NTA
Údarás Náisiúnta Iompair
National Transport Authority

Jacobs SYSTRA

# Greater Dublin Area Transport Strategy

# 2022 2042

## Greater Dublin Area Transport Studies

## Dublin South West

November 2021

## Contents

# Executive Summary

**Introduction**

The National Transport Authority (NTA) commissioned Jacobs Engineering Ireland Limited (Jacobs), in collaboration with Systra, to complete a series of Area Based Studies for the Greater Dublin Area (GDA). This study will inform the NTA's review of the Transport Strategy for the Greater Dublin Area (2016-2035) which will consider the future development of the transport network in the GDA for the period up to 2042.

This report details the findings for the Dublin South West study area, which extends for 8km to the south west of Dublin City Centre and encompasses the Harold's Cross suburb at its northern extent before spanning in a south westerly direction to include the suburbs of Kimmage, Terenure, Rathfarnham and Knocklyon. At its southern extent, the study area covers the suburbs of Ballycullen, Firhouse and part of Tallaght south of the N81.

The methodology for this study is based on the Area Based Transport Assessment (ABTA) process which has been adapted and comprises the following key steps:

- Policy Context – understand the planning and transport policy context within which this study sits;
- Baseline Assessment – provide a clear understanding of the existing spatial characteristics, land uses, transport conditions and constraints in the study area;
- Establish Context – understand the future growth proposals for the study area as well as future travel patterns which proposed transport options need to serve;
- Options Development and Assessment – identify high-level transport options to serve demand in the study area and assess them via a multi-criteria analysis against the objectives of the study; and
- Final Summary – present the options to be taken forward and investigated further as part of the detailed preparation of the Draft Transport Strategy.

**Policy Context**

A comprehensive review of existing national, regional and local level legislation, policy and guidance relevant to this study has been undertaken in order to provide context for the identification of interventions which align with wider policy goals. Key documents include:

- Project Ireland 2040 – National Planning Framework;
- Project Ireland 2040 – National Development Plan;
- Strategic Investment Framework for Land Transport (2014);
- Draft National Investment Framework for Transport in Ireland;
- Smarter Travel: A Sustainable Transport Future (2009 to 2020);
- The Climate Action Plan (2019);
- The Regional Spatial and Economic Strategy for the Eastern and Midland Region (2019 to 2031);
- Dublin Metropolitan Area Strategic Plan; and
- Transport Strategy for the Greater Dublin Area (2016 to 2035).

**Baseline Assessment**

The study area largely consists of developed residential suburbs, with a mix of employment land uses and local retail centres. Key trip attractors within the study area include Tallaght Business Park, Greenmount Industrial Estate, Rathfarnham Shopping Centre, and the urban villages of Harold's Cross, Terenure and Rathfarnham. Outside the study area, key trip attractors include Dublin City Centre, Citywest Business Campus, Sandyford Business Park and University College Dublin (UCD).

The study area is not directly served by heavy or light rail lines, and instead relies on a bus-based public transport network. While key radial bus connections exist, there is a lack of high-quality orbital services

connecting key destinations such as UCD, Sandyford and Citywest. The study area does have cycle infrastructure in places but with notable gaps on the main radial routes into the city and on the orbital routes.

Car ownership is higher in the study area (82%) than the wider GDA (79%), as is the proportion of trips to work by car (58% vs. 55%). However, trips to work by public transport (12% vs. 10%) and bicycle (9% vs 5%) are higher in the study area than the wider GDA.

The study area has relatively flat topography and is home to a number of key watercourses including the River Dodder, the Grand Canal and River Poddle.

**Context**

Chapter 4 provides the context of the transport demand and supply in the forecast year, 2042. It considers the proposed growth in the area, transport proposals, travel patterns and forecast demand if modal shift was to occur. It demonstrates how there is minimal expected land use change in the study area. Population and education levels are expected to experience low levels of growth, but employment is expected to grow by 28%. The majority of this employment growth is expected to be clustered around the Tallaght Business Park.

The chapter highlights how there are no major road interventions proposed within the study area, although there are number of smaller scale interventions proposed. Under the current strategy, the study area is not planned to benefit directly from investment in light or heavy rail, but the Luas Green line adjacent to study area has planned improvements. The bus network is expected to see comprehensive improvements through the BusConnects programme. Alongside the proposed services detailed in a Chapter 3, bus priority measures are proposed along three core bus corridors in the study area. The GDA Cycle Network Plan proposals are expected to create a comprehensive cycle network in the study area with varying qualities of service.

The 2040 demand suggests that Dublin City Centre, UCD, Tallaght and Citywest form some of the key origins and destinations for the study area. The study area has a relatively high car mode share and comparatively low public transport mode share, with the proportion of public transport trips being highest towards the north of the study area. Whilst a number of large junctions, such as the M50's Junction 11, operate near capacity, the road network in the study area is moderately congested with a large number of junctions demonstrating existing operational headroom. Similarly, the proposed bus network is expected to function primarily within capacity except for four services that are forecast to operate over 85% capacity at points.

Public transport trips within the study area experience significantly higher journey times in comparison to car and cycle trips. Alongside a lack of orbital services, this is also likely due to areas of the network experiencing low bus speeds as a result of congestion and a lack of bus priority measures.

Analysis is also undertaken to estimate the level of public transport demand along key movement corridors if certain levels of mode shift away from car were to occur. This analysis is intended to provide an indicative level of demand to help inform the options development process, in terms of level of provision required. Analysis was undertaken on three identified movement corridors passing through the study area:

- Radial corridor from Tallaght and Citywest to Dublin City Centre;
- Orbital corridor from UCD to Naas Road; and
- Orbital corridor from UCD and Sandyford to Tallaght.

This analysis determined that, in order to enable a car mode shift of 50% (i.e. 50% of all car trips in 2042 shift to other modes including public transport), capacity for 2,700 public transport trips would be required to cater for northbound demand along the radial corridor (Tallaght/Citywest to City Centre). This figure includes both modelled public transport demand and additional demand from shifted car trips.

A similar analysis was undertaken for the two orbital corridors; however, given the nature of the methodology which considers sectors within close proximity to the study area, demand was shown to be relatively low. It is

noted that further analysis to cover orbital demand across a wider area across the GDA is likely to be required in order to inform options selection for orbital corridors.

**Options Development**

To identify options to serve demand in the study area in 2042, the following steps were completed:

- A review of relevant planning and transport policies and strategies has provided the overall context for options, and identified current thinking in relation to the future transport network;
- A baseline analysis of the existing transport network identified existing network issues and opportunities;
- An analysis of planning and travel data from the 2042 Planning Sheet and a Do-Minimum run of the Eastern Regional Model for 2042 provided insights into future travel demand and network capacity constraints; and
- A review of the GDA Strategy objectives against which all options should be aligned.

The above steps resulted in the preparation of an options long list to serve demand in the study area:

| Type of option | Description |
|---|---|
| PT corridor | Radial public transport option connecting Tallaght to Dublin City Centre |
| PT corridor | Orbital public transport option connecting UCD to Naas Road |
| PT corridor | Orbital public transport option connecting UCD to Sandyford and Tallaght |
| BusConnects bus service | Service A1 – Increase AM frequency |
| BusConnects bus service | Service S6 – Increase AM / PM frequency |
| BusConnects bus service | Service S8 – Increase AM frequency |
| BusConnects bus service | Service P43 – Increase AM / PM frequency |
| Bus infrastructure | Provide eastbound bus lane on the R113 Killininny Road |
| Bus infrastructure | Provide northbound bus lane on Whitestown Way towards Tallaght |
| Bus infrastructure | Provide bus, cycle and traffic lanes on the R817 Old Bridge Road and Cypress Grove Road |
| Bus infrastructure | Introduce parking restrictions along Fortfield Park and Fortfield Road |
| Bus infrastructure | Convert Rathgar Avenue to one way southbound |
| Cycle infrastructure | Cycle measures along R818 Terenure Road between Templeogue Road to junction of Fortfield Road / Kimmage Road Lower |
| Cycle infrastructure | Cycle measures along Kenilworth Park, Clareville Road and Larkfield Park |

The long list of options, where relevant, were shortlisted based on their ability to serve modelled demand in the forecast year. Three main options to serve demand on the radial corridor were identified:

- Bus spines (x2);
- Bus spine with Priority; and
- Light Rail.

The remaining options were considered to be complementary measures and have not been assessed as part of the multi-criteria analysis.

**Options Assessment**

The shortlisting of core options is carried forward into Chapter 6 for a qualitative multi-criteria analysis, providing a high-level assessment based on professional judgement. Building on the key themes of the Common Appraisal Framework, a set of criteria which sit within these overarching themes were developed to enable a

more detailed assessment of options to be undertaken. The criteria were based on the objectives for the Transport Strategy, as provided by the NTA.

The options brought forward to the assessment stage for the radial corridor were compared via the comparative analysis, which demonstrated that, overall, a Bus Spine with Priority performs best. However, it is noted that all three options should be taken forward as part of further work in the development of the revised Transport Strategy for the GDA. Alongside the radial corridor options, two orbital spines have been identified for further development, with a series of complementary measures such as improvements to BusConnects bus services, bus priority infrastructure and cycle network improvements also included.

**Summary**

This study provides a comprehensive review of the Dublin South West study area in relation to proposals for future land use and transport networks and identifies a series of transport options to serve future travel demand. Three core movement corridors have been identified from the modelled data provided which cater for the majority of movements through the study area: one radial corridor and two orbital corridors. A demand analysis has been undertaken, incorporating both modelled public transport demand and additional demand from car mode shift to identify the most appropriate options to serve these core corridors.

Overall, two bus-based options, one with priority, and a light rail option have been short-listed as being best suited to provide for future radial travel demand in the study area. All three options align with the Transport Strategy objectives, with the option of Bus with Priority providing the best fit. In addition, two orbital corridors which could be served by public transport have been identified. While a short list of proposed modes has not been provided here, it is suggested that these options are explored as part of wider orbital corridors for the GDA. Further, a series of complementary measures to enhance proposed BusConnects bus services, provide bus priority and close gaps in the cycle network have been outlined for further consideration.

# 1. Introduction

## 1.1 Background to the study

The National Transport Authority (NTA) commissioned Jacobs Engineering Ireland Limited (Jacobs) in collaboration with Systra to complete an Area Based Study for Dublin South West.

This study was commissioned in order to inform the NTA's review of the Transport Strategy for the Greater Dublin Area (2016 – 2035), which will consider the future development of the transport system in the Greater Dublin Area (GDA) for the period up to 2042. In this context, the purpose of this study is to:

- Provide a comprehensive assessment of future travel demand in the Dublin South West area;
- Identify realistic potential options to meet future travel demand to and from this area, and in particular to cater for demand into Dublin City Centre and other key destinations;
- Focus in particular on options for public transport and active modes provision, taking account of emerging proposals;
- Assess potential options using a multi-criteria assessment framework; and
- Recommend options which can be taken forward for further assessment as part of the development of the revised Transport Strategy.

## 1.2 Overview of the study area

The Dublin South West study area extends for 8km to the south west of Dublin City Centre within the Dublin City Council (DCC) and South Dublin County Council (SDCC) local authority areas. The study area as defined by NTA is shown in Figure 1-1.

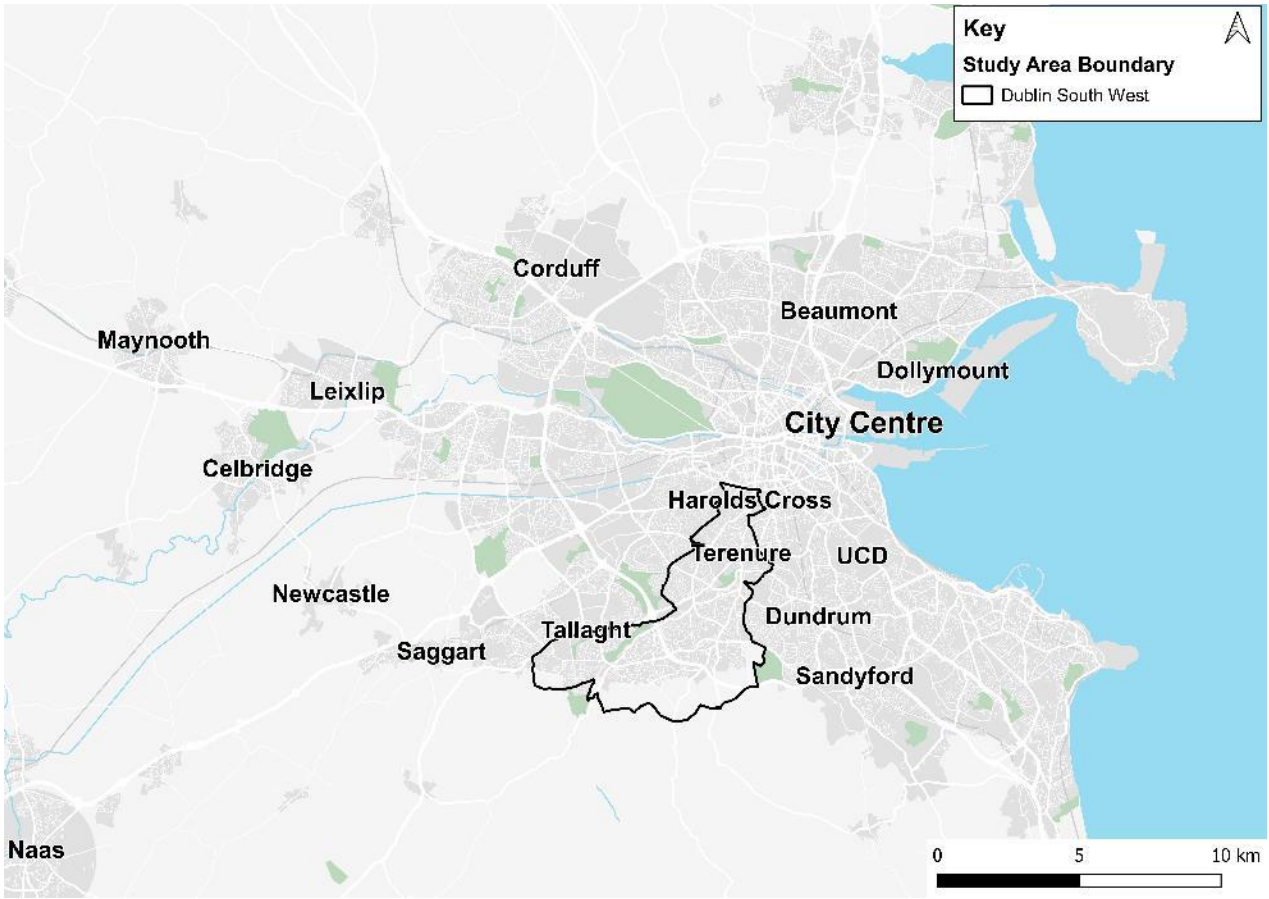



Figure 1-1: Dublin South West Study Area (Wider Context)

The study area encompasses the Harold's Cross suburb at its northern extent before spanning in a south westerly direction to cover the suburbs of Kimmage, Terenure, Rathfarnham and Knocklyon. At its southern extent, the study area covers the suburbs of Ballycullen, Firhouse and part of Tallaght south of the N81.

The study area is bounded by the R111 and Grand Canal to its north whilst the portion of the area south west of the M50 is bounded by the N81 to the north west. Key roads in the area include the M50 orbital motorway, N81, R137, R115 and R114. The area primarily consists of suburban residential and employment land uses, as presented in Figure 1-2.

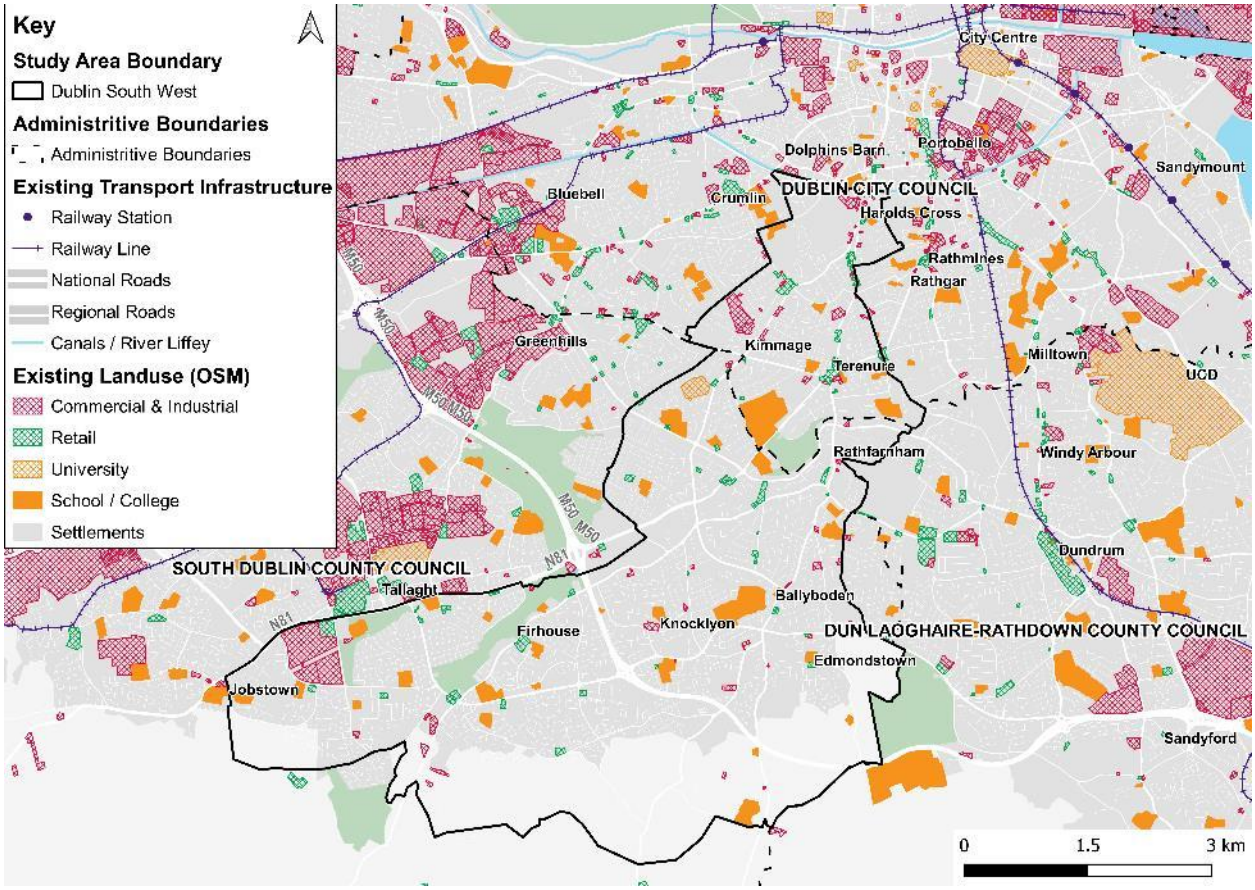



Figure 1-2: Dublin South West study area (Study Area Context)

## 1.3 Study methodology

The methodology for this study is based on the Area Based Transport Assessment (ABTA) process, which has been developed by both the NTA and Transport Infrastructure Ireland (TII). This approach ensures that movement and accessibility of all forms, across all modes of travel, is considered in the development of areas at a local level. The ABTA approach has been adapted for the purposes of this study and comprises the following key steps:

- Policy Context – understand the planning and transport policy context within which this study sits;
- Baseline Assessment – provide a clear understanding of the existing spatial characteristics, land uses, transport conditions and constraints in the study area;
- Establish Context – understand the future growth proposals for the study area as well as future travel patterns which proposed transport options need to serve;
- Options Development and Assessment – identify high-level transport options to serve demand in the study area and assess them via a multi-criteria analysis against the objectives of the study; and
- Final Summary – present the options to be taken forward and investigated further.

## 1.4 Report structure

This report is comprised of the following chapters:

- Chapter 2 – Policy context
- Chapter 3 – Baseline assessment;
- Chapter 4 – Future context;
- Chapter 5 – Options development;
- Chapter 6 – Options assessment; and
- Chapter 7 – Summary.

# 2. Policy Context

This section provides a comprehensive review of existing national, regional and local level legislation, policy, and guidance relevant to this study. It examines plans, policies and objectives at all levels in order to provide the broad context for this area study. It therefore frames the development of the study and provides a context for the identification of interventions which align with wider policy goals.

## 2.1 National policy

### 2.1.1 Project Ireland 2040 - National Planning Framework

Project Ireland 2040 was adopted by the Government in February 2018 and includes two elements:

- National Planning Framework (NPF) - shaping development in economic, environmental and social terms to 2040; and
- National Development Plan (NDP) - setting out the investment priorities that will underpin the NPF from 2018 to 2027.

Project Ireland 2040 provides the framework for future development and investment in Ireland and is the overall Plan from which other, more detailed plans will take their lead, including city and county development plans and regional strategies. The NPF is a tool to assist the achievement of more effective regional development.

The objectives of the NPF, in brief, are to:

- Guide the future development of Ireland, taking into account a projected 1 million increase in population, and create 660,000 additional jobs and 550,000 more homes by 2040;
- Direct 25% of this growth to Dublin, 25% across Cork, Limerick, Galway and Waterford and the remaining 50% across key regional centres, towns and villages (as set out in the Regional Spatial and Economic Strategy [RSES]); and
- Co-ordinate delivery of infrastructure and services in tandem with growth, helping to tackle congestion and quality of life issues.

The NPF represents the overarching national planning policy document and is underpinned by a series of core principles named National Strategic Outcomes (NSOs) which include:

- NSO 1 Compact Growth;
- NSO 2 Enhanced Regional Accessibility;
- NSO 4 Sustainable Mobility;
- NSO 7 Enhanced Amenity and Heritage; and
- NSO 8 Transition to a Low Carbon and Climate Resilient Society.

These principles are translated by supporting policies and actions at sectoral, regional and local levels.

In relation to Dublin, the NPF requires the preparation of the Dublin Metropolitan Area Strategic Plan (MASP) (part of the RSES), and notes that the identification of infrastructure required to sustain growth is a key priority of this Plan. In relation to Dublin, the NPF itself sets a clear focus on:

- Supporting future growth by better managing growth and ensuring it can be accommodated within and close to the city. This includes a focus on underutilised land within the canals and M50 ring, and a more compact urban form.
- Enabling significant population and jobs growth in the Dublin metropolitan area, together with better management of the trend towards overspill into surrounding counties.

- There will be a requirement for significant greenfield development on sites which have good integration with the city and can be served by high capacity public transport. Some existing sites have already been designated as Strategic Development Zones (SDZs).

- Addressing infrastructural bottlenecks, improving quality of life and increasing housing supply in the right locations.

Key transport-related growth enablers for Dublin include:

- Delivering key rail projects set out in the Transport Strategy for the GDA including Metro Link, DART expansion and the upgrade of Luas green line link to Metro Link;
- The development of an improved bus-based system, with better orbital connectivity and integration with other transport networks;
- Delivering the metropolitan cycle network set out in the GDA Cycle Network Plan, including key commuter routes and urban greenways; and
- Improving access to Dublin Airport, including public transport.

This policy sets the context for the development of transport interventions, including those considered through this study. It highlights that there will be significant growth to 2040 and that improvements to public transport and active mode provision are key to supporting the levels of planned development.

### 2.1.2 Project Ireland 2040 - National Development Plan

The NDP sets out the enabling investment to implement the strategy set out in the NPF, for the period 2018 to 2027. Under the NDP, investment in public transport infrastructure will be accelerated to support the development of an integrated and sustainable national public transport system consistent with the NPF's NSOs of Sustainable Mobility and Company Growth. Projects with allocated funding within the NDP include:

- Continued investment in bus and train fleets and infrastructure;
- The delivery of the Dublin BusConnects programme;
- The complete construction of Metro Link;
- Delivery of the priority elements of the DART Expansion Programme;
- A Park & Ride programme; and
- Cycling and walking networks in key urban areas.

These projects will deliver significant improvements. This study, and other work the NTA is doing to review the Transport Strategy for the Greater Dublin Area, will consider other longer-term interventions required to support the NPF to 2040 and beyond.

### 2.1.3 Investing in Our Transport Future: Strategic Investment Framework for Land Transport (2014)

The Strategic Investment Framework for Land Transport (SIFLT) sets out the strategic framework to consider the role of transport in the future development of the Irish economy and estimates the appropriate level of investment required in the land transport system. The framework establishes:

- High-level priorities for future investment in land transport; and
- Key principles, reflective of those priorities, to which transport investment proposals will be required to adhere.

Priorities include:

- Achieve steady state maintenance – emphasising the importance of efficient maintenance and management;

- Addressing urban congestion – recognising that improvements to the efficiency and sustainability of urban transport systems are a key priority. The document specifically notes that this "must be guided by demand/capacity assessments and recognise the role of urban centres as key drivers of economic activity, nationally and regionally." It goes on to say that measures should include improved and expanded public transport capacity, walking and cycling infrastructure as well as Intelligent Transport Systems to improve efficiency and capacity; and
- Maximising the contribution of land transport networks to national development.

This framework highlights the need for this study to identify measures that address urban congestion and improve the provision of sustainable transport modes.

### 2.1.4 Project Ireland 2040 – Draft National Investment Framework for Transport in Ireland (NIFTI)

NIFTI is the Department of Transport's new high-level strategic framework for prioritising future investment in the land transport network. At the time of writing, the public consultation for NIFTI is currently underway and expected to conclude in May 2021. Once published, NIFTI will replace SIFLT as the framework for future land transport investment. NIFTI is intended to ensure that transport investment is aligned with and supports the NPF and its NSOs. NIFTI outlines key investment priorities that future transport projects must align with to be considered for funding.

Priorities include:

- Decarbonisation – Recognises the fact transport accounts for approximately one-fifth of Irish greenhouse gas emissions, therefore decarbonisation is an urgent priority in the context of climate change targets;
- Protection and renewal – many of the challenges faced by the network can be addressed, at least partially, through protection and renewal. Adequate maintenance is necessary to ensure safety, make sustainable modes an attractive option, deliver connectivity and accessibility and ensure the resilience of key pieces of infrastructure;
- Mobility of people and goods in urban areas – requires prioritisation in order to facilitate compact and sustainable growth in towns and cities. Support will be given to projects that reduce urban congestion, especially through the use of sustainable mobility measures; and
- Enhanced regional and rural connectivity – through addressing priority bottleneck and network constraints as well as ensuring all parts of the country are well served with access to major ports and airports.

This framework highlights the need for this study to identify measures to address issues such as climate change and urban congestion through modal shift and improved provision for sustainable modes.

### 2.1.5 Smarter Travel: A Sustainable Transport Future (2009 to 2020)

Smarter Travel: A Sustainable Transport Future presents an overall policy framework for sustainable transport in Ireland. The policy sets out a vision, goals and targets to be achieved and outlines 49 actions that form the basis of achieving a more sustainable transport future.

Smarter Travel acknowledges that continued growth and dependency on the private car is not sustainable and therefore sets an objective to promote a significant mode shift in favour of public transport, walking and cycling. A key target in this regard was to reduce the proportion of travel to work trips by car from 65% to 45%.

Key goals of Smarter Travel include:

- Improving quality of life and accessibility to transport for all;
- Improving economic competitiveness through maximising the efficiency of the transport system and alleviating congestion and infrastructural bottlenecks;

- Minimising the negative impacts of transport on the environment through reducing air pollution;
- Reducing overall travel demand and commuting distances in the private car; and
- Reducing reliance on fossil-fuel-based transport modes.

This policy is currently under review as part of the Sustainability Mobility Policy Review. Consultation on the review closed in early 2020. The consultation documents emphasised that the purpose of the review was to put in place a new policy which supports:

- A shift away from the private car to greater use of active travel and public transport;
- Travel by cleaner and greener transport; and
- Comfortable and affordable journeys to and from work, home, school, college, shops and leisure.

The new policy will align with the NPF and will replace the Smarter Travel policy, plus the National Cycle Network Policy Framework.

This policy highlights the need for this study to place key emphasis on identifying the interventions required to support mode shift.

### 2.1.6 National Cycle Policy Framework (2009 to 2020)

Ireland's first *National Cycle Policy Framework 2009-2020's* vision is that all cities, towns, villages and rural areas will be bicycle friendly. The overarching mission of the Framework is to create a strong national cycling culture to align with *Smarter Travel's* objective that 10% of all trips will be by bike by 2020.

The Framework sets out a comprehensive package of interventions – both 'hard' (planning and infrastructure) and 'soft' (communication and education) – to make cycling a convenient and safe option for everyone. The approach recommended is a hierarchy of measures, including:

- Reducing volumes of through-traffic, especially HGVs, in urban centres and in the vicinity of schools and colleges;
- Calming traffic/ enforcing low traffic speeds in urban areas; and
- Making junctions safe for cyclists and removing multi-lane one-way street systems.

A number of objectives relevant to this study include:

- Support the planning and design of urban centres to support cyclists and pedestrians;
- Improve integration between cycling and public transport to enable multi-modal travel;
- Provide secure parking for bikes; and
- Evaluate and monitor the implementation of measures.

This policy is currently under review as part of the Sustainability Mobility Policy Review (as detailed above). This policy highlights the need for this study to identify the cycle infrastructure required to support future growth.

### 2.1.7 Building on Recovery: Infrastructure and Capital Investment (2016 to 2021)

*Building on Recovery: Infrastructure and Capital Investment 2016-2021*, published by the Department of Public Expenditure and Reform in 2016, presents the Government's new €42 billion framework for infrastructure investment in Ireland over the period 2016 to 2021.

The Exchequer transport capital allocation is largely framed by the recommendations and priorities set out in the *Strategic Investment Framework for Land Transport* (superseded by the *Planning Land Use and Transport Outlook 2040* in 2018). These priorities are threefold:

- Maintain and renew the strategically important elements of existing land transport system;

- Address urban congestion; and
- Improve the efficiency and safety of existing transport networks.

Under the Plan, €100 million is being committed to smarter travel and carbon reduction measures, including Greenways, to ensure that the transport sector makes a major contribution to climate change mitigation targets.

This policy highlights the need for this study to identify measures that contribute to climate change mitigation targets, whilst addressing the priorities outlined above.

### 2.1.8 Climate Action Plan (2019)

The *Climate Action Plan: To Tackle Climate Breakdown* was published by the Government in June 2019. The Plan identifies how Ireland will achieve its 2030 targets for reduction in carbon emissions and a pathway towards achieving a net zero emissions by 2050.

A central pillar of this plan is the role that transport can play in reducing our carbon footprint and improving air quality in our towns and cities. The plan acknowledges that the delivery of improved public transport will lead to a modal shift away from unsustainable transport choices and go a large way to the decarbonisation challenge that lies ahead.

The *Climate Action Plan* sets a target reduction of 45-50% in Ireland's transport emissions by 2030. The projected increase in population and economic activity and the resulting increased travel demand from the movement of people and goods will further intensify Dublin's current decarbonisation challenge. In 2017, transport accounted for a significant proportion of Ireland's greenhouse gas emissions – approximately 20%.

Other targets in relation to transport include:

- Increasing the number of electric vehicles;
- Building the electric vehicle charging network at the rate required to meet demand;
- Require at least one recharging point in new non-residential buildings with more than 10 parking spaces; and
- Raise the blend proportion of biofuels in road transport.

This plan highlights the need for this study to identify measures that contribute to reductions in transport related carbon emissions.

### 2.1.9 Road Safety Strategy (2013 to 2020)

The Road Safety Strategy sets out targets to be achieved in terms of road safety in Ireland, with the primary target defined as follows:

'A reduction of road collision fatalities on Irish roads to 25 per million population or less by 2020 is required to close the gap between Ireland and the safest countries. This means reducing deaths from 162 in 2012 to 124 or fewer by 2020. A provisional target for the reduction of serious injuries by 30% from 472 (2011) to 330 or fewer by 2020 or 61 per million population has also been set.'

The Strategy goes on to state that 'the attractiveness of walking depends strongly on the safety of the infrastructure provided. Collisions involving pedestrians account for 1 in 5 fatalities annually.' It also notes that 'collisions involving cyclists account for 1 in 25 road deaths annually, and many collisions involving cyclists lead to serious head injuries.'

The Road Safety Authority (RSA) undertook a consultation on their new strategy 2021-2030, which closed in November 2020. The new strategy is proposed to have an end date of 2030 to align with the EU Road Safety Policy. The review document notes that while the long-term trend shows that roads in Ireland have become safer

for road users overall, this has not been the case for all road user groups. It notes that the biggest decrease in fatalities was among pedestrians and that there were 68% fewer pedestrian causalities in 2019 compared to 2000, but that pedestrians are still the second largest fatality group, behind car occupants. The new strategy will look at how to further reduce fatalities and serious injuries and how to deal with new issues in road safety.

#### 2.1.10 UN Convention on the Rights of People with Disabilities

In March 2019, Ireland ratified the *UN Convention on the Rights of People with Disabilities*. Article 9 of the 'UNCRPD' includes the right to transport and creating an accessible end to end journey, with the user focus central to this approach. Its focus is:

"To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia:

"Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces.

"Information, communications and other services, including electronic services and emergency services."

Article 9 for the first time enshrines the right to transport within Irish legislation. The focus on Usability and Accessibility has implications and opportunities across transport planning and provision, including the National Planning Framework and the way that schemes are appraised to capture wider benefits associated with ensuring this Right.

#### 2.1.11 Other national guidance

The following national guidance has also been considered:

- Area Based Transport Assessment Guidance (ABTA), National Transport Authority and Transport Infrastructure Ireland, 2018;
- Design Manual for Urban Roads and Streets (DMURS), Department of Transport, Tourism and Sport, 2013 (updated 2019);
- National Physical Activity Plan, Healthy Ireland, 2019 (updated 2021);
- National Cycle Manual, National Transport Authority, 2011;
- Permeability: A Best Practice Guide, National Transport Authority, 2015;
- Achieving Effective Workplace Travel Plans; Guidance for Local Authorities, National Transport Authority[1].

## 2.2 Regional policy

#### 2.2.1 Regional Spatial and Economic Strategy for the Eastern and Midland Region (2019 to 2031)

The *Regional Spatial and Economic Strategy for the Eastern and Midland Region* (RSES) translates the objectives of the NPF at a regional level and provides a link between the NPF and local plans. Overall, it provides a framework for investment to better manage spatial planning and economic development throughout the Region to 2031, and beyond to 2040.

[1] https://www.nationaltransport.ie/wp-content/uploads/2012/03/Achieving-Effective-Workplace-Travel-Plans-Guidance-for-Local-Authorities11.pdf

The RSES identifies 16 regional strategic outcomes (RSOs). Integrated transport and land use is one of these, aiming to promote best use of transport infrastructure and promote sustainable and active modes of travel. The key challenge facing the region is identified as the transition to a low carbon society. The RSES therefore identified a number of primary areas of transition, with sustainable transport systems being one of these.

**Dublin Metropolitan Area Strategic Plan**

The Metropolitan Area Strategic Plan (MASP) for Dublin sets out a strategic planning and investment framework for the Dublin metropolitan area covering the short term (to 2026), medium term (to 2031) and longer term (to 2040). It includes a vision for future growth to 2031 including large scale development opportunities and a sequence of infrastructure priorities. It envisages a 250,000 increase in population of the metropolitan area between 2016 and 2031.


The vision is underpinned by a spatial framework in line with the overall settlement strategy focused on:

- Consolidation of Dublin City and suburbs;
- Key towns of Swords, Maynooth and Bray; and
- Planned development in strategic development areas in Donabate, Dunboyne, Leixlip and Greystones.

The MASP includes a number of guiding principles for development, with a key focus on integrated transport and land use, focusing growth on public transport corridors and nodes. It aims to see 50% of all new homes within or adjoining the existing built up area in Dublin and 50% in other settlements. To unlock development capacity in strategic development areas, the MASP identifies sequencing of enabling infrastructure and directs the cross-sectoral investment required to deliver development.

The MASP identifies five strategic development corridors and areas and for each, highlights the:

- Population capacity (as opposed to targets) in the short, medium, and longer term;
- Strategic residential development opportunities;
- Strategic employment opportunities; and
- Infrastructure required to enable this development in the short to medium and medium to longer term.

The MASP recognises that "Facilitating modal shift to more sustainable transport options, including walking and cycling, is a key element in promoting better traffic management and climate change strategies in the metropolitan area." It supports the NTA Greater Dublin Area Cycle Network Plan and recognises that Greenways (such as the Dodder Valley Greenway) are of strategic value as routes. More detail is provided on the Dodder Valley Greenway in section 3.1.2.

### 2.2.2 Transport Strategy for the Greater Dublin Area (2016 to 2035)

The *Transport Strategy for the Greater Dublin Area 2016-2035* provides a framework for the planning and delivery of transport infrastructure and services in the GDA up to 2035. It provides a transport planning policy around which other agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, can align their investment priorities.

The GDA's transport infrastructure must be planned for and invested in on the basis of the following:

- Assumed sustained economic growth;
- Substantial population growth;
- Full employment;
- That no one is excluded from society, by virtue of the design and layout of transport infrastructure and services or by the cost of public transport use; and
- That the environment in the GDA is protected and enhanced.

The Strategy set out high-level proposals for the walking, cycling, public transport and road networks, as well as parking management measures and other supporting measures for the entire GDA. This study looks to update work done as part of this strategy with a new forecast year of 2042.

### 2.2.3 Transport Strategy for the Greater Dublin Area Review

The NTA is required by legislation to review the Transport Strategy for the Greater Dublin Area every six years. The ongoing review will assess the implementation of the current plan and look to produce an updated strategy which will set out the framework for investment in transport infrastructure and services, through to 2042. The NTA aims to complete the review by the end of 2021, so that the new strategy can be approved by the Minister for Transport in early 2022.

The review process recognises that the following are particular challenges and considerations for the new strategy:

- Climate change and the environment – recognising the need for transport to lead the way towards a net zero emissions future;
- Growth and change – ensuring the public transport investment aligns with changes in the location of population, jobs and schools;
- Health and quality – recognising that transport can open up opportunities and have a positive impact on health and wellbeing;
- The economy – with effective public transport being a major driver of economic activity; and

  This transport study will feed into the review process currently being undertaken by the NTA.

### 2.2.4 Greater Dublin Area Cycle Network Plan

The Greater Dublin Area Cycle Network Plan was adopted by the NTA in early 2014 and is identified as a key future growth enabler for Dublin in the NPF.

The plan forms the strategy for the implementation of a high quality, integrated cycle network for the GDA. This involves the expansion of the urban cycle network from 500km to 2,480km, comprising a mix of cycle tracks and lanes, cycle ways and infrastructure-free cycle routes in low traffic environments. Within the urban network this will consist of a series of routes categorised as follows:

- **Primary** – main cycle arteries that cross the urban area and carry most cycle traffic – target quality of service (QoS) of two abreast plus overtaking width = 2.5m

- **Secondary** – link between principle cycle routes and local zones – target QoS of single file plus overtaking width = 1.75m
- **Feeder** – cycle routes within local zones and/or connection from zones to the network levels above.

Specific proposals relevant to the Dublin South West study area are detailed in Section 4.2.5.

## 2.3 Local policy

A number of local policy documents are relevant to the Dublin South West study area. Local policy documents have been reviewed to inform growth locations and future transport developments. The following documents have the future context set out in Chapter 4:

- South Dublin County Council Development Plan (2016-2022);
- South Dublin County Council Development Plan (2022-2028) Strategic Issues Consultation Booklet;
- Dublin City Development Plan (2016-2022);
- Dublin City Council Development Plan (2022-2028) Strategic Issues Paper;
- South Dublin County Council Tallaght Town Centre Local Area Plan (2020-2026); and
- Ballycullen – Oldcourt Local Area Plan (2014-2024).

# 3. Baseline Assessment

## 3.1 Description of the study area

### 3.1.1 General

The Dublin South West study area largely consists of developed residential suburbs, with a mix of employment land uses. Alongside clusters of employment land uses, such as at Tallaght Business Park, a number of suburban centres are spread throughout the study area. Examples of these include Rathfarnham Shopping Centre and the urban villages of Harold's Cross, Terenure and Rathfarnham. The main locations for residential growth in the study area at present are around Scholarstown and the lands of the Ballycullen / Oldcourt Local Area Plan, which also contains significant tracts of undeveloped zoned greenfield land.

### 3.1.2 Transport network and services

**Road network**

The Dublin South West study area is served by a network of national, regional and local roads, these are presented in Figure 3-1.

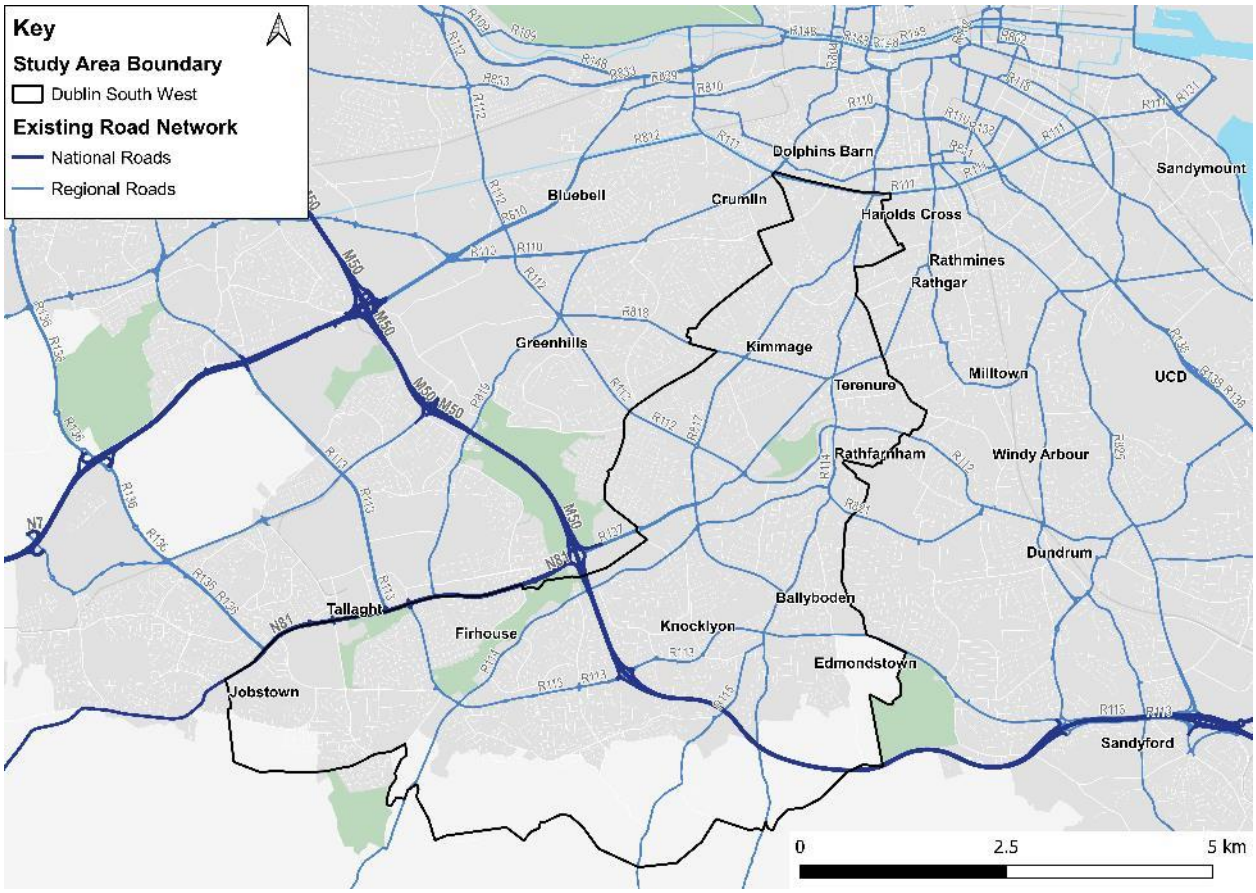



Figure 3-1: Dublin South West road network

The national road network provides the basis for Dublin's wider national-level and inter-regional connectivity. There are a number of Motorway and National roads within the study area including:

- **M50:** Is Dublin's orbital motorway providing connections to the wider national road network and is the busiest motorway in Ireland with AADT flows of 115,000 in 2019 at its approach to the junction 11. It runs through the study area from its south eastern boundary to its north western boundary. Passing

through Dublin's outer suburbs, it connects Dublin Port and Airport to Shankill in South East Dublin. The M50 is a motorway with three lanes in each direction over most of its length, and an auxiliary lane provided on the approach to key junctions. Within the study area the M50 has two grade separated interchanges; junction 12 allows interchange between the M50 and the R113 at Knocklyon, whilst junction 11, the Tallaght Interchange connects the M50 and N81/R137. The M50 also passes over or under the R114, R115 and R116.

- **N81:** Is the national secondary road that runs from Tullow, County Carlow, in the south and enters the study area on its south western edge before converting to the R137 at the M50's junction 11. The section of road north east of its junction with the R136 is a single carriageway road with a single driving lane in each direction. The road is a dual carriageway with two driving lanes in both directions between its junctions with the R136 and M50, which is known as the Tallaght Bypass. An eastbound bus lane runs along the section of N81 between Glenview Roundabout and the M50 Interchange.

The study areas regional road network comprises mainly radial routes connecting the City Centre to the National road network and wider environs, while the local road network provides key links to residential streets and local attractions.

**Heavy and light rail network**

The heavy rail network in the GDA is comprised of several individual lines, running a combination of the DART, Commuter and Intercity services. However, at present there is no heavy or light rail lines in the Dublin South West study area. Figure 3-2 presents the rail network in the context of the study area.

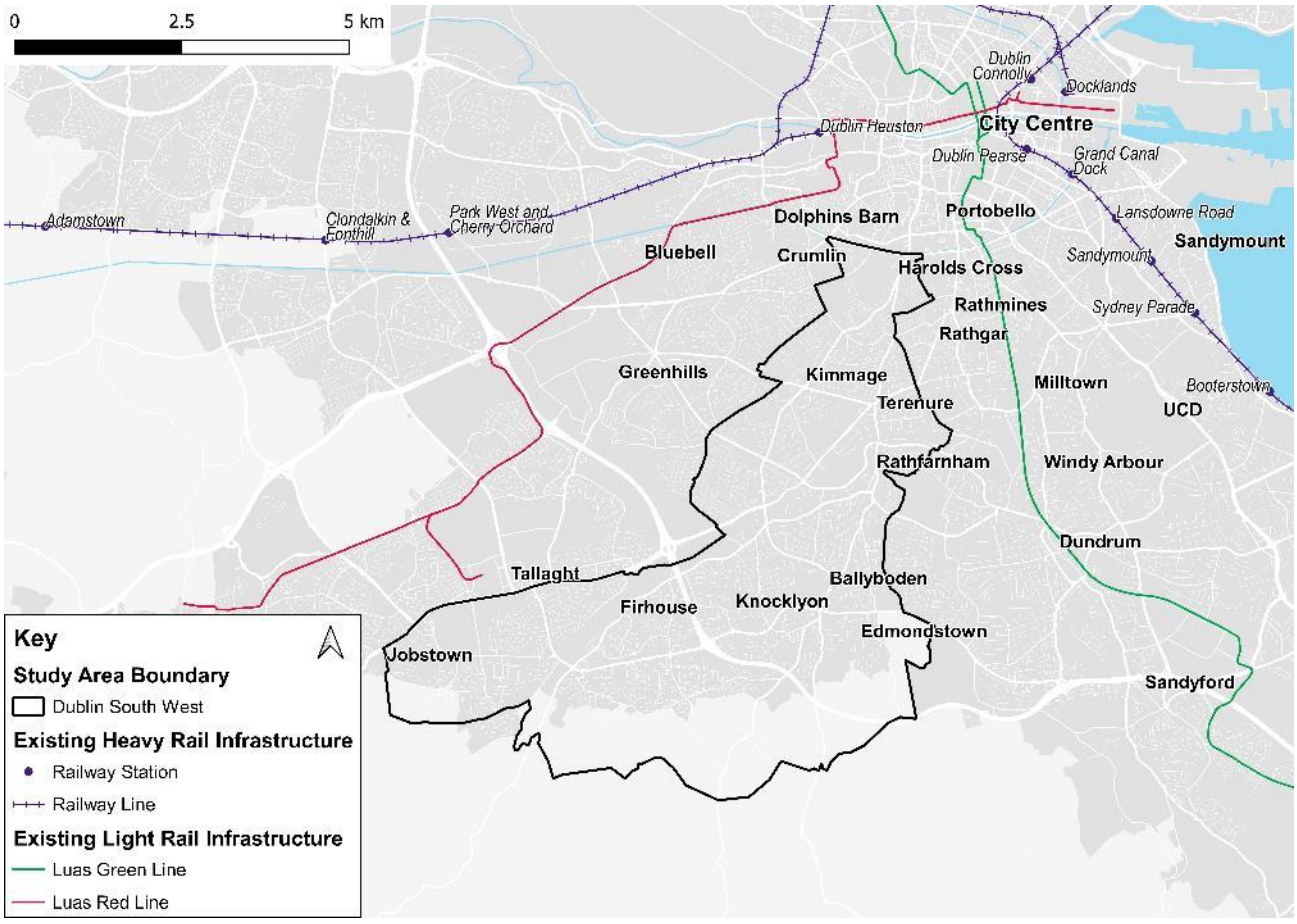


Figure 3-2: Heavy and light rail network

The nearest heavy rail lines to the study area are the Kildare Line to west and South-Eastern line to the east:

- The Kildare Line runs in a south westerly direction out of Dublin City Centre providing commuter services as far south as Portlaoise and Intercity services to Cork, Limerick and Galway. The nearest

stations are Clondalkin/Fonthill and Park West and Cherry Orchard, which are located approximately 8km and 7km from the Firhouse area, respectively.

- The South-Eastern line extends southwards from Dublin City Centre, providing an electrified DART service as far south as Greystone and diesel Commuter and Intercity services further southwards to Arklow, Gorey, Wexford and Rosslare. Lansdowne Road station is the nearest to the northern part of the study area, located approximately 3.5km from Harold's Cross; whereas the Sandymount and Sydney Parade are both located approximately 5km away from Rathfarnham.

The light rail network within Dublin is the Luas which consists of two lines, the Red and Green which flank the Dublin South West study area:

- The Red Line runs to the west of the study area from Tallaght to the Point. At its western end the Red Line has a spur from north of Tallaght to Citywest, whilst at its eastern end it has a spur from Busáras to Connolly. The nearest stop on the Red Line is the Tallaght (The Square) stop which is located approximately 2km from Firhouse.
- The Green Line runs to the east of the study area from Broombridge north of Dublin City centre, southwards to Bride's Glen in South Dublin. With the Green Line running roughly parallel to the north of the study area, the Windy Arbour, Milltown, Cowper, Beechwood, Ranelagh and Charlemont stops are all situated within approximately 1-2km of the eastern part of the study area.

**Bus network**

As part of the BusConnects programme, a redesign of the bus network in the GDA is proposed to provide greater capacity, enhance priority and a more coherently planned network. The implementation of the New Dublin Area Bus Network will be completed in phases commencing in 2021, as such the proposed network is set out here as part of the baseline. The new network features:

- **Spines** – frequent routes made up of bus services timetabled to work together along a radial corridor;
- **Orbitals** – providing connections between the suburbs, town centres and key transport interchanges without requiring travel into the city centre;
- **Other city-bound routes** – other routes which operate on their own timetables outside of spine routes;
- **Local routes** – routes providing connections within local areas;
- **Peak only** – services operating during peak periods to provide additional capacity on key corridors; and
- **Express** – direct services from outer suburbs to city centre at peak times.

The New Dublin Area Bus Network which serves the Dublin South West study area is outlined in Figure 3-3. Table 3-1 presents the services within the New Dublin Bus Network that pass through the Dublin South West study area. The table details the route, route type and weekday peak headway. Peak period times are typically between 07:00 to 09:00 for the AM period, and 16:00 and 18:00 for the PM period.

Based on the service and headway information provided in Figure 3-3 and Table 3-1, gaps and opportunities for further improvement in the new network have been identified. These predominantly relate to connectivity with key trip attractors within the study area:

- Lack of orbital services dissecting the centre of the study area connecting UCD and Dundrum to Ballymount and Clondalkin; and
- Lack of orbital services connecting Sandyford through Tallaght and beyond to Citywest or Clondalkin.

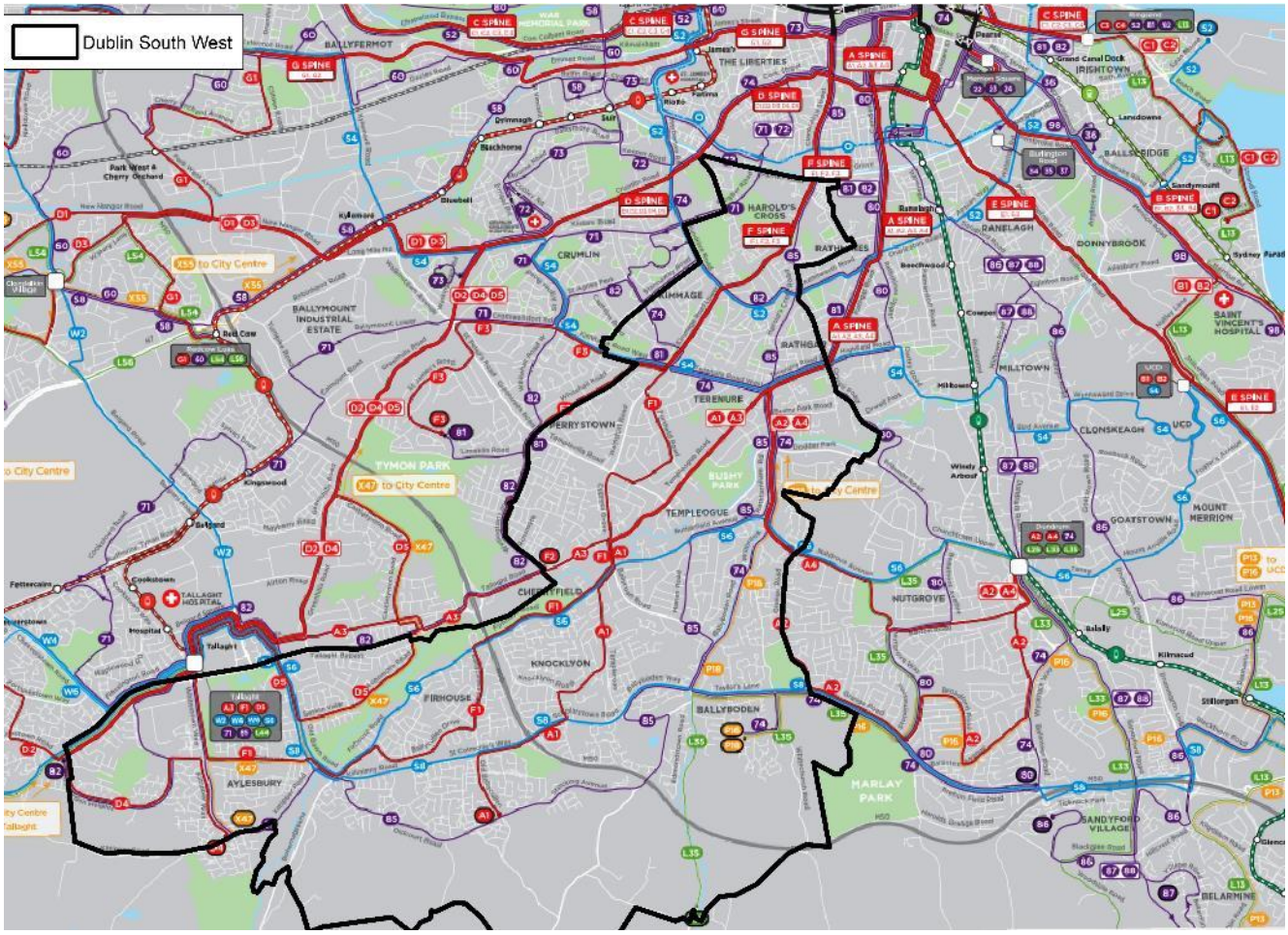



Figure 3-3: New Dublin Bus Network in the Dublin South West study area

Table 3-1: BusConnects proposed services and headways

| Route Type | Service | Route | Weekday Peak Frequency (Mins) |
|---|---|---|---|
| Spine routes | A1 | Beaumont - City Centre - Knocklyon | 12 |
| | A2 | Airport - City Centre - Ballinteer - Dundrum | 12 |
| | A3 | DCU - City Centre - Tallaght | 12 |
| | A4 | Swords - City Centre - Dundrum | 12 |
| | F1 | Charlestown - Finglas Bypass - City Centre - Tallaght | 10 |
| | F2 | Charlestown - Finglas NW - City Centre - Templeogue | 10 |
| | F3 | Charlestown - Finglas SW - City Centre - Greenhills | 10 |
| | D5 | Edenmore - City Centre - Tallaght | 30 |
| Orbital routes | S2 | Heuston - Kimmage - Ballsbridge - Poolbeg | 15 |
| | S4 | Liffey Valley - Ballyfermot - Crumlin - Milltown - UCD | 10 |
| | S6 | Tallaght - Dundrum - UCD - Blackrock | 15 |
| | S8 | Tallaght - Sandyford - Dún Laoghaire | 15 |
| Other city-bound routes | 74 | Drumdum - Whitechurch - Crumlin - City Centre | 30 |
| | 71 | Tallaght - Ballymount - Warrenmount - East Wall | 30 |
| | 72 | Drimnagh - Warrenmount - East Wall | 30 |
| | 85 | Tallaght - Ballyboden - Harold's Cross - Parnell Square | 10 |

| Route Type | Service | Route | Weekday Peak Frequency (Mins) |
|---|---|---|---|
| | 80 | Liffey Valley - City Centre - Ballinteer | 10 |
| | 81 | Greenhills - City Centre - Ringsend | 15 |
| | 82 | Killinarden - Crumlin - Ringsend | 20 |
| Local routes | L35 | Rockbrook - Dundrum | 60 |
| Peak only / express route | X47 | Kiltipper - Seskin View - Tymon North - City Centre | 60 |
| | P18 | Whitechurch - City Centre | 30 |
| | P43 | Ballyknockan – Blessington – City Centre | 60 |
| | P16 | Whitechurch - UCD | 60 |
| | P44 | Ballymore Eustace – Blessington – City Centre | 60 |

### Cycle network

The Dublin South West study area cycle network is presented in Figure 3-4. The infrastructure provided along many of the key local and regional roads varies in quality with it comprising of a mixture of on road cycle lanes and some segregated cycle tracks. In addition to the sub-standard nature of much of the infrastructure, there are some complete gaps in the network as follows:

- The R818 Terenure Road West & Kimmage Road West;
- The R114 Butterfield Avenue;
- The R113 South Tallaght Road, between its junction with Firehouse Road West and the N81; and
- Kenilworth Park, Clareville Road and Larkfield Park, between the R137 Harold's Cross Road and the R817 Kimmage Road Lower.

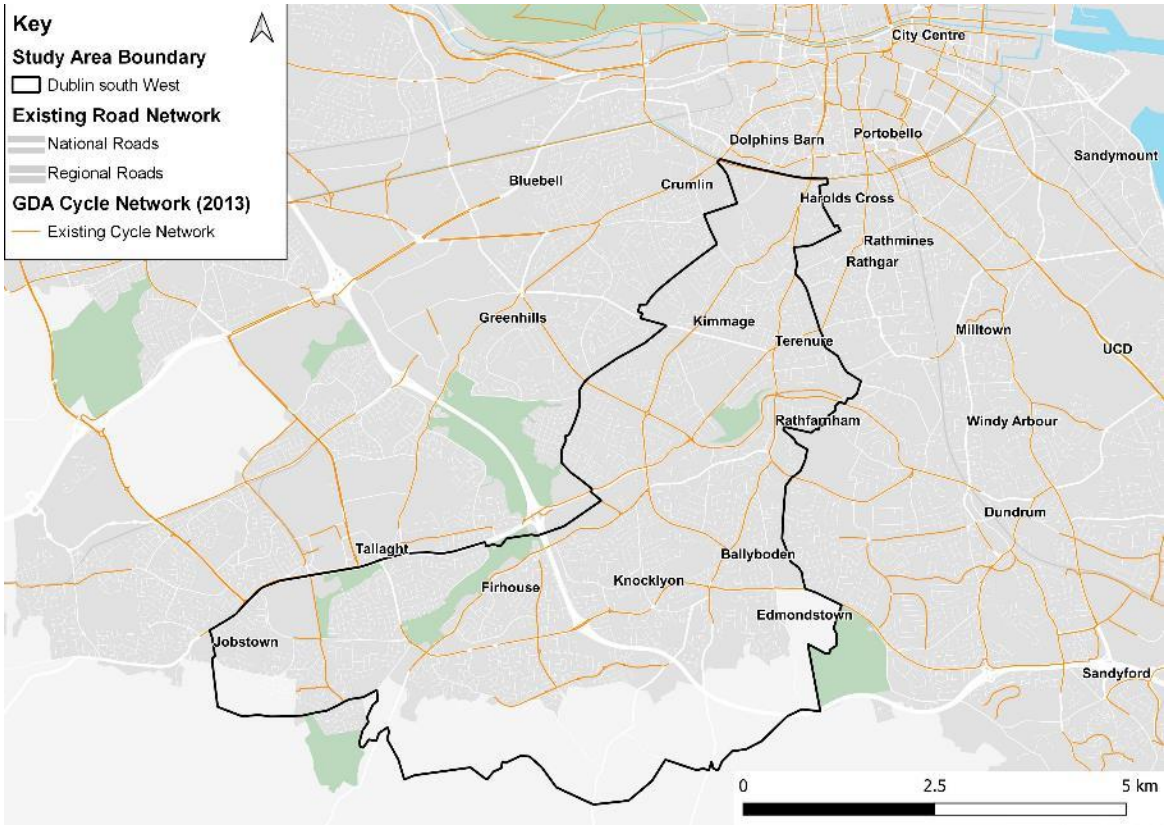



Figure 3-4: Dublin South West existing cycle network

**Walking network**

Throughout the Dublin South West study area, footways and street lighting are provided adjacent to most roads providing good connectivity within and between settlements and to key facilities such as schools, universities, and town centres. While footpaths are provided in the vast majority of built-up areas, the quality of this provision is often poor. Footpath widths are often substandard, and surfaces can be uneven. There are often many obstructions on footpaths such as advertising, redundant poles, and other street clutter. This causes particular problems for those with mobility and visual impairments or those walking with buggies and prams. There are many junctions in the study area which do not provide for certain pedestrian movements, such as at Terenure village.

The M50 causes severance issues for pedestrians within the study area, as they're required to use one of a limited number of over- and underpasses to cross the road. The N81, to a lesser extent, acts as a key barrier to pedestrians due to its high traffic flow, although signalised crossings are provided at regular intervals along its length.

**Parking provision**

Dublin City Council have parking demand management measures in place in the form of on-street permit parking zones. These zones cover the northern section of the Dublin South West study area, including Harold's Cross and parts of Kimmage and Terenure. There is significant Private Non-Residential parking provided throughout the study area, this is typically clustered around key trip attractors. This appears to a mixture of chargeable and free of charge parking. Key employment sites, such as Tallaght Business Park, have off-street parking provision.

**Road safety**

In comparison to other areas in Ireland, levels of fatal collisions in Dublin are high. Between the 1st January and 31st December 2020, Dublin experienced 20 fatal collisions, with Cork being the only area experiencing more[2]. Data on road fatalities or serious injuries is not available for the study area.

## 3.2 Existing travel patterns

### 3.2.1 Key trip attractors

Key trip attractors which would generate significant demand for Public Transport services were identified within the study area. For the purposes of this assessment, the following land uses have been considered as key trip attractors:

- Education (universities, secondary schools) including Technological University Dublin (Tallaght Campus), Griffith College, Terenure College, Our Lady's School, High School Rathgar, Presentation College, Colaiste Eanna, Sancta Maria College'
- Commercial centres (shopping centres, town centres) including Kimmage, Terenure, Rathfarnham, Templeogue and Tallaght;
- Healthcare (hospitals) including Tallaght University Hospital;
- Leisure (sport stadiums, theatres, cinemas etc.) including Tallaght Stadium, National Basketball Arena, Tymon Park, Dodder Valley Park, Bushy Park;
- Employment (business parks, large office developments etc.) including Tallaght Business Park, Cashel Business Centre, KCR Industrial Estate, Nutgrove Retail Park.

[2]https://www.rsa.ie/Documents/Fatal%20Collision%20Stats/Provisional_Reviews_of_Fatal_Collisions/RSA%20Road%20Fatalities%201200X600px%20DECEMBER%202020%20v3.pdf

### 3.2.2 Car Ownership

Car ownership data has been obtained from the Census 2016 Small Area Population Statistics (SAPS). Table 3-2 presents the car ownership data for the GDA and Dublin South West study area. The proportion of households who own at least one car, excluding those who did not provide a response, is higher in Dublin South West (82%) than the GDA (79%).

Table 3-2: Car ownership data (Census 2016 SAPS)

| Area | Total Households | Cars per household | | | | |
|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4+ |
| Greater Dublin Area | 666,724 | 19% | 43% | 32% | 5% | 2% |
| Dublin city and suburbs | 422,515 | 24% | 44% | 27% | 4% | 1% |
| Dublin South West | 45,772 | 15% | 42% | 34% | 6% | 2% |

### 3.2.3 Travel data

**Travel to work/school/college by mode**

Statistical analysis has been undertaken on the Census 2016 SAPS to identify the mode split for those travelling to work, school or college. Table 3-3 presents the travel to work data for the GDA and Dublin South West.

The proportion of people who travel to work by active modes is higher in the study area (17%) than the average for the GDA (15%). The proportion of people who travel by bus, minibus or coach is also higher in the study area (12%) than the average for the GDA (10%). The proportion of people using train, DART or Luas is lower in the study area (2%) than the GDA average (7%), reflecting the lack of rail provision in the study area. The proportion of people driving a car or van is slightly higher in the study area (58%) than the GDA average (55%), whilst the proportion of car passengers is the same.

In the NTA's 'Smarter Travel: A Sustainable Transport Future (2009 to 2020), a key target cited was to reduce the proportion of travel to work trips by car from 65% to 45%, which suggests that significant interventions are required including increased infrastructure, services and demand management measures to reach this target in the study area. This target and progress against are expected to be reviewed extended into future years.

Table 3-3: Travel to work data (Census 2016 SAPS)

| Area | Total work | On foot | Bicycle | Bus, minibus or coach | Train, DART or Luas | Motorcycle or scooter | Car / van driver | Car passenger |
|---|---|---|---|---|---|---|---|---|
| Greater Dublin Area | 835,694 | 11% | 6% | 11% | 7% | 1% | 61% | 3% |
| Dublin city and suburbs | 522,495 | 14% | 8% | 14% | 8% | 1% | 51% | 3% |
| Dublin South West | 56,774 | 9% | 10% | 13% | 2% | 1% | 62% | 3% |

Table 3-4 details the travel to school or college data for the GDA and Dublin South West study area. The proportion of people travelling by active modes (On foot or by bicycle) is higher in the study area (41%) than the GDA average (35%). The proportion of people travelling by public transport, road or rail based, is lower in the study area (18%) than the GDA average (22%).

Table 3-4: Travel to school or college data (Census 2016 SAPS)

| Area | Total School/ College | On foot | Bicycle | Bus, minibus or coach | Train, DART or Luas | Motorcycle or scooter | Car / van driver | Car passenger |
|---|---|---|---|---|---|---|---|---|
| Greater Dublin Area | 427,946 | 32% | 4% | 18% | 4% | 0% | 4% | 37% |
| Dublin city and suburbs | 247,745 | 36% | 6% | 18% | 5% | 0% | 3% | 31% |
| Dublin South West | 28,272 | 36% | 7% | 18% | 1% | 0% | 4% | 34% |

Journey time to Work / School / College

Table 3-5 presents the journey time data for travelling to work, school or college. In line with the average for the GDA, the majority of trips to work, school or college in the study area have a journey time under 30 minutes.

Table 3-5: Journey time to work, school or college data (Census 2016 SAPS)

| Area | Total | Under 15 mins | 1/4 hour - under 1/2 hour | 1/2 hour - under 3/4 hour | 3/4 hour - under 1 hour | 1 hour - under 1 1/2 hours | 1 1/2 hours and over |
|---|---|---|---|---|---|---|---|
| Greater Dublin Area | 1,237,858 | 26% | 31% | 22% | 9% | 9% | 2% |
| Dublin city and suburbs | 757,975 | 23% | 34% | 25% | 9% | 7% | 2% |
| Dublin South West | 83,519 | 22% | 35% | 26% | 9% | 7% | 2% |

Table 3-6 presents the time leaving home to travel to work, school or college data. In line with the average for the Greater Dublin Area, the majority of trips in the study area take place between 8:00 and 9:00.

Table 3-6: Time leaving home to travel to work, school or college (Census 2016 SAPS)

| Area | Total | Before 06:30 | 06:30 - 07:00 | 07:01 - 07:30 | 07:31 - 08:00 | 08:01 - 08:30 | 08:31 - 09:00 | 09:01 - 09:30 | After 09:30 |
|---|---|---|---|---|---|---|---|---|---|
| Greater Dublin Area | 1,237,858 | 7% | 9% | 11% | 17% | 23% | 20% | 6% | 8% |
| Dublin city and suburbs | 757,975 | 6% | 8% | 11% | 17% | 25% | 19% | 5% | 9% |
| Dublin South West | 83,519 | 4% | 7% | 13% | 19% | 25% | 18% | 5% | 8% |

## 3.3 Environmental conditions

The following environmental conditions are of note for the Dublin South West study area:

- The Dodder Valley Park and Grand Canal are located within the study area and are designated as Proposed Natural Heritage Areas;
- A number of watercourses traverse the study area; these include:
  - The River Dodder flows from the south-western extent of the study area to the north-east roughly following the route of the R144;
  - The Grand Canal forms the northern boundary of the study area flowing west to east;
  - The River Poddle flows north from Tymon Park, through Kimmage and Harold's Cross;
- Air quality within the Ireland is classed as 'good' according to the Environmental Protection Agency's Air Quality in Ireland (2019) report;
- The study area is home to Rathfarnham Castle, a National Monument in State Care, as well as seven Architectural Conservation Areas; and
- The topography of the study area is relatively flat with its lowest elevation at its northern extent in Harold's Cross. Moving south the elevation increases gradually until the lands south of Ballycullen where the elevation begins to increase at a greater rate towards the Dublin Mountains.

## 3.4 Summary of baseline assessment

Following the examination of the existing transport infrastructure and services, and travel demand patterns the Dublin South West study area, a number of key conclusions have been identified:

- **Roads –** The Dublin South West study area is served by a comprehensive road network consisting of a mixture of National Primary, National Secondary, Regional and Local roads. Car ownership in the study area is higher than the GDA average, with 82% of households owning at least one car (Census 2016 SAPS). This aligns with the fact that in the study area 58% of commute trips are made by car or van, which is higher than the GDA average at 55%;
- **Bus –** The proposed BusConnects network will provide the Dublin South West study area with a good level of service by operating a number of orbital and radial services at variety of frequencies. Nonetheless a number of gaps in the provision still exist, particularly regarding orbital movements that pass through the study area. Bus use in the study area is higher than the GDA average for commute trips, at 12% (Census 2016 SAPS);
- **Rail –** There is no light or heavy rail within the Dublin South West study area at present. The nearest services are the Luas Red and Green light rail lines. Reflecting this lack of provision, rail use is much lower in the study area than the GDA average, with 2% of commute trips and 1% of trips to school or college using rail (Census 2016 SAPS);
- **Walking –** Walking facilities are provided alongside the majority of roads within the study area, although the standard of provision can often be inadequate. Walking trips within the study area are higher than the GDA average for travelling to school or college, accounting for 34% of trips. Whilst walking trips for work are lower within the study area than the GDA average, accounting for 8% of trips; and
- **Cycling –** Infrastructure for cycling is generally provided along many of the key routes throughout the study area, although the standard of this provision varies widely. A number of gaps have been identified on some of the regional and local roads. The proportion of trips cycling is higher within the study area than the GDA average, at 9% and 7% for commute and school or college trips respectively.

# 4. Context

This section sets out the context of the transport demand and transport supply in the forecast year of 2040. It builds on the baseline (2016) assessment to consider proposed growth and predicted future travel patterns and anticipated travel demand across the study area. This data forms the basis of the assessment of the future year issues and opportunities, and the basis for identifying potential options for intervention.

## 4.1 Future land use

### 4.1.1 Overview

The future land use scenario presented here is based on a Planning Sheet for 2040 provided by the NTA in discussion with relevant local authorities. It reflects the 2016 and 2040 population, employment, and education places across the study area in line with regional and local planning aspirations. It is aligned with the overall objectives of the NPF and the RSES.

As Table 4-1 demonstrates, growth in the Dublin South West study area is small when compared to the GDA as a whole though there is significant levels of employment growth (+28%) proposed.

Table 4-1: NTA Planning Sheet population, employment and education statistics

| Area | 2016 | 2040 | Growth | |
|---|---|---|---|---|
| | | | Absolute | Percentage |
| **Population** | | | | |
| Dublin South West | 108,654 | 115,824 | 7,170 | 7% |
| GDA | 4,761,865 | 5,790,237 | 1,028,372 | 22% |
| **Employment** | | | | |
| Dublin South West | 13,832 | 17,717 | 3,885 | 28% |
| GDA | 1,468,093 | 1,996,002 | 527,909 | 36% |
| **Education** | | | | |
| Dublin South West | 18,614 | 19,789 | 1,175 | 6% |
| GDA | 982,185 | 1,186,472 | 204,287 | 21% |

### 4.1.2 Population

Figure 4.1, Figure 4-2 and Figure 4-3 present for Dublin South West the population growth, 2016 and 2040 levels, respectively.

The highest levels of population growth are expected in Edmondstown and greenfield lands south of Ballycullen, Oldcourt and Jobstown. Moderate levels of population growth are also expected in Knocklyon, Scholarstown, Ballyroan and Ballyboden. This is in line with the South Dublin County Council Development Plan (2016-2022) that identifies some of these as Consolidation Areas that have capacity to accommodate housing development. The high population in the greenfield lands south of Ballycullen and Oldcourt corresponds to the Ballycullen – Oldcourt Local Area Plan (LAP) (2014-2024) which provides for the construction of approximately 1,600 new dwellings.

High levels of population growth are also expected in Tallaght immediately adjacent to the study area. Within the South Dublin County Council Development Plan, Tallaght is designated as a Metropolitan Consolidation Town that has capacity to accommodate housing development. This growth corresponds with the Tallaght Town Centre LAP (2020-2026) which provides for the construction of 3,000-5,000 dwellings over the plan period.

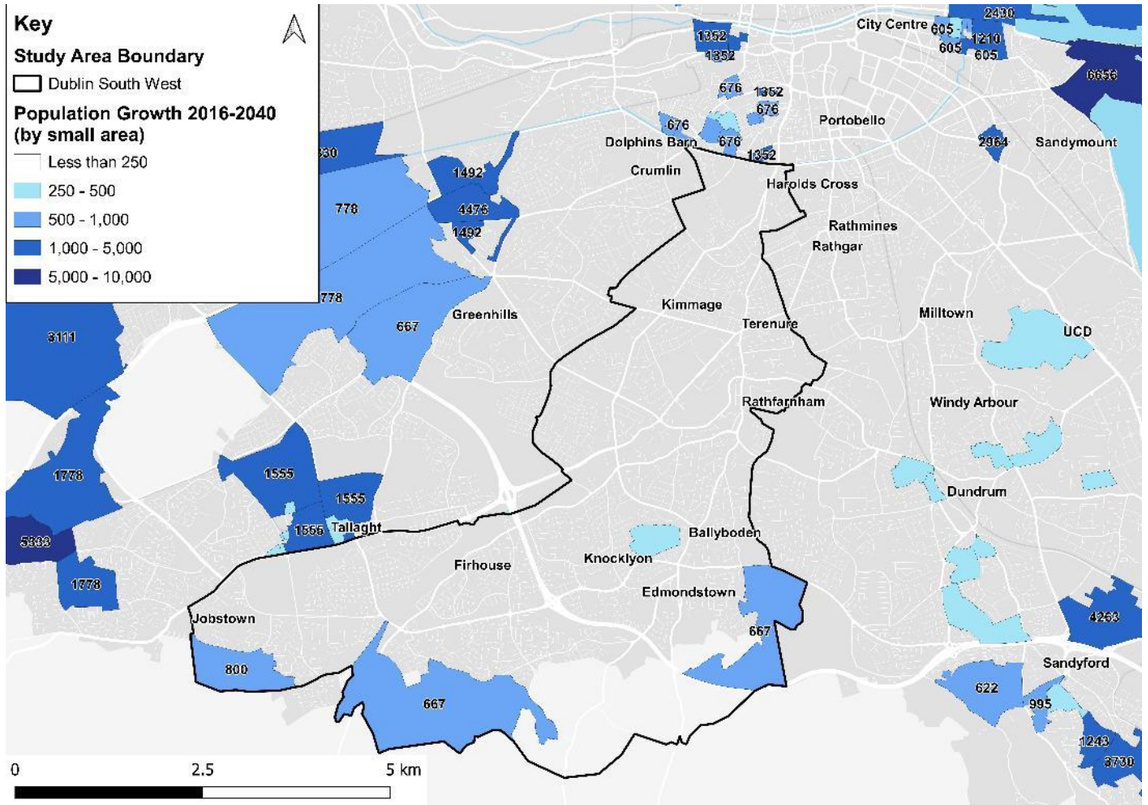



Figure 4.1: Population growth in Dublin South West from 2016-2040

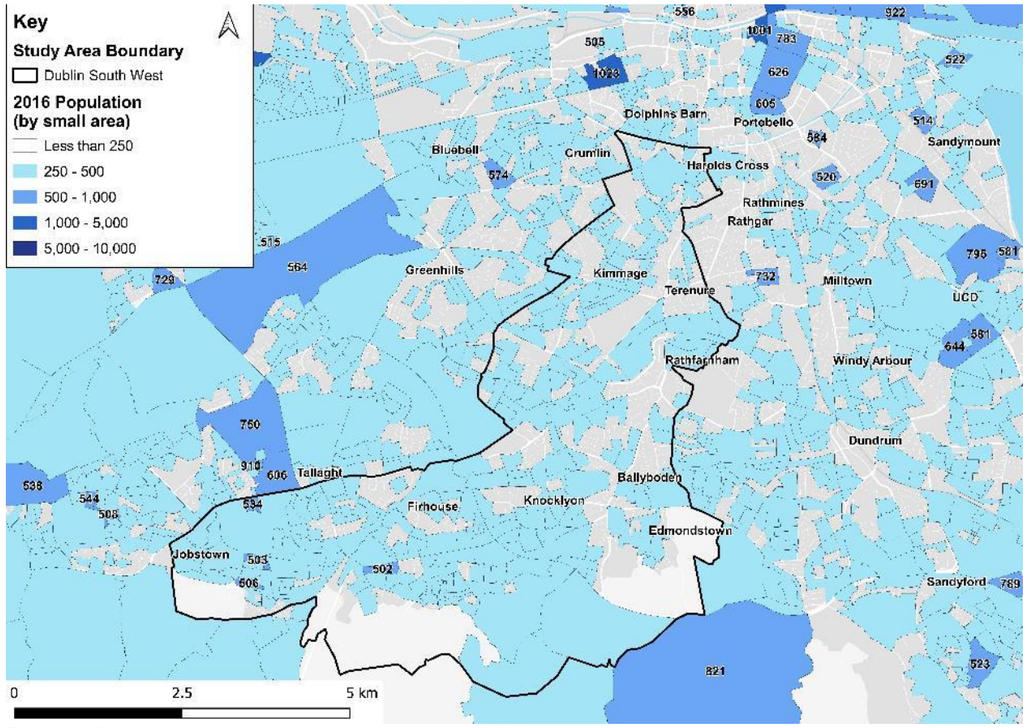



Figure 4-2: Population in the Dublin South West in 2016

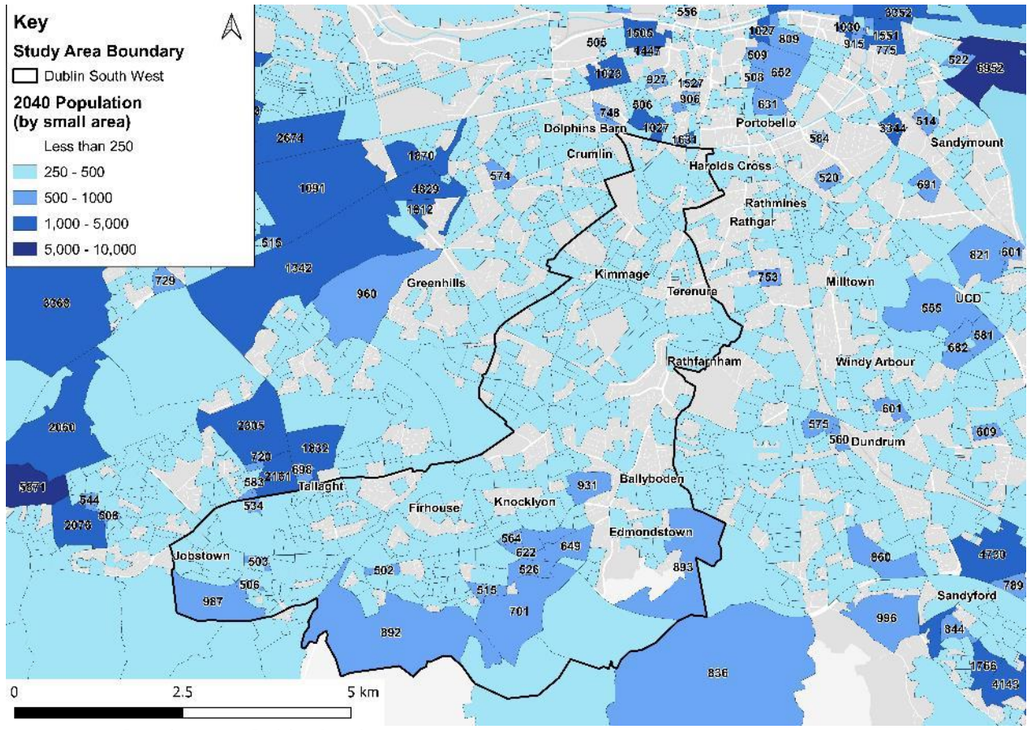



Figure 4-3: Population in Dublin South West in 2040

### 4.1.3 Employment

Figure 4.4, Figure 4-5 and Figure 4-6 present for Dublin South West the employment growth, 2016, 2040 levels, respectively.

Employment growth of 28% from (13,832 to 17,717) is projected for Dublin South West, the highest proportion of which is forecast for Tallaght Business Park and the Arena Centre, Tallaght. There is also growth proposed in the Cookstown and Broomhill Industrial Estates located adjacent to the study area.

The South Dublin County Council Development Plan (2016-2022) identifies enterprise lands and urban centres where planned and existing economic activity is largely focused. Tallaght Business Park has been identified as enterprise land by South Dublin County Council. The Dublin City Development Plan identifies a number of metropolitan centres and economic clusters as key employment locations. Tallaght and Dundrum are located adjacent to the study area and are identified as metropolitan centres. The Tallaght Town Centre LAP identifies Tallaght Business Park as an area for enterprise and employment, whilst Cookstown and Broomhill Industrial Estates are identified as areas for enterprise and residential-led regeneration.

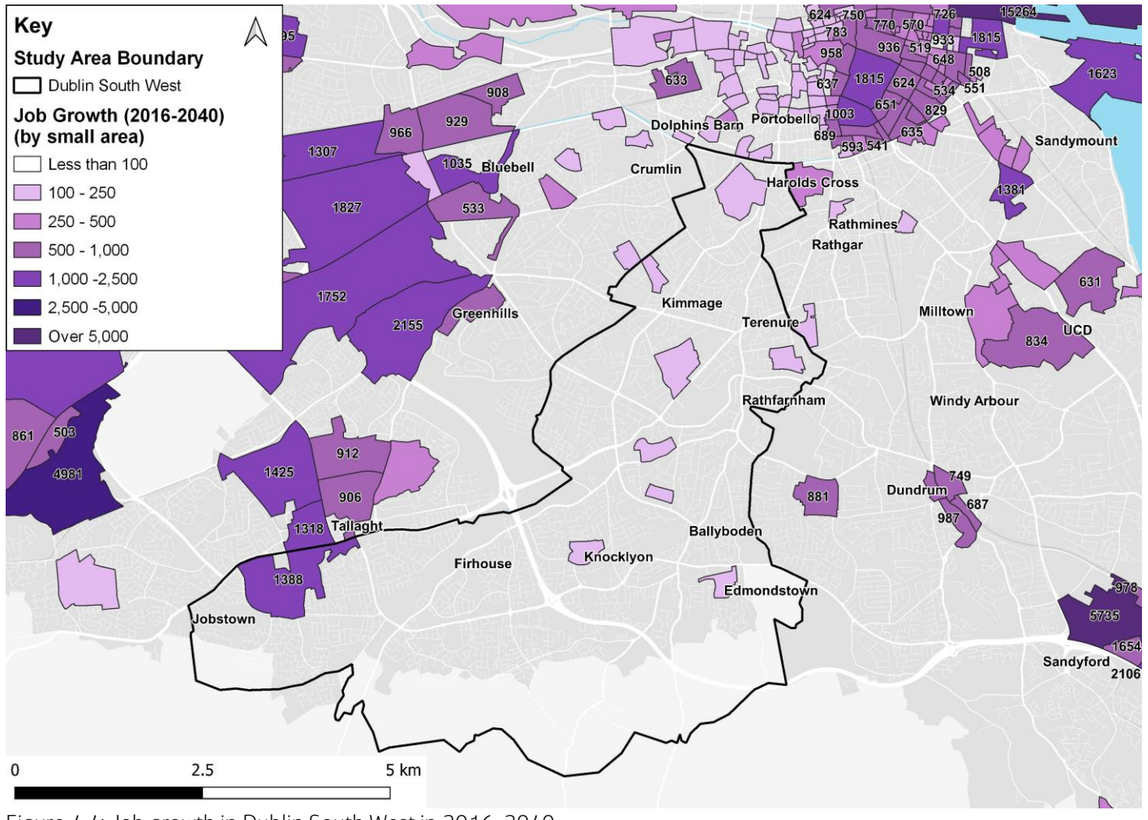



Figure 4.4: Job growth in Dublin South West in 2016-2040

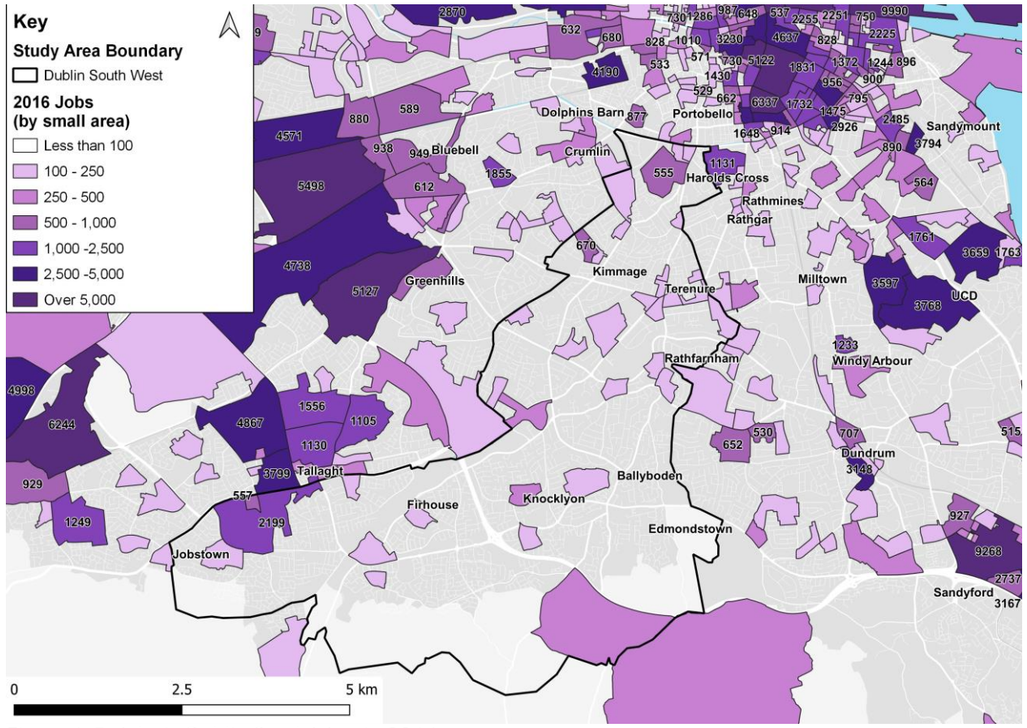



Figure 4-5: Jobs in Dublin South West in 2016

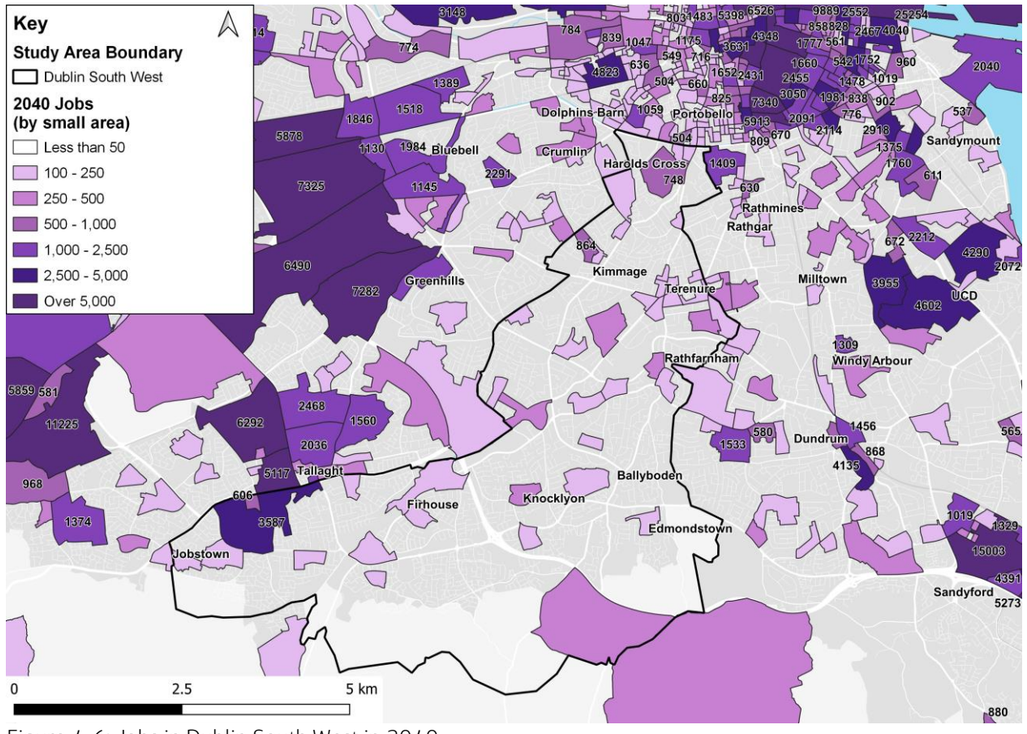



Figure 4-6: Jobs in Dublin South West in 2040

### 4.1.4 Education

Figure 4-7, Figure 4-8 and Figure 4-9 present for Dublin South West the education growth, 2016 and 2040 levels, respectively. The figures demonstrate that the highest concentration of growth in education places is forecast to be at Terenure College and at the Harold's Cross school campus.

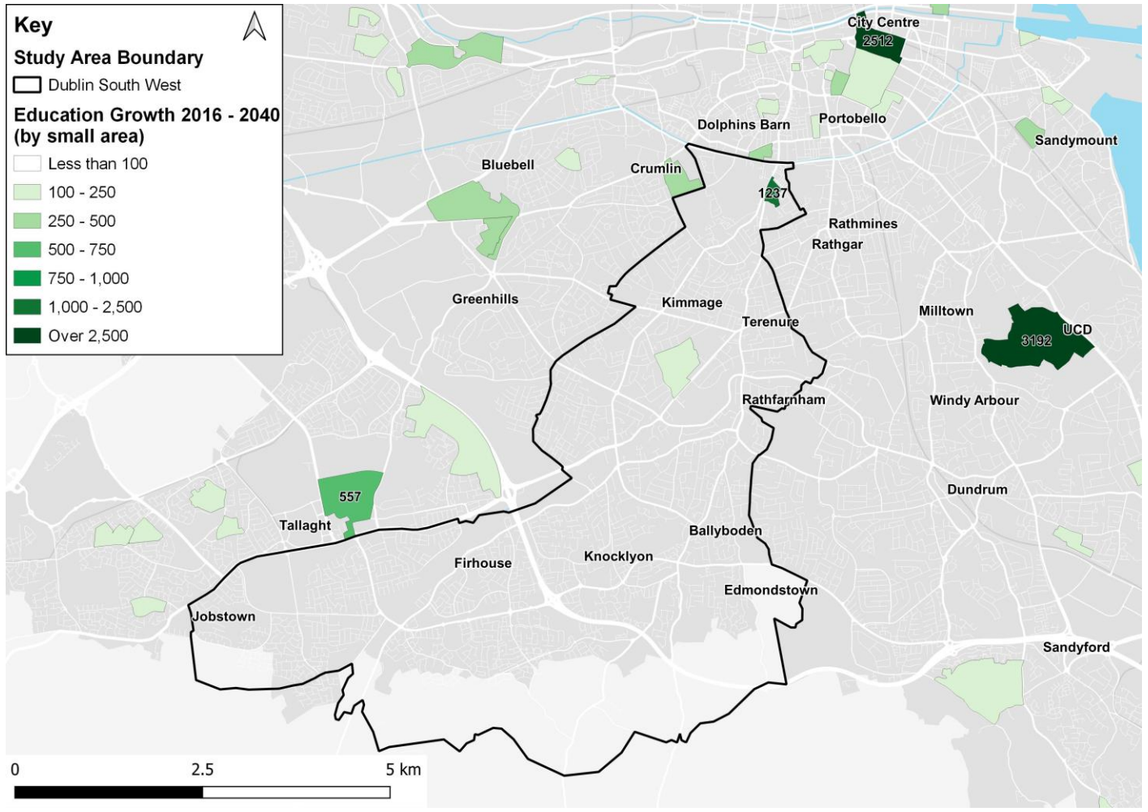



Figure 4-7: Education growth in Dublin South West in 2016-2040

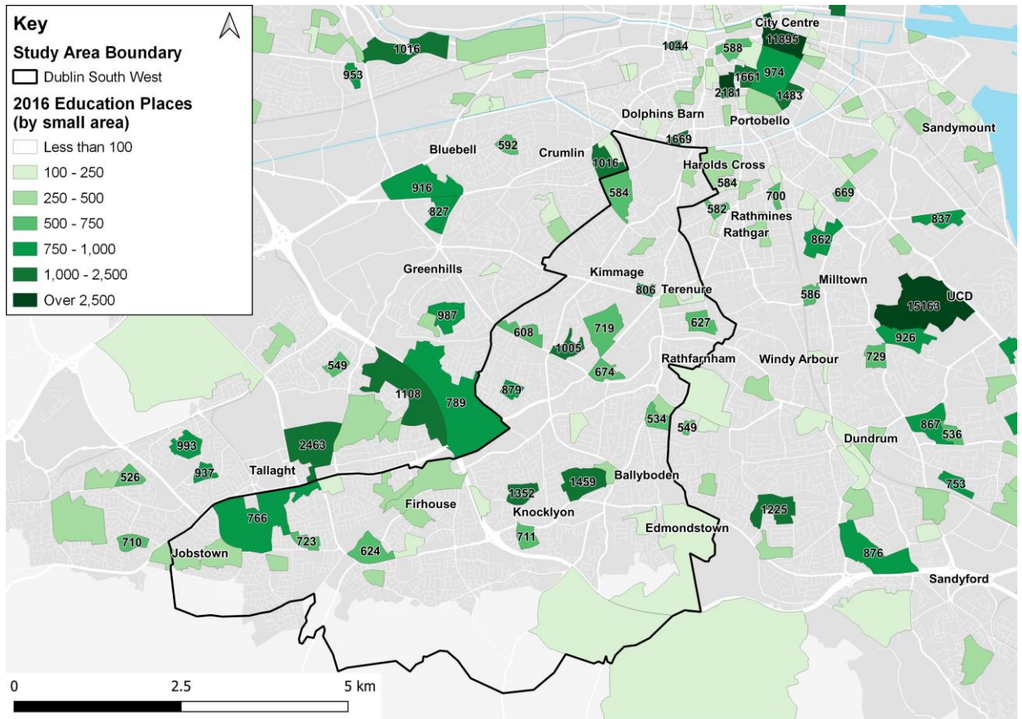



Figure 4-8: Education in Dublin South West in 2016

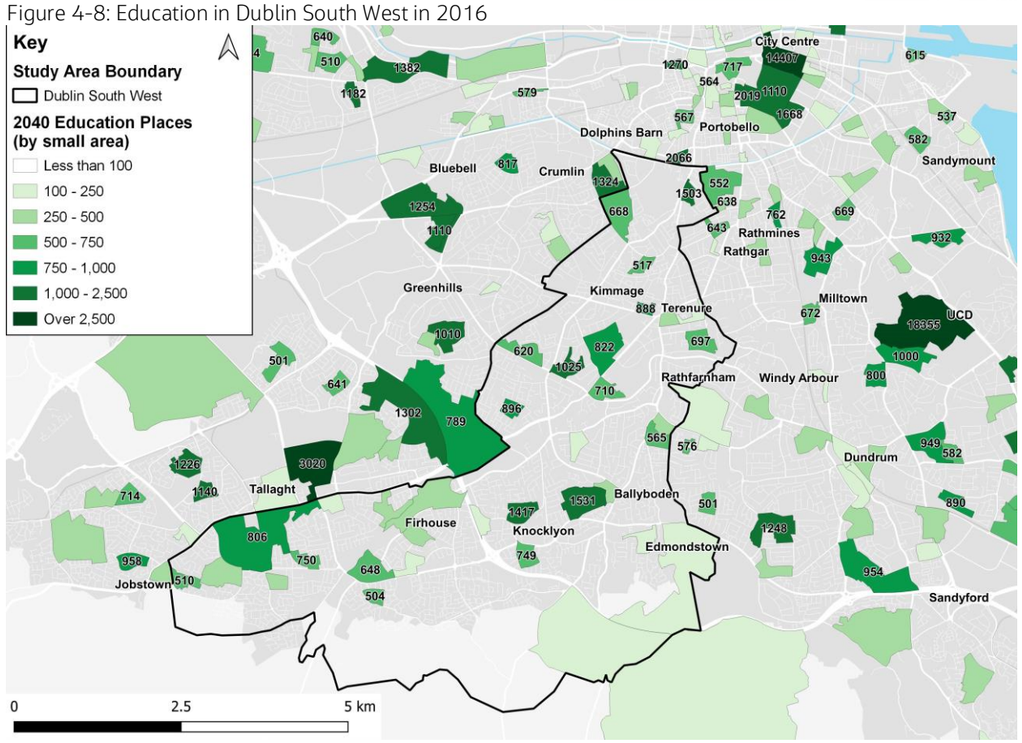



Figure 4-9: Education in Dublin South West in 2040

## 4.2 Proposals for future transport interventions

### 4.2.1 Overview

A range of proposals for future transport interventions have been highlighted in previous policies, strategies and plans. This section provides a brief summary of those schemes which will be considered when identifying options to serve demand in 2042.

### 4.2.2 Road improvement schemes

The Transport Strategy for the Greater Dublin Area (2016-2035), as detailed in Section 2.2.2, does not provide any specific road infrastructure proposals within the Dublin South West study area. The following proposals are near the study area and may induce additional demand that impacts the study area:

- Reconfiguration of the N7 from its junction with the M50 to Naas, to rationalise junctions and accesses in order to provide a higher level of service for strategic traffic travelling on the mainline;
- Widening of the M50 to three lanes in each direction between Junction 14 (Sandyford) and Junction 17 (M11) plus related junction and other changes; and
- Enhance orbital movement, outside of the M50 C-Ring, between the N3, the N4 and N7 national roads, by the widening of existing roads and the development of new road links.

The Transport Strategy for the Greater Dublin Area (2016-2035) also proposes to implement demand management measures on the M50 and radial national routes approaching the M50, in order to ensure they retain sufficient capacity to fulfil their strategic functions, including freight movement.

The South Dublin County Council Development Plan (2016-2022) outlines a series of proposals for the short and medium to long term development of the regional road network. The proposals most relevant to this study are detailed in Table 4-2.

Table 4-2: South Dublin short, medium and long term road proposals (Source: South Dublin County Council Development Plan 2016-2022)

| Road | Description | Function |
|---|---|---|
| Ballycullen-Oldcourt Street Network | Various streets within the Ballycullen-Oldcourt LAP lands. | Formation of a strategic street network providing access throughout the site. |
| Tallaght Town Centre Street Network | Various streets within the Tallaght Town Centre. | Formation of a strategic street network within the Tallaght Town Centre LAP lands. |
| Templeroan Road Extension | New link road from Knocklyon Road to Firhouse Road. | Local road re-alignment. |
| Ballyboden Road/Stocking Lane (R115) | Upgrade of existing road. | To enhance pedestrian and cycling facilities and exploit the tourist potential of the route. |
| Blessington Road/N81 | Upgrade of the existing route including the extension of the dual carriage way from Jobstown to the Embankment and an upgrade from the Embankment to the County border at Lisheen, to a safe, modern, single lane, carriageway with associated works for public | Improvement of the National Road network between Tallaght and Blessington, Co. Wicklow. |

| Road | Description | Function |
|---|---|---|
| | transport. | |
| Killinniny Road | Minor widening of the existing carriageway within the curtilage of the existing road. | To reduce delays to the M50 and create additional road space for the provision of dedicated bus and cycle lanes. |
| Western Dublin Orbital Route (south) | New road from Boherboy to Tootenhill. | Link between the N81 and the N4 with a by-pass function around Rathcoole and Saggart. |

The Ballycullen – Oldcourt LAP 2014-2024 outlines the construction of a new main link local street within the plan lands. This will connect with Oldcourt Road and Bohernabreena Road and serve to provide the development with access to the wider road network. The LAP also proposes to upgrade existing roundabout junctions along Stocking Avenue and Hunters Road to signalised junctions with pedestrian and cyclist crossings.

### 4.2.3 Light Rail

Whilst there is no existing light rail within the defined study area, improvements to the adjacent Luas Green line may serve trips originating in the east of the study area. The GDA Transport Strategy in the short term proposes to provide additional capacity on the Luas Green Line south of the City Centre, while in the longer term it proposes to upgrade the line to metro standard. The Tallaght Town Centre LAP (2020-2026) proposes to develop a transport hub in Tallaght Town Centre to facilitate seamless interchange between active modes, bus and Luas Red line. Whilst Tallaght Town Centre is not within the study area, it is within close proximity, therefore the improved interchange may impact demand within the study area.

### 4.2.4 Bus Network

As noted in Chapter 3, the new Dublin Area Bus Network is being rolled out as part of the BusConnects programme from early 2021 and has been taken as the 'base' situation within this study.

The BusConnects programme has also identified 16 Core Bus Corridors which require enhanced walking, cycling and bus infrastructure. The Dublin South West study area has three corridors within it:

- Core Bus Corridor 10 – Tallaght to Terenure
- Core Bus Corridor 11 – Kimmage to the City Centre
- Core Bus Corridor 12 – Rathfarnham to the City Centre

The 16 Core Bus Corridors have been combined into 12 schemes for progression through to the planning application and construction phases. According to the BusConnects programme, construction of supporting infrastructure will commence on a phased basis for the 12 schemes from 2022, each scheme taking approximately 2 years to construct, with all schemes constructed by 2027.

The South Dublin County Council Development Plan (2016-2022) seeks to facilitate the provision of Park and Ride facilities in appropriate locations, this includes the identification of a potential site in Firhouse or Knocklyon.

### 4.2.5 Cycling

The GDA Cycle Network Plan 2014 forms the strategy for the implementation of a high quality, integrated cycle network for the GDA. The South Dublin County Council Development Plan (2016-2022) seeks to reduce walking and cycling distances between key trip attractors and public transport corridors through the delivery of local permeability improvements. The Tallaght Town Centre LAP (2020-2026) supports the development of the GDA Cycle Network, giving particular priority to routes 9A and SO5. Development proposals will also be required to demonstrate filtered permeability.

Due to the nature of the general road network in this area, which lacks high capacity main traffic arteries unlike most of the rest of the city, the cycle route network is quite complex. The main cycle routes in this sector form a web of criss-crossing routes, with various spurs and cross links. There are six orbital routes in the study area that provide cross-links between the radial routes and give access to destinations within this sector, and in the adjoining West and South-Central sectors.

The GDA Cycle Network Plan proposes a number of greenway routes within the Dublin South West study area. Greenways are high quality cycleways, which are generally segregated from traffic and often routed through parks and areas of high amenity value such as coastal, canal and riverside routes. These include the Dodder Valley Greenway and the River Poddle Way and Tymon Park Greenways. The existing and proposed cycle network is presented in Figure 4-10.

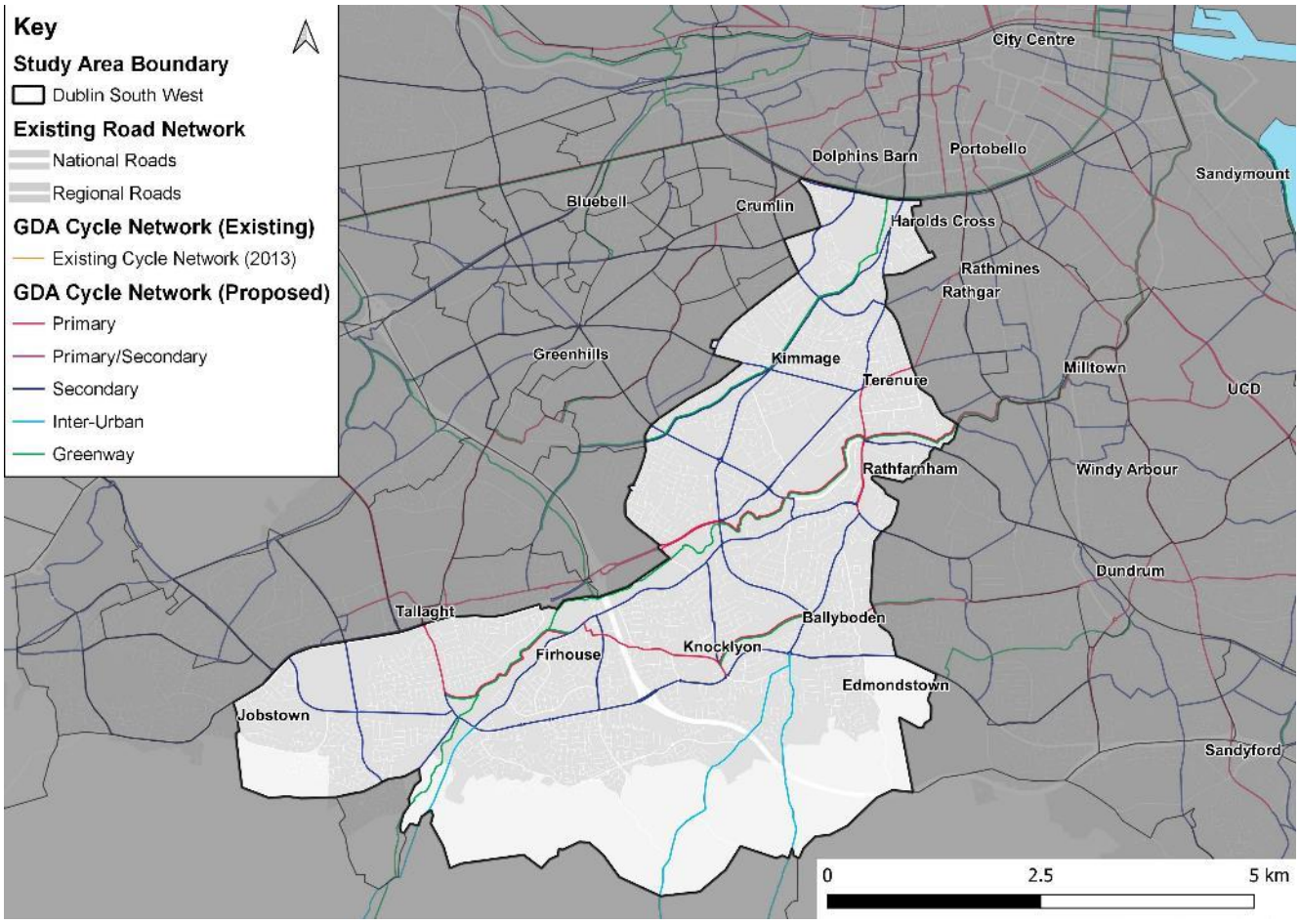



Figure 4-10: Dublin South West Proposed cycle network

A gap analysis has confirmed that the existing cycle network proposals are quite comprehensive and there is limited need for significant additions to the proposed cycle network in this sector. Detailed below are the key routes with proposals that could be improved to a higher quality of service:

- The R818 Terenure Road West between its junctions with the R137 Templeogue Road and the R817 Fortfield Road; and
- Kenilworth Park, Clareville Road and Larkfield Park, between the R137 Harold's Cross Road and the R817 Kimmage Road Lower.

## 4.3 Future travel patterns

### 4.3.1 Model assumptions

The assessment of future travel demand is based on the outputs from the NTA Eastern Regional Model (ERM)..

The ERM represents a 2042 scenario including:

**Five time periods:**

- AM 07:00 to 10:00
- Lunch time 10:00 to 13:00
- School run 13:00 to 16:00
- PM 16:00 to 19:00; and
- Off peak 19:00 to 07:00.

**Three mode classes;**

- Public transport (bus, Luas, rail and light rail);
- Road (cars, LGV, HGV and taxi); and
- Active modes (walk and cycle).

**Five trip purposes:**

- Employers Business;
- Education;
- Commute;
- Other; and
- Retired.

**Do Minimum**

The model run represents a 'Do Minimum' scenario which includes proposed development, all existing transport provision, plus a number of changes to the transport network. Details of the transport schemes included are provided in Appendix A.

The model trips are assigned to a constrained network, meaning route choice of each trip is affected by capacities and journey times (e.g. impacts from queuing) in the model in relation to all the other trips. This means there is a likelihood that due to the volume of trips in the model, some journeys use routes through local roads, instead of using the key strategic movements which are the focus of this study.

The ERM has been used to understand some of the key transport patterns in 2042 such as mode share, trip lengths, origins and destinations, route capacity and volume to capacity. These are described in the subsequent paragraphs in this section, and this information will be used to support the option development process.

### 4.3.2 Origins and destinations

Spatial analysis, using GIS, has been undertaken on trips that have an origin and/or destination within the study area, using the demand outputs from the model.

**Trips from the Dublin South West study area**

Figure 4-11 presents the origins and destination of trips which originate within the study area in the AM peak.

For trips which originate in the study area in the AM peak, the main destinations are:

- Dublin City Centre;
- Tallaght and Citywest;
- UCD;
- Nutgrove / Dundrum;
- Naas Road area;
- Rathmines; and
- Sandyford.

The trip movements in PM have also been analysed. Overall, the main destinations for trips from the study area in the PM peak are to:

- Dublin City Centre;
- Tallaght and Citywest;

- Nutgrove / Dundrum; and
- Crumlin.

The trip demand analysis shows that there is a key radial commuter corridor through the Dublin South West study area from Tallaght and Citywest to Dublin City Centre. Trips originating from the southern end of the study area tend to travel in higher proportions to Tallaght and Citywest. Whilst trips originating from the northern end of the study area tend to travel in higher proportions to Dublin City Centre. The analysis also shows how trips tend to move orbitally out of the study area to Tallaght, Citywest, UCD and Sandyford.

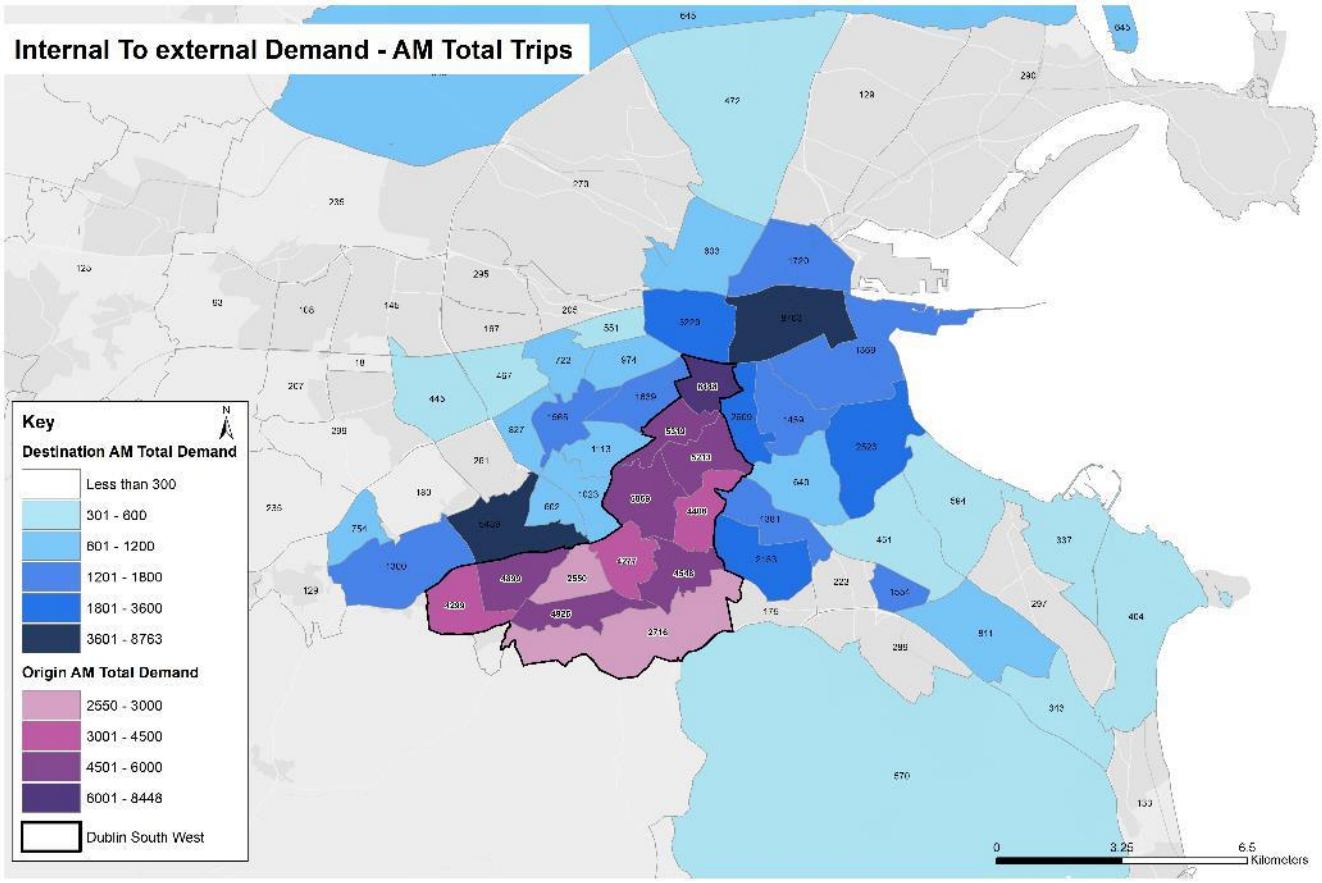



Figure 4-11: Total trips by all modes from the study area (AM peak)

**Trips to the Dublin South West study area**

Figure 4-12 presents the origins and destination of trips which have destinations within the study area in the AM peak. The figure shows that the main movements into the study area in the AM peak originate from:

- Dublin City Centre;
- Tallaght and Citywest;
- Kimmage; and
- Nutgrove / Dundrum.

The trip movements in the PM peak have also been analysed. Overall, key movements to the study area in the PM peak originate from:

- Dublin City Centre;
- Tallaght and Citywest;
- UCD;

- Rathmines; and
- Sandyford.

This analysis demonstrates that there is also a key radial corridor for trips travelling into the study area, with a high proportion of trips originating in Dublin City Centre, Tallaght and Citywest. There is also an orbital movement of trips travelling into the study area from areas such as Kimmage and Nutgrove / Dundrum.

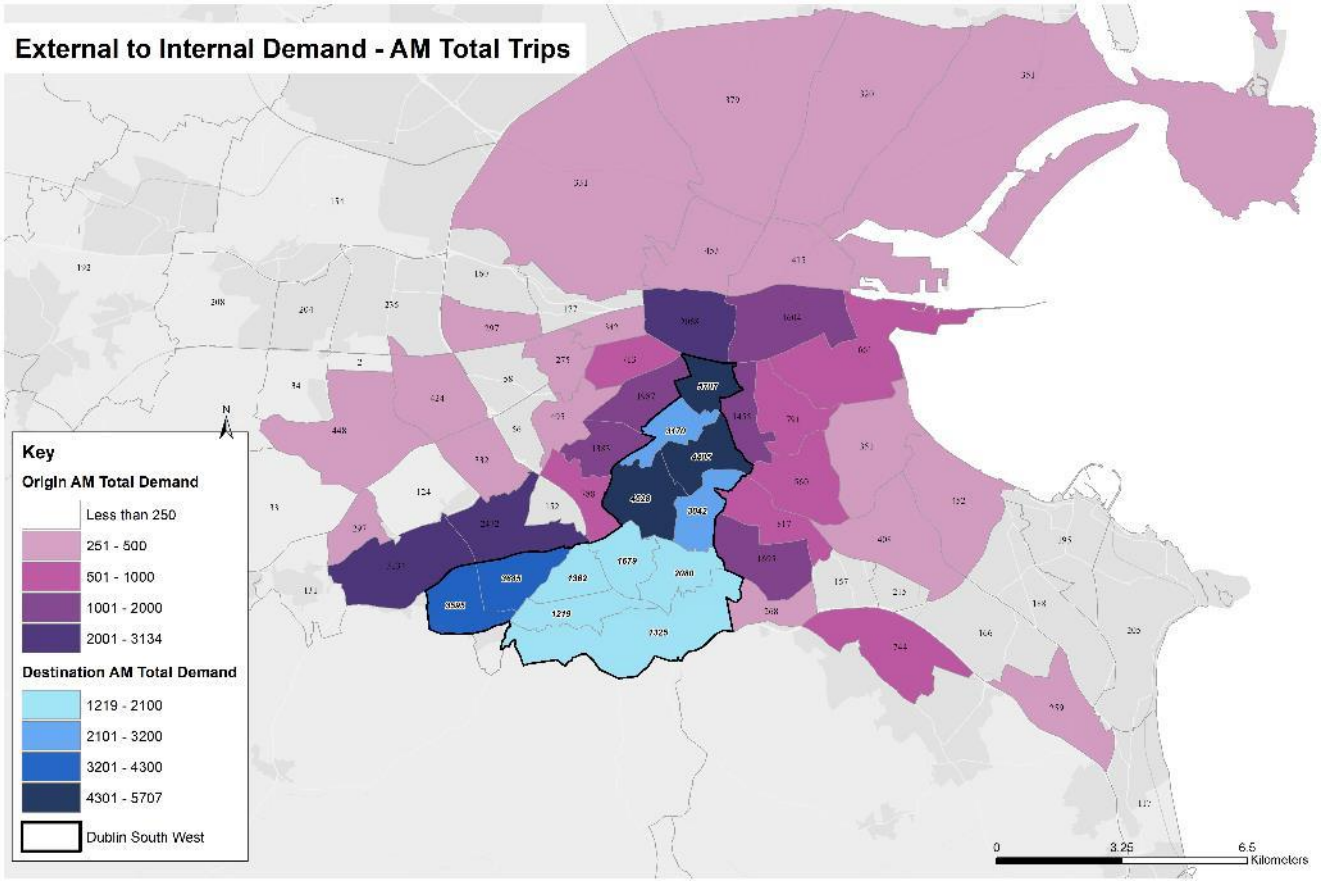



Figure 4-12: Total trips by all modes to the study area (AM peak)

**Trips within the Dublin South West study area**

Figure 4-13 shows the internal movements in the Dublin South West study area for all modes in the AM peak where the number of trips between any two zones within the study area.

The internal movements predominantly move radially towards or away from Dublin City Centre. Internal movements with the highest levels of demand are between:

- Whitestown and Oldbawn;
- Ballycullen and Firhouse; and
- Ballycullen and Knocklyon.

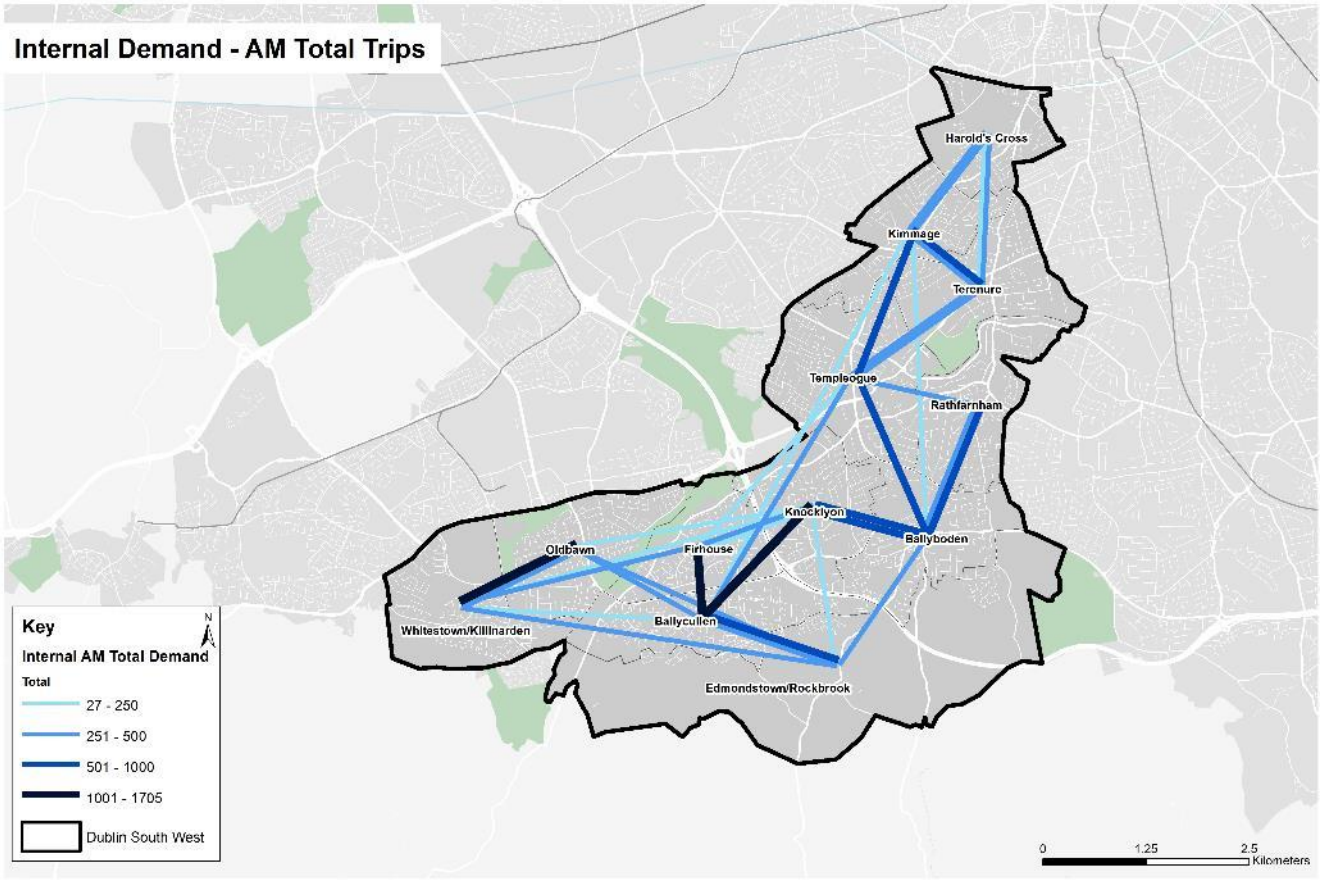



Figure 4-13: Total internal trips within the study area (AM Peak)

**Origins and destinations by mode**

Trip patterns have been disaggregated by mode where either the origin or destination is within the Dublin South West study area and the other origin or destination is outside the study area. Trips have been categorised as car, public transport and active mode trips. Maps are provided in Appendix B for the AM peak.

Active mode trips are mostly between zones within, adjacent, or in close proximity to the study area. It is clear that a high proportion of active mode trips occur between the study area and Dublin City Centre and Tallaght. The public transport internal to external trips mainly travel from the study area to Dublin City Centre, Tallaght and UCD. The public transport external to internal trips mainly originate from Dublin City Centre and Tallaght as well Dublin Airport and to the west of study area.

### 4.3.3 Mode share

Mode share data has been extracted from the model for trips originating in the Dublin South West study area for car, public transport, cycling and walking trips. This has been spatially analysed for the AM peak and presented in Figure 4-14. Overall, the AM peak data shows that:

- Car is the dominant mode (majority 41-70%);
- PT trips are highest (21-30%) in the north east of the study area, towards Dublin City Centre;
- Walking trips are highest (30%+) to the north and south of the study area, with very high levels around Jobstown; and
- Cycling is highest in the centre of the study area mainly between (6 – 14%).

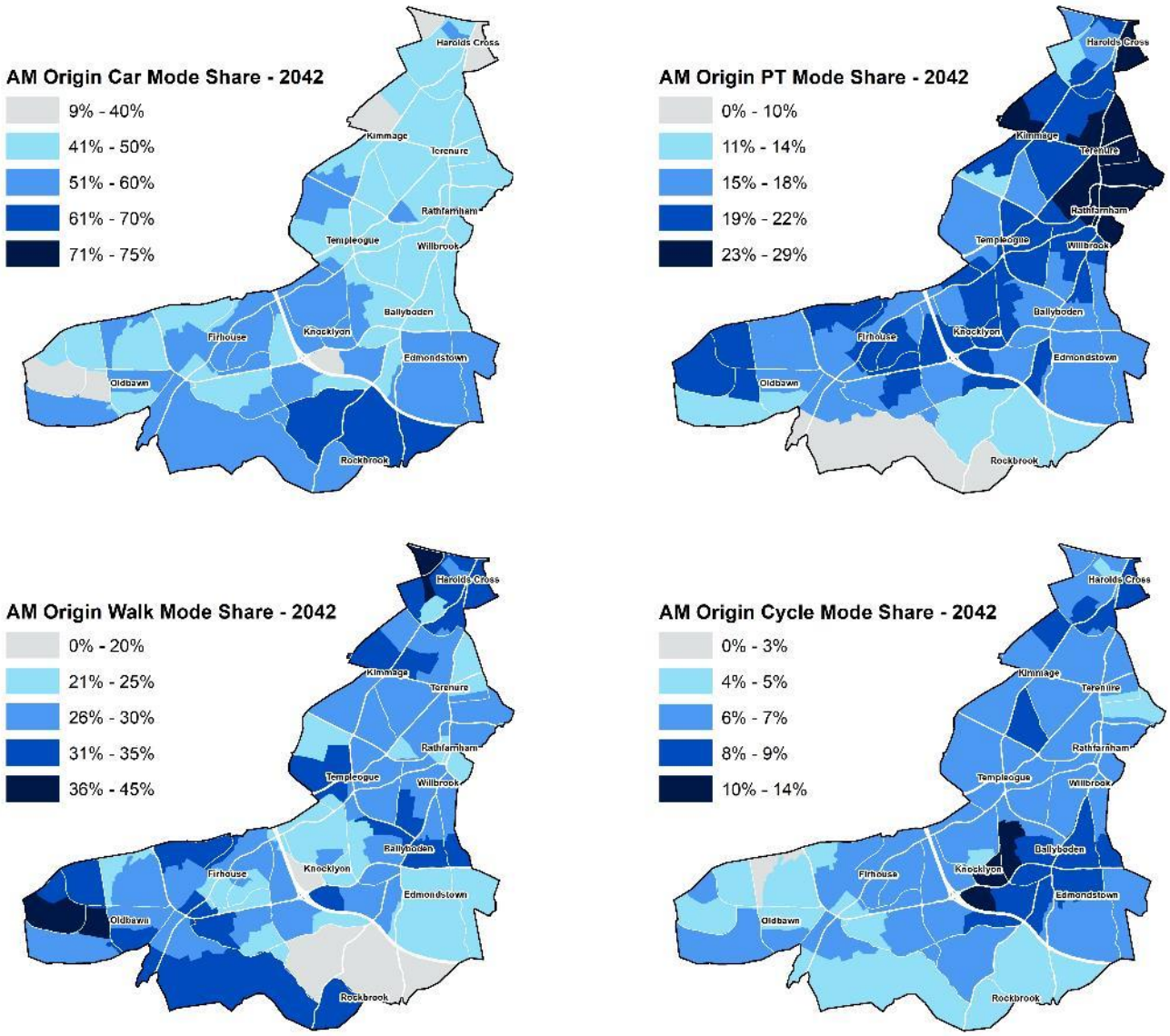



Figure 4-14: AM peak mode share

**Car mode share**

The car mode share for the Dublin South West study area for the AM peak decreases as you travel north through the study area, with the highest in Rockbrook, outside of the M50. This reflects that areas on the rural-urban fringe and are less well served by alternatives to the car, compared to areas towards Dublin City Centre.

*Implication – Car mode share is significantly higher in the Dublin South West Study area than the Smarter Travel targets, particularly in the southern section.*

**Public transport mode share**

The highest proportions of public transport use can be found towards the north of the study area, in Terenure, Rahfarnham, Kimmage and Harold's Cross. This reflects the location of these areas on existing key bus corridors, with regular services, as well their proximity to the City Centre.

Rockbrook and South Tallaght show the lowest proportions of public transport use reflecting the fact that they sit on the rural-urban fringe and are less well served by public transport services.

*Implication – Although there is good public transport mode share towards the north of the study area, there needs to be large improvements in provision to drive uptake in areas on the rural-urban fringe to the south.*

**Cycle mode share**

The cycle mode share for the Dublin South West study area for the AM peak shows areas of concentrated increased mode share in Knocklyon, Ballyboden, and Kimmage. This may reflect the presence of schools and and other key trip attractors in these locations, where short trips are undertaken by bike. Across the entire study area, the AM peak demonstrates considerably higher proportions of cycling mode share than in across the 24-hour period.

*Implication – Some areas show a high cycle mode share in the AM Peak, though this is not reflected in the 24-hour periods. It is likely that this is due to inconsistent provision for cyclists across the study area, not encouraging cycling for casual trips or for longer distance trips.*

**Walking mode share**

The walk mode share for the Dublin South West study area is relatively high in the AM Peak in local centres such as South West Tallaght, Ballyboden, Templeogue and Harolds Cross. This reflects the proximity of these areas to key trip and commuter attractors such as employment, schools and neighbourhood centres.

*Implication – The areas with the highest AM Peak mode share for walking are driven by proximity to employment, such as Tallaght Business Park. Some local provisions should be made in some areas to further encourage walking to local centres.*

### 4.3.4 Capacity by mode

**Roads**

Figure 4-15 identifies junctions within the Dublin South West study area that experience a volume over capacity (V/C) ratio higher than 60% in the 2042 forecast model run for the AM Peak. Junctions with a V/C ratio higher than 85% are defined as operating close to capacity. A number of junctions with such ratios can be seen in the vicinity of M50 Junction 11 (Tallaght), running back along the M50 to the south east through the study area. Junctions are also consistently at high volume to capacity ratios along the R137 into Dublin City Centre from the M50 particularly locally around Terenure. Major capacity constraint can also be found at the roundabout between the R115 and R822 in Ballyboden.

Overall, within the study area the road network is moderately congested, with a large number of junctions demonstrating existing operational headroom and spare capacity. This allows for growth and a degree of

flexibility to introduce meaningful measures to build greater resilience into the network through enhanced public transport and cycling infrastructure.

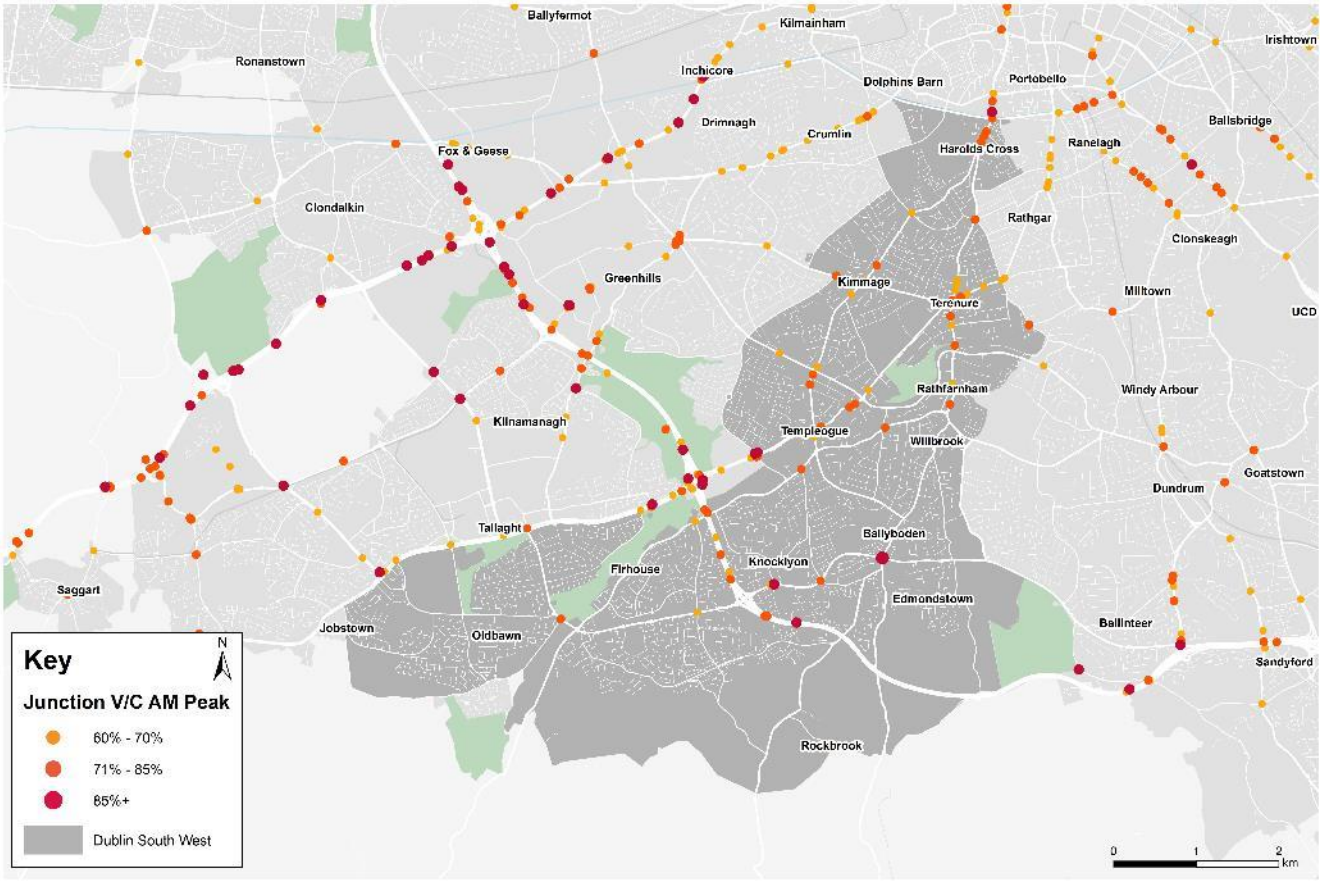



Figure 4-15: Volume to capacity ratio of junctions in the Dublin South West study area for the AM Peak

**Public transport**

Public transport demand outputs from the model have been analysed to determine which routes are forecast to operate over capacity in the forecast year. There are two definitions of capacity – crush capacity and design capacity. Crush capacity is the technical term for when a vehicle is full, including passengers who are standing. Transport services are planned for on the basis that such a level of capacity is not reached and instead the design capacity is used. Design capacity equates to 85% of the crush capacity and therefore systems are designed with an element of headroom to allow for fluctuations in demand. Figure 4-16 and Figure 4-17 show which spine and orbital bus routes are forecast to be over the design capacity in the AM peak in 2042. Routes forecast to be overcapacity include:

- The A1 radial spine route which connects Knocklyon, Templeogue, Terenure and Rathgar to Dublin City Centre. This route is over design capacity from Knocklyon to Terenure;
- The S4 orbital route which routes via Kimmage and Terenure to UCD. This route is over design capacity through Kimmage;
- The S6 orbital route which connects Firhouse, Templeogue, Rathfarnham with Dundrum and UCD. This route is over its design capacity between Templeogue and UCD; and
- The S8 orbital route which connects Tallaght with Sandyford via Ballyboden. This route is over design capacity from Knocklyon through to Sandyford.

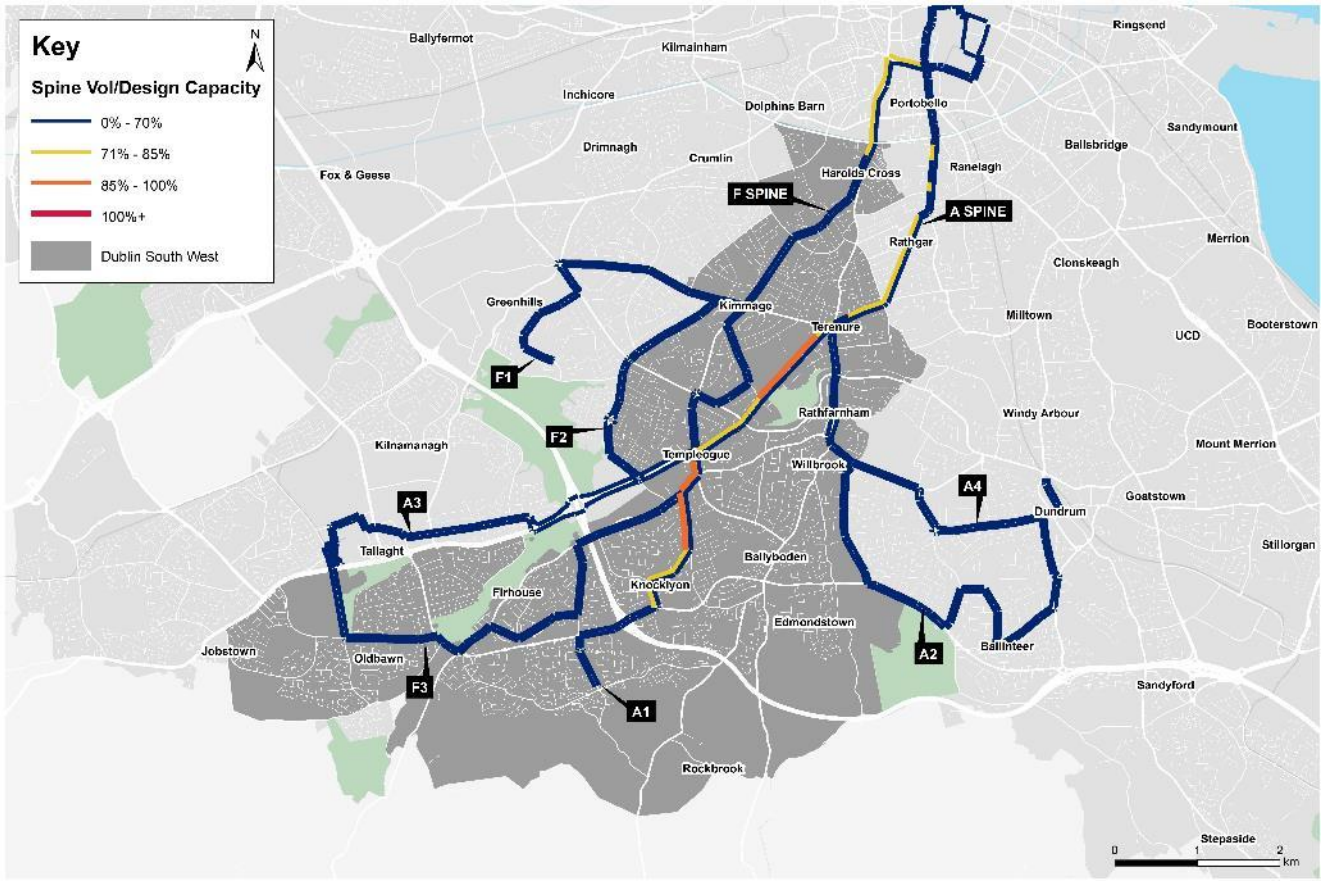



Figure 4-16: Capacity utilisation of spine bus routes (AM peak)

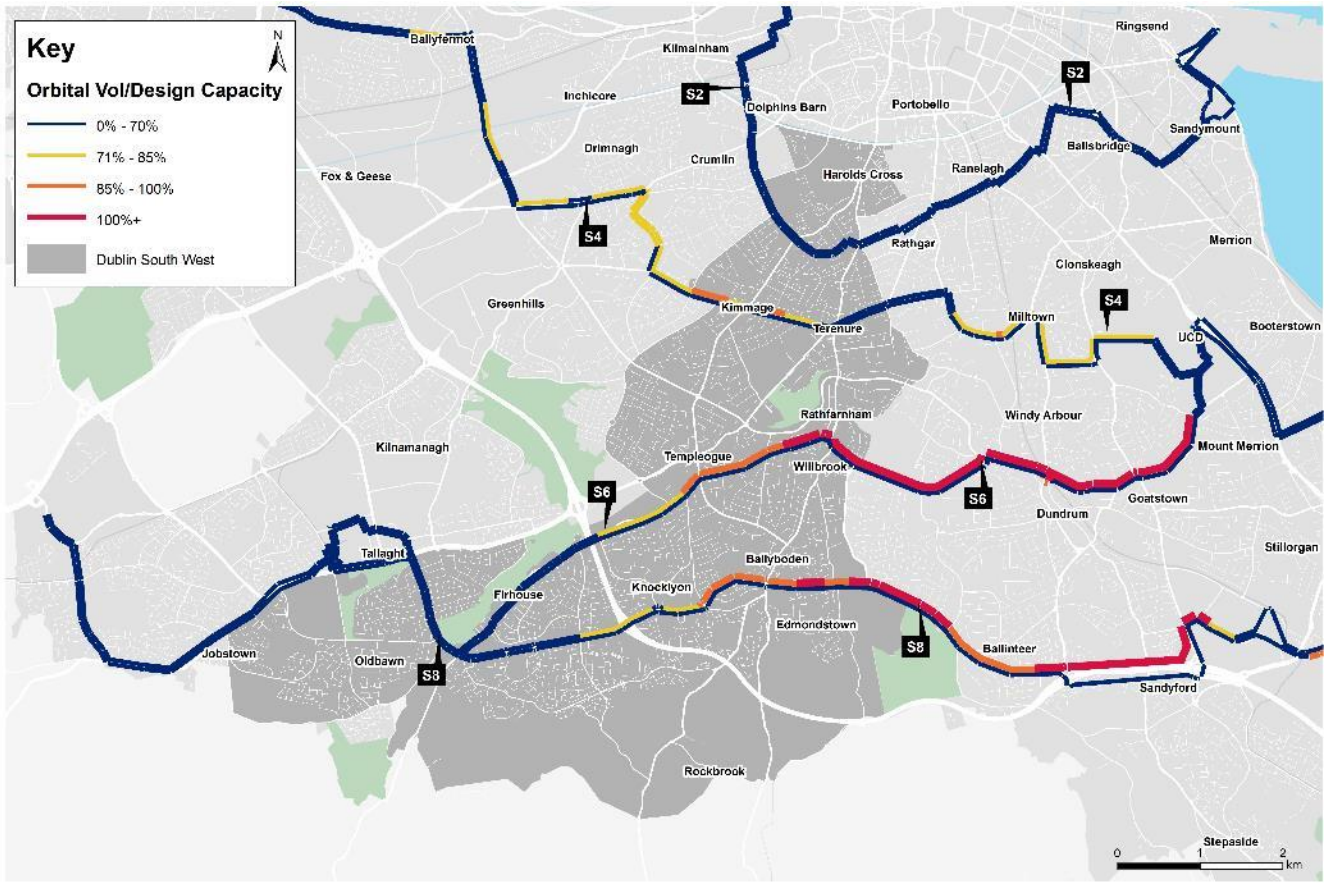


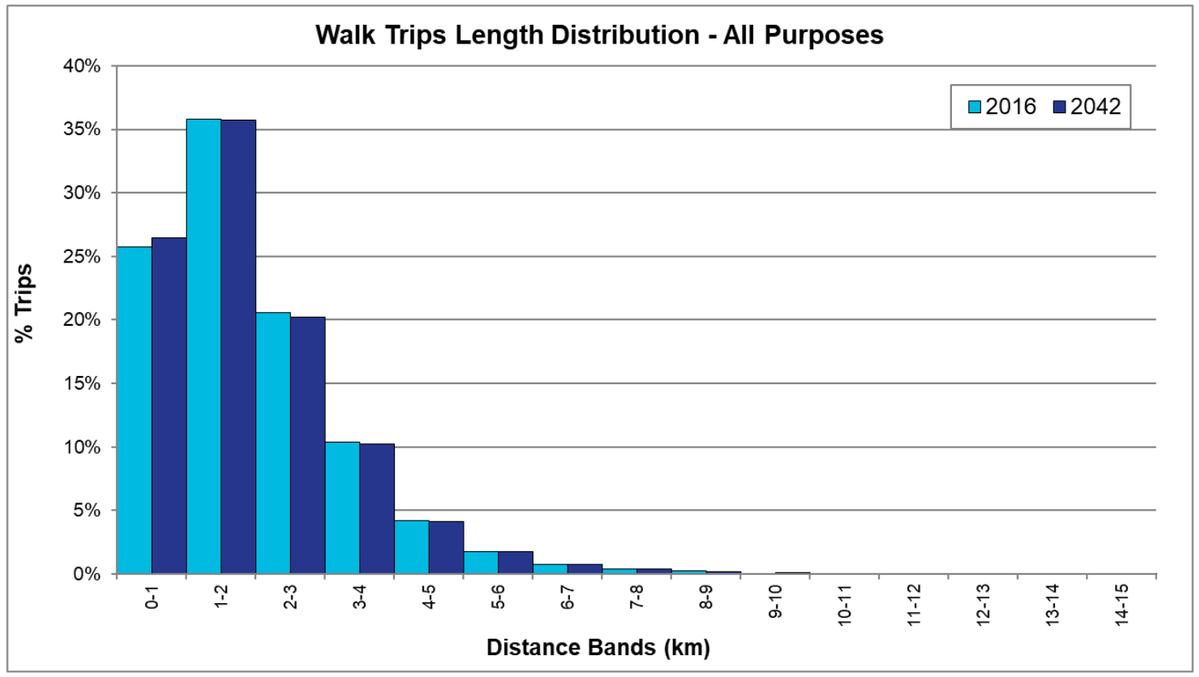

Figure 4-17: Capacity utilisation of orbital bus routes (AM peak)

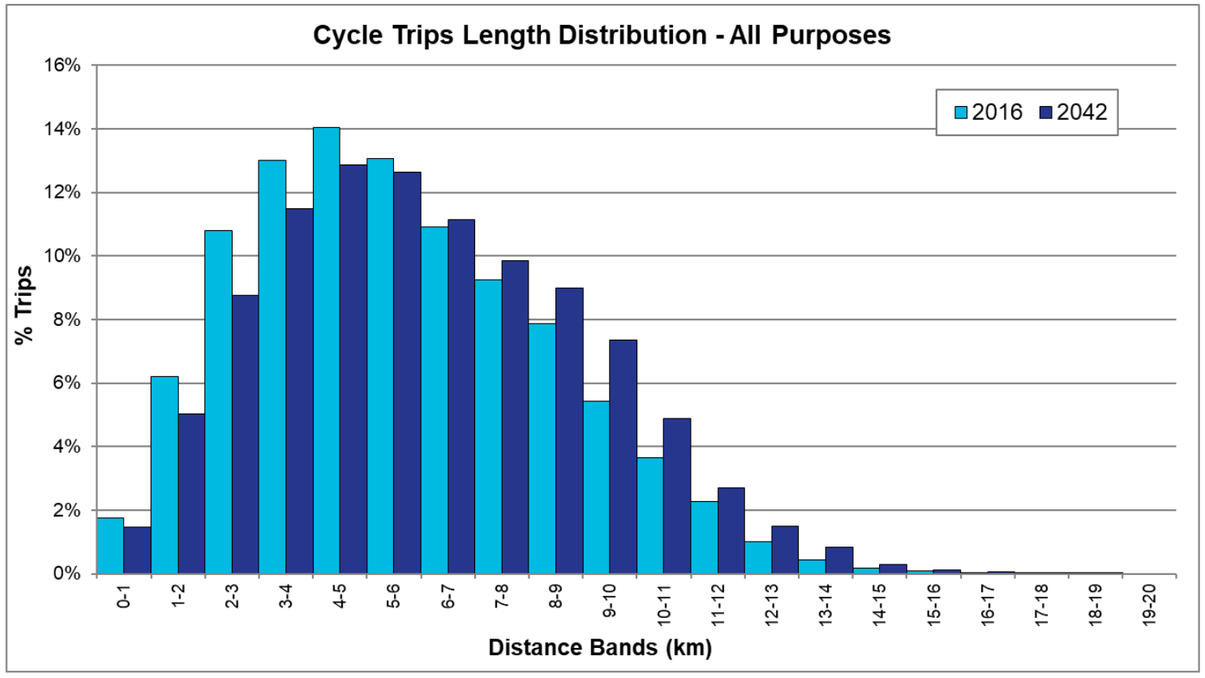
### 4.3.5 Trip lengths

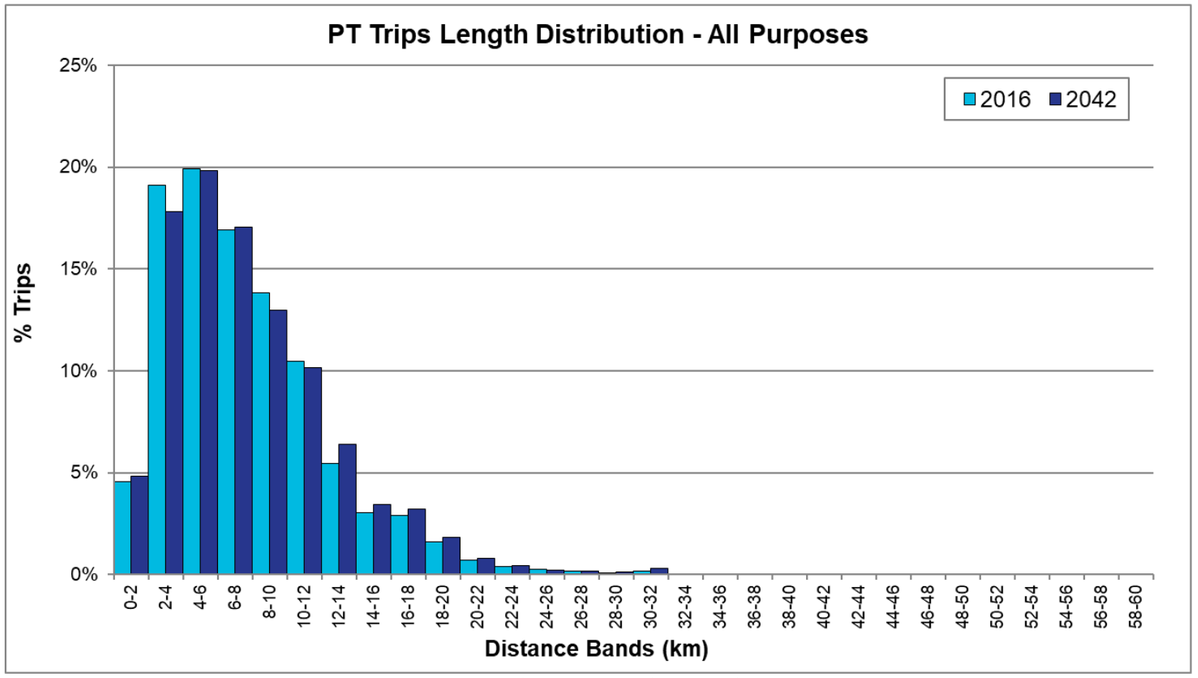
Data on the distribution of trip lengths for the Dublin South West study area has been extracted from the model for the 2016 and 2042 forecast year. It is split by mode and is presented in Figure 4-18.

Overall, the data shows:

- Car – increase in short distance car trips between 2016 and 2042. Over 50% less than 6km;
- Walking – most walking trips are short with over 70% less than 3km with little change in trends in the forecast year;
- Public transport and cycling – an increase in longer trips made, particularly in cycling shifting from shorter distance trips; and
- A large proportion of car trips from the study area are under eight kilometres in length, this provides opportunity for a large shift to public transport or active modes if improved facilities are made available.



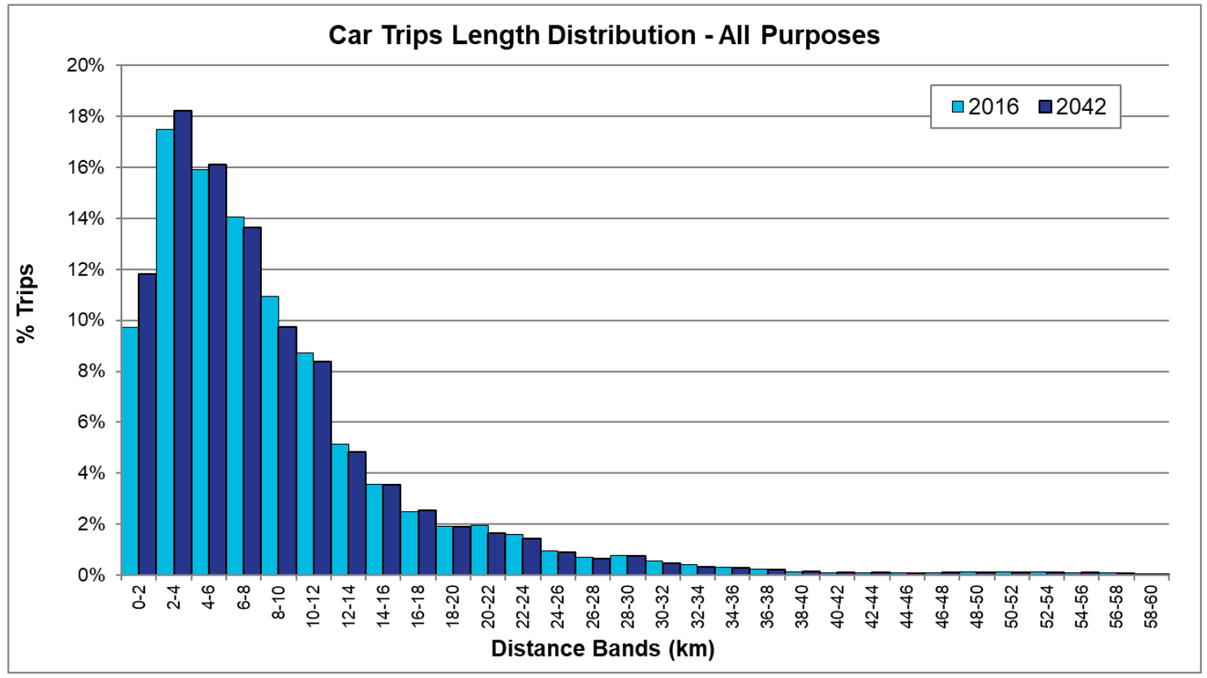




Figure 4-18: Dublin South West trip length distribution for all modes (AM peak)

### 4.3.6 Journey time by mode

Journey time data, disaggregated by zones, has also been extracted from the model for car, public transport, cycling and walking. For the Dublin South West study area, the data indicates that public transport trips experience significantly higher journey times in comparison to car and cycle trips. This is especially the case for orbital movements, where there is poor provision of direct public transport services and bus priority measures. In these cases, the model assumes these public transport trips travel radially into and out of the City Centre, severely increasing their journey time. This presents an opportunity to decrease public transport journey times by providing for bus priority and orbital movements.

### 4.3.7 Bus speeds

Figure 4-19 presents the model output 2042 bus speeds for the AM peak. The figure shows a number of key areas in the network that experience low speeds. This increases bus journey times and inhibits modal shift to bus from car. The key areas experiencing low speeds are:

- The R113 Killinniny Road between its junctions with Parklands Road and Ballycullen Road;
- The R113 at the M50's junction 12;
- Whitestown Way's northbound approach to the N81;
- The R817 Old Bridge Road and Cypress Grove Road between its junction R114 Firhouse Road and the R112 Templeville Road;
- Along the entirety of Fortfield Park and Fortfield Road from its junction with R112 until its junction with the R817;
- Approaches to Terenure and Rathfarnham villages; and
- The R137 Harold's Cross Road at its junction with Rathgar Avenue.


Figure 4-19: Dublin South West bus speeds (AM peak)

## 4.4 Mode shift analysis

The previous section has considered the estimated travel demand and network performance in 2042. As well as the public transport network needing to accommodate public transport demand in 2042, there is also a need to cater for a mode shift from private car to sustainable modes such as walking, cycling and public transport. This section considers different levels of mode shift for key movement corridors through the study area.

### 4.4.1 Methodology

A process has been developed to simulate how a change in mode shift could increase the demand for public transport trips. The potential number of public transport trips from the shift can then be used to indicate the level of public transport improvements which would be needed to accommodate a mode shift. The methodology is summarised in Appendix C.

This process has been undertaken for three key movement corridors which pass through the Dublin South West study area. The corridors were identified by identifying key origins and destinations using the data discussed in Section 4.3.2, alongside analysis of the network capacity utilisation, as presented in Section 4.3.4. The three key movement corridors are shown in Figure 4-20 and listed below:

- Radial corridor from Tallaght and Citywest to Dublin City Centre;
- Orbital corridor from UCD to Naas Road; and
- Orbital corridor from UCD and Sandyford to Tallaght.

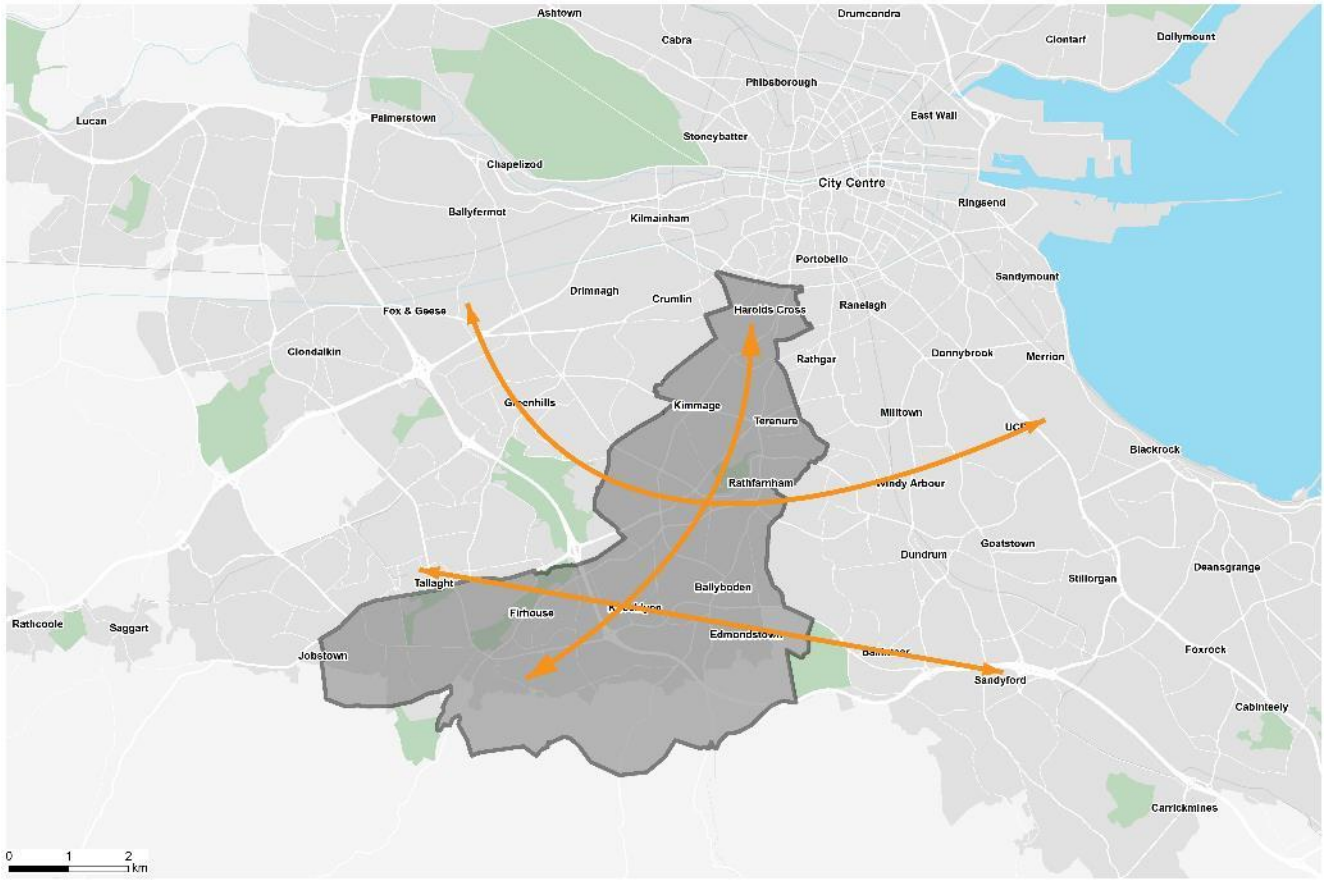



Figure 4-20: Key movement corridors in Dublin South West

For each corridor, model zones have been grouped into sectors and districts. The district boundaries form the screenlines for further analysis. Therefore, sectors are grouped into districts in accordance with where the screenlines are required. The screenlines were selected to analyse key movements in to and out of the study area

alongside key movements within the study area, such as crossing the M50. The 2042 model demand outputs provide a baseline number of trips between each pair of sectors for car, public transport, cycle and walk. For a specified percentage car mode shift, the process estimates how many of the car trips become walk, cycle or public transport trips.

The distance between each pair of sectors has been estimated by calculating the crow flies distance between the centroids of each sector. This allows the mode shift to be based on distance, as shorter trips are more likely to become walking trips and longer trips are more likely to become public transport trips. The distances have been divided into three bands based on the trip length distribution information in Section 4.3.5. Each sector to sector movement is then allocated one distance band.

### 4.4.2 Results

The information in this section outlines high-level, indicative results to inform option development, by providing order of magnitude changes in demand resulting from an assumed mode shift. Further analysis of mode shift and associated changes in demand for public transport has been undertaken in the strategic analysis for the GDA as a whole as part of the wider strategy development process.

**Radial corridor**

To identify demand for public transport on the radial corridor, its model zones have been grouped into sectors and districts as shown in Figure 4-21.

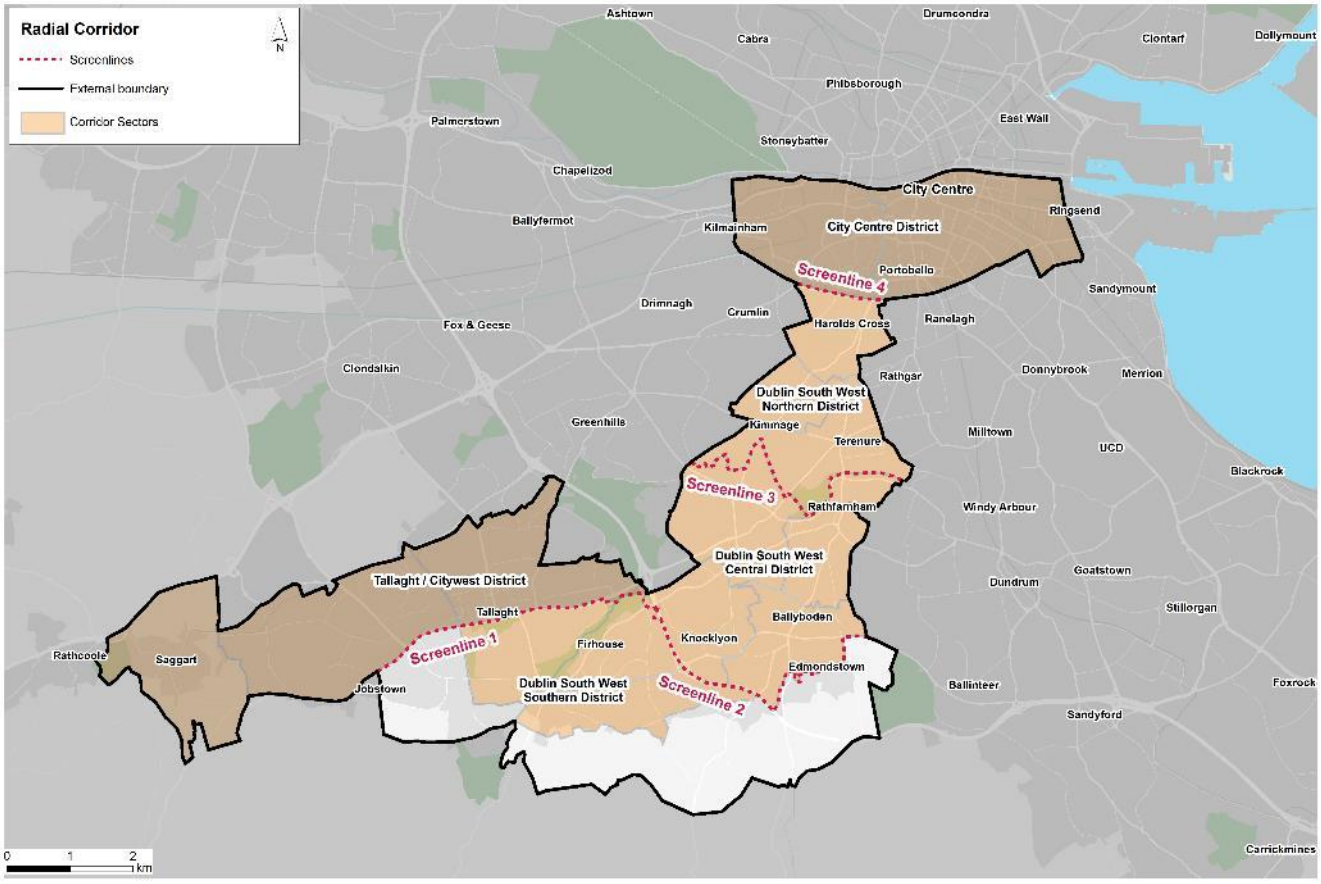



Figure 4-21: Radial demand corridor

In line with the methodology outlined above, distance bands for trips between these sectors were then calculated to identify which proportion of shifted car trips shift to public transport. The results are outlined in Table 4-3.

Table 4-3: Mode splits by distance band for the radial corridor[3]

| Distance band (km) | Walk | Cycle | Public transport |
|---|---|---|---|
| 0-2.6 | 73% | 6% | 22% |
| 2.6-8.2 | 21% | 18% | 61% |
| 8.2+ | 0% | 10% | 90% |

Thereafter, the number of public transport trips for different levels of mode shift have been calculated for all the districts in the corridor and summarised in Table 4-4.

Table 4-4: Car mode shift for the radial corridor (AM peak)[4]

| Car mode shift | Existing car demand | Existing public transport demand | Shifted public transport demand | Total public transport demand after mode shift |
|---|---|---|---|---|
| 0% | 10,220 | 8,718 | 0 | 8,718 |
| 25% | 10,220 | 8,718 | 971 | 9,689 |
| 50% | 10,220 | 8,718 | 1,942 | 10,660 |

To consider public transport capacity on existing services, movements across screenlines have been analysed in more detail. A screenline is an imaginary line which enables movements which cross the line to be captured. The four screenlines shown in Figure 4-21, have been chosen to capture key movements along the corridor.

Movements between districts that cross each of the screenlines have been extracted for the analysis for the whole area, with the results provided in Table 4-5.

Table 4-5: Car mode shift by screenline (AM peak)

| Screenline | Car mode shift | Existing public transport demand | | Shifted public transport demand | | Total public transport demand after mode shift | |
|---|---|---|---|---|---|---|---|
| | | NB | SB | NB | SB | NB | SB |
| Screenline 1 | 0% | 847 | 418 | 0 | 0 | 847 | 418 |
| | 25% | 847 | 418 | 92 | 137 | 939 | 555 |
| | 50% | 847 | 418 | 184 | 275 | 1,031 | 693 |
| Screenline 2 | 0% | 1,302 | 262 | 0 | 0 | 1,302 | 262 |
| | 25% | 1,302 | 262 | 166 | 175 | 1,468 | 437 |
| | 50% | 1,302 | 262 | 332 | 349 | 1,634 | 611 |
| Screenline 3 | 0% | 1,821 | 260 | 0 | 0 | 1,821 | 260 |
| | 25% | 1,821 | 260 | 141 | 156 | 1,962 | 416 |
| | 50% | 1,821 | 260 | 282 | 312 | 2,103 | 572 |
| Screenline 4 | 0% | 2,446 | 323 | 0 | 0 | 2,446 | 323 |
| | 25% | 2,446 | 323 | 154 | 127 | 2,600 | 450 |
| | 50% | 2,446 | 323 | 309 | 254 | 2,755 | 577 |

[3] Data source: Number of trips by mode within selected sectors
[4] Data source: Number of trips by car and public transport within selected sectors (total)

To achieve a car mode shift of 50%, provision for approximately 2,700 trips would be required to cater for northbound demand across Screenline 4, which is the highest level of demand across all of the screenlines.

**Orbital corridor**

After undertaking the mode shift analysis for the two orbital corridors the total corridor demand for each was found to be relatively low. The demand was of a level that at most only a bus spine would be appropriate, as per the public transport capacities presented later in Table 5-3. Therefore, screenline analysis was not undertaken as this would only reduce the demand further.

The low demand is likely to be result of the methodology only considering sectors within or in close proximity to the Dublin South West study area. As a result, it only captures relatively short distance trips. Further analysis over a greater area, such as along the M50 corridor, is likely to capture longer distance orbital trips, resulting in a high overall demand figure. Further commentary is provided on this in Section 5.2.1 .

## 4.5 Summary

### 4.5.1 Issues

Some growth is expected in the Dublin South West study area up to 2040 and beyond, this includes significant growth in employment through the area.

Currently within the study area there is a high car mode share. This is likely due a lack of public transport provision in some areas, whilst in others the service may provide uncompetitive journey times. There is also a low cycle mode share throughout the area, which is likely due to lack of high quality cycle infrastructure.

Analysis also shows that several public transport services are approaching or over capacity in the AM Peak, including routes into Dublin City Centre and orbitally around the outskirts, this may further help encourage people to make journeys by car instead of public transport.

### 4.5.2 Constraints

With regards to public transport there is no existing or proposed light or heavy rail within the Dublin South West study area. For bus travel, there are constraints on the capacity of the existing services as well as an identified lack of orbital services connecting the centre of the study area connecting UCD and Dundrum to Ballymount and Clondalkin and connecting Sandyford through Tallaght and beyond to Citywest or Clondalkin.

In terms of car travel, the M50 dissects the south of the study area. This experiences heavy congestion and also has limited crossing points. Several junctions along the major routes into Dublin City Centre are also at or near capacity.

For walking and cycling there is limited opportunity to safely cross key infrastructure routes within the area, particularly large barriers such as the M50. A lack of high quality cycle infrastructure, particularly between local centres, reduces the attractiveness of cycling as a potential transport mode.

### 4.5.3 Opportunities

The opportunities for the Dublin South West study area lie in providing access to increased frequency and higher capacity public transport to encourage people to use these modes. There are currently no rail services into the area, so either expanding these into the area or linking the area to such services via bus or active modes may also be an opportunity to increase the use of sustainable modes.

A clear radial corridor of demand from Tallaght through Dublin South West to the City Centre has emerged from the analysis. Some radial bus services are forecast to operate over design capacity within the corridor. This, alongside the road network experiencing moderate to high rates of congestion presents an opportunity to

improve journey times by encouraging a modal shift through the provision of a high-quality public transport corridor.

The M50 is currently the primary way of making orbital trips in the area particularly towards the south of the study area, but it is heavily congested. A number of orbital bus routes are also forecast to operate over their design capacity in 2042. Therefore, an opportunity exists to improve the provision of orbital public transport services to encourage modal shift whilst also reducing congestion on the M50.

Improving cycle infrastructure and facilities will help to increase cycle mode share and therefore help to decrease the number of short trips made via car. Whilst providing interchange facilities at key transport hubs will facilitate modal shift away from car to active modes and public transport for longer length trips.

# 5. Options Development

## 5.1 Strategy objectives

To guide the identification of options for the Dublin South West study area, the NTA have outlined a set of overarching themes, outcomes and objectives for the GDA Transport Strategy; these are outlined in Table 5-1.

Table 5-1: GDA Transport Strategy theme, outcomes and objectives

| Strategy theme | Strategy outcome | Strategy objective |
|---|---|---|
| **Environment** | An enhanced natural and built environment | To meet our environmental obligations by transitioning to a clean, low emission transport system through reducing car dependency and increasing walking, cycling and public transport use. |
| **Community** | Connected communities and better quality of life | To improve health and quality of life of our society by improving connectivity between people and places, delivering safe and integrated transport options, and increasing opportunities for walking and cycling. |
| **Economy** | A strong sustainable economy | Supporting economic activity and growth by improving the opportunity for people to travel for work or business where and when they need to and facilitating the efficient movement of goods. |
| **Accessibility** | An inclusive transport system | To deliver a high quality, equitable and accessible transport system, which caters for the needs of all members of society. |

## 5.2 Options development

To identify options to serve travel demand in the study area in 2042, the following steps have been completed:

- A review of relevant planning and transport policies and strategies has provided the overall context for options, and identified current thinking in relation to the future transport network;
- A baseline analysis of the existing transport network identified existing network issues and opportunities;
- An analysis of planning and travel data from the 2040 Planning Sheet and a Do-Minimum run of the Eastern Regional Model for 2042 provided insights into future travel demand and network capacity constraints; and
- A review of the GDA strategy objectives against which all options should be measured.

The above steps resulted in the preparation of an options long list for each of the key transport patterns as detailed in Table 5-2. The options long list is set out in detail below.

Table 5-2: Options long list

| Type of option | Description |
|---|---|
| PT corridor | Radial public transport option connecting Tallaght to Dublin City Centre |
| PT corridor | Orbital public transport option connecting UCD to Naas Road |
| PT corridor | Orbital public transport option connecting UCD to Sandyford and Tallaght |
| BusConnects bus service | Service A1 – Decrease AM headway |
| BusConnects bus service | Service S6 – Decrease AM / PM headway |
| BusConnects bus service | Service S8 – Decrease AM headway |
| BusConnects bus service | Service P43 – Decrease AM / PM headway |
| Bus infrastructure | Provide eastbound bus lane on the R113 Killinniny Road |

| Type of option | Description |
|---|---|
| Bus infrastructure | Provide northbound bus lane on Whitestown Way towards Tallaght |
| Bus infrastructure | Provide bus, cycle and traffic lanes on the R817 Old Bridge Road and Cypress Grove Road |
| Bus infrastructure | Introduce parking restrictions along Fortfield Park and Fortfield Road |
| Bus infrastructure | Convert Rathgar Avenue to one way southbound |
| Cycle infrastructure | Cycle measures along R818 Terenure Road between Templelogue Road to junction of Fortfield Road / Kimmage Road Lower |
| Cycle infrastructure | Cycle measures along Kenilworth Park, Clareville Road and Larkfield Park |

It should be noted that inherent within these options, in particular those that require intervention in the streetscape, is the intention to address the weaknesses of the pedestrian environment in the study area through improvements to junctions including additional crossing points, increased pedestrian crossing times, and where identified, the implementation of additional pedestrian links to connect residential areas with public transport services and local centres.

### 5.2.1 Public transport corridors

**Radial corridor**

The radial corridor demand calculated in Section 4.4 is used to inform the identification of appropriate options to serve this corridor. Five main options were considered as part of this study in order to meet anticipated demand to / from the study area. Each of the five main options considered has a theoretical capacity which is used as the basis by which to short-list options to progress through to the assessment stage. The capacity range for each mode is presented in Table 5-3 and based on UITP's 'Making the right mobility choices.' It should be noted that the capacity range for these modes have significant overlaps and are approximate.

Table 5-3:Public transport mode capacity range

| Mode | | Min | Max |
|---|---|---|---|
| 1 | Bus Spine | 0 | 2,400 |
| 2 | Bus with priority infrastructure | 2,400 | 4,000 |
| 3 | Light rail | 3,600 | 7,000 |
| 4 | Heavy Rail | 5,000 | 50,000 |
| 5 | Metro | 7,500 | 25,000 |

In order to undertake the initial sift of options to progress through to the assessment, the corridor demand has been compared against the mode capacity range outlined in Table 5-3. The corridor demand figure used has been obtained from Table 4-5. For each direction the demand has been obtained from the screenline that has the highest level of demand when a 50% car mode shift has been applied. For northbound movements this was screenline 4 with 2,700 trips and for southbound movement this was screenline 1 with 700 trips. Table 5-4 presents the public transport options long list for each of the corridors alongside the initial assessment results for each option. Where bus options are considered, two radial spines are proposed to ensure suitable capacity but also accessibility.

Table 5-4: Public transport options long list

| AM Demand | | Option | | Min Capacity | Max Capacity | Initial Assessment | Reason |
|---|---|---|---|---|---|---|---|
| NB | SB | | | | | | |
| 2,700 | 700 | 1 | Bus spines (x2) | 2,400 | 4,800 | Progress | Sufficient capacity |
| | | 2 | Bus spine with | 2,400 | 4,800 | Progress | Sufficient capacity |

| AM Demand | | Option | | Min Capacity | Max Capacity | Initial Assessment | Reason |
|---|---|---|---|---|---|---|---|
| NB | SB | | | | | | |
| | | | priority | | | | |
| | | 3 | Light Rail spine | 3,600 | 7,000 | Progress | Sufficient capacity |
| | | 4 | Heavy Rail spine | 5,000 | 50,000 | Discount | Insufficient demand |
| | | 5 | Metro spine | 7,500 | 25,000 | Discount | Insufficient demand |

As a result of the initial assessment presented in Table 5-4, the options being taken forward to the Multi Criteria Analysis (MCA) stage for the radial corridor are as follows:

- Bus spines (x2);
- Bus spine with Priority; and
- Light Rail.

It is noted that light rail has been taken forward for further assessment despite having a minimum capacity, at 3,600, that exceeds the corridor demand of 2,700. This is because the assumptions underlying both the modelling and mode shift calculation create an element of uncertainty around the corridor demand figure. In light of this uncertainty, it was deemed appropriate to take light rail forward as the demand figure and minimum capacity are proximate, being within 1,000 trips of each other.

**Orbital demand corridors**

When undertaking the initial assessment of the study area's trip distribution and capacity utilisation, a number of orbital corridors were identified as potentially requiring an intervention. The orbital corridors are:

- Orbital corridor from UCD to Naas Road; and
- Orbital corridor from UCD and Sandyford to Tallaght.

Following the initial analysis noted in Section 4.4, demand for public transport trips on the orbital corridors was found to be low. This is likely due to the fact that the methodology adopted in this study has only considered sectors within or in close proximity to the Dublin South West study area; therefore, it only captures relatively short distance trips. Further analysis to assess demand for these orbital movements across a larger area is likely to be required in order to identify the type of public transport intervention which is most likely to be required to serve wider orbital demand. Considering the demand for these corridors was considerably below the maximum capacity for a bus spine, as presented in Table 5-3, it was not deemed appropriate to identify the most appropriate mode options to serve these corridors.

However, given the available information does suggest some demand for orbital movements exists, public transport corridor options are retained and suggested to be taken forward for further consideration.

### 5.2.2 Supplementary options

Alongside the public transport corridor options that have been taken through the MCA process, a number of other supplementary options have been identified. These consist of smaller scale cycle and bus interventions.

**Upgrades to Proposed BusConnects bus services**

As discussed in Section 4.3.4, the model outputs have been used to analyse the public transport capacity utilisation. A number of routes were identified where the volume exceeded the design capacity, at 85% of crush capacity. For these routes' options have been identified to increase the capacity to accommodate the demand, these options are presented in Table 5-5.

Table 5-5: Options to upgrade BusConnects bus services

| Service | Problem | Option identified |
|---|---|---|
| A1 | Northbound service forecast to operate over design capacity in the AM peak. | Increase AM frequency from 12 to 10 minutes. |
| S6 | Eastbound service forecast to operate over design capacity in the AM peak. | Increase AM eastbound frequency from 15 to 10 minutes. |
| | Westbound service forecast to operate over design capacity in the PM peak. | Increase PM westbound frequency from 15 to 10 minutes. |
| S8 | Eastbound service forecast to operate over design capacity in the AM peak. | Increase AM frequency from 15 to 12 minutes. |
| P43 | Northbound service forecast to operate over design capacity in the AM peak. | Increase AM northbound frequency from 60 to 30 minutes. |
| | Southbound service forecast to operate over design capacity in the PM peak. | Increase PM southbound frequency from 60 to 30 minutes. |

It is acknowledged that the above options have been identified based on outputs from the do minimum model run, which doesn't contain any of the bus priority infrastructure proposed by BusConnects. Therefore, further testing is required to determine the necessity and performance of these options in the context of the BusConnects infrastructure. It is recommended that these options be taken forward for further consideration as part of the GDA strategy work but are not considered as part of the MCA within this report.

**Bus priority measures**

A number of bus infrastructure options have been developed by firstly using the bus speeds presented in Section 4.3.7 to identify areas in the network where speeds are particularly low. Then a desk based assessment of the road network in these areas was undertaken to identify potential options.

Following the analysis of forecast bus speeds presented in section 4.3.7, a number of bus infrastructure measures have been identified in order to increase the speeds in certain areas of the network where the speeds are particularly low. These are as follows:

- Provide eastbound bus lane along the R113 Killinniny Road from its junction with Parklands Road, through its junction with Ballycullen Road and across the M50 junction 12 flyover;
- Provide northbound bus lane along Whitestown Way's northbound approach to the N81;
- Provide dedicated bus, cycle and traffic lanes in both directions along the R817 Old Bridge Road and Cypress Grove Road between its junction R114 Firhouse Road and the R112 Templeville Road;
- Introduction of parking restrictions along the entirety of Fortfield Park and Fortfield Road from its junction with Fortfield Park until its junction with the R817. This is intended to reduce the impact of parked cars on bus movements; and
- Conversion of Rathgar Avenue to one way in a southbound direction to provide additional public transport capacity at its junction with the R137 Harold's Cross Road.

It is acknowledged that the above options have been identified based on outputs from the do minimum model run, which doesn't contain any of the bus priority infrastructure proposed by BusConnects. Therefore, further testing is required to determine the necessity and performance of these options in the context of the BusConnects infrastructure. It is recommended that these options be taken forward for further consideration as part of the GDA strategy work but are not considered as part of the MCA within this report.

**Cycle interventions**

Based on the cycle network gap analysis undertaken in Section 4.2.5 a number of cycle infrastructure interventions have been identified to further encourage modal shift away from the car. These links have existing

proposal as part of the GDA Cycle Network Plan, but the following interventions are concerned with providing a higher quality of service than is currently intended.

The first intervention is on the R818 Terenure Road West between its junctions with the R137 Templeogue Road and the R817 Fortfield Road. It is currently proposed to create secondary cycle route along this link. It is recommended that this be upgraded to a primary route in order to provide a higher quality of service.

The second intervention is along Kenilworth Park, Clareville Road and Larkfield Park, between the R137 Harold's Cross Road and the R817 Kimmage Road Lower. These links also have proposals to create a secondary cycle route. It is recommended that this be upgraded to a primary route in order to provide a higher quality of service

It is recommended that these options be taken forward for further consideration as part of the GDA strategy work but are not considered as part of the MCA within this report.

# 6. Options Assessment

## 6.1 Methodology

The approach to the assessment of options is guided by the 'Guidelines on a Common Appraisal Framework (CAF) for Transport Project and Programmes October 2020' (Department of Transport). This requires all schemes to be appraised under the general themes of:

- Economy;
- Environment;
- Safety;
- Integration; and
- Accessibility / Social Inclusion.

Given the early nature of this study, a largely qualitative Multi Criteria Analysis (MCA) was considered to be an appropriate tool to guide the assessment of options. The MCA undertaken is a high-level assessment based on professional judgement.

Building on the key themes of the CAF, a set of criteria which sit within these overarching themes have been developed to enable a more detailed assessment of options to be undertaken. These criteria have been based on the GDA Transport Strategy objectives provided by the NTA (and presented in Section 5.1), as outlined in Table 6-1.

Table 6-1: Assessment criteria

| Theme | Criteria | Description |
|---|---|---|
| **Environment** | Decarbonisation | Supporting the decarbonisation of transport by encouraging mode shift away from private car. |
| | Environmental Impact | Provides positive impact on the local built and natural environment e.g. landscape, air quality etc. |
| **Economy** | Sustainable growth | Support sustainable development and facilitate growth to 2040 by providing capacity aligned with demand. |
| | Journey Times | Improves time it takes to undertake similar end to end journey. |
| | Value for Money | Potentially provides good value for money. |
| | Resilience | Provide resilience for the future (beyond 2040). |
| **Integration** | Integration | Provides integration with the existing and future proposed transport network. |
| **Accessibility and Inclusion** | Accessibility and Inclusion | Improves accessibility to public transport services and enhances inclusion, catering for the needs of all members of society. |
| **Safety** | Road Safety | Improves road safety. |
| **Health** | Physical Activity | Increases physical activity. |

The options identified have been assessed relative to each other against the aforementioned criteria using the rating scale outlined in Table 6-2.

Table 6-2: Rating scale

| Colour | Definition |
|---|---|
| | The option has significant advantages over other options |
| | The option has some advantages over other options |
| | The option is comparable to others |
| | The option has some disadvantages over other options |
| | The option has significant disadvantages over other options |

## 6.2 Results

### 6.2.1 Environment

Table 6-3: MCA results for environment

| Criteria | Description | Option 1 Conventional Bus Spine | | Option 2 Bus spine with priority | Option 3 Light Rail Spine |
|---|---|---|---|---|---|
| | | Option A 1 x Spine | Option B 2 x Spine | | |
| Decarbonisation | Supporting the decarbonisation of transport by encouraging mode shift away from private car. | | | | |
| Environmental Impact | Provides positive impact on the local built and natural environment e.g. landscape, air quality etc. | | | | |

Option 1 would provide optimal integration with existing infrastructure within the study area, with minimal environmental disruption to the surrounding network. Option 1 would operate on existing highway infrastructure and scores well on deliverability. Option 1 has less priority when compared to options 2 and 3, and thus it is expected that Option 1 will not generate the same levels of modal shift.

Option 2 would provide optimal integration with existing infrastructure within the study area, with low to medium environmental disruption to the surrounding network. Option 2 would operate on existing highway infrastructure and scores well on deliverability. The level of priority, improved journey times and improved service reliability would encourage greater levels of modal shift away from the private car.

Option 3 would provide a low to medium level integration with existing infrastructure within the study area, with low to medium environmental disruption to the surrounding network. However, Option 3 would strongly encourage modal shift away from the private car, due to its levels of priority and reliability, supporting wider decarbonisation.

### 6.2.2 Economy

Table 6-4: MCA results for economy

| Criteria | Description | Option 1 Conventional Bus Spine | | Option 2 Bus spine with priority | Option 3 Light Rail Spine |
|---|---|---|---|---|---|
| | | Option A 1 x Spine | Option B 2 x Spine | | |
| **Sustainable Growth** | Support sustainable development and facilitate growth to 2040 by providing capacity aligned with demand. | | | | |
| **Journey Times** | Improves time it takes to undertake similar end to end journey. | | | | |
| **Value for Money** | Potentially provides good value for money. | | | | |
| **Resilience** | Provide resilience for the future (beyond 2040). | | | | |

Conventional Bus Spines are a low-cost public transport option, that can be easily incorporated into the existing transport network within the study area. However, without supporting priority infrastructure, and due to the congested nature of the existing and future network, travel times would be adversely impacted. The congestion on the network will also impact reliability of service and limit the frequency of services on specific corridor.

A single, conventional bus spine does not meet the projected trips and associated growth to 2040, whereas two conventional bus spines will closely meet this projected demand. Option 1 will provide a more limited scope for continued growth and modal shift on the network when compared with other options.

Bus Spines with priority are a medium-cost public transport option, that may in some areas required land take to accommodate the functional operation. However, they can be incorporated into the existing transport network within the study area, with obvious opportunities to reallocate general traffic lanes. Priority infrastructure at junctions (such as bus gates and priority signals), as well as dedicated lanes will support improved travel times and allow a higher frequency of services to operate.

A Light Rail Spine would be a high cost public transport option, requiring significant new infrastructure to accommodate its operation. This may be incorporated into the existing network through reallocation of road space within the study area. This option would provide a lot of flexibility for future growth. However, Option 3 would also exceed existing and projected demand in the South West study area for 2042 and as such, may not provide similar value for money as other options. With full priority infrastructure, this option would provide optimal and consistent travel times, as well as allowing a higher frequency of services to operate.

### 6.2.3 Integration

Table 6-5: MCA results for integration

| Criteria | Description | Option 1 Conventional Bus Spine | | Option 2 Bus spine with priority | Option 3 Light Rail Spine |
|---|---|---|---|---|---|
| | | Option A 1 x Spine | Option B 2 x Spine | | |
| **Integration** | Provide integration with the existing and future proposed transport network. | | | | |

Option 1 would provide optimal integration with existing infrastructure within the study area, with minimal disruption to the surrounding network.

Option 2 would integrate well with existing infrastructure within the study area, but may require some infrastructure improvements, such as revised junction footprints and additional land take at constrained pinch points on the network. There may be low to medium disruption to the surrounding network.

Option 3 would provide low to medium integration with existing infrastructure within the study area – depending specifically on corridor selection. This option could be incorporated into or run entirely separate from the existing network.

### 6.2.4 Accessibility and Inclusion

Table 6-6: MCA results for accessibility and inclusion

| Criteria | Description | Option 1 Conventional Bus Spine | | Option 2 Bus spine with priority | Option 3 Light Rail Spine |
|---|---|---|---|---|---|
| | | Option A 1 x Spine | Option B 2 x Spine | | |
| **Accessibility and Inclusion** | Improves accessibility to public transport services and enhances inclusion, catering for the needs of all members of society. | | | | |

Option 1 would utilise existing walking and cycle links. Additional measures could easily be introduced, such as cycle parking to allow enhanced accessibility and integration between modes. Frequency of bus stops could be introduced with a degree of flexibility to accommodate pedestrian desire lines and key trip attractors. Option 1B would improve accessibility further as it involves the introduction of two bus spines.

Option 2 would utilise existing walking and cycle links. Additional measures could easily be introduced to reinforce the enhanced levels of cycle priority that would form part of the infrastructure proposals for Options 2, such as cycle parking to allow enhanced accessibility and integration between modes. Frequency of bus stops could be introduced with a degree of flexibility to accommodate pedestrian desire lines.

Option 3 would utilise existing walking and cycle links. Additional measures could easily be introduced to reinforce the enhanced levels of cycle priority that would form part of the infrastructure proposals for Option 3, such as cycle parking to allow enhanced accessibility and integration between modes. However, Option 3 does not have the flexibility for accessibility that both Option 1 and 2 would present due to the fixed nature of the service.

### 6.2.5 Safety

Table 6-7: MCA results for safety

| Criteria | Description | Option 1 Conventional Bus Spine | | Option 2 Bus spine with priority | Option 3 Light Rail Spine |
|---|---|---|---|---|---|
| | | Option A 1 x Spine | Option B 2 x Spine | | |
| **Road Safety** | Improves road safety. | | | | |

Whilst Option 1 would support seamless integration with existing infrastructure, it does not necessarily address national safety policies to improve road safety infrastructure. Option 1 would have to operate within a congested network and would not provide dedicated infrastructure to address safety hotspots.

Option 2 would more directly address national safety policies to improve road safety infrastructure. This would include replacement and new infrastructure at junctions, facilitating enhanced opportunities for pedestrians and cyclists to cross the road. Option 2 would also provide dedicated cycle infrastructure, protecting and regulating how cyclists interact with other modes of traffic.

While Option 3 would involve the introduction of dedicated light rail infrastructure, it is assumed that a light rail service would use the road network and share road space with other users, especially as it nears the city centre. In this sense, the introduction of a light rail would also require reconsideration regarding their associated footprint design, providing the opportunity to improve road safety across all modes.

### 6.2.6 Health

Aligning with scoring well on accessibility, Options 1, 2 and 3 score comparably on physical activity, as they would integrate well with other active travel measures, such as walking and cycling.

Table 6-8: MCA results for physical activity

| Criteria | Description | Option 1 Conventional Bus Spine | | Option 2 Bus spine with priority | Option 3 Light Rail Spine |
|---|---|---|---|---|---|
| | | Option A 1 x Spine | Option B 2 x Spine | | |
| **Physical Activity** | Increases physical activity. | | | | |

### 6.2.7 Summary

In summary, Option 2 performs the best overall in terms of environment as it is expected to encourage a good level of modal shift away from private car whilst causing low to medium level environmental disruption. Despite this, Option 3 performs best in terms of decarbonisation while Option 1 performs best in terms of environmental impact. Option 2 performs best in terms of economy as it potentially provides good value for money whilst supporting sustainable development and growth by providing capacity aligned with demand. It should also have a positive impact on journey times and provide some resilience in terms of capacity beyond 2040. Due to Option 1 involving the introduction of little to no new infrastructure, it performs best in terms of its integration with the surrounding transport network. Option 1B performs the best in terms of accessibility and inclusion. This is largely down to the Option involving the introduction of two bus spines, therefore providing access to a wider catchment area. Option 2 performs the best in terms of road safety as it involves the introduction of bus priority measures

that segregate buses from general motor traffic. In terms of physical activity all options score comparably as they would all integrate well with other active travel measures.

Therefore Option 1 performs the best against two of the criteria, integration and accessibility and inclusion whilst Option 2 performs the best against the remaining four criteria.

# 7. Summary

This report has outlined the approach and results from the study of the Dublin South West area, as defined by the NTA for the purposes of providing input into the preparation of the Transport Strategy. The study area is heavily reliant on the existing road network which is forecast to operate with a moderate level of congestion in 2042.

This, alongside the study area's proximity to key trip attractors such as Tallaght and Dublin City Centre, provide an opportunity to shift car trips to public transport and active modes through the provision of high-quality infrastructure and services. From the demand analysis, a key radial corridor of trips travelling between the study area, Tallaght and City Centre emerged.

## 7.1 Public Transport Options

Given the early nature of this study, a qualitative Multi Criteria Analysis (MCA) was considered to be an appropriate tool to guide the assessment of public transport options. Building on the key themes of the CAF, a set of criteria which sit within these overarching themes has been developed to enable a more detailed assessment of options to be undertaken. These criteria have been based on the GDA Transport Strategy objectives provided by the NTA.

### 7.1.1 Radial Corridor

Following the development of a long list of public transport options for the radial corridor, a high level sift was undertaken using forecast trips from the Eastern Regional Model against the context of the operational capacity of the options included on the long list. This sift identified three main options to be progressed to the MCA stage as follows:

- Bus Spines
- Bus Spines with Priority
- Light Rail Spine

These options are expected to provide for the forecast demand in 2042 whilst also providing resilience for potential demand beyond 2042. Whilst all three options are viable options to accommodate the radial trips within the study area, the options that performed best at the MCA are as follows:

- Option 1B:  Bus spine x2; and
- Option 2 Bus spine with priority.

### 7.1.2 Orbital Corridor

Whilst the radial corridor generates the main volume of trips to and from the city centre area, it is worth noting that the ERM also generated a low to moderate level of trip distribution on the north and south orbital corridors across the study area. These orbital corridors were identified are as follows:

- Orbital corridor from UCD to Naas Road; and
- Orbital corridor from UCD and Sandyford to Tallaght.

The volume of trip generation is likely due to the fact that the methodology adopted in this study has only considered sectors within or in close proximity to the Dublin South West study area; therefore, it only captures relatively short distance trips. Further analysis to assess demand for these orbital movements across a larger area is likely to be required in order to identify the type of public transport intervention which is most likely to be required to serve wider orbital demand. Considering the demand for these corridors was considerably below the maximum capacity for a bus spine, as presented in Table 5-3, it was deemed not necessary to develop options and progress these options to the MCA.

## 7.2 Supplementary Options

Alongside public transport provision for the radial and orbital demand corridors, it is recommended that consideration be given to further supplementary options. These options should complement existing and proposed public transport services as well as improve accessibility and interchange for cyclists.

### 7.2.1 Cycle Interventions

A gap analysis was undertaken on the existing proposed cycle infrastructure improvements, aimed at encouraging sustainable modal shift. These links have existing proposal as part of the GDA Cycle Network Plan. This study recommends providing a higher quality of service than is currently proposed as follows:

- R818 Terenure Road West – upgrade proposals from a secondary cycle route to a primary cycle route; and
- Kenilworth Park, Clareville Road and Larkfield Park – upgrade proposals from a secondary cycle route to a primary cycle route.

### 7.2.2 Upgrades to proposed BusConnects services

This study has identified a number of BusConnects bus routes where the forecast demand exceeds the design capacity. It is proposed that the service frequency is increased on each of these routes. These routes are as follows:

- Service A1: Northbound service forecast to operate over design capacity in the AM peak;
- Service S6: Eastbound and Westbound service forecast to operate over design capacity in the AM and PM peak respectively;
- Service S8: Eastbound service forecast to operate over design capacity in the AM peak; and
- Service P43: Northbound and Southbound service forecast to operate over design capacity in the AM and PM peak respectively.

### 7.2.3 Bus priority measures

In addition to the main radial corridor options outline above, this study has further identified a number of bus infrastructure measures in order to increase the speeds in certain areas of the network where the speeds are particularly low. These are as follows:

- Provide eastbound bus lane along the R113 Killinniny Road from its junction with Parklands Road, through its junction with Ballycullen Road and across the M50 junction 12 flyover;
- Provide northbound bus lane along Whitestown Way's northbound approach to the N81;
- Provide dedicated bus, cycle and traffic lanes in both directions along the R817 Old Bridge Road and Cypress Grove Road between its junction R114 Firhouse Road and the R112 Templeville Road;
- Introduction of parking restrictions along the entirety of Fortfield Park and Fortfield Road from its junction with Fortfield Park until its junction with the R817. This is intended to reduce the impact of parked cars on bus movements; and
- Conversion of Rathgar Avenue to one way in a southbound direction to provide additional public transport capacity at its junction with the R137 Harold's Cross Road.

It should be noted that the above recommendations for BusConnects service upgrades and bus priority measures were based on outputs from the do minimum ERM model run, which doesn't contain any of the bus priority infrastructure proposed by BusConnects. Therefore, further testing is required to determine the necessity and performance of these options in the context of the BusConnects infrastructure.

# Appendix A. Do Minimum Model Run Transport Scheme

## A.1 Road Schemes

The Do Minimum model run contains the following road schemes:

- N3 Castaheany Interchange Upgrade;
- N3-N4 Barnhill to Leixlip Interchange;
- North-South Road – west of Adamstown SDZ linking the N7 to N4 and on to Fingal;
- Glenamuck District Distributor Road;
- Leopardstown Link Road Phase 2;
- Porterstown Distributor Link Road;
- R126 Donabate Relief Road: R132 to Portrane Demesne;
- Oldtown-Mooretown Western Distributor Link Road;
- Swords relief Road at Lord Mayors;
- Poolbeg development roads;
- Cherrywood development roads;
- Widening of the M7 between Junction 9 (Naas Norther) and Junction 11 (M7/M9) to provide an additional lane in each direction; and
- Capacity enhancement and reconfiguration of the M11/N11 from Junction 4 (M50) to Junction 14 (Ashford) inclusive of ancillary and associated road schemes, to provide additional lanes and upgraded junctions, plus service roads and linkages to cater for local traffic movements.

## A.2 Bus schemes

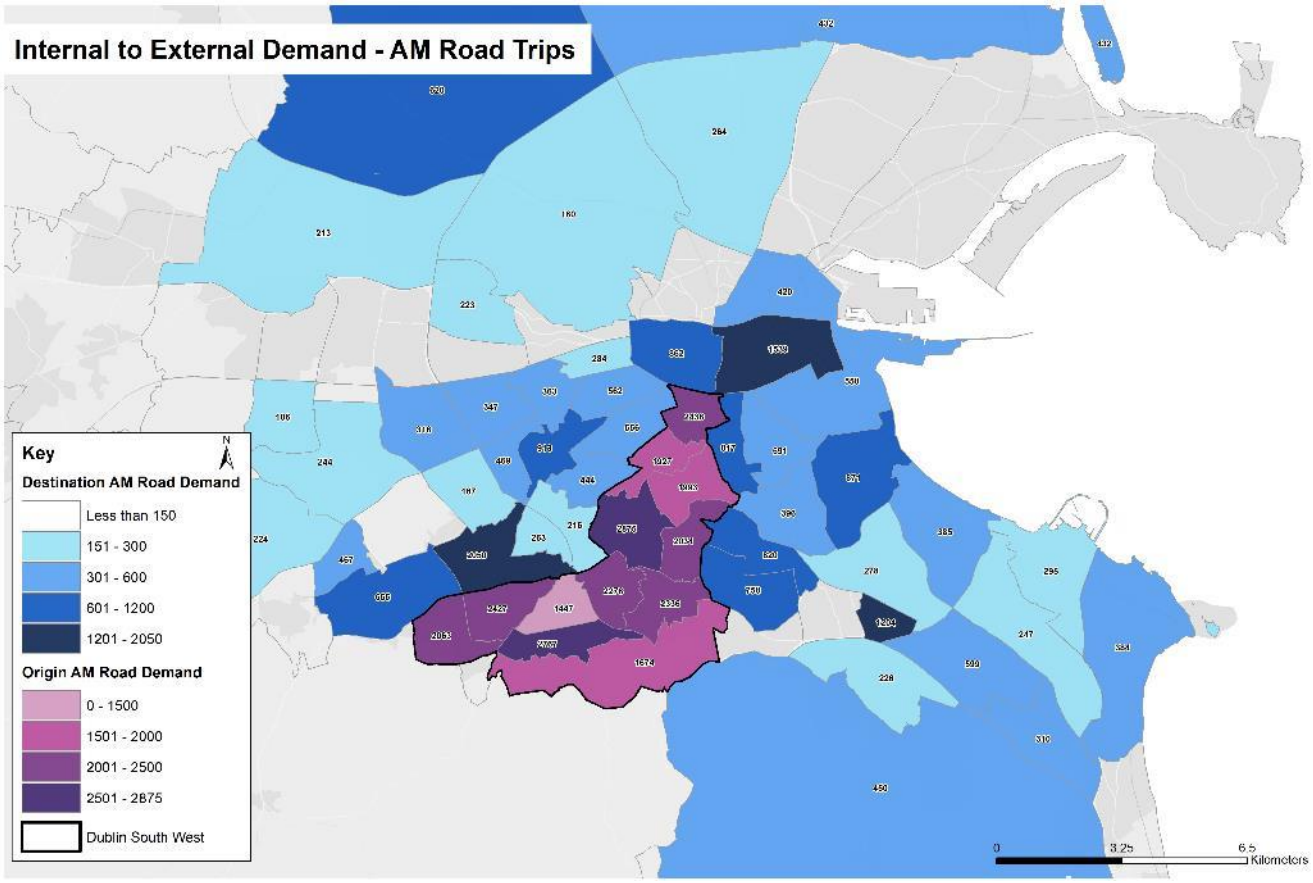
The Do Minimum model runs contains the bus services and frequencies related to the New Dublin Area Bus Network. The model does not include any of the of the associated BusConnects bus priority infrastructure proposals which would improve journey times.

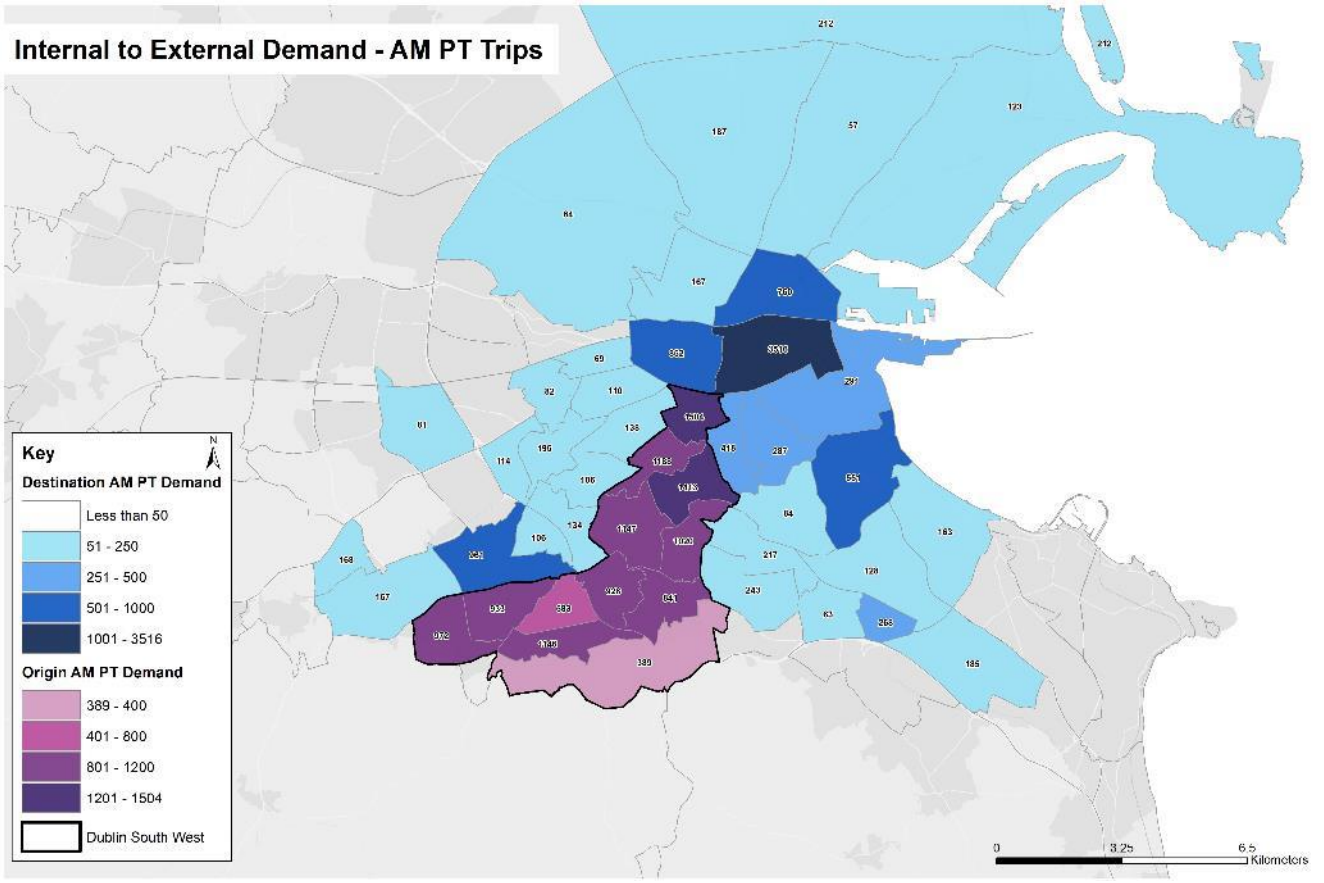
## A.3 Rail schemes

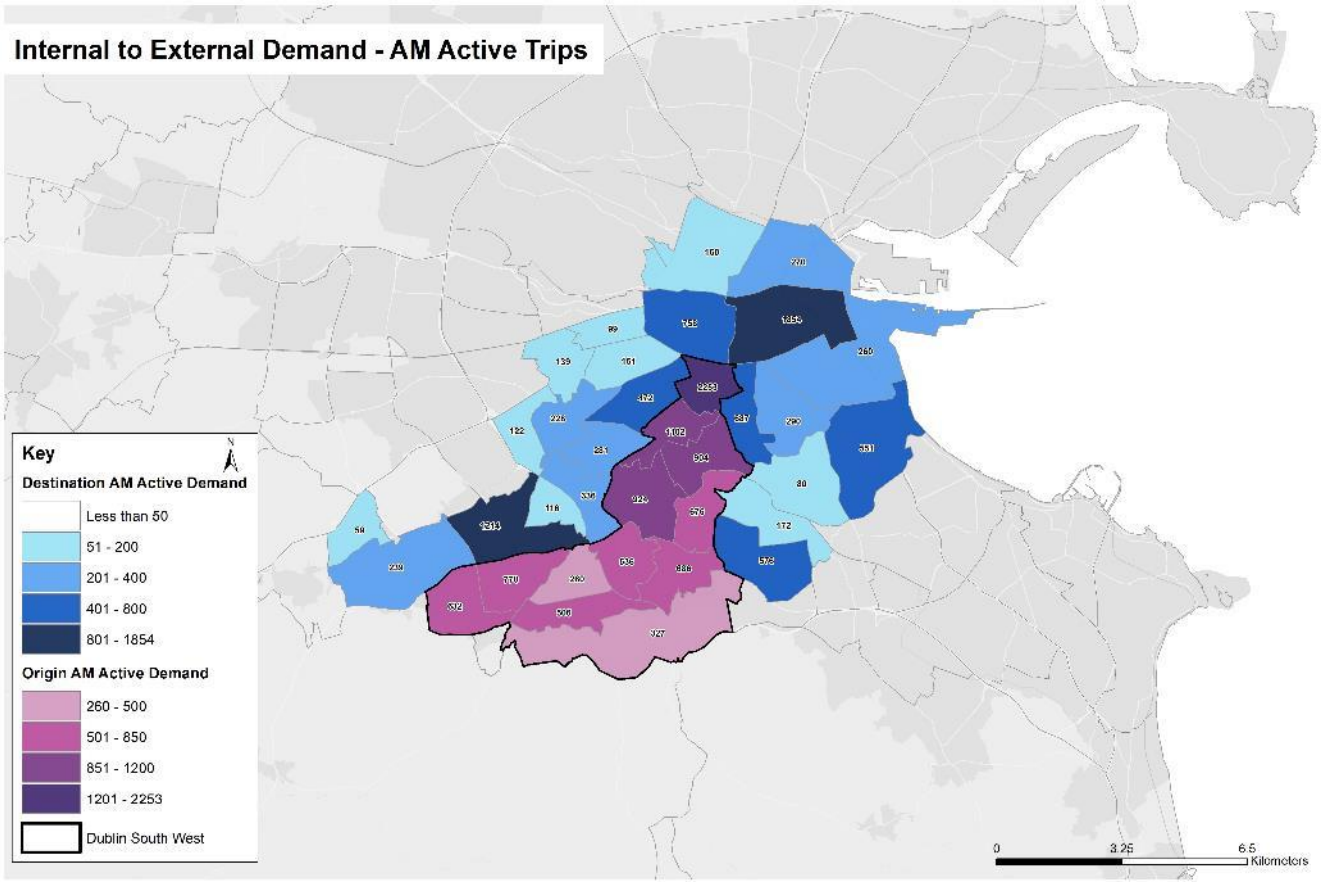
The Do Minimum model runs contains the following rail schemes:

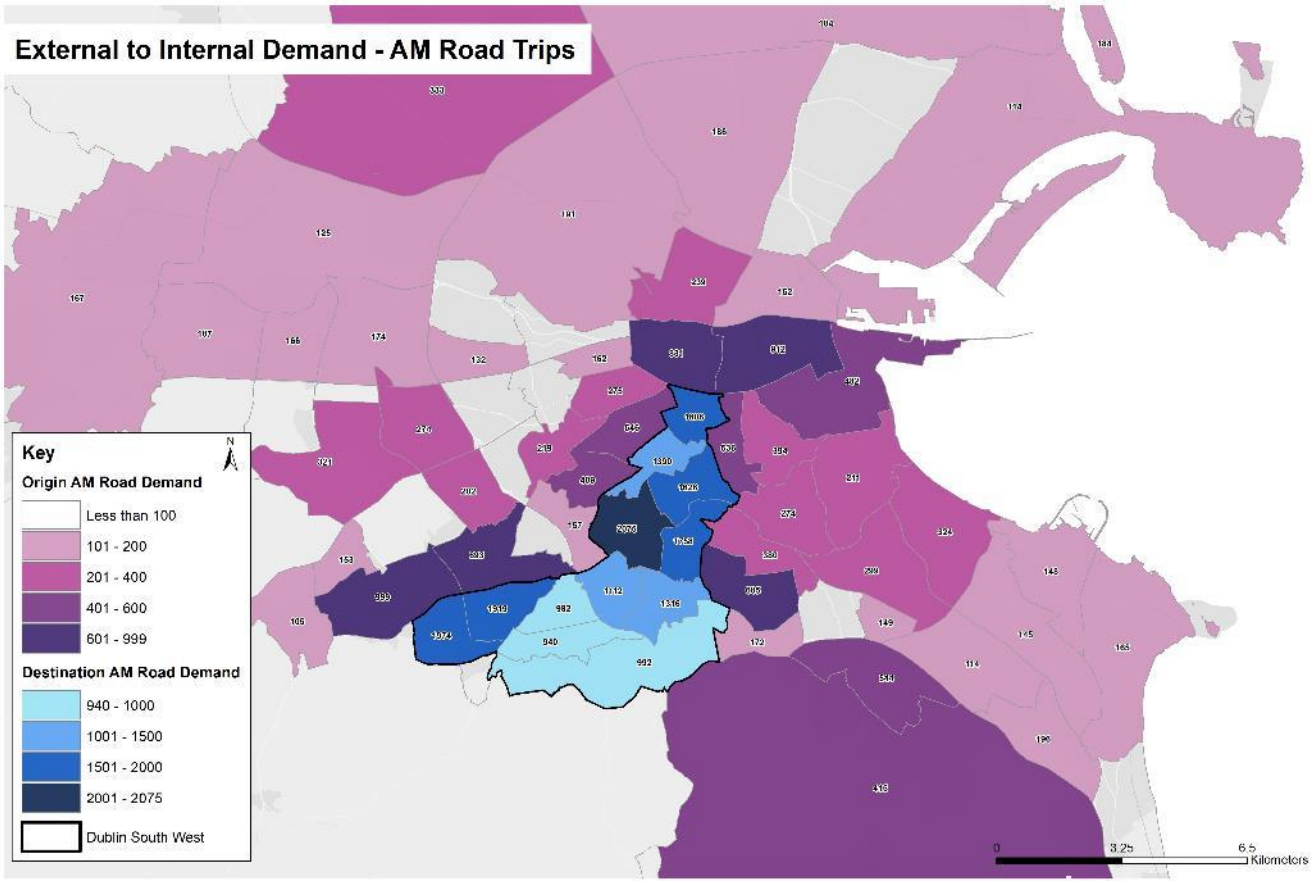
- Revised Irish Rail timetable;
- Interim DART Expansion Programme (non-tunnel elements) including additional stations at Kishogue and Pelletstown; and
- Luas Cross City incorporating LUAS Green Line Capacity Enhancement - Phase 1.

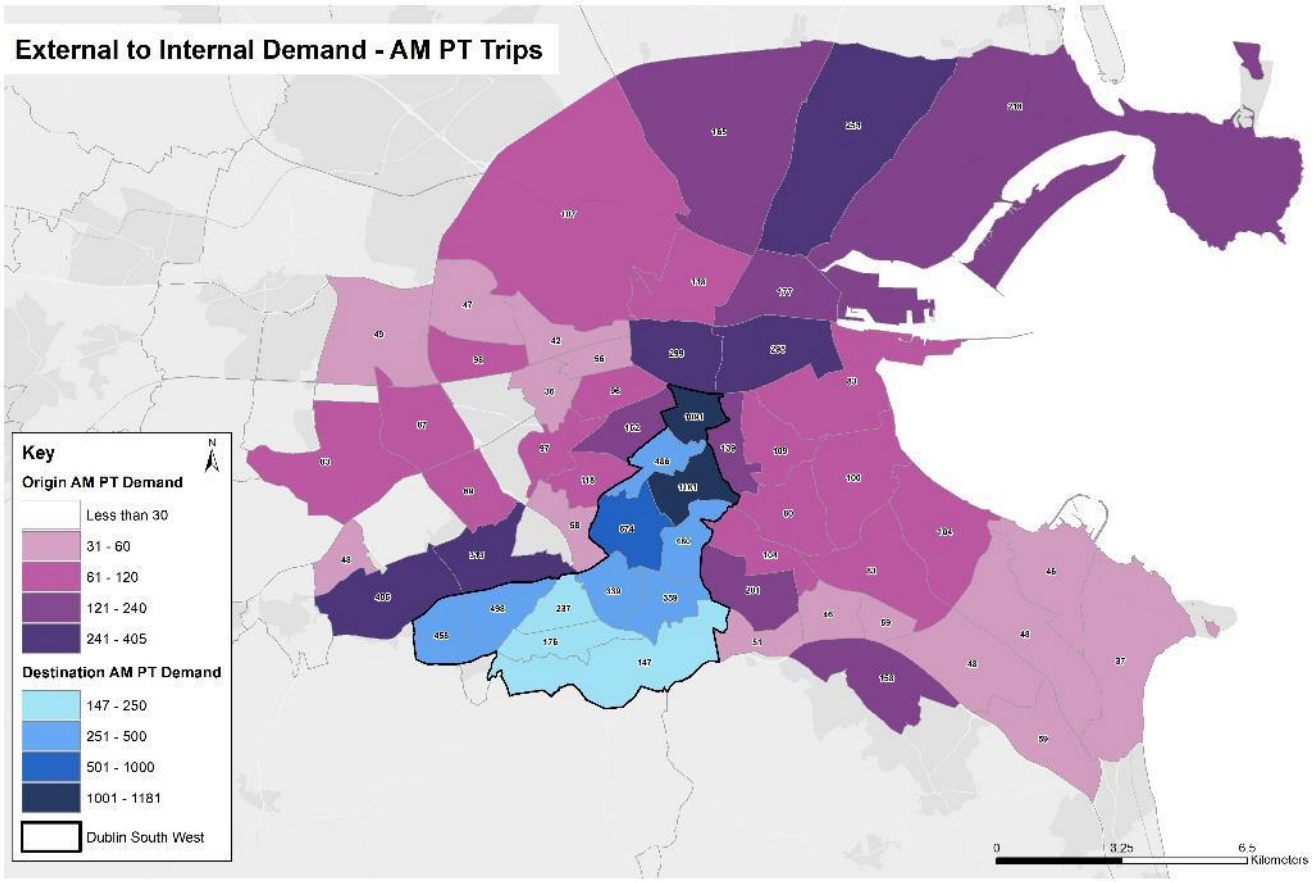
# Appendix B. Demand Maps split by mode

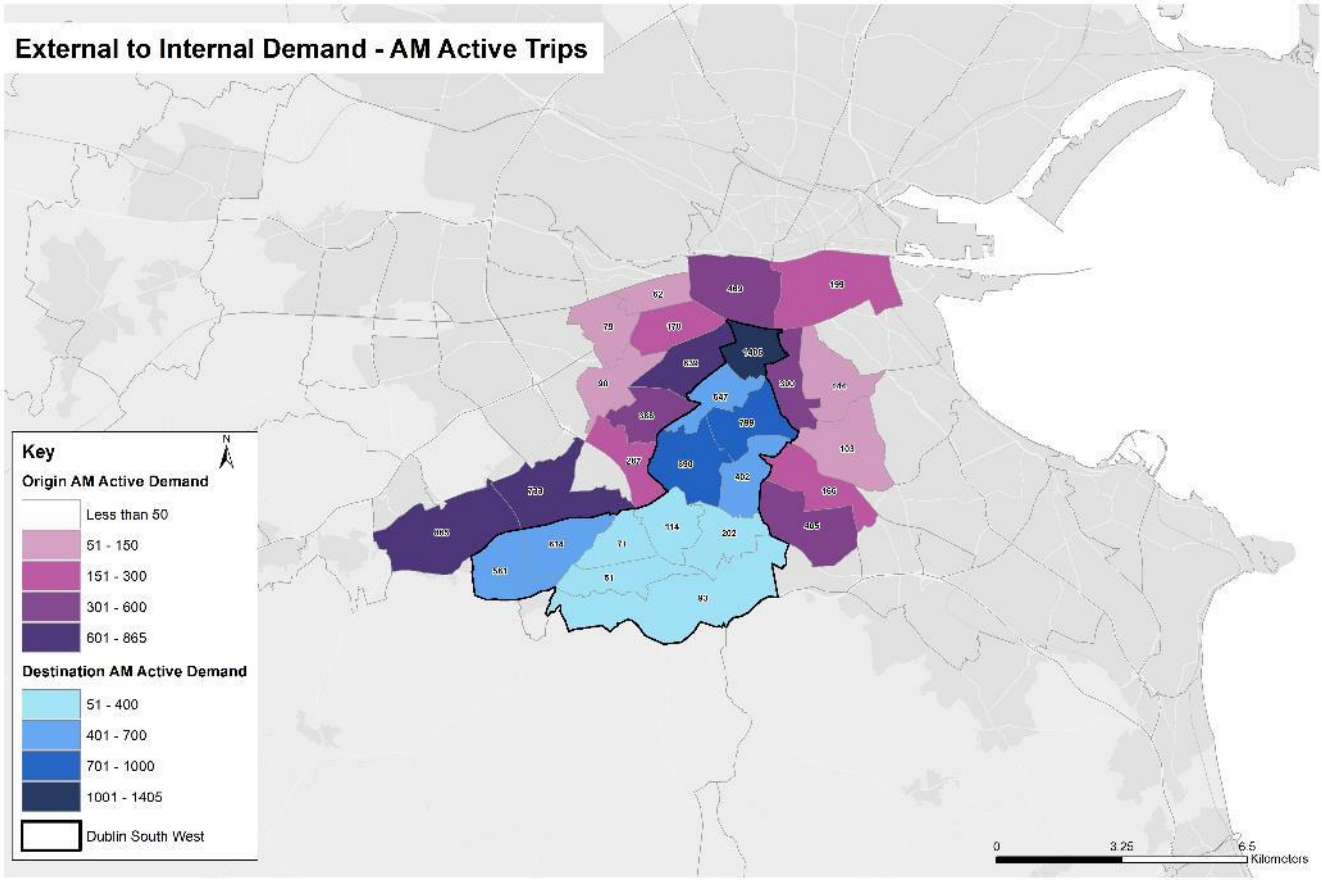



Internal to External Demand - AM PT Trips
Key
Destination AM PT Demand
Less than 50
51 - 250
251 - 500
501 - 1000
1001 - 3516
Origin AM PT Demand
389 - 400
401 - 800
801 - 1200
1201 - 1504
Dublin South West
0
3.25
6.5
Kilometers


Internal to External Demand - AM Active Trips
Key
Destination AM Active Demand
Less than 50
51 - 200
201 - 400
401 - 800
801 - 1854
Origin AM Active Demand
260 - 500
501 - 850
851 - 1200
1201 - 2253
Dublin South West
0
3.25
6.5
Kilometers


External to Internal Demand - AM Road Trips
Key
Origin AM Road Demand
Less than 100
101 - 200
201 - 400
401 - 600
601 - 999
Destination AM Road Demand
940 - 1000
1001 - 1500
1501 - 2000
2001 - 2075
Dublin South West
0
3.25
6.5
Kilometers


External to Internal Demand - AM PT Trips
Key
Origin AM PT Demand
Less than 30
31 - 60
61 - 120
121 - 240
241 - 405
Destination AM PT Demand
147 - 250
251 - 500
501 - 1000
1001 - 1181
Dublin South West
0
3.25
6.5
Kilometers

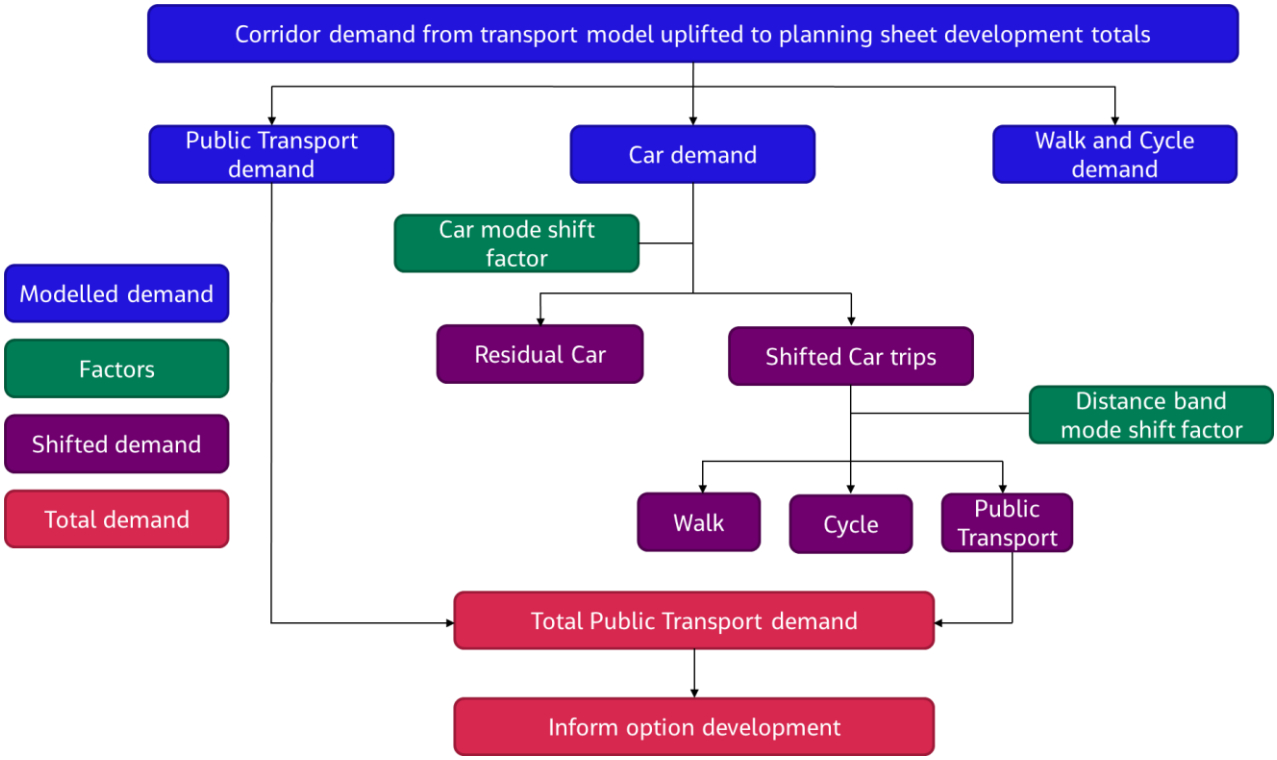

External to Internal Demand - AM Active Trips
Key
Origin AM Active Demand
Less than 50
51 - 150
151 - 300
301 - 600
601 - 865
Destination AM Active Demand
51 - 400
401 - 700
701 - 1000
1001 - 1405
Dublin South West
N
0
3.25
6.5
Kilometers

# Appendix C. Mode shift analysis methodology

This technical note explains the mode shift calculation used to inform the option development process for each area being considered as part of the Greater Dublin Area Transport Studies. The mode shift calculation is based on the Eastern Regional Model (ERM) and the planning sheets provided by the NTA with the results providing an indicative number of additional public transport trips which need to be catered for if a mode shift away from car is achieved.

This method produces an indicative set of results which provides the order of magnitude of changes in demand which is considered sufficient to inform option development at this early stage. It is noted that the results are affected by the underlying assumptions of the planning sheet and ERM i.e. demand is assigned to a constrained network and that no model run has been undertaken to identify mode shift.

This exercise has been undertaken for the AM period only when there is the largest car demand in the ERM. The flow chart below shows the overall process underpinning the mode shift calculation.




First a corridor is identified (e.g. outside the M50 into the city centre) and the transport demand using the corridor is obtained from the ERM, disaggregated by mode – public transport, car and walk and cycle.

A factor is then applied to the car demand to create the mode shift away from car to one of the other modes. Two factors for mode shift have been applied in this study: 25% of car trips shift and 50% of car trips shift. This aims to provide a broad order of magnitude of demand to inform option development and assessment.

The shifted car trips are then allocated to become either a new walking, cycling or public transport trip. This decision is based on the trip lengths of the shifted car trips as it is assumed that shorter trips are more likely to become walking trips and longer trips are more likely to become public transport trips. The trip length distributions for each mode are obtained from the ERM.

Three bands were defined:

- A lower band bounded a distance which 75% of walking trips in the ERM are shorter than or equal to;
- A middle band bounded by a distance which 75% of cycling trips in the ERM are shorter than or equal to; and
- An upper band for any trips with a longer distance.

For the Dublin South West study area, the following bands and mode shares by distance are obtained from the ERM:

| Distance Band (km) | Walk | Cycle | Public Transport | Total |
|---|---|---|---|---|
| 0-2.6 | 73% | 6% | 22% | 100% |
| 2.6-8.2 | 21% | 18% | 61% | 100% |
| 8.2+ | 0% | 10% | 90% | 100% |

In the lower band of trips less than 2.6km, 73% of the trips in the ERM are walking trips, but there are still 6% of trips which are cycle trips and 22% of trips which are public transport trips.

The proportion of trips in each band made by walk, cycle and public transport were derived from the ERM, and applied to the shifted car trips. This gives a number for the shifted public transport trips which can be added to the public transport trips from the ERM to provide a total public transport demand for the corridor. This number can then be used to inform the development of options to support the estimated demand along the corridor.