61% for journeys between 2 and 20 km. The overall PT more share is 30%. Short trips dominate travel to and from City Edge, with 78% of trips being less than 5 km; encouragingly, 82% of these are now made by sustainable modes such as walking, cycling, or public transport.

6.2.6 The total number of trips from and to City Edge area across all distance bands in time periods has increased significantly to 77,424.

6.2.7 These findings demonstrate substantial improvements in sustainable mobility for City Edge as a result of the significant change in land use, particularly for local and medium-distance trips.

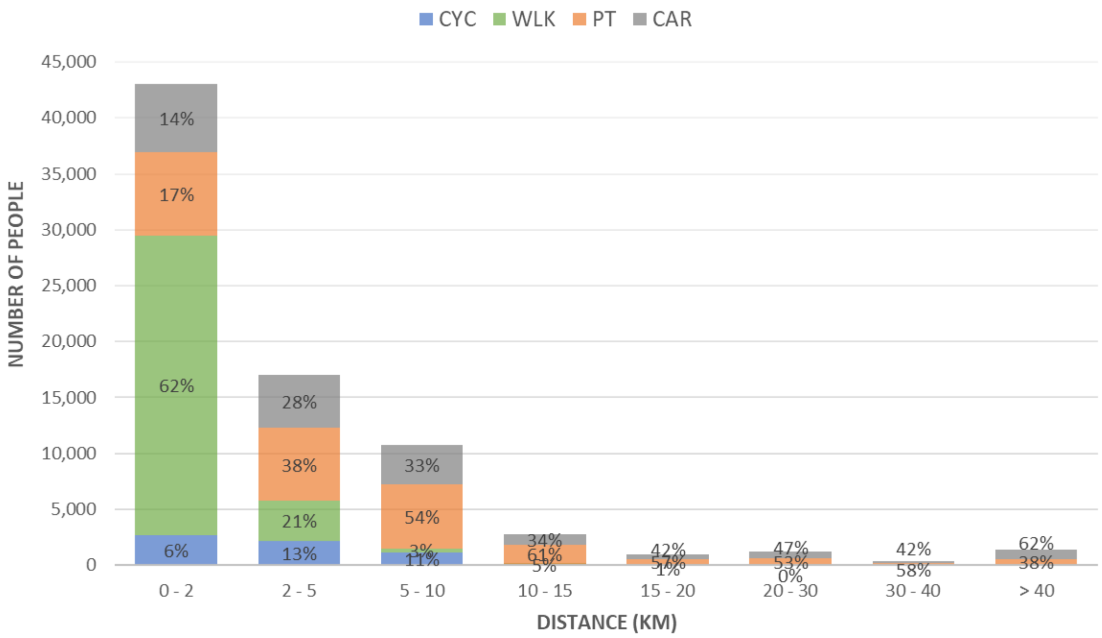

Figure 11. Baseline 2042 Trip Distribution

Scenario 3: Reference Case

6.2.8 In Scenario 3, car mode share for travel to and from City Edge has further decreased across all distance bands.

6.2.9 Public transport mode share has increased substantially, now ranging from 42% to 69% for trips between 2 and 20 km. The overall PT mode share is 35%. The majority of journeys—74%—are less than 5 km in length, and, 90% of these short trips are made by sustainable modes such as walking, cycling, or public transport.

6.2.10 The overall number of City Edge trips has increased slightly compared to Scenario 2.

6.2.11 These results highlight a significant shift towards active and public transport, reflecting the introduction of additional public transport schemes such as the MetroLink, various Luas extensions and the DART+ schemes.

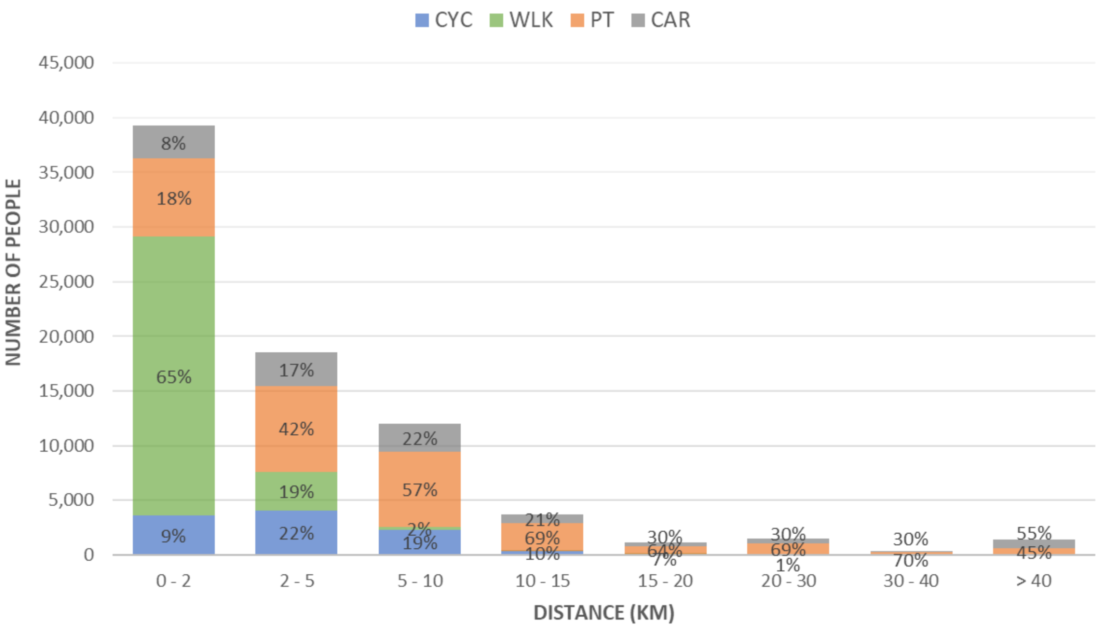

Figure 12. Scenario 3 Trip Distribution

Scenario 5: Public Transport Optioneering 1

6.2.12 In the first Transport Optioneering scenario, which includes the orbital Luas, the proportion of trips made by car has mainly decreased within the 5–10 km distance band. The overall number of car trips has reduced slightly compared to Scenario 2.

6.2.13 A significant majority (76%) of trips to and from City Edge are short, being less than 5 km in length. The overall mode share for public transport is 33% which equals 26,085 trips.

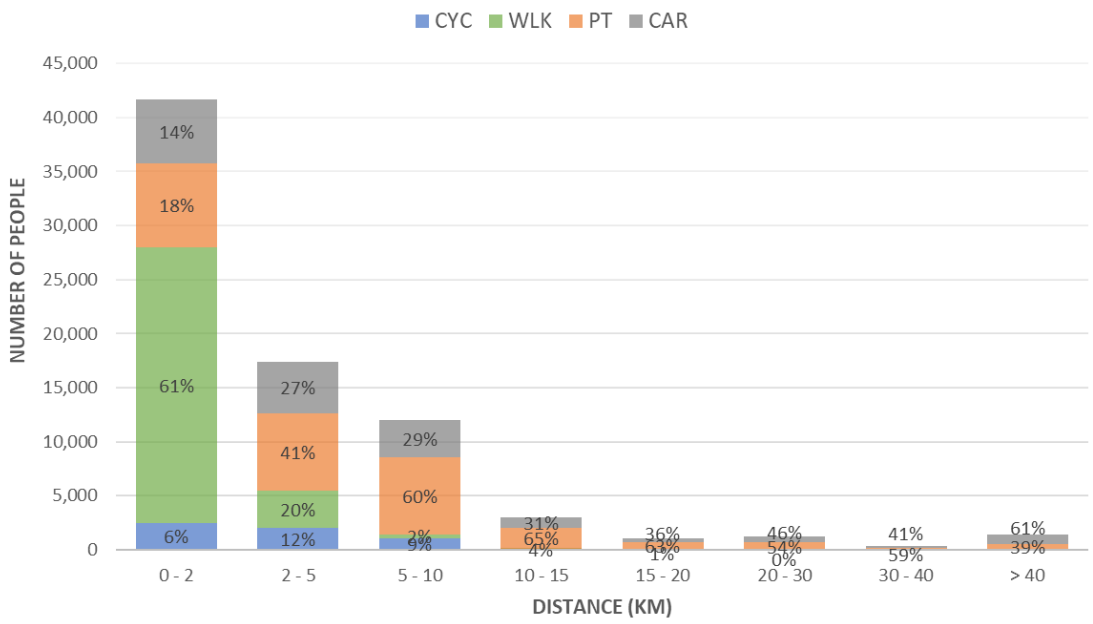

Figure 13. Scenario 5 Trip Distribution

Scenario 6: Public Transport Optioneering 2

6.2.14 In the second Transport Optioneering scenario, which includes the Kimmage Luas scheme, the overall mode share for public transport is to 31% which is slightly below Scenario 5.

6.2.15 The number of public transport trips from and to City Edge is 24,213 which is higher than Scenario 2 but below Scenario 5.

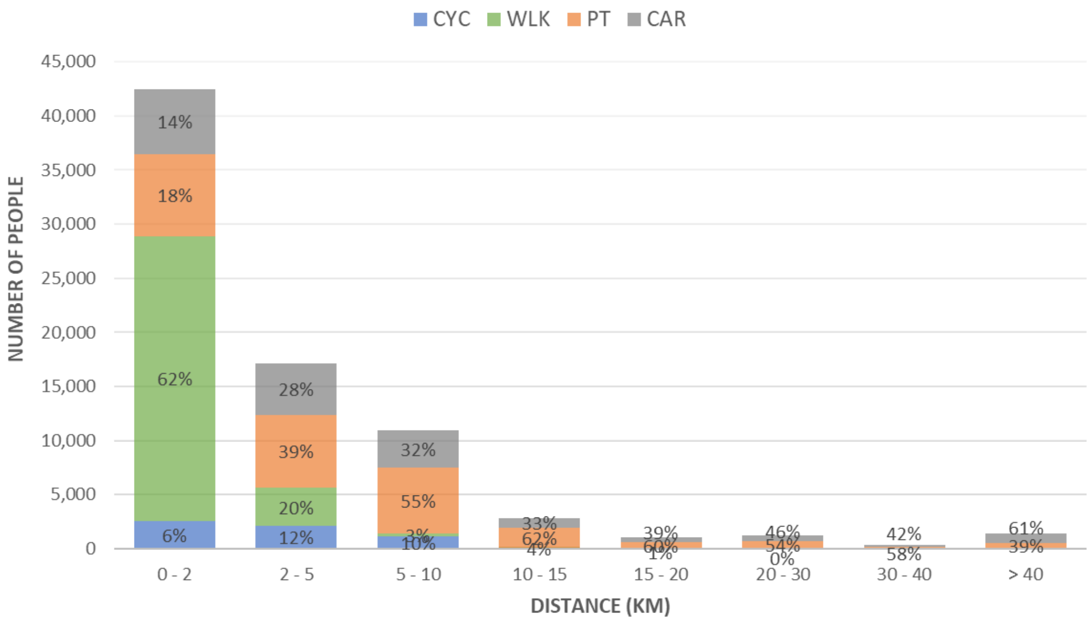

Figure 14. Scenario 6 Trip Distribution

Scenario 7: Land Use Optioneering 1

6.2.16 In Scenario 7, with 50% of the Priority Development Areas (PDAs) built out, the share of trips made by car increased from 22% to 28% compared to Scenario 2. Despite this rise in car usage, the overall number of trips decreased significantly by 31,543, representing a 43% reduction compared to Scenario 2.

6.2.17 The results show that a lower level of development leads to a higher proportion of car trips in lower distance bands.

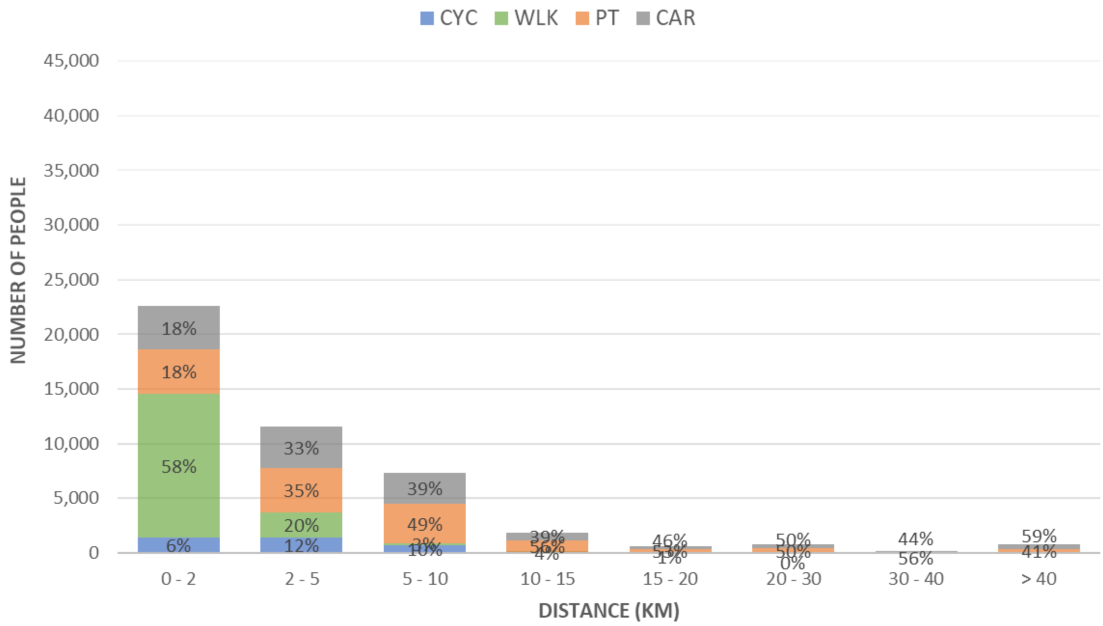

Figure 15. Scenario 7 Trip Distribution

Scenario 8: Land Use Optioneering 2

6.2.18 In Scenario 8, with 75% of the Priority Development Areas (PDAs) built out, the share of trips made by car increased from 22% to 25% compared to Scenario 2. Despite this rise in car usage, the overall number of trips decreased significantly by 15,803, representing a 20% reduction compared to Scenario 2.

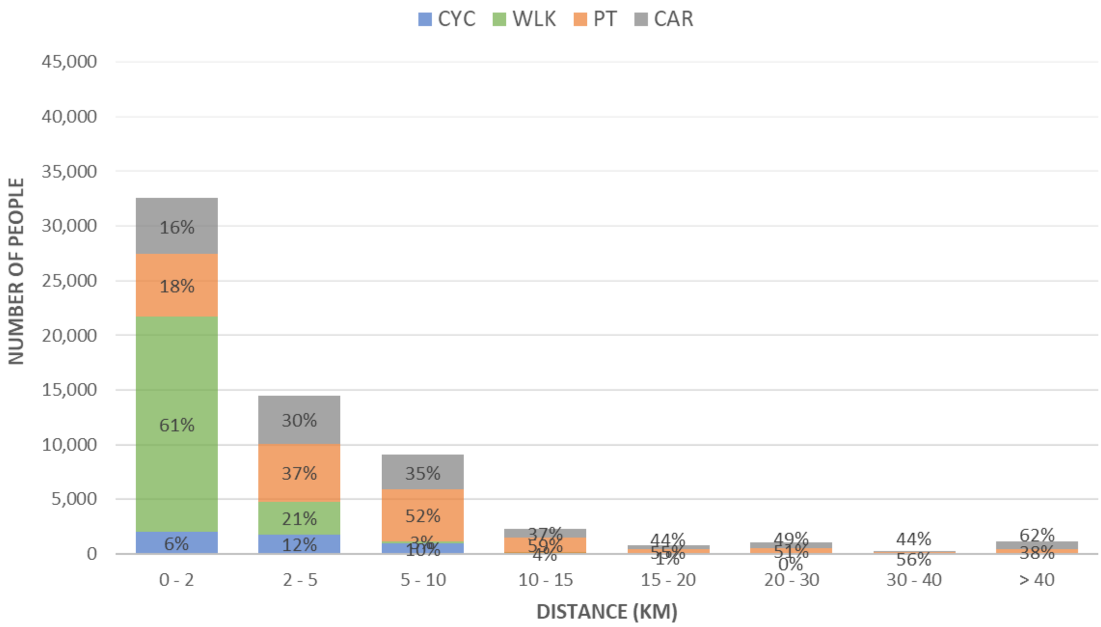

Figure 16. Scenario 8 Trip Distribution

6.2.19 Car mode share has decreased slightly from 28% to 27%, while public transport mode share has risen from 30% to 31%. This change corresponds with an overall increase of 475 public transport trips compared to Scenario 7.

6.2.20 The lower level of development leads to a similarly higher proportion of car trips in lower distance bands, similar to Scenario 7.

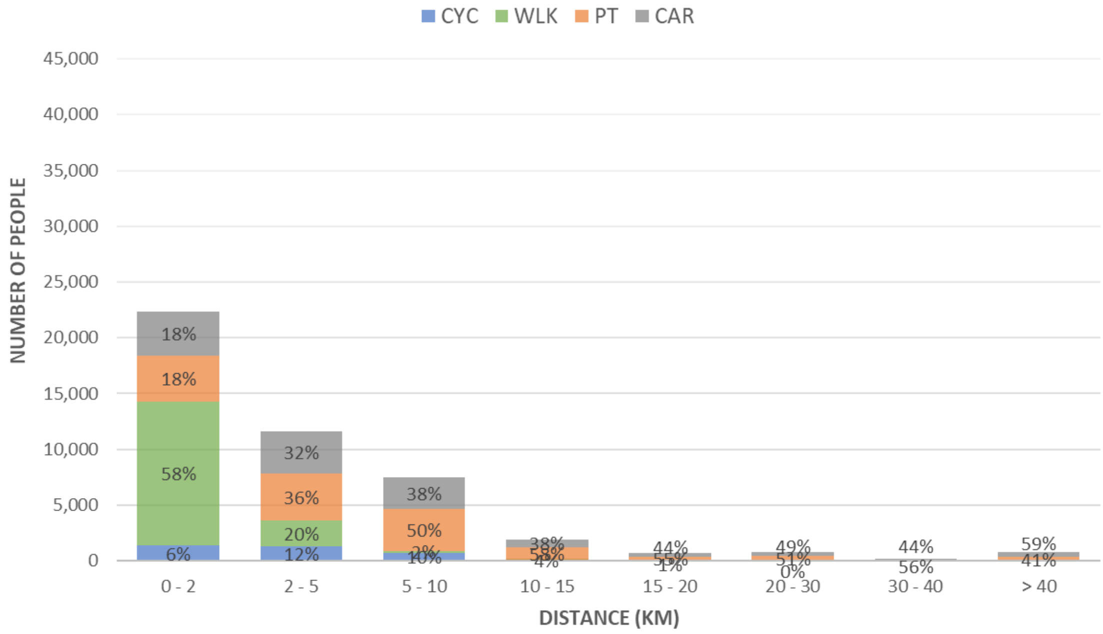

Figure 17. Scenario 9 Trip Distribution

Scenario 10: Emerging Preferred Scenario

6.2.21 Overall, car mode share has remained at 22%, while public transport mode share has risen from 30% to 33% compared to Scenario 2. This shift has resulted in an increase of 2,057 public transport trips overall. In total, 78% of all trips to and from City Edge are made by sustainable modes of transport (public transport, walking and cycling).

6.2.22 The total number of trips is 77,584.

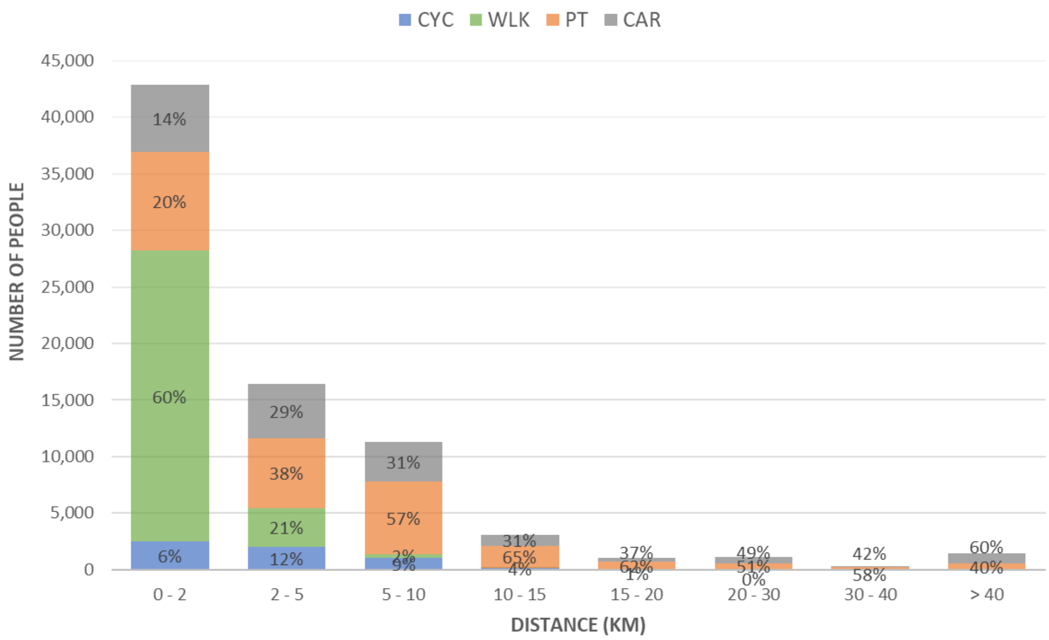

Figure 18. Scenario 10 Trip Distribution

6.3 Public Transport

6.3.1 The following sections show the impact of City Edge on key public transport services, including the Luas Red line, Kimmage Luas, orbital Luas, S4 bus service and DART+ South West rail services.

Luas Red line

6.3.2 Figure 19 illustrates the boarding and alighting profile for the Luas Red Line, covering the section from Red Cow to Abbey Street and incorporating all branch lines. The data indicate that the line operates above its intended capacity in all modelled scenarios, with capacity consistently exceeded as the service approaches the City Edge area (shown as the second and third stops in the figure). The section between Heuston and Museum consistently records the highest passenger volumes across all scenarios.

6.3.3 Passenger loading figures fluctuate by approximately 1,000 passengers depending on the scenario. Scenario 3 stands out, with boarding numbers at Heuston significantly higher than those in other scenarios, a result of the inclusion of all Greater Dublin Area (GDA) Transport Study schemes.

6.3.4 Despite generating and attracting noticeably fewer public transport trips, Land Use Optioneering scenarios 7 and 8 do not result in any significant reduction in demand on the Luas Red Line. Therefore, the Luas Red Line is projected to experience significant crowding levels in 2042, irrespective of the development scale at City Edge.

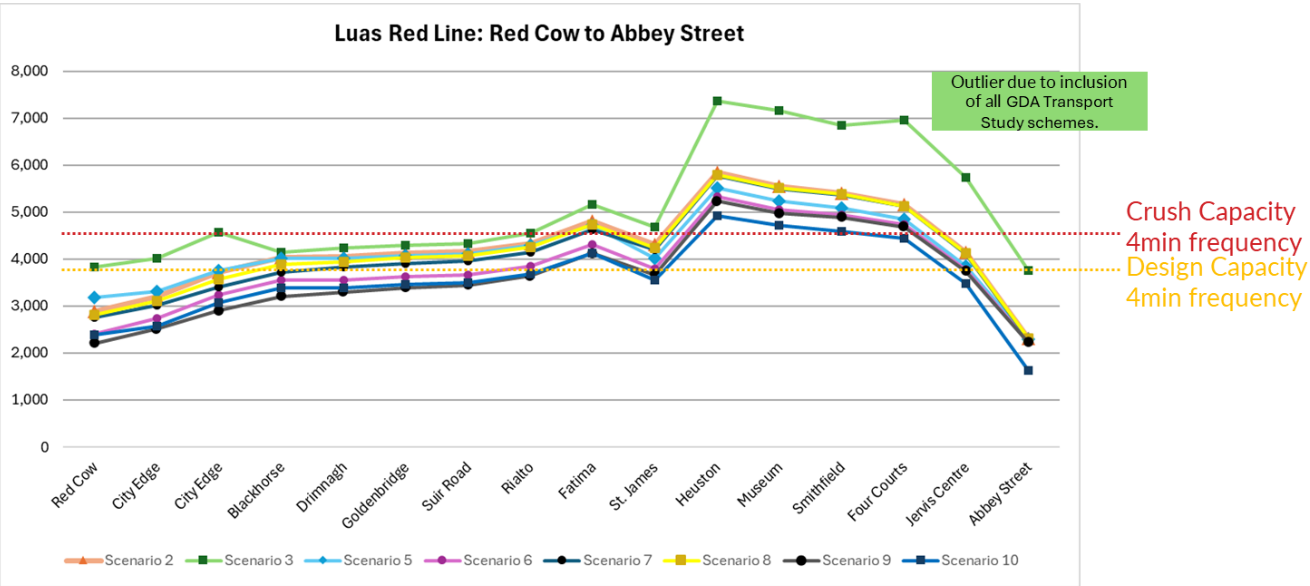

Figure 19. Luas Red Line Boarding and Alighting Profile (2042 AM Peak Eastbound)

Kimmage Luas

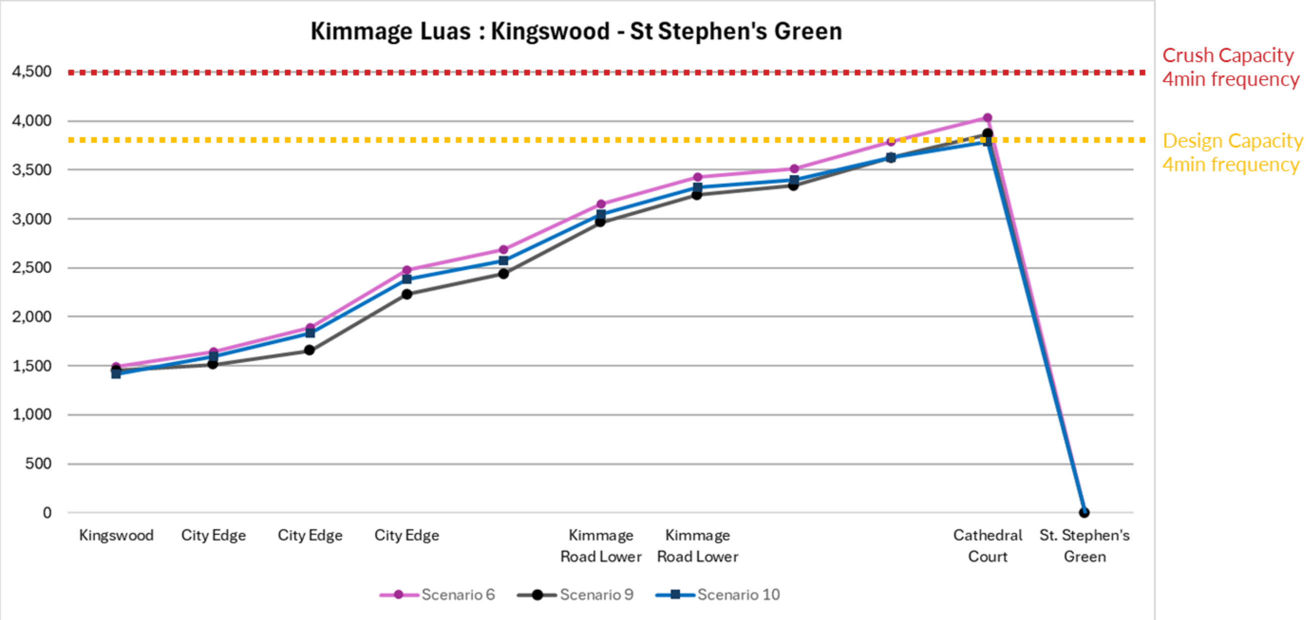

Figure 20. Kimmage Luas Boarding and Alighting Profile (2042 AM Peak Eastbound)

6.3.5 Boarding and alighting profiles demonstrate that there is sufficient demand for the proposed Kimmage Luas line. Having the line operational by 2042, would provide an alternative to the existing Luas Red Line for radial public transport trips towards the city centre, thereby reducing pressure on the Red Line and adding resilience to the overall public transport network. Therefore, as can be seen in Figure 19, Scenarios 6, 9 and 10 provide for the Red line having lower levels of crowding than the other scenarios.

6.3.6 Furthermore, the introduction of the Kimmage Luas line is expected to lower traffic volumes on the M50 compared to present-day conditions, contributing to reduced congestion and enhancing the effectiveness of sustainable transport options in the region.

S4 Bus Service

6.3.7 The S4 bus route is currently the only orbital bus service serving the City Edge area. Operating at a 10-minute frequency, the S4 connects Liffey Valley Shopping Centre with University College Dublin (UCD). The route alignment is illustrated in Figure 21.

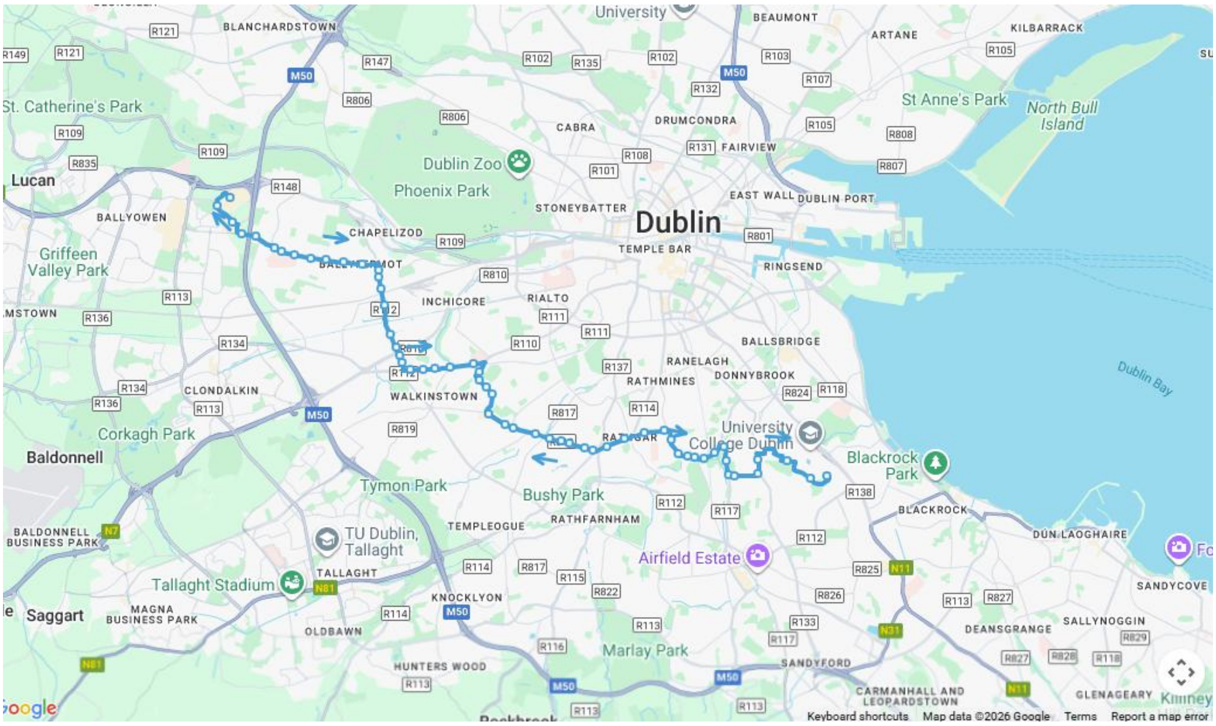

Figure 21. S4 Bus Service Route[1]

6.3.8 Figure 22 presents the boarding and alighting profile for the S4 bus service, indicating that the service will exceed its capacity in all modelled scenarios by 2042.

6.3.9 The loading profiles are largely consistent across all scenarios, with the exception of scenarios 3 and 10.

6.3.10 Scenario 3 (shown in green) shows notably lower passenger volumes, which can be attributed to the introduction of additional public transport services in this scenario, as detailed in section 5.2.6.

6.3.11 In contrast, scenario 10 (shown in blue) displays significantly higher passenger numbers due to an increase in service frequency to every five minutes. Despite this increased frequency, the S4 bus would still operate above its capacity.

6.3.12 Overall, these findings underscore the high demand for orbital public transport services.

[1] Source: Citymapper, https://citymapper.com/dublin/bus/bus-s4?lang=en

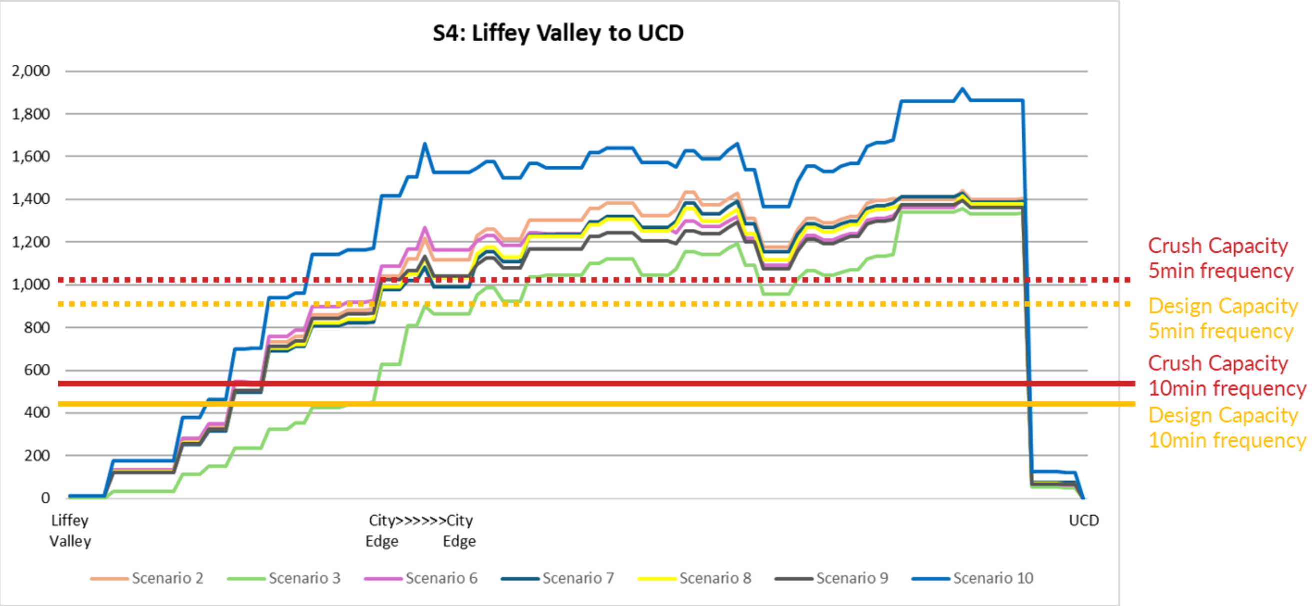

Figure 22. S4 Bus Service Boarding and Alighting Profile (2042 AM Peak Eastbound)

Orbital Luas

6.3.13 An indicative orbital Luas service has been tested as part of Scenario 5. This was mainly in response to high levels of crowding on the S4 bus service as a result of significant orbital demand. The orbital Luas service would replace the current bus service S4 in Scenario 5.

6.3.14 Figure 23 shows the loading profile on the orbital Luas. The boarding and alighting profile indicates that an Orbital Luas service would experience sufficient demand and would even approach crush capacity in the Terenure area. A frequency of three minutes has been assumed for the line. Demand for the orbital Luas greatly exceeds passenger numbers of the current S4 bus service.

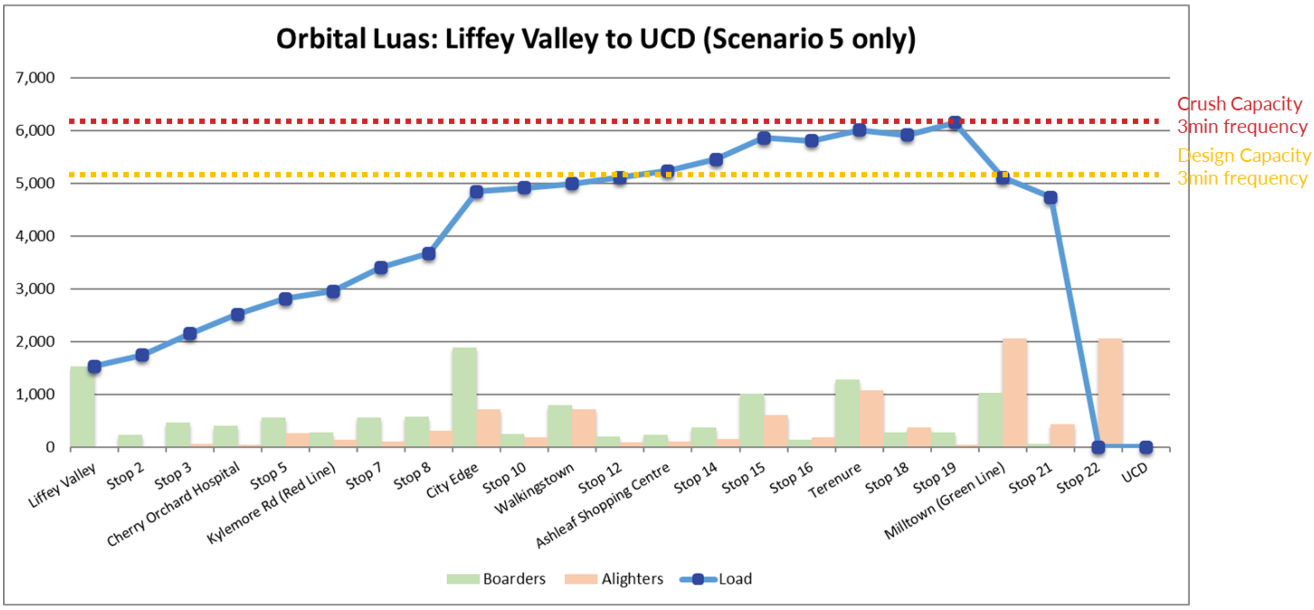

Figure 23. Orbital Luas Boarding and Alighting Profile (2042 AM Peak Eastbound)

6.3.15 The new line would help support existing radial public transport services, such as the Luas Red Line, by reducing pressure and redistributing demand more evenly across the network.

6.3.16 Additionally, the orbital Luas route would present an attractive public transport alternative for local suburban car trips around the M50 belt, thereby contributing to a reduction in car dependency. As a result, traffic volumes on the M50 are expected to decrease compared to present-day levels, helping to alleviate congestion and promote more sustainable travel patterns in the capital region.

DART+ South West

6.3.17 Figure 24 below shows the boarding and alighting profile for eastbound DART+ South West services in Scenario 10 during the AM peak. As with the Luas Red Line analysis, individual branch lines have been consolidated. The figure illustrates the section between Hazelhatch and Celbridge and the new station at Kylemore, and passenger numbers reflect all services operating towards Heuston, Grand Canal Dock, and Docklands.

6.3.18 The analysis indicates that the highest numbers of passengers boarding occur at Adamstown and Kishoge, while the number of alighting passengers surpasses boarders at Kylemore indicating the significant economic function of City Edge.

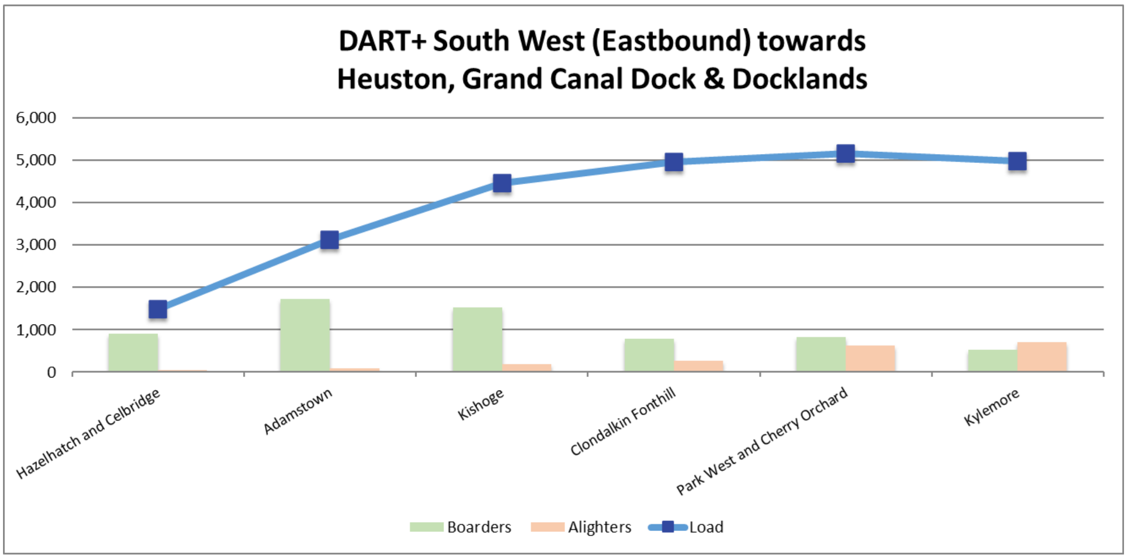

Figure 24. DART+ South West Boarding and Alighting Profile (2042 AM Peak Eastbound)

6.4 Impact on the Road Network

6.4.1 Figure 25 below illustrates total hourly traffic flows at the Red Cow Interchange during the 2042 AM peak hour, with blue arrows representing the M50 and green arrows representing the N7 and R110. The white arrows indicate both the absolute number and the percentage share of City Edge-related traffic.

6.4.2 Due to the mix of land use, the adoption of a mobility strategy that promotes low car ownership, and significant investment in public transport, traffic levels on key national roads are projected to decrease, even as population grows. Additionally, the contribution of car trips from the City Edge area to overall traffic volumes is expected to reduce both in actual numbers and in percentage.

6.4.3 As shown in Table 8, total AM peak-hour traffic at the Red Cow Interchange (M50/N7) in the 2024 Baseline is 34,187 PCU, with the City Edge PDAs contributing 2,592 PCU, or 8%. By 2042, all modelled scenarios indicate lower overall traffic flows due to wider external schemes. Across these scenarios, the City Edge share of traffic on the national road network ranges from 5% to 7%, remaining below the 2024 Baseline contribution.

6.4.4 Therefore, the traffic contribution of City Edge exists within the context of wider regional trends and investment, underlining the importance of coordinated transport planning to effectively manage future demand and maintain network performance.

6.4.5 This highlights the need for integrated transport planning and sustained investment to manage future demand effectively and safeguard network performance.

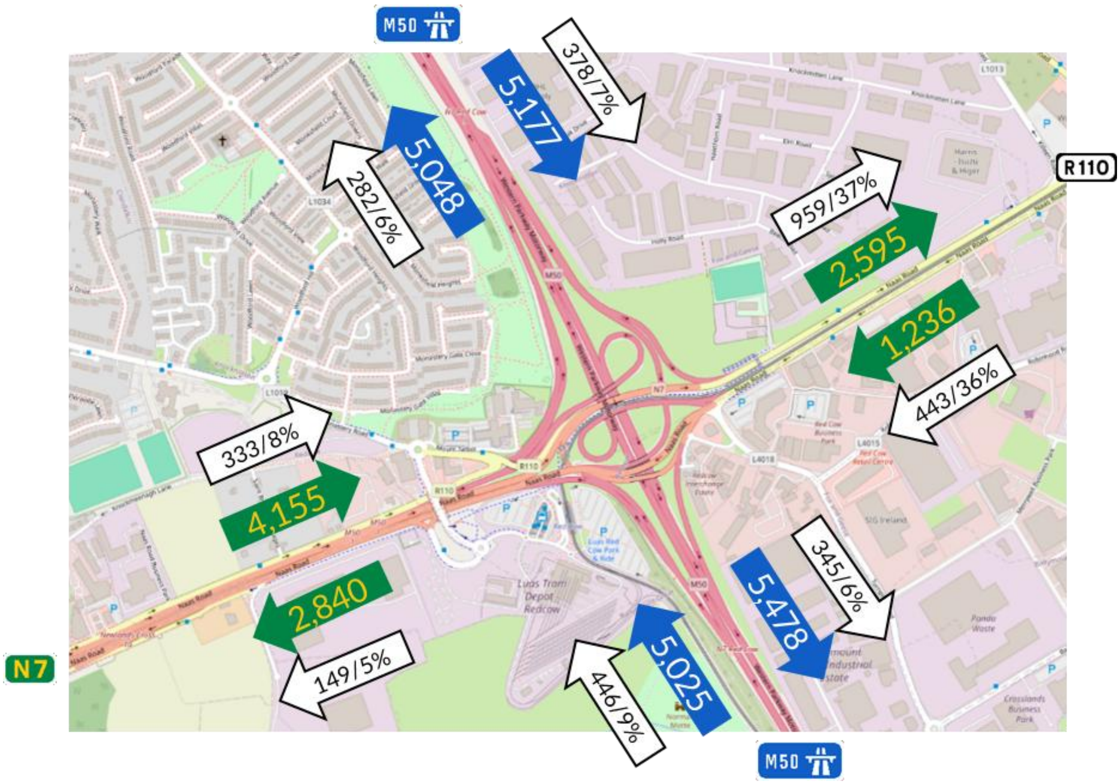

Figure 25. Traffic Flows at Red Cow Interchange in Scenario 10 (2042, AM peak hour)

Table 8. Total Flows on National Roads & City Edge Traffic Contribution (2042 AM Peak Hour)

SCENARIO		TOTAL FLOWS ON M50 AND N7 (PCU) AT RED COW INTERCHANGE	CITY EDGE CONTRIBUTION	CITY EDGE CONTRIBUTION (%)
1	Baseline (2024)	34,187	2,592	8%
2	Committed Transport Schemes	27,943	1,956	7%
3	Reference Case	26,971	1,564	6%
5	Transport Optioneering 1 (Orbital Luas)	27,941	1,985	7%
6	Transport Optioneering 2 (Kimmage Luas)	27,920	1,963	7%
7	Land Use Optioneering 1 (50% of PDA)	28,186	1,392	5%
8	Land Use Optioneering 2 (75% of PDA)	27,817	1,730	6%
9	Transport & Land Use Optioneering	28,090	1,486	5%
10	Emerging Preferred Scenario	27,723	1,933	7%

7. CONCLUSION

7.1.1 Overall Demand for Travel to and from the PDAs

The analysis of travel demand associated with the City Edge Priority Development Areas (PDA) shows a strong emphasis on sustainable mobility, with a high share of local trips being undertaken by active modes such as walking and cycling. For example, in Scenario 10, 78% of all trips to and from City Edge are made by sustainable modes (public transport, walking and cycling).

By 2042, development within the City Edge PDAs is expected to generate significant additional demand across daily and peak periods, reflecting the combined effects of residential, commercial, and recreational growth.

> The diverse mix of complimentary land uses encourages walking and cycling for local trips and public transport for wider trips across the city. This travel behaviour supports broader policy objectives of promoting sustainability and reducing car dependency.

7.1.2 Capacity of the Existing and Planned Public Transport Network

The current and committed public transport network provides a robust foundation but is exceeding capacity under 2042 demand. The Luas Red Line remains above capacity in all tested scenarios, indicating crowding and reliability risks unless additional public transport schemes are delivered.

Orbital bus services play a vital role in supporting non-radial travel. However, the S4 is forecast to operate above capacity even with increased frequencies, signalling the need for further investment in orbital public transport services.

> Elements of the public transport network are expected to operate over capacity as development progresses. Scenario testing identifies a limit to achievable public transport mode share without further intervention.

7.1.3 Contribution and Impact on the Operation of the Road Network

City Edge will measurably contribute to traffic volumes in the vicinity of the M50 and N7 by 2042, with up to approximately 7% of vehicle movements on key corridors attributable to the development.

While this is a significant addition, overall traffic levels remain primarily shaped by wider regional growth and planned transport schemes. Modelling suggests that strengthened public transport provision, including orbital bus and rail, can temper car demand and reduce pressure on strategic corridors, with all scenarios showing reductions in M50 volumes relative to a car-oriented baseline.

City Edge is projected to contribute less traffic to the M50 and surrounding national roads than today, reflecting the combined effects of wider planned investments under the GDA Strategy and the transit-focused approach at City Edge.

7.1.4 **Future Pressure Points on the Network and Additional Investment or Phasing Considerations**

7.1.5 The modelling work indicates a ceiling level on achievable public transport mode share under the current unless more schemes are added.

7.1.6 The analyses identify clear future pressure points across the public transport network including the Luas Red line and the S4 orbital bus corridor.

To accommodate future demand and relieve pressure on constrained corridors, additional schemes such as the Kimmage Luas are required by 2042. This is required alongside a focused examination of further orbital public transport capacity to strengthen resilience and support continued mode shift regardless of City Edge.

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