Appendix F
Feasibility Study & Options Assessment Reports

Ringsend to City Centre Core Bus Corridor Options Study

Feasibility and Options Assessment Report

National Transport Authority

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Glossary of Terms

- **BRT**: Bus Rapid Transit
- **DCC**: Dublin City Council
- **DTTAS**: Department of Transport, Tourism and Sport
- **EPO**: Emerging Preferred Option
- **FCC**: Fingal County Council
- **GDA**: Greater Dublin Area
- **GIS**: Geographic Information Systems
- **LAP**: Local Area Plan
- **LoS**: Level of Service
- **NTA:** National Transport Authority
- **OSI**: Ordnance Survey Ireland
- **PNHA**: proposed Natural Heritage Area
- **QBC**: Quality Bus Corridor
- **CBC**: Core Bus Corridor
- **QoS**: Quality of Service
- **RMP**: Record of Monuments and Places
- **ROA**: Route Options Assessment
- **RPA**: Railway Procurement Agency
- **RTPI**: Real Time Passenger Information
- **SAC**: Special Area of Conservation
- **SPA**: Special Protection Area

Definitions

- **Study Area**: The area along the Ringsend to City Centre corridor within which route options have been identified and assessed.
- **Route Section**: The road(s) along which the Ringsend to City Centre Core Bus Corridor will be provided. A route section is generally confined to a single road/street.
- **Route Options:** Various adjacent route sections are combined to form 'end-to-end' route options.
- **Scheme Option:** This refers to the detailed development of a route option in terms of bus and cycle provisions and road configuration along the route. Typically, a number of scheme options are designed along each route option.
- **Journey Time**: The time taken to make a journey between two distinct points including dwell times at stops and delays at junctions.
- **CBC Infrastructure**: All physical facilities required to support the CBC system – stops, CBC lanes, public lighting, etc.
- **Route Options Assessment Study:** The assessment process for potentially viable route options carried out in order to identify the nature and extent of the effects, both positive and negative, on the existing and planned transport infrastructure and receiving environment. The outcome of the route options assessment study is a recommendation for a preferred route for the proposed scheme.

Citations

- The background mapping used frequently in figures in report Sections 4, 5, 6, 7 and 8 is based on OSI maps. The source is ArcGIS Viewer for Silverlight (ESRI), for which AECOM hold a license.
- Residential, employment destination and education destination figures in report Section 6 are based on the Census 2011 Small Area Population Statistics (SAPS).

Appendices

- **Appendix A - Multi Criteria Analysis Tables:** Presents the tables of MCA criteria and sub-criteria used to assess the developed scheme options along each route option identified in the study area.
- **Appendix B - Data Collection:** Presents a discussion on the data collected and the existing situation in the study area.
- **Appendix C - Bus Journey Times:** Presents the matrix and criteria used to calculate the journey times along each route.
- **Appendix D - Problem Identification:** Presents a summary of the problems identified as well as a discussion of the existing conditions along each of the route options.
- **Appendix E - Parking Survey:** Presents a discussion on the parking conditions identified in the existing road network within the study area.
- **Appendix F - Cost Estimate:** Presents a summary of the infrastructure and land acquisition costs associated with each of the scheme options considered.
- **Appendix G - Infrastructural Cost Estimate:** Presents a detailed breakdown of the infrastructural cost estimate for each of the scheme options considered.
- **Appendix H** - Environmental Desktop Study Report.
- **Emerging Scheme Design Drawings:** Drawing Sheets.

1. Introduction

1.1 Preamble

This report presents the findings of the route options assessment work undertaken for the Ringsend to City Centre Core Bus Corridor (CBC) and a recommendation on the **emerging preferred option** is made.

The work presented in this report concentrates on the bus priority provision developed for the CBC, based on the assumption that a number of high frequency bus services will avail of the CBC infrastructure.

The assessment undertaken of potentially feasible route options, identified within the scheme study area, against established MCA criteria is discussed in this report. Where a number of design options were considered along the preferred route, these are also discussed and documented. A concept scheme design along the emerging preferred option identified is subsequently presented.

1.2 Report Structure

- **Section2:** The strategic transport policy context which has led to the identification of a need for the delivery of a CBC on this corridor is discussed in this section.
- **Section 3:** The objectives of the core bus network and the proposed scheme are presented. The extent of the CBC study area assessed, effectively defining the proposed scheme corridor, is described in this section identifying key constraints and opportunities, the integration of the corridor with the wider public transport network and the compatibility with other road users.
- **Section 4:** The methodology for identifying and assessing the feasibility of the various route options potentially available within the study area is discussed in this section, including:
  - the selection and determination of initial criteria for screening and assessing technically feasible route options, based on distinct, project-specific objectives;
  - the definition of MCA criteria; and
  - The presentation of an initial network ('spider's web') of route sections examined.
- **Sections 5 and 6:** Details the options assessment for the study area.
- **Section 7:** The Emerging Preferred Option is identified and described.
- **Section 8:** Presents a cost estimate for the concept design of the Emerging Preferred Scheme.
- **Section 9:** Discusses the Emerging Scheme Benefits.
- **Section 10:** Includes a description of the supplementary scheme design along North Wall Quay.
- **Section 11:** Discusses the next steps.

2. Transport Context

2.1 Transport Strategy for the Greater Dublin Area 2016 – 2035

The Transport Strategy for the Greater Dublin Area 2016 – 2035 identified a core bus network for the Greater Dublin Area (GDA).

The core network represents the most important bus routes in the region, which are generally characterised by a high frequency of bus services, high passenger volumes and with significant trip attractors located along the route.

The identified core network comprises sixteen radial bus corridors, three orbital bus corridors and six regional bus corridors.

The GDA Transport Strategy includes objectives to develop the Core Bus network to achieve, as far as practicable, continuous priority for bus movement on the sections of the Core Bus Network within the Metropolitan Area, with the goal of making the overall bus system more efficient and attractive to users including the core principle which states:

"Development in the GDA shall be directly related to investment in integrated high quality public transport services and focused on compact urban form."

The GDA Transport Strategy also states, as a Primary Policy (see Section 2.2.1):

"The Strategy must therefore, promote, within its legislative remit, transport options which provide for unit reductions in carbon emissions. This can most effectively be done by promoting public transport, walking and cycling, and by actively seeking to reduce car use in circumstances where alternative options are available."

The Ringsend to Pearse Street CBC is identified in the GDA Transport Strategy as a core radial bus corridor as part of the Core Bus Network.

2.2 Infrastructure and Capital Investment 2016-2021

On 29th September 2015, the Minister for Public Expenditure & Reform, Mr Brendan Howlin TD, announced an investment programme that proposed expenditure of €3.6 billion on public transport which included 'further upgrading of Quality Bus Corridors'.

2.3 Integrated Implementation Plan 2013 – 2018

The NTA published the Integrated Implementation Plan 2013 – 2018 in February 2014. This report sets out the short term infrastructure investment programme for the GDA up to 2018 including in investment in existing bus services.

The proposals in relation to Bus investment are encompassed in four investment areas: 1. Bus Fleet Investment; 2. Bus Stop and Shelter Provision; 3. General Bus Network Improvements; and 4. Bus Rapid Transit Schemes.

Investment areas 2 & 3 are of most relevant to the subject scheme and will be addressed.

More specifically, the Integrated Implementation Plan proposes the following measures in relation to bus network improvements:

- Further development of a QBN appropriate to serve the needs of the GDA;
- Seeking to achieve, as far as practicable, continuous inbound priority and the maximum possible outbound priority on key bus routes into Dublin City Centre;
- Enhancing bus priority at other urban locations in the GDA;
- Seeking enhanced bus prioritisation at signalised traffic junctions in the GDA;
- Improving the level of interchange facilities between services and with other transport modes; and
- Creation of bus hubs or bus focal points in key urban locations in the GDA.

These measures will provide an interim transport solution in the shorter term, pending the development of a higher capacity rail solution, such as a New Metro North which may serve this study area.

However, it should be noted that route selection has yet to be undertaken at the time of writing.

2.4 Greater Dublin Area Cycle Network Plan

The Greater Dublin Area (GDA) Cycle Network Plan sets out the strategy for the development of an integrated cycle network.

It identifies that the Ringsend to City Centre corridor forms part of the primary cycle network (Routes 13, 5 and S01/N10), 13, 13A), secondary cycle network (Route S01A, 13B, 13E and N5) and thus form a key part of the strategic cycle network, see Figure 2.4.1 and Figure 2.4.2**.**

It is therefore important that any upgrade to bus priority infrastructure along the corridor should take cognisance of this objective and, where practical, provide cycle infrastructure to the appropriate level and quality of service (as defined by the NTA National Cycle Manual) required for a primary and secondary cycle route.

Figure 2.4:1 GDA Cycle Network Plan for Ringsend (extract) – 1

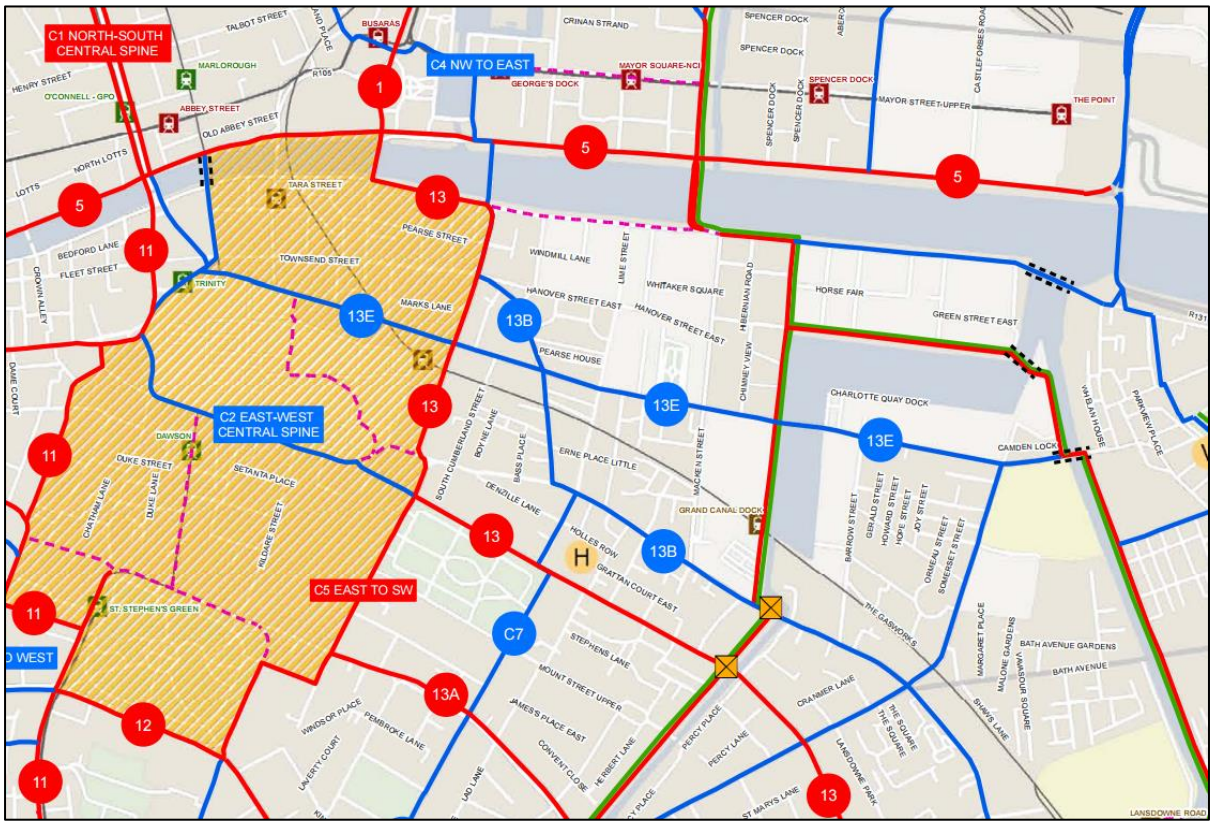

Figure 2.4:2 GDA Cycle Network Plan for City Centre (extract) – 2

2.5 Dublin City Centre Transport Study

The Dublin City Centre Transport Study has been prepared to integrate the transport policies and proposals of Dublin City Council (DCC) and the National Transport Authority (NTA) and inform an agreed framework for strategic investment.

The study was issued for public consultation in June 2015 and proposes the following relevant measures to improve the operation, management and efficiency of the bus network within Dublin City:

- To maximise the performance of the bus network by ensuring that sufficient road capacity and junction priority are provided to allow buses to operate efficiently, with reliable and predictable journey times;
- To further optimise the routing of the bus corridors through the City Centre area, improving interchange arrangements and optimising the efficiency of the service.

In relation to existing QBCs, the study proposes to implement measures to rectify existing capacity and travel time issues.

These measures include the provision of continuous bus lanes and the deployment of advanced ITS, such as traffic signal operation and journey time reporting.

2.6 Dublin City Council Development Plan (2016 – 2022)

- To support improvements to the city's bus network and related services to encourage greater usage of public transport in accordance with the objectives of the NTA's strategy and the Government's 'Smarter Travel' document.
- To facilitate and support measures proposed by transport agencies to enhance capacity on existing public transport lines and services, to provide/improve interchange facilities and provide new infrastructure.
- To review future strategic provision of bus depots/garages in the city in consultation with Dublin Bus and the NTA.

2.7 Strategic Development Zone (SDZ)

Poolbeg West is situated in the Peninsula which extends into Dublin Bay just south of the mouth of the River Liffey, and is only 2 km east of O'Connell Bridge in Dublin City Centre.

Poolbeg Peninsula offers an outstanding opportunity to develop a mixed living and working community which will help to meet the growth needs of the city in terms of housing, employment and the continued growth of Dublin Port.

Poolbeg West comprises some 34 Ha of the 520 Ha Dublin Docklands area.

Poolbeg West SDZ consists of an area between Pigeon House Road, Seán Moore Road, and Seán Moore Park and extends in an easterly direction along Sandymount Strand as far as Irishtown Nature Park.

Figure 2.7:1 illustrates the local context.

Figure 2.7:1 Poolbeg SDZ location Map (Source: Figure 1.2 Poolbeg West SDZ Planning Scheme 2017)

The road network around Poolbeg peninsula comprises strategic and local roads. The strategic network includes the R131 Sean Moore Road and the R131 East Link Road from the Sean Moore Roundabout to the East Link Bridge. Ringsend Road, Irishtown Road and Bath Street act as major east-west links and are busy traffic routes connecting the city centre, Ringsend and the Poolbeg peninsula, as well as the southern suburbs.

Current public transport services to the Poolbeg peninsula are limited. The most frequent local bus service serves the neighbouring Ringsend and Sandymount area, and for the majority of its route it is not routed along a Quality Bus Corridor (QBC). The principal bus priority corridors are a distance away on the Pearse Street and the Blackrock QBCs. The closest DART station is Lansdowne Road Station, which is approximately 1.5 km (a 20 minute walk) from the Poolbeg peninsula.

Dublin City Council supports NTA plans to provide new and extended/improved services in the Poolbeg West Planning Scheme document (Section 2.2.1) in which it is stated:

"Key Principle: Provide strong social economic and transportation connections between Poolbeg West and the rest of the city, including the central area.

The development of the Docklands has seen the expansion of city's economic core to the east. Poolbeg West will provide much needed housing and additional commercial space. The focus of new connections to/from the site will be via the development of 'Sustainable Transport Corridors' which prioritise pedestrian, cyclist and public transport movements. By ensuring attractive alternatives to the car are available, car use will be minimised."

2.8 Dublin Docklands Development Zoning (DDDZ)

Dublin City Council supports NTA plans to provide new and extended/ improved services as follows:

- Core bus route 15A extension from John Rogerson's Quay to Poolbeg via Dodder Bridge (10 minute frequency or higher)
- Existing Core bus route 1 serving Ringsend and Beach Road to have increased frequency (10 min frequency or higher)
- An extension to existing route no. 18 from Strand Road along beach road and Sean Moore Road into the site. (no change in frequency)
- Shuttle bus from Clontarf DART station to Poolbeg.

Dublin City Council has also made reference to the area in the Dublin City Development Plan 2016-2022 referring to the area in Section FDA 13 South Bank/Poolbeg which states, as an objective:

"To improve accessibility through the development of a movement framework with a strong emphasis on public transport, pedestrian/cycle networks and incorporating innovative approaches geared to developing sustainable modes of commuter movement and car parking."

3. Corridor Audit and Scheme Objectives

3.1 Physical Constraints and Opportunities

There are a number of constraints and opportunities, both natural (i.e. existing natural environment) and physical (the built environment), which constrain route options for the proposed scheme within the defined study area.

These include:

- Grand Canal (including protected structures);
- River Dodder;
- River Liffey,
- Existing and committed future development along the route;
- Existing protected monuments within the study area;
- A number of street trees and other natural features along the potential route options within the study area;
- The existing urban and sub-urban roads and street network;
- DART line (Iarnród Éireann) and in particular low level bridges;
- The need to maintain traffic flow for all modes during construction;
- Limited availability of land in urban areas; and
- Public parks including Ringsend Park and Pearse Square Park.

3.2 Interchange with existing and proposed public transport

One of the key objectives of the proposed CBC scheme is to enhance interchange between the various modes of public transport operating in the city and wider metropolitan area, both now and in the future.

Route options within the study area have therefore been explored with this in mind and, in so far as possible, seek to provide for improved existing or new interchange opportunities with other transport services, including:

- Existing Dublin Bus services at numerous locations along the route;
- Existing DART service along the route; and
- Proposed Swiftway BRT from Swords to City Centre.

The Eastern Bypass infrastructural proposals are also noted.

3.3 Compatibility with other users

A key objective of the proposed scheme is to improve pedestrian and cyclist facilities along the route. In general, suitable level of service should be proposed for these modes. Where it is considered impractical to construct cycle facilities along a particular section of the CBC route, such facilities would need to be provided along suitable alternative routes and as required by the GDA Cycle Network Plan.

There may be locations where segregated cycle facilities cannot be provided along the CBC route and there is no suitable routing alternative. In this instance, it may be possible for cyclists to share with vehicles in the bus lane. However, such proposals need careful consideration and design to ensure the safety of cyclists, with additional mitigation measures, such as speed restrictions for vehicles in bus lanes being applied.

General traffic flow and local access will generally be maintained along the CBC corridor although it is inevitable that there will be impacts on traffic capacity along the route associated with the reallocation of road space to CBC priority and cycle lanes and the introduction of turning movement restrictions. Reductions in traffic carrying capacity of the road network need, however, to be considered in the context of the overall significant increase in efficiency and reliability of the bus services that will be achieved.

3.4 Scheme Objectives

Having regard to the findings of the studies and plans set out in Section 2, the following objectives were established for the Ringsend CBC Corridor:

- Deliver the on street infrastructure necessary to provide continuous priority for bus movements along the Core Bus Corridor. This will mean enhanced bus lane provision on the corridor, removing current delays in relevant locations and enabling the bus to provide a faster alternative to car traffic along the route, making bus transport a more attractive alternative for road users. It will also make the bus system more efficient, as faster bus journeys means that more people can be moved with the same level of vehicle and driver resources; and
- Provide any cycle facilities along the route that are required under the Greater Dublin Area Cycle Network Plan (published by the NTA, 2013) to the target Quality of Service(s) specified therein and to give consideration to further providing cycle facilities along sections of the route where they may be not expressly required under the Cycle Network Plan.
- Compatibility to Poolbeg Strategic Development Zone; it is noted that in the draft Poolbeg SDZ report (2017), it is stated that:

  'Dublin City Council supports NTA plans to provide new and extended/ improved services as follows:

  - *Core bus route 15A extension from John Rogersons Quay to Poolbeg via Dodder Bridge (10 minute frequency or higher)*
  - *Existing Core bus route 1 serving Ringsend and Beach Road to have increased frequency (10 min frequency or higher)*
  - *An extension to existing route no. 18 from Strand Road along beach road and Sean Moore Road into the site. (no change in frequency)*
  - *Shuttle bus from Clontarf DART station to Poolbeg'*

4. Assessment Methodology

4.1 Introduction

This section of the report presents the methodology used for the assessment of potentially viable route options identified within the study area.

A two-stage assessment process was adopted as follows:

- An initial 'Stage 1' high-level route sections assessment or 'sifting' process which appraised potentially viable route sections in terms of ability to achieve scheme objectives and whether they could be practically delivered; and
- Routes which passed this initial stage were taken forward to a more detailed 'Stage 2' assessment.

4.2 Study Area

Arising from the transport policy context and scheme objectives set for the Ringsend CBC, the broad study area identified for the proposed scheme is illustrated in red in Figure 4.21 below.

The study area includes a road network in the vicinity of the existing bus routes and extends to include additional potentially feasible route options.

The study area is generally bounded to the west by the approximate extent of the eastern Dublin City Centre and to the approximate south-eastern extent of the Ringsend area.

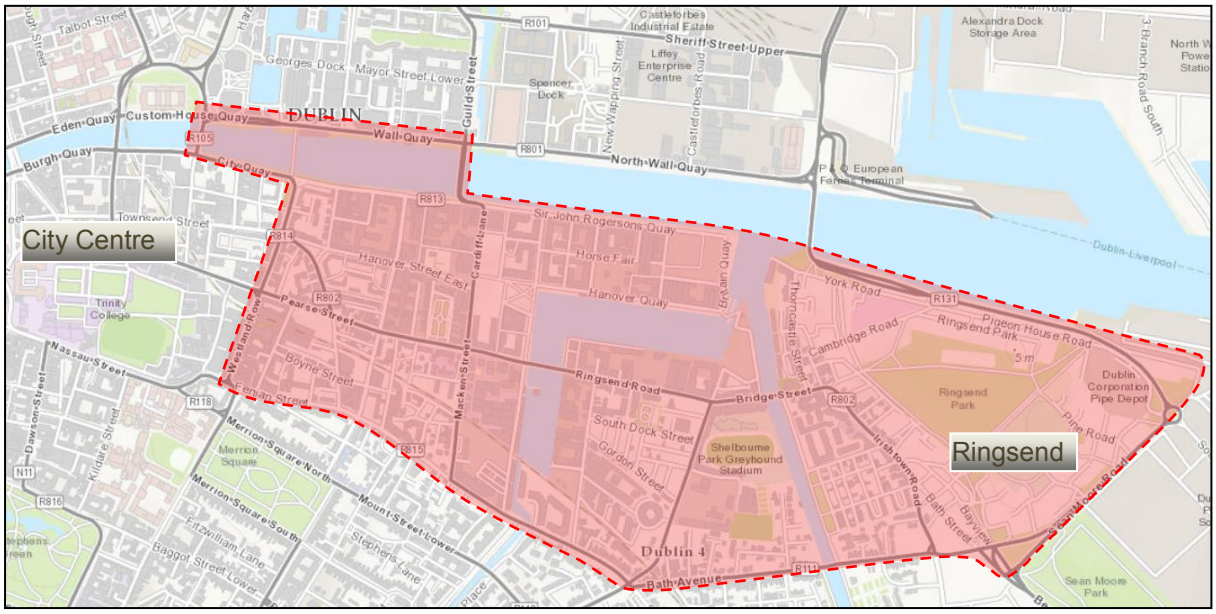

Figure 4.2:1 Study Area

4.3 Stage 1: Route Sections Assessment – Sifting Stage

An initial ‘spiders-web’ of potential route sections that could accommodate a CBC was identified within the study area. This ‘spiders-web’ of route sections was chosen with reference to the CBC characteristics and in order to meet the scheme objectives as set out in Section 2 of this report.

Initial route sections identified also took cognisance of the physical constraints and opportunities present (Section 3.3) and the ability to integrate with other public transport modes and routes (Section 3.4). Of particular relevance in developing the spiders-web was the potential for the road or route sections to facilitate fast and reliable journey times and thereby be able to practically accommodate bus lane priority.

The resulting study area corridor spiders-web of route sections identified is presented in Figure 4.3:1.

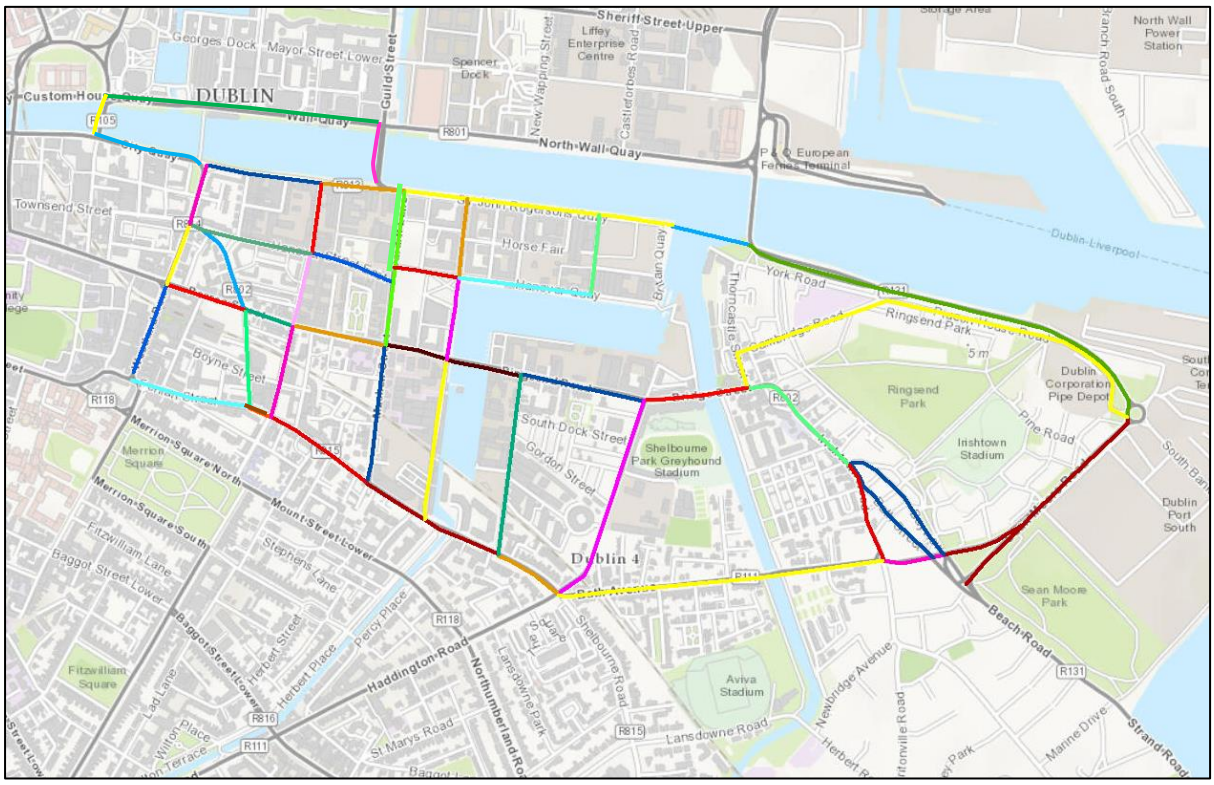

Figure 4.3:1 Spiders Web of Route Sections

At the Stage 1 ‘sifting’ stage, the initial ‘spiders-web’ of route sections presented in Figure 4.3:1 was narrowed down using a high level qualitative method based on professional judgement and a general appreciation for existing physical conditions/constraints within the study area from available survey information and site visits. This exercise identified route sections that would either not achieve the scheme objectives or would be subject to significant cost and/or impact to achieve these objectives (e.g. excessive land-take).

This assessment stage focused on engineering constraints together with a desktop study, identifying high level environmental constraints and population catchment analysis.

4.4 Stage 2: Scheme Options Assessment - Detailed Assessment

Following completion of the 'Stage 1' assessment, the remaining potentially feasible route sections were progressed to Stage 2 of the assessment process. This stage comprised a more detailed qualitative and quantitative assessment of scheme options identified along each potential route, using criteria established to compare scheme options.

The first step in the Stage 2 assessment was to combine shorter route sections which passed the Stage 1 assessment, to form longer end-to-end potential routes within the study area.

After developing route options, each was explored using different design concepts to identify the degree of facility provision and necessary infrastructure requirements. This process involved the development of several scheme options for each route within the study area.

The scheme options for each route were then progressed to a multi-criteria analysis.

The 'Common Appraisal Framework for Transport Projects and Programmes' published by the Department of Transport, Tourism and Sport (DTTAS), March 2016, requires schemes to undergo a 'Multi-Criteria Analysis' (MCA) under the following criteria:

- Economy;
- Integration;
- Accessibility and Social Inclusion;
- Safety;
- Environment; and
- Physical Activity.

Physical Activity has been scoped out of the multi-criteria analysis at this stage. This is because all route options are considered to promote physical activity equally and as such it is not considered to be a key differentiator between route options.

An appreciation of constraints and opportunities within the study area as well as the defined project objectives, led to the establishment of project-specific route options MCA criteria.

These were tailored to have commonality to the Common Appraisal Framework guidelines where practical.

Table 4.1 presents a summary of the MCA criteria and sub-criteria used as part of the 'Stage 2' detailed route options assessment process.

Table 4.1: MCA criteria

MCA criteria	Assessment Sub-Criteria
1. Economy	1.a. Capital Cost
	1.b. Transport Reliability and Quality (Journey Time)
2. Integration	2.a. Land Use Integration
	2.b. Residential Population and Employment Catchments
	2.c. Transport Network Integration
	2.d. Cycle Network Integration
	2.e. Traffic Network Integration
3. Accessibility & Social Inclusion	3.a. Key Trip Attractors (Education/Health/Commercial/Employment)
	3.b. Deprived Geographic Areas
4. Safety	4.a. Road User Safety
5. Environment	5.a. Archaeology and Cultural Heritage
	5.b. Architectural Heritage
	5.c. Flora & Fauna
	5.d. Soils and Geology
	5.e. Hydrology
	5.f. Landscape and Visual
	5.g. Air Quality
	5.h. Noise & Vibration
	5.i. Land Use Character

In applying these criteria to the assessment process, it is clearly recognised that for different sections of the study area corridor, greater emphasis may need to be applied to some criterion over others in terms of their significance and influence on the route selection process.

4.4.1 Economy (1)

4.4.1.1 Capital Cost (1.a.)

Capital cost estimates consist of both the indicative infrastructure cost estimate and land acquisition costs. For the route options considered, an outline 'Order of Magnitude' cost was prepared for assessment and comparison purposes.

This cost estimate was based on a range of per kilometre rates reflecting the extent of construction works required. The following steps have been followed in order to derive cost estimates for each route option:

- Step 1: Define construction activity levels and assumptions for corridor sections.
- Step 2: Define construction activity levels and assumptions for junctions.
- Step 3: Estimation of cost rates in relation to construction activity levels for corridor sections.
- Step 4: Estimation of cost rates in relation to construction activity levels for junctions.
- Step 5: Estimation of cost rates in relation to construction activity levels for stops.
- Step 6: Apply appropriate cost rates to each route option to derive route option cost estimate.

Criterion 1. a.i Indicative Infrastructure Cost Estimate

1. a.i.i. Corridor Sections

As part of the route optioneering process, constraints and associated mitigation measures, which provide improved / full bus lane provision, have been identified, grouped and ranked in levels.

Table 4.2: Construction Works for Corridor Sections

Construction Activity Level	Construction Works Assumption	€/km
Minor – Minor works locally	• Kerbs improvement locally (removal and replacement) • Footpaths improvement locally (breaking out/additional concrete) • Road resurfacing locally (milling/reinstatement or overlay) • Road markings (non-destructive removal of existing road markings, new road markings) • Signage (removal/relocation/replacement of existing and/or installation of new)	€650,000

Construction Activity Level	Construction Works Assumption	€/km
Moderate – Roadway widening (excluding private land acquisition)	• General site clearance (street furniture removal/relocation, etc.) • Safety barriers/guardrails (removal and new) • Services protection/relocation/diversion (power supply, communications) • Drainage works (removal of and installation of new drainage systems) • Limited earthworks • Pavement full depth reconstruction • Road markings (non-destructive removal of existing road markings, new road markings) • Kerbs footways and paved areas (removal and new) • Road lighting (relocation, cabling, ducting) • Signage (removal/relocation/replacement of existing and/or installation of new) • Street furniture removal/relocation • Landscaping works (top soiling, fence, trees relocation, hedges, road margins re-grading, etc.)	€1,300,000

Construction Activity Level	Construction Works Assumption	€/km
Major – Roadway widening (including private land acquisition):	• General site clearance (street furniture removal/relocation, etc.) • Safety barriers/guardrails (removal and new) • Services protection/relocation/diversion (power supply, communications, water, gas) • Drainage works (removal of and installation of new drainage systems) • Earthworks (embankment treatments, retaining walls, slopes regrading, etc.) • Pavement full depth reconstruction • Kerbs footways and paved areas (removal and new) • Road markings (non-destructive removal of existing road markings, new road markings) • Signage (removal/relocation/replacement of existing and/or installation of new) • Road lighting (replacement, cabling, ducting) • Landscaping works (top soiling, fence, trees relocation, hedges, road margins, re-grading, etc.) • Property boundary reinstatement works (walls, gates, driveways landscaping etc.)	€2,500,000

1.a.i.ii. Junctions

Table 4.3 presents the construction activity levels for junctions, the assumed level of works for each category and the per junction rate.

Table 4.3: Construction Works for Junctions

Construction Activity Level	Construction Works Assumption	€/junction
Minor – Modifications to existing signal controlled junctions to introduce bus priority (i.e. changing method of control, etc.), without significant alteration to their existing geometry and layout	• Road markings (non-destructive removal of existing road markings, new road markings) • Anti-skid surface • Signage (removal/relocation/replacement of existing and/or installation of new) • Dished kerbs and tactile paving • Guardrails/Bollards • Additional signal poles/heads • Additional traffic signals ducting, cabling and chambers • Modifications to the signal controller and associated traffic signal installation works (including electrical) • Additional loop detectors	€70,000
Moderate – Upgrading existing minor/major junctions (including roundabouts) to signal control junctions, without significant alteration to their existing geometry and layout (excluding private land acquisition)	• Kerbs improvement locally (removal and new) • Footpaths improvement locally (breaking out and new) • Road markings (non-destructive removal of existing road markings, new road markings) • Signage (removal/relocation/replacement of existing and/or installation of new) • Anti-skid surface • Dished kerbs and tactile paving • Guardrails/Bollards • New signal poles/heads • New traffic signals ducting, cabling and chambers • New signal controller and associated traffic signal installation works (including electrical) • New loop detectors • Services protection/relocation/diversion (power supply, communications) • Limited earthworks • Pavement reconstruction • New road lighting (relocation, cabling, ducting)	€230,000

Construction Activity Level	Construction Works Assumption	€/junction
Major – Significant modifications to existing signal controlled junctions (including private land acquisition)	• General site clearance (street furniture removal/relocation, etc.) • Safety barriers/guardrails (removal and new) • Services protection/relocation/diversion (power supply, communications, water, gas) • Drainage works (removal of and installation of new drainage systems) • Earthworks (embankment treatments, retaining walls, slopes re-grading, etc.) • Pavement full depth reconstruction • Kerbs footways and paved areas (removal and new) • Road markings (non-destructive removal of existing, new road markings) • Anti-skid surface • Signage (removal/relocation/replacement of existing and/or installation of new) • Dished kerbs and tactile paving • Guardrails/ Bollards • Additional signal poles/heads • Additional traffic signals ducting, cabling and chambers • Modifications to the signal controller and installation works (incl. electrical) • Additional loop detectors • Road lighting (replacement, cabling, ducting) • Landscaping works (top soiling, fence, trees, hedges, margins re-grading, etc.) • Property boundary reinstatement works (walls, gates, driveways landscaping etc.)	€1,000,000

1.a.i.iii. Bus Stops

For cost estimation purposes only, QBC stops have been assumed to comprise the following items:

- Raised Kerbs
- Raised Platform
- Paving
- Illuminated shelters
- Identification posts
- RTPI
- Lighting
- Associated ducting (communications and power)
- Bus Stop Furniture (i.e. passenger guardrails, benches, bollards, etc.)

Based on the above assumptions, outline costs for the bus stops were estimated to be €20,000/stop

These costs exclude VAT, professional fees and re-routing of services.

It should be noted that the above listed Bus Stop cost estimates are subject to refinement, based on a more detailed analysis at detailed design stage.

Criterion 1.a.ii. Land Acquisition Cost Estimate

Land Acquisition Costs will be accounted for separately @ €1,500/m2

Exclusions from the cost estimation process at this stage are listed below:

- VAT
- Fees for planning process,
- Statutory Undertakers
- Professional Fees
- Escalation and inflation adjustments

4.4.1.2 Transport Reliability and Quality of Service (1.b.)

This criterion assesses route options in terms of the degree to which transport reliability and quality of service is likely to be achieved. The assessment considers the following:

Criterion 1.b.i. Journey Time; the extent to which journey time savings, and associated economic benefits, for public transport services, can be achieved on a route. This would be practically achieved through the extent to which any or all of the following measures can be implemented;

- Enhancement of existing bus and / or provision of new bus lanes along road links;
- Provision of bus lanes through junctions (preferably through signal controlled junctions);

- Local upgrading of road sections to provide more carriageway space and therefore, additional capacity;
- Use of traffic signals to provide virtual priority e.g. queue relocation;
- Removal of 'pinch points' for bus services and traffic along the route; and
- Rationalisation of existing bus stops in terms of location, indentation (i.e. ability to provide laybys to avoid blockage of bus lanes) and spacing.

Journey times for each route option have been calculated by comparing the time required by a bus to travel between common start and end points on each route. The following assumptions have been made in calculating the comparative journey times along route options:

- Top operational speed (free-flow) of 50 kph in suburban areas and 30 kph in City Centre areas;
- Dwell time of 15 seconds per stop on average (assumes introduction of cashless fares as part of the CBC/Bus Service upgrade programme in the Greater Dublin Area. Assumes that on average, buses stop at every second stop i.e. 30 second delay at every second stop);
- Delay of 15 seconds per junction on average (assumes buses stop at every second junction i.e. 30 second delay at every second junction)

These assumptions assume dedicated bus priority infrastructure or free-flowing traffic conditions along a route section by direction of travel. Where the indicative scheme determined for a route suggests that this is not practically achievable, modified speeds and delay assumption are applied as appropriate. These additional delays are estimated based on available queue length information, automatic vehicle location information from Dublin Bus and estimates of the impact of traffic management measures (such as queue relocation).

Delays at junctions and stops include delays associated with deceleration /acceleration to/from a stationary position.

Criterion 1.b.ii. Number of Major Junctions; the number of major junctions / signalised crossings along each route have been compared.

For the purposes of this assessment, major junctions are generally defined as signalised junctions and roundabouts (i.e. any junction likely to cause delays to buses)

Regardless of the level of practical or feasible bus priority provided at major junctions, there will always be an element of delay to buses associated with signalised junctions, even with the most efficient signalling system being provided. While it is impossible to completely avoid major junctions on any route option, this risk of potential delay has been considered when comparing route options. This feeds into the overall journey time calculations as indicated above.

1.b.iii. Level of Bus Priority Provision; the level of bus priority achievable along route options has been considered and compared. The level of priority is predominantly concerned with the degree to which road space can practically be allocated to buses, the amount of protection afforded to this priority (i.e. segregation) and the provision for buses at junctions such as bus lanes at the stop line. This feeds into the overall journey time calculations as indicated above.

4.4.2 Integration (2)

4.4.2.1 Land-Use Integration (2.a.);

This criterion identifies the extent to which a route would encourage or support planned development and provide for economic opportunities; whether particular route options offer synergies with other urban enhancement proposals and whether route options afford the potential to regenerate particular streets or quarters (of most relevance to the City Centre area).

The interaction of routes with Local Area Plans (LAPs), masterplans or specific objectives in the County Development Plans are also considered under this criterion.

4.4.2.2 Residential Population and Employment Catchments (2.b.);

Criterion 2.b.i. Residential Population Catchments: This criterion compares the existing residential populations within 5, 10 and 15 minute walk catchments from bus stops and is representative of the number of potential bus users for a particular route option. The assessment does not include future populations of zoned, but yet undeveloped residential development lands along route options. The analysis involved extracting 2011 population statistics from the Central Statistics Office (CSO) 'small areas' dataset. GeoDirectory was used to assist in calculating the proportional figures for the population within the specific contour bands for each of the routes. This information was subsequently used to calculate the population living within the contours.

Criterion 2.b.ii. Employment Population Catchments: This criterion compares the existing employment populations within a 10 minute walk catchments. The analysis involved extracting information from the 2011 POWSCAR (Place of Work, School or College - Census of Anonymised Records) data, which contains data on employment and school goers within specific areas. The areas used for the analysis were taken from the NTA's multi-modal transport model of the Greater Dublin Area and correspond to the zones defined in the model. These zones are effectively modified Central Statistics Office (CSO) boundaries.

GeoDirectory was used to assist in calculating the proportional figures for the employment units within the specific contour bands for each of the routes. This information was subsequently used to calculate the number of people working within the contours. As with the residential population catchments, the assessment does not quantitatively assess the future populations of zoned, but yet undeveloped commercial development lands along route options.

4.4.2.3 Transport Network Integration (2.c.);

This criterion identifies the extent to which route options would maximise wider public transport usage and reach in terms of facilitating efficient interchange between other transport routes and modes (e.g. other core/feeder bus routes, Swiftway BRT routes, Luas, DART, suburban rail, future Metro.). Linked to this, is the availability of space at potential interchange locations for facilities such as cycle parking areas, covered interchange areas, safe walking areas to and from stops, kiss-and-ride etc.

4.4.2.4 Cycle Network Integration (2.d.);

This criterion considers whether a route option forms part of the GDA Cycle Network Plan, with routes which overlap with designated Cycle Routes given a higher designation in terms of benefits arising where cycle infrastructure can be provided as part of the proposed scheme. In some instances however it may be more appropriate to modify an existing or proposed cycle route as part of the GDA Cycle Network so that CBC and cycle network objectives can both be achieved within the broader corridor area. Consideration is also given to cycle routes intersecting with the bus route.

The quality of cycle provision practically achievable on route options has been assessed as this is considered to be a proxy for encouraging physical activity along the route. For comparison purposes, the highest level of practical cycle provision achievable on each route has been determined and compared between route options.

4.4.2.1 Traffic Network Integration (2.e.);

A comparative assessment of the expected traffic impact of each route option was undertaken based on professional judgement and understanding of traffic conditions in the study area.

This represents a high level assessment of the traffic impact of the route options considered in the Stage 2 Multi-Criteria Analysis (MCA). The anticipated traffic impact expected to be incurred by motorists using private vehicles as a result of the different route options will be assessed. The dis - benefit experienced by motorists in respect of reduced junction capacity and restricted movements will be considered.

4.4.3 Accessibility and Social Inclusion (3)

4.4.3.1 Key Trip Attractors (3.a.)

This assessment criterion identifies key trip attractors located within approximate 15 minute walk catchments which would generate significant demand for bus services but would not be otherwise picked up by either the employment or residential catchment analysis. For the purposes of this assessment the following land-uses have been considered as key trip attractors:

- Education (schools and universities);
- Commercial centres (shopping centres, town centres etc.);
- Healthcare (hospitals);
- Leisure (sport stadiums, theatres, cinemas etc.); and
- Employment (business parks, large office developments etc.).

4.4.3.2 Deprived Geographic Areas (3.b.)

The possible impact of the route options on deprived geographic areas including RAPID (Revitalising Areas by Planning, Investment and Development) areas and the HP Deprivation Index was investigated.

4.4.4 Safety (4)

4.4.4.1 Road User Safety (4.a.)

Generally, the introduction of CBC will result in a reduction in road accidents due to people switching from private car to public transport. However, the reduction in accidents is unlikely to differ between various route options, particularly over the short sections being investigated as part of this assessment.

Therefore, for the purposes of comparing route options, the number of junctions along the route has been used as a proxy for road safety. The number of junctions is effectively a measure of the number of potential conflicts on the route and therefore a measure of the potential for a collision.

The type of movement required by the bus at junctions on the route is also considered with routes where turning movements (either left or right) are required being assigned a lower scoring in terms of safety.

4.4.5 Environmental (5)

The scope and methodology for the environmental assessment was established by considering what environmental aspects are likely to be impacted and are therefore of importance in evaluating the route options. A list of the environmental topics considered is outlined in Table 4.4.

Table 4.4: Environmental Aspects Considered

Aspect	Rationale
Included in Environmental Assessment	
6.a./6.b.Archaeological, Architectural and Cultural Heritage	The provision of CBC infrastructure has the potential to impact on the archaeological, architectural and cultural heritage environment. At this stage of the assessment process, a conservative approach has been adopted in assessing the potential for impact and this is further described below (see Section 5.3.6.1).
6.c. Flora and Fauna	The provision of CBC infrastructure has the potential to impact on flora and fauna.
6.d. Soils and Geology	The provision of CBC infrastructure has the potential to impact on soil and geology as a result of land-take and possible ground excavation (including potential to encounter ground contamination).
6.e. Hydrology	The provision of CBC infrastructure has the potential to impact on surface water bodies as a result of land-take (with particular emphasis on floodplains and flood zones).

Aspect	Rationale
6.f. Landscape and Visual	The provision of CBC infrastructure has the potential to impact the townscape/streetscape along the CBC route.
6.g Air Quality	The provision of CBC infrastructure has the potential to impact the air quality along the CBC route.
6.h. Noise & Vibration	The provision of CBC infrastructure has the potential to impact the noise environment along the CBC route.
6.i. Land Use Character	The provision of CBC infrastructure has the potential to impact on land use character through land-take, severance or reduction of viability which prevents or reduces it from being used for its intended use.
Scoped out of Environmental Assessment	
Agronomy	Given the urban/suburban nature of the proposed scheme and the assumption that the CBC will run on predominantly existing road infrastructure this aspect is not considered to be relevant to the assessment.
Hydrogeology	Hydrogeology is not considered to be a determining factor in the selection of the preferred route option. Also at this stage of the design process it is not possible to determine the quality, type or duration of these impacts, particularly as the location and type of structures e.g. underpasses, bridges etc. is unknown.
Property/Land Acquisition	This aspect has been considered separately as part of the Economy criterion in the overall multi-criteria analysis commensurate with the information available at the route option assessment stage.
Socio-economics	Elements of socio-economics such as journey times, catchment analysis, transport integration, quality of service for cyclists etc. are assessed under other non-environmental criteria and will be considered as part of the multi-criteria analysis.

An environmental desktop study was undertaken by Roughan O' Donovan to assess the scheme options under the environmental aspects considered. The results of the study are included in the MCA tables presented in Appendix A and the Environmental Desktop Study Report is included in Appendix H.

Archaeological, Architectural and Cultural Heritage

As mentioned previously a conservative approach has initially been adopted in undertaking the route options assessment in relation to the archaeological, architectural and cultural heritage environment. The constraints comprise Recorded Monuments and Protected Structures (RMPs) within 50m of each CBC route section, extending to 250 m in Greenfield areas. Sites of archaeological and cultural heritage merit and sites of architectural heritage merit which are directly intersected by the CBC route sections are also included within the scope of this assessment.

During the detailed design of the proposed scheme, the aim will be to avoid known constraints and/or minimise the number of constraints which may be directly or indirectly impacted by the proposed scheme. Appropriate mitigation for construction will be included which will seek, where practicable, to ensure preservation in situ of archaeological remains and the avoidance of impacts on archaeological and cultural heritage constraints. A similar approach has been adopted in relation to the route options assessment for architectural heritage.

As a result, the assessment effectively evaluates the potential for impact on architectural heritage from façade to façade which provides for a comparative and qualitative evaluation of Protected Structures along route sections, in particular along heavily developed sections such as those identified within the City Centre.

However, it is important to note that the CBC route will primarily travel on existing established road networks.

Other than locations of potential significant widening of the existing road curtilage, it is currently not anticipated that adjacent structures and buildings will be impacted by the proposed scheme (while acknowledging that the designation of, and protection afforded to a Protected Structure is not restricted to the structure itself but to all elements within its curtilage, e.g. coal cellars and boundary elements).

Within the City Centre, the selection of a viable route options will involve the running of the CBC service in the vicinity of numerous Protected Structures irrespective of which route section is preferred (archaeological, architectural and cultural heritage is only one of the criteria being considered as part of the MCA analysis). The detailed design of the proposed scheme will seek to avoid and minimise impacts on architectural heritage.

4.4.6 Route Options Summary Table

A route options summary table (in Project Appraisal Balance Sheet, (PABS)) format has been prepared which collates and summarises the appraisal of route options under each of the assessment criterion.

The route options summary table is presented in **Appendix A**.

For each individual assessment criterion considered, routes have been relatively compared against each other based on a five point scale, ranging from having significant advantages to having significant disadvantages over other route options.

For illustrative purposes, this five point scale is colour coded as presented in Table 4.5 with advantageous routes graded to ‘dark green’ and disadvantaged routes graded to ‘dark red’.

Table 4.5: Route Options Colour Coded Scoring Scale

Colour	Description
	Significant advantages over the other options
	Some advantages over other options
	Neutral compared to other options
	Some disadvantages over other options
	Significant disadvantages compared to other options

At the end of the route options assessment, an overall Multi Criterion Analysis (MCA) table is provided, bringing together each of the individual criterion assessments.

This is then summarised under the main assessment criterion as set out in Table 4.1.

A qualitative appraisal of, and conclusions from the route options assessment is then provided, highlighting the key issues considered in determining the recommended route option ('preferred' and in some instances, where applicable, 'next preferred'). It should be noted that a balanced approach is taken when assessing the preferred route. All criteria are considered in undertaking the assessment and a lower scoring on one criterion, for example, would not necessarily mean that the route is not suitable.

4.4.7 Conclusion

The outcome from the transport analysis and the findings of the multi-criteria analysis are then finally considered in a holistic manner to derive an Emerging Preferred Option (EPO).

5. Stage 1: Route Sections Assessment

5.1 Introduction

This Section of the report addresses the route sections identified within the study area.

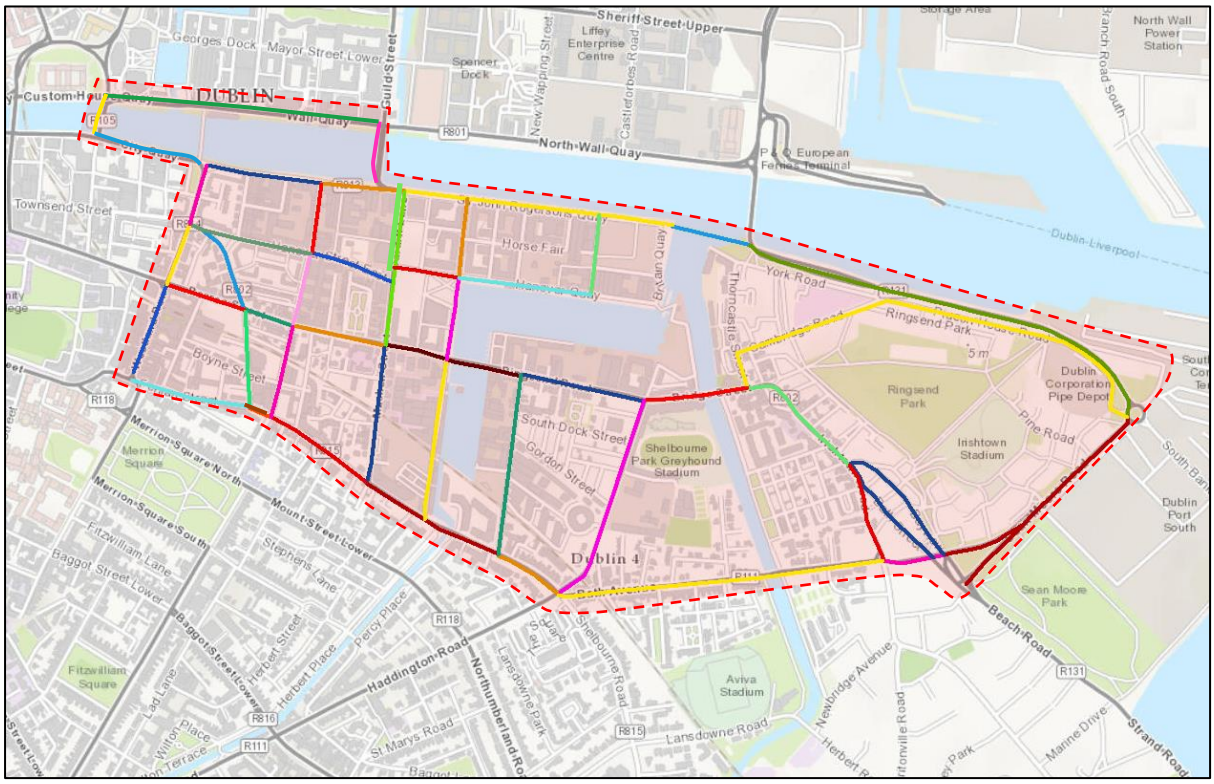

Figure 5.1:1: Potential Route Sections within the Study Area

5.2 Route Sections Assessment

As there are a large number of potential ‘end-to-end’ routes within study area, the roads available for CBC routing have been subdivided into shorter sections for the purposes of the ‘Stage 1’ route sections sifting process. Following the route sifting process, remaining routes have been combined to form longer route options where possible.

Figure 5.2:1 presents the initial potential route sections identified. A summary of the Stage 1 route sections sifting process is presented in Table 5.1.

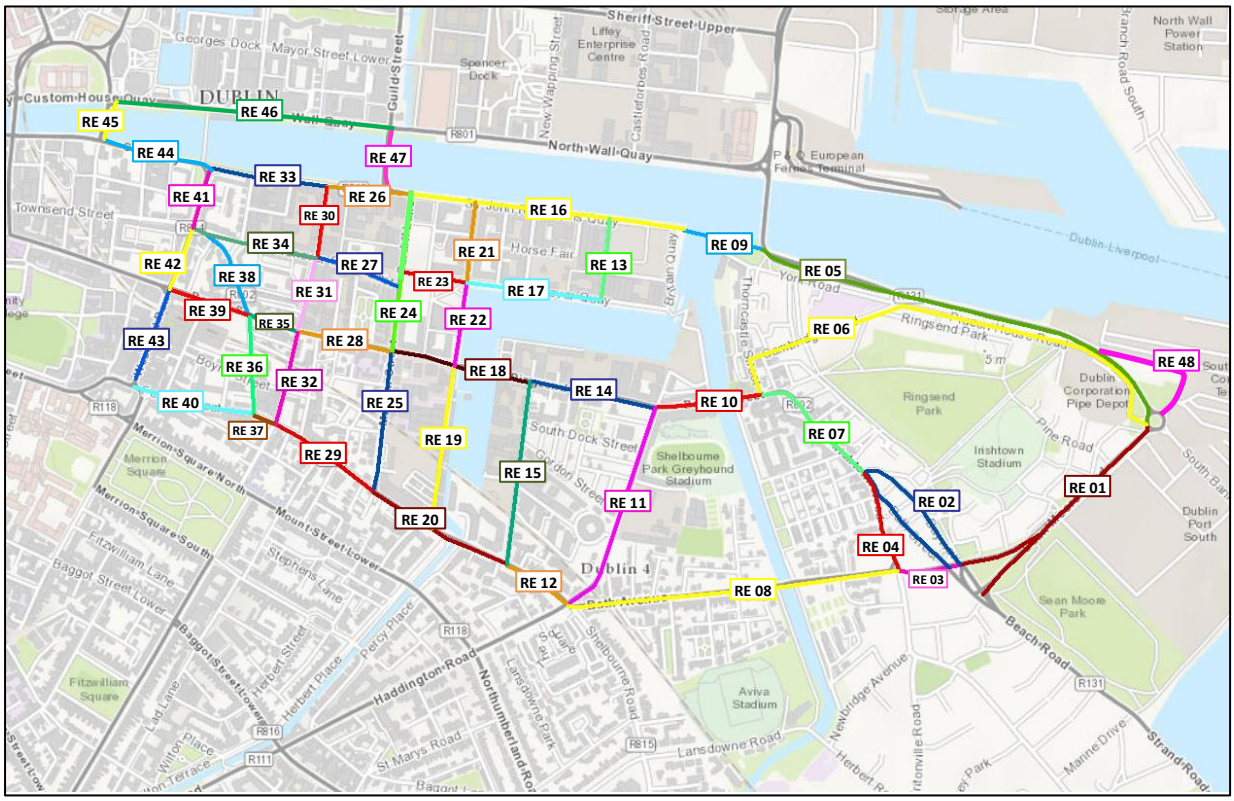

Figure 5.2:1: Route Sections – City Centre to Ringsend

Table 5.1: SAS 1 Route Sections Sifting (Stage 1) Summary

Section No.	Description	Area Characteristics	Comment	Pass /Fail
RE 01	Sean Moore Road (R131), Beech Road (R802) /Church Avenue (R111) / Cranfield Place to Pigeon House Rd	Urban	Single carriageway with central hatching /wide verge, provides link to key attractor; as a result, this is a feasible route section.	Pass
RE 02	Bath Street (R802) / Pembroke Street / Bayview (R802), Irishtown Road to Church Avenue/Sean Moore Road.	Urban One-way streets, on-street parking, traffic calming.	Single carriageway road, one way, with on-street parking for residential properties, limited opportunity to widen but single bus lane can replace existing traffic lane; as a result, this is a viable route section.	Pass
RE 03	Church Avenue (R111), Bath Street/Sean Moore Road (R131) to Tritonville Road	Urban	Single carriageway, narrow with commercial properties and limited potential for reconstruction, as a result, this is not a viable route section.	Fail
RE 04	Irishtown Road, Church Avenue/Tritonville Road/Londonbridge Road to Pembroke Street	Urban On-street parking. Church of St. Mathews	Single carriageway with on-street parking, possibility of reconfiguring parking in parts and widening in other areas, as a result, this is a viable route section.	Pass
RE 05	R131, Pigeon house Rd/Sean Moore Rd to East Link Bridge	Urban East Link Toll Bridge.	Single carriageway which diverges into multiple lanes on approach to Tollgate, possibility of reconfiguring carriageway to provide segregated bus lane on grass verge alongside carriageway, as a result, this is a viable route section.	Pass

Section No.	Description	Area Characteristics	Comment	Pass /Fail
RE 06	Pigeon House Rd/Cambridge Rd/Thorncastle St , Sean Moore Rd to Bridge St	Urban On-street parking, traffic calming.	Single carriageway with on-street parking and speed bumps, possibility of reconfiguring parking in parts and widening in other areas, as a result, this is a viable route section.	Pass
RE 07	Irishtown Road-Bridge Street (R802), Junction of Pembroke Street/Irishtown Road to Thorncastle Street.	Urban On-street car parking. Existing bus route and cycle facilities in part.	Single carriageway wide in part with hatching and on road cycle facilities, as a result, this is a viable route section.	Pass
RE 08	Londonbridge Road (R111), Irishtown Road/Church Road/Tritonville Road to Shelbourne Road/Haddington Road/Grand Canal Street Upper/South Lotts Road.	Urban On-street parking, traffic calming. Bridge Height Restriction - 3.86m.	Single carriageway with on street parking, however the majority of properties have off-road parking facilities. One-way shuttle over bridge, with a restricted bridge height of 3.86m, as a result, this is a not viable route section.	Fail
RE 09	New bridge link, Sir John Rogerson Quay and East Link (R131)	Urban Proposed bridge scheme	Proposed bridge which could be designed to accommodate bus facilities, as a result, this is a feasible route section.	Pass
RE 10	Bridge Street (R802), Junction of Bridge Street Throncastle Street to South Lotts Street/Ringsend Road/South Dock Road.	Urban Existing bus route, existing cycle facilities in part. St. Patricks Church	Single carriageway restricted through the village, with limited capacity to provide facilities, narrow over bridge, however due to limited sections under the rail bridges; this link has been brought forward as a viable route section.	Pass
RE 11	South Lotts Road, Ringsend Road/South Dock Road/Bridge Street to Grand Canal Street Upper/Haddington Road/Shelbourne Road	Urban On-street parking, traffic calming. Bridge height, 3.35m.	Single carriageway generally wide with on-street parking, however narrows on approach to bridge, with limited capacity to widen at the southern end and a restricted bridge height; as a result, this is not a viable section.	Fail
RE 12	Grand Canal Street Upper, Haddington Road/Shelbourne Road/Bath Street/South Lotts Road to junction of Barrow Street.	Urban On-street car parking.	Single carriageway with on-street parking, limited capacity to widen in sections due to residential properties, as a result, this is not a viable section.	Fail
RE 13	Benson Street (R802), Junction of Hanover Quay to Sir John Rogerson's Quay.	Urban On-street car parking.	Single narrow carriageway with on street parking and limited capacity to provide facilities, as a result, this is not a viable route section.	Fail
RE 14	Ringsend Road, South Lotts Road/South Dock Road/Bridge Street to junction of Barrow Street.	Urban On-street parking, existing cycle facilities, existing bus route.	Single carriageway, wide with road hatching, on-road cycle lanes and some sections of bus lane, limited capacity to widen in parts, however provides link to bus depot, as a result, this is a viable route section.	Pass

Section No.	Description	Area Characteristics	Comment	Pass /Fail
RE 15	Barrow Street, Grand Canal Street Upper to Ringsend Road	Urban Wide carriageway, on-street parking, traffic calming.	Single carriageway with on-street parking, narrows significantly at the bridge, with bridge height restrictions, as a result, this is not a viable route section.	Fail
RE 16	Sir John Rogerson's Quay, to Cardiff Lane	Urban	Single carriageway road, with on-street parking and wide path with cycle facilities, as a result this is a viable route section.	Pass
RE 17	Hanover Quay, Forbes Street to Benson Street	Urban	Carriageway with on-street parking and traffic calming. Route is very narrow at Benson Street end; as such this is not a viable route section.	Fail
RE 18	Ringsend Road-Pearse Street, junction of Barrow Street to Macken Street.	Urban, Wide carriageway with existing bus lanes.	Single carriageway with existing bus facilities, as a result, this is a viable route section.	Pass
RE 19	Grand Canal Quay and Clanwilliam Terrace, Grand Canal Street Lower to Pearse Street	Urban On-street parking, bridge height 2.36m	Carriageway with on-street parking and bridge of height 2.36, as such this is not a viable route section.	Fail
RE 20	Grand Canal Street Upper, Junction of Barrow Street to Junction of Macken Street.	Urban, Wide carriageway	Single carriageway with on-street parking and limited potential to reconfigure lane width to provide facilities, as a result, this is not a viable route section.	Fail
RE 21	Forbes Street, Hanover Quay to Sir John Rogerson's Quay	Urban	Single carriageway with wide path and indented on-street parking. Trees are planted at regular intervals along the footpath, limited capacity to provide facilities; as such this is not a viable route section.	Fail
RE 22	Grand Canal Quay, Pearse Street to Hanover Quay	Urban Pedestrian only	This route is only accessible for pedestrians and cyclists; as such this is not a viable route section.	Fail
RE 23	Misery Hill, Cardiff Lane to Forbes Street	Urban One-way	Single narrow carriageway, one-way in the west direction, limited capacity to provide facilities, as such this is not a viable route section.	Fail
RE 24	Cardiff Lane/Macken Street, Sir John Rogerson Quay to Pearse Street.	Urban On-street parking, coach and taxi ranks.	Single carriageway with large volume of coach and taxi parking due to location of Bord Gais theatre, limited capacity to remove, as a result, this is a not a viable route.	Fail.
RE 25	Macken Street, Pearse Street to Grand Canal Street Upper	Urban On-street parking, bridge height 4.38m	Single carriageway with large volume of on-street parking, narrows at bridge, as a result, limited capacity to provide facilities, as a result, this is not a viable route.	Fail
RE 26	Sir John Rogerson Quay, Cardiff Lane to Lime Street	Urban One way street	One-way street some off-street parking, wide path and off-street cycle facilities, as a result, this is a viable route section. Alternative route may be required for other direction.	Pass

Section No.	Description	Area Characteristics	Comment	Pass /Fail
RE 27	Hanover Street East, Lime Street/Hanover Street East/Erne Street Lower to Macken Street	Urban	Narrow single carriageway with access to garages/ rear of properties, as a result, this is not a viable route section.	Fail
RE 28	Pearse Street, Macken Street to Erne Street Lower	Urban	Wide carriageway with existing inbound bus route, off-street parking provided, as a result, this is a viable route section.	Pass
RE 29	Grand Canal Street Lower, Macken Street to Erne Street Upper.	Urban	Wide carriageway with on-street parking, lane widths could not be reconfigured to provide facilities; as a result, this is not a viable route section.	Fail
RE 30	Lime Street, Sir John Rogerson Quay to Hanover Street East	Urban	Narrow street, with on-street parking, loading and Dublin Bike parking station, residential units bounding the road with little capacity to provide facilities, as such this is not a viable route section.	Fail
RE 31	Erne Street Lower, Hanover Street East to Pearse Street	Urban	Single carriageway road with residential units fronting the street, and on-street parking, limited capacity to provide facilities, as such this is not a viable route section.	Fail
RE 32	Erne Street Upper, Pearse Street to Hogan Place.	Urban	Single carriageway with residential units fronting the street, on-street parking and limited bridge height (3.24m), as a result, this is not a viable route section.	Fail
RE 33	Sir John Rogerson's Quay, Lime Street to Lombard Street East	Urban	Single carriageway with wide path as a result, this is a viable route section.	Pass
RE 34	Hanover Street East, Lime Street/Erne Street Lower to Sandwith Street Lower	Urban	Single carriageway with on-street parking, as a result, this is not a viable route section.	Fail
RE 35	Pearse Street, Erne Street Lower to Sandwith Street Upper/Lower.	Urban	Wide carriageway with bus lanes in either direction, as a result, this is a viable route section.	Pass
RE 36	Sandwith Street Upper, Pearse Street/Sandwith Street Lower to Fenian Street.	Urban	Wide carriageway with on street parking, narrows at bridge crossing, as a result, this is not a viable route section.	Fail
RE 37	Hogan Place, Erne Street Lower to Sandwith Street Upper	Urban	Wide single carriageway with limited potential to reconfigure lanes width, as a result, this is not a viable route section.	Fail
RE 38	Sandwith Street Lower, Townsend Street/Lombard Street East to Pearse Street	Urban One-way street.	Wide one-way street, with a number of lanes, cycle facilities and parking, as a result, this is a viable route section. Alternative route may be required for bus route in opposite direction.	Pass
RE 39	Pearse Street, Sandwith Street Upper/Lower to Lombard Street East/Westland Row.	Urban One-way	Wide carriageway with a number of lanes, on-street parking and existing bus facilities. Provides a direct link to terminus of scheme, as a result, this is a viable route section. One-way street, therefore alternative return route required.	Pass
RE 40	Fenian Street, Sandwith Street Upper to Lincoln Place.	Urban	Wide carriageway with on street parking, however limited capacity to widen, as a result, this is not a viable route section.	Fail

Section No.	Description	Area Characteristics	Comment	Pass /Fail
RE 41	Lombard Street East, City Quay to Townsend Street	Urban One-way, on-street parking, existing bus route	Wide carriageway with a number of lanes, a cycle lane and on street parking. This route is one-way in the southbound direction and is not a viable route section.	Fail
RE 42	Lombard Street East, Townsend Street to Pearse Street	Urban One-way, existing bus route	Wide carriageway with a number of lanes and a cycle lane. This route is one-way in the southbound direction and is not a viable route section.	Fail
RE 43	Westland Row, Lincoln Place to Pearse Street	Urban Existing bus route	Wide carriageway with a number of lanes including a bus lane a cycle lane. Bridge height of 4.96m, Dublin bus height is 4.39m. This route section does not form part of a feasible end-to-end route and hence is not viable.	Fail
RE 44	City Quay, Moss Street to Lombard Street East	Urban One-way, two-way cycle route (Liffey Cycle Scheme)	Wide one-way carriage with a number of lanes and sufficient road space for a segregate bus lane. This route section forms part of the Liffey Cycle Route and hence is viable.	Pass
RE 45	Talbot Memorial Bridge	Urban Existing cycle lanes	Wide bridge with two lanes of traffic in each direction and segregated cycle lanes; hence, it is a viable route section.	Pass
RE 46	Custom House Quay / North Wall Quay	Urban	Wide carriageway with one to two lanes of traffic in each direction, including bus lane. This route section forms part of the Liffey Cycle Route and there is potential for the provision of a fully segregated one-way bus lane, hence this route section viable.	Pass
RE 47	Samuel Beckett Bridge	Urban Existing bus and cycle lanes	Wide bridge with two lanes of traffic in each direction and existing bus and cycle lanes, hence this is a viable route section.	Pass
RE 48	Pigeon House Road (east) / Sean Moore Road	Urban	Carriageway with little traffic demand and potential for reconstruction of road to provide segregated bus lanes, hence this is a viable route section.	Pass

Following the ‘Stage 1’ sift, 23 of the 48 route sections assessed passed the initial sifting stage and were progressed to the next assessment stage.

These route sections are presented in Figure 5.2:2: Route Sections passing Stage 1 ‘Sift’.

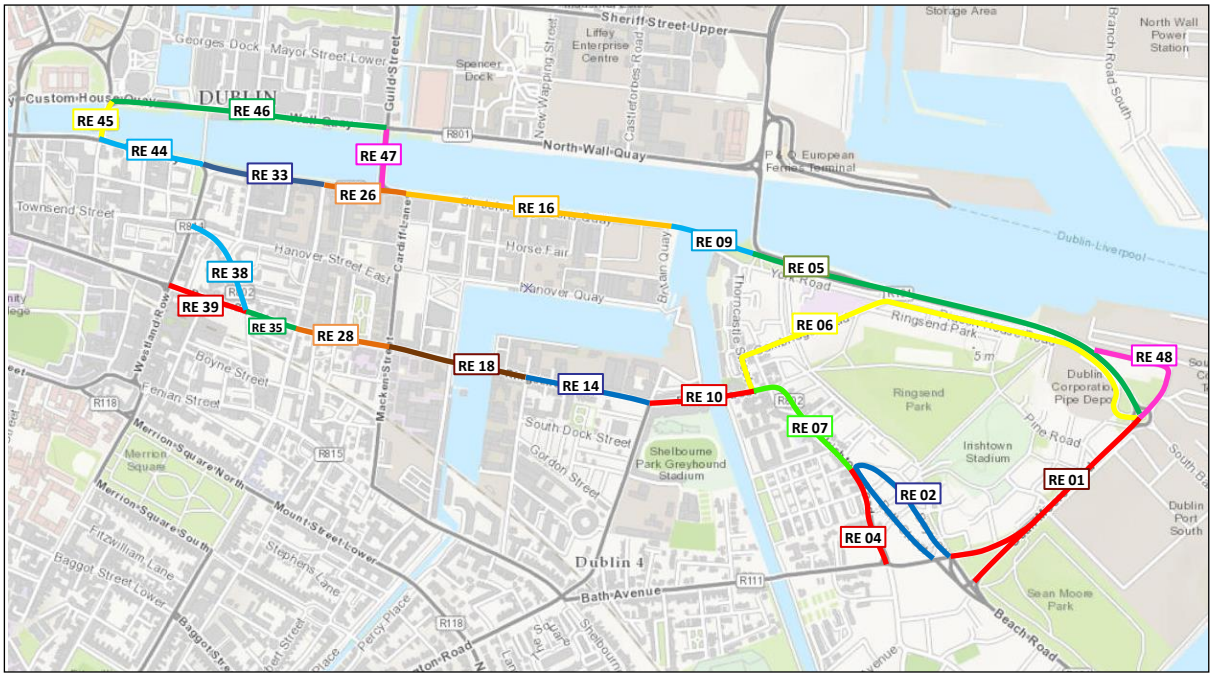

Figure 5.2:2: Route Sections passing Stage 1 ‘Sift’

6. Stage 2: Scheme Options Assessment

6.1 Introduction

The first step in the Stage 2 assessment involves combining shorter route sections which passed the Stage 1 assessment, to form longer end-to-end potential routes within the study area.

After developing routes options, each was explored using different design concepts to identify potential scheme options for each route. The scheme options for each route are described in this report Section.

6.2 Route Options

6.2.1 Introduction

Following the 'Stage 1' sift for the study area, the remaining 23 route sections were combined to form three cohesive route options, connecting Dublin City core to the south-eastern extent of the Ringsend area, as shown in Figure 6.2:1 below.

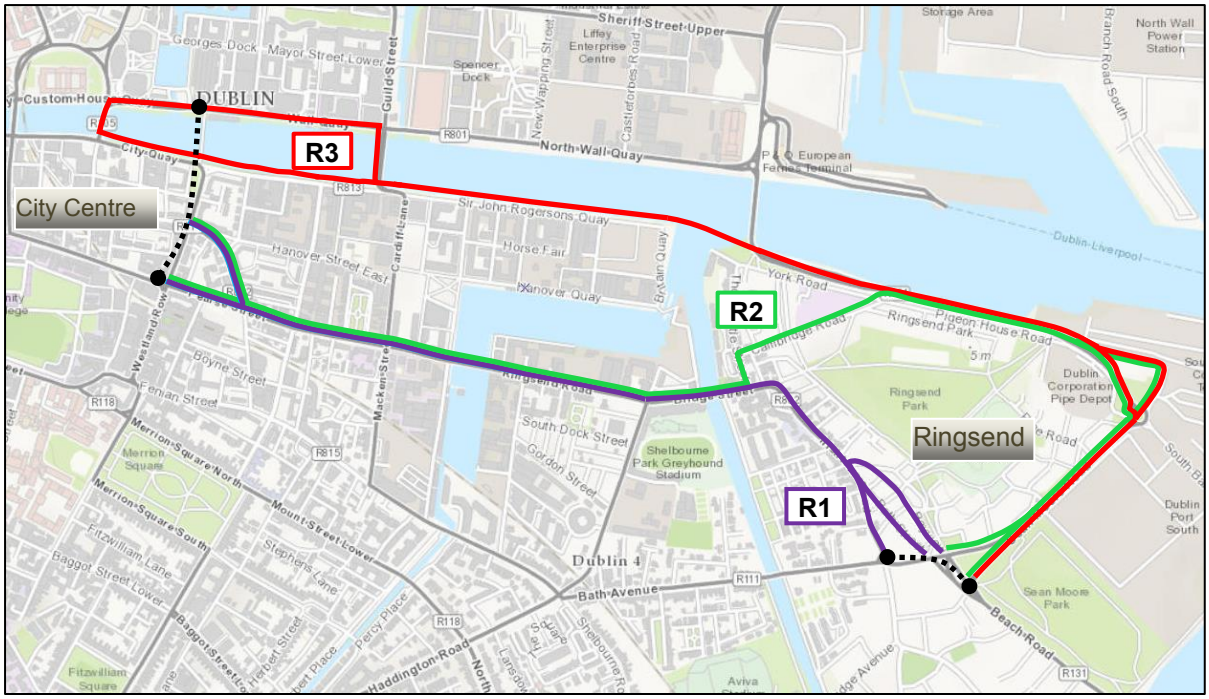

Figure 6.2:1: Cohesive Route Options

R1: A route option along Bath Street/Bayview, Irishtown Road, Bridge Street, Ringsend Road and Pearse Street.

R2: A route option along Sean Moore Road, Pigeon House Road, the East Link, Cambridge Road, Bridge Street, Ringsend Road and Pearse Street.

R3: A route option along Sean Moore Road, Pigeon House Road, the East Link, Sir John Rogerson's Quay and a one-way loop between Samuel Beckett Bridge, the north quays, Talbot Memorial Bridge and back along the south quays back to Sir John Rogerson's Quay.

Two scheme options have been developed for each of the three route options.

Scheme options that would provide maximum bus priority along each route have been considered early in this process. However, they have not been included in the following MCA stage as their impact on the environment, traffic, and cost, would be major. The scheme options that are brought into the assessment process would ensure a significant level of bus priority along each route with optimum road user facility provision and a more practical approach in terms of impact on the environment, traffic and costs. Each of these optimum scheme options are described in detail below.

6.2.2 R1 – Irishtown to Pearse Street

Figure 6.2:2 below illustrates the population residing within the 5, 10 and 15 minute catchment zones of the existing and proposed bus stops along route R1.

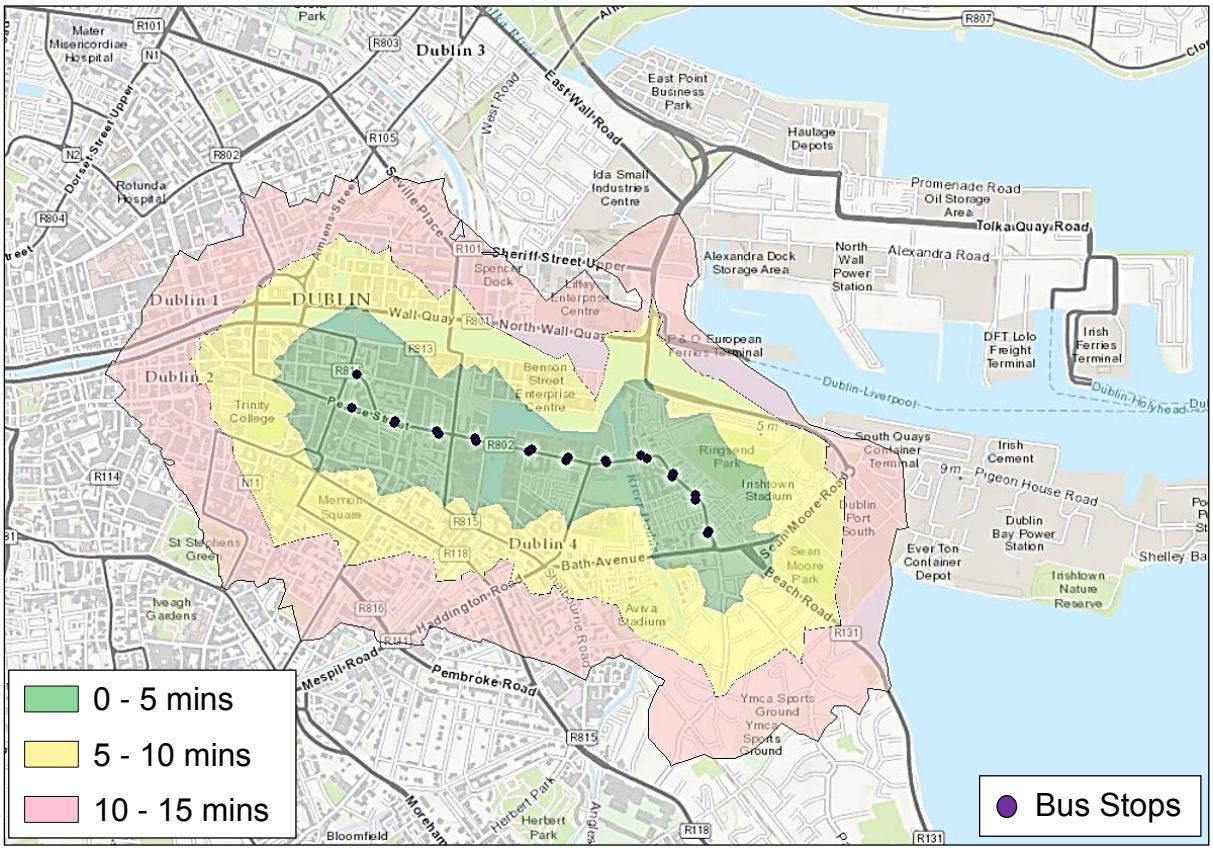

Figure 6.2:2: Walking distance catchment zones for route R1 bus stops

Inbound: This route option would connect Irishtown Road to Pearse Street via Bridge Street and Ringsend.

Outbound: Eastbound, buses would travel the same route as taken by inbound vehicles. This route is approximately 2.1 km in each direction.

Stops: 11 stops would be provided in each direction along this route. See Figure 6.2:2. Bus stop locations have been optimised to facilitate the route geometry and optimise catchment based on population and employment destinations.

Catchment: The outermost isochrone defines the perimeter within which the nearest bus stop can be reached by pedestrians in 15 minutes or less at a typical walking pace. The population residing within each of the isochrones areas (to the nearest thousand) is summarised below:

- 0-5 minutes walking distance – 12,000 residents
- 5-10 minutes walking distance – 11,000 residents
- 10-15 minutes walking distance – 22,000 residents
- Total catchment within 15 minutes walking distance – 45,000 residents

These figures are based on the Census 2011 Small Area Population Statistics (SAPS).

Junctions: There are a total of 9 signalised junctions and 2 pedestrian crossings along this route option. ITS measures may be required to deliver the level of bus priority required for additional bus services.

Journey time: The bus travel time along the entire route would be approximately 15 minutes in each direction for both scheme options.

Infrastructure cost: The estimated cost of upgrading the existing route and junctions is €3,084,000 for R1 scheme option 1 and €3,124,300 for R1 scheme option 2 – see section 6.2.2 and 6.2.3.

Land acquisition cost: There is no land acquisition costs associated with either of the R1 scheme options.

Constraints: The following constraints would need to be considered if this route option is progressed:

- The replacement of parallel parking along the route for the provision of segregated bus and cycle lanes.
- The presence of numerous entrances to existing residential properties and commercial establishments along the route;
- Limited potential for widening along certain sections of route to provide segregated bus and cycle facilities in each direction.
- Bridge crossing of Grand Canal (including protected structures);
- Bridge crossing of River Dodder;
- Existing and committed future development along the route;
- Existing protected monuments within the study area;
- Public Parks (e.g. Pearse Square Park), street trees and other natural features along the route;
- Existing and committed future development along the route;
- Existing protected monuments within the study area;
- The existing urban roads and street network;
- The need to maintain traffic flow for all modes during construction; and
- Limited availability of land in urban areas.

Environmental Impact: The impacts are summarised in the MCA table in Appendix A and discussed in greater detail in the Environmental Impact Report in Appendix H.

6.2.3 R1 Scheme Option 1

Scheme Option 1 has been developed along route R1 to optimise the available road space throughout the route for bus and cycle facilities whilst minimizing the impact on existing traffic and land acquisition where possible.

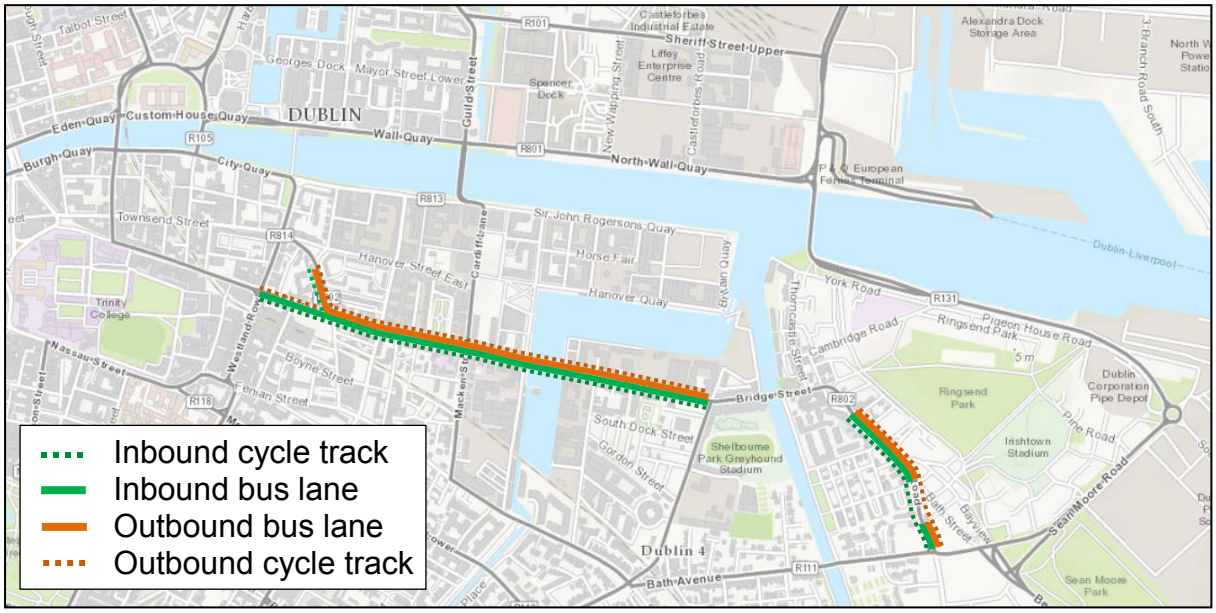

Figure 6.2:3: R1 Option 1

6.2.3.1 Scheme summary

R1 Option 1 would extend from Irishtown Road to Pearse Street via Bridge Street and Ringsend Road. Segregated bus lanes would be provided in each direction along the following sections of the route:

- Along Sandwith Street Lower between Townsend Street and Pearse Street;
- Along Pearse Street and Ringsend Road between the Westland Row / Pearse Street junction and the Ringsend Road / Bridge Street junction;
- Along Irishtown Road between St Patrick's Villas and Oliver Plunkett Avenue; and
- Along Irishtown Road between the Barracks and the Londonbridge Road.

R1 Option 1 would provide segregated cycle lanes in each direction along the following sections of the route:

- Along Sandwith Street Lower between Townsend Street and Pearse Street;
- Along Pearse Street and Ringsend Road between the Westland Row / Pearse Street junction and the Ringsend Road / Bridge Street junction; and
- Along Irishtown Road between St Patrick's Villas and Londonbridge Road.

The segregated bus and cycle facilities which would be provided by the proposed scheme design are shown above in Figure 6.2:3. Analysis of the traffic impact of the proposed works in comparison to the existing conditions has shown that:

- Irishtown Road – Provision of segregated inbound and outbound cycle facilities along the majority of Irishtown Road. Also segregated bus facilities where buses currently share road space – moderate positive impact.

- Bridge Street – no change to existing facilities – No positive or negative impact.
- Ringsend Road – Full segregated cycle and bus facilities where currently commuters share the road space – moderate positive impact.
- Pearse Street - Full segregated cycle and bus facilities where currently commuters share the road space at junctions (left-turning movements with buses) – moderate positive impact.
- Sandwith Street Lower – Full bus and cycle facilities along Sandwith Street Lower between Townsend Street and Pearse Street where some facilities currently exist – Minor positive impact

6.2.3.2 Impact on infrastructure

Pearse Street/Townsend Street/Sandwith Street

Along Townsend Street and Sandwith Street, R1 option 1 would require the removal of some sections of footpaths and ancillaries (tactile paving, kerbs etc.) along with the relocation of all associated services and street furniture (traffic bollards, where necessary. The removed footpaths would be replaced with a new 2m footpath.

Sandwith Street junction to South Dock Road Junction

R1 Option 1 would require the removal of 62 formal parking spaces along Pearse Street and Ringsend Road. Provision of facilities would necessitate a realignment of turning lanes on approaches to Erne Street lower, Macken Street, Barrow Street and South Dock Road. Some sections of footpaths and ancillaries (tactile paving, kerbs etc.) would be removed along with the relocation of all associated services where necessary. The footpaths would be replaced with new 2m footpaths on both sides. R1 Option 1 would incorporate a 2 metre wide segregated inbound cycle lane on both eastbound and westbound carriageways. R1 Option 1 would also require the relocation of approximately 27 trees along this section.

South Dock Road Junction to Church Avenue via Irishtown Road

From the southernmost junction of St. Patricks Villas, segregated bus and lanes would be provided until the junction of Irishtown Road and Bath Street. Sections of footpaths and ancillaries (tactile paving, kerbs etc.) would be removed along with the relocation of all associated services and street furniture where necessary. Delivery of the R1 Option 1 along the sections stipulated would require the removal of 10 formal (of which 3 are disabled) and 66 informal parking spaces. R1 Option 1 would not be provided along the full length of Irishtown Road due to the close proximity of the Village Inn and the easternmost property of Dodder Terrace.

6.2.4 R1 Scheme Option 2

Scheme Option 2 has been developed along route R1 to optimise the available road space throughout the route for bus and cycle facilities whilst minimizing the impact on existing traffic and land acquisition where possible.

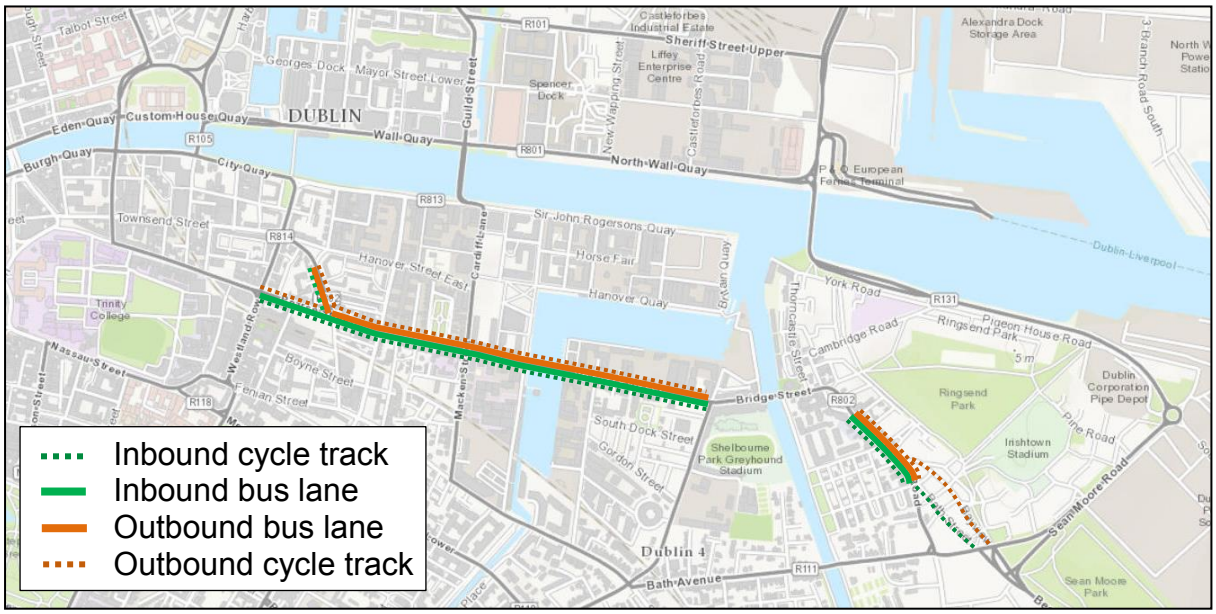

Figure 6.2:4: R1 Option 2

6.2.4.1 Scheme summary

R1 option 2 would extend from Bath Street / Bayview to Pearse Street via Irishtown Road, Bridge Street and Ringsend Road. Segregated bus lanes are proposed in each direction along the following sections of the route:

- Along Sandwith Street Lower between Townsend Street and Pearse Street;
- Along Pearse Street and Ringsend Road between the Westland Row / Pearse Street junction and the Ringsend Road / Bridge Street junction; and
- Along Irishtown Road between St Patrick's Villas and Oliver Plunkett Avenue.

This scheme design proposes segregated cycle lanes in each direction along the following sections of the route:

- Along Sandwith Street Lower between Townsend Street and Pearse Street;
- Along Pearse Street and Ringsend Road between the Westland Row / Pearse Street junction and the Ringsend Road / Bridge Street junction; and
- Along the entirety of Bath Street (inbound cycle lane only) and Pembroke Street (outbound cycle lane only).

The facilities to be provided by the proposed scheme design are shown above in Figure 6.2:3. Analysis of the traffic impact of the proposed works in comparison to the existing conditions has shown that:

- Bath Street – Provision of Inbound cycle lane where none currently exist. May effect on-street parking – moderate negative impact.
- Pembroke Street - Provision of Outbound cycle lane where none currently exist. May effect on-street parking – moderate negative impact.
- From the junction of Bath Street/Irishtown Road this scheme option follows along the same route as R1 Option 1 which has already been detailed above (see Section 6.2.2).

6.2.4.2 Impact on infrastructure

R1 option 2 would follow along the same streets as R1 option 1; the difference being that option 1 would begin/end at the Irishtown Road/Church Avenue junction whereas option 2 would operate a one-way system along Bath Street and Pembroke Street/Bayview. As such, this section of the report shall concentrate on the impact that option 2 would have on Bath Street and Bayview.

Bath Street

The provision of a shared corridor (cyclists, buses and traffic) along the street would require all informal parking, of which there are 25 spaces including 2 disabled, to be prohibited. Some additional road markings would be required.

Pembroke Street/Bayview

A shared corridor (cyclists, buses and traffic) would be required along this section of the route and this would require all parking to be prohibited along St. Josephs Terrace. As such, additional road markings would be required.

6.2.5 R2 – Sean Moore Road to Pearse Street

Figure 6.2.5 below illustrates the population residing within the 5, 10 and 15 minute catchment zones of the existing and proposed bus stops along route R2.

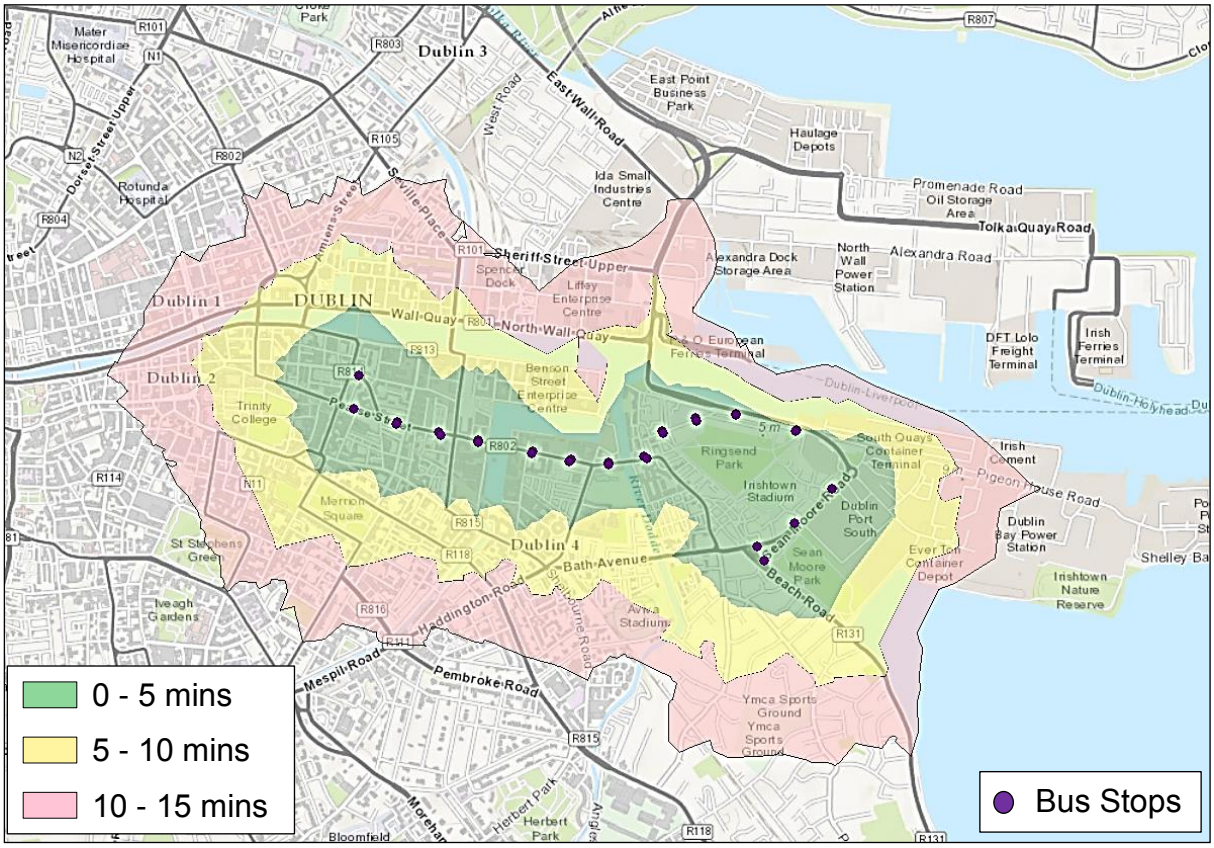

Figure 6.2:5: Walking distance catchment zones for route R2 bus stops

Inbound: This route option would connect Sean Moore Road to Pearse Street via the East Link, Cambridge Road, Bridge Street and Ringsend Road.

Outbound: Eastbound, buses would travel the same route as taken by inbound vehicles. This route is approximately 3.4 km in each direction.

Stops: 15 stops would be provided in each direction along this route. Bus stop locations have been optimised to facilitate the route geometry and optimise catchment based on population and employment destinations.

Catchment: The outermost isochrone defines the perimeter within which the nearest bus stop can be reached by pedestrians in 15 minutes or less at a typical walking pace. The population residing within each of the isochrones areas (to the nearest thousand) is summarised below:

- 0-5 minutes walking distance – 12,000 residents
- 5-10 minutes walking distance – 10,000 residents
- 10-15 minutes walking distance – 16,000 residents
- Total catchment within 15 minutes walking distance –38,000 residents

These figures are based on the Census 2011 Small Area Population Statistics (SAPS).

Junctions: There are a total of 11 signalised junctions and 3 pedestrian crossings along this route option. ITS measures may be required to deliver the level of bus priority required for additional bus services.

Journey time: The bus travel time would be approximately 25 minutes in each direction for R2 Option 1 and 26 minutes for R2 option 2.

Infrastructure cost: The estimated cost of upgrading the existing route and junctions is €5,404,900 for both R2 scheme options.

Land acquisition cost: There is no land acquisition costs associated with this R2 Option 1 while the total land acquisition cost associated with this R2 option 2 is €405,000.

Constraints: The following constraints would need to be considered if this route option is progressed:

- The replacement of parallel parking along the route for the provision of segregated bus and cycle lanes.
- The presence of numerous entrances to existing residential properties and commercial establishments along the route;
- Limited potential for widening along certain sections of route to provide segregated bus and cycle facilities in each direction.
- Bridge crossing of Grand Canal (including protected structures);
- Bridge crossing of River Dodder;
- Existing and committed future development along the route;
- Existing protected monuments within the study area;
- Public Parks (e.g. Pearse Square Park), street trees and other natural features along the route;
- Existing and committed future development along the route;
- Existing protected monuments within the study area;

- The existing urban roads and street network;
- The need to maintain traffic flow for all modes during construction; and
- Limited availability of land in urban areas.
- Sections of the existing stone wall separating East Link Road and Pigeon House Road would have to be removed to facilitate continuity of a physically segregated busway; this wall is included in the list of Dublin City Council's protected structures and thus, specific approval would be required.

Environmental Impact: The impacts are summarised in the MCA table in Appendix A and discussed in greater detail in the Environmental Impact Report in Appendix H.

6.2.6 R2 Scheme Option 1

Scheme Option 1 has been developed along route R2 to optimise the available road space throughout the route for bus and cycle facilities whilst minimizing the impact on existing traffic and land acquisition where possible.

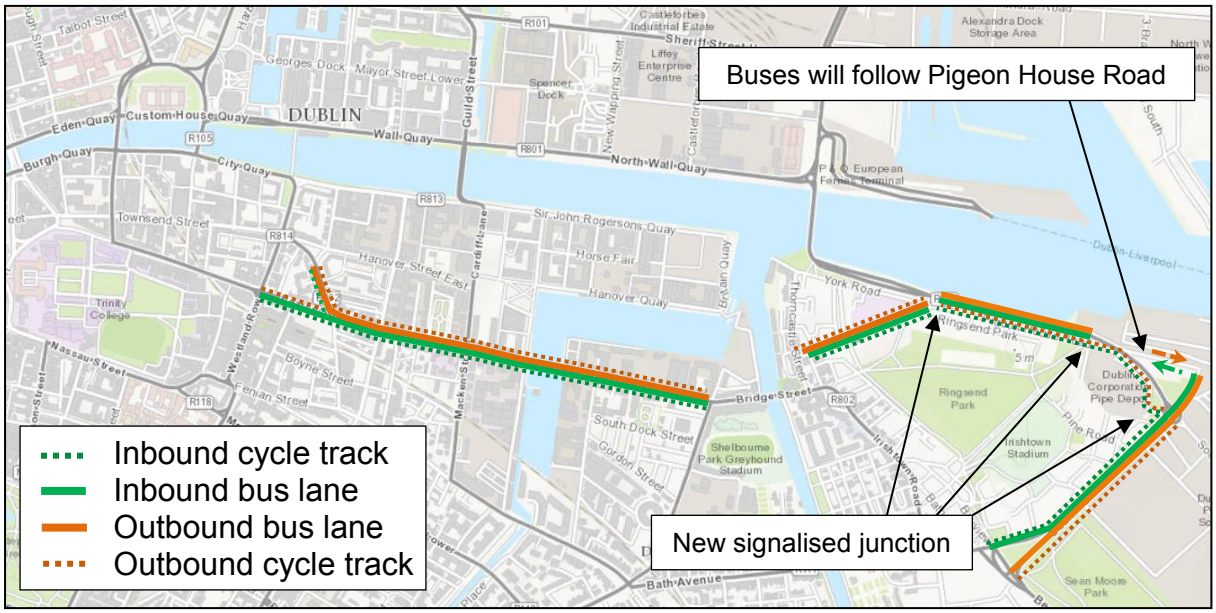

Figure 6.2:6: R2 Option 1

6.2.6.1 Scheme summary

R2 Option 1 would extend from Sean Moore Road to Pearse Street via the East Link, Cambridge Road, Bridge Street and Ringsend Road. Segregated bus lanes are proposed in each direction along the following sections of the route:

- Along Sandwith Street Lower between Townsend Street and Pearse Street;
- Along Pearse Street and Ringsend Road between the Westland Row / Pearse Street junction and the Ringsend Road / Bridge Street junction;
- Along Thorncastle Road between Bridge Street and Cambridge Road;
- Along the entirety of Cambridge Road;
- Along the East Link between Cambridge Road and Cambridge Avenue; and
- Along the entirety of Sean Moore Road.

R2 Option 1 proposes segregated cycle lanes in each direction along the following sections of the route:

- Along Pearse Street and Ringsend Road between the Westland Row / Pearse Street junction and the Ringsend Road / Bridge Street junction;
- Along Thorncastle Road between Bridge Street and Cambridge Road;
- Along the entirety of Cambridge Road;
- Along Pigeon House Road from Cambridge Road to the Sean Moore Road roundabout; and
- Along the entirety of Sean Moore Road.

The facilities to be provided by the proposed scheme design are shown above in Figure 6.2:3. Analysis of the traffic impact of the proposed works in comparison to the existing conditions has shown that:

- Seán Moore Road - Provision of full cycle and bus facilities where presently none exist – major positive impact
- Pigeon House Road/R131 East Link Road – Full cycle facilities to be provided along the full length of Pigeon House Road where currently none exist.
- Segregated Bus facilities also to be provided between Cambridge Road and Cambridge Avenue where none currently exist – major positive impact.
- Cambridge Road – Full bus and cycle facilities where none currently exist – major positive impact.
- Thorncastle Street – Full bus and cycle facilities between Bridge Street and Cambridge Road where none currently exist. Some on-street parking may be affected in this area – minor positive impact.
- From the junction of Thorncastle Street/ Bridge Street this scheme option follows along the same route as the R1 scheme options (Bridge Street, Ringsend Road etc.) which has already been detailed above (see Section 6.2.2).

6.2.6.2 Impact on infrastructure

Seán Moore Road to the Pigeon House/Cambridge Road Roundabout

R2 Option 1 would include the removal of traffic islands from the central median and the relocation of pedestrian crossings at the Bremen road and Pine Road junctions. To facilitate this R2 Option 1, some land-take (from the grounds of the Sea Scouts Hall) would be required at the transition between Seán Moore road and Pigeon House Road.

In order to facilitate buses to continue travelling westward along Pigeon House Road, R2 Option 1 necessitates the construction of a signalised junction to allow the corridor to cross the East Link road. The works on Pigeon House road would require extensive earthworks along with the relocation of the existing wall, 29 trees, public lighting and electricity/telephone poles and cables.

Pigeon House/Cambridge Road Roundabout to Thorncastle Street/Bridge Street junction

To facilitate R2 Option 1, 39 formal and 110 informal parking spaces would have to be removed along this section. Some sections of footpath and ancillaries (tactile paving, kerbs etc.) would be removed along this section along with the relocation of all associated services where necessary. The existing footpaths would be replaced with new footpaths and cycle lanes alongside both carriageways. 15 trees would be relocated as part of the proposed works. The rest of this route continues along Bridge Street, Ringsend and Pearse Street as detailed in section 6.2.3.

6.2.7 R2 Scheme Option 2

Scheme Option 2 has been developed along route R2 to optimise the available road space throughout the route for bus and cycle facilities whilst minimizing the impact on existing traffic and land acquisition where possible.

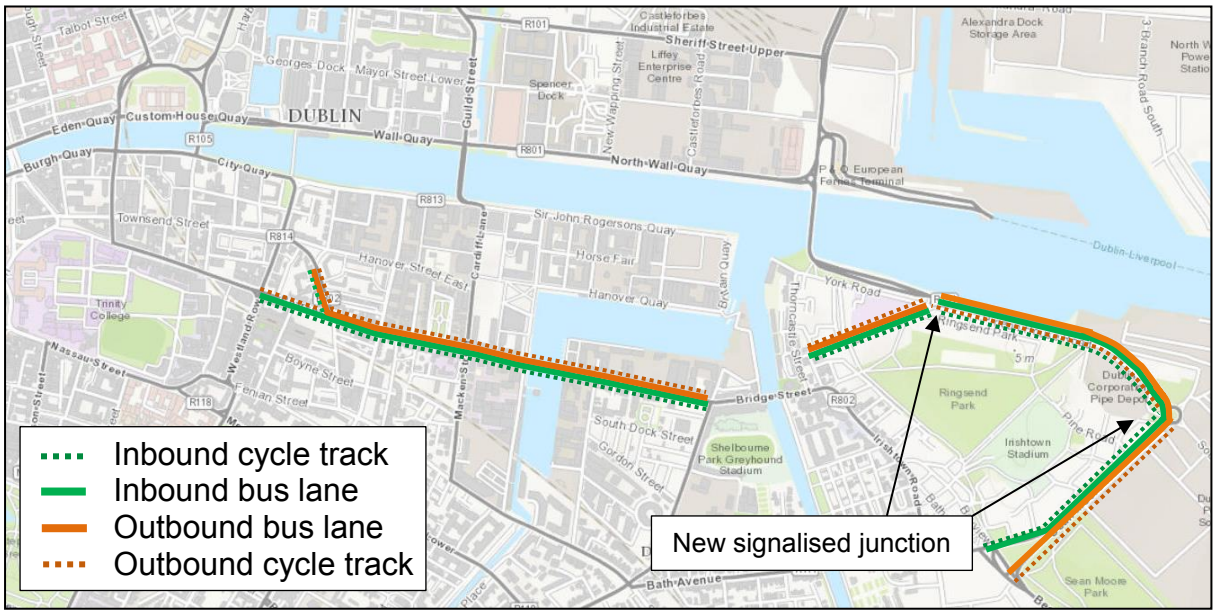

Figure 6.2:7: R2 Option 2

6.2.7.1 Scheme summary

R2 Option 2 would extend from Sean Moore Road to Pearse Street via the East Link, Cambridge Road, Bridge Street and Ringsend Road. Segregated bus lanes are proposed in each direction along the following sections of the route:

- Along Sandwith Street Lower between Townsend Street and Pearse Street;
- Along Pearse Street and Ringsend Road between the Westland Row / Pearse Street junction and the Ringsend Road / Bridge Street junction;
- Along Thorncastle Road between Bridge Street and Cambridge Road;
- Along the entirety of Cambridge Road;
- Along the East Link between Cambridge Road and Cambridge Avenue; and
- Along the entirety of Sean Moore Road.

This scheme design proposes segregated cycle lanes in each direction along the following sections of the route:

- Along Pearse Street and Ringsend Road between the Westland Row / Pearse Street junction and the Ringsend Road / Bridge Street junction;
- Along Thorncastle Road between Bridge Street and Cambridge Road;
- Along the entirety of Cambridge Road;
- Along Pigeon House Road from Cambridge Road to the Sean Moore Road roundabout; and
- Along the entirety of Sean Moore Road.

The facilities to be provided by the proposed scheme design are shown above in Figure 6.2:3. Analysis of the traffic impact of the proposed works in comparison to the existing conditions has shown that:

- Seán Moore Road - Provision of full cycle and bus facilities where presently none exist – major positive impact
- Pigeon House Road/R131 East Link Road – Full cycle facilities to be provided along the full length of Pigeon House Road where currently none exist.
- Segregated Bus facilities also to be provided between Cambridge Road and Cambridge Avenue where none currently exist – major positive impact.
- Cambridge Road – Full bus and cycle facilities where none currently exist – major positive impact.
- Thorncastle Street – Full bus and cycle facilities between Bridge Street and Cambridge Road where none currently exist. Some on-street parking may be affected in this area – minor positive impact.
- From the junction of Thorncastle Street/ Bridge Street this scheme option follows along the same route as R1 scheme options (Bridge Street, Ringsend Road etc.) which has already been detailed above (see Section 6.2.2).

6.2.7.2 Impact on infrastructure

Seán Moore Road to the Pigeon House/Cambridge Road Roundabout

R2 Option 2 would include the removal of traffic islands from the central median and the relocation of pedestrian crossings at the Bremen road and Pine Road junctions. R2 Option 2 would require the conversion of the Seán Moore/Pigeon House Roundabout to a 3-arm junction. Localised two-way traffic would be directed along Pigeon House Road. The existing R131 East Link Road would become bus and cyclist only designated lanes.

Pigeon House/Cambridge Road Roundabout to Thorncastle Street/Bridge Street junction

To facilitate R2 Option 1, 39 formal and 110 informal parking spaces would have to be removed along this section. Some sections of footpath and ancillaries (tactile paving, kerbs etc.) would be removed along this section along with the relocation of all associated services where necessary. The existing footpaths would be replaced with new footpaths and cycle lanes alongside both carriageways. 15 trees would be relocated as part of the proposed works.

The rest of this route continues along Bridge Street, Ringsend and Pearse Street as detailed in section 6.2.3.

6.2.8 R3 – Sean Moore Road to Talbot Memorial Bridge

Figure 6.2:8 below illustrates the population residing within the 5, 10 and 15 minute catchment zones of the existing and proposed bus stops along route R3.

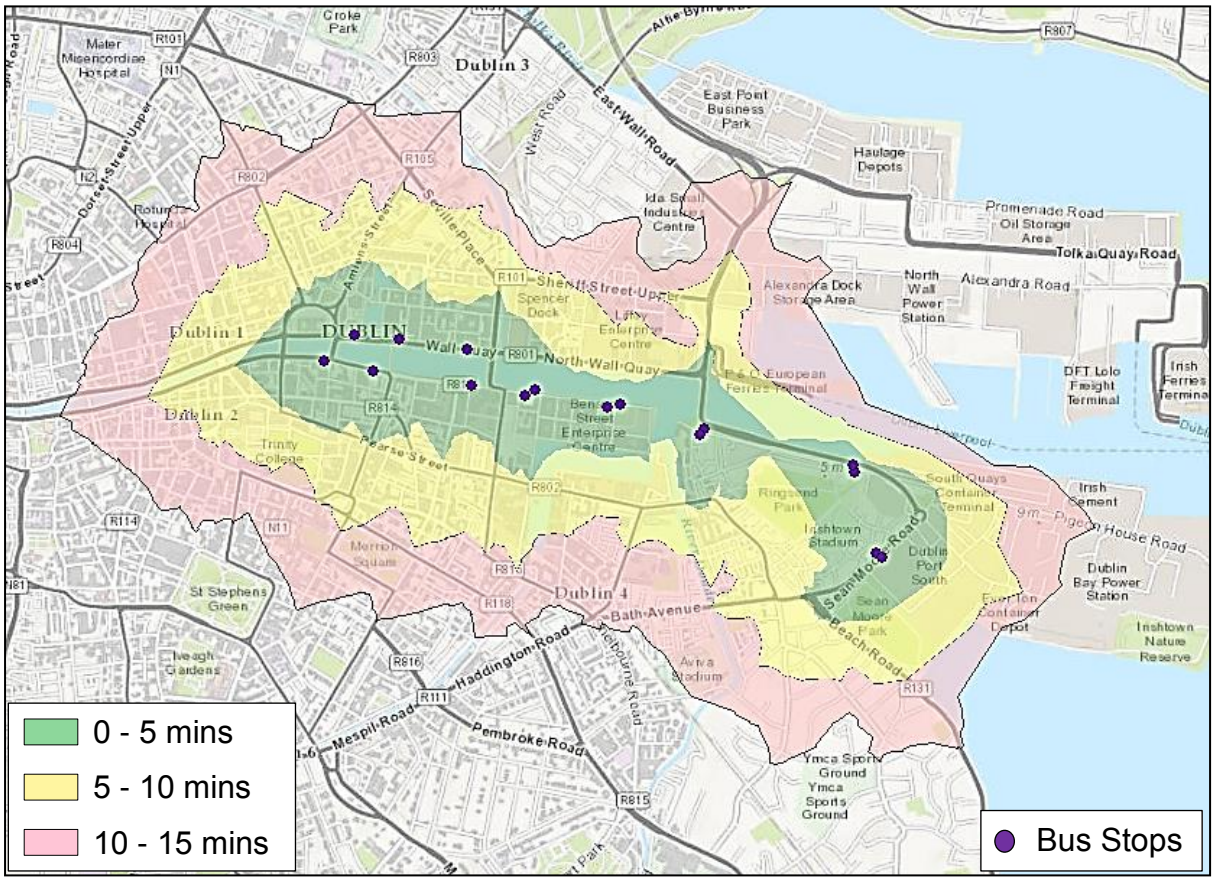

Figure 6.2:8: Walking distance catchment zones for route R3 bus stops

Inbound: This route option would connect Sean Moore Road to Talbot Memorial Bridge via the East Link, across the proposed bridge to Sir John Rogerson's Quay, Samuel Beckett Bridge and the north and south quays.

Outbound: Eastbound, buses would travel the same route as taken by inbound vehicles. This route is approximately 3.35 km in each direction.

Stops: 8 stops would most likely be provided in each direction along this route. Bus stop locations have been optimised to facilitate the route geometry and optimise catchment based on population and employment destinations.

Catchment: The outermost isochrone defines the perimeter within which the nearest bus stop can be reached by pedestrians in 15 minutes or less at a typical walking pace. The population residing within each of the isochrones areas (to the nearest thousand) is summarised below:

- 0-5 minutes walking distance – 10,000 residents
- 5-10 minutes walking distance – 16,000 residents
- 10-15 minutes walking distance – 20,000 residents
- Total catchment within 15 minutes walking distance – 46,000 residents

These figures are based on the Census 2011 Small Area Population Statistics (SAPS).

Junctions: There are a total of 11 signalised junctions (10 for Scheme Option 2) and 6 pedestrian crossings along this route option. ITS measures may be required to deliver the level of bus priority required for additional bus services.

Journey time: The bus travel time along the entire route would be approximately 26 minutes in each direction for R2 Option 1 and 20 minutes for R2 Option 2.

Infrastructure cost: The estimated cost of upgrading the existing route and junctions is €6,246,100 for R3 Option 1 and €7,420,300 for R3 option 2; with an additional €30,000,000 estimated cost for the bridge connecting Thorncastle Street to Sir John Rogerson's Quay for both scheme options.

Land acquisition cost: There is no land acquisition costs associated with this R3 Option 1 while the total land acquisition cost associated with this R3 option 2 is €1,635,000 (will be updated).

Constraints: The following constraints would need to be considered if this route option is progressed:

- The replacement of parallel parking along the route for the provision of segregated bus and cycle lanes.
- The presence of numerous entrances to existing residential properties and commercial establishments along the route;
- Limited potential for widening along certain sections of route to provide segregated bus and cycle facilities in each direction.
- Bridge crossing of River Dodder;
- Bridge crossings of River Liffey;
- Existing and committed future development along the route;
- Existing protected monuments within the study area;
- Public Parks (e.g. Pearse Square Park), significant street trees and other natural features along the route;
- Existing and committed future development along the route;
- Existing protected monuments within the study area;
- The existing urban roads and street network;
- The need to maintain traffic flow for all modes during construction;
- Limited availability of land in urban areas; and
- Sections of the existing stone wall separating East Link Road and Pigeon House Road would have to be removed to facilitate continuity of a physically segregated busway; this wall is included in the list of Dublin City Council's protected structures and thus, specific approval would be required.

Environmental Impact: The impacts are summarised in the MCA table in Appendix A and discussed in greater detail in the Environmental Impact Report in Appendix H.

6.2.9 R3 Scheme Option 1

Scheme Option 1 has been developed along route R3 to optimise the available road space throughout the route for bus and cycle facilities whilst minimizing the impact on existing traffic and land acquisition where possible.

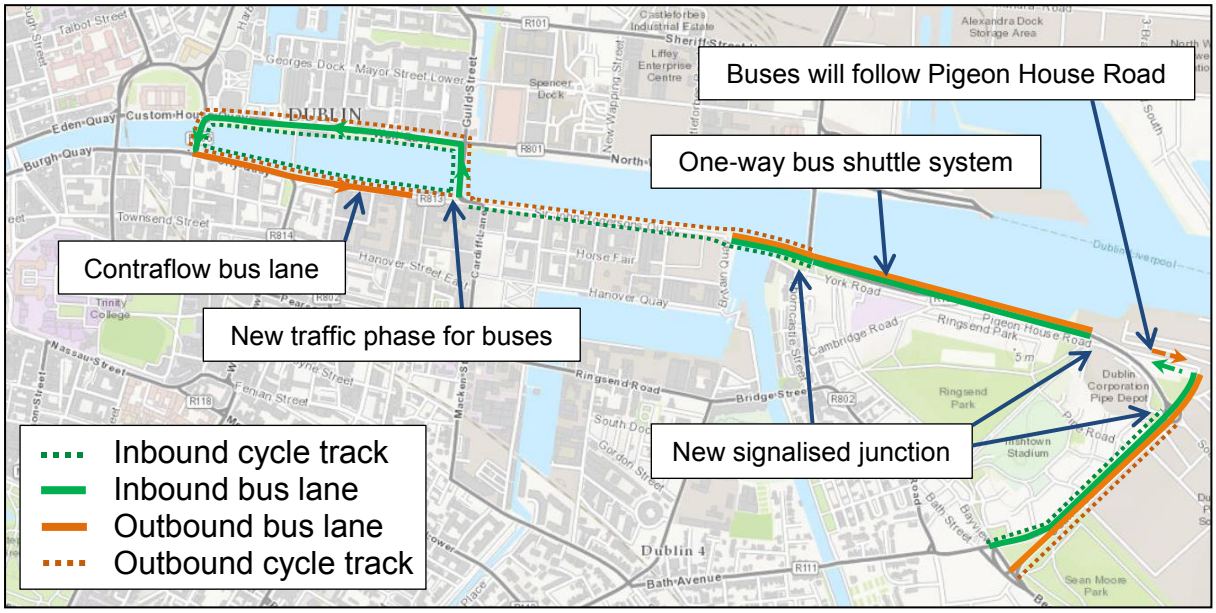

Figure 6.2:9: R3 Option 1

6.2.9.1 Scheme summary

R3 Option 1 would extend from Sean Moore Road to Pearse Street via the East Link, Cambridge Road, Bridge Street and Ringsend Road. Segregated bus lanes are proposed in each direction along the following sections of the route:

- The loop around the north quays (westbound bus lane) and south quays (eastbound bus lane) between Talbot Memorial Bridge (southbound bus lane) and Samuel Beckett Bridge (northbound bus lane);
- Along the proposed bridge connecting Sir John Rogerson's Quay to Thorncastle Street;
- Along the East Link between Thorncastle Street and Cambridge Road;
- Along the East Link between Cambridge Road and Cambridge Avenue; and
- Along the entirety of Sean Moore Road.

R3 Option 1 proposes segregated cycle lanes in each direction along the following sections of the route:

- The loop around the north quays and south quays between Talbot Memorial Bridge and Samuel Beckett Bridge;
- Along the entirety of Sir John Rogerson's Quay;
- Along the proposed bridge connecting Sir John Rogerson's Quay to Thorncastle Street;
- Along the entirety of Sean Moore Road.

The facilities to be provided by the proposed scheme design are shown above in Figure 6.2:9. Analysis of the traffic impact of the proposed works in comparison to the existing conditions has shown that:

- Seán Moore Road – Provision of full segregated bus and cycle facilities where currently none exist – major positive impact.
- Pigeon House Road/R131 East Link Road – Full segregated bus facilities to be provided along the full length of Pigeon House Road where currently none exist. – Moderate positive impact.
- York Road - Provision of full segregated bus and shared cycle facilities where currently none exist — moderate positive impact.
- Proposed Bridge over River Dodder - Provision of full segregated bus and cycle facilities where currently none exist – major positive impact.
- Sir John Rogerson's Quay – Provision of full segregated cycle facilities to upgrade existing facilities. Bus shall share road space with traffic – Minor positive impact.
- Loop around Quays - Provision of full segregated bus and cycle facilities to match existing facilities – No impact.

6.2.9.2 Impact on infrastructure

Seán Moore Road to the Pigeon House/Cambridge Road Roundabout

R3 Option 1 would include the removal of traffic islands from the central median and the relocation of pedestrian crossings at the Bremen road and Pine Road junctions.. To facilitate the R3 Option 1, some land take (from the grounds of the Sea Scouts Hall) would be required at the transition between Seán Moore road and Pigeon House Road. In order to facilitate buses to continue travelling westward along Pigeon House Road, R3 Option 1 necessitates the construction of a signalised junction to allow the corridor to cross the East Link road. The works on Pigeon House road would require extensive earthworks along with the relocation of the existing wall, 29 trees, public lighting and electricity/telephone poles and cables.

Pigeon House/Cambridge Road Roundabout to Cardiff Lane junction

R3 Option 1 would include the removal of parking along York Road, Thorncastle Street, Sir John Rogerson's Quay and City quays (123 Formal parking, 264 informal spaces and 3 taxi spaces). R3 Option 1 would also require a reduction in size of the existing toll booths on the East Link road and the delivery of a new bridge crossing the river Dodder between Thorncastle Street and Sir John Rogerson's Quay. The proposed works on York Road would require extensive earthworks, the removal of kerbing and relocation of the boundary wall along the existing grass median. The proposed works would require the relocation of 23 trees, St. Patricks rowing club and a substation at the junction of York road and Thorncastle Street.

6.2.10 R3 Scheme Option 2

Scheme Option 2 has been developed along route R3 to optimise the available road space throughout the route for bus and cycle facilities whilst minimizing the impact on existing traffic and land acquisition where possible.

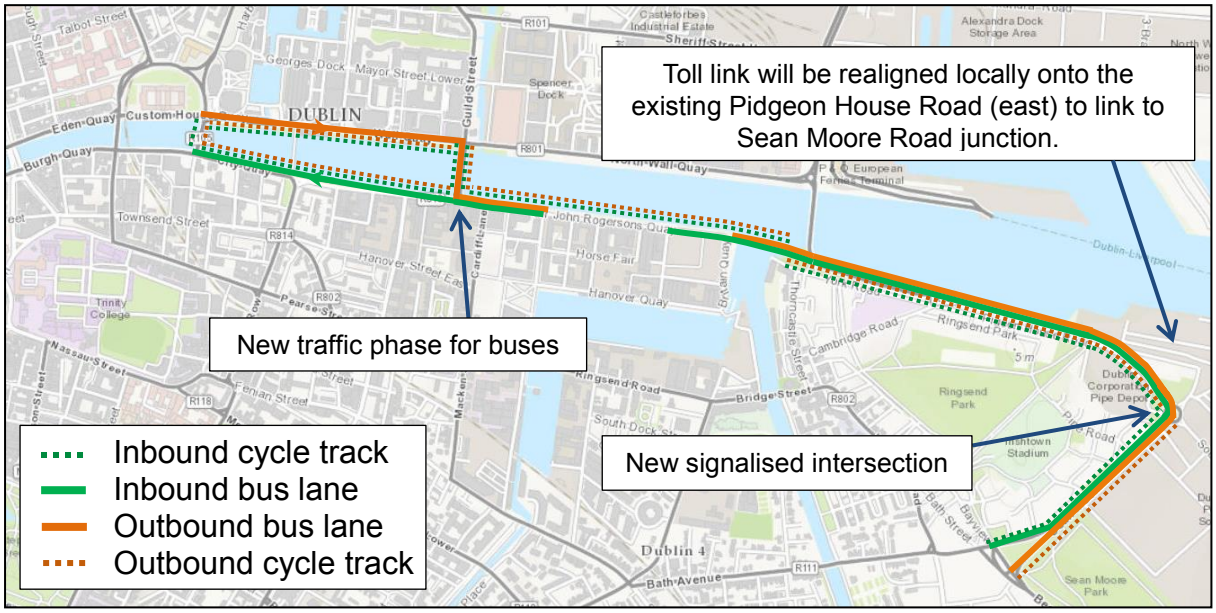

Figure 6.2:10:R3 Option 2

6.2.10.1 Scheme summary

R3 Option 2 would extend from Sean Moore Road to Pearse Street via Sean Moore Road, Sir John Rogerson's Quays and the north/south quays. Segregated bus lanes are proposed in each direction along the following sections of the route:

- Along Eden and Custom House Quays between Rosie Hackett and Talbot Memorial bridges;
- Along Sir John Rogerson's Quay from Samuel Beckett bridge to Forbes Street;
- Along the proposed bridge connecting Sir John Rogerson's Quay to Thorncastle Street;
- Along the entirety of York Road, Sean Moore Road and the grass margin in between Pigeon House Road and East Link.

In addition to these two-way segregated bus lanes, this scheme design includes the provision of segregated bus lanes:

- Along the South quays between Cardiff Lane and the Burgh Quay/Hawkins Street junction (eastbound only);
- Along the North Quays between Talbot Memorial Bridge and Samuel Beckett Bridge (westbound only) and;
- Across Samuel Beckett Bridge (southbound only); and
- Two lanes heading southbound only across Rosie Hackett Bridge (right turn onto Burgh Quay and through lane onto Hawkins Street).

R3 Option 2 proposes segregated cycle lanes in each direction along the following sections of the route:

- The loop around the north quays and south quays between Talbot Memorial Bridge and Samuel Beckett Bridge (including bridges);
- Along the entirety of Sir John Rogerson's Quay;
- Along the proposed bridge connecting Sir John Rogerson's Quay to Thorncastle Street;
- Along the East Link /Pigeon House Road grass verge between Seán Moore junction and Cambridge Road; and
- Along the entirety of Sean Moore Road.

The facilities to be provided by the proposed scheme design are shown above in Figure 6.2:10. Analysis of the traffic impact of the proposed works in comparison to the existing conditions has shown that:

- Seán Moore Road – Provision of full segregated bus and cycle facilities where currently none exist – major positive impact.
- Pigeon House Road – Full segregated bus and cycle facilities to be provided along the full length of Pigeon House Road where currently none exist. – Major positive impact.
- York Road - Provision of segregated cycle facility (eastbound only) and shared cycle facilities (westbound) where currently none exist –– moderate positive impact.
- Proposed Bridge over River Dodder - Provision of full segregated bus and cycle facilities where currently none exist – major positive impact.
- Sir John Rogerson's Quay – Provision of full segregated cycle facilities to upgrade existing facilities. Bus shall share road space with traffic between the Benson Street junction and the Forbes street junction – Minor positive impact.
- North and South Quays - Provision of single bus lane and cycle facilities – Minor positive impact.

6.2.10.2 Impact on infrastructure

Seán Moore Road to Cardiff Lane

R3 Option 2 would include the removal of traffic islands from the central median and the relocation of pedestrian crossings at the Bremen road and Pine Road junctions. R3 Option 2 would also require the conversion of the Seán Moore/Pigeon House Roundabout to a 3-arm junction. Localised two-way traffic would be directed along Pigeon House Road. The existing R131 East Link Road would become bus and cyclist only designated lanes.

Traffic coming to and from Tom Clarke Bridge (through the East Link tolls) would be re-directed along the eastern end of Pigeon House Road/northern end of Seán Moore. This section of road would be prohibited to buses and cyclists (traveling northbound/southbound along Seán Moore Road and east/west along Pigeon House Road). A new roundabout would be required at the entrance to Marine Terminals Ltd. As a traffic calming measure a raised table would be installed across the entrance to the recycling centre on Pigeon House road. The works on Pigeon House Road/York Road would require extensive earthworks along with the relocation of the existing wall, 29 trees, public lighting and electricity/telephone poles and cables.

R3 Option 2 would require the delivery of a new bridge crossing the river Dodder between Thorncastle Street and Sir John Rogerson's Quay. The proposed new bridge would be bus and cyclist traffic only. R3 Option 2 would also require the construction of a ramped bus stop along the East Link Road. As a traffic calming measure and to aid pedestrians and cyclists to navigate across minor roads, raised tables would be installed at the entrances/exits to Pembroke Cottages, Benson Street, Britain Quay, Blood Stoney Road and Forbes Street.

City Quays from Cardiff Lane

The proposals (West) for R2 Option 2 would entail buses travelling inbound along Sir John Rogerson's and City Quays before returning along Sir John Rogerson's Quay (East) via Butt Bridge and Custom House Quay. Traffic lane alignment changes would be required along this route.

6.3 Stage 2 Assessment Summary

A summary of the MCA results for the scheme options is presented in Table 6.1. Neutral scoring sub-criteria are omitted from the summary table i.e. where scheme options score neutrally to other options. The full MCA table including a justification for the sub-criteria scoring awarded to each scheme option is presented in Appendix A.

In terms of economy, a differentiator between scheme options is the capital cost. R3 scheme options would cost significantly more than other route options, primarily due to the cost of the proposed bridge over the River Dodder. R1 scheme options are the shortest routes with the least amount of junctions and hence bus travel times along these route options would shortest. Conversely, R3 Option 1 is the longest route with the most junctions and hence would offer the longest journey time.

R3 scheme options score the highest under Integration. Compared to R1 and R2, R3 scheme options are better able to integrate with existing and planning residential, commercial and office developments, in particular the Irish Glass Bottle Site development in Ringsend. Unlike the other options, route R3 has the potential for interchange with the Luas and also align with part of a primary cycle route, as identified in the GDA Cycle Network Plan, as well as a Greenway (Dodder).

In terms of Accessibility and Social Inclusion, all routes serve a similar number of key trip attractors and a similar range of affluent and disadvantaged areas as identified in the Pobal Deprivation Index.

Route R1 scheme options score highest under Road Safety as they contain less junctions along their route and they also do not require any turning movements through any of their junctions.

All routes score similarly under Physical Activity as the physical benefits associated with the same mode of transport (bus) on each route is the same.

In terms of the environmental sub-criteria, R3 scheme options have the least potential to impact on landscape and visual, air quality, noise and vibration and land use character in comparison with the other routes; hence R3 Option 1 and 2 score highest under these sub-criteria. However, R3 scheme options have the greatest potential to impact on protected structures and trees and therefore score lowest under the architectural heritage and flora and fauna sub-criteria.

Each sub-criterion in the MCA table is evenly weighted. Of all the route option designs, R3 Option 2 received the highest average score overall.

It is observed through the MCA scoring that R2 Option 2 could be identified as an alternative emerging preferred option if the project objectives were focused on facilitating demand of the existing development. However, the project objectives are primarily focused on facilitating the demand of both existing and future planned development (mainly in the Docklands and Poolbeg Peninsula), which R3 Option 2 achieves optimum results for. Thus, R3 Option 2 is identified as the emerging preferred option for the Ringsend to City Centre CBC.

Table 6.1: Route Options Assessment Summary (Main Criteria)

MCA criteria	Assessment Sub-Criteria	R1 Option 1	R1 Option 2	R2 Option 1	R2 Option 2	R3 Option 1	R3 Option 2
Economy	1.a. Capital Cost						
	1.b. Transport Reliability and Quality (Journey Time)						
Integration	2.a. Land Use Integration						
	2.c. Transport Network Integration						
	2.d. Cycle Network Integration						
Safety	4.a. Road Safety						
Environmental	6.b. Architectural Heritage						
	6.c. Flora & Fauna						
	6.f. Landscape and Visual						
	6.g. Air Quality						
	6.h. Noise & Vibration						
	6.i. Land Use Character						

7. Emerging Preferred Route

7.1 Introduction

This section of the report presents the final conclusions from the assessment process for the end-to-end route options considered and recommends a preferred route. A description of the preferred route is given together with ancillary measures required on other streets and key issues to be addressed through the scheme design development.

7.2 Route Options Assessment Conclusions

Within the study area where potential route options were considered to be available, they have been assessed in accordance with the methodology set out in Chapter 4 including a 'Multi-Criteria Analysis' under the headings of Economy, Integration, Accessibility and Social Inclusion, Safety, Physical Activity and Environment.

7.3 Route Option Description

Based on the conclusions from the route options assessment process, the recommended preferred route for the proposed scheme is presented in Figure 7.3:1.

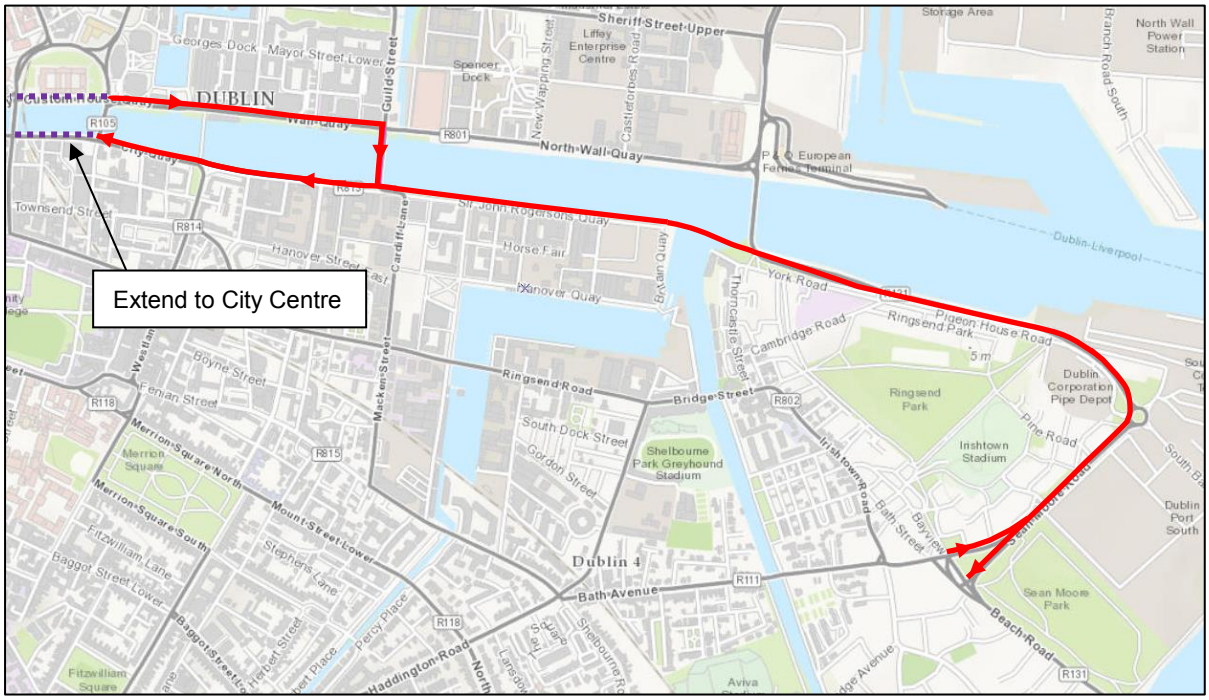

Figure 7.3:1: Ringsend CBC Emerging Preferred Option

Inbound: This route option would connect Sean Moore Road to Talbot Memorial Bridge via Pigeon House Road/East Link grass verge, across the proposed bridge to Sir John Rogerson's Quay along the south quays to Talbot Memorial Bridge.

Outbound: Buses would travel from Talbot Memorial Bridge along the north quays to Samuel Beckett Bridge and across to Sir John Rogerson's Quay where they continue to the proposed bridge, along Pigeon house Road / East Link grass verge and onto Sean Moore Road. This route is approximately 3.35km in each direction.

7.3.1 Bus Stop Locations

The CBC stop locations are indicated in Figure 7.3.2**.** The residential catchment within 5, 10 and 15 minutes walking distance of the proposed stops is also illustrated in Figure 7.3.2**.** The outermost isochrone defines the perimeter within which the stop can be reached by pedestrians in 15 minutes or less at a typical walking pace. The population residing within each of the isochrones areas is summarised below:

- 0-5 minutes walking distance – 10,000 residents
- 5-10 minutes walking distance – 16,000 residents
- 10-15 minutes walking distance – 20,000 residents
- Total catchment within 15 minutes walking distance – 46,000 residents

These figures are based on the Census 2011 Small Area Population Statistics (SAPS). Furthermore, there are a total of 105,000 people working or attending an educational institution within the 15 minute walking catchment of the CBC stops i.e. 85,000 in employment and 20,000 in education.

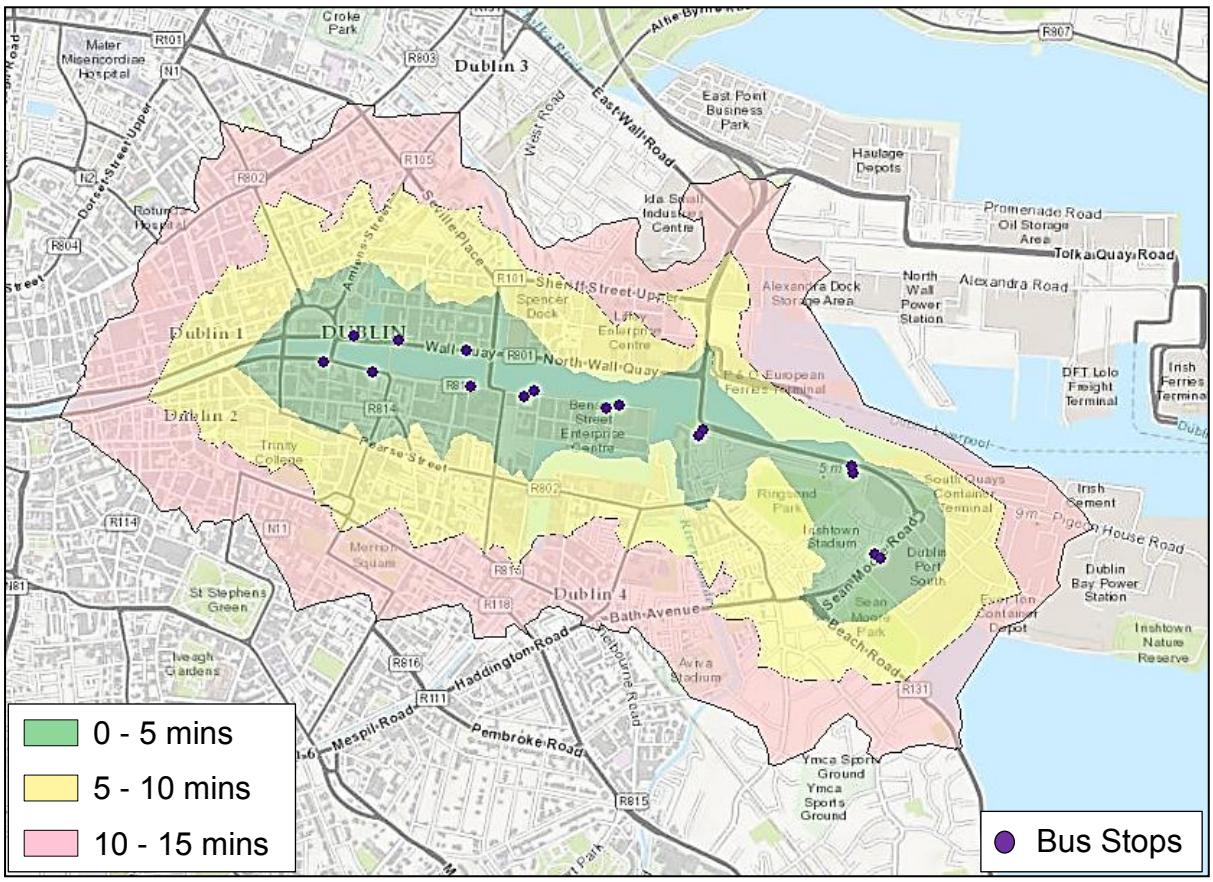

Figure 7.3:2: Walking distance catchment zones for CBC bus stops

7.3.2 Provision for Cyclists

The Greater Dublin Area Cycle Network Plan identifies the EPO corridor as part of the Dodder Greenway, a primary cycle network (Route 5) and secondary cycle network (Route 13E/N5); see Figure 7.3.3. Thus, the EPO forms a key part of the strategic cycle network. It is therefore important that CBC design along the corridor takes cognisance of this and it is intended that the proposed scheme incorporates, where practical, the cycle infrastructure required to provide a high quality of service in accordance with the National Cycle Manual, as required for a primary and secondary cycle route. A road segregated cycle track is proposed in each direction along the entirety of the CBC route as illustrated in Figure 7.3:3.

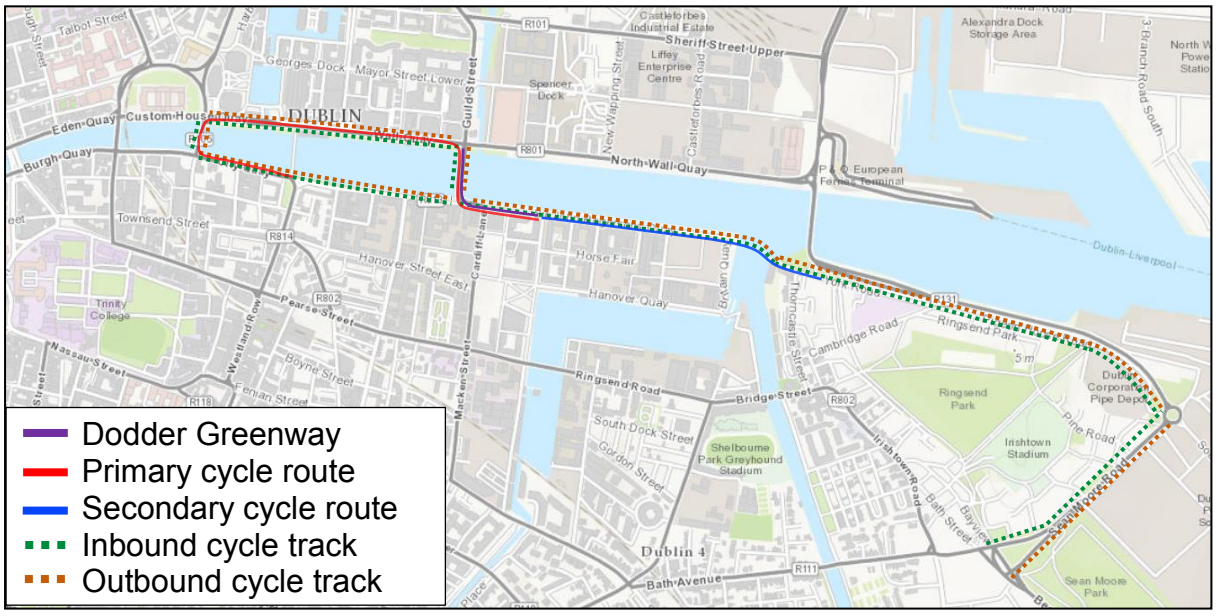

Figure 7.3:3: Proposed cycle facilities along the route

7.4 Proposed Scheme Design along the EPO

(refer to the Emerging Scheme Design Drawings)

The emerging preferred option design is illustrated in Figure 7.4.1 below.

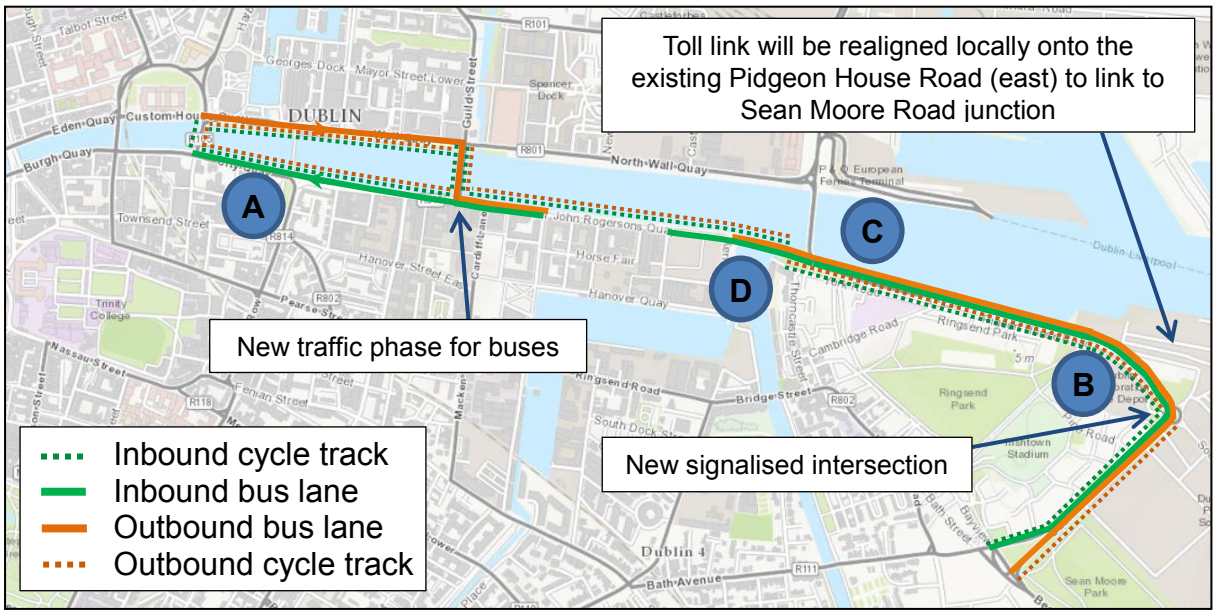

Figure 7.4:1: Emerging Preferred Scheme

The scheme design includes the following:

- **[A]** The routing of buses between Sir John Rogerson's Quay and Talbot Memorial Bridge via the south quays (inbound contra-flow bus lane) and the north quays and Samuel Beckett Bridge (outbound).
- Use of existing southbound (outbound) bus lanes along Samuel Beckett Bridge, North Wall Quay and Custom House Quay; any gaps in the existing bus lanes along these streets/bridge will be filled in by new bus lanes to ensure continuity of bus priority.
- The provision of new segregated bus lanes along the following streets/bridge:
  - City Quay (outbound);
  - Eastbound (outbound) and Westbound (inbound) along the grass margin in between Pigeon House Road and East Link.
  - Eastbound (outbound) and Westbound (inbound) along Sir John Rogerson's Quay from Samuel Beckett bridge to Forbes Street;
  - Inbound from Lime Street junction to City Quay;
  - Proposed bridge connecting Sir John Rogerson's Quay to Thorncastle Street over the Dodder (inbound and outbound); it should be noted that the final design of proposed bridge (delivered separately) will dictate the exact road alignment at either end of the bridge, thus the Ringsend CBC Scheme design at that location is dependent on the design process outcomes for the bridge.
  - **[B]** Roundabout to be upgraded to signalised cross-roads; and
  - Sean Moore Road (northbound and southbound).
- Use and improvement (as required) of existing two-way cycle facility along the entire length of the route; the provision of new segregated cycle lanes along the following sections;
  - North Wall Quay, Custom House Quay, City Quay and Sir John Rogerson's Quay;
  - Pigeon House Road / East Link grass verge (two-way cycle lane); and
  - Sean Moore Road (segregated northbound and southbound lanes between Beach Road and the Pigeon House Road / R131 roundabout).
- **[C]** Relocation of existing Boat House and services sub-stations located near East Link Toll Plaza.
- A new roundabout will be provided at the South Bank Quay entrance (port) to cater for local access movements including the Poolbeg Yacht and Boat Club.
- **[D]** York road becomes one-way westbound.
- The provision of a bus gate to allow buses to continue westbound on Sir John Rogerson's Quay at the Samuel Beckett Bridge junction.
- New bus stop provisions, as required, along the route to optimise patronage.
- Existing bus stops to be upgraded with shelters, bus kerbing and RTPI etc. as required.
- Provision of sustainable bus priority through traffic management proposals along Sir John Rogerson's Quay between Forbes Street and the proposed Dodder Bridge.

7.5 Summary

The following summarises the main features of the proposed EPO:

Table 7.1: Summary table

Route length	**3.35 km**
Length of bus priority (outbound)	3.35 km
Length of bus priority (inbound)	3.35 km
Length of dedicated one-way cycle lanes in each direction	0.63 km
Length of dedicated two-way cycle lanes	2.72 km
Number of bus stops (outbound)	8
Number of bus stops (inbound)	8
Residential catchment area (within 15 mins walking distance of nearest bus stop)	42,000
Number of people working or attending an educational institution within the 15 minute catchment area	105,000
Number of signalised intersections	10
Number of pedestrian crossings	6

8. Feasibility Working Cost Estimate

8.1 High Level Cost Estimate

The Feasibility Working Cost Estimate for the proposed Ringsend to City Centre CBC, based on current rates, is approximately **€8.78 million** plus **€30 million** for the construction of the proposed bridge over the Dodder.

It was developed primarily based on standard rates that AECOM-ROD have available from similar types of projects in Dublin and includes high level information on the typical urban streetscape construction including:

- Preliminaries;
- Site Clearance;
- Earthworks;
- Pavement;
- Kerbs and Footways;
- Traffic Signs and Markings;
- Other Items (Ramps, Traffic Signals, Pedestrian Crossings, Street Lights, Landscaping, Boundary);
- Design and Construction Supervision Costs; and
- High Level Land Acquisition Costs.

A detailed cost estimate and significant further work would be required to provide a more accurate cost at the subsequent stage of development. This detailed estimate would need to allow for Risk, Contingencies and future inflation etc.

Table (iii): Feasibility Working Cost Estimate for EPO

CBC	Infrastructure (€)	Preliminaries and Contingency @ 30% (€)	Land acquisition (€)	Total cost (€)
Ringsend to City Centre	5,496,250	1,648,875	1,635,000	38,780,125
	bridge over the Dodder: €30,000,000			

8.2 Exclusions

The high-level cost estimate for the Ringsend CBC EPO does not consider:

- Professional Fees;
- Planning Costs;
- Marketing;
- Capital Contributions;
- Inflation;
- VAT;

- Costs associated with neighbouring proposed CBC projects (e.g. Ringsend CBC);
- Potential city centre cellar works and acquisition of private landings;
- Administration and management costs; and
- Maintenance costs.

8.3 Notes

- Boundaries of properties and ownership may change as a result of applications lodged before or after the current date.
- The Ringsend CBC cost estimate includes the development of the Poolbeg bridge over the Dodder; although the final option and design for an opening bridge or not will determine the cost estimate region, an indicative cost estimate of €30M has been allowed for high-level cost estimate purposes.
- The Ringsend CBC cost estimate assumes no land acquisition and minor works in the City Centre section, aside from necessary junction improvements.
- Proposals for further scheme design measures may alter the total cost estimates including:
  - additional traffic management measures;
  - optimisation of land-take;
  - consistent bus priority at junctions; and
  - enhancement of accessibility through implementation of permeability links
- The cost estimates have a tolerance of +/- 20% and reflect 2016 prices, with the exception of land take costs where a standard rate of €1,500 / sq. m has been allowed for cost estimation purposes.
- As the scheme designs develop, cost estimates will be refined and updated in line with the NTA Cost Management Guidelines for Public Transport Investment Projects.

9. Supplementary Scheme Design along North Wall Quay

(refer to the Emerging Scheme Design Drawings)

Having identified the emerging preferred option, the feasibility to enhance the existing bus facility along North Wall Quay, between Samuel Beckett Bridge and the Point junction, was identified as supplementary scheme design – refer to Figure 9.1.

Considerations included the approved planned scheme for the Point junction and the provision of new continuous bus lanes, hence optimising journey time of bus services using the Port Tunnel coming from the North of the City.

The supplementary scheme design along North Wall Quay also proposes a continuous two-way cycle facility between Samuel Beckett Bridge and the Point junction.

No trees or existing properties will be impacted by this scheme design.

However, the supplementary scheme design along North Wall Quay requires the removal of 12 parking spaces on the northern side of North Wall Quay.

The existing two-way cycle facility is also proposed to be improved. This requires some encroachment into the Liffey Campshires locally.

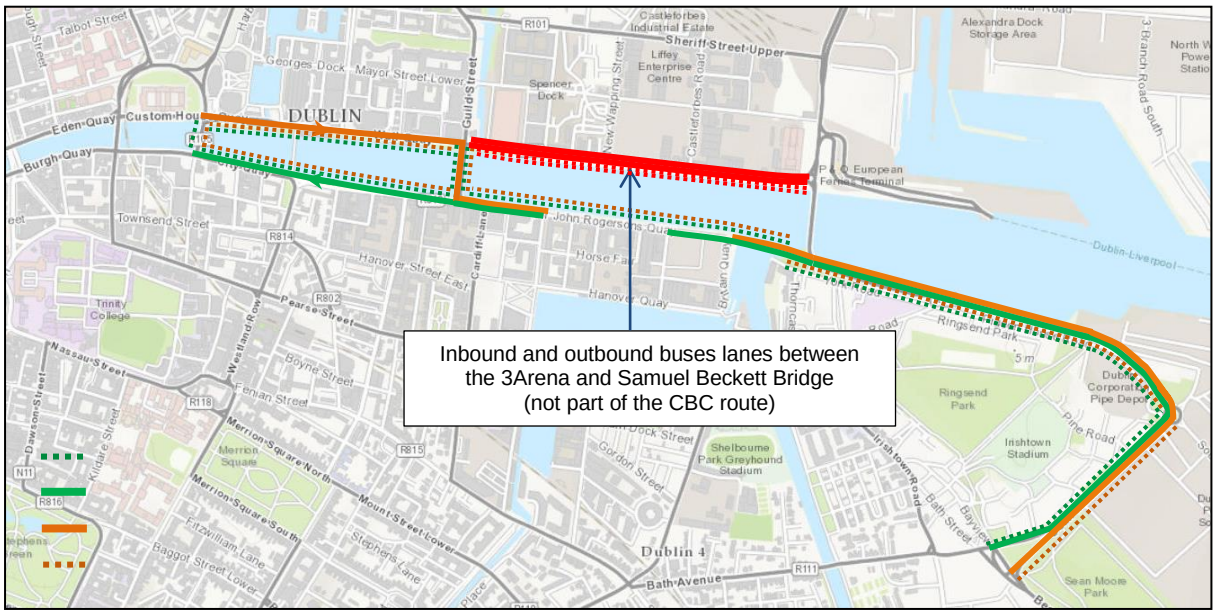

Figure 9.1: Supplementary Scheme Design along North Wall Quay

10. Emerging Preferred Scheme Benefits

The Emerging Preferred Scheme will deliver bus infrastructure necessary to achieve enhanced bus priority along the Ringsend to City Centre Core Bus Corridor, though the provision of as continuous as possible bus lanes enabling the bus to become a faster and more attractive to car traffic along the route. The bus system is envisaged to become more efficient.

The Emerging Preferred Scheme will provide significantly enhanced two-way cycle facilities with high Quality of Service along the route.

The Emerging Preferred Scheme design fully integrates with existing and future planned development and transport infrastructure schemes in the vicinity of the study area.

The Emerging Preferred Scheme design incorporates sophisticated traffic management techniques to maximise level of services for all road users, following the principles included in the Design Manual of Urban Streets and Roads and taking into account issues such as permeability, personal security, traffic conditions, mobility impaired access, and safe crossing of roads.

In summary, the Emerging Preferred Scheme will have the following benefits:

- Serving the future planned development in the Poolbeg Peninsula;
- Utilising in the most effective way the planned bridge over the Dodder River;
- Reliability due to bus priority in the vast majority of locations;
- Reduction of commuting time;
- Reduction of car congestion and enhancement of attractiveness of urban centres;
- Provision of safe cycling facilities and the opportunity for more people to cycle along the Ringsend to City Centre CBC;
- Reconfiguration of existing junctions, which will provide considerable benefits for pedestrian accessibility and bus priority, making the bus routes more attractive;
- Proposed new bus stops, which increase the attractiveness and catchment area of the bus route in this Study Area;
- Complementary pedestrian facilities upgrade; and
- Serving important trip attractors:
  - Irish Glass Bottle Site;
  - South/Grand Canal Docks;
  - IFSC; and
  - Convention Centre.

11. Next Steps

This report has identified an emerging preferred option for the bus infrastructure along this Ringsend to City Centre Core Bus Corridor for which a concept design has been developed. The next project stage (The development of a Preliminary Design) will further refine and update the initial concept design along the route. Further account will be taken of likely public transport service levels, particularly the bus service patterns and any changes to the overall bus network which may arise from the separate bus network review process. The proposals will be amended, if and as required, to integrate any resultant changes. The Preliminary Design will define the final practically achievable scheme for the CBC, taking into account more detailed studies of constraints, impacts and environmental assessment required at a local level.

Prior to finalisation of the Ringsend CBC scheme design, a public consultation process will be undertaken, with inputs and feedback received incorporated where practical and appropriate to do so. This Preliminary Design will form the basis of the planning consent process for the scheme, which will require a development consent application to be made directly to An Bord Pleanála, due to the nature and extent of the proposed works.