

DUBLIN CITY CENTRE TRANSPORT PLAN 2023

Technical Notes | Part 6: Public Transport



Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council



Jacobs

Dublin City Centre Transport Plan 2023 Technical Note Part 6: Public Transport

Client name:	National Transport Authority	Project no:	321130AK
Client reference:	N/A	Project manager:	Matthew Foy
Document no:	6	Prepared by:	Katie McLoughlin
Revision no:	Final	File name:	06 Dublin City Centre Transport Plan Public Transport Technical Note.docx
Date:	24/10/2023		
Doc status:	Final		

Document History and Status

Revision	Date	Description	Author	Checked	Reviewed	Approved
Final	24/10/2023	Issued	KM	MF	DK	SHP

Distribution of Copies

Revision	Date	Description	Author	Checked	Reviewed	Approved
Final	07/02/2024	Issued	KM	MF	DK	SHP

Jacobs Engineering Ireland Limited

Merrion House
 Merrion Road
 Dublin 4, D04 R2C5
 Ireland

T +353 (0)1 269 5666
 F +353 1 269 5497
www.jacobs.com

Copyright Jacobs Engineering Ireland Limited © 2024.

All rights reserved. The concepts and information contained in this document are the property of the Jacobs group of companies. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright. Jacobs, the Jacobs logo, and all other Jacobs trademarks are the property of Jacobs.

NOTICE: This document has been prepared exclusively for the use and benefit of Jacobs' client. Jacobs accepts no liability or responsibility for any use or reliance upon this document by any third party.

6

PUBLIC TRANSPORT



Contents

1	Introduction	3
1.1	Study Context	3
1.2	Purpose of This Technical Note	3
1.3	Structure	3
2	Policy and Planning Information	4
2.1	Dublin City Development Plan 2022-2028	4
2.1.1	Chapter 7 – The City Centre, Urban Villages and Retail	4
2.1.2	Chapter 8 – Sustainable Movement and Transport	5
2.2	Greater Dublin Area Transport Strategy 2022-2042	7
2.2.1	Chapter 8 – Planning for Sustainable Transport	7
2.2.2	Chapter 9 – Integration and Inclusion	8
2.2.3	Chapter 12 – Public Transport	9
3	Receiving Environment	13
3.1	Public Transport Development to 2030	13
3.1.1	Buses	13
3.1.2	Luas Network	19
3.1.3	Heavy Rail	20
3.1.4	MetroLink	22
3.2	Future Public Transport Network	23
3.2.1	Planned Network	23
3.2.2	Key Public Transport Nodes	24
4	Principles for Network Development	26
5	Challenges and Opportunities for Public Transport	27
5.1	Overview	27
5.2	Allowing for Increased Movements	27
5.2.1	Option 1: Do Nothing	28
5.2.2	Option 2: Revising Bus Network	28
5.2.3	Option 3: Transport Management Plan to Reduce Conflicts with Private Traffic	30
5.3	Integrated Network Promoting Interchange	31
5.3.1	First and Last Mile	31
5.3.2	Interchange locations	32
5.3.3	Attractive Interchange	33
5.4	Communicating with Users	34

- 6 Further Considerations 35**
 - 6.1 Connecting the West of the City35**
 - 6.2 The City Centre Quays36**
 - 6.3 Pearse Street36**
 - 6.4 D'Olier Street.....37**

- 7 Conclusion..... 38**
 - 7.1 Preferred Network for Public Transport Mode38**
 - 7.2 Key Recommendations38**

1 INTRODUCTION

1.1 Context

The Dublin City Centre Transport Plan 2023 (the Plan) is an update of the 2016 City Centre Transport Study, as provided for in the Dublin City Development Plan (DCDP) 2022-2028¹. It is intended to frame the implementation of the DCDP and the 2022-2042 National Transport Authority (NTA) Transport Strategy for the Greater Dublin Area (the Transport Strategy) in Dublin City Centre.

The Plan considers ways to optimise and enhance the transport network to meet the transport needs, challenges, and opportunities for the city centre. This is based on prevailing national, regional and local transport policy, most notably the Hierarchy of Road Users model set out in the National Sustainable Mobility Policy (NSMP), which places sustainable modes at the top. The emerging proposals have been developed with the sustainable growth of the city and its economy as a key aim, as well as its social, cultural and environmental wellbeing.

A suite of technical notes has been produced which informed the development of the Plan. This note should be read in conjunction with the other technical notes.

1.2 Purpose of This Technical Note

The goal of this technical note is to identify the preferred public transport network within the context of all technical notes, in particular Technical Note 3: Traffic Management.

This technical note sets out the expected public transport network for 2030 as outlined in the DCDP, consisting of bus, light rail and heavy rail components forming an integrated network. The effects of the longer-term introduction of MetroLink and DART+ as per the DCDP and Transport Strategy are also considered. By examining the future public transport network, this technical note identifies potential issues that could impact on the efficiency and resilience of the network. These have been explored both in terms of individual modes and the public transport network as a whole, culminating in a set of recommended measures to maximise the benefits of the network, as well items for further consideration.

1.3 Structure

The structure of this technical note is as follows:

- **Chapter 2** outlines the relevant policies that informed this technical note within the wider Plan.
- **Chapter 3** presents the receiving environment considered for public transport.
- **Chapter 4** presents the principles used to guide the development of recommendations.
- **Chapter 5** outlines challenges and opportunities for the future public transport network and potential solutions for addressing them.
- **Chapter 6** provides a set of recommendations and further considerations.

¹ Published by Dublin City Council (DCC) in 2022

2 POLICY AND PLANNING INFORMATION

A review of relevant policy and strategy documentation, and a review of upcoming, planned, and proposed projects within Dublin City which are likely to affect proposals laid out within the Plan, are outlined respectively in Technical Note 1: Policy and Background Review and in Technical Note 2: Development Trends Review.

Within this section are high level extracts from the DCDP and from the Transport Strategy relevant to this technical note.

2.1 Dublin City Development Plan 2022-2028

The DCDP governs spatial policy in the city; its main strategic approach is to develop a city that is low carbon, sustainable and climate resilient. The DCDP's vision is for a city where people will choose to live, work, experience city living, invest, and socialise.

The chapters within the DCDP that informed this technical note are Chapter 7. The City Centre, Urban Villages and Retail, and Chapter 8. Sustainable Transport and Movement.

2.1.1 Chapter 7 – The City Centre, Urban Villages and Retail

Chapter 7 of the DCDP details how the city centre and key urban villages, which are defined within the chapter, offer the opportunity to provide people with vibrant areas to live, shop, eat, relax and work. It explores how active modes and public transport can be used to develop healthy and sustainable urban centres that offer more space and comfort for pedestrians and cyclists.

High quality public transport services, specifically, can play an important role in inviting regeneration by being used to connect urban villages to each other and to the city centre, and to support the need for high-density, mixed-used developments and residential-led intensification in key urban villages that will enable them to strengthen the positive impact they have on their respective local areas' placemaking functions as social gathering places.

The policies and objectives within Chapter 7 of the DCDP relevant to this technical note are reproduced in Table 2-1 and Table 2-2, respectively.

Table 2-1: City Centre, Urban Villages and Retail Policies from the DCDP

<i>It is the Policy of Dublin City Council:</i>	
CCUV39	<p>Permeable, Legible and Connected Public Realm</p> <p>To deliver a permeable, legible and connected public realm that contributes to the delivery of other key objectives of this development plan namely active travel and sustainable movement, quality urban design, healthy placemaking and green infrastructure.</p>
CCUV42	<p>Public Realm – City Centre</p> <p>To move to a low traffic environment generally and to increase the amount of traffic free spaces provided in the city centre over the lifetime of the Plan as well as create new high quality public realm areas where possible taking into account the objective to enhance access to and within the city centre by public transport, walking and cycling.</p>

Examples of other policies used to inform this technical note were CCUV38: High Quality Street and Spaces and CCUV41: New Infrastructure Development.

Table 2-2 City Centre, Urban Villages and Retail Objectives from the DCDP

<i>It is the Objective of Dublin City Council:</i>	
CCUVO13	<p>Civic Spine /College Green Dame Street Project</p> <p>To implement a programme of environmental and public realm improvements along the Grand Civic Spine from Parnell Square to Christchurch Place and along the city quays, and to prioritise and deliver the redevelopment of the College Green and the Dame Street area up to the junction with South Great George’s Street and including Foster Place, as a premier civic space for the city with a traffic free world class public realm.</p>
CCUVO17	<p>Improve Links North / South</p> <p>To improve north / south links between Grafton Street and Henry Street shopping areas through the implementation of “The Heart of the City’ Public Realm Masterplan for the City Core 2016.</p>

Examples of other objectives used to inform this technical note were CCUVO5: Underutilised and Inactive City Centre Streets and CCUVO9: Town Centre Health Check.

2.1.2 Chapter 8 – Sustainable Movement and Transport

Chapter 8 of the DCDP emphasises the importance of transitioning to sustainable modes of transport to mitigate against the negative impacts of climate change by setting mode share targets that can be seen in Table 2-4. This chapter of the DCDP proposes numerous approaches of achieving these targets, including reallocating some of the road available away from private vehicles and effective integration of land use and transportation.

Through the key public transport projects over the coming years (including BusConnects, DART+, MetroLink and the extension of the Luas), the DCDP stresses that the public transport network will become more integrated and will combine with active modes to provide a viable alternative to using a car by catering to all trips, regardless of distance, throughout the city.

The policies and objectives within Chapter 8 of the DCDP relevant to this technical note are reproduced in Table 2-3 and Table 2-4.

Table 2-3: Sustainable Transport and Mobility Policies from the DCDP

<i>It is the Policy of Dublin City Council:</i>	
SMT1	<p>Modal Shift and Compact Growth</p> <p>To continue to promote modal shift from private car use towards increased use of more sustainable forms of transport such as active mobility and public transport, and to work with the National Transport Authority (NTA), Transport Infrastructure Ireland (TII) and other transport agencies in progressing an integrated set of transport objectives to achieve compact growth.</p>
SMT3	<p>Integrated Transport Network</p> <p>To support and promote the sustainability principles set out in National and Regional documents to ensure the creation of an integrated transport network that services the needs of communities and businesses of Dublin City and the region.</p>
SMT4	<p>Integration of Public Transport Services and Development</p> <p>To support and encourage intensification and mixed-use development along public transport corridors and to ensure the integration of high-quality permeability links and public realm in tandem with the delivery of public transport services, to create attractive, liveable and high-quality urban places.</p>
SMT5	<p>Mobility Hubs</p> <p>To support the development of mobility hubs at key public transport locations and local mobility hubs in tandem with new developments to include shared car and micro mobility initiatives, creating a vibrant, accessible and liveable place to support the transportation experience.</p>
SMT14	<p>City Centre Road Space</p>

It is the Policy of Dublin City Council:

To manage city centre road-space to best address the needs of pedestrians and cyclists, public transport, shared modes and the private car, in particular, where there are intersections between DART, LUAS and Metrolink and with the existing and proposed bus network.

SMT19 Integration of Active Travel with Public Transport
 To work with the relevant transport providers, agencies and stakeholders to facilitate the integration of active travel (walking/cycling etc.) with public transport, ensuring ease of access for all.

SMT22 Key Sustainable Transport Projects
 To support the expeditious delivery of key sustainable transport projects including Metrolink, Bus Connects, DART+ and LUAS expansion programme so as to provide an integrated public transport network with efficient interchange between transport modes, serving the existing and future needs of the city and region.

SMT23 The Rail Network and Freight Transport
 (i) To work with Iarnród Éireann/Irish Rail, the NTA, TII and other operators to progress a coordinated approach to improving the rail network, integrated with other public transport modes to ensure maximum public benefit and promoting sustainable transport and improved connectivity.

Examples of other policies used to inform this technical note were SMT2: Decarbonising Transport, SMT24: Shared Mobility and Adaptive Infrastructure and SMT31: Transport Tunnels.

Table 2-4: Sustainable Transport and Mobility Objectives from the DCDP

It is an Objective of Dublin City Council:

SMT01 Transition to More Sustainable Travel Modes
 To achieve and monitor a transition to more sustainable travel modes including walking, cycling and public transport over the lifetime of the development plan, in line with the city mode share targets of 26% walking/cycling/micro mobility; 57% public transport (bus/rail/LUAS); and 17% private (car/ van/HGV/motorcycle).

2.2 Greater Dublin Area Transport Strategy 2022-2042

The Transport Strategy for the Greater Dublin Area (GDA) sets out a 20-year framework for investment in transport infrastructure and services. The Transport Strategy emphasises the need to align with wider national and regional policies, as well as spatial planning policy and strategy as Ireland undertakes a climate transition towards a low carbon and climate resilient society.

The chapters within the Transport Strategy that informed this technical note are Chapter 8: Planning for Sustainable Transport, Chapter 9: Integration and Inclusion and Chapter 12: Public Transport.

2.2.1 Chapter 8 – Planning for Sustainable Transport

Chapter 8 of the Transport Strategy sets out the measures that are essential for reducing the need to travel and a transport system that is more focussed on sustainable modes rather than cars to cater for the majority of travel demand. These measures are based on the NSMP’s Hierarchy of Road Users model (see Figure 2-1) which prioritises walking and wheeling, cycling and public transport over cars. The intended outcome of following this framework is a less car-dependent society due to following sustainable transport-centric policies.

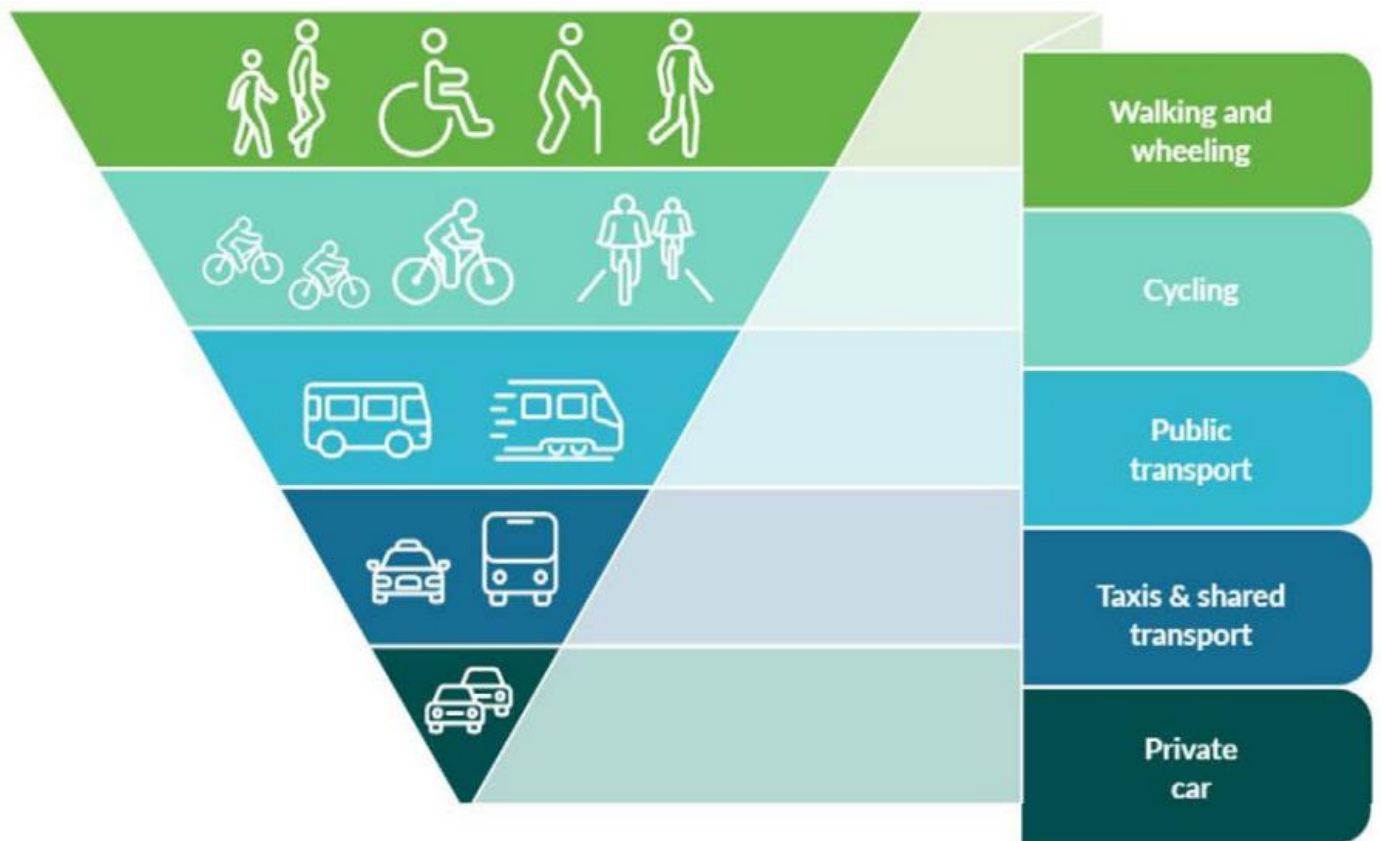


Figure 2-1: Hierarchy of Road Users (NSMP)

Relevant measures from Chapter 8 of the Transport Strategy are outlined in Table 2-5.

Table 2-5: Transport Strategy Chapter 8 Relevant Measures

Transport Strategy Measures:	
PLAN1	<p>Policy Concepts in Transport and Land Use Planning</p> <p>The NTA, in the implementation of the Transport Strategy and in the development of other plans and programmes, will be guided by emerging concepts in land use and transport planning as they become integrated into the national policy framework.</p>

Transport Strategy Measures:

	The Road User Hierarchy
PLAN2	The NTA, in the decision-making process around the design, planning and funding of transport schemes in the GDA, will be guided by the priority afforded to each mode in the Road User Hierarchy as set out in the Transport Strategy.
	Transit-Oriented Development
PLAN7	The NTA will continue to support and facilitate the delivery of Transit-Oriented Development at locations identified as appropriate for such, and will work with EMRA and the local authorities in identifying further locations served by existing and proposed public transport which are appropriate for high density development supporting a mix of uses.
	Filtered Permeability
PLAN9	Development Plans, SDZ Planning Schemes and Local Area Plans in the GDA should ensure that the road and street networks in new development areas are designed on the basis of providing for filtered permeability, and should incorporate measures which deliver filtered permeability in existing neighbourhoods.
	Reallocation of Road Space
PLAN16	The NTA, in conjunction with the local authorities, will seek the reallocation of road space in appropriate locations in Dublin City Centre, Metropolitan towns and villages, and towns and villages across the GDA in accordance with the road user hierarchy, in order to prioritise walking, cycling and public transport use and prioritise the placemaking functions of the urban street network.

Examples of other measures used to inform this technical note were PLAN3: Housing and Transport and PLAN4: Consolidated Development.

2.2.2 Chapter 9 – Integration and Inclusion

A well-integrated transport system is critical for allowing people access different parts of the network as seamlessly as possible. Chapter 9 of the Transport Strategy discusses how the NTA plan to continue developing a transport network that provides users with the ability to access different parts of the GDA in a seamless and inclusive manner through different modes complementing each other. This involves:

- Careful consideration in the design and planning of schemes by understanding how a scheme will integrate with the rest of the network; and
- The development of Park & Ride and Interchanges:
 - Park & Ride will allow those without direct access to public transport greater mobility by providing access to the network at specific nodes.
 - Major interchanges and mobility hubs will allow for high-capacity public transport services to integrate with other modes to provide transport users access seamless and extensive network.

Integration and inclusion are vital for a well-functioning and reliable public transport service because:

- A well-integrated network provides users with the comfort that reaching their destination will be easy and reliable,
- Mobility hubs are to play a large role in how different services and modes interact with each other; and
- Inclusive services provide accessibility for all users.

Relevant measures from Chapter 9 of the Transport Strategy are outlined in Table 2-6.

Table 2-6 Transport Strategy Chapter 9 Relevant Measures

<i>It is the Policy of the National Transport Authority:</i>	
	Integration of All Modes in Transport Schemes
INT3	It is the intention of the NTA, in the design and planning of transport schemes, to ensure that the needs of all transport modes are considered, as appropriate, based on the objectives of the scheme and on the road user hierarchy.
	Major Interchanges and Mobility Hubs
INT5	It is the intention of the NTA, in conjunction with TII, Irish Rail, local authorities, and landowners to deliver high quality major interchange facilities or Mobility Hubs at appropriate locations served by high capacity public transport services. These will be designed to be as seamless as possible and will incorporate a wide range of facilities as appropriate such as cycle parking, seating, shelter, kiosks selling refreshments plus the provision of travel information in printed and digital formats.
	Interchange
INT6	It is the intention of the NTA, in conjunction with local authorities and transport operators, to ensure that passengers wishing to change between services on the transport network are provided with as safe, convenient and seamless interchange experience.

Examples of other measure used to inform this technical note were INT3: Park & Ride and INT15: Equality in Transport.

2.2.3 Chapter 12 – Public Transport

Chapter 12 of the Transport Strategy sets out how the NTA plans to approach the provision of public transport over the course of the strategy and beyond. It discusses the need to use the public transport fleet efficiently by marrying the appropriate form of public transport to relevant links based on travel patterns and land use development. This has led to plans to satisfy much of the demand within the city using bus services, with rail-based options being used along key corridors. The importance of interchange is stressed, highlighting how it strengthens the network as a whole and how it can be a convenient and cost-effective way of providing transport users with options for how to take their journeys. This chapter lays out the NTA’s strategy for each public transport mode in turn, focussing on the continued expansion of high-quality bus services, proposed expansions to the Luas network and the DART (in the form of DART+), and the introduction of MetroLink.

Chapter 12.2 – Bus

Within Chapter 12 of the Transport Strategy there are numerous changes planned for the bus network to provide adaptable, flexible and reliable services that integrate well with existing land use and travel patterns and that complement other modes. This is important because buses are the backbone of public transport within Dublin and are a vital service to the city now and in the future. BusConnects is currently being rolled out in a staged approach and, once completely implemented, will provide a greater level of services that is more accessible, reaches more areas and integrates better with the city and with other modes.

BusConnects involves Core Bus Corridors (CBCs) which will facilitate faster and more reliable journeys due to increased levels of bus priority. CBCs will serve the core BusConnects spines and will be supplemented by orbital, radial and local bus routes enabling fast and efficient interchange along CBCs. As part of BusConnects, the Network Redesign, called the New Dublin Area Bus Network in the Transport Strategy, is expected to complete delivery by 2025 which will see all BusConnects spines implemented before the construction of the CBCs. Supporting the plans set out under BusConnects will be a transition towards higher capacity and lower/zero emissions buses.

Relevant measures from Chapter 12 of the Transport Strategy related to buses are outlined in Table 2-7.

Table 2-7: Transport Strategy Chapter 12 - Bus Relevant Measures

<i>Transport Strategy Measures:</i>	
	Core Bus Corridor Programme
BUS1	Subject to receipt of statutory consents, it is the intention of the NTA to implement the 12 Core Bus Corridors as set out in the BusConnects Dublin programme.

<i>Transport Strategy Measures:</i>	
BUS2	<p>Additional Radial Core Bus Corridors</p> <p>It is the intention of the NTA to evaluate the need for, and deliver, additional priority on radial corridors.</p>
BUS3	<p>Orbital and Local Bus Routes</p> <p>It is the intention of the NTA to provide significant improvements to orbital and local bus services in the following ways:</p> <ol style="list-style-type: none"> 1. Increased frequencies on the BusConnects orbital and local services; and 2. Providing bus priority measures at locations on the routes where delays to services are identified.
BUS4	<p>New Dublin Area Bus Service Network</p> <p>It is the intention of the NTA to complete the delivery of the new Dublin Area Bus Service Network in 2024.</p>
BUS6	<p>Higher Capacity Bus Fleet</p> <p>In the later phases of the Transport Strategy period, it is the intention of the NTA to introduce higher capacity bus vehicles onto select appropriate BusConnects corridors in order to increase passenger carrying capabilities in line with forecast demand.</p>

Examples of other measures used to inform this technical note were BUS5: Bus Service Network Monitoring and Review, BUS6: Higher Capacity Bus Fleet and BUS7: Zero Emission Bus Fleet for Dublin.

Chapter 12.3 – Light Rail

The Transport Strategy outlines the proposed light rail network comprising existing Red and Green Luas Lines, along with Luas Lucan, MetroLink, and extensions of existing Luas lines to Bray, Poolbeg and Finglas. Routes for future light rail opportunities are outlined as areas where travel demand is likely to exceed that which can be served by bus. It is identified that “a network of multiple high-capacity lines incorporating bus and light rail is a more viable option in serving a city of the scale and density of Dublin in that a much wider population can be served directly with a high-quality system than could feasibly be served with a more limited Metro network”. As such the measures outlined below, see Table 2-8, are predominantly related to the expansion of the Luas network, with a smaller number of corridors identified as being suited to future Metro lines.

Relevant measures from Chapter 12 of the Transport Strategy related to light rail are outlined in Table 2-8.

Table 2-8: Transport Strategy Chapter 12 – Light Rail Relevant Measures

<i>Transport Strategy Measures:</i>	
LRT1	<p>MetroLink</p> <p>A Railway Order application for the MetroLink was made to An Bord Pleanála in 2022. Subject to receipt of approval, it is intended to proceed with the construction of the project.</p>
LRT3	<p>Luas Finglas</p> <p>It is intended to extend the Luas Green Line northwards to Finglas, inclusive of a potential park and ride facility at or close to its terminal stop.</p>
LRT4	<p>Luas Lucan</p> <p>It is intended to develop a light rail line from Lucan to the City Centre, supplementing and complementing the planned bus system, to serve the overall public transport needs in this area.</p>
LRT5	<p>Luas Bray</p> <p>It is intended to extend the Luas Green Line southwards in order to serve the Bray and Environs area.</p>
LRT6	<p>Luas Poolbeg</p>

Transport Strategy Measures:	
	Subject to the assessment of forecast travel demand arising out of development patterns in the SDZ and its environs, it is intended to extend the Red line to Poolbeg.
LRT10	<p>New Light Rail Stops</p> <p>The NTA, in conjunction with TII, will monitor the changes in demand for travel on the Green and Red lines and consider the development of additional stops where sufficient passenger usage has been identified. A new stop on the Naas Road will be provided as part of the early phases of the City Edge development</p>
LRT11	<p>Enhance Priority for Trams</p> <p>The NTA, in conjunction with TII and the local authorities, will explore how best to manage the road and street network to:</p> <ul style="list-style-type: none"> • ensure reliable and competitive journey times for Luas; • maximise service efficiency; and • enable capacity to expand in line with increase future demand.

Examples of other measures used to inform this technical note were LRT7: Post-2042 Luas Lines and LRT8: Orbital Luas.

Chapter 12.4 DART+ and Rail

The continued electrification of the rail fleet is expected to contribute to the transition to a more sustainable transport system. All passenger lines radiating from Dublin, totalling over 100km, will be electrified which will provide more people within Dublin and surrounding areas access to sustainable transport and contribute to the common objective of decarbonising the transport system. Alongside plans for DART+ will be the reopening of the Navan Rail Line, which will cater to further travel demand via rail from County Meath into Dublin City Centre, whereupon interchange will be possible with Luas and bus services. Furthermore, included within the Transport Strategy are improvements to Connolly Station, integration with MetroLink at Glasnevin with a combined metro/rail station, track widening between Park West and Heuston and protecting the alignment of the DART+ Tunnel to allow for its future delivery.

Relevant measures within the Transport Strategy related to rail are outlined in Table 2-9.

Table 2-9: Transport Strategy Chapter 12 – DART+/Rail Relevant Measures

Transport Strategy Measures:	
RAIL1	<p>DART+</p> <p>The DART+ Programme will be implemented, providing electrified services to Drogheda in the north and Maynooth plus Celbridge in the west, in addition to an enhanced level of service to Greystones. The programme will include additional fleet, aligned with higher passenger demand, and a higher frequency of service on all lines.</p>
RAIL3	<p>DART Extension</p> <p>The NTA and Irish Rail will, over the lifetime of the Strategy, extend the DART to deliver electrified rail services to the following towns:</p> <ul style="list-style-type: none"> • Sallins/Naas; • Kilcock; and • Wicklow
RAIL4	<p>Navan Rail Line</p> <p>The existing rail network in the GDA will be extended by the provision of a new rail line from the M3 Parkway terminus station (just west of Dunboyne) to Navan town, serving Dunshaughlin and Kilmessan along its route. The precise alignment of this line will be determined as the project proceeds through the scheme design, appraisal and planning processes.</p>

*Transport Strategy Measures:***New Rail Stations****RAIL6**

The NTA, in conjunction with Irish Rail, will develop new rail stations at Cabra, Glasnevin, Heuston West, Kylemore, Woodbrook, west of Sallins, west of Louisa Bridge and west of Maynooth. Kishoge station will also open in the short term as development of the Clonburris SDZ is realised. Other stations will be considered where development patterns support such provision.

Examples of other measures used to inform this technical note were RAIL2: DART+ Tunnel and RAIL7: Station Upgrades.

The policies and objectives in the DCDP and the measures in the Transport Strategy will guide the development of this technical note. In particular, they set out a need to:

- Incentivise a modal shift towards sustainable modes, in line with the road user hierarchy;
- Deliver a more integrated sustainable transport network; and
- Realise the potential of mobility hubs as a vehicle for interchange.

These are based on the common narrative of both policy documents of moving to a more sustainable transport system that puts the needs and well-being of the individuals who live in and visit the city first. This can be achieved by building a platform that can be used to drive changes that make public transport a viable and attractive option for people when choosing to make a journey.

3 RECEIVING ENVIRONMENT

The ongoing response to climate change, anticipated economic and demographic growth, as well as land-use changes will impact on why, when, how, and how often people travel in the future. Many of the policies outlined in Section 2 aim to improve the desirability of sustainable transport and planning in Dublin City, and so by 2030 it is expected that the city will see:

- A changed urban form with more activity and a higher proportion of compact, mixed-use developments;
- A higher capacity high-quality public transport network reinforced by the rollout of BusConnects and DART+, with a focus on multi-modal interchanges, such as mobility hubs;
- Better availability of active travel and shared mobility options;
- Well-connected hubs to serve the economy as an efficient interface for people, firms and goods; and
- An outdoor environment that is receptive to civic activity as well as a reduction in private car traffic.

3.1 Public Transport Development to 2030

By 2030, there will be a number of changes to the public transport network in line with the DCDP and Transport Strategy. This section presents the 2030 baseline public transport network for buses, Luas and heavy rail.

While MetroLink won't be operational by 2030, construction is expected to have started so it has been included in the receiving environment.

Active travel and shared mobility will increasingly supplement the public transport offering as solutions for the first and last-mile legs of a journey. Current policies addressing multi-modal interchanges will promote the further integration of different transport options into a coherent, seamless system of mobility options.

3.1.1 Buses

BusConnects is one of the three bus programmes outlined in the Transport Strategy, and the one that is relevant to this technical note. The programme is made up of different elements, with the CBCs, Network Redesign and New Bus Stops being used to inform this technical note.

BusConnects Network Redesign

The BusConnects Network Redesign involves a new bus network based on high-frequency spines radiating from the city centre, supported by other services. It will also see an overall increase in bus services and capacity. BusConnects is currently being implemented in a phased approach, which will create a more reliable and more efficient bus service for all. It is anticipated that the full Network Redesign and associated infrastructure will be in place to form the baseline receiving environment for this Plan. Included in this is the College Street Dame Street Project, which will remove all vehicular traffic, including buses, on Dame Street between Georges Street and College Green.

Figure 3-1 presents the BusConnects network within the Dublin canal cordon. There are 8 spines (A to H; shown in red), each composed of separate routes (e.g. A1, A2, A3 and A4) which have different termini outside of the city centre. Supporting services include the orbital routes (O, N, S and W; shown in blue), as well as additional radial routes (shown in purple).

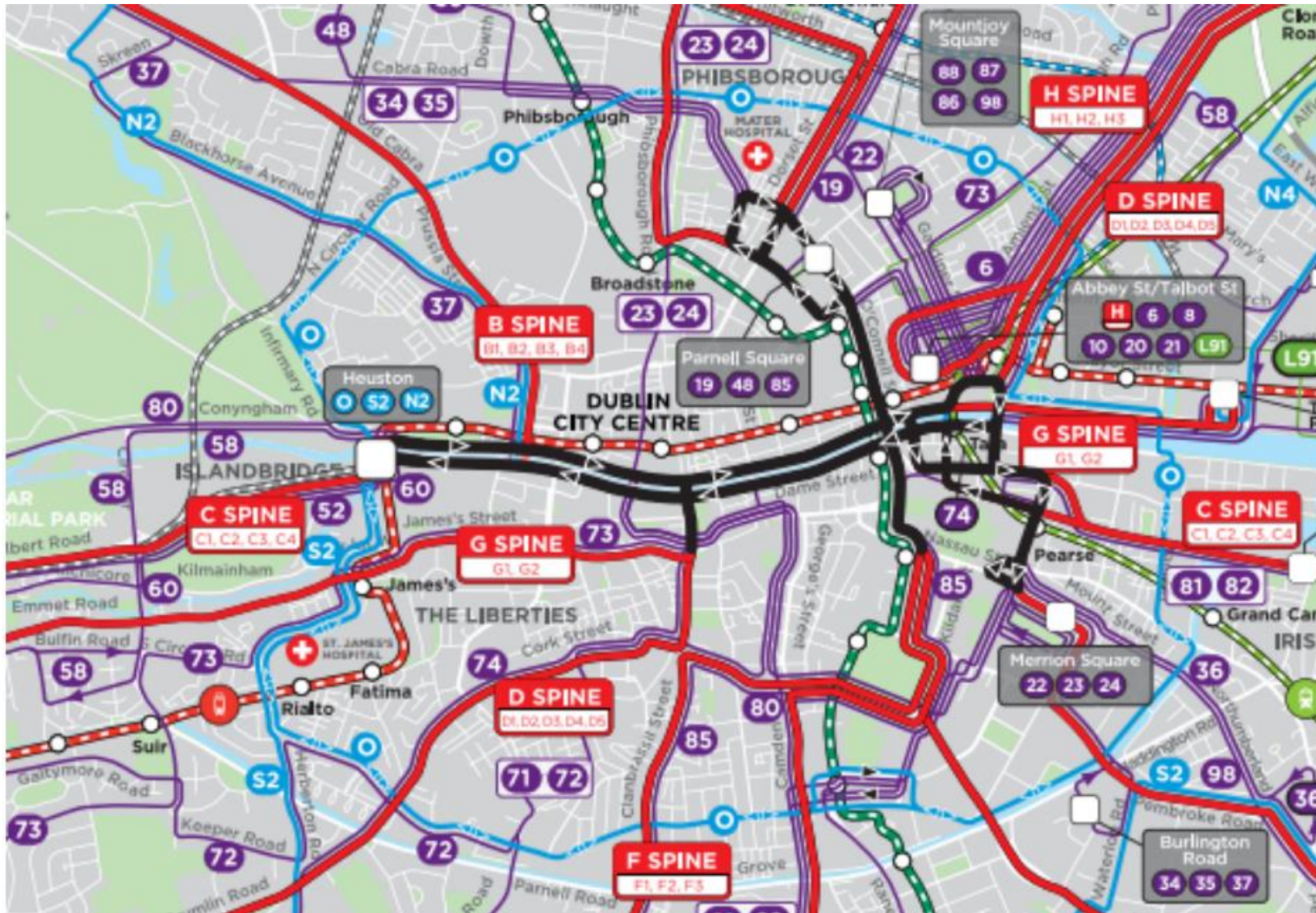


Figure 3-1 BusConnects Network Map (busconnects.ie)

BusConnects Service Frequencies

Most BusConnects services will run seven days a week, with some services operating at higher frequencies during peak times. Some additional services will operate during selected peak times on weekdays. Overall, the highest total frequencies are scheduled to occur during these hours:

- 7am to 8am (AM Peak Hour); and
- 5pm to 6pm (PM Peak Hour).

The approximate number of scheduled BusConnects services in the AM and PM peak hours throughout the city are shown in Figure 3-2 and Figure 3-3 respectively. Data in this section has been extracted and analysed from service frequency information from the September 2022 version of the service frequency tables. It is important to note that the frequencies represent a snapshot of the plan as it was in September 2022, and both in-service routes and future are subject to change.

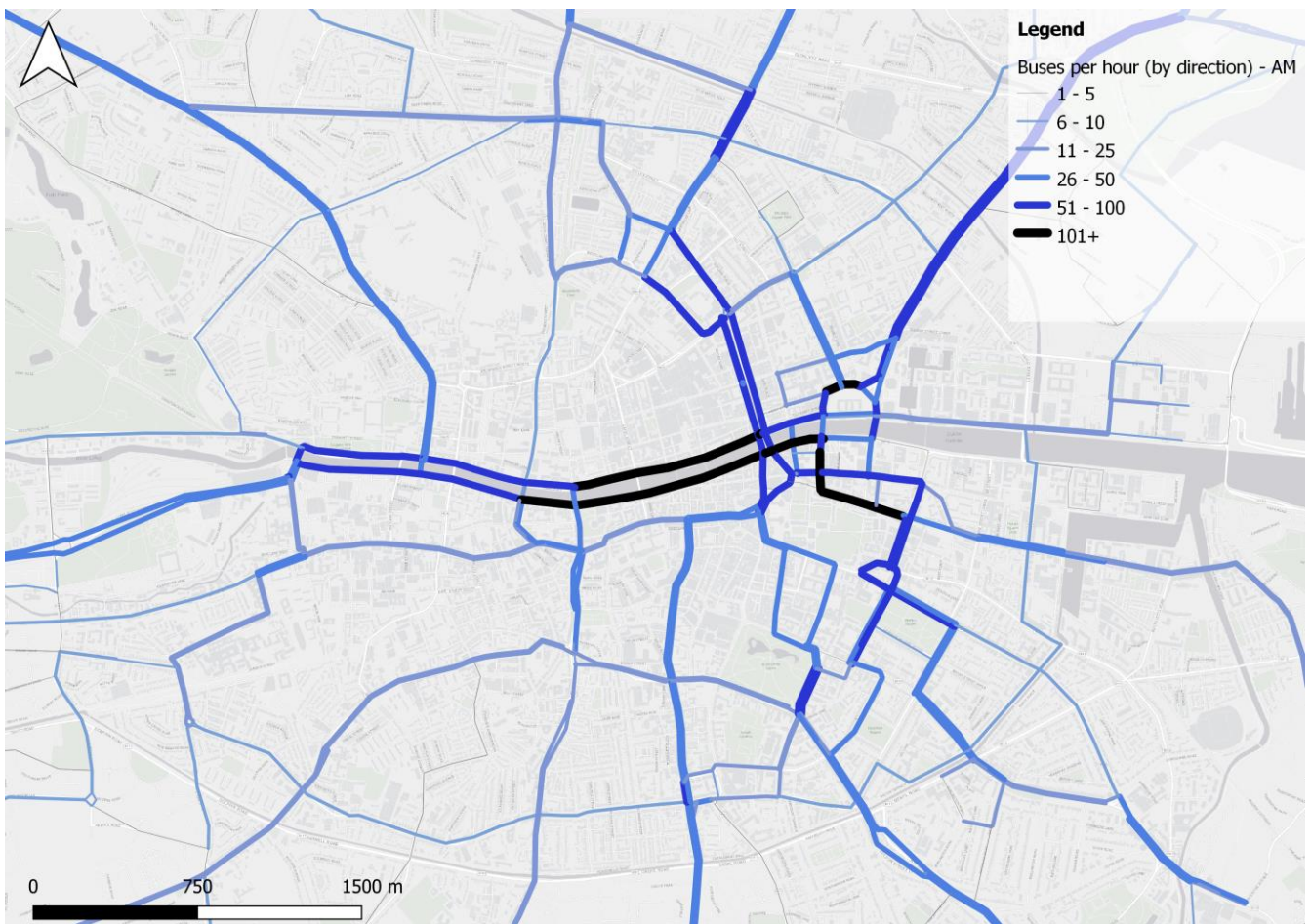


Figure 3-2 Scheduled BusConnects services (AM peak hour)

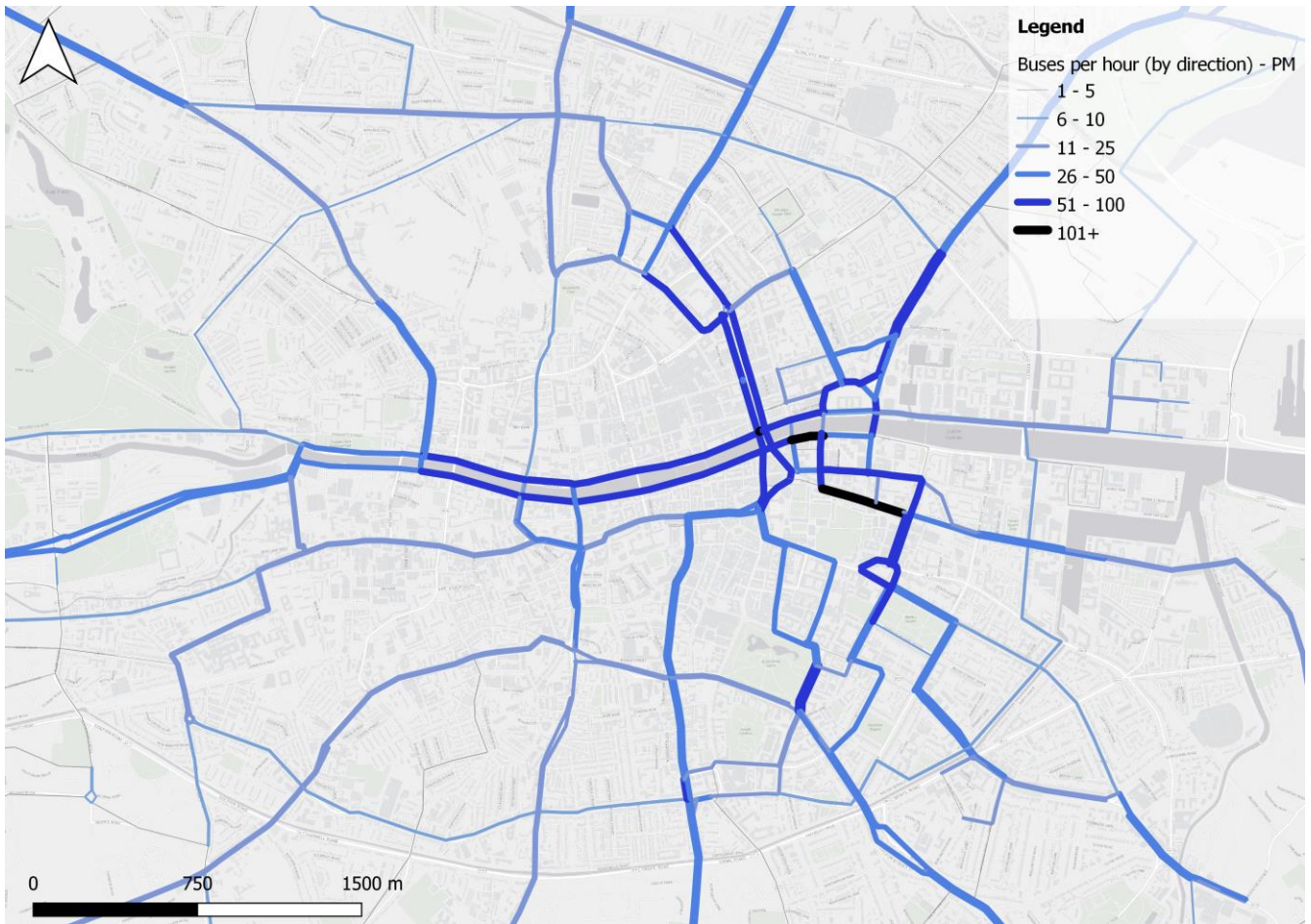


Figure 3-3 Scheduled BusConnects services (PM peak hour)

The highest scheduled frequencies in each of these peak hours are where spine routes converge, in particular along the Quays, O’Connell Street and the eastern side of the city centre.

Table 3-1 presents the number of scheduled BusConnects buses per hour at selected locations within Dublin City Centre during the AM peak hour (7am to 8am). The highest number of buses can be seen on the Quays, with up to 108 buses in the peak hour per direction, followed by Beresford Place (with 105 buses in the AM peak hour). Similarly, Parnell Square sees 87 buses in each direction in the AM peak hour, many of which also serve the O’Connell Street area.

Table 3-1: Number of Scheduled AM Peak Hour Services at Select Locations

Key Locations	Number of Services
Heuston Station	45
Wolfe Tone Quay	54
Smithfield (Arran Quay)	86
Bachelors Walk	108
Custom House Quay	45
Beresford Place	105
Parnell Square	87

Figure 3-4 shows the number of buses per hour serving the Quays at Bachelors Walk as presented in the service frequency charts for September 2022, which has been identified as a key destination within the study area. As shown, branches of the B, C, D and G Spines will serve the Quays, as well as radial routes (the routes with only numbers) and express and peak services (the routes beginning with X or P, respectively). In Figure 3-4, the number in the second row represents the hour

for which the data applies. The number in each column represents the number of buses in that hour for the respective route, which is shown in the first column. As can be seen the hour with the most services (the peak hour) is 07:00 to 08:00, with a total of 108 buses scheduled. During the peak hour, 8 buses will serve the Quays via each of the C1 and C2 branch routes, equating to a frequency of one approximately every 8 minutes, with other branch services being less frequent at 2 (every 30 mins), 4 (every 15 mins) and 5 (every 12 mins) buses per hour. The 37 will be the radial route with the highest frequency, offering 4 services per hour, whilst express and peak services will operate during peak hours only.

Route	Time of Day (Weekday)																
	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
B1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
B2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
B3	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
B4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
C1	8	6	2	2	2	2	2	2	3	3	8	2	2	2	2	2	1
C2	8	6	2	2	2	2	2	2	3	3	8	2	2	2	2	2	1
C3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
C4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
D1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
D2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
D3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
D4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
D5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
G1	5	5	4	4	4	4	4	4	5	5	5	4	4	4	4	4	2
G2	5	5	4	4	4	4	4	4	5	5	5	4	4	4	4	4	2
37	4	4	3	3	3	3	3	3	4	4	4	3	3	3	3	3	2
52	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
58	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
74	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
P29	2	1								1	1						
X30	4									1	2						
X31	3									1	2						
X32	1										1						
X25	2									1	3						
X26	1																
X27	3									1	3						
X28	2									1	2						
X55	3										2						
X56	1																
X58	2										1						
X62	4									1	3						
P64	3																
P65	3																
Sum	108	70	58	58	58	58	58	58	63	70	97	57	57	58	58	58	31

Figure 3-4 BusConnects Sample Frequencies of Services along Bachelors Walk

BusConnects Bus Stops

The bus stops associated with the Network Redesign will align with the locations of existing bus stop clusters, for example on O’Connell Street or St Stephen’s Green. However, the total number of bus stops may vary. Figure 3-5 and Figure 3-6 present the stop locations for BusConnects spine routes and radial routes, respectively, highlighting the cluster locations of bus stops along O’Connell Street and the Quays, where several routes converge.

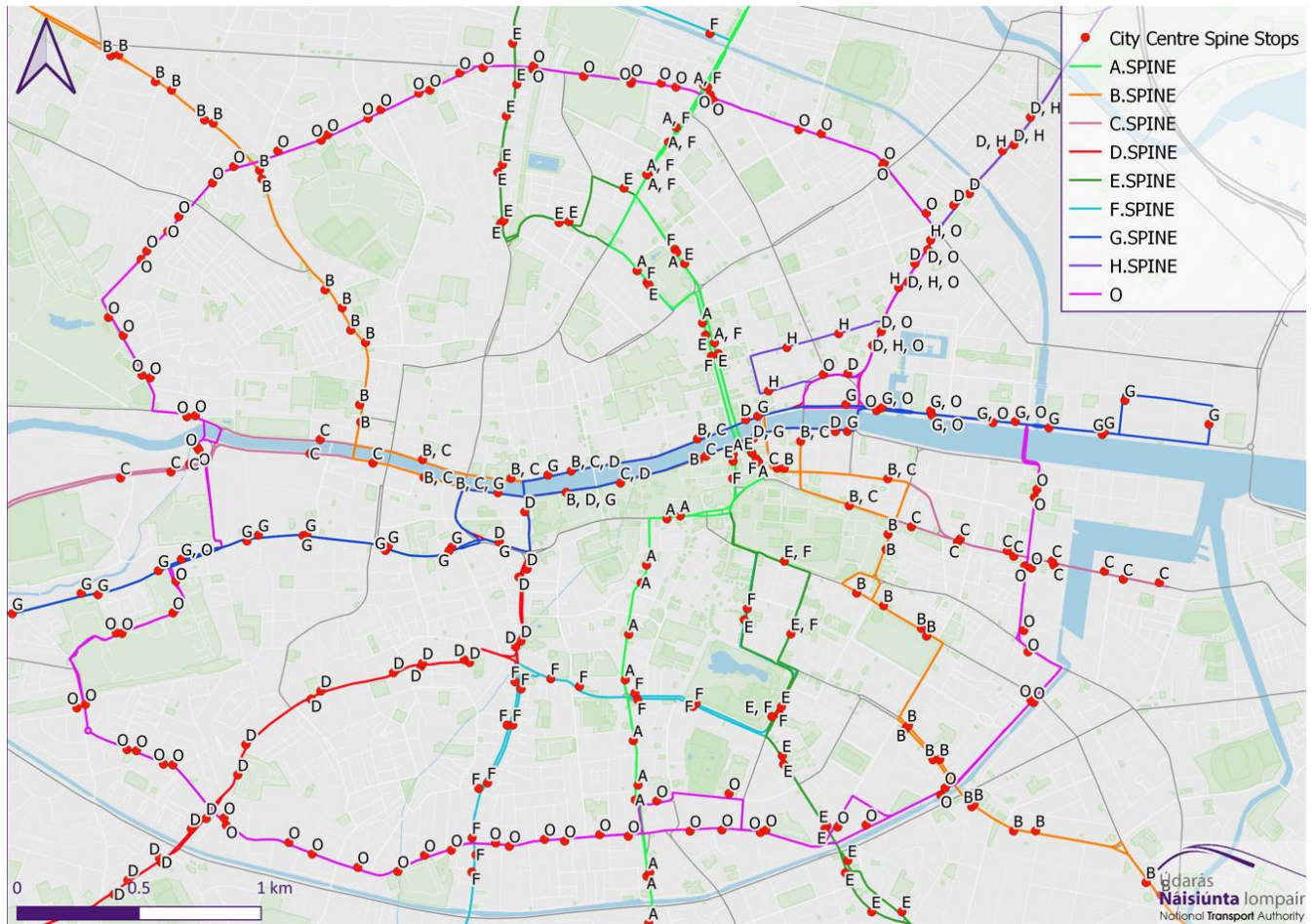


Figure 3-5: BusConnects Spine Stop Locations within Study Area (NTA)

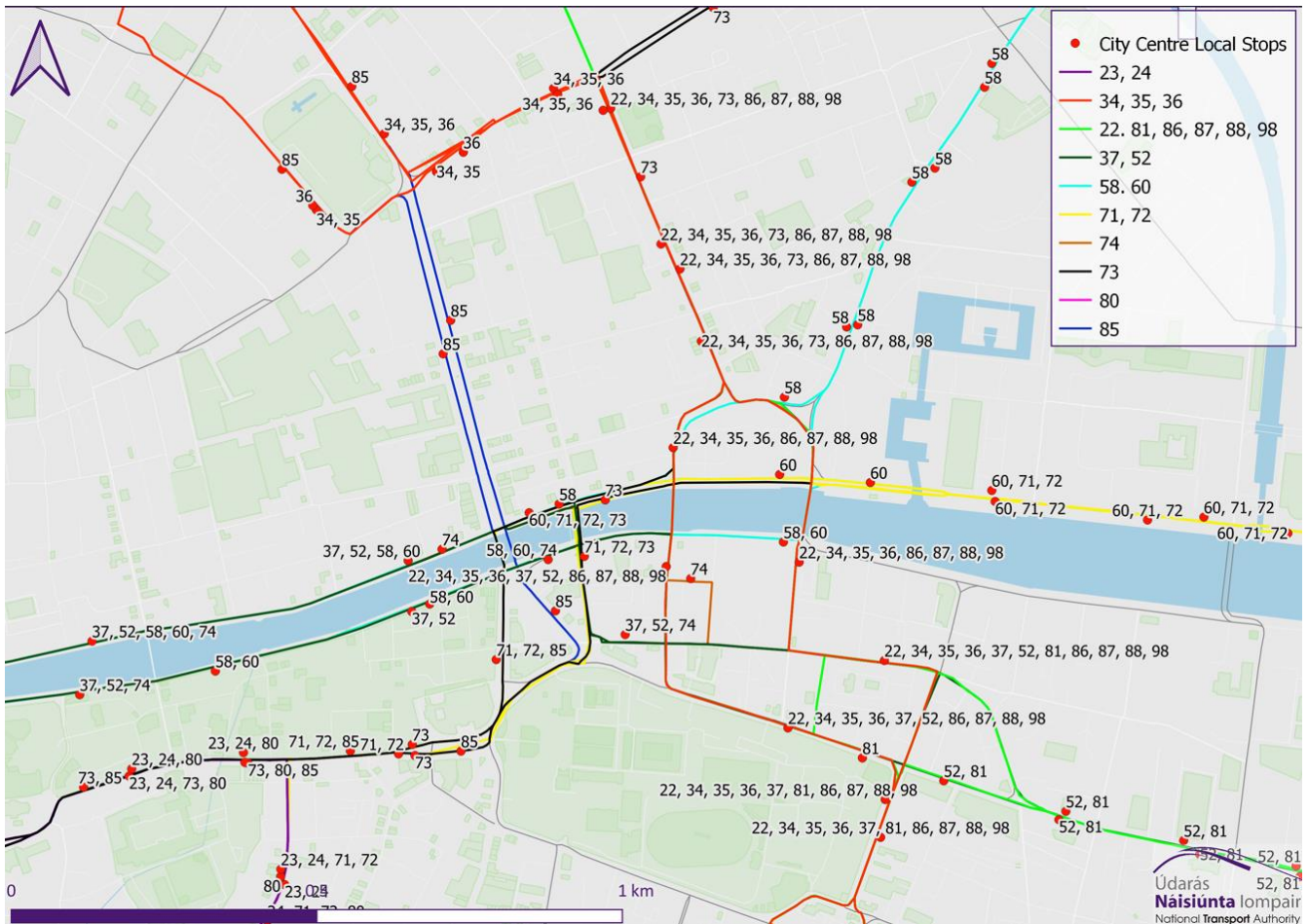


Figure 3-6: BusConnects Local Route Stops in Central Liffey Area (NTA)

Regional Bus Services

In addition to intra-urban bus services, Dublin City Centre is connected to locations throughout Ireland via a number of inter-urban bus, regional bus and coach services. Busáras Coach Station serves as a hub for many of these connections, though a significant number of them connect into other locations throughout the city. These services are operated by Bus Éireann and a number of private companies. The routing and stopping patterns of these services would need to be carefully considered to ensure that they don't conflict with proposals to other modes.

Interchange

Opportunities for bus-to-bus interchange will be possible at many locations throughout the city due to the high density of the planned redesign, as can be seen in Figure 3-1, Figure 3-5 and Figure 3-6. Additionally, most Luas stops will be served by buses, as will all rail stations within the city. Once MetroLink is operational, interchange opportunities between this mode and bus will also be very high, again due the proximity of bus services to planned stations.

3.1.2 Luas Network

The existing Luas network consists of the Green and Red Lines. The Green Line runs between Broombridge and Brides Glen via O'Connell Street. The Red Line runs between Saggart/Tallaght and The Point, serving both Heuston and Connolly Stations. Figure 3-7 presents the existing Luas network within the study area

Extensions of the Luas network to Finglas and Lucan are identified for consideration in the DCDP and Transport Strategy. The extension to Finglas will connect to the Green Line and the extension to Lucan will connect to the Red Line and both will reduce the need for car travel into the city centre. However, given that it is not a guarantee that these will be in operation by 2030, they are not considered as part of the receiving environment.

Interchange opportunities between Luas and bus will be very due to the high density of the bus network. Direct interchange between the Luas Red Line and rail will be possible at Heuston and Connolly Stations. While the Green Luas Line does not stop at any rail stations, the proximity of Tara Street Station to Abbey Street and Westmoreland Luas Stops (5-minute walk) means that interchange with a short walk will be possible. Interchange with MetroLink will be possible at the planned

stations at O’Connell Street (with the Luas Green Line at O’Connell Street and the Luas Red Line at Abbey Street) and at Charlemont (with the Luas Green Line).

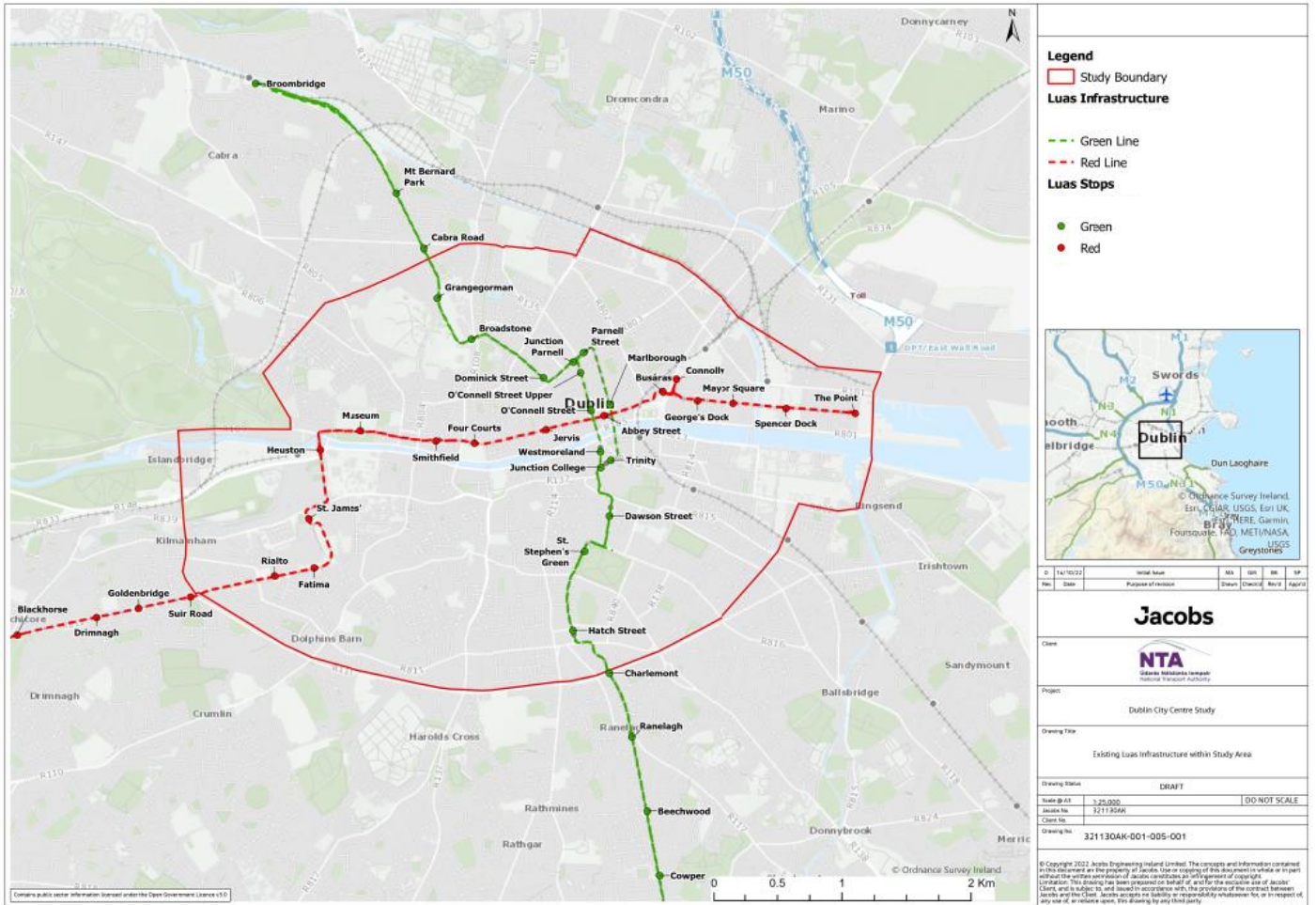


Figure 3-7: Existing Luas Infrastructure within Study Area

3.1.3 Heavy Rail

The heavy rail infrastructure in the study area is shown in Figure 3-8. Currently, the heavy rail network carries intercity services, the DART and commuter services, in addition to freight rail services which are covered in Technical Note 7: Goods Movement. It is expected that by 2030 the DART+ programme will be completed, which will electrify the remaining sections of rail network in the study area, as well as introducing higher frequency services and new rolling stock.

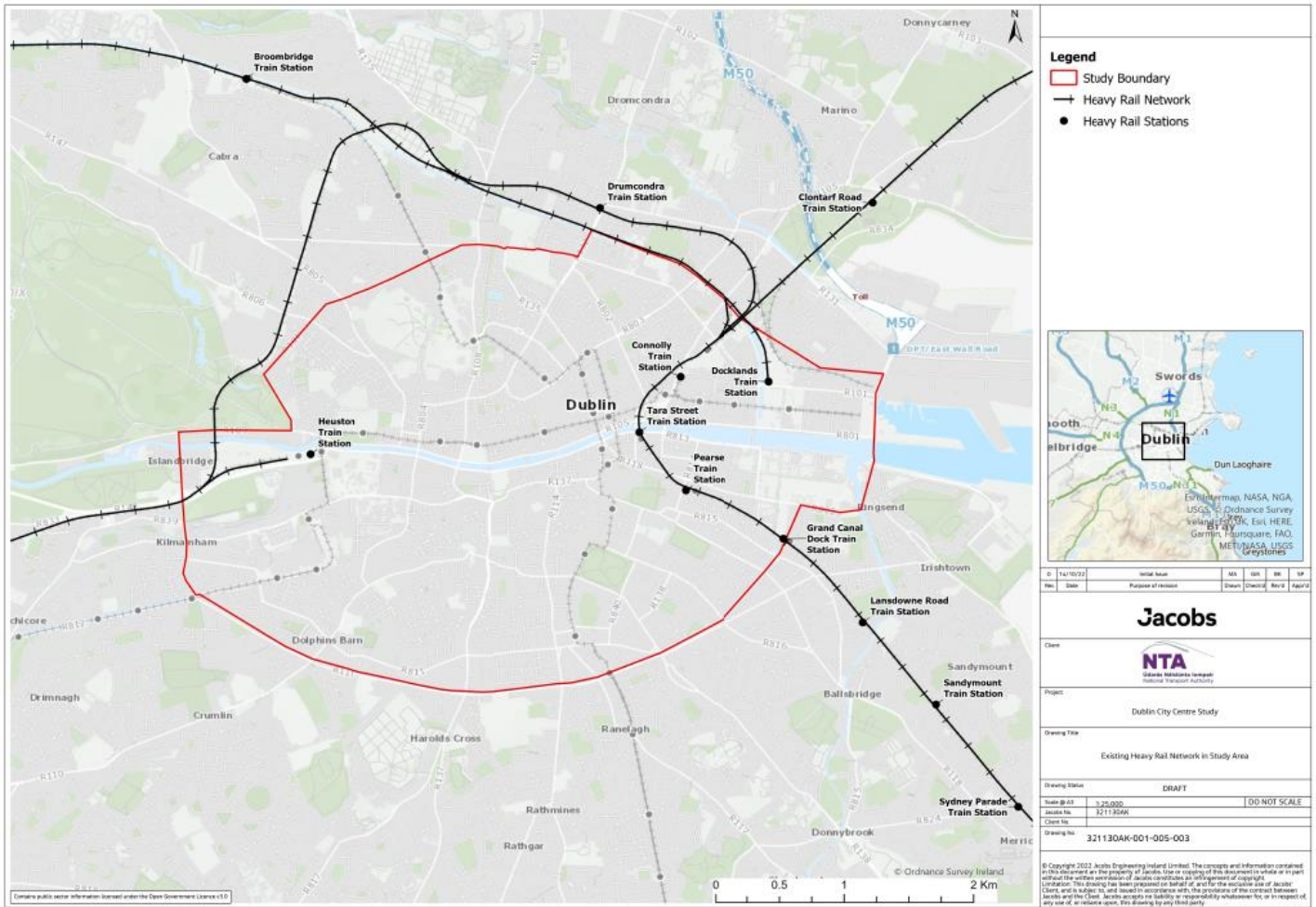


Figure 3-8: Existing Heavy Rail Network in Study Area

Intercity Services

Intercity services connect the capital to Ireland’s major cities and towns from Dublin Heuston and Dublin Connolly stations. Trains run to Belfast, Cork, Galway, Limerick, Rosslare, Tralee, Sligo, Waterford and Westport.

DART and Commuter Services

The study area is also served by the electric rail system, DART and the regular commuter rail services listed below:

- Dublin Northern Commuter service extends from Pearse Station in the city centre via Dublin Connolly Station to Dundalk.
- Dublin Portlaoise Commuter service extends South-West from Dublin’s Heuston Station.
- Dublin Longford Commuter service extends from Pearse Station via Dublin Connolly Station to Longford.
- Dublin Dunboyne/M3 Parkway service extends from Dublin’s Docklands/Connolly Station via Clonsilla to Dunboyne/M3 Parkway.
- Dublin Southern Commuter service operates from Dublin Connolly Station to Gorey Station.
- Phoenix Park Commuter services operate from Portlaoise through the Phoenix Park Tunnel to terminate in Grand Canal Dock.

DART+

DART+ is a programme to extend and electrify the DART network. It is split into the following four projects, in the order that they are to be operational: DART+ West, DART+ South West, DART+ Coastal North and DART+ Coastal South. Below, the enhancements relevant to this Plan within each project are listed:

- DART+ West:
 - Electrification from the City Centre to Maynooth;
 - City Centre enhancements at Connolly Station;
 - Combined Rail/Metro Station at Glasnevin;
 - Relocation of Docklands Station to integrate with the Luas; and
 - New grade-separated pedestrian, cycle and vehicle crossings as required.
- DART+ South West:
 - Electrification from Dublin Heuston to Hazelhatch-Celbridge;
 - Widening the railway corridor to four tracks between Park West Station and Dublin Heuston; and
 - Increasing the frequency of trains within Phoenix Park Tunnel by addressing constraints.
- DART+ Coastal North:
 - Re-configuration and upgrading existing rail depots at Fairview.
- DART+ Coastal South:
 - Elimination of level crossing to reduce rail/road conflict that limits train capacity; and
 - Provision of new grade separated pedestrian, cycle and vehicle crossings as required.

The current electrified DART network extends along the Coastal North and South routes from Malahide and Howth to Greystones, comprising about 50km. The DART+ programme will involve electrifying an additional 100km of rail lines, including the remainder of the Dublin heavy rail network, shown in Figure 3-8. This electrification will facilitate increased train capacity on the heavy rail network.

Some parts of the DART+ programme are expected to be completed by 2030, with other elements extending for the lifetime of the Transport Strategy (up to 2042) and potentially beyond. The implementation of DART+ will allow for increased passenger numbers. In terms of the receiving environment for 2030, while the heavy rail network's alignment or stations will not change within the study area, the DART+ programme will serve a higher travel demand and result in more passengers accessing (and interchanging at) rail stations in Dublin.

Interchange

Interchange opportunities with bus will be very high since all rail stations within the study area will be served by BusConnects services. Connolly and Heuston Stations will have interchange available with the Luas Red Line. Tara Street Station's proximity to Abbey Street and Westmoreland Stops on the Luas Green Line (5-minute walk to each) means that interchange will be possible with both Luas Lines. A new Iarnród Éireann (IÉ) station will be constructed at Glasnevin on the existing rail line, providing interchange with the Glasnevin MetroLink Station, and the existing station at Tara Street will offer the opportunity to interchange with the underground MetroLink Station planned for this location.

3.1.4 MetroLink

Whilst MetroLink is not anticipated to be operational by 2030, it is planned to be in construction by that time, with an expected opening year of approximately 2035. As the alignment and proposed stop locations have been planned, and the project's Business Case has been approved by Government, MetroLink has been considered part of the receiving public transport environment for this Plan.

Opportunities for interchange with other public transport modes will be present along the central and southern sections of the alignment. At Glasnevin MetroLink station, a new IÉ station will be constructed on the existing railway line to provide for interchange with the Maynooth and Kildare Lines. Tara Street MetroLink station will be underground adjacent to the existing Tara Street station and will provide interchange opportunities to DART and mainline train services.

Passengers will be able to interchange with Luas services near O'Connell Street Station (Luas Green Line at O'Connell Street Upper and Red Line at Abbey Street) and at Charlemont Station (Luas Green Line). Figure 3-9 presents the proposed MetroLink stations within the study area.

The opportunity to interchange between MetroLink and bus will be very high due to the amount of bus services planned to be in operation in proximity to each station.

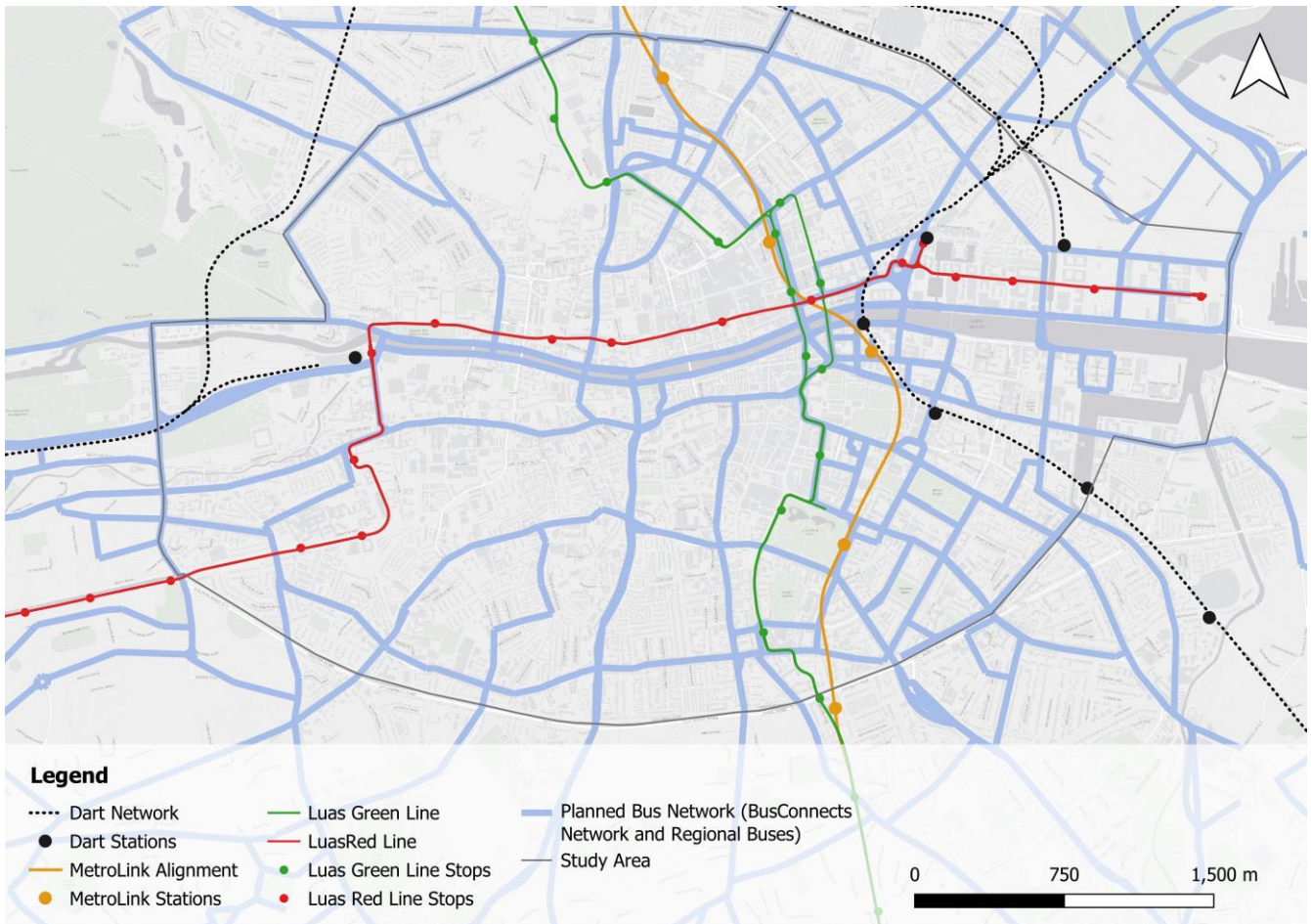


Figure 3-10 Future public transport network for study area

3.2.2 Key Public Transport Nodes

Within the study area, there are a number of key existing and future public transport nodes, shown in Figure 3-11 which offer interchange between the various public transport modes.

- Heuston: Heavy Rail Station offering direct interchange with Luas Red Line and bus network;
- Connolly: Heavy Rail Station offering direct interchange with Luas Red Line and bus network;
- Busáras: Bus Depot in close proximity to Luas Red Line and Connolly Rail Station;
- Docklands: Heavy Rail Station in close proximity to Luas Red Line;
- O’Connell Street: two Luas Green Line stops, in close proximity to the Luas Red Line at Abbey Street and bus network;
- Tara Street: Existing heavy rail station, with future direct interchange with MetroLink;
- Charlemont: Existing Luas Green Line stop offering future direct interchange with MetroLink.

The implementation of DART+ will further increase the interchange passenger volumes at heavy rail stations, by enabling higher frequency services.

The implementation of BusConnects will enable a high degree of opportunities for bus-to-bus, bus-to-rail and bus-to-Luas interchange at many locations. All major rail stations will be on the alignment of a number of bus services and many Luas stops will have a direct interchange with BusConnects services. Additionally, many BusConnects services will allow for important nodes to be ideal for bus-to-bus interchange, such as Christchurch and O’Connell Bridge.

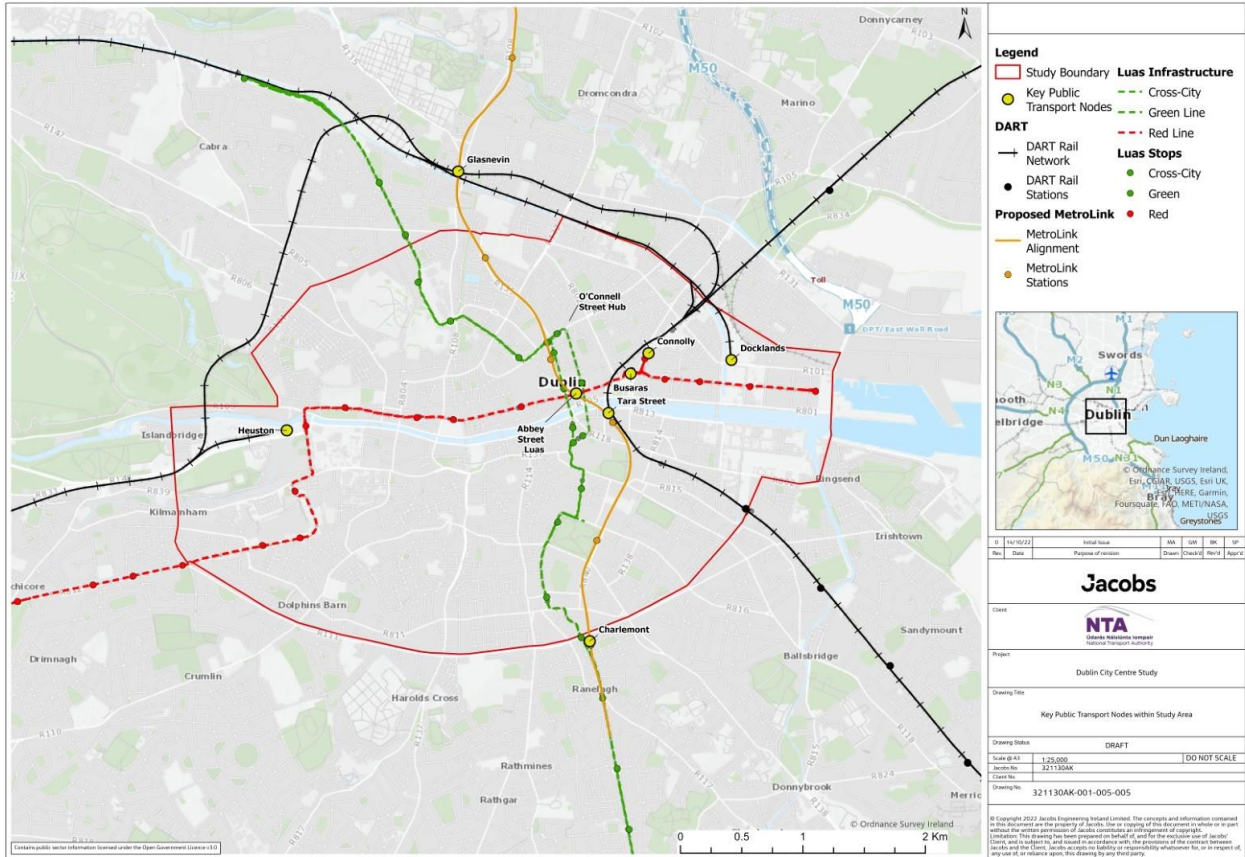


Figure 3-11 Key Public Transport Nodes within Study Area

4 PRINCIPLES FOR NETWORK DEVELOPMENT

Upon reviewing the policies and objectives in the DCDP and Transport Strategy, as presented in Chapter 2, a set of principles have been devised for how to assess and identify any changes to the preferred public transport network. These principles were developed to allow a modal shift to take place and to further integrate public transport with active modes. They are:

- Be accessible;
- Be direct, simple and legible;
- Be reliable;
- Connect people to where they want to go, when they want to go there;
- Be integrated with other transport networks;
- Be integrated with public spaces;
- Have simple and convenient interchanges; and
- Rationalise bus stops to optimise efficiency.

They were devised to allow effective integration with a multi-modal transport system based around active modes and public transport, which can incentivise a transition to a more sustainable mode share in line with the road user hierarchy. They can also be used to drive high quality interchange options at mobility hubs, thus providing legible and accessible options for users. Furthermore, Technical Note 3: Traffic Management creates a platform to provide more space and priority for public transport and for the development of longer-term sustainable transport projects which would further incentivise the shift to more sustainable modes of transport by allowing public transport to operate more efficiently within the city.

5 CHALLENGES AND OPPORTUNITIES FOR PUBLIC TRANSPORT

5.1 Overview

A public transport network has already been identified within the DCDP, Transport Strategy, and other relevant plan documents. This is the preferred network. However, challenges may arise in maintaining the efficiency and resilience of this network. Some of the key challenges to consider in delivering the future public transport network successfully are anticipated to be:

- Maintaining service frequency;
- Achieving desirable journey times;
- Maintaining journey time reliability;
- Providing attractive interchange opportunities; and
- Communicating with users.

The first three points all relate to ensuring that public transport services can move efficiently through the network with minimal fluctuation in journey times. This is especially relevant to bus and Luas networks, which can face delays due to congestion on the road network and conflicts with car traffic.

This section discusses options to address the increased movements on the road network. The challenges of providing an integrated network that promotes interchange, and of communicating effectively with users, are also explored here.

5.2 Allowing for Increased Movements

Travel to, from, and within Dublin City Centre is expected to increase by 2030 due to projected population growth. This increased demand may apply to all modes of travel.

In the case of the rail network, improvements under the DART+ programme will facilitate increased capacity by enabling higher-frequency services. The operation of these services will not be affected by road traffic due to the rail network being fully segregated, so the capacity increase can be addressed in isolation. However, buses and Luas share the road network with general traffic; and at city centre locations where services converge and road space is limited, maintaining service frequency and journey time reliability for buses and Luas can be difficult.

The BusConnects Network Redesign has multiple services converging at O'Connell Street and the Quays. While this will offer increased capacity and frequency, the presence of multiple bus stops at these locations may impact on journey times due to limited space for bus movements, busy activity at bus stops and junction constraints at O'Connell Bridge at which there is a confluence of many different modes. The highest number of BusConnects services on the Quays occurs during 07:00 and 08:00, during which there are approximately 108 buses planned in each direction along the Quays (NTA BusConnects Frequency Tables).

The East Regional Model (ERM), part of the NTA's Regional Modelling System, was also used as a data source as it contains information on non-BusConnects services. The ERM Reference Case 2028 in the AM peak hour indicates approximately 31 non-BusConnects buses utilising Bachelors Walk, making a total of 139 buses using Bachelors Walk in the AM peak hour.

Approximately 187 buses (a combination of BusConnects and non-BusConnects services, both directions) will be utilising O'Connell Bridge in the AM peak hour, indicating high levels of convergence in this area. These services, along with general traffic movements and cyclists and pedestrians, will interact with the Luas Green Line on O'Connell Bridge. This area will have a demand for movement by many modes, including public transport and walking and cycling, creating a high potential for network congestion, reducing journey time reliability and efficiency for public transport and increasing the safety risks for road users.

While much of the existing Luas network has dedicated lanes which provides for segregated running of trams, parts of both the red and green lines must share road space with other traffic (Shared Tramways). Luas services also cross many road junctions. Together, Shared Tramways and junctions make up 9% of the Luas network².

The Transport Strategy notes that in the future, on some corridors in the city, the bus network will be insufficient to accommodate the anticipated travel demand and a light rail alternative may be the preferred solution for these corridors. This will reduce bus movements on these corridors and potentially at these areas of high demand, however these potential Luas corridors will not be delivered within the timeframe of this Plan.

Increased bus, Luas and traffic movements are expected to exacerbate conflicts between these modes in the city centre, posing a challenge to efficient and reliable operation of the bus and Luas networks. In response, the following high-level options have been identified:

- Option 1: Do Nothing (Implement the planned bus network without changes to the bus or road networks);
- Option 2: Revise the planned bus network to reduce numbers of bus services converging in busy areas; or
- Option 3: Implement traffic management solutions to reduce conflicts from private traffic (retaining the planned bus network).

These options are explored in the following sections.

5.2.1 Option 1: Do Nothing

The “Do Nothing” option is to implement the public transport network as planned, without any changes to the bus or road networks; buses, Luas and general traffic would continue to share the road network throughout the city.

However, with bus frequencies and traffic levels both expected to increase, this is anticipated to lead to increasing congestion with the potential to cause delays to both buses and cars in the city centre. Without any intervention, it will become increasingly difficult for the public transport network to operate efficiently and reliably. Congestion on the road and overcrowding on services will create an unattractive experience for public transport users. Higher traffic levels also mean increased safety risks to vulnerable road users, including pedestrians and cyclists who may be accessing public transport services.

An intervention of some form is therefore essential to maximise the benefits of the future public transport network.

5.2.2 Option 2: Revising Bus Network

One option that was considered involved revising the bus network to reduce numbers of services converging in areas such as the Quays. The service frequencies and ability to interchange are key features of BusConnects, so reducing frequencies or removing stopping locations were ruled out. However, this potential option involved considering whether a spine route could use a different path through the city centre.

As an example, an alternative routing for the BusConnects D Spine is presented in this section. The current and alternative routing for the BusConnects D Spine are both shown in Figure 5-1.

BusConnects D Spine Alignment

At present, the planned inbound routing of the D Spine in BusConnects travels southbound on Amiens Street and Talbot Memorial Bridge, before turning onto the South Quays and continuing westbound. It then turns onto Lower Bridge Street towards Christchurch and Patrick Street, serving the Cork Street to Crumlin Road corridor in the south-west of the city. For the outbound journey, the service utilises Cork Street and Patrick Street as well, however continues via O’Donovan Rossa Bridge and eastbound along the North Quays, then continues east to Beresford Place and northbound on Amiens Street out of Dublin City Centre.

A revision to the D Spine route was considered, which would divert away from the Quays by utilising Moss Street (south of Talbot Memorial Bridge), and routing via Pearse Street, Kildare Street, Saint Stephen’s Green East and South, and Kevin Street in the west before re-joining the Cork Street corridor. This would require a change to Pearse Street to allow two-way bus travel on a section of it between Moss Street and Westland Row.

² <https://luas.ie/safe-driving-around-luas.html>: “There are over 37km of Luas tram lines in Dublin. Together Junctions and Shared Tramways make up 9% of the Luas tracks.”

This revision would maintain coverage in the north-east and south-west of Dublin City Centre, whilst reducing the volume of services utilising the Quays. The revised routing would maintain interchange with the heavy rail network and with the Luas Red Line at Connolly Station, as well as maintaining proximity to interchange with the Luas Green Line at Saint Stephens Green and Dawson Street. Additional interchange opportunities could be created at Pearse Street with both the heavy rail network (south-eastern services that do not stop at Connolly Station) and BusConnects Spine B and Spine C, and potentially with the future MetroLink station on Saint Stephen’s Green East and BusConnects Spine E and Spine F on Saint Stephen’s Green.

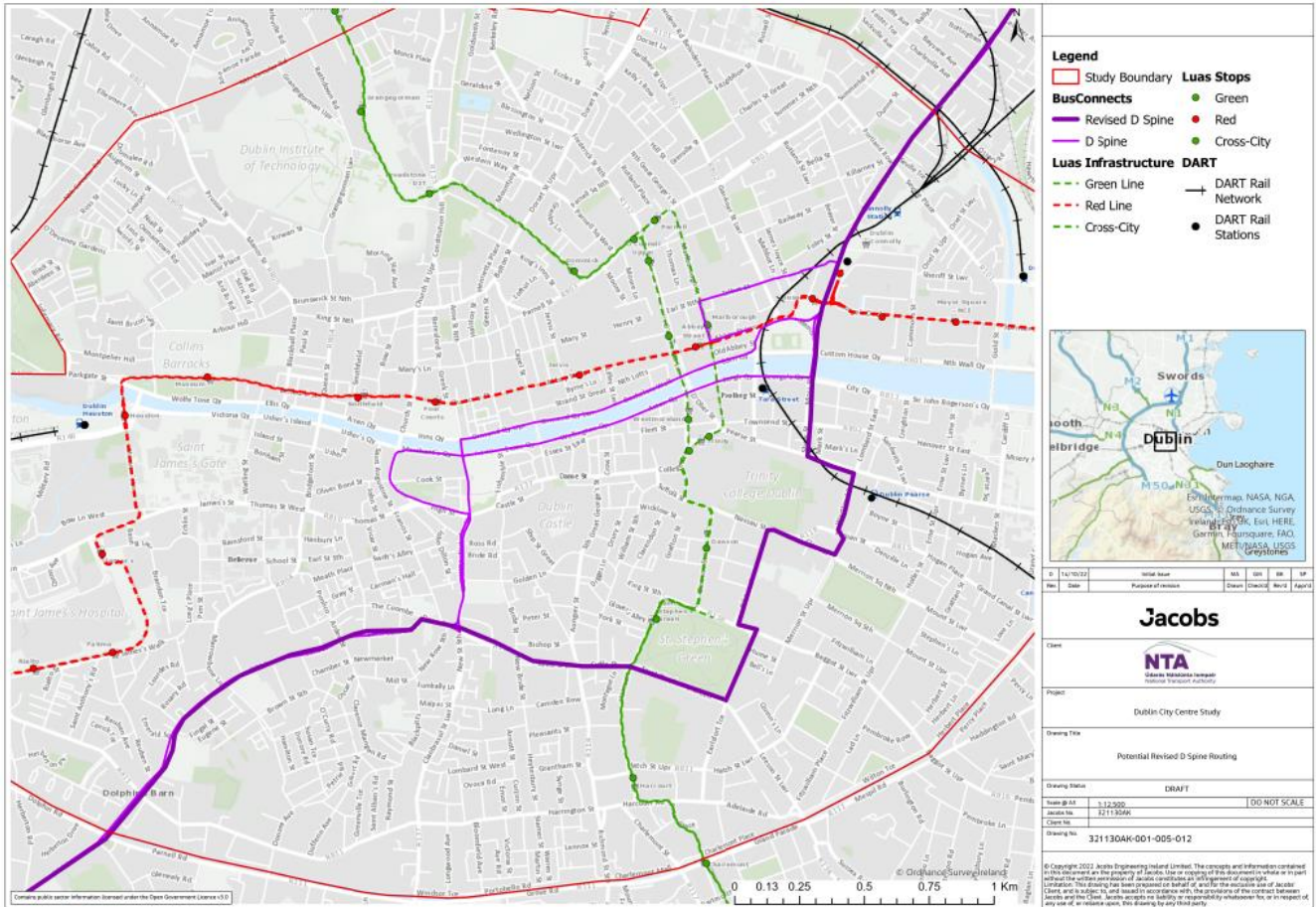


Figure 5-1: Potential Revision to BusConnects D Spine

However, this revised route would disadvantage passengers travelling on the D spine to reach the core city centre. It would also require extensive investigation into altered stop locations, and how the rest of the bus network would be impacted.

The BusConnects network has been designed as a whole, with the routes working together to form a cohesive network. Any changes to redirect routes away from busy areas would also mean reducing potential interchange opportunities for passengers. Additionally, while this might alleviate the problem of congestion in busy areas, conflicts between buses and traffic will still occur so the issue would not be resolved as whole. Due to this, it was found that revising the BusConnects spine routes would not be the preferred solution to address the challenge of maintaining public transport reliability amidst increased movements. This potential change to the D spine was therefore not taken forward. Similarly, revisions to the E and F spines were considered, and also ruled out.

Routing Buses on Luas Red Line

The Luas Red Line alignment runs parallel to the Quays, and therefore, the possibility of utilising the Luas Red Line corridor for bus routing as an alternative to the Quays arose as an option. This is discussed in more detail below.

At present, the Luas Red Line traverses from Heuston Station along Benburb Street, Chancery Street, and along all sections of Abbey Street (Upper, Middle and Lower) through Dublin City Centre. Therefore, in theory, some of the buses that serve the Quays could instead share the Luas Red Line alignment, to facilitate a reduction in services utilising the Quays and relieve operational pressure on the Quays. Additionally, there are other areas of Dublin City Centre where bus services share Luas alignments, such as on Dawson Street, and at St James’ Hospital.

As the bus corridor would follow the same alignment as the Luas Red Line, the overall accessibility of the public transport network would not be improved, nor would it offer any interchange benefit as the services would offer coverage of the same areas.

However, from the perspective of the Luas network, the conflict with buses could impact the efficiency and reliability of the Luas network. There are also physical constraints associated with implementing this. For example, at present, there is insufficient width at Luas stops, such as at the Four Courts and Smithfield, to accommodate buses overtaking trams; and to address this problem, reconstruction works on both the Luas tracks and platforms would be necessary, which would be costly, and would disrupt Luas Red Line services for approximately 1-2 years, and would incur high costs to implement.

Therefore, this option has not been progressed any further.

5.2.3 Option 3: Traffic Management Plan to Reduce Conflicts with Private Traffic

Private traffic makes up a large proportion of vehicles on the road. A reduction in private traffic volumes would make more road space available. This space could then be reallocated to sustainable modes, allowing more room for public transport as well as walking and cycling. Increased space and reduced traffic volumes would enable buses and Luas to operate more efficiently. This option involves implementing a traffic management solution that would move general traffic away from high-volume areas to facilitate movement of sustainable modes. Technical Note 3: Traffic Management proposes a strategy for achieving this reallocation of general traffic by creating a platform that enables a higher degree of movement by sustainable modes.

Reducing cars in the city centre would create an opportunity to prioritise sustainable movement of people over private vehicles. Benefits for the public transport network would include:

- More efficient operation of Luas and buses with reduced delays;
- More reliable journey times for Luas and bus;
- Potential to increase capacity of Luas and bus services; and
- Safer and more attractive environment for accessing public transport and interchanging.

The arrangement would also offer opportunities for better public space and better environment and infrastructure for walking and cycling.

As an example, a potential configuration for the Quays was investigated to explore how road space could be reallocated in the absence of vehicular traffic. Figure 5-2 presents a potential cross-section for the North Quays. This example involves removing through-traffic, while facilitating access by allowing cars onto certain sections of the Quays. With less space required for cars, the existing footpaths could be widened, and a high-quality, two-way cycle-track provided. By providing more space to pedestrians and cyclists and minimising their interaction with traffic, the Quays could be made a more attractive hub to access public transport.

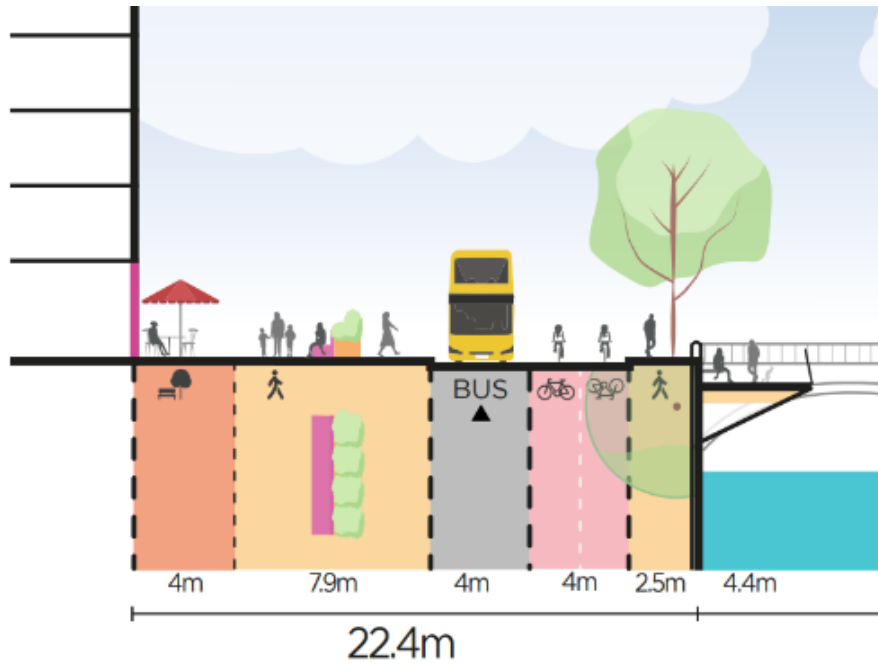


Figure 5-2 Potential configuration of North Quays

A Traffic Management Plan would enable similar opportunities in locations throughout the city centre. The reduction in traffic would create opportunities to reallocate road space to walking, cycling and public transport infrastructure, promoting a shift to sustainable modes. This option therefore has the potential to address increased movements into the future and support efficient and reliable operation of the public transport network.

5.3 Integrated Network Promoting Interchange

Each mode of the public transport network forms part of a wider transport system. Interchange is an essential part of this system, allowing connections to more locations while focusing on direct, high-frequency public transport routes. This includes opportunities to interchange between public transport services and:

- Other services of the same mode (e.g. bus to bus or train to train);
- Other public transport modes including bus, DART, Luas and eventually MetroLink; and
- Private car through Park & Ride facilities.

Integration with the city’s walking and cycling networks is also crucial to maximising the benefits of the public transport system. Active modes provide options for passengers to travel the distance from their origin point to a public transport service, or from the service to their end destination. These components are the ‘first and last mile’ of a journey.

This section discusses opportunities for providing an integrated public transport network, involving consideration of the first and last mile as well as how to provide attractive interchange options.

5.3.1 First and Last Mile

Public transport journeys typically involve one or more legs of travel to and/or from the public transport service.

In some cases the distance may be short and walkable, especially for trips within the city centre where services and stops are more densely located. Thus, within a city centre context, walking and cycling are often appropriate options for the first and/or last mile of a journey.

The public transport network should facilitate safe and efficient connections with the walking and cycling networks. By providing appropriate footpath width and pedestrian crossings in the vicinity of public transport nodes, walking to and from the nodes can be made more attractive. Similarly, the cycling experience can be enhanced by linking the cycle network with secure, high-capacity bike parking as close as possible to public transport nodes.

In other cases, where passengers are further from public transport connections, the first and last mile can form a significant part of the journey and affect the choice of mode, making options such as park and ride more attractive. Demand Responsive Transit (DRT) could be a sustainable alternative for longer first and last mile travel. This could involve shared mobility

services such as on-demand buses or shared taxi. Services like these would make use of technology to process passenger requests in real-time and plan efficient routes responding to the level of demand and passenger locations.

The more attractive and direct the first and last mile connections are, the larger the public transport catchment. Improving the first and last mile experience can therefore increase the number of potential public transport users, and contribute to a shift in mode share towards more sustainable modes.

5.3.2 Interchange locations

There are many locations in Dublin City Centre where public transport services overlap or intersect, providing opportunities to interchange. An assessment was carried out to quantify the interchange potential of locations throughout the study area by considering the number of interchanges with other services available. The assessment took into account BusConnects Spines, Luas stations, DART stations and future MetroLink stations. The number of interchange opportunities from the selected location, the distance to these services and the types and capacities of transport modes available for interchange were considered. These were then used to assign each location with a numerical score.

Based on the score calculated, interchange locations have been categorised as one of the following:

- Very High Interchange Potential;
- High Interchange Potential;
- Medium Interchange Potential; or
- Low Interchange Potential.

Figure 5-3 presents the locations with Medium to Very High interchange potential, within the context of the surrounding public transport networks.

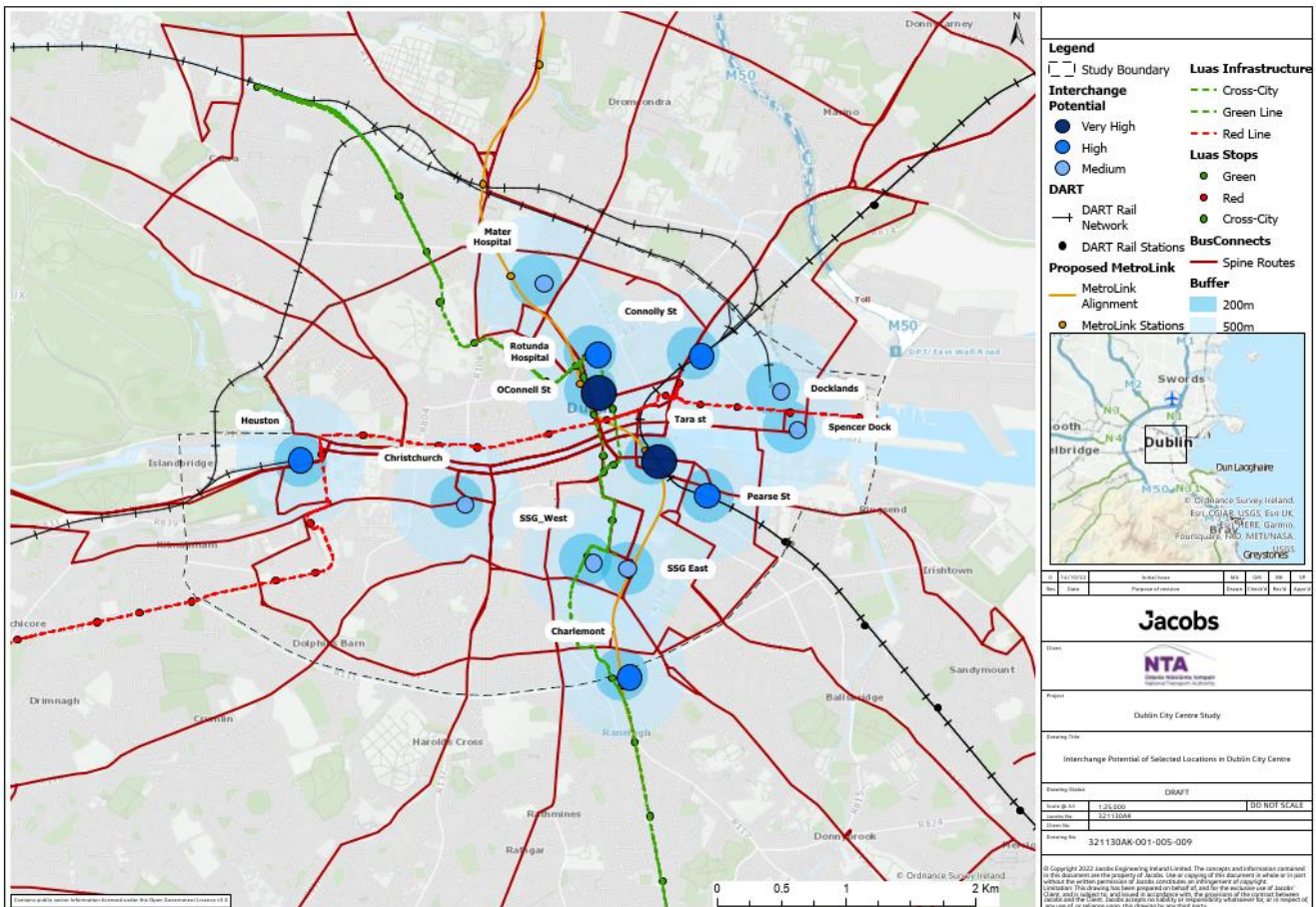


Figure 5-3: Interchange Potential of Selected Locations in Dublin City Centre

The locations with the highest interchange potential, rated Very High, were found to be O’Connell Street and Tara Street. These offer the most attractive interchange opportunities due to the number of BusConnects Spines within the vicinity, the proximity to Luas and DART stops, and proximity to future MetroLink stops.

Charlemont, Heuston Station, Connolly Station, Pearse Street and Rotunda Hospital all have High interchange potential. While Heuston and Connolly are not in close proximity to future MetroLink locations, they connect to the heavy rail network as well as Luas and BusConnects services. Conversely, Rotunda is not part of the heavy rail network, but is close to the future O'Connell Street MetroLink stop and also offers interchange with the Green Luas line and most BusConnects spines.

Additionally, under BusConnects, bus-to-bus interchange locations will exist throughout the city due to the convergence of many routes at a single location. Many of these occur at locations rated High or Very High in Figure 5-3 above. Other examples of bus-to-bus interchange locations include O'Connell Bridge, Christchurch, and Parnell Square.

5.3.3 Attractive Interchange

There is another challenge in making interchange an attractive option. Passengers may experience some additional travel time as well as a loss in comfort when changing to another service (compared to being able to make their whole journey on the same service). This can be offset by:

- Minimising journey times on routes, so that the overall journey time is still attractive (which can be supported by public transport prioritisation on the road network);
- High-frequency services, to minimise waiting time;
- Intelligent route planning to communicate options for interchanging between modes and services;
- Providing comfortable and safe waiting areas; and
- Accurate real-time information, so passengers know when the next service will arrive.

There is an opportunity to develop some of these High potential and Very High potential interchange locations further into mobility hubs, consolidating public transport services. At these major interchanges, shared mobility and micro mobility options could be considered, and significant numbers of secure and sheltered cycle parking and supporting services could be provided. Taxis could also play a part in the overall public service offer at these locations. Figure 5-4 presents an example image representing a mobility hub which incorporates these services.



Figure 5-4 Representation of a mobility hub (CoMo UK)

At Heuston Station, the Luas Red Line and heavy rail network are effectively integrated; this could be strengthened further with bus services terminating at this location, as well as the provision of cycle parking. Similarly, mobility hubs could be developed at Connolly and Busáras stations, which are also in close proximity to the Luas Red Line. When MetroLink is operational in 2035, direct interchange with the heavy rail network will be present at both Glasnevin and Tara Street stations, with direct interchange with the Luas Green Line present at Charlemont.

Interchange will form a key part of the overall public transport network, and will rely on the network operating efficiently and reliably.

5.4 Communicating with Users

Public transport users in the future will consist of a mix of existing and new users; some people may already be very familiar with the existing system, while there will also be people who have newly moved to Dublin, newly begun to travel independently (e.g. teenagers), or are switching from another mode of transport. Information about public transport must be clearly communicated to meet the needs of all users.

This will include providing the basic information required to use public transport, such as route maps and timetables. The more legible and accessible this information is, the easier it will be for public transport to navigate the network and keep up to date with changes over time.

There will also be opportunities to maximise the benefits of public transport by making effective use of technology. For example, static information on routes and timetables can be expanded on by interactive services like the Transport for Ireland (TFI) Journey Planner to allow users to plan journeys and interchange. Real-time data can further improve the user experience. This could involve tracking service locations, or potentially more detailed information on the services, such as occupancy levels.

Currently, the TFI Journey Planner presents users with journey options that may include multiple public transport modes and short walking legs. It also incorporates some real-time information to provide live departure times for services where available. In the future, this could be further expanded to include mixed-mode options which could also involve travel by private car, taxi or bicycle for part of the journey.

Clear communication will become increasingly important as the public transport network continues to develop. The key components of this are:

- **Collating and processing information:** Public transport information will come from a wide range of sources, including both static and real-time data. Increasingly large quantities of data will need to be collected, stored and transferred appropriately.
- **Presenting and sharing information:** Information can be made available to users in various ways, including:
 - Real-Time Passenger Information (RTPI) displays at stops and stations;
 - Static information such as brochures and posters;
 - Transport for Ireland app;
 - Transport for Ireland website;
 - General Transit Feed Specification Realtime (GTFS-R) format data provided through the NTA's Application Programming Interface (API); and
 - Third-party solutions making use of open data.

Providing information in different forms is important to meet the needs of all users. In each of these cases, it is important that users have access to the information relevant to them, and that it is presented legibly.

- **Ensuring reliability:** Users must be able to rely on the information provided to them. Where changes are made to the network (such as a change in route, new timetable or cancelled service), this must also be reflected straight away in digital information. Any physical information sources (such as posters at bus stops) should show the date they were created, and advise users how to check for updates.
- **Responding to data:** Efficiency and resiliency of the public transport network can be promoted by responding in real time to available data. This may include:
 - Temporarily increasing frequency of scheduled services during unexpected peaks in demand;
 - Managing road traffic and traffic signals to prioritise public transport based on real-time demand; or
 - Operating Demand-Responsive Transit (DRT), whether for first- and last-mile services or longer routes.

As technology continues to develop, additional digital opportunities will likely become available. The public transport network should continue to make use of emerging technology to provide the best user experience possible.

6 FURTHER CONSIDERATIONS

In addition to the proposals discussed in Section 5, this section presents items that could be considered to further develop and enhance the public transport network in the future.

6.1 Connecting the West of the City

The future public transport network outlined in Section 3.2.1 provides connections and interchange points throughout the study area. However, the density of public transport serving areas in the west of the city, such as the Liberties, is limited compared to other parts of the city. Passengers accessing public transport in the west of the city may have a longer first / last mile and fewer interchange opportunities than passengers in the east.

This could be offset by re-routing existing bus services to pass through underserved areas in the west of the city. For example:

- Route 37 (Wilton Terrace – Blanchardstown Shopping Centre) currently travels along the Quays in each direction. A potential rerouting off the quays could better serve the west of the city, for example travelling on Thomas Street then Bridgefoot Street or Watling Street rather than remaining on the Quays, as depicted in Figure 6-1;
- The 23 and 24 could use similar routing instead of crossing the Liffey at Father Matthew Bridge; or
- The proposed 74 route, which will link Dundrum and Whitechurch to the city centre, could be revised to take a different path through the south-west of the study area.

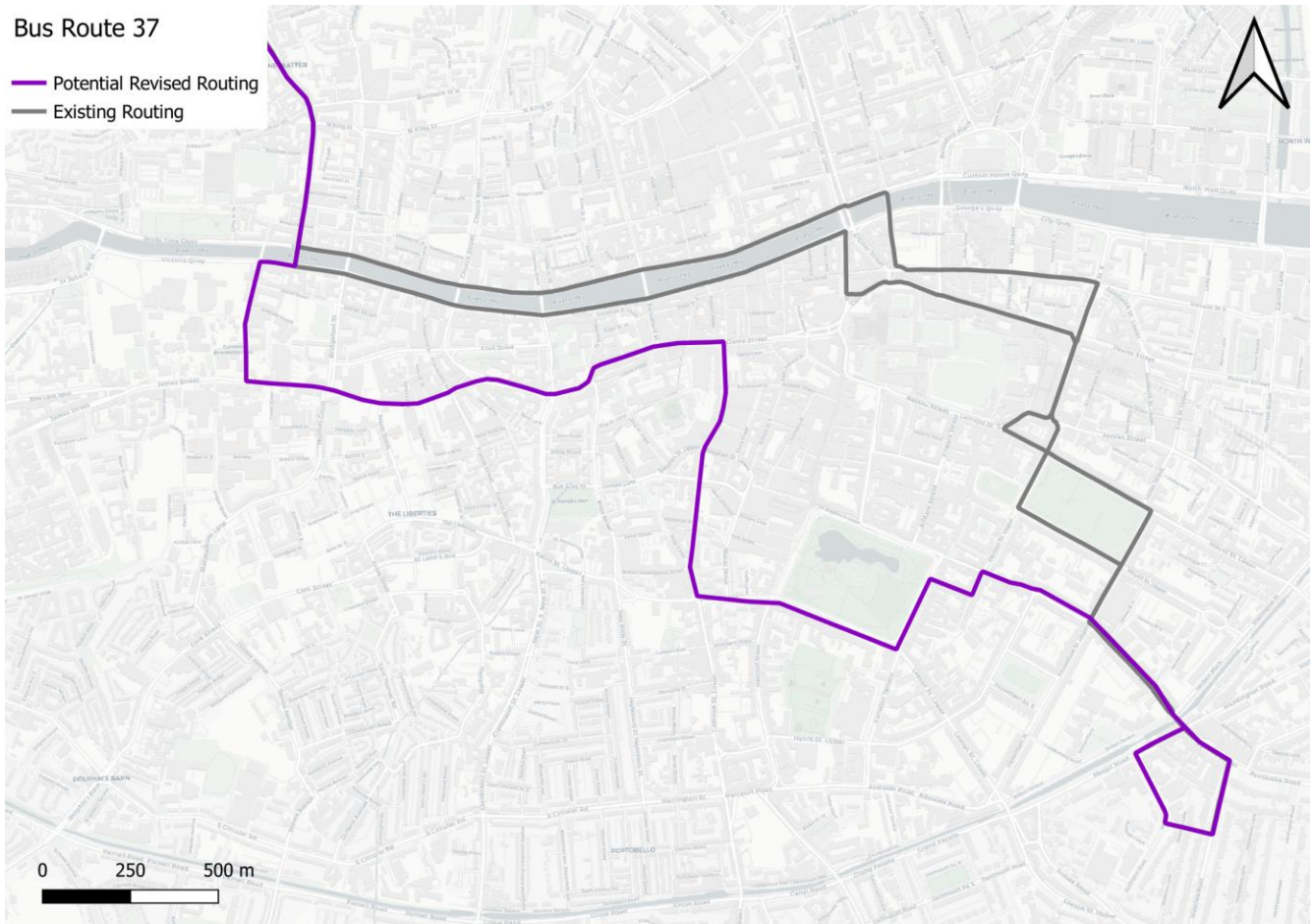


Figure 6-1 Potential revised routing of bus route 37

Such re-routings could spread the available bus services out further, allowing for a larger public transport catchment.

6.2 The City Centre Quays

To facilitate greater pedestrian movement and public realm space on the North Quays, bus lines could be progressively routed via the South Quays. For example, regional buses could be moved to the South Quays, as they require less stops. If an efficient stopping pattern can be established along the South Quays that doesn't impede the quality of service of the routes, it may be possible in the future to move all bus services from the North to the South Quays. A phased approach could be set up to achieve this to ensure that it is done in a systematic way that retains a high level of service and reliability.

6.3 Pearse Street

At present, Pearse Street is identified as a 'Linking Route' for pedestrians under DCC's The Heart of Dublin: City Centre Public Realm Masterplan, connecting to the Secondary Network on Nassau Street, and to the Primary Network along the Quays. It is also identified as a Primary Radial Route within the GDA Cycle Network, linking to the Primary Orbital network in the east which serves the Quays. Therefore, it has a strong function within the active travel networks, presenting an opportunity for this to be enhanced further.

From a public transport perspective, Pearse Street is located along the proposed BusConnects B and C Spine routes, as well as being served by multiple radial routes. These are high frequency services with headways of approximately 2-5 minutes. As a result, Pearse Street has a prominent movement function within the public transport network and thus presents an opportunity to strengthen its role by creating a central bus stopping location away from both the Quays and O'Connell Street, with opportunity to interchange with the heavy rail network at Pearse Station.

The recommendations in Technical Note 3: Traffic Management are expected to lead to a reduction in private vehicle volumes. This is supported by modelling and analysis using the East Regional Model (ERM). With this potential reduction in private vehicle volumes, there may be an opportunity to reconfigure traffic arrangements on Pearse Street and reallocate road space to public transport, thus enhancing the public realm and developing the potential for a sustainable transport hub.

Figure 6-2 presents the potential lane reconfiguration on Pearse Street to prioritise public transport and active travel movements.

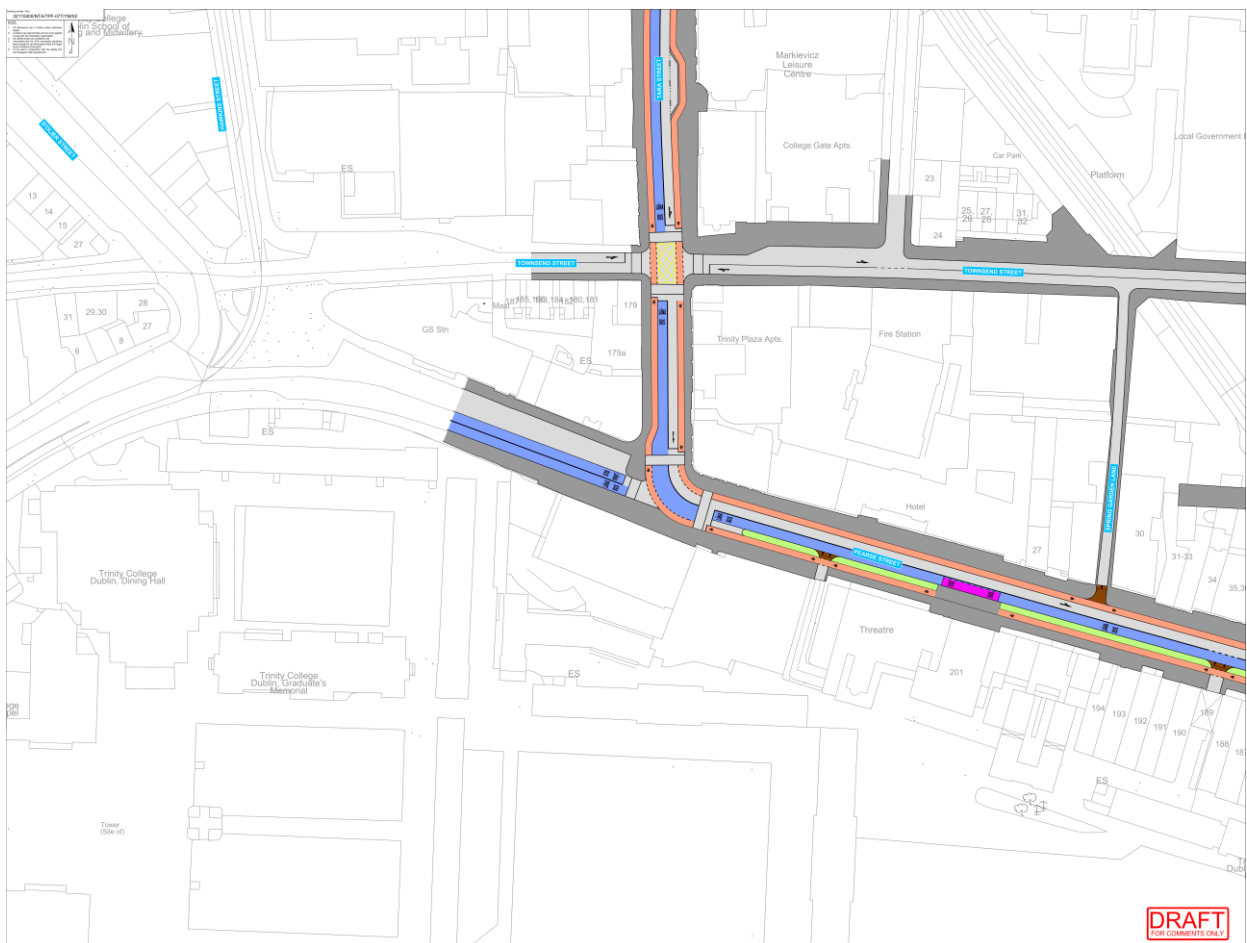


Figure 6-2: Potential Reconfiguration of Pearse Street to Prioritise Active Travel and Public Transport Movements

6.4 D'Olier Street

At present, D'Olier Street has four general traffic lanes, however the nearside (leftmost) lane is occupied by several bus stops and this is a prominent bus stopping location for many bus services. The possibility of reconfiguring D'Olier Street to facilitate two-way bus flow has been examined. This would simplify the bus network in this area, allowing passengers to access buses in either direction from the same street rather than having to use stops on different streets.

This opportunity would complement the potential reconfiguration of Pearse Street; if implemented, the reconfiguration of D'Olier Street to also allow two-way bus flows would enable continuous two-way bus flows between D'Olier Street / Burgh Quay and Pearse Street / Westland Row. With the reduction of bus services on Westmoreland Street as a result of the pedestrianisation of College Green and implementation of the Traffic Movement Plan, there could be an opportunity to fully remove bus services from Westmoreland Street and create a strong public space spanning Westmoreland Street, College Green and Dame Street.

To facilitate a two-way bus flow on D'Olier Street, analysis would be required to investigate:

- Appropriate turning space required for buses to manoeuvre from D'Olier Street onto O'Connell Bridge; and
- Junction capacity at Baggot Street/Ely Place/Merrion Street Upper to accommodate buses travelling from Saint Stephen's Green towards Pearse Street.

7 CONCLUSION

7.1 Preferred Network for Public Transport Mode

The preferred public transport network is outlined within the Transport Strategy, the DCDP and other relevant planning documents. This network is described in Section 3 Receiving Environment and pictured in Figure 3-10. While potential options to revise the bus network were explored, it was found that revising the BusConnects spine routes would not be an appropriate solution to address congestion. The preferred public transport network is therefore taken forward as planned.

Following the pedestrianisation of the College Green/Dame Street area, the implementation of future Luas lines and the future MetroLink service, there will be opportunities to re-evaluate the network to further align with the identified principles.

7.2 Key Recommendations

Some challenges were identified that should be considered to deliver an efficient and reliable public transport network. Potential interventions could be made to reduce future problems of convergence within the City Centre, improve overall transport accessibility, improve the integration of the network with other modes, and to simplify services for public transport users.

The following recommendations are proposed to maximise the benefits of the public transport network:

- Implement a Traffic Movement Plan to reduce car traffic in the city centre;
- Provide mobility hubs close to key public transport nodes;
- Improve walking and cycling infrastructure for first- and last-mile connections to public transport;
- Continue to improve reliability and availability of information for public transport users; and
- Continue to re-evaluate the public transport network in the future.

