Swiftway
Bus Rapid Transit

Swords/Airport to City Centre

Route Options Assessment
Volume 1: Main Report

October 2014

Údarás Náisiúnta Iompair
National Transport Authority

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AECOM

ARUP

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Appendices

Executive Summary

This report presents the route options assessment work undertaken for the Swords / Airport to City Centre Bus Rapid Transit (BRT) scheme and makes a recommendation on a **preferred route**.

Swiftway BRT

The proposed scheme forms part of the planned 'Swiftway' BRT Network for Dublin which was launched by the National Transport Authority (NTA) in February 2014.

The Swiftway BRT Network will comprise of three new BRT routes as follows:

- Swords / Airport to City Centre (the proposed scheme);
- Blanchardstown to UCD; and
- Clongriffin to Tallaght.

BRT is a high quality form of bus transport that is similar to light rail (Luas) in terms of quality of service. Its features include:

- Modern, attractive, multi-door vehicles;
- Use of own BRT lane or shared Bus/BRT lane;
- BRT vehicle given priority at traffic signals;
- Conveniently located stops with optimal spacing;
- High quality stops and level boarding on and off vehicles; and
- Off-board fare collection (tickets purchased in advance or use of Leap card).

Scheme Objectives

The following scheme specific objectives have been set for the proposed scheme:

- To deliver a high quality public transport service along the Swords/Airport to City Centre corridor, encompassing all aspects of BRT, including BRT lanes and associated pedestrian and cycle facilities along the route, Swiftway vehicles, operational standards and customer service;
- Journey-time reliability and consistency of bus speeds along the Swiftway route. BRT lanes is to be provided ensuring whole route Swiftway vehicle priority where practical;
- To deliver overall enhancements and benefits to pedestrians and cyclists travelling along or intersecting the Swiftway route;
- To provide a high frequency service between the City Centre and Dublin Airport;
- To deliver an enhanced urban environment at stops and along the full length of the route;

- To minimise adverse impacts on the natural and built environment;
- To minimise impacts on general traffic where practicable;
- To provide a clear and legible bus system which avoids where possible, splitting of the northbound and southbound services onto different roads; and
- To establish the standard for BRT schemes in Ireland.

The Study Area

The proposed Swords / Airport to City Centre Swiftway will serve a busy transport corridor with several key destinations along, or close to, the route. These include Dublin Airport, Santry, Dublin City University, St. Patrick's College, several hospitals as well as the major growth area of Swords itself.

The corridor is already a busy transport artery, with additional capacity required to cater for travel growth predicted. While a rail based solution may be required in the long term, Swiftway can provide an attractive public transport service for the short and medium term.

It is not practical that the proposed scheme would directly serve all destinations within the broader corridor, and maintain a core scheme objective of journey time reduction and reliability. As such, the introduction of proposed scheme will also result in a rationalisation of the wider bus network and service provision within the corridor. This network rationalisation will both complement the proposed scheme and improve overall transport accessibility and level of service provision for existing and new public transport users.

Route Options Assessment Process

A two-stage assessment was adopted:

- An initial 'Stage 1' high-level route options assessment or 'sifting' process which appraised routes 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.

The Stage 2 assessment comprised a 'Multi-Criteria Analysis' (MCA) of route options under the following main criteria:

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

An appreciation of the constraints and opportunities within the study area, as well as the defined project objectives, led to establishment of project-specific route options assessment sub-criteria under each of the main criteria listed above.

The Preferred Route

As part of the initial scheme planning for the proposed scheme, a Corridor Assessment study was undertaken. This included the development of the 'Swiftway' concept, establishment of objectives for the proposed scheme, generation of initial patronage demand forecasts, establishment of an outline business case for the provision of a Swiftway service and an initial assessment of route options along the Swords corridor. The purpose of the initial corridor assessment studies was to establish the viability of the scheme and that a technically feasible route was available within the broad Swords to City Centre corridor.

Early outputs from this study informed the establishment of an initial emerging preferred route (EPR) for the proposed scheme which was used to launch the Swiftway BRT Network in February 2014.

This route options assessment report effectively supersedes earlier corridor assessment work undertaken and describes the detailed assessment of potentially viable route options within the study area identified for the proposed scheme against established assessment criteria.

The resulting recommended preferred route and proposed stop locations are presented in **Figure (i).**

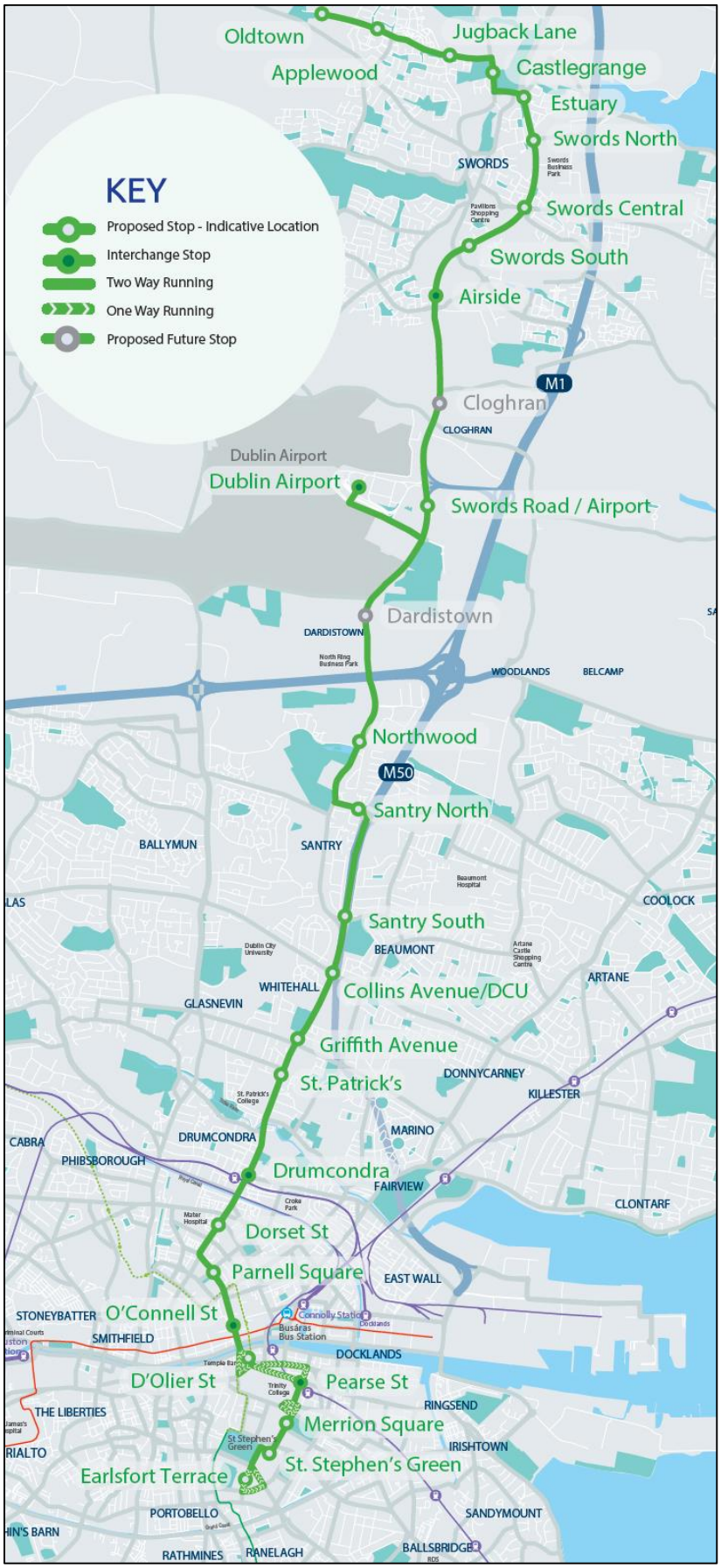

Figure (i): Swords / Airport to City Centre Swiftway Scheme Preferred Route

The preferred route starts on the Glen Ellan Extension Road in Oldtown in the northwest of Swords. A terminus for Swiftway vehicles, comprising layover space and driver welfare facilities, will be provided at the western edge of Oldtown. The first stop will be located in the developing neighbourhood centre of Oldtown serving the surrounding residential estates and the Swords Educate Together and Brian Bóroimhe schools.

The preferred route continues along Glen Ellan Road Extension Road towards Applewood where the next stop will be located close to the junction with the Ashton Distributor Road. This stop will serve residents in the Castleview and Applewood areas as well as those living south of the preferred route along Rathbeale Road. This stop will also serve the Thornleigh Educate Together National School and is in close proximity to Applewood Main Street.

The next stop will be located adjacent to Jugback Lane and will serve eastern parts of Applewood, St. Finian's Community College and residents living in the Broadmeadows area south of the preferred route.

From Jugback Lane, the preferred route continues along Glen Ellan Road before turning onto Balheary Road where the next stop is located. This stop will serve the Swords Business Campus and the Castlegrange residential neighbourhood.

The preferred route then turns onto Castlegrange Road before following the R132, along the Swords Bypass, with stops provided at the Estuary, Seatown (Swords North), Malahide Road (Swords Central) and Pinnock Hill (Swords South) junctions. These stops will serve residential areas along the corridor as well as the retail and commercial centre of Swords, including Swords Pavilions. The Swords Central stop will also serve future development lands to the east of the R132 (i.e. the Barrysparks LAP lands).

South of Swords, the preferred route continues along the R132, stopping at Airside Retail Park. The Airside stop will serve residents in the River Valley area as well as passengers travelling to Airside Retail Park.

From Airside, the preferred route continues along the R132 towards Dublin Airport with potential for a future stop at Cloghran to serve development lands to the south of Clonshaugh Road.

It is anticipated that Swiftway services from Swords will stop at an Airport stop located on the R132 with a separate Swiftway service to/from the City Centre entering the airport, providing more direct access to the terminals and airport campus.

From the airport, the preferred route follows the R132, with a future stop identified at Dardistown (subject to demand). A stop will also be located at the entrance to Northwood to cater for existing residential and employment demand in the area.

The preferred route continues along the R132 towards Santry, turning onto Coolock Lane where a stop (Santry North) will be located to serve central and northern areas of Santry as well as western areas of Coolock. From here, Swiftway vehicles will be routed via the N50 before stopping at a 'Santry South' stop located below the Shantalla Road overpass. This stop will serve central and southern areas of Santry as well as being the closest stop to Beaumont Hospital.

Continuing southwards, the next stop is located at the R132/Collins Avenue junction and will serve Dublin City University.

A stop will be located at Griffith Avenue, while at the northern end of Drumcondra, a stop will be located outside St. Patricks College, serving the college as well as the retail centre of Drumcondra. A second stop will be located at the southern end of Drumcondra next to Clonliffe Road, to facilitate interchange with suburban rail services at the nearby Drumcondra rail station. This stop is also the closest stop to Croke Park.

The preferred route continues southwards along Dorset Street with a stop located to the south of Gardiner Street. This stop will serve residential areas in the vicinity as well as the Mater Hospital.

From Dorset Street, the preferred route turns onto North Frederick Street and continues onto Parnell Square East where the next stop is located. As well as serving north inner city residential and retail areas, this stop will serve the Rotunda Hospital and Gate Theatre.

The preferred route will continue from Parnell Square East onto O'Connell Street where a stop will be located to serve the North City Centre commercial core and provide opportunity for interchange with Luas (Red Line and Cross City Line) and other bus services.

South of the River Liffey, a one-way loop system is envisaged around D'Olier Street, College Street, and Westmoreland Street. Southbound, the preferred route runs along D'Olier Street, and travelling northbound the preferred route travels along College Street and Westmoreland Street. These stops will provide opportunity for interchange with Luas and other bus services.

The southbound stop will be located on D'Olier Street with the corresponding northbound stop located on Westmoreland Street to serve the South City Centre area including Temple Bar and Trinity College.

From here, the preferred route travels along Townsend Street / Lombard Street before turning onto Westland Row. The return trip for northbound vehicles along this section will be made via Pearse Street. A stop will be located at the junction of Pearse Street and Westland Row serving Trinity College and providing interchange with DART and suburban rail services at Pearse Street rail station.

The preferred route continues south along Westland Row, along Merrion Street Lower and onwards to Merrion Square West where the next stop is located. This stop will serve the south east business district, Grafton Street retail core and areas of interest such as the National Gallery of Ireland, National Museum of Ireland and Government Buildings.

From Merrion Square, the preferred route continues straight through Ely Place and onto Hume Street to the next stop (St Stephen's Green). This stop will serve the South City Centre retail and commercial core as well as retail areas along Baggot Street Lower.

The preferred route turns from Hume Street onto St. Stephens Green East and continues onto Earlsfort Terrace where the final stop will be located across from the National Concert Hall. This stop will serve commercial offices in the vicinity as well as the National Concert Hall, Iveagh Gardens and several nearby hotels.

Swiftway vehicles will use Hatch Street and Leeson Street Lower to return to St. Stephens Green East and commence the northbound service back to Swords.

The proposed scheme will improve existing, and provide new pedestrian and cycle facilities along the preferred route. This includes delivering a significant section of the 'Greater Dublin Area Cycle Network Plan' designated cycle route 2A, which follows the preferred route from Dorset Street Lower at Belvidere Road to the R132 at Pinnock Hill. In the City Centre, the proposed scheme will also facilitate sections of Cycle Routes C8, 2B, 3, 13 and 13E.

Two of the key features of Swiftway will be frequency of service and reliability of journey times. The Swords / Airport to City Centre Swiftway service is initially intended to operate at a frequency of approximately every four minutes in the peak hour along the busiest sections of the route and the target journey time from Swords to O'Connell Street will be approximately 35 minutes – a reduction of about one third from current peak hour bus journey times along this corridor.

An advantage of BRT as a public transport mode is the non-fixed nature of the service and the scheme has been designed so that it can be inter-operable (through interchange) in the future with the planned Blanchardstown to UCD Swiftway service.

Next Steps

A flowchart illustrating the next stages in the project development, up to and including the statutory planning process, is presented in **Figure (ii)**.

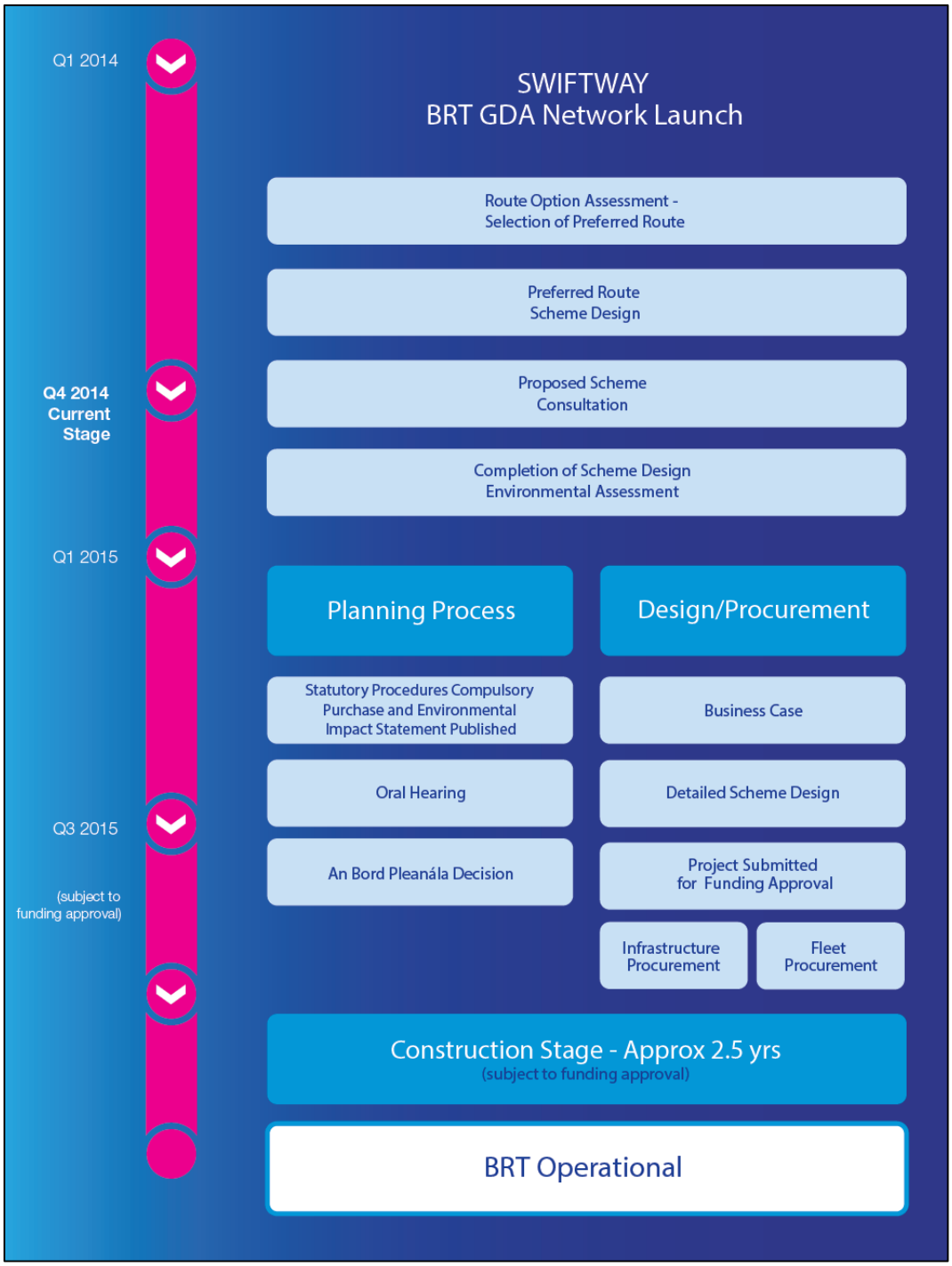

Figure (ii): Swords / Airport to City Centre Swiftway Next Steps

Preliminary scheme design is progressing for the preferred route identified from the Route Options Assessment process. An initial scheme design has been prepared for the preferred route and will be presented to the public as part of the 'Proposed Scheme Public Consultation' scheduled to run through October and November 2014.

A final preliminary scheme design will be completed, taking on board feedback from the public consultation process where practical, to confirm a preferred scheme for the Swiftway service, including land acquisition requirements where necessary.

This preferred scheme will be the subject of a comprehensive environmental impact assessment and progressed through the Statutory Planning and Compulsory Purchase Order (for land acquisition) processes.

Subsequent to the planning stage, the detailed scheme design will be finalised and tender documents for infrastructure procurement, associated systems and vehicle fleet acquisition will be prepared.

Subject to funding approval, the proposed scheme could then proceed to procurement and construction stages. It is anticipated that, subject to project funding, the construction period would be about two and a half years.

Glossary of Terms

- **BRT**: Bus Rapid Transit
- **DCC**: Dublin City Council
- **DTTAS**: Department of Transport, Tourism and Sport
- **EPR**: Emerging Preferred Route
- **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
- **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

- **Scheme**: This refers to the measures, which will need to be put in place to deliver the Swiftway Swords / Airport to City Centre Swiftway infrastructure and priority measures.
- **Study Area**: The area along the Swords / Airport to City Centre corridor within which route options have been identified and assessed.
- **Study Area Section**: An identifiable extent of the study area between two locations.
- **Route**: The road(s), or alternative location, along which the Swords / Airport to City Centre Swiftway service will be provided. The route is not necessarily confined to a single road/street. It could for example be partially diverted onto an adjacent/parallel road/street.
- **Route Options:** Short sections of route at specific locations where a number of options exist on adjacent or nearby roads.
- **End-to-End Route Options**: Various route options are combined to form 'end-to-end' route options.
- **Journey Time**: The time taken to make a journey between two distinct points including dwell times at stops and delays at junctions.
- **BRT Infrastructure**: All physical facilities required to support the BRT system – stops, BRT 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.

1 Introduction and Background

1.1 Preamble

This report presents the findings of the detailed route options assessment work undertaken for the Swords / Airport to City Centre Swiftway scheme (hereafter referred to as the 'proposed scheme') and a recommendation on a **preferred route** is made.

This route options assessment report effectively supersedes earlier corridor assessment work undertaken and describes the detailed assessment of potentially viable route options within the study area identified for the proposed scheme against established assessment criteria.

1.2 Report Structure

The route option assessment process and corresponding report structure are detailed below:

- **Section 1 –** Subsequent parts of this section provide an introduction and background to the planned Swiftway BRT network, the Swiftway concept and feedback related to the proposed scheme which was received from the Swiftway network launch in February 2014.
- **Section 2** – The strategic policy context and work to date which has led to the development of the proposed scheme along the proposed scheme corridor are discussed in this section.
- **Section 3 –** The objectives of the Swiftway network and the proposed scheme are presented.
- **Section 4** – The proposed scheme corridor is described identifying key constraints and opportunities, the integration of the Swiftway with the wider public transport network and the compatibility with other road users. The study area is split into 3 sections. The previous corridor assessment study and public consultation outcomes are also presented.
- **Section 5** – The methodology for identifying and assessing the feasibility of the various route options is discussed in this section including:
  - the identification of study area sections where practical route options were considered and presentation of the 'spiders web' – the network of options examined;
  - the selection and determination of initial criteria for screening and assessing technically feasible route options, based on distinct, project-specific objectives; and
  - the definition of assessment criteria.
- **Sections 6, 7, 8 and 9** –Details the route options assessment for each of the three route sections and Dublin Airport.
- **Section 10** – The methodology and the results of the scheme transport modeling and a comparative economic appraisal of 'end-to-end' route options are presented in this section.
- **Section 11** – The preferred route for the proposed scheme is described.

- **Section 12** – The next steps for the project are set out in this section.

1.3 Swiftway BRT Network

The planned introduction of Bus Rapid Transit (BRT) to the Greater Dublin Area (GDA) public transport network will deliver a new form of high capacity, high quality, and high level of service public transport system for Dublin.

The proposed scheme is identified for development by the National Transport Authority (NTA) as part of its statutory 'Integrated Implementation Plan 2013-2018'.

The complete 'Swiftway' BRT Network was launched by the NTA in February 2014, and comprised three new BRT routes as follows:

- Swords / Airport to City Centre;
- Blanchardstown to UCD; and
- Clongriffin to Tallaght.

The proposed Swiftway BRT network presented at the network launch is shown in **Figure 1.1**.

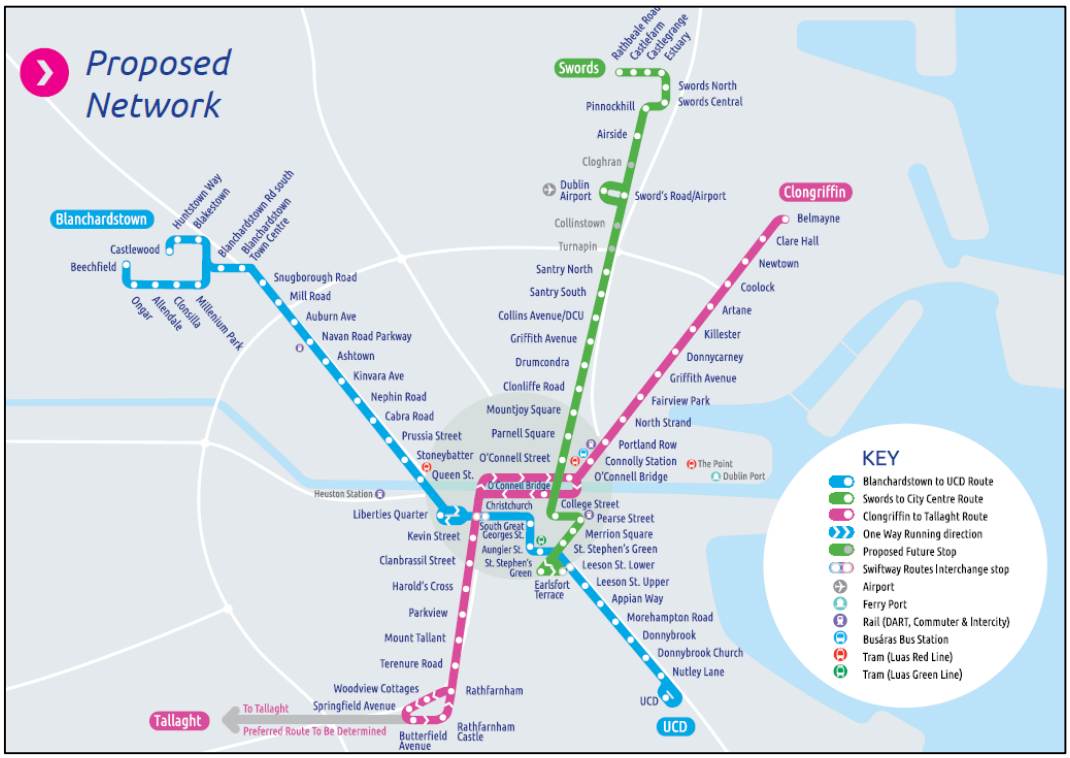

Figure 1.1: Proposed Swiftway BRT Network

The proposed Swiftway BRT network will also form an integral component of the overall public transport network in Dublin. The final selected preferred routes will therefore seek to maximise interchange opportunities with all existing and future public transport modes operating in the city such as regular bus services, Luas, DART/suburban rail services and the future planned Metro system. The route will also integrate with the existing and future pedestrian and cycle networks.

1.4 Swiftway BRT Concept

The primary characteristics of the Swiftway system proposed for Dublin are summarised below. These characteristics have been used to inform the route options assessment for this scheme.

- **High Capacity:** The proposed Swiftway service capacity is based on a moderately high capacity system using 18m long single articulated buses that can cater for up to 3,600 passengers per direction per hour (ppdph) approximately. The Swiftway infrastructure (e.g. BRT lanes and stops) is to be designed however so that it could in the future, subject to demand, be increased to a capacity of 4,500 ppdph by using longer vehicles (circa 26m long).
- **Reliable and Fast Journey Times:** The provision of priority measures on public transport corridors will lead to more reliable journey times for passengers. Increased priority and reduced dwell times at Swiftway stops will lead to considerably lower journey times than what is currently achieved by conventional bus services.
- **Low Dwell Times:** As a result of off-board fare collection and vehicles with multiple doors, boarding and alighting will be quicker when compared to conventional buses which means the vehicle does not wait for long periods at the stop. This will contribute considerably to a reduction in overall journey times.
- **Frequency:** Swiftway will operate a high frequency service and is initially planned to operate at a frequency of 4 minutes during peak commuter periods along the busiest sections, reducing to match demand off peak.
- **High Quality Stops:** Swiftway stops will be comfortable, well equipped, safe and secure, with level boarding access to the vehicles. Swiftway stop layouts will incorporate shelters, real time passenger information (RTPI), ticket vending machines (TVMs) and closed circuit television (CCTV). Stop locations will be rationalised to optimise catchment accessibility and service reliability. Typically within the City Centre stop spacing will generally be 400m, while in suburban areas the spacing will be generally increased to 800m.
- **Off-Vehicle Ticketing:** All tickets for the Swiftway system will be purchased before boarding the vehicle, thus speeding up the boarding process.
- **Attractive Vehicles:** Swiftway vehicles will be articulated (typically 18m or longer) high passenger capacity vehicles with multiple doors. The Swiftway vehicles will be modern, clean, comfortable, accessible, safe and secure.
- **Distinctive Branding:** Swiftway will have its own distinctive brand identity, 'Swiftway', which will be displayed on the vehicle fleet, the design of stops and in all marketing material.
- **BRT Lane Priority:** Where possible, it is intended to provide as near as practical full priority for Swiftway vehicles along the length of the route. Swiftway priority measures will primarily consist of on-street BRT lanes for use by Swiftway and other designated vehicles only. Generally this will consist of lateral running lanes (i.e. kerbside BRT lanes in each direction) although alternative arrangements such as central running lanes may be considered where appropriate.

Additional measures such as physical segregation between BRT lanes and general traffic lanes may also be provided in appropriate locations as required for traffic management enforcement.

The hours of operation of Swiftway will generally be between 06:00 and 24:00 in order to maximise the perception of the Swiftway route as a 'fixed' link, to avoid driver confusion (i.e. unintentional use of BRT lane during hours of operation) and to maximise compliance. The lanes will be future proofed to accommodate vehicles of up to 26m in length.

Swiftway priority measures may reduce road capacity for general traffic at some locations and may impose increased delays on non-public transport modes. Some increased delays for general traffic are, in effect, as part of the "trade-off" of providing an enhanced public transport system that is designed to achieve the desired and sustainable travel mode shift away from private car usage.

- **Operational System:** A semi-open system is generally proposed for the Swiftway BRT Network, whereby multiple authorised services are allowed to use the BRT lanes (typically, laterally at edge of roadway), either along its entire length or joining and leaving at certain points along the Swiftway routes. Provision for cyclists along the Swiftway routes will generally be provided on adjacent, segregated, cycle lanes. For certain sections of routes, additional restrictions on the type of vehicles may apply (for example, along median running BRT lane sections) for practical operational reasons.
- **Enforcement:** BRT lanes will require stringent traffic management enforcement. It is essential for the smooth and efficient operation of the Swiftway system that there is no parking, loading/unloading or unauthorised use of BRT lanes during operational hours.
- **Depot:** Swiftway Depots will be required to facilitate vehicle parking, maintenance/repair, fuelling/re-fuelling, and cleaning as well as staff parking and changing facilities. The depot location has yet to be fully confirmed for the proposed scheme and is subject to on-going investigation. However for the purposes of route options assessment for the proposed scheme, the depot is assumed to be located at the current Dublin Bus depot site in Harristown.
- **Control Centre:** A Swiftway control centre is likely to be located at Broadstone where the existing Dublin Bus control centre is located.
- **Terminus:** To minimise the amount of 'dead running' by the Swiftway vehicles, a Swiftway terminus facility needs to be located close to the final stop on the route. A Swiftway terminus will typically facilitate temporary vehicle layover with parking for three vehicles. A dwell time of about 5 minutes per Swiftway vehicle is anticipated at the terminus facility. A welfare facility is required to accommodate Swiftway drivers during the layover time. This layover time will facilitate comfort breaks for drivers, let drivers carry out quick inspections of the vehicle if required and allow scheduled headways between Swiftway vehicles to be maintained. For the proposed scheme a terminus will be located at the northern end of the route. It is not proposed to facilitate a terminus facility in the City Centre.

1.5 Swiftway BRT Network Launch

1.5.1 Initial Corridor Assessment Studies

As part of the initial scheme planning for the proposed scheme, a Corridor Assessment study was undertaken. This included the development of the 'Swiftway' concept, establishment of objectives for the proposed scheme, generation of initial patronage demand forecasts, establishment of an outline business case for the provision of a Swiftway service and an initial assessment of route options along the Swords corridor. The purpose of the Corridor Assessment studies was to establish the viability of the scheme and that a technically feasible route was available within the broad Swords to City Centre corridor.

Early outputs from this study informed the establishment of an initial emerging preferred route (EPR) for the proposed scheme which was used to launch the Swiftway BRT Network in February 2014.

1.5.2 Initial Emerging Preferred Route (EPR)

The Swiftway Network Launch presented an initial EPR for each of the three Swiftway Lines planned for Dublin, including an EPR for the proposed scheme, as identified from the initial corridor assessment work undertaken. The route presented at the launch is illustrated in **Figure 1.2**.

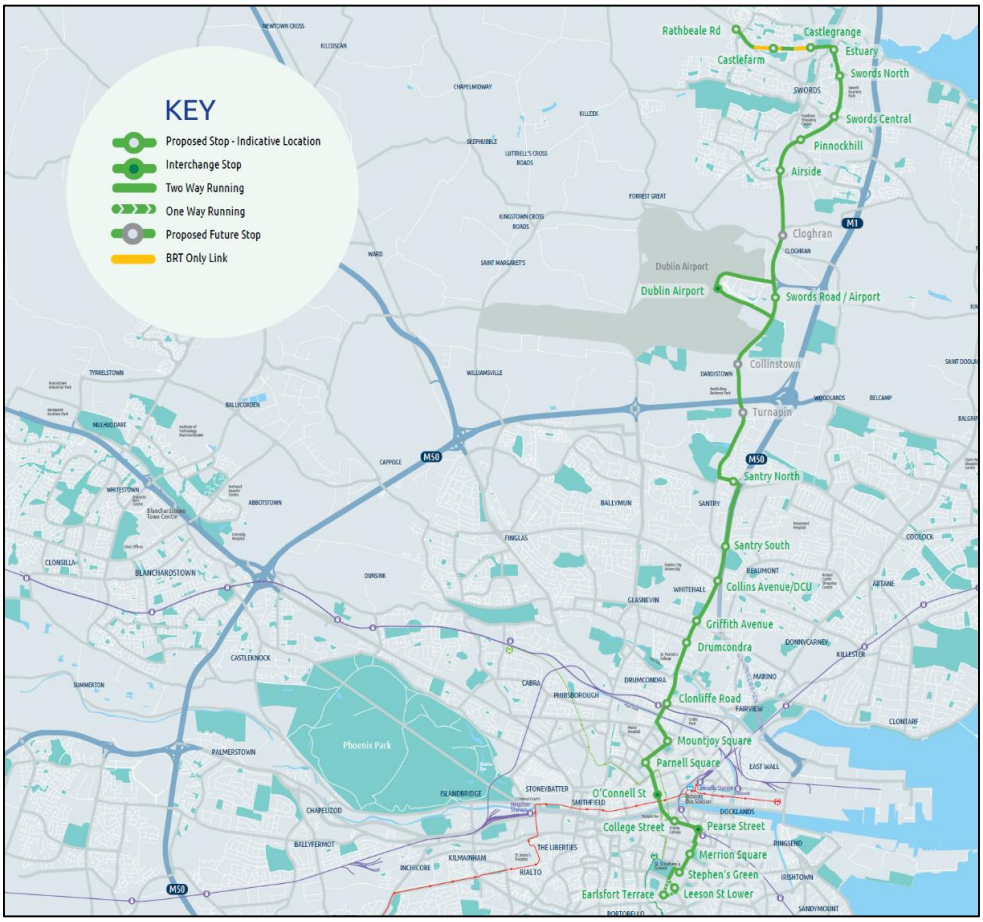

Figure 1.2: Swords / Airport to City Centre Emerging Preferred Route Presented at Swiftway Launch

1.5.3 Public Consultation

The NTA launched a public consultation on proposals for the Swiftway BRT network for Dublin on 17th February 2014. Members of the public were invited to review the proposals of each of the three Swiftway routes and submit their suggestions and feedback prior to 18th March 2014. Submissions could either be made using the on-line submission facility or by post to the NTA's Office.

A total of 550 submissions were received, one of which included a petition signed by 315 local residents in Swords.

All 550 of the submissions received were reviewed by the NTA. In total, 367 (66.7%) of the submissions were generally in favour of implementing Swiftway routes in Dublin, 63 (11.5%) were totally against the concept of Swiftway. The remainder 120 (21.8%) submissions were undecided on their general view of the Swiftway proposals for Dublin.

The Swiftway Consultation Report, which is available on the NTA's website presents full details and responses to comments received. (http://www.nationaltransport.ie/wp-content/uploads/2014/01/Swiftway_Public_Consultation_Report_-_July_2014.pdf)

The key issues specifically raised in relation to the routing of the proposed scheme are listed below.

- The proposed route through the open space and park area at Pinegrove is disruptive to local residents and will have a negative impact on the quality of life for the nearby residents. The proposed route will result in a significant reduction in green space and a loss of a children's play area.
- The proposed Swiftway route does not take into account the large population living in the west of Swords. River Valley area has approximately one third of the population of Swords. Consider operating a short spur of main Swiftway route into River Valley area during peak times.
- Follow emerging preferred route to Estuary stop, then follow Castlegrange Rd, Balheary Rd and Glen Ellan Road through Applewood and terminus in Oldtown.
- Follow emerging preferred route to Pinnock Hill roundabout, then follow Dublin Rd, Brackenstown Rd, Murrough Rd, and Glen Ellan Road terminating in Oldtown.
- Alternative route to commence at Swords Manor, along Murrough Road, along Glen Ellan Ring Road and exit Balheary Road onto proposed route. Follow emerging preferred route to Estuary stop, then follow the R132 to Lissenhall serving adjacent development lands.
- How can the Swiftway run on the Rathbeale Road when the road is already overcapacity?
- Turnapin stop should be put in place from the start not at a later date. Additional stops at Northwood apartments, Drumcondra Road and Richmond Road/Botanic Avenue, preferably on the northern side of the Tolka.
- Extend bus service to Knocksedan Demesne.
- No Swiftway service in Santry village.

- Can the route be revised and go via Fitzgibbon Street and Jones Road onto Drumcondra Road rather than Belvidere Place and Dorset Street? This will also link Croke Park and the Conference Centre.
- Ballymun feeder route via Santry Avenue to Swiftway route on R132.
- Extend from Earlsfort Terrace to Rathmines, Terenure, and Rathfarnham to join the proposed Tallaght/Clongriffin route at Rathfarnham.
- Careful consideration should be given to the section linking Grafton Street with O'Connell Street.

The issues raised during the public consultation have been considered as part of the route options assessment process and in determining the preferred route.

2 Transport Planning and Policy Context

2.1 Introduction

The following National and Regional transport planning and policy documents introduce the concept of BRT and make recommendations as to potential routing for the Swiftway Network. These documents are presented in the order in which they were written and / or published, showing the evolution of the BRT concept for Dublin:

- **June 2011**

  Greater Dublin Area Draft Transport Strategy 2011-2030, National Transport Authority;

- **November 2011**

  Infrastructure and Capital Investment 2012-16: Medium Term Exchequer Framework, Department of Public Expenditure and Reform;

- **April 2012**

  Study of Transport Options for Fingal Corridors in advance of Metro North', National Transport Authority;

- **October 2012**

  Bus Rapid Transit Core Dublin Network', National Transport Authority; and

- **April 2013**

  Integrated Implementation Plan 2013 – 2018', National Transport Authority.

These documents provide the policy framework for the development of a BRT system between Swords and the City Centre. Relevant extracts from the documents are outlined in this Section and commentary provided where necessary.

2.2 Greater Dublin Area Draft Transport Strategy 2011-2030 (2030 Vision)

The Greater Dublin Area Draft Transport Strategy 2011 – 2030 (2030 Vision) was published by the NTA in June 2011. As in previous plans, the draft strategy identified significant existing and future travel demand between Swords and the City Centre via Dublin Airport. In the medium to long term, the draft strategy concludes that the future travel demand will require a light rail line along this corridor; Metro North. In addition, the draft strategy provided a prioritisation approach to the larger investment projects which sought to take account of the prevailing funding constrains and the likely scale and timing of development along particular corridors. Arising from that prioritisation, Metro North was categorised as a "medium-term" scheme, for delivery towards the end of the strategy period.

The strategy also represents the first introduction of BRT concept into Irish transport planning policy. It acknowledges that serious delays to buses still occur on many parts of the bus network, and where road traffic grows, these delays are likely to worsen.

The strategy states that a renewed emphasis will be placed on upgrading and enhancing bus priority to overcome these delays with a particular focus on addressing known 'pinch points'.

The strategy proposed the following measures with regard to infrastructural improvements, of relevance to the current proposal:

"Measure BUS 6: *……Measures will be implemented to improve bus segregation and junction priority on the Priority 2 Quality Bus Corridors,..... These bus corridors, also forecast to carry high passenger numbers, are:*

(i) Swords QBC;…….

……The Authority will seek the provision of necessary bus priority measures at locations and corridors where large numbers of buses are likely to be delayed or where substantial delays are likely to occur to smaller numbers of buses. These locations include Dublin City Centre, other larger town centres and their approaches."

*"**Measure BUS 7**: ……The Authority may also identify and assess the potential for development or upgrade of other corridors (in addition to Priority 1 corridors) to facilitate BRT type provision."*

Taking the existing demand for travel identified along the corridor from Swords to the City Centre, combined with the identification of BRT as a potential means to meet such demand, a scheme to upgrade the Swords Road QBC was brought forward by the NTA.

2.3 Infrastructure and Capital Investment 2012-16: Medium Term Exchequer Framework

The 'Medium Term Exchequer Framework' was published by the Department of Public Expenditure and Reform in November 2011. It presented the findings of a Government-wide review of infrastructure and capital investment policy and outlined the Government's commitment to ensuring that the country's stock of infrastructure is capable of facilitating economic growth.

This report stated that among the main priorities over the medium term would be the:

> *"Continuing investment in the Railway Safety Programme, replacement Public Sector Obligation buses, upgrade of existing quality bus corridors (with emphasis on the Ballymun/Airport/Swords corridor) and a number of important cycling and pedestrian projects."*

The report also provided commitment with regard to funding by stating the following:

> *"Funding is also being provided for the following priority projects and programmes:*
>
> - *Upgrade of existing QBCs with emphasis on the Ballymun/Airport/Swords corridor".*

The construction of Metro North itself was officially deferred at this point.

2.4 Study of Transport Options for Fingal Corridors

Following the publication of the above documents, the NTA prepared the *'Study of Transport Options for Fingal Corridors in advance of Metro North'* report in April 2012 in which transport needs and possible interim transport solutions for the main transport corridors between Fingal and the City Centre were assessed in the absence of Metro North. The NTA report is broken down into two parts:

- A general analysis of existing travel demand and travel patterns on the main transport corridors between Fingal and the City Centre (referenced corridors illustrated in **Figure 2.1**) and an identification of issues and problems that will need to be addressed; and

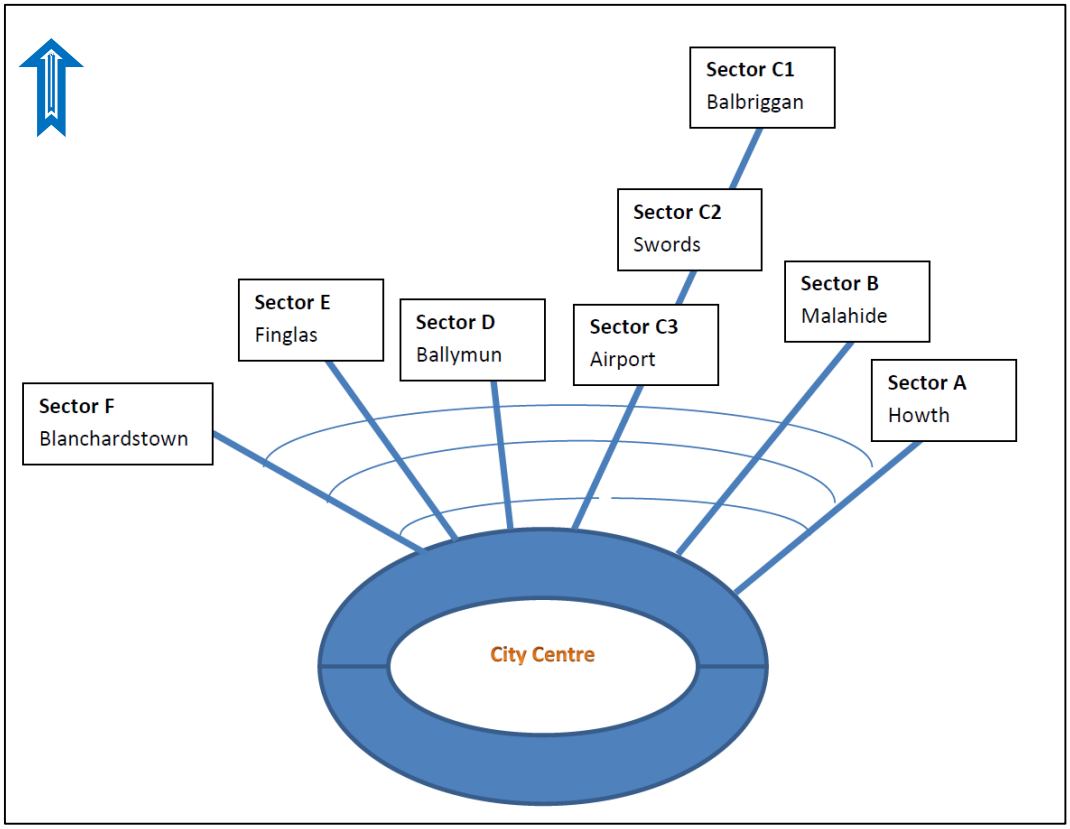

Figure 2.1: Corridors between Fingal and the City Centre (*Figure 1 in the NTA report*)

- An examination of possible transport options and solutions to address the issues that could support travel demand prior to the development of Metro North (referenced transport options illustrated in **Figure 2.2**).

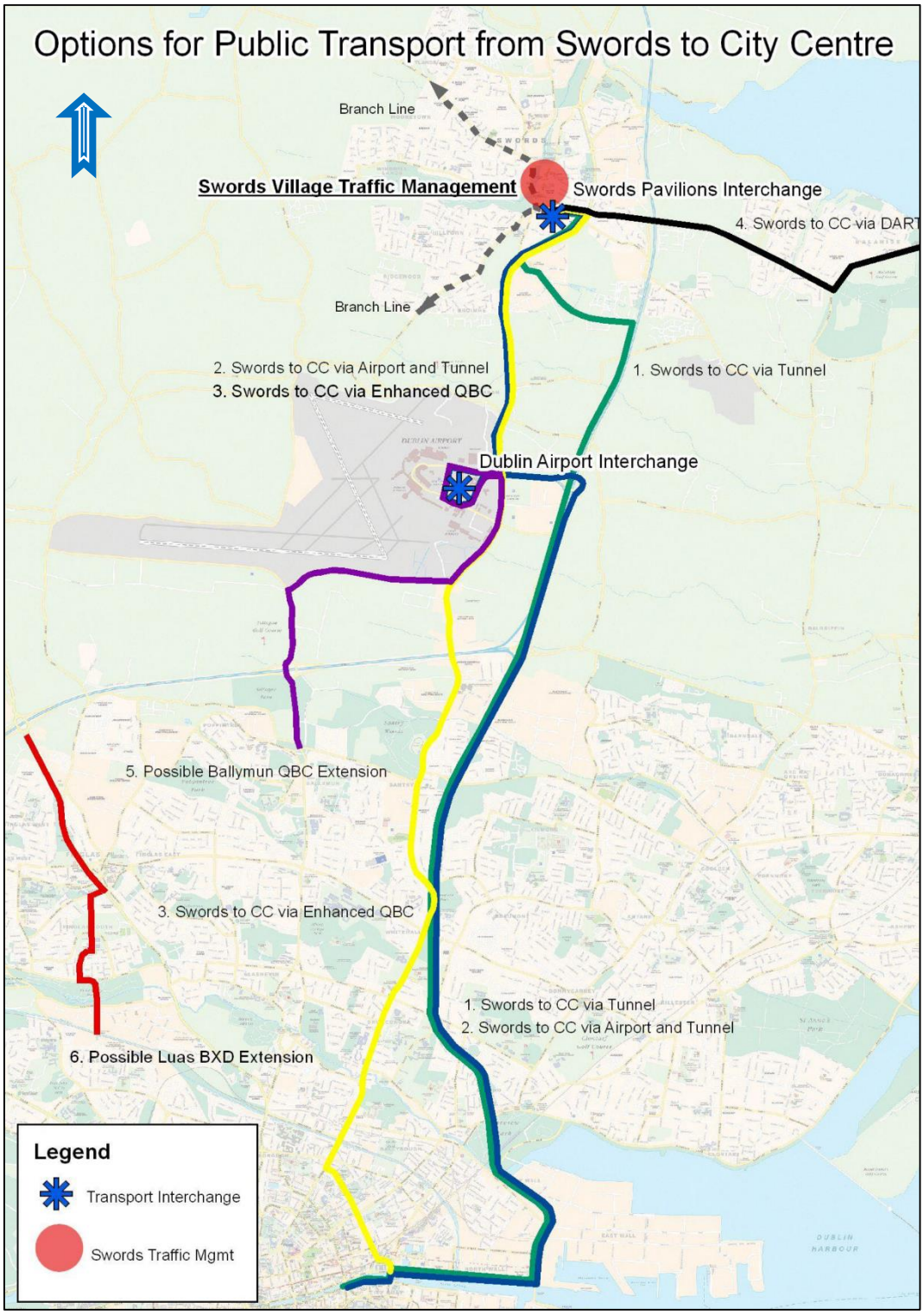

Figure 2.2: Proposed Transport Options (*Figure 6 in the NTA report*)

In addition to the proposals for the Swords corridor, potential improvements to other Fingal corridors are also identified, comprising:

- Improvements to the Ballymun QBC;
- Extension of Ballymun QBC to the Airport Interchange; and
- Northbound extension of the Luas Cross City line to Finglas.

As part of the examination of possible transport options to address the transport issues identified in the analysis of current travel patterns and travel demand, the NTA report identifies, among others, that *"the only way to increase trip capacity between Swords and the City Centre in the absence of Metro North is by extracting more capacity from the existing road network by reallocating space to Bus and / or BRT services"* (extract from page 24 of the NTA report).

The above conclusion is based on the fact that:

"…only two main roads serve trips between Swords and the City Centre, i.e. the R132 and the M1… It should also be noted that the capacity provided by these two roads must serve ***all*** *trips using them to access the City Centre (i.e. not just trips originating in Swords). As there are no proposals to increase road capacity for car trips within the M50, in practice the capacity for car trips between Swords and the City Centre is capped at current levels."*

Following on from the above, the NTA report identifies measures that would increase the trip carrying capacity of the available road network. These measures include:

- *'Reallocating existing road space to bus, improving bus journey times and reducing journey time variability;*
- *Adding capacity to the Northern Rail line and delivering a mode shift from car to rail on this corridor – thereby generating spare road capacity for allocation to bus and appropriate car use;*
- *Improving bus service frequency;*
- *Providing better and more direct services; and*
- *Introducing complementary traffic management measures to ensure better and more reliable bus journey times and provide for a better walking and cycling environment – in particular in Swords town centre.'*

In light of the above, the NTA report proposed two major QBC enhancements:

- further development of the Ballymun QBC; and
- an enhanced Swords Road QBC.

The report identified that the enhancement of the existing Swords Road QBC would remove pinch points and would provide improved priority along its full length which would reduce journey times and make bus journeys more competitive relative to car trips. The report also outlined the need to future-proof the scheme to ensure its compatibility for possible BRT services.

The report outlined the following service options which could be facilitated by the enhanced QBC (refer to **Figure 2.2**):

1. Swords Interchange to City Centre Direct via Dublin Port Tunnel;

2. Swords Interchange to City Centre via Airport and Dublin Port Tunnel;

3. Swords Interchange to City Centre via Swords Road Enhanced QBC; and

4. Swords Interchange to DART.

It was considered that the routes proposed in Option 1 and 2 are already covered to some extent by private operators providing 'point to point' services through the Port Tunnel and the level of service can be enhanced in the future by additional capacity provision if necessary. It was also considered that current rail journey times between Malahide and the City Centre when added to the bus journey time and the interchange time at Malahide made Option 4 a less attractive option as a standalone measure.

It is considered that Option 3 would serve the whole corridor and respond to existing demand while also meeting the objectives of the draft Greater Dublin Area Transport Strategy 2011-2030 (NTA, 2011), namely to improve links between communities within the Region and to improve accessibility to work, education, retail, leisure and other activities:

'The development of an enhanced Swords Road QBC will enable reduced journey times, potentially 35 minutes from the Swords Interchange to O'Connell Street and 44 minutes to Merrion Square. The service could deliver a capacity of between 2,500 to 3,000 passengers per hour per direction. An option to upgrade the Enhanced QBC to BRT style services can also be examined subject to feasibility and cost effectiveness.'

As stated above, Option 3 also provided an option to upgrade to a BRT level of service which was outlined in Measure BUS 7 of the draft Greater Dublin Area Transport Strategy 2011-2030 (NTA, 2011), as discussed earlier in report Section 2.2. This option was therefore taken forward.

2.5 Bus Rapid Transit Core Dublin Network

The Bus Rapid Transit Core Dublin Network Report was published by the NTA in October 2012. This report expanded on the BRT concept as first introduced in the aforementioned Draft Greater Dublin Area Transport Strategy 2011 – 2013 and investigated the feasibility of introducing BRT on a number of routes in the Greater Dublin Area, namely the following (refer to Figure 34 in the BRT Core Dublin Network Report):

- Stillorgan Road corridor;
- Malahide Road corridor;
- Blanchardstown/Navan Road corridor; and
- Tallaght to City Centre (via Kimmage area) corridor.

This core network was derived from transport demand analysis and represents corridors that are likely to fit within the carrying capacity envelope of the BRT system concept proposed for Dublin in the long term.

It should be noted that as it was intended that the Swords to City Centre route would be served by Metro North, it did not form part of the initial core BRT network. However, for the purposes of exploring whether BRT could perform a role on this corridor on an interim basis, it was included for analysis in the study.

Demand forecasting was carried out under different scenarios using different combinations of infrastructure and land use to determine which corridors would have sufficient capacity to cater for both current demand and future demand based on growth in population and investment in public transport infrastructure.

Feasible route options were also assessed at a high level from an environmental, engineering and constructability point of view, to identify any potential design related obstacles or areas where expensive intervention in terms of property take or structures might be required.

Following the assessment, the study forecast a strong passenger demand along the Swords to Tallaght corridor, in particular between Swords and the City Centre and concluded that:

> *"Overall, the link between the City Centre and Swords has demand levels that exceed the capacity of a moderate capacity BRT system, in the longer term. While BRT may provide an interim partial transport solution in the shorter term, a higher capacity rail solution, such as a metro system, will ultimately be required on this corridor. In light of this, the Swords to City Centre BRT section has not been progressed to the later costing and appraisal sections of this feasibility study report."*

This conclusion is consistent with that which emerged from the earlier GDA Draft Transport Strategy work and, as such, the viability of introducing a BRT scheme on the Swords corridor in the short to medium term, in advance of Metro North, was subsequently assessed by the Consultant team working on an upgrade of the Swords Road QBC in conjunction with the NTA and Local Authorities. Initially, the NTA investigated options to improve and enhance the Swords Road QBC along the R132 corridor. This work indicated that a higher level of service, than that which can be delivered by a QBC, is warranted along the Swords Road corridor. Furthermore, initial economic appraisal of the QBC scheme indicated that the level of investment required to implement the required enhancements were not justified by the benefits of the scheme if progressed as a conventional bus scheme only. This report builds on this initial work and further confirms the economic feasibility of the scheme as a BRT project.

2.6 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 Greater Dublin Area for a five year period up to 2018.

Based on the findings of the above studies and plans, this report proposed to progress the development of three BRT routes to planning approval and to commence construction as funds become available for:

- Swords / Airport to City Centre;
- Blanchardstown to UCD; and
- Clongriffin to Tallaght.

The proposed scheme was identified as a feasible scheme which, in the short to medium term, would provide additional capacity to a high demand public transport corridor.

While including the proposed scheme in the Integrated Implementation Plan 2013-2018, the NTA Plan also states that while BRT does not have sufficient capacity to serve this link over the longer term, it would provide an interim transport solution in the shorter term, pending the development of a higher capacity rail solution, such as a metro, on this corridor.

2.7 Greater Dublin Area Cycle Network Plan

In August 2013, the NTA published the Greater Dublin Area Cycle Network Plan. Following a period of consultation with the public and various stakeholders it was officially adopted and published in early 2014. The plan undertook a review of existing cycle facilities in the GDA and sets out the strategy for the development of an integrated cycle network for the future.

The plan identified that the existing Swords QBC corridor would form part of the primary cycle network (Route 2A) and thus form a key part of the strategic cycle network. It is therefore important that any upgrade to bus priority infrastructure along the corridor for BRT takes cognisance of this objective and, where practical, provides cycle infrastructure to the appropriate level and quality of service (as defined by the NTA National Cycle Manual) required for a primary cycle route.

2.8 Conclusion

The various studies discussed in the preceding sub-sections set out the transport planning policy context and need for the proposed scheme. The need for the scheme is predominantly borne out of the need to provide a higher quality, higher capacity public transport service, than currently exists, to serve the Swords corridor in the short to medium term in advance of Metro North. BRT is identified as serving this purpose and allowing key development areas such as Swords to continue to develop in advance of this.

3 Objectives and Alternatives

3.1 Introduction

This section first sets out the objectives for public transport along the corridor based on the findings of the studies and plans set out in the previous section. It then sets out a rationale for BRT by outlining briefly the do-nothing and do-minimum alternatives. The final section then provides the scheme-specific objectives of the Swords/Airport to City Centre Swiftway scheme.

3.2 Objectives for the Swords Road Corridor

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

- To increase mode share for public transport, walking and cycling for those living, working and availing of services along the corridor;
- To enhance public transport provision along the corridor to provide a higher frequency, quicker and more reliable public transport service with increased capacity;
- To link Swords directly to the southeast City Centre area in order to serve demand between the town and this significant employment zone;
- To provide a high-frequency, reliable and fast public transport link between Dublin Airport, the City Centre, including the south east City Centre, with a higher capacity than that which exists at present; and
- To fully integrate any potential new system with existing and future planned public transport investments in the GDA, which will comprise the development of the Luas, Metro, BRT, Rail and QBC networks.

3.3 Alternatives to BRT

It was necessary then to consider if there were feasible alternative means by which the above objectives could be met. These comprised the existing situation (i.e. do-nothing) and an enhanced QBC option (i.e. do-minimum).

a) **Do-Nothing**

Doing nothing (existing QBC, possibly with minor upgrades) would deprive Swords and the wider corridor of any significant public transport improvements, in advance of the future delivery of Metro North. Other than for reasons of budgetary constraint, this is considered to be a sub-standard solution to meeting existing transport demand on the corridor, particularly in the short to medium term given the current uncertainty about the delivery date of Metro North.

b) Enhanced QBC (Do-minimum)

Previous studies assessed the potential to upgrade the existing Swords QBC facility to provide better bus priority and pedestrian/cyclist facilities along its length.

In order to deliver any significant additional benefit in terms of journey-time reliability, considerable land-take would need to be acquired along the route to remove 'pinch points' and facilitate improved bus lanes and improvements in pedestrian and cycle facilities along the corridor. The work undertaken indicated that, given the level of infrastructure investment required to deliver an enhanced QBC in any case, a higher level of segregation and priority could be warranted along the Swords Road corridor. In other words, the balance between additional cost and additional benefits of moving towards a BRT level of service demonstrated greater value for money than an enhanced QBC.

The NTA therefore recommended to the local authorities – Dublin City Council and Fingal County Council – that the Swords QBC corridor be progressed as a BRT, delivering both the infrastructure and public transport service enhancements in tandem. This report builds on this initial work and further confirms the economic feasibility of the scheme.

3.4 Project Objectives

Having ascertained that a BRT scheme would meet the objectives for the Swords Road corridor, and that there were no feasible alternatives which would do similar, the following objectives for the Swiftway Scheme were derived:

- To deliver a high quality public transport service along the Swords/Airport to City Centre corridor, encompassing all aspects of BRT, including BRT lanes and associated pedestrian and cycle facilities along the route, Swiftway vehicles, operational standards and customer service;
- Journey-time reliability and consistency of bus speeds along the Swiftway route. BRT lanes is to be provided ensuring whole route Swiftway vehicle priority where practical;
- To deliver overall enhancements and benefits to pedestrians and cyclists travelling along or intersecting the Swiftway route;
- To provide a high frequency service between the City Centre and Dublin Airport;
- To deliver an enhanced urban environment at stops and along the full length of the route;
- To minimise adverse impacts on the natural and built environment;
- To minimise impacts on general traffic where practicable;
- To provide a clear and legible bus system which avoids, where possible, splitting of the northbound and southbound services onto different roads; and
- To establish the standard for BRT schemes in Ireland.

4 Study Area

4.1 Introduction

Arising from the transport policy context and initial studies undertaken, the broad study area identified for the proposed scheme is as identified by the area within the red line in **Figure 4.1** below. Generally speaking, the study area was taken to include roads within a 500 m radius of the existing Swords Road (R132) QBC corridor, but extends beyond this in places to consider potentially feasible route options.

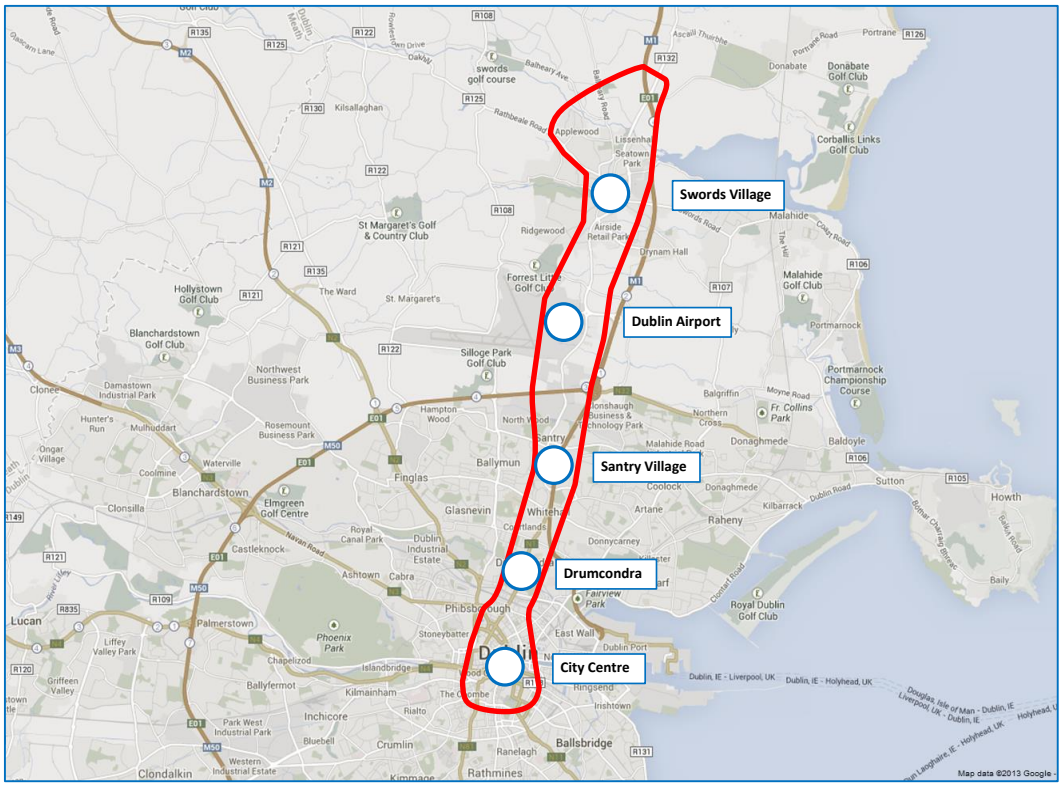

Figure 4.1: Proposed Scheme Study Area

4.2 Study Area Sections

The study area has been divided into three more manageable sections to simplify the assessment process:

- Section 1 - Swords North to Dublin Airport (Corballis Road South);
- Section 2 - Dublin Airport (Corballis Road South) to Royal Canal; and
- Section 3 - Royal Canal to St. Stephens Green.

The extent of each of these corridor sections is presented in **Figure 4.2**.

Dublin Airport is considered separately both in terms of route and service options.

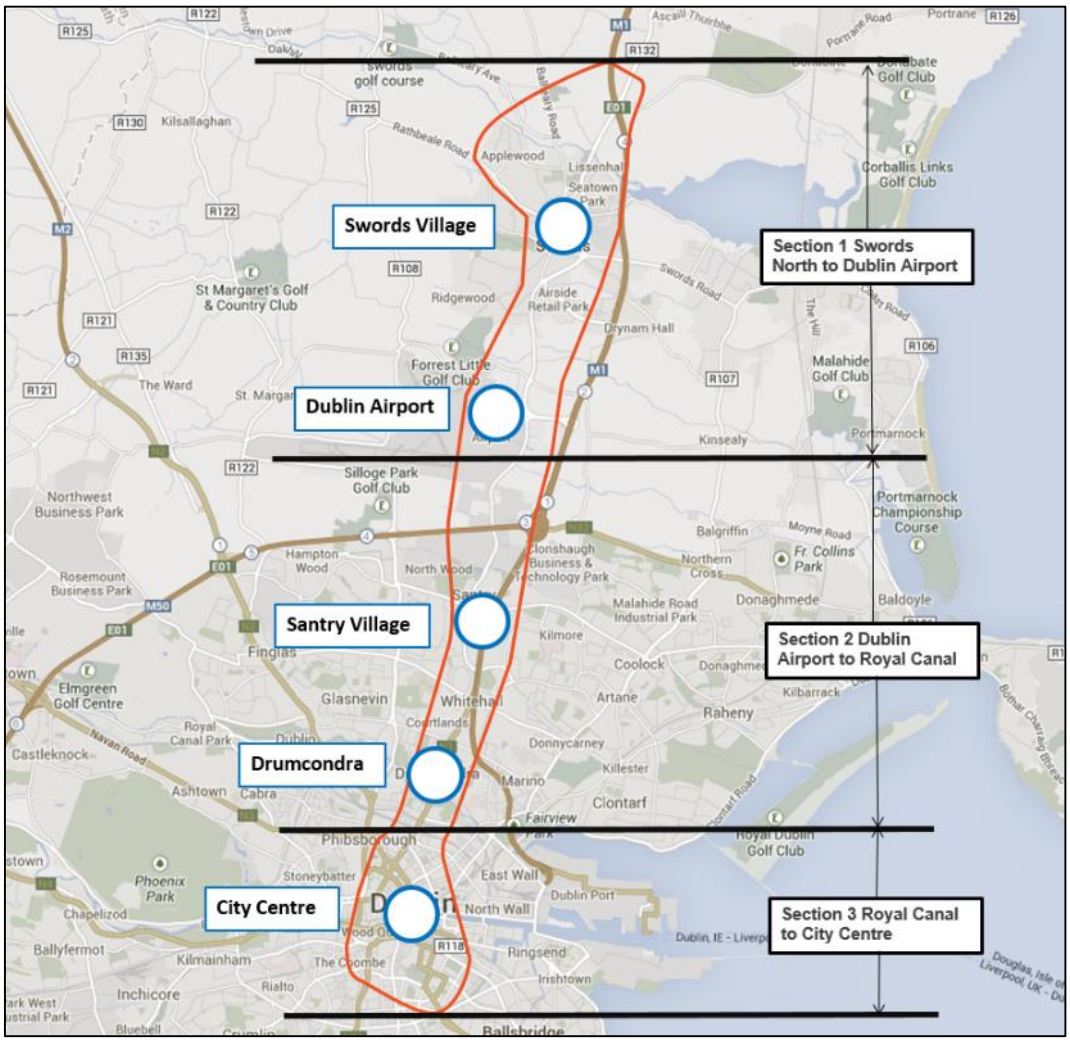

Figure 4.2: Study Area Sections

4.2.1 Section 1: Swords North to Dublin Airport (Corballis Road South)

The land-use along the corridor north of Swords Village is predominantly residential. There are also employment uses locally, including Balheary Industrial Park, the Bristol-Myers Squibb facility located off Watery Lane and the Swords Business Park to the east of the R132. In Swords town centre there is a mix of retail/commercial and residential development. Along the R132 the land uses are a mix of greenbelt and general enterprise/employment while the future land-use associated with the Swords town centre expansion plans to the east and west of the R132 is expected to be a mix of general enterprise/employment, retail and residential. There is retail/commercial land-use at Airside Retail Park. The area between Airside and Dublin Airport is generally greenbelt with some residential areas.

The road characteristics vary for different roads within the corridor section. The residential roads within North-west Swords (Balheary Road, Glen Ellan Road) generally consist of one lane in each direction with footpaths provided on each side of the road.

By contrast, the R132 is generally a dual two-lane carriageway for large lengths of the corridor, with the north and southbound carriageways being segregated by a central median (between Pinnock Hill and Estuary junctions). Generally, footpaths are provided on one or both sides of the R132 in this study area section although, there are sections where there are no footpaths on either side (e.g. sporadic provision only between Estuary and Pinnock Hill roundabouts).

The Swiftway route will generally follow the existing QBC route along the R132 for the majority of this study area section. Variant route options within the study area section primarily derive from consideration of routing through Swords Main Street as opposed to remaining on the R132 past the existing Swords town centre. The identification of an appropriate location to terminate the Swiftway system to the north of Swords town centre also gives rise to a number of potential route options.

The Section 1 study area is presented in **Figure 4.3**.

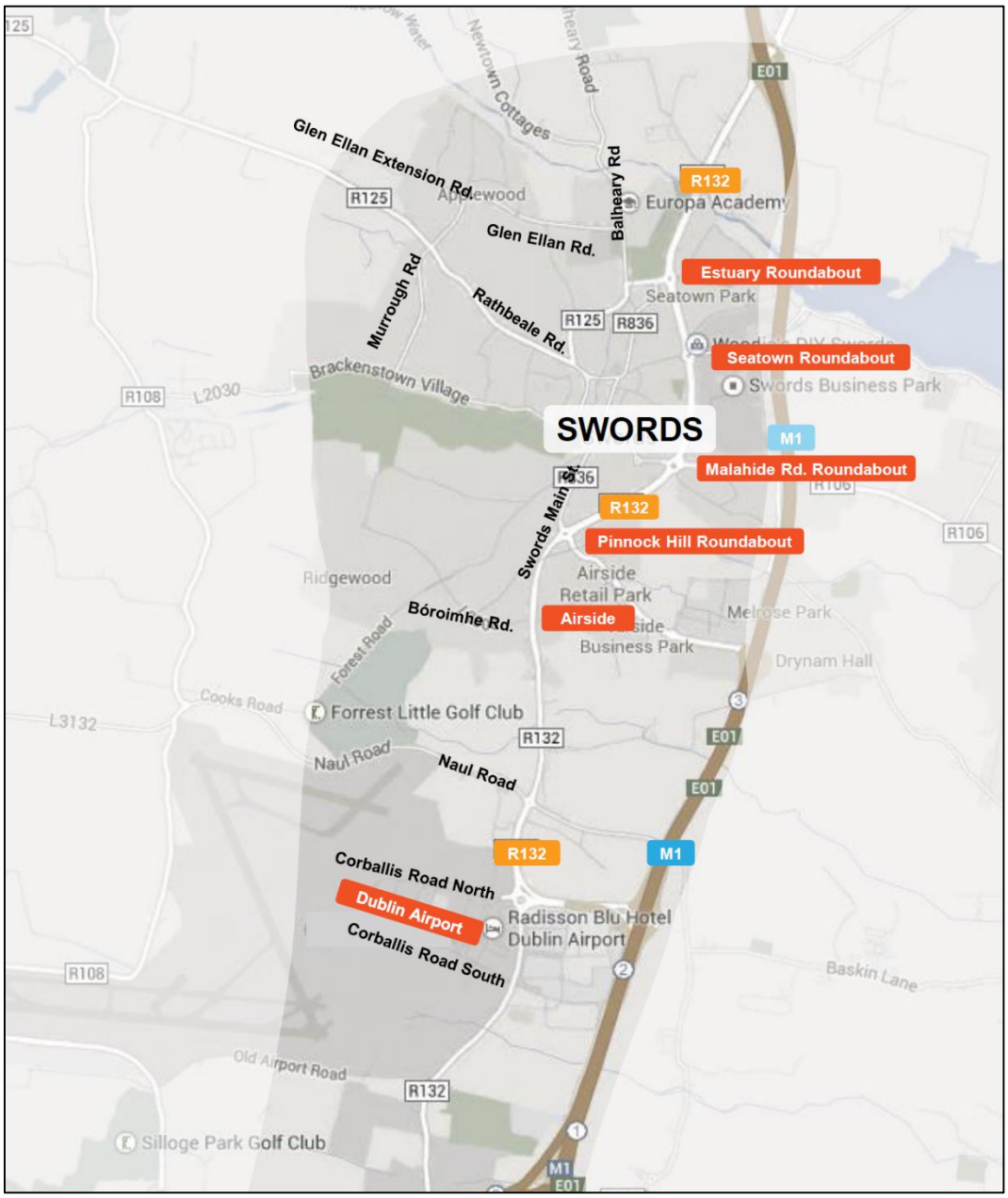

Figure 4.3: Section 1 Study Area

4.2.2 Section 2: Dublin Airport (Corballis Road South) to Royal Canal

The land uses along Section 2 of the study area vary significantly between Dublin Airport and the Royal Canal. From the airport, moving south, the land-use along the western side of the corridor is predominantly mixed-use general enterprise/employment. There are also areas of recreational / open space between Coolock Lane and Northwood Avenue and south of the airport car park. Along the eastern side of the corridor, the land-use is mainly residential between Coolock Lane and Northwood Avenue. From the Old Airport Road to Northwood Avenue, the land-use is generally enterprise/employment.

The R132 is generally 4 lanes wide, with two lanes (typically comprising a bus lane and general traffic lane) in both directions as far as Morton Stadium where the roadway narrows to a single lane in each direction. Santry Demesne pNHA is located adjacent to Morton Stadium with the R132 forming the eastern boundary of this site. The primary importance of the Santry Demesne pNHA (as described in the NPWS site synopsis) is that it contains a legally protected plant species, Hairy St. John's Wort (*Hypericum hirsutum*), which was recorded at the site in 1991. The site synopsis states that the woodland is of general ecological interest as it occurs in an area where little has survived of the original vegetation. The section of the R132, from Morton Stadium as far as Coolock Lane, is 3 lanes wide (2 lanes southbound, 1 lane northbound).

Through Santry village the land-use is a mix of residential, commercial and neighbourhood retail outlets. Along the N50, bypassing Santry village, there is no direct access to adjacent land other than via the junctions at Coolock Lane and Shantalla (partial access to and from the south only). The western side of the R132 is predominantly residential from the centre of Santry village, where there are some retail outlets and the Omni Shopping Centre present, to Griffith Avenue. Directly north of Griffith Avenue on the western side of the road is Plunkett College and its grounds. On the eastern side of the road from Collins Avenue to Griffith Avenue there is a mix of residential, medical (Highfield Private Hospital) and recreational land uses. Through the centre of Santry village, there are generally three lanes (2 southbound, 1 northbound) apart from a number of short, more restricted sections where there are only 2 lanes (one in each direction). From the Santry 'slip road' to Griffith Avenue the road is generally 4 lanes wide, with two lanes in both directions (one bus lane and one general traffic lane) except where traffic merges from the slip road with traffic from the N50 as far as Collins Avenue where it widens to 5 lanes (3 lanes southbound).

From Griffith Avenue, the predominant land-use on both sides of the R132 corridor (from Whitworth Road to Griffith Avenue) is residential, with mixed use facilities (retail and commercial) present near the junctions with Clonliffe Road and Botanic Avenue. St. Patricks College is located along the western side of this section, north of Botanic Avenue. This section of the R132 is generally 4 lanes wide, with two lanes in both directions (one bus lane, one general traffic lane). Exceptions to this include between Whitworth Road and St. Alphonsus' Avenue where there are 3 lanes southbound and 2 lanes northbound.

Route variants for the Swiftway system in this study area section primarily relate to options to bring the service along the Main Street in Santry or to bypass Main Street and retain the Swiftway on the R132 / N50 corridor.

The Section 2 study area is presented in **Figure 4.4**.

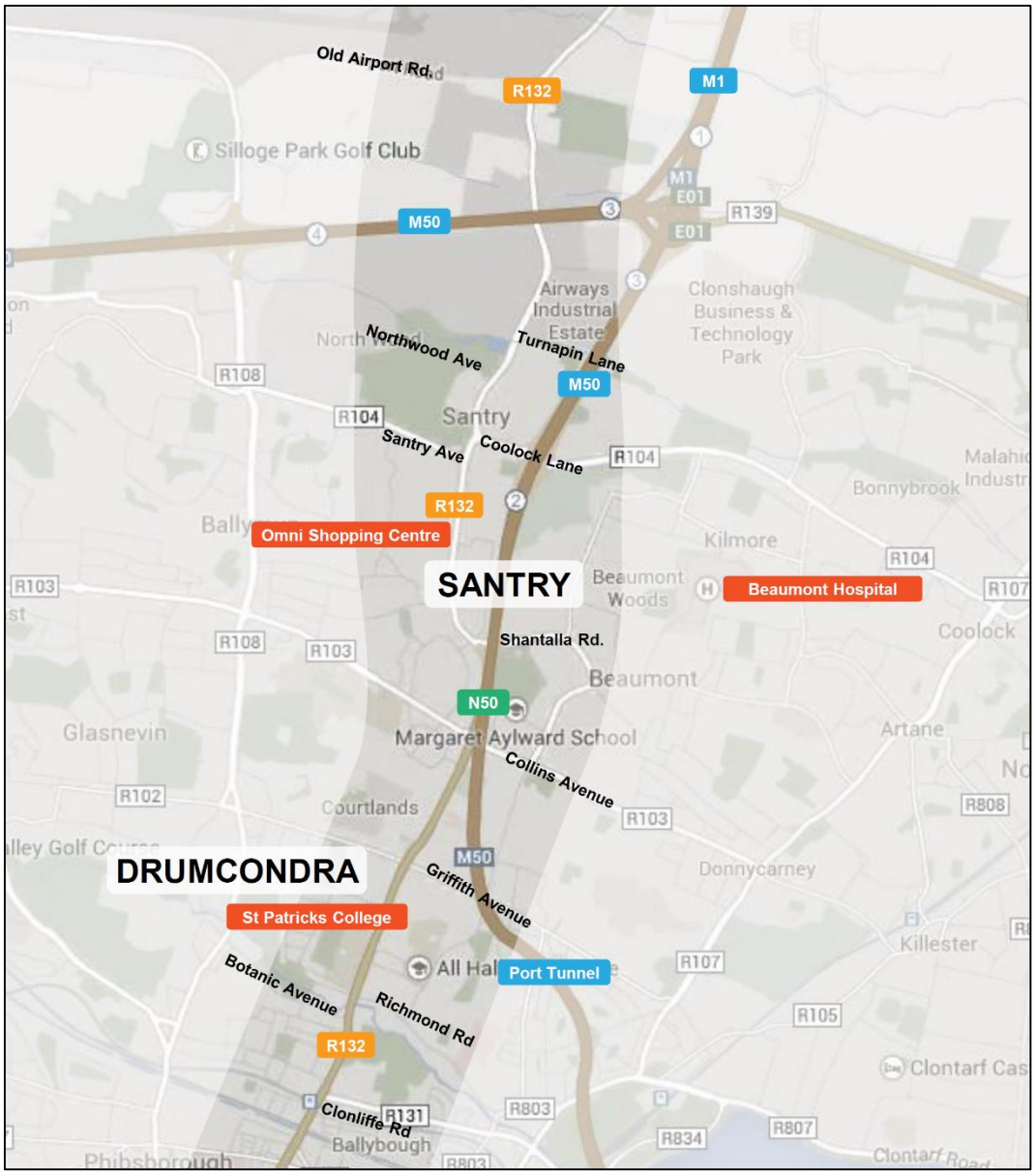

Figure 4.4: Section 2 Study Area

4.2.3 Section 3: Royal Canal to St. Stephens Green

The study area for this section of the route encompasses almost the entire 'core' City Centre area. This is the historic core of the city traversing some of the main thoroughfares and encompassing many of the most significant architectural features in the state. Existing land-use varies considerably and includes pockets of residential, together with retail, office and other commercial and educational / institutional uses.

The City Centre study area includes individual buildings, streets and squares of significant heritage value including a number of Architectural Conservation Areas (ACAs). Major landmarks include:

- Georgian Squares (*inter alia*, St. Stephen's Green, Merrion Square, Fitzwilliam Square, Mountjoy Square, Parnell Square);

- Georgian Streets (*inter alia*, Fitzwilliam Street, Gardiner Street, Dawson Street, Great Georges Streets North and South, Hume Street / Ely Place, Westland Row);
- Architectural Landmark Buildings (*inter alia*, General Post Office, Leinster House, Custom House, National Museums and Library, Trinity College, Rotunda Hospital, National Concert Hall);
- Quay walls, bridges and streetscapes; and
- The southern turnaround point of the proposed route is to be determined as part of this route options assessment process.

The Section 3 study area is presented in **Figure 4.5**.

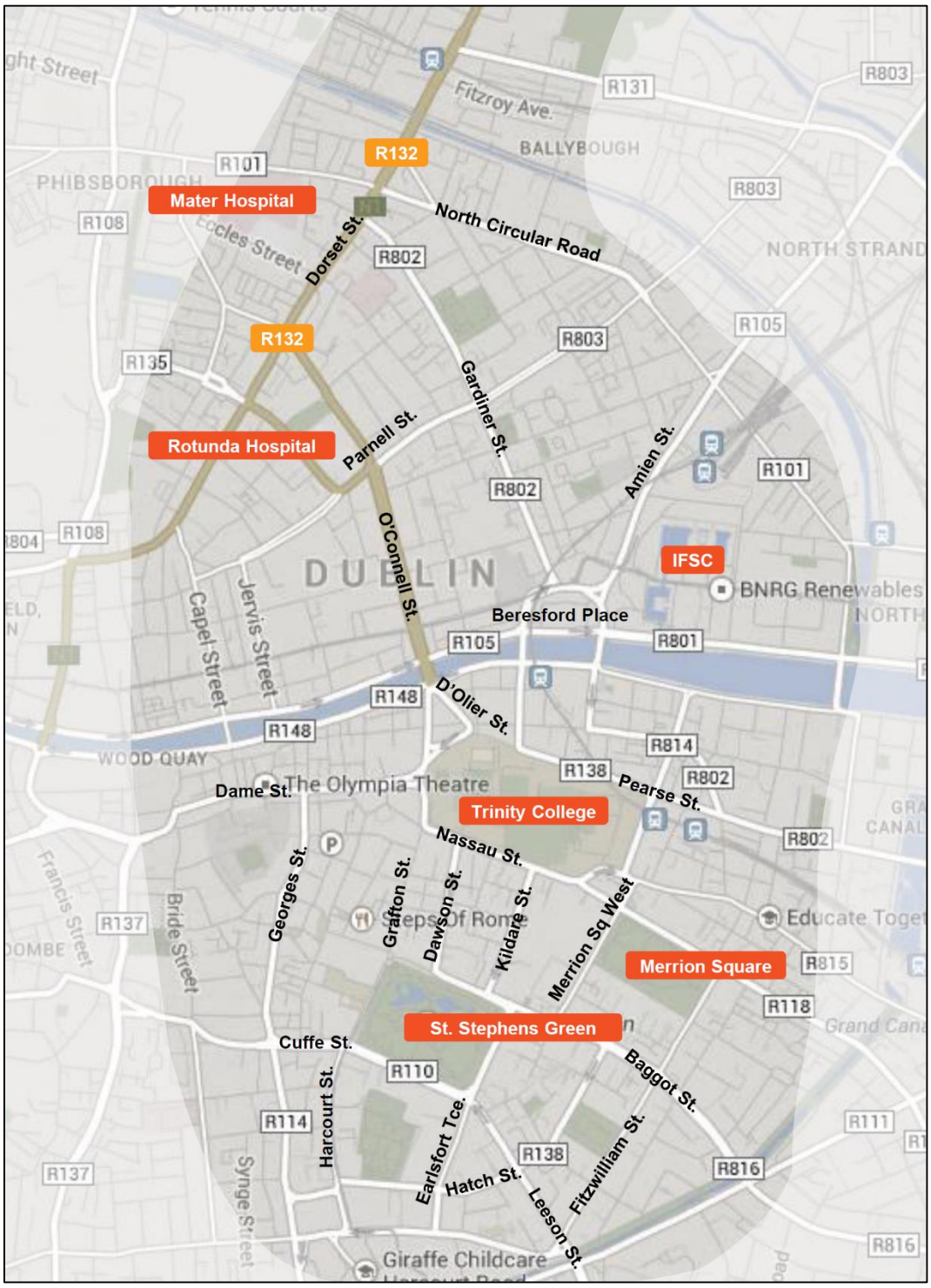

Figure 4.5: Section 3 Study Area

4.3 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:

- Santry Demesne;

- Dublin Port Tunnel northern portal;
- River Tolka;
- Royal Canal (including protected structures);
- Luas Cross City;
- River Liffey;
- Recently constructed urban enhancement projects, including Dorset Street and O'Connell Street;
- Trinity College;
- Existing and committed future development along the route, in particular in the City Centre, much of which has significant heritage value, including particular Architectural Conservation Areas;
- Existing monuments along the route;
- Significant street trees and other natural features along the route;
- Existing urban and sub-urban roads and street network;
- Bridges at identified natural constraints;
- Availability of land in urban and suburban areas;
- Public Parks;
- Maynooth / Sligo Rail line;
- DART/Suburban/Intercity rail line through the City Centre; and
- The need to maintain traffic flow for all modes during construction.

4.4 Integration with Existing and Proposed Public Transport Network

One of the key objectives of the proposed scheme is to enhance interchange between the various modes of public transport operating in the city, both now and in the future. Route options within the study area have therefore been developed with this in mind and, in so far as possible, provide for interchange with existing and planned future transport services, including:

- Intercity/Suburban Rail services at Drumcondra Rail Station;
- Luas Red Line and Luas Cross City on O'Connell Street;
- DART/Intercity/Suburban Rail services at Pearse Street Station;
- Future DART Underground at Pearse Street Station;
- Future Metro North stops on the R132, including immediately to the south of the R106 Malahide Road junction;
- Other planned Swiftway routes from Clongriffin to Tallaght and Blanchardstown to UCD in the vicinity of St. Stephens Green; and

- Existing Dublin Bus services at numerous locations along the route.

4.5 Compatibility with Other Road Users

A key objective of the proposed scheme is to improve pedestrian and cyclist facilities along the route. In general, segregated facilities will be proposed for these modes.

Where it is considered impractical to construct pedestrian or cycle facilities along a particular section of the Swiftway route (and it is considered inappropriate to reroute the Swiftway), such facilities will need to be provided along a suitable alternative route.

There may be locations where segregated cycle facilities cannot be provided along the Swiftway route and there is no suitable routing alternative. In this instance, it may be possible for cyclists to share with vehicles in the BRT 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 BRT lanes being applied.

General traffic will be maintained along the Swiftway corridor although it is inevitable that there will be impacts on traffic capacity along the route associated with the reallocation of road space to the BRT 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 total trip capacity on the Swiftway route / corridor following the introduction of the Swiftway service.

5 Assessment Methodology

5.1 Assessment Process

This section of the report presents the methodology used for the assessment of route options within the study area. A two-stage assessment was adopted:

- An initial 'Stage 1' high-level route options assessment or 'sifting' process which appraised routes 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.

5.2 Stage 1: Route Options Assessment – Sifting Stage

5.2.1 Initial Route Option Identification

For the most part, the proposed scheme will follow the route of the existing Swords QBC along the R132.

Practically, there are only a limited number of areas within the study area, where alternative potential routing options are available. These areas are listed below and illustrated in **Figure 5.1**:

- Swords North BRT Terminus;
- Swords town;
- Airside;
- Dublin Airport;
- Santry village; and
- Dublin City Centre.

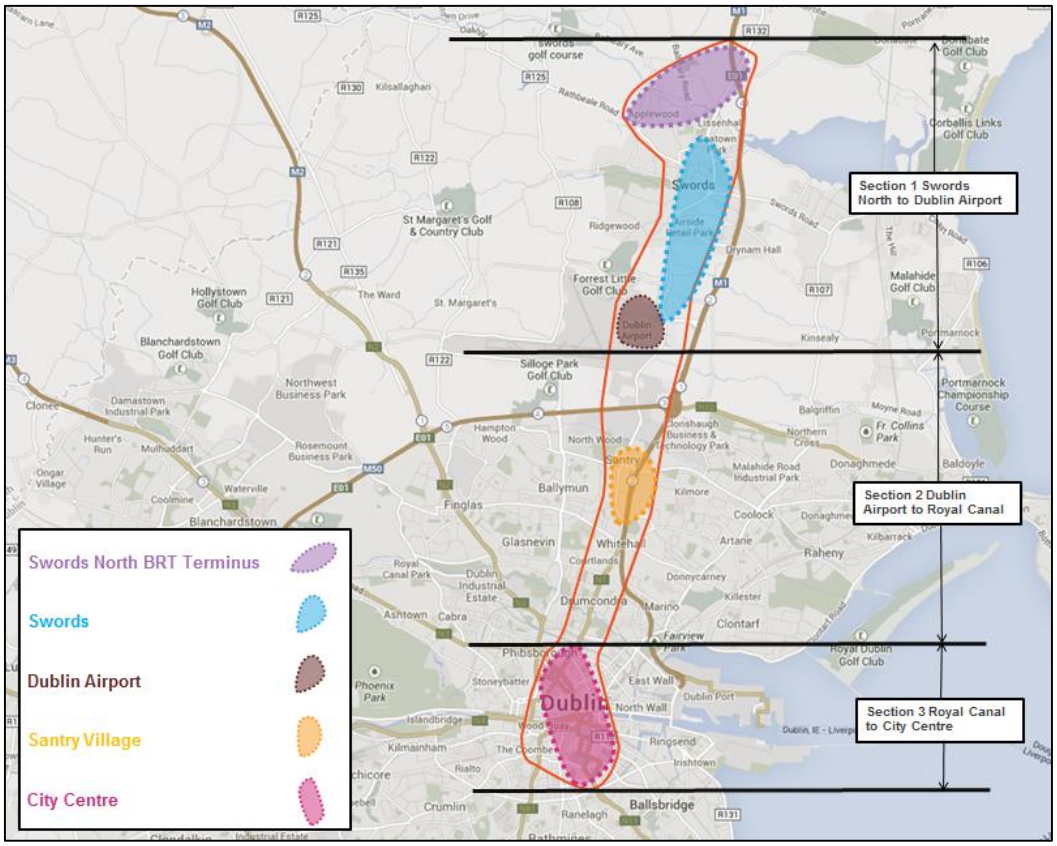

Figure 5.1: Study Area Sections with Route Options

5.2.2 Spiders Web Development

An initial 'spiders-web' of potential route options that could possibly accommodate a Swiftway service was identified for each study area section. This 'spiders-web' of route options was chosen with reference to the Swiftway system characteristics and in order to meet the scheme objectives as set out in Section 3 of this report. Initial route options identified also took cognisance of the physical constraints and opportunities present (Section 4.3) and the ability to integrate with other public transport modes (Section 4.4). 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 BRT lane priority.

The resulting study area corridor spiders-web of route options identified is presented in **Figure 5.2**.

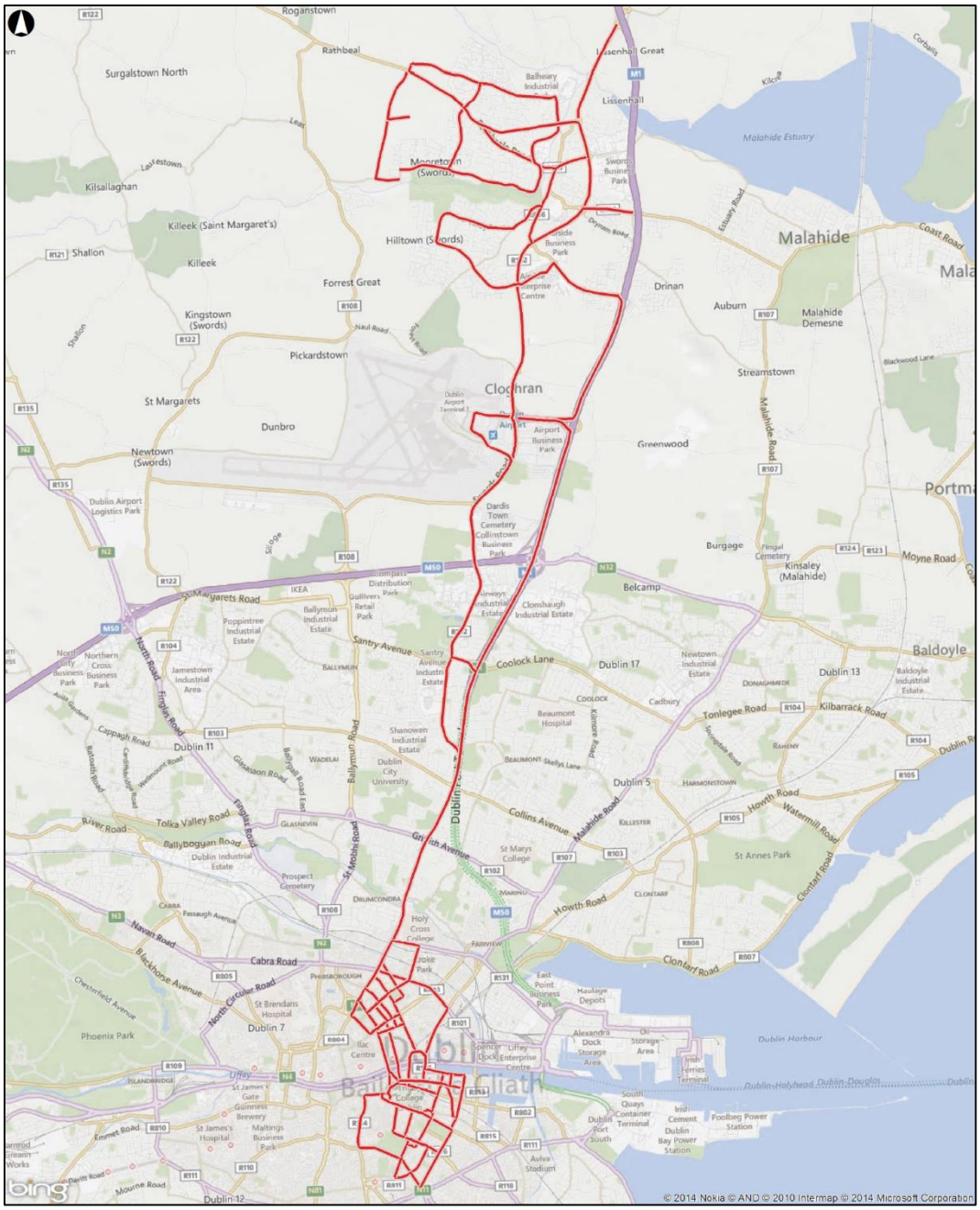

Figure 5.2: Spiders Web of Route Options

At the Stage 1 'sifting' stage, the initial 'spiders-web' of route options presented in **Figure 5.2** 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 options 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.

5.3 Stage 2: Route Options Assessment – Detailed Assessment

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

The 'Guidelines on a Common Appraisal Framework for Transport Projects and Programmes' published by the Department of Transport (DoT, now DTTAS), June 2009, requires schemes to undergo a 'Multi-Criteria Analysis' (MCA) under the following criteria;

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

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 assessment criteria.

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

Table 5.1 presents a summary of the assessment criteria and sub criteria used as part of the 'Stage 2' detailed route options assessment process.

Table 5.1: Assessment Criteria

Assessment Criteria	Assessment Sub-Criteria
1. Economy	1.a. Capital Cost
	1.b. Operation and Maintenance Cost
	1.c. 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
3. Accessibility & Social Inclusion	3.a. Key Trip Attractors (Education/Health/Commercial/Employment)
	3.b. Deprived Geographic Areas
4. Safety	4.a. Road Safety
	4.b. Pedestrian 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.

5.3.1 Economy (1)

5.3.1.1 Capital Cost (1.a.)

Capital cost estimates consist of both the indicative infrastructure cost estimate and land acquisition costs. The methodology used in determining these costs, standardised to per-kilometre rates, is described below.

1.a.i. Indicative Infrastructure Cost Estimate

This sub-criterion is established to assess route options for their likely capital infrastructure cost. Each route option has been assessed relative to the nature and extent of infrastructure requirements to deliver the scheme objectives. In order to evaluate route options, a degree of initial outline design has been undertaken for some routes to inform infrastructure requirements.

Infrastructure costs include:

- **Carriageway:** whether potential re-alignment (i.e. re-alignment of the highway) is necessary and the extent of new or existing pavement reconstruction works required;
- **Drainage:** the extent to which additional drainage works, or modification of existing drainage networks is required;
- **Services/Utilities:** the extent of utility service protection or relocation works required;
- **Lighting:** whether existing public lighting would need to be replaced or a new public lighting system required along a particular route option;
- **Structures:** whether the introduction of the proposed scheme on a route would require existing structures to be modified or replaced and consideration of any new structures to be provided;
- **Swiftway priority:** whether provision of new Swiftway or upgrading of existing bus priority infrastructure is required. For comparison purposes, the scheme design is assumed to consist of lateral BRT lanes (i.e. kerbside BRT lanes). However there are some locations where central (median) BRT lanes could be considered;
- **Construction traffic management:** an assessment of the extent of the likely traffic management measures (e.g. potential diversion of traffic away from the route) required to construct the proposed scheme along routes; and
- **Cycle route infrastructure:** The practicality and extent of works required to accommodate cycle route infrastructure along route options.

For the purposes of the route options assessment, a high level cost estimate has been prepared. Based on this estimate, the capital cost of the BRT infrastructure is calculated to be approximately €6,600,000 per kilometre.

This rate does not include any costs associated with land acquisition or ancillary project costs common to all route options, such as a depot, control room, vehicle fleet and systems. These costs, however, are considered in the transport economic assessment of 'end-to-end' route options in Section 10.

1.a.ii. Land Acquisition Cost Estimate

This criterion evaluates the likely costs associated with land acquisition and associated boundary/accommodation works for each route option. The assessment takes consideration of:

- The number of adjacent public/commercial/residential/industrial properties, from which land acquisition would be required as well as the extent (area) of land acquisition likely to be necessary; and
- The costs associated with boundary/accommodation works.

For the purposes of route options comparison and assessment, the extent of land acquisition required for each route option is calculated by developing an outline design for each option based on ordnance survey mapping available, and applying the following assumed typical scheme assumptions:

- 3.5 m BRT lane;

- 3.0 m Traffic Lane;
- 2.0 m Footpath; and
- 2.0 m Cycle Track.

Outline designs prepared for some route options also considered any specific constraints and tailored the above assumptions where appropriate to practically minimise land-take without compromising on the overall scheme objectives.

The areas of land-take required are presented as being either public land or private land. For the purposes of comparing route options, public land is generally defined as the space between physical boundaries on either side of a road (e.g. property boundary wall to property boundary wall). Areas outside the road reserve are assumed to be private land except where it is clear that it is owned by a public entity (e.g. a public park). Any private land that may be located within the road reserve, but are not clearly private land, are considered as public areas as part of this methodology. This exercise has been based on available Ordnance Survey mapping and topographical survey.

The methodology typically adopted in calculating the land acquisition costs is very site specific (value of the property, costs of acquiring and moving to a new property etc.). However for the purpose of this assessment, a high level assessment methodology has been used to develop a cost per square metre (sqm) for private land acquisition based on valuations carried out by the RPA for other public transport projects. Using this information, a rate of €1,500/sqm has been applied to route options to derive an indicative cost for private land-take for all route options.

For the purposes of this assessment, no cost has been assumed for public land acquisition.

5.3.1.2 Operation and Maintenance Cost (1.b.)

In order to estimate Operation and Maintenance (O&M) costs of the proposed Swiftway service, use was made of the RPA's Luas O&M spreadsheet model. The Luas O&M model was developed by the RPA and is based on models originally developed by Transport for London (TfL). The model was updated to reflect outturn budgets for 2010 and costs were adjusted to 2009 prices using the Consumer Price Index (CPI).

The proposed scheme is being developed to deliver a similar quality of service to the existing Luas systems in Dublin and as such certain aspects of the operational costs associated with Luas have been retained in developing the O&M costs for the proposed scheme.

The numbers of drivers and operational staff, for the proposed scheme, have been estimated based on the methodology for current Luas light rail systems. Also staff salaries have been assumed to reflect current levels for Luas staff.

The cost of maintaining a Swiftway vehicle has been assumed to be significantly different from light rail costs however and therefore is based on the costs of vehicle maintenance for the 2010 Dublin Bus fleet (updated to 2014 costs). An allowance has been made for a higher specification of vehicles for the Swiftway system relative to Dublin Bus. The Swiftway stops will have similar

infrastructure to light rail stops including ticket vending machines, passenger information display systems etc. therefore the costs of maintaining these assets are assumed to be similar to light rail costs. Additionally, costs associated with vandalism, stop cleaning etc. are assumed to be similar to light rail costs.

Other overhead costs such as rates, insurance, marketing and advertising etc. are assumed to be similar to light rail costs.

Based on this methodology, an O&M rate of €1M per kilometre has been calculated and applied to all route options.

5.3.1.3 Transport Reliability and Quality of Service (1.c.)

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

1.c.i. Journey Time; the extent to which journey time savings, and associated economic benefits, for public transport services, including the Swiftway, 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 thereby BRT) and / or provision of new BRT priority along road links;
- Provision of Swiftway priority through junctions (preferably through signal controlled junctions);
- Local upgrading of road sections to provide more carriageway space and therefore, additional capacity;
- Removal of 'pinch points' for Swiftway / 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 BRT lanes) and spacing.

Journey times for each route option have been calculated by comparing the time required by a Swiftway vehicle to travel between common start and end points on each route. Where both the start and end points are not the same for each route option (e.g. at the route, and therefore, the scheme terminus), the journey time is calculated between one common point and the end of the route. The following assumptions have been made in calculating the comparative journey times along route options:

- Top operational speed of 50 kph in suburban areas and 30 kph in City Centre areas;
- Dwell time of 25 seconds per stop (conservative assumption); and
- Delay of 15 seconds per junction on average (conservative assumption).

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

1.c.ii. Number of Signalised Junctions; the number of signalised junctions along each route have been compared.

Regardless of the level of practical or feasible bus priority provided at signalised junctions, there will always be an element of delay to Swiftway vehicles associated with signalised junctions, even with the most efficient signalling

system being provided. While it is impossible to completely avoid signalised 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.c.iii. Level of Swiftway 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 Swiftway vehicles, the amount of protection afforded to this priority (i.e. segregation) and the provision for Swiftway vehicles at junctions such as BRT lanes at the stop line. This feeds into the overall journey time calculations as indicated above.

5.3.2 Integration (2)

5.3.2.1 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.

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

2.b.i. Residential Population Catchments: This criterion compares the existing residential populations within 5, 10 and 15 minute walk catchments from Swiftway stops and is representative of the number of potential Swiftway users for a particular route option. The assessment does not quantitatively assess the future populations of zoned, but yet undeveloped residential development lands along route options but does broadly consider likely future Swiftway patronage arising. 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.

2.b.ii. Employment Population Catchments: This criterion compares the existing employment populations within 5, 10 and 15 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 but does broadly consider likely future Swiftway patronage arising.

5.3.2.3 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 transport modes (e.g. Luas, DART, rail stations and public and private bus operators). 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.

5.3.2.4 Cycle Network Integration (2.d.);

This criterion is established to assess route options for the practicality of achieving cycle track segregation and their potential to integrate high quality cycle facilities. The assessment considers the following;

2.d.i. Compatibility with the GDA Cycle Network Plan; This criterion considers whether a route option forms part of the GDA Cycle Network Plan, with routes where Swiftway and designated Cycle Routes overlap 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 provide a parallel cycle track off the Swiftway route. Consideration is also given to cycle routes intersecting with the Swiftway route.

2.d.ii. Quality of Infrastructure for Cyclists; The quality of cycle provision practically achievable on route options has been assessed. For comparison purposes, the highest level of practical cycle provision achievable on each route has been determined and compared between route options.

5.3.3 Accessibility and Social Inclusion (3)

5.3.3.1 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 the Swiftway service 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); and
- Employment (business parks, large office developments etc.).

5.3.3.2 Deprived Geographic Areas (3.b.)

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

5.3.4 Safety (4)

5.3.4.1 Road Safety (4.a.)

Generally, the introduction of Swiftway 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 Swiftway vehicle at junctions on the route is also considered with routes where turning movements (either left or right) are required being assigned a lower ranking in terms of safety.

5.3.4.2 Pedestrian Safety (4.b.)

This criterion assesses the safety of passengers accessing the stops along the route. This is predominantly concerned with the proximity of stops to crossing facilities and the presence of footpaths along desire lines to stops.

5.3.5 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 5.2**.

Table 5.2: Environmental Aspects Considered

Aspect	Rationale
Included in Environmental Assessment	
5.a./5.b.Archaeological, Architectural and Cultural Heritage	The provision of Swiftway 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 5.3.5.1).
5.c. Flora and Fauna	The provision of Swiftway infrastructure has the potential to impact on flora and fauna.
5.d. Soils and Geology	The provision of Swiftway 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).
5.e. Hydrology	The provision of Swiftway infrastructure has the potential to impact on surface water bodies as a result of land-take (with particular emphasis on floodplains and flood zones).
5.f. Landscape and Visual	The provision of Swiftway infrastructure has the potential to impact the townscape/streetscape along the Swiftway route.
5.g Air Quality	The provision of Swiftway infrastructure has the potential to impact the air quality along the Swiftway route.
5.h. Noise & Vibration	The provision of Swiftway infrastructure has the potential to impact the noise environment along the Swiftway route.
5.i. Land Use Character	The provision of Swiftway 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 Swiftway 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

Aspect	Rationale
	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.

When preparing the Environmental Impact Statement (EIS) for the preferred route and scheme design, the environmental topics which have been scoped out (and others that are not considered relevant for the route options assessment), will be reviewed and incorporated into the EIS as appropriate.

The full environmental evaluation of route options is contained in **Volume 2 – Route Options Environmental Report**. The results of the environmental assessment have been consolidated into the summary assessment tables for each route option.

5.3.5.1 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 Swiftway 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 Swiftway 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. At this stage of the assessment, the exact nature and extent of potential impacts cannot be determined for all route sections assessed.

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 Swiftway 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 Swiftway 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.

5.3.6 Route Options Summary Table

For each study area section, 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 for each study area section 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 5.3**, with advantageous routes graded to ‘dark green’ and disadvantaged routes graded to ‘dark red’.

Table 5.3: Route Options Colour Coded Ranking 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

The extent of reporting may vary between each study area section route options assessment, depending on the significance attached to specific criterion in terms of route differentiation.

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

This is then summarised for each study area section under the main assessment criterion as set out in Table 5.1.

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

The recommended route options from each study area section are then collated to provide 'end-to-end' scheme route options which are taken forward for transport analysis assessment.

5.3.7 Transport Demand and Economic Appraisal

The transport modeling exercise was undertaken using the NTA's multimodal transport model of the Greater Dublin Area. This exercise has been undertaken for a number of routes formed by combining all route options which remain from the previous assessment stages.

These 'end-to-end' route options and potential stop locations were coded into the NTA's multi-modal transport model, with the benefits accruing from each of the options then being appraised. The assessment examined (from a patronage demand and business case perspective) the viability of the 'end-to-end' route options emanating from the multi-criteria analysis assessment. Details of the transport analysis are presented in Section 10.

5.3.8 Conclusion

The outcome from the transport analysis and the findings of the multi-criteria assessment are then finally considered in a holistic manner to derive a preferred 'end-to-end' route.

6 Study Area Section 1: Swords North to Dublin Airport

6.1 Terminus Options Assessment

When assessing route options for the northern end of the study area, a key consideration is the terminus location for the proposed scheme. In this regard, there are a number of locations where the scheme could be terminated, including options to develop the scheme on a phased basis.

The function of the terminus also needs to be considered in terms of the operational model for the Swiftway service.

The NTA's *'Study of Transport Options for Fingal Corridors in advance of Metro North'*, as discussed in Section 2.4, previously advocated the introduction of a 'hub and spoke' bus network model for Swords, with a bus hub being located centrally in Swords, which would have local feeder services interchanging with 'trunk services' running along the QBC corridor.

Initial work on the Swords Road QBC upgrade Phase II scheme planning investigated the options available for such a 'bus hub' for interchange in Swords town centre. The availability of a suitable site for such a facility is limited and the service model would require a significant change to the overall bus network, both locally and regionally.

The adoption of the Swiftway service for Swords as part of transport planning policy however, resulted in a further evaluation of the overall bus network operational concept, which moved away from the 'hub and spoke' model envisaged for the QBC.

For Swiftway, the most efficient service that provides the most patronage, is an 'end-to-end service', providing access to the existing large residential populations. In this context, the purpose of the terminus is to provide layover for vehicles prior to commencing service and, as such, it should be located close to the start of the preferred route.

Broadly speaking, there are seven areas within the Greater Swords Area which could be considered for the Swiftway service terminus location:

- River Valley;
- Holywell;
- Drynam;
- Central Swords (considered in the context of a 'hub and spoke' service model as described above);
- Estuary Roundabout;
- North-West Swords; and
- Lissenhall.

While these are all possible terminus locations, not all options maximise the benefits associated with the proposed scheme.

Figure 6.1 illustrates the existing residential population demographic for the Swords area.

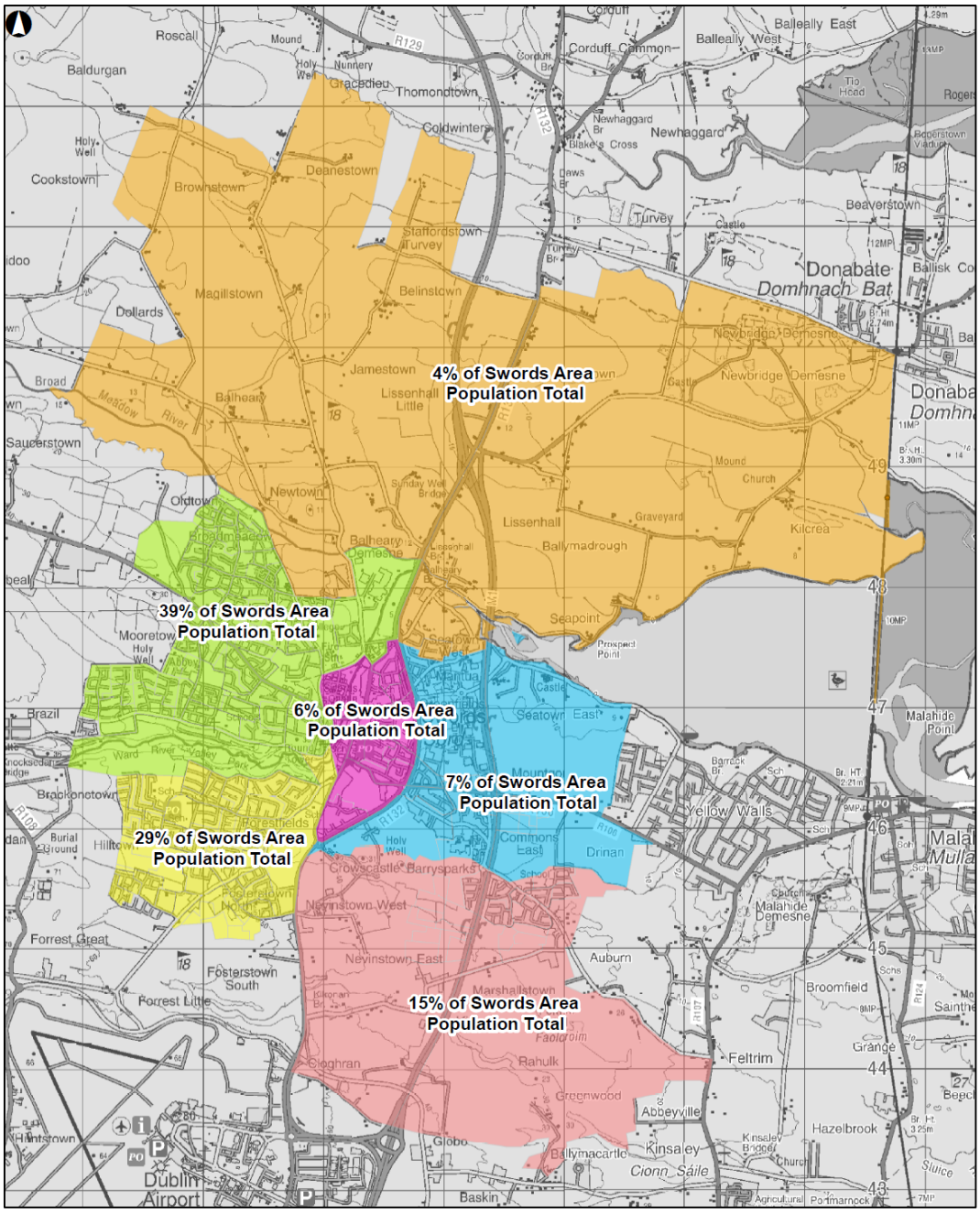

Figure 6.1: Proportion of Total Swords Population in Identified Zones

Considering that almost 40% of the existing population of Swords is located to the north / north-west of Swords, this area is considered to be the largest existing residential catchment and one which is currently expanding, with primary residential growth concentrated, in the short term, in developing areas such as Oldtown.

For this reason, it is not considered beneficial to terminate the service anywhere south of Estuary Roundabout and miss out on this major established catchment. Therefore, a terminus location is preferred to the north of Swords, assuming a feasible route exists.

The option to extend Swiftway northwards as far as Lissenhall is considered as part of the route options assessment process but is unlikely to be attractive in the short term on the basis that significant development is yet to progress within these lands. One of the advantages of BRT, however, is its flexibility and the option remains to provide a public transport service, including a possible Swiftway service spur, if deemed appropriate, to Lissenhall in the future.

Within North-west Swords there are a number of possible terminus locations, but each of these locations are dependent on the ability of a route to be physically provided to each terminus option.

It should also be noted that as Swiftway cannot physically provide a direct service to all locations in Swords, some general bus network reconfiguration will be required to provide an efficient, higher overall capacity public transport service and to ensure that areas not directly served by Swiftway will also be able to avail of an overall improvement in public transport provision.

6.2 Stage 1: Route Options Assessment

Within this study area section, there are a number of route options which have been considered. The route options considered are concentrated in the vicinity of Swords town centre and potential Swiftway terminus locations to the north and north-west of Swords. Given the interdependency of route options for Swords town and the onward continuation of the route to a terminus location, both have initially been considered together.

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

The 'Stage 1' route options sifting process assesses potential route options within the Section 1 at a high level against the criteria described in report Section 5. **Figure 6.2** presents the initial potential route options identified. A summary of the Stage 1 route options sifting process is presented in **Table 6.1**.

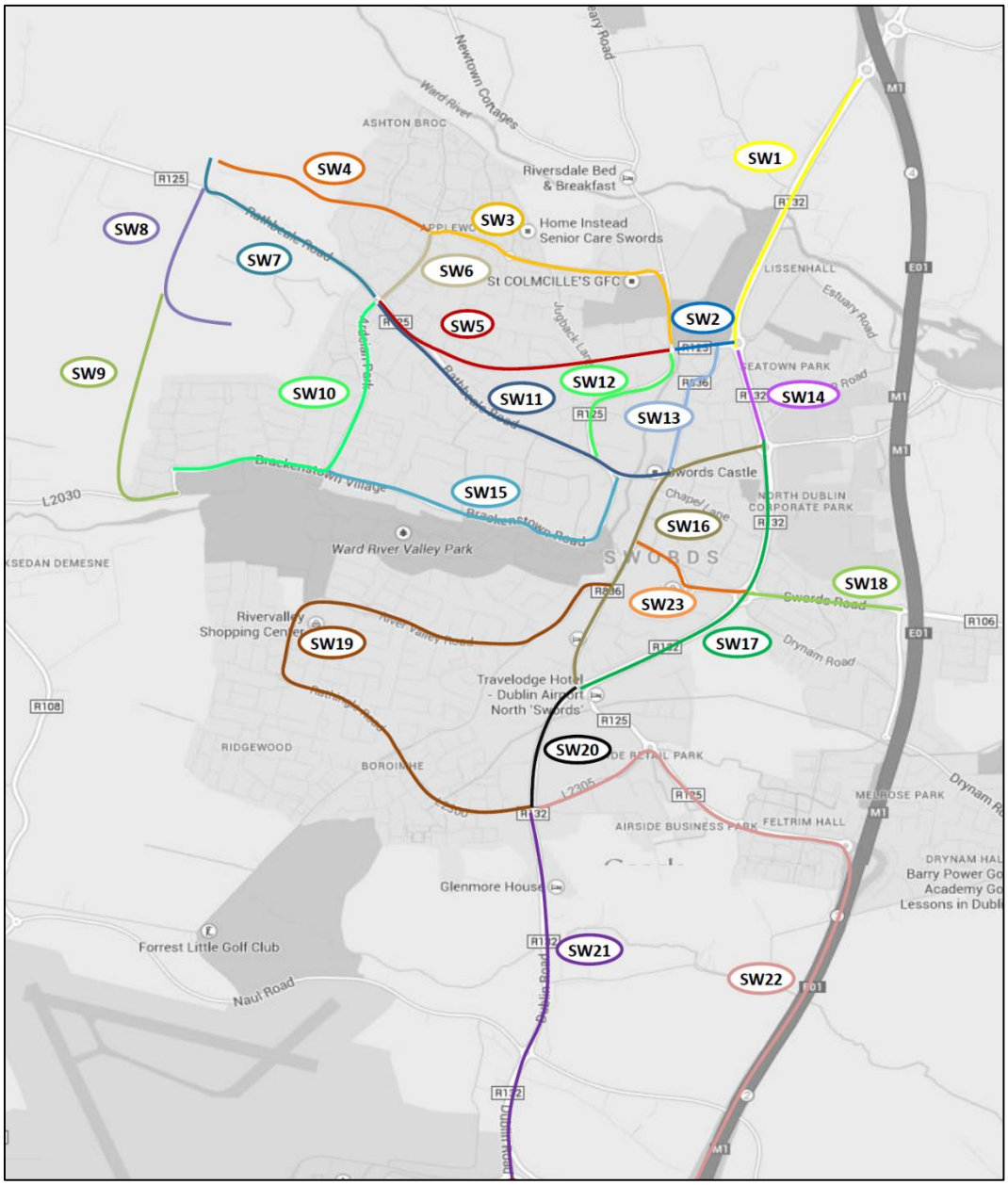

Figure 6.2: Section 1 Route Options - Swords North to Dublin Airport

Table 6.1: Section 1 Route Option Sifting (Stage 1) Summary - Swords North to Dublin Airport

Route Option Number	Comments	Pass/Fail
SW1	Feasible route option along the R132 where sufficient space currently exists to provide Swiftway priority. However, this route option does not serve existing public transport deficit. There is no existing demand for the service at this location until such time as zoned lands at Lissenhall are developed. A possible option to extend a Swiftway service to Lissenhall in the future is not precluded, but is not however considered as part of this scheme.	Fail
SW2	This is a potentially feasible route option along Castlegrange Road providing a link between the R132 and other routes in North-west Swords. Swiftway priority is feasible with some public land-take.	Pass
SW3	This is a potentially feasible route option along Balheary Road and Glen Ellan Road into North-west Swords. Swiftway priority is possible, but with some land-take requirements. The route option provides access to the Swiftway system for a large existing residential catchment while also servicing a large additional residential population within the now developing lands at Oldtown (if provided in tandem with SW4).	Pass
SW4	SW4 is an extension to route option SW3 extending the route option as far as the proposed Western Distributor Road. Swiftway priority is possible, but with some land-take requirements and some changes to proposals in the Oldtown/Mooretown LAP. This route option provides access to the Swiftway system for existing residential catchments along the Glen Ellan Extension Road while also servicing a large additional residential population within the now developing lands at Oldtown. This route option ends at a location identified within the Oldtown LAP lands where a terminus could be facilitated.	Pass
SW5	This is a potentially feasible route option along Castlegrange Road, a section of public green and Rathbeale Road. Swiftway priority is possible with some land-take, mainly from public greens. This route option provides direct access to Swiftway for a large existing residential catchment and in addition to new catchment areas now developing in Oldtown (if provided in tandem with SW7).	Pass
SW6	This is a potentially feasible route option along Glen Ellan Road (north-south). Due to spatial constraints, this route option may be challenging in terms of providing BRT priority without property acquisition. This route option passes the 'Stage 1' sift, however, as it follows existing established bus routes and would serve a large existing catchment area.	Pass
SW7	This is a potentially feasible route option along Rathbeale Road. Swiftway priority is possible but with some land-take and some changes to the Oldtown/Mooretown LAP. This route option provides direct access to Swiftway for a small existing residential catchment in addition to new catchment areas in the Oldtown/Mooretown development lands.	Pass
SW8	This is an extension of route option SW4/SW7, utilising the planned, but as of yet not developed Swords Western Distributor Road to extend the Swiftway system into the centre of the Mooretown LAP lands. The extension is unlikely to be delivered as part of an initial phase of Swiftway implementation, however, as it would serve future demand rather than existing demand and relies on bringing forward new road infrastructure to complete. This route option does not therefore pass the Stage 1 sift but could be considered further as a possible extension of the proposed scheme if connecting route options are adopted and delivered.	Fail

Route Option Number	Comments	Pass/Fail
	Planning and design of the relevant section of the Swords Western Distributor Road may need to take cognisance of such a Swiftway extension to Mooretown in the future.	
SW9	SW9 is an extension of route option SW8, utilising the planned, but as of yet not developed Swords Western Distributor Road to extend Swiftway into the centre of the Mooretown LAP lands. The extension is unlikely to be delivered as part of an initial phase of Swiftway implementation however as it would serve future demand, rather than existing demand, and relies on bringing forward new road infrastructure to complete. This route option does not therefore pass the 'Stage 1' sift but could be considered further as a possible extension of the proposed scheme if connecting route options are adopted and delivered. Planning and design of the relevant section of the Swords Western Distributor Road may need to take cognisance of such a Swiftway extension to Mooretown in the future.	Fail
SW10	This is a potentially feasible route option along Murrough Road terminating on Brackenstown Road, effectively following the route of a number of existing scheduled bus services locally. Due to spatial constraints, Murrough Road may be challenging in terms of providing BRT priority without property acquisition. This route option passes the 'Stage 1' sift, however, as it follows existing established bus routes and would serve a large existing catchment area.	Pass
SW11	This route option is not considered to be feasible due to the inability to provide sufficient priority through Bridge Street and Rathbeale Road without considerable private land-take/property acquisition. This route option could impact significantly on Swiftway services due to relatively high traffic volumes on the route option. Without land-take, shared running would significantly impact the reliable operation of the Swiftway system.	Fail
SW12	This route option is not considered to be feasible due to the inability to provide priority along Watery Road without significant land acquisition thereby reducing journey time reliability and increasing overall journey time for Swiftway services.	Fail
SW13	This route option is not considered feasible owing to significant on-street parking, direct driveway access and restricted cross-section in places which would require significant property acquisition. Without land-take, shared running would significantly impact the reliable operation of the Swiftway system.	Fail
SW14	This is a potentially feasible route option along the R132 between Seatown and Estuary Roundabout where sufficient space exists to provide Swiftway priority.	Pass
SW15	This route option is not considered to be feasible due to the inability to provide sufficient priority through Bridge Street. Priority could be provided along Brackenstown Road in places.	Fail
SW16	This is a potentially feasible route option through Swords Main Street. It would involve major changes to the character of Main Street. This route option was, however, progressed to the next stage for further assessment.	Pass
SW17	This is a potentially feasible route option along the R132 between Pinnock Hill and Seatown Roundabouts where space exists to provide Swiftway priority. Opportunity exists to serve Swords Pavilions and the	Pass

Route Option Number	Comments	Pass/Fail
	new Swords town centre areas as identified in the FCC Development Plan and Swords Town Centre Masterplan.	
SW18	Potentially feasible route option which serves an existing small residential and commercial catchment along the Malahide Road. However, this route option is not considered desirable as it misses out on a large existing residential catchment in North-west Swords.	Fail
SW19	This route option is not considered feasible due to the inability to provide priority at key locations namely the junction of Forrest Road and Dublin Road, thereby reducing journey time reliability and overall journey time for Swiftway services.	Fail
SW20	Technically feasible route option along the R132 between Airside and Pinnock Hill junctions where space exists to provide Swiftway priority	Pass
SW21	Technically feasible route option along the R132 between the Airport Roundabout and Airside Retail Park. Bus lanes exist for large sections of the route option.	Pass
SW22	This route option is not considered feasible due to the requirement for significant land-take to provide Swiftway priority along the route option particularly along the Drinan Link Road. There is also a safety concern associated with Swiftway vehicles using the M1 motorway with standing passengers.	Fail
SW23	This route option is not considered feasible due to the requirement for significant land-take to provide Swiftway priority along the route option particularly between Swords Main Street and the Pavilions Roundabout.	Fail

Following the 'Stage 1' sift, 12 of the 23 route options assessed passed the initial sifting stage. Of these, three route options existed where there is no feasible alternative – SW14 between Seatown and Estuary roundabouts, SW20 between Pinnock Hill roundabout and Airside, and SW21 between Airside and the Airport roundabout.

As such, 9 route options were progressed to the next assessment stage. These route options are presented in **Figure 6.3**.

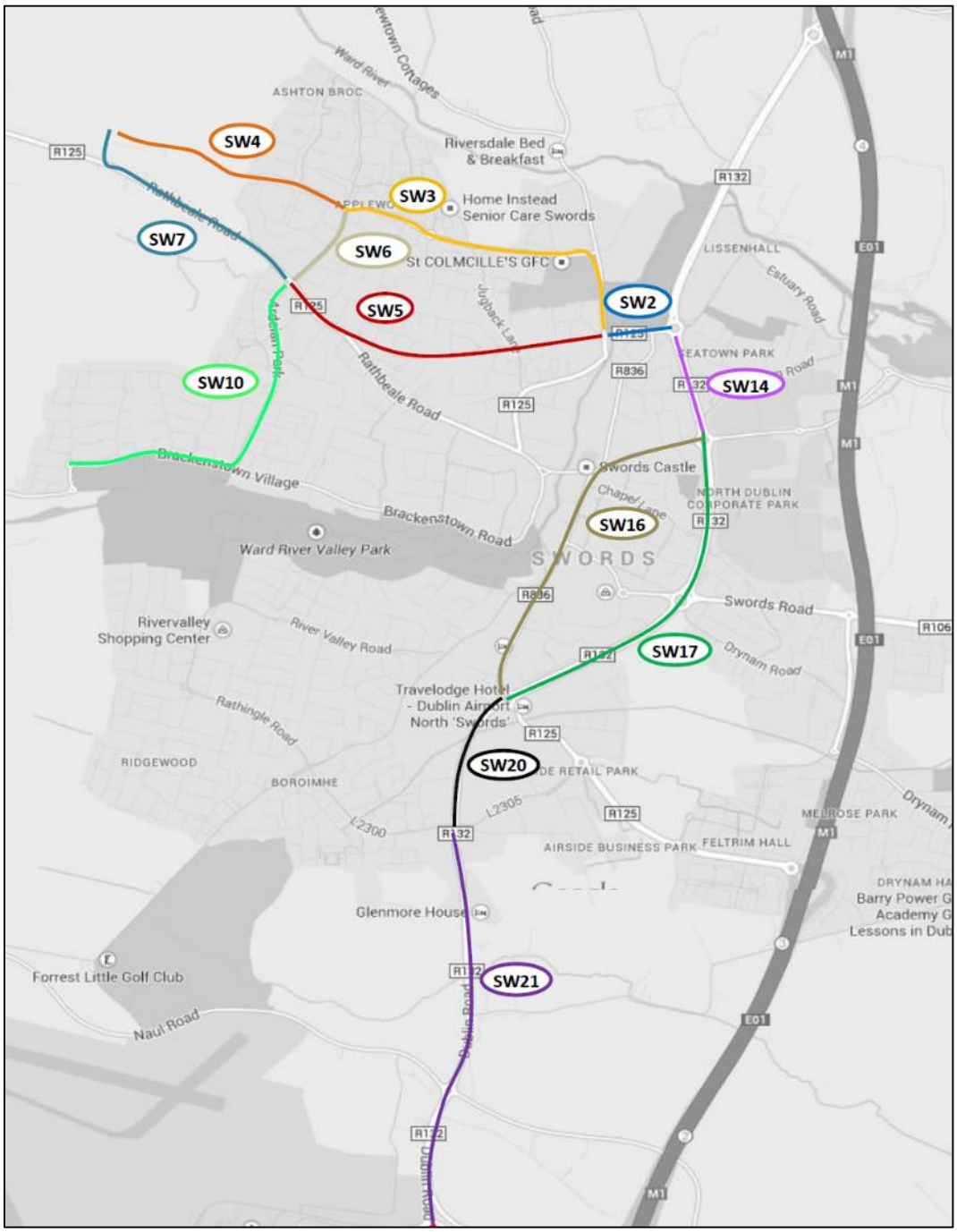

Figure 6.3: Section 1 Route Options Remaining After Stage 1 Assessment

6.3 Stage 2: North-West Swords Route Options Assessment

6.3.1 Introduction

Following the 'Stage 1' sift for the Swords North to Dublin Airport study area, the remaining route options were combined to form 6 cohesive route options between the R132 and the potential route terminus. These route options are presented in **Figures 6.4** to **6.9**.

Two core route options into North-west Swords, via the R132 Estuary Road junction, were taken forward:

- A route option via Balheary Road and Glen Ellan Road; and
- A route option via Pine Grove Park.

The route option, via Glen Ellan Road, has three potential route variants. GE1 and GE3, which would terminate within, and directly serve the developing lands at Oldtown, and GE2, which follows existing bus routing, terminating at Brackenstown. Providing Swiftway priority along these route options require further examination in terms of land-take and environmental impacts arising.

The route option, via Pine Grove Park, was effectively the Emerging Preferred Route as presented at the time of the Swiftway Network launch in February 2014. This route option remained as a potential option, but needed to be considered in more detail as part of this process in terms of identification of a suitable terminus location and completion of environmental studies to fully appraise any impacts arising. As with the Glen Ellan Road route options, three variant route options are considered, with PG1 and PG3 terminating within Oldtown and PG2 terminating in Brackenstown.

6.3.2 Route Option GE1: Glen Ellan Road with Oldtown Terminus

Route option GE1, is presented in **Figure 6.4** and described in the following text.

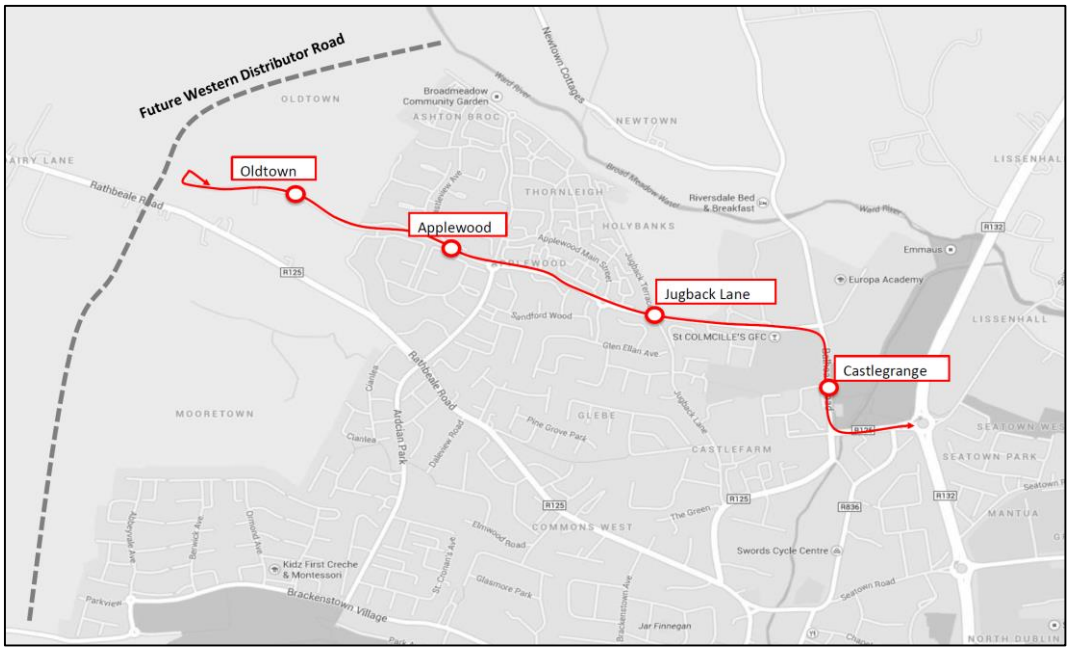

Figure 6.4: Route Option GE1 Glen Ellan Road with Oldtown Terminus

Northbound: This route option would deviate from the R132 at the existing Estuary R132 roundabout junction, taking the Swiftway system into the residential areas in North-west Swords. Swiftway vehicles would travel along Castlegrange Road, Balheary Road and Glen Ellan Road. This route option would terminate on the Glen Ellan Road Extension in Oldtown.

Southbound: Southbound Swiftway vehicles would travel the same route as taken by northbound vehicles.

Stops: A total of 4 stops would most likely be provided, at Castlegrange, Jugback Lane, Applewood and Oldtown.

The journey time for this route option from the Estuary junction to the route terminus is 6-7 minutes over a distance of approximately 2.6km.

This route option has the potential to be extended in the future to a terminus/stop location within the Mooretown lands as identified in the Oldtown/Mooretown LAP.

The roads used by this route option perform a distributor road function serving several residential areas. The cross section varies along the route option but the standard distributor road carriageway typically consists of 2 traffic lanes with a footpath on either side. A cycle lane is also provided on both sides of the road along some sections.

There are no private dwelling driveways with direct access onto any portion of the route option. There are a total of 4 junctions along this route option, all of which would likely require upgrading to facilitate Swiftway priority measures.

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

- Land-take (both public and private) would be required to provide physical Swiftway priority along the route option;

- There would be a need to upgrade the Castlegrange Road/R132 junction to a traffic signal controlled junction to facilitate Swiftway priority particularly for Swiftway vehicles turning right out of Castlegrange Road;
- There would be a need to widen/replace the existing culvert/bridge along Castlegrange Road between the R132 and Balheary Road to facilitate Swiftway priority in both directions;
- There would possibly be a requirement to close Jugback Lane to traffic;
- The Glen Ellan Road/Applewood Main Street and Glen Ellan Road/Ashton Distributor Road roundabouts would need to be upgraded to traffic signal controlled junctions to facilitate Swiftway priority and for the safe movements of Swiftway vehicles;
- The Oldtown/Mooretown LAP proposes that the recently constructed Glen Ellan Road Extension (from the eastern boundary of the LAP lands) consist of a 6.5 m carriageway with no provision for bus lanes. To provide Swiftway priority to the proposed terminus location it would be necessary to widen the road carriageway. This may have an impact on extant planning permissions in the area;
- There is potential for the route option to be extended to Mooretown town centre when the lands are developed; and
- There would be a need to rationalise existing bus services as they would closely match this Swiftway route option.

6.3.3 Route Option GE2: Glen Ellan Road with Brackenstown Terminus

Route option GE2, is presented in **Figure 6.5**.

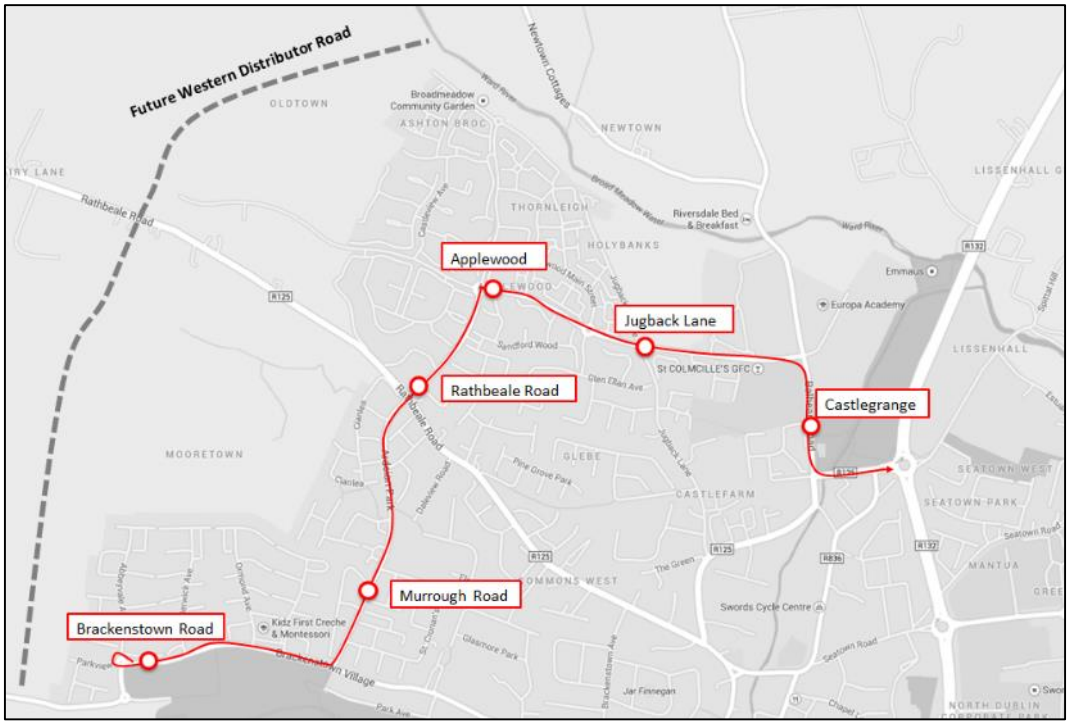

Figure 6.5: Route Option GE2 Glen Ellan Road with Brackenstown Terminus

Northbound: This route option would deviate from the R132 at the existing Estuary R132 roundabout junction, taking the Swiftway system into residential areas in North-west Swords. Swiftway vehicles would travel along Castlegrange Road, Balheary Road, Glen Ellan Road, Murrough Road and Brackenstown Road. The route option would terminate on Brackenstown Road.

Southbound: Southbound, Swiftway vehicles would travel the same route as taken by northbound vehicles.

Stops: A total of 6 stops would most likely be provided, at Castlegrange, Jugback Lane, Applewood, Rathbeale Road, Murrough Road and Brackenstown.

The journey time for this route option from the Estuary junction to the route terminus is 8-9 minutes over a distance of approximately 3.7 km.

The roads used by this route option perform a distributor road function serving several residential areas. The cross-section varies along the route but the standard distributor road carriageway typically consists of 2 traffic lanes with a footpath on either side. A cycle lane is also provided on both sides of the road along some sections.

There are no private dwelling driveways with direct access onto any portion of the route option. There are a total of 6 junctions along this route option, all of which would likely require upgrading to facilitate Swiftway priority measures.

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

- A significant amount of land-take (both public and private) would be required to provide physical Swiftway priority along the route option;
- There would be a need to upgrade the Castlegrange Road/R132 junction to a traffic signal controlled junction to facilitate Swiftway priority particularly for Swiftway vehicles turning right out of Castlegrange Road;
- There would be a need to widen/replace the existing culvert/bridge along Castlegrange Road between the R132 and Balheary Road to facilitate Swiftway priority in both directions;
- There would possibly be a requirement to close Jugback Lane to traffic;
- The Glen Ellan Road/Applewood Main Street and Glen Ellan Road/ Ashton Distributor Road roundabouts would need to be upgraded to traffic signal controlled junctions to facilitate Swiftway priority and the safe movements of Swiftway vehicles. The Murrough Road/Rathbeale Road junction would also need to be upgraded to a traffic signal controlled junction; and
- There would be a need to rationalise existing bus services as they would closely match this Swiftway route option.

6.3.4 Route Option GE3: Glen Ellan Road and Rathbeale Road with Oldtown Terminus

Route option GE3, is presented in **Figure 6.6**.

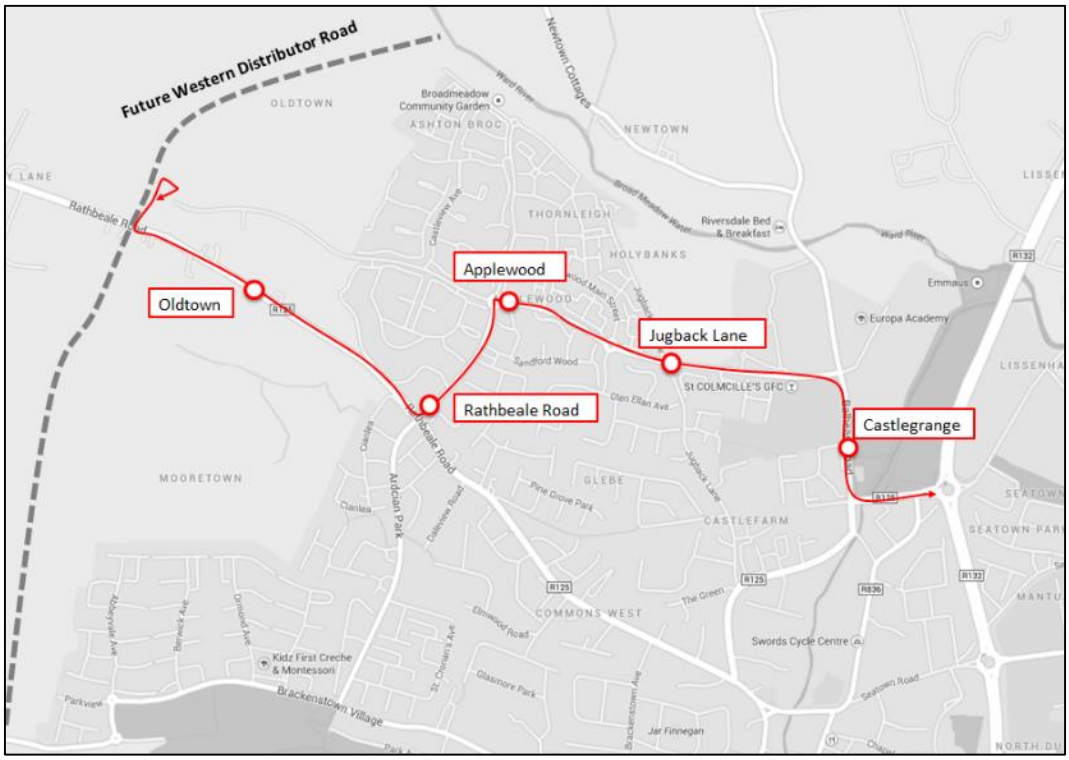

Figure 6.6: Route Option GE3 Glen Ellan Road and Rathbeale Road with Oldtown Terminus

Northbound: This route option would deviate from the R132 at the existing Estuary R132 roundabout junction, taking the Swiftway into the residential areas in North-west Swords. Swiftway vehicles would travel along Castlegrange Road, Balheary Road, Glen Ellan Road and Rathbeale Road. This route option would terminate on the Glen Ellan Road extension in Oldtown.

Southbound: Southbound, Swiftway vehicles would travel the same route as taken by northbound vehicles.

Stops: A total of 5 stops would most likely be provided, at Castlegrange, Jugback Lane, Applewood, Rathbeale Road and Oldtown.

The journey time for this route option from the Estuary junction to the route terminus is 7-8 minutes over a distance of approximately 3.0km.

The roads used by this route option perform a distributor road function serving several residential areas. The cross section varies along the route but the standard distributor road carriageway typically consists of 2 traffic lanes with a footpath on either side. A cycle lane is also provided on both sides of the road along some sections. The section of Rathbeale Road used by this route option has a narrow footpath on one side of the road only.

There are a total of 5 junctions along this route option, all of which would likely require upgrading to facilitate Swiftway priority measures.

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

- A significant amount of land-take (public and private) would be required to provide physical Swiftway priority along the route option;

- There would be a need to upgrade the Castlegrange Road/R132 junction to a traffic signal controlled junction to facilitate Swiftway priority particularly for Swiftway vehicles turning right out of Castlegrange Road;
- There would be a need to widen/replace the existing culvert/bridge along Castlegrange Road between the R132 and Balheary Road to facilitate Swiftway priority in both directions;
- There would possibly be a requirement to close Jugback Lane to traffic;
- The Glen Ellan Road/Applewood Main Street and Glen Ellan Road/ Ashton Distributor Road roundabouts would need to be upgraded to traffic signal controlled junctions to facilitate Swiftway priority and the safe movement of Swiftway vehicles. The Murrough Road/Rathbeale Road junction would also need to be upgraded to a traffic signal controlled junction;
- The Oldtown/Mooretown LAP proposes that the Rathbeale Road within the LAP lands would consist of a 6.5m carriageway with no provision for bus lanes. It would therefore be necessary to change the road cross section to facilitate Swiftway vehicle priority; and
- There is potential for the route option to be extended to Mooretown town centre when the lands are developed.

6.3.5 Route Option PG1: Pine Grove with Oldtown Terminus

Route option PG1, is presented in **Figure 6.7**.

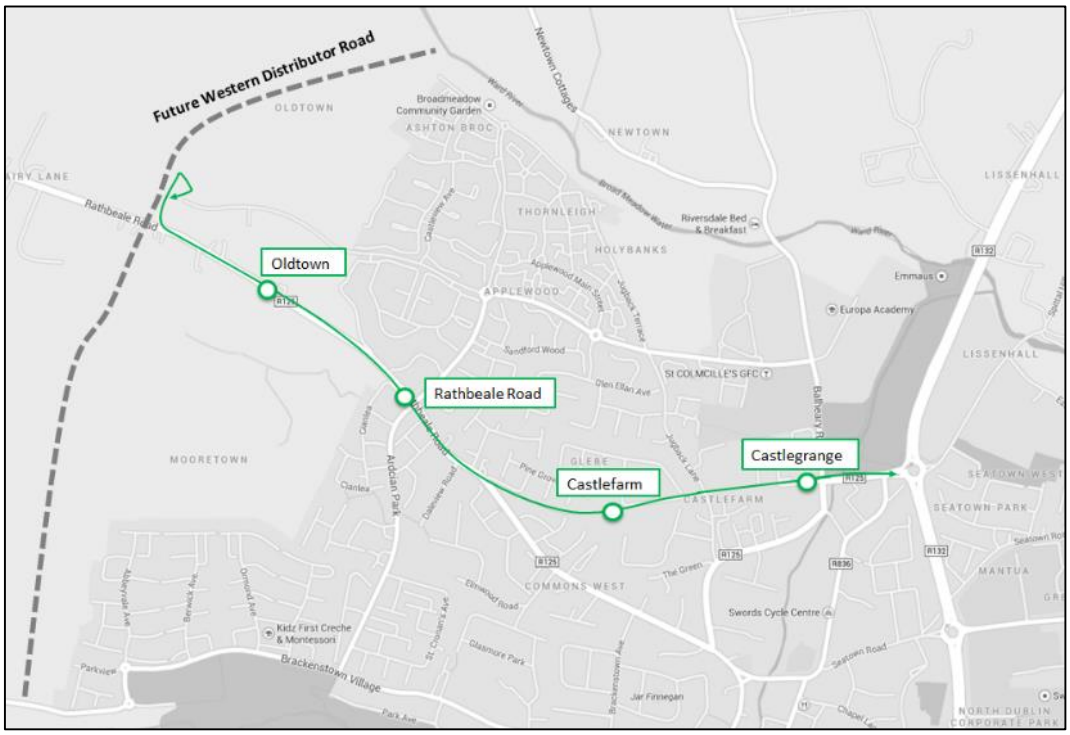

Figure 6.7: Route Option PG1 Pine Grove with Oldtown Terminus

Northbound: This route option would see Swiftway vehicles travel along Castlegrange Road, Castlegrange Green, a new 'Swiftway-only' link joining Castlegrange Green to Broadmeadow Road, onto Broadmeadow Road, a new 'Swiftway-only' link joining Broadmeadow Road to Pine Grove Park, onto Pine

Grove Park and Rathbeale Road. This route option would terminate on the Glen Ellan Road Extension in Oldtown.

Southbound: Southbound, Swiftway vehicles would travel the same route as taken by northbound vehicles.

Stops: A total of 4 stops would most likely be provided along this route option to maximise the residential catchment area served by the Swiftway service. These would be located at Castlegrange, Castlefarm, Rathbeale Road and Oldtown.

The journey time for this route option from the Estuary junction to the route terminus is 6-7 minutes over a distance of approximately 2.6 km.

Castlegrange Green is a traffic calmed road providing access to the Castlegrange residential development with a wide green verge on the northern side of the road. There is currently no vehicular connection between Castlegrange Green and Broadmeadow Road. There is, however, a green strip including a pedestrian footpath to the north of the Fingal County Council Water Service facility which links these two roads and is currently open to pedestrians only. This route option would see the provision of a new 'Swiftway-only' link constructed through this area.

Broadmeadow Road is a residential road providing access to the Broadmeadow residential area. There are a small number of houses which are directly accessed off Broadmeadow Road and on-street parking is occasionally observed outside these properties.

There is currently a green located between Broadmeadow Road and Pine Grove Park. This route option would introduce a 'Swiftway-only' link through this green bringing the Swiftway service through to Rathbeale Road. The treatment of these 'Swiftway-only' links, its impact on the public open space and pedestrian connectivity from surrounding residential estates would require detailed, sensitive consideration as part of any scheme design for this route option.

There are a total of 4 junctions along this route option which are all likely to require upgrading to facilitate bus priority measures.

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

- A significant amount of land-take (public and private) would be required to provide physical Swiftway priority along the route option;
- There would be a need to reconstruct/widen the existing culvert/bridge along the Castlegrange Road between the R132 and Balheary Road to facilitate Swiftway priority in both directions;
- There would be a need to upgrade the Castlegrange Road/R132 junction to a traffic signal controlled junction to facilitate Swiftway priority particularly for Swiftway vehicles turning right out of Castlegrange Road;
- There would be a need to convert the existing green strip between Castlegrange Green and Broadmeadow Road to a two-way 'Swiftway-only' road link;
- There would be a need to introduce a two-way 'Swiftway-only' link through the existing green between Broadmeadow Road and Pine Grove Park. Should

this route option be adopted, there may be an opportunity to create a more vibrant public space and amenity facilities centred on the Swiftway stop at this location;

- During the Swiftway public consultation in February 2014, local residents voiced concerns over routing through Pine Grove Park on grounds that it would have a negative impact on the quality of life for the nearby residents and reduce the amenity value of the green;
- There would be a need to upgrade Pine Grove Park/Rathbeale Road junction to a traffic signal controlled junction;
- The Oldtown/Mooretown LAP proposes that the Rathbeale Road within the LAP lands would consist of a 6.5 m carriageway with no provision for bus lanes. It would therefore be necessary to change the road cross section to facilitate Swiftway vehicle priority; and
- There is potential for the route option to be extended to Mooretown town centre when the lands are developed.

6.3.6 Route Option PG2: Pine Grove with Brackenstown Terminus

Route option PG2, is presented in **Figure 6.8**.

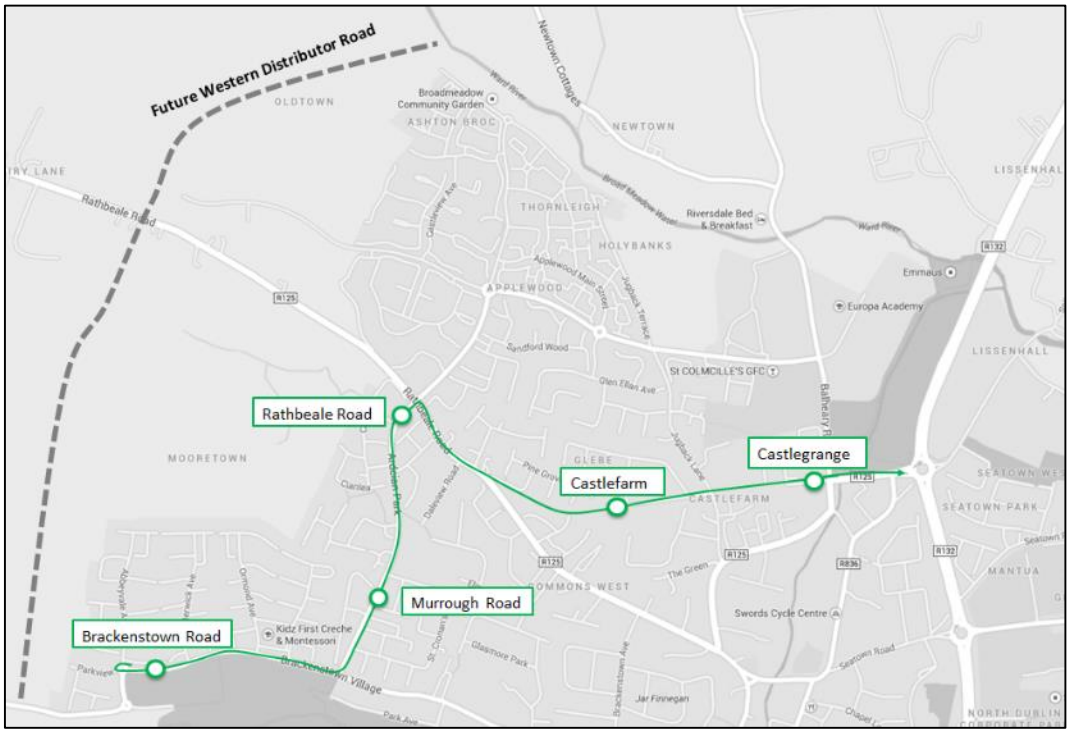

Figure 6.8: Route Option PG2 Pine Grove with Brackenstown Terminus

Northbound: This route option would see Swiftway vehicles travel along Castlegrange Road, Castlegrange Green, a new 'Swiftway-only' link joining Castlegrange Green to Broadmeadow Road, onto Broadmeadow Road, a new 'Swiftway-only' link joining Broadmeadow Road to Pine Grove Park, onto Pine Grove Park, Rathbeale Road and Murrough Road. This route option would terminate on Brackenstown Road.

Southbound: Southbound, Swiftway vehicles would travel the same route as taken by northbound vehicles.

Stops: A total of 5 stops would most likely be provided along this route option to maximise the residential catchment area served by the Swiftway service. These would be located at Castlegrange, Castlefarm, Rathbeale Road, Murrough Road and Brackenstown Road.

The journey time for this route option from the Estuary junction to the route terminus is 7-8 minutes over a distance of approximately 3.2 km.

Castlegrange Green is a traffic calmed road providing access to the Castlegrange residential development with a wide green verge on the northern side of the road. There is currently no vehicular connection between Castlegrange Green and Broadmeadow Road. There is, however, a green strip including a pedestrian footpath to the north of the Fingal County Council Water Service facility which links these two roads and is currently open to pedestrians only. This route option would see the provision of a new 'Swiftway-only' link constructed through this area.

Broadmeadow Road is a residential road providing access to the Broadmeadow residential area. There are a small number of houses which are directly accessed off Broadmeadow Road and on-street parking is occasionally observed outside these properties.

There is currently a green located between Broadmeadow Road and Pine Grove Park. This route option would introduce a 'Swiftway-only' link through this green bringing the Swiftway service through to Rathbeale Road. The treatment of these 'Swiftway-only' links, its impact on the public open space and pedestrian connectivity from surrounding residential estates would require detailed, sensitive consideration as part of any scheme design for this route option.

From Rathbeale Road, Swiftway vehicles would use Murrough Road and Brackenstown Road. Both of these roads consist of a two-lane carriageway with one traffic lane and an on-road cycle lane provided in each direction. Footpaths are provided on both sides of the carriageway and are separated from the road by a green verge.

There are a total of 5 junctions along the route option which are all likely to require upgrading to facilitate bus priority measures.

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

- There would be a need to reconstruct/widen the existing culvert/bridge along Castlegrange Road between the R132 and Balheary Road to facilitate Swiftway priority in both directions;
- There would be a need to upgrade the Castlegrange Road/R132 junction to a traffic signal controlled junction to facilitate Swiftway priority particularly for Swiftway vehicles turning right out of Castlegrange Road;
- There would be a need to convert the existing green strip between Castlegrange Green and Broadmeadow Road to a two-way 'Swiftway-only' road link;

- There would be a need to introduce a two-way 'Swiftway-only' link through the existing green between Broadmeadow Road and Pine Grove Park. Should this route option be adopted, there may be an opportunity to create a more vibrant public space and amenity facilities centred on the Swiftway stop at this location;
- During the Swiftway public consultation in February 2014, local residents voiced concerns over routing through Pine Grove Park on grounds that it would have a negative impact on the quality of life for the nearby residents and reduce the amenity value of the green;
- There would be a need to upgrade Pine Grove Park/Rathbeale Road and the Brackenstown Road/Murrough Road junctions to traffic signal controlled junctions; and
- There would be a need to rationalise existing bus services as they would closely match part of this Swiftway route option.

6.3.7 Route Option PG3: Pine Grove and Glen Ellan Road with Oldtown Terminus

Route option PG3, is presented in **Figure 6.9**.

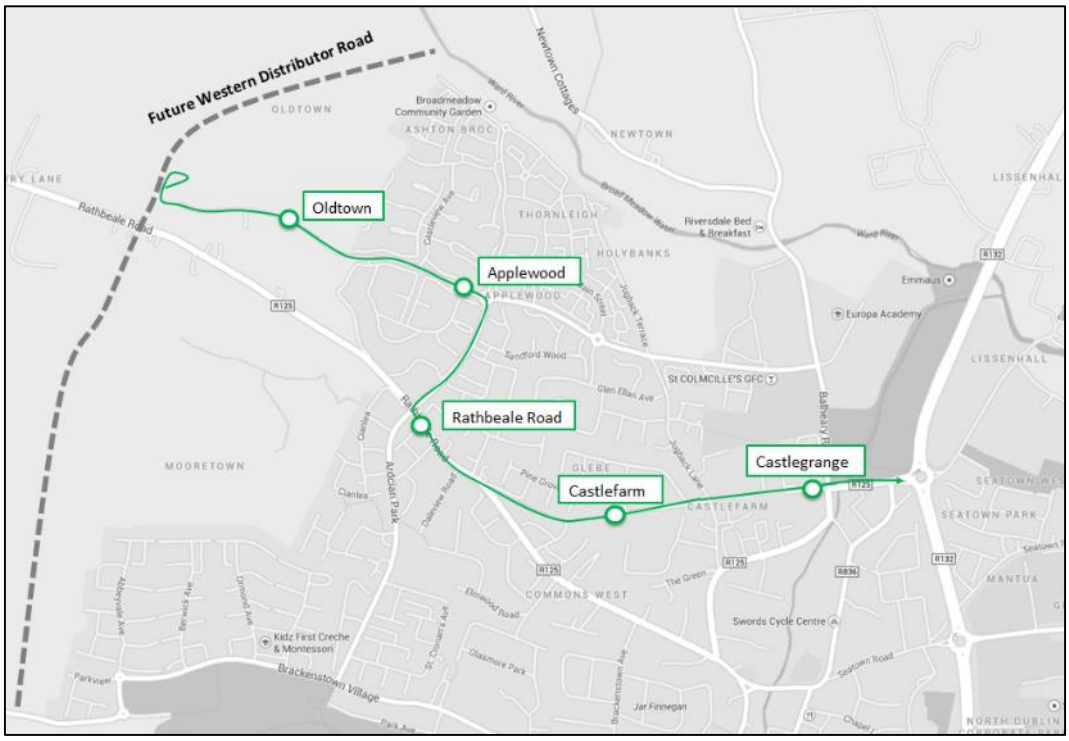

Figure 6.9: Route Option PG3 Pine Grove and Glen Ellan Road with Oldtown Terminus

Northbound: This route option would see Swiftway vehicles travel along Castlegrange Road, Castlegrange Green, a new 'Swiftway-only' link joining Castlegrange Green to Broadmeadow Road, Broadmeadow Road, a new 'Swiftway-only' link joining Broadmeadow Road to Pine Grove Park, Pine Grove Park, Rathbeale Road, Glen Ellan Road and Glen Ellan Road Extension. This route option would terminate on the Glen Ellan Road Extension in Oldtown.

Southbound: Southbound, Swiftway vehicles would travel the same route as taken by northbound vehicles.

Stops: A total of 5 stops would most likely be provided along this route to maximise the residential catchment area served by the Swiftway. These would be located at Castlegrange, Castlefarm, Rathbeale Road, Applewood and Oldtown.

The journey time for this route option from the Estuary junction to the route terminus is 7-8 minutes over a distance of approximately 3.1 km.

Castlegrange Green is a traffic calmed road providing access to the Castlegrange residential development with a wide green verge on the northern side of the road. There is currently no vehicular connection between Castlegrange Green and Broadmeadow Road. There is, however, a green strip including a pedestrian footpath to the north of the Fingal County Council Water Service facility which links these two roads and is currently open to pedestrians only. This route option would see the provision of a new 'Swiftway-only' link constructed through this area.

Broadmeadow Road is a residential road providing access to the Broadmeadow residential area. There are a small number of houses which are directly accessed off Broadmeadow Road and on-street parking is occasionally observed outside these properties.

There is currently a green located between Broadmeadow Road and Pine Grove Park. This route option would introduce a 'Swiftway-only' link through this green bringing the Swiftway service through to Rathbeale Road. The treatment of these 'Swiftway-only' links, its impact on the public open space and pedestrian connectivity from surrounding residential estates would require detailed, sensitive consideration as part of any scheme design for this route option.

From Rathbeale Road, Swiftway vehicles would use Glen Ellan Road and Glen Ellan Extension Road. Both of these roads consist of a two-lane carriageway with one traffic lane provided in each direction. Footpaths are provided on both sides of the carriageway and are separated from the road by a green verge.

There are a total of 5 junctions along the route which are all likely to require upgrading to facilitate bus priority measures.

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

- There would be a need to reconstruct/widen the existing culvert/bridge along Castlegrange Road between the R132 and Balheary Road to facilitate Swiftway priority in both directions;
- There would be a need to upgrade the Castlegrange Road/R132 junction to a traffic signal controlled junction to facilitate Swiftway priority particularly for Swiftway vehicles turning right out of Castlegrange Road;
- There would be a need to convert the existing green strip between Castlegrange Green and Broadmeadow Road to a two-way 'Swiftway-only' road link;
- There would be a need to introduce a two-way 'Swiftway-only' link through the green between Broadmeadow Road and Pine Grove Park. Should this route option be adopted, there may be an opportunity to create a more vibrant

public space and amenity facilities centred on the Swiftway stop at this location;

- During the Swiftway public consultation in February 2014, local residents voiced concerns over routing through Pine Grove Park on grounds that it would have a negative impact on the quality of life for the nearby residents and reduce the amenity value of the green;
- There would be a need to upgrade Pine Grove Park/Rathbeale Road and the Glen Ellan Road/Ashton Distributor Road junction to traffic signal controlled junctions; and
- The Oldtown/Mooretown LAP proposes that the recently constructed Glen Ellan Road Extension (from the eastern boundary of the LAP lands) consist of a 6.5 m carriageway with no provision for bus lanes. To provide Swiftway priority to the proposed terminus location it would be necessary to widen the road carriageway. This may have an impact on extant planning permissions in the area.

6.3.8 Stage 2 Route Options Assessment

The 'Stage 2' route options assessment summary tables for the North-west Swords area are presented in **Appendix A1 and A2**.

The relative ranking of route options against the scheme assessment sub-criteria is summarised in **Table 6.2.**

Table 6.2: North-West Swords Route Options Assessment Summary (Sub-Criteria)

Assessment Criteria	Assessment Sub-Criteria	GE1	GE2	GE3	PG1	PG2	PG3
Economy	Capital Cost						
	Operation and Maintenance Cost						
	Transport Reliability and Quality of Service						
Integration	Land Use Integration						
	Residential Population and Employment Catchments						
	Transport Network Integration						
	Cycling Integration						
Accessibility & Social Inclusion	Key Trip Attractors						
	Deprived Geographic Areas						
Safety	Road Safety						
	Pedestrian Safety						
Environment	Archaeology and Cultural Heritage						
	Architectural Heritage						
	Flora and Fauna						
	Soils and Geology						
	Hydrology						
	Landscape and Visual						
	Air Quality						
	Noise & Vibration						
	Land Use Character						

In terms of 'Economy', a primary differentiator between route options is the operation and maintenance costs of route options which is linked to route length. Shorter route options such as route options GE1 and PG1 are therefore more attractive. Capital cost is also linked to route lengths and the complexity of works required to provide priority. Route options GE2 and PG1 are higher compared to other options considered, largely due to the quantity of private land-take required. In terms of transport reliability and quality of service, route option GE2 is less attractive than other options through a combination of overall length and the extent to which priority can practically be delivered on the route.

In terms of 'Integration', the primary driver is residential catchments which would be served by the route. Route options along Glen Ellen Road serve larger catchments in closer proximity than routes through Pine Grove Park. While route options GE2 and PG2 that extend further into the southwest may serve higher existing residential populations, they do however miss out on what is a large developing residential community in Oldtown and are already well serviced by existing bus services.

There is relatively little to differentiate between route options in this section of the study area under the 'Accessibility and Social Inclusion' criterion.

Similarly, under 'Safety' there is relatively little to differentiate, with route options having a requirement for more turning movements through junctions considered to be slightly less advantageous. Route options GE1 and PG1 therefore rank slightly higher as they are more direct routes.

In terms of 'Environment', route options which route through the open space at Pine Grove are generally considered to be less attractive in terms of potential for environmental impacts, to varying degrees, for example, landscape and visual and flora and fauna. Route options PG1 and GE3, which extend along Rathbeale Road are considered to have the potential for greater impact given that road widening for priority has the potential to impact on a site of archaeological merit.

A summary of the assessment and relative ranking of route options against the five main assessment criteria is presented in **Table 6.3**.

Table 6.3: North-West Swords Route Options Assessment Summary (Main Criteria)

Assessment Criteria	GE1	GE2	GE3	PG1	PG2	PG3
Economy						
Integration						
Accessibility & Social Inclusion						
Safety						
Environment						

Based on the assessment undertaken, route option GE1 appears to offer more benefits over other options. Route option **GE1** is therefore preferred for the North-west Swords area for the following reasons:

- It has a comparatively low Capital Cost and Operation and Maintenance cost;
- It serves large residential catchments (both existing and developing);
- It has low and reliable journey times (6-7 minutes);
- It has a moderate extent of private land-take – predominantly required from common areas within residential developments;
- It is consistent with, and would deliver part of the GDA cycle network;
- It has a lower landscape and visual impact when compared to other routes and is primarily delivered along an on an established road corridor currently trafficked by buses;
- It has lower impact on flora and fauna, air quality and noise and vibration; and
- It has a lower impact on land-use character, particularly public amenity, compared to the Pine Grove route options.

In selecting route option GE1 as the preferred route option, it effectively deviates locally from the Emerging Preferred Route indicated previously at the Swiftway Network Launch (February 2014), which followed the initial section of route option PG1. Based on the completed route options assessment process presented in this report, however it is considered appropriate to do so for the preceding reasons and conclusions outlined.

Based on the multi-criteria assessment undertaken for this section of the study area, **route option GE1 is identified as the preferred route option for North-west Swords** and as such this route option is taken forward for consideration in the transport assessment in Section 10**.**

Route option PG3 is identified as the next best, offering an alternative connection to the terminus location in Oldtown and has therefore also been carried forward for further comparison in the transport assessment in Section 10.

6.4 Stage 2: Swords Central Route Options Assessment

6.4.1 Introduction

Following the Stage 1 sift for Swords town centre, two route options were passed to the Stage 2 assessment:

- A route option via Swords Main Street; and
- A route option via the R132 Swords bypass.

6.4.2 Route Option SW16: Swords Main Street

Route option SW16, through Swords town centre, is presented in **Figure 6.10**.

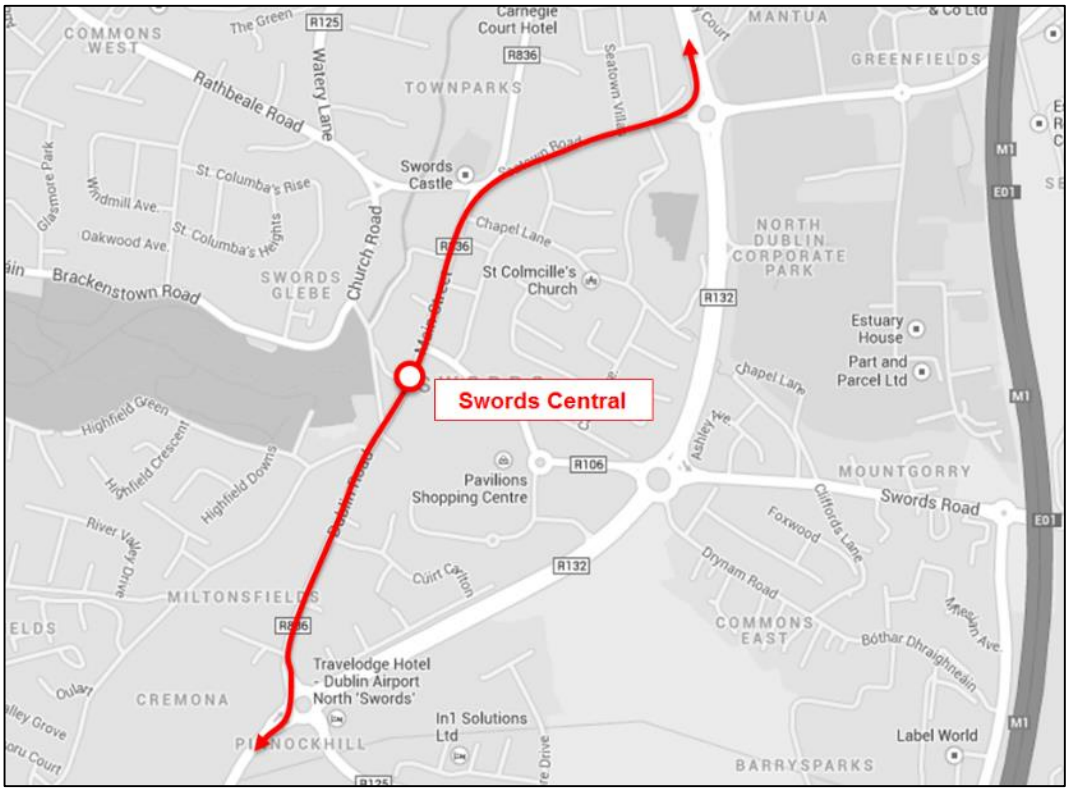

Figure 6.10: Route Option SW16 Swords Main Street

Northbound: North of Pinnock Hill Roundabout, Swiftway vehicles would divert off the R132 onto the R836 Dublin Road and through Swords town centre. The Swiftway service would travel along Main Street before turning onto Seatown Road. The Swiftway vehicles would join the R132 again at Seatown Roundabout.

Southbound: The Swiftway vehicles would turn right from the R132 at the Seatown roundabout and onto Seatown Road before continuing towards Swords town centre turning onto Main Street. It would continue along Dublin Road before re-joining the R132 at Pinnock Hill Roundabout.

Stops: There would be one Swiftway stop in Swords town centre (Swords Central) for this route option.

The journey time for this route option from the Pinnock Hill junction to the Seatown junction is 4-5 minutes over a distance of approximately 1.7 km.

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

- There is restricted road width through Swords Main Street for two-way BRT lane provision;
- There is restricted road width along Seatown Road;
- Significant land acquisition would likely be required on Main Street and Seatown Road to accommodate an acceptable level of continuous Swiftway priority;
- The removal of car parking along Main Street would be required;

- A reduction in pedestrian space would likely be necessary, with associated impact on the Swords town centre environs;
- The introduction of Swiftway on Swords Main Street may necessitate implementation of a wider Swords traffic management plan (e.g. the possibility of making Main Street one-way to facilitate better pedestrian and public transport environment and to minimise land-take/property acquisition requirements);
- The rationalisation of existing bus services routed along Swords Main Street; and
- The availability of space to accommodate cycling Route 2A along Swords Main Street in addition to BRT lanes.

6.4.3 Route Option SW17: R132 Swords Bypass

Route option SW17 along the R132 Swords bypass to the east of Swords town centre is presented in **Figure 6.11**.

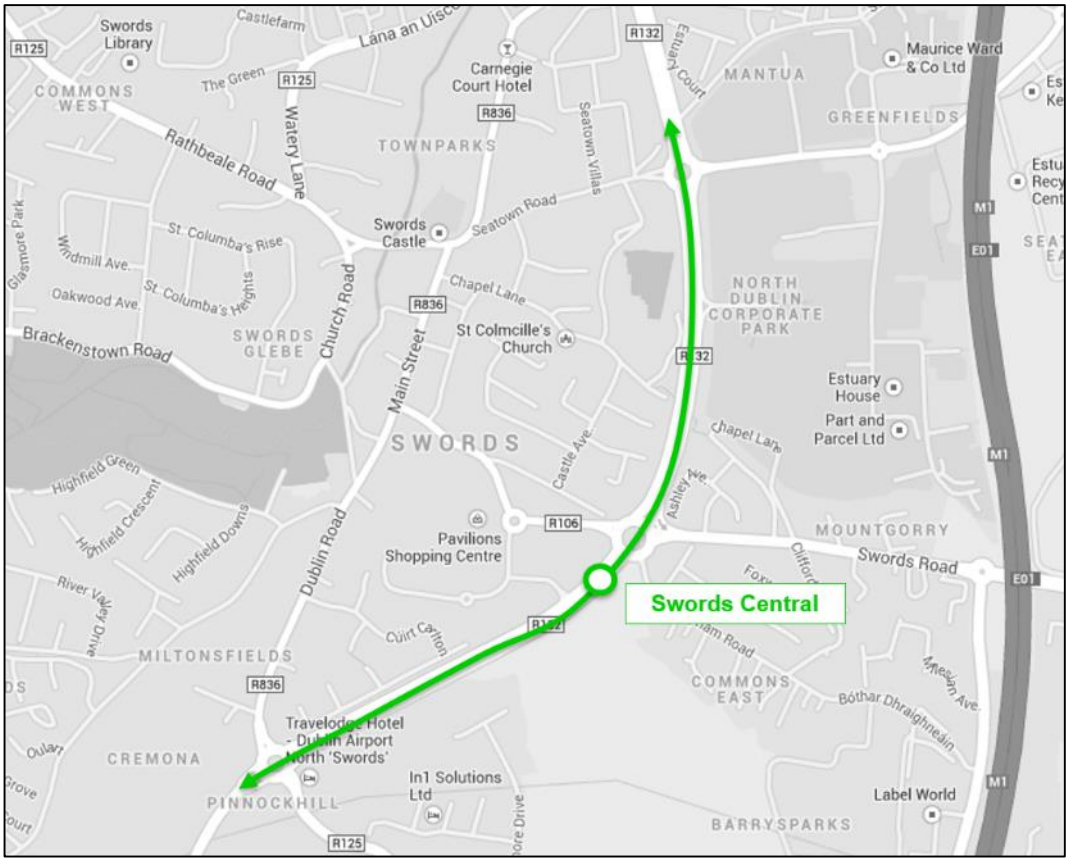

Figure 6.11: Route Option SW17 R132 Swords Bypass

Northbound: North of the R132 Pinnock Hill Roundabout, Swiftway service would stay on the R132 by-passing Swords town centre (Main Street).

It is likely that with this route option, Pinnock Hill, Malahide Road and Seatown roundabouts would be upgraded to traffic signal controlled junctions to facilitate improved traffic management, cycle/pedestrian facilities and provide Swiftway priority through the junctions.

Southbound: South of the R132 Seatown Roundabout, the Swiftway service would continue along the R132 by-passing the current Swords town centre area (Main Street).

Stops: There would be one Swiftway stop adjacent to the Swords Pavilions Shopping Centre (Swords Central) for this route option.

The journey time for this route option from the Pinnock Hill junction to the Seatown junction is 3-4 minutes over a distance of approximately 1.7 km.

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

- The on-line R132 stop adjacent to the Swords Pavilions needs to take cognisance of existing road and access layouts, extant planning permissions for the Metro North scheme, the Swords Pavilions Shopping Centre development and the Swords Town Centre Masterplan proposals for lands to the east and west of the R132 at this location (including the Barrysparks LAP);
- The connectivity across the R132 for pedestrians at a potential Swords Central Stop is currently limited (an existing pedestrian overbridge is available however to the south of Malahide Road roundabout junction) and would need to be facilitated as part of a signalised upgrade to the R132 Malahide Road Roundabout. This would also facilitate improved Swiftway priority through the junction;
- The Pinnock Hill Roundabout would need to be upgraded to a traffic signal controlled junction to provide Swiftway priority and facilitate safe pedestrian and cyclist movements across the junction;
- Cycle facilities (Route 2A) extending northwards along the R132 would be routed via Dublin Road and Swords Main Street in accordance with the cycle network adopted as part of the GDA Cycle Network. From Pinnock Hill junction northwards, Cycle Route 2A would depart from this route option and travels along Dublin Road/Swords Main Street;
- The introduction of the Swiftway system would likely result in a rationalisation of bus services in the Swords area. The proposed Swiftway stop on the R132 could be an attractive interchange location with local and regional scheduled bus services; and
- The availability of frontage along R132 may be constrained by extant planning permissions for development access and Metro. However, the flexibility of the Swiftway concept enables the provision of a Swiftway stop which can adapt to future development needs and any variant land-use and transport planning requirements. Similar connectivity issues are observed at Seatown and Estuary roundabouts.

6.4.4 Route Options Assessment

The Stage 2 route options assessment summary table for the Central Swords route options is presented in **Appendix A3**.

The relative ranking of route options against the scheme assessment sub-criteria is summarised in **Table 6.4.**

Table 6.4: Swords Central Route Options Assessment Summary (Sub-Criteria)

Assessment Criteria	Assessment Sub-Criteria	SW16	SW17
Economy	Capital Cost		
	Operation and Maintenance Cost		
	Transport Reliability and Quality of Service		
Integration	Land Use Integration		
	Residential Population and Employment Catchments		
	Transport Network Integration		
	Cycling Integration		
Accessibility & Social Inclusion	Key Trip Attractors		
	Deprived Geographic Areas		
Safety	Road Safety		
	Pedestrian Safety		
Environment	Archaeology and Cultural Heritage		
	Architectural Heritage		
	Flora and Fauna		
	Soils and Geology		
	Hydrology		
	Landscape and Visual		
	Air Quality		
	Noise & Vibration		
	Land Use Character		

In terms of 'Economy', a differentiator between route options is the capital cost. Route option SW16 would cost considerably more than route option SW17, largely due to the quantity of private land-take required. In terms of transport reliability and quality of service, route option SW17 is more attractive than route option SW16 due to a combination of the number of junctions and the extent to which priority can practically be delivered on the route.

In terms of 'Integration', route option SW16 serves larger catchments in closer proximity than route option SW17. However, route option SW17 has the potential to encourage future development in the Barrysparks LAP lands, better serves a major existing trip attractor, Pavilions Shopping Centre, and therefore ranks higher under land use integration. Notwithstanding this, on balance, route option SW16 is considered to rank slightly higher than route option SW17 under the 'Integration' criterion, although the relative differences are marginal.

There is relatively little to differentiate between route options in this section of the study area under the 'Accessibility and Social Inclusion' criterion.

Under 'Safety', route option SW17 is considered to rank higher as it is a more direct route option with no turning movements required.

In terms of 'Environment', route option SW16 through Swords town centre is generally considered to be less attractive in terms of potential for environmental impacts, such as impact on landscape and visual, archaeology and cultural heritage, architectural heritage, and flora and fauna.

A summary of the assessment and relative ranking of route options against the five main assessment criteria is presented in **Table 6.5**.

Table 6.5: Swords Central Route Options Assessment Summary (Main Criteria)

Assessment Criteria	SW16	SW17
Economy		
Integration		
Accessibility & Social Inclusion		
Safety		
Environment		

Based on the assessment undertaken, it is apparent that route option **SW17**, which would route the Swiftway along the R132, extending northwards beyond Swords town centre, offers the most practical, deliverable route option for the following reasons:

- The lower capital cost compared to town centre route;
- Avoids impacting on significant property numbers which reduces planning risk, scheme costs and construction disruption;
- The likelihood of being able to deliver considerably shorter overall Swiftway route journey times and assurances on Swiftway service journey time reliability when compared to the Swords Main Street option;
- Relatively minor private land-take required;
- The assessment shows that the overall catchment within a 10 minute walk of stops would reduce only slightly when compared to if the Swiftway service was to run through Swords town centre. However, through the rationalisation of bus routes and provision of local connecting bus services, the overall public transport catchment could be increased;
- The retention of the Swiftway service on the R132 corridor would also be consistent with serving future proposed land-use planning objectives, including the expansion of Swords eastwards, centred on an envisaged R132 'transport node' south of Malahide Road roundabout. The Swiftway service can serve to act as a catalyst to encourage development along the route in the short to medium term; and
- Less environmental impacts.

Based on the detailed assessment undertaken, route option SW16 is not considered to be a feasible option and as such, **only route option SW17 is taken forward for consideration in the transport assessment** in Section 10.

7 Dublin Airport

7.1 Introduction

A key objective of the proposed scheme is to provide improved public transport connectivity to Dublin Airport.

In addition to airport passenger travel demand, the airport also comprises multiple employment generators including:

- Airport operations – employees tend to be shift workers with arrival and departure profiles outside of normal peak commuter periods (e.g. early starting times commensurate with peak passenger departure times); and
- Airport administration and other commercial operations – employees tend to have typical commuter arrival and departure profiles. In addition to existing demand, lands to the east of the existing airport terminals are zoned for office and employment and are likely to be developed with increased density over time.

Routing the Swiftway service directly through the airport presents a number of challenges however:

- It would result in a journey time penalty for passengers travelling from Swords to the City Centre as a result of the longer distance travelled. This in turn may impact upon patronage from potential passengers north of the airport; and
- The correct location for a Swiftway stop or stops within the airport needs careful consideration given that two terminals (T1 & T2) and numerous other public transport facilities exist within the airport.

7.2 Airport Travel Demand

The transport demand profile at the airport is significantly different to the transport demand profiles in other areas in Dublin. In most areas the transport demand profile is dominated by workers and students arriving to their places of work, school or education in the morning period and arriving back to their residences in the evening period. This profile accounts for the morning and evening peak traffic and public transport trips that are seen throughout the transport network. However at the airport the profile of transport demand is dominated by passenger arrivals and departures, which do not always correspond with morning and evening peak traffic volumes. An estimate of the demand profile was developed based on flight schedules. **Figure 7.1** outlines the estimated transport demand profile at Dublin Airport. The profile generated accounts for wait times between flight departure and time of arrival at the airport by estimating the average time of arrival at the airport prior to flight departure.

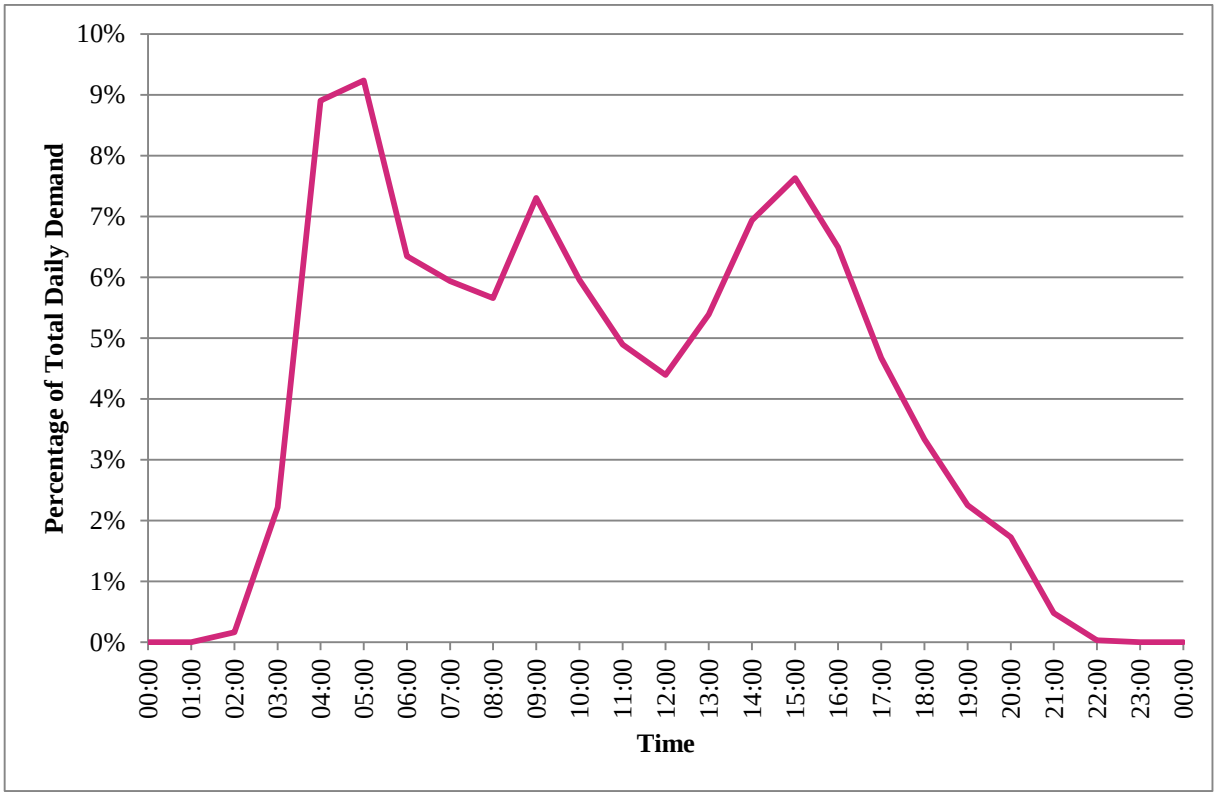

Figure 7.1: Transport Demand Time Profile at Dublin Airport

From **Figure 7.1** we can see that there are three peak periods for passenger arrivals at Dublin Airport, the largest peak is seen between 04:00 to 06:00, with smaller peaks identified from 09:00 to 10:00 and 14:00 to 16:00 respectively.

7.3 Service Options

In order to provide a Swiftway service to the airport, a total of three service options were considered;

- Service Option 1 – Bypass option with the Swiftway service remaining on the R132, with an associated Airport stop;
- Service Option 2 – Swiftway services are routed through the airport;
- Service Option 3 – A split service is provided whereby a separate Swiftway service is provided connecting to the City Centre which starts and terminates at the Airport. This service would be provided in addition to a bypass Swiftway service remaining on the R132 to Swords.

7.4 Airport Route Options

Route options which would potentially facilitate potential airport Swiftway service options were identified and assessed.

7.4.1 Route Option DA0 (Service Option 1)

This route option is presented in **Figure 7.2**.

The route option would remain on the R132 and not enter the airport campus.

A single stop in each direction would be provided along the R132 adjacent to the Airport Business Park access road. A BRT lane would be provided in each direction along the R132.

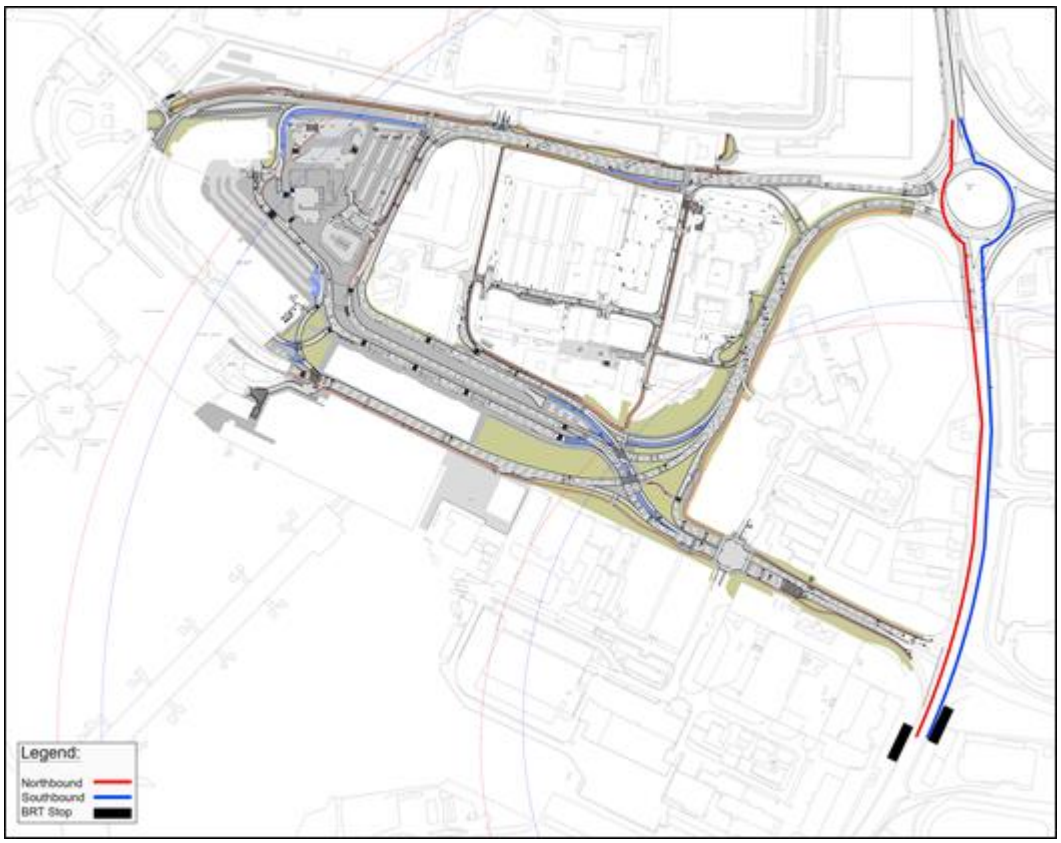

Figure 7.2: Route Option DA0

7.4.2 Route Option DA1 (Service Option 2, 3 as a variant)

This route option is presented in **Figure 7.3**.

Northbound, route option DA1 would enter the airport campus on Corballis Road South, travelling on existing road infrastructure as far as the East Link Road junction. A new link would be required connecting to Corballis Avenue where the northbound Swiftway stop would be located. Dedicated BRT lanes are unlikely to be possible along Corballis Avenue. Northbound Swiftway vehicles would exit onto the R132 via Corballis Road North.

Southbound, Swiftway vehicles would enter via the Airport Roundabout onto Corballis Road North and East Link Road where the southbound Swiftway stop would be located. Swiftway vehicles would exit to the R132 via Corballis Road South.

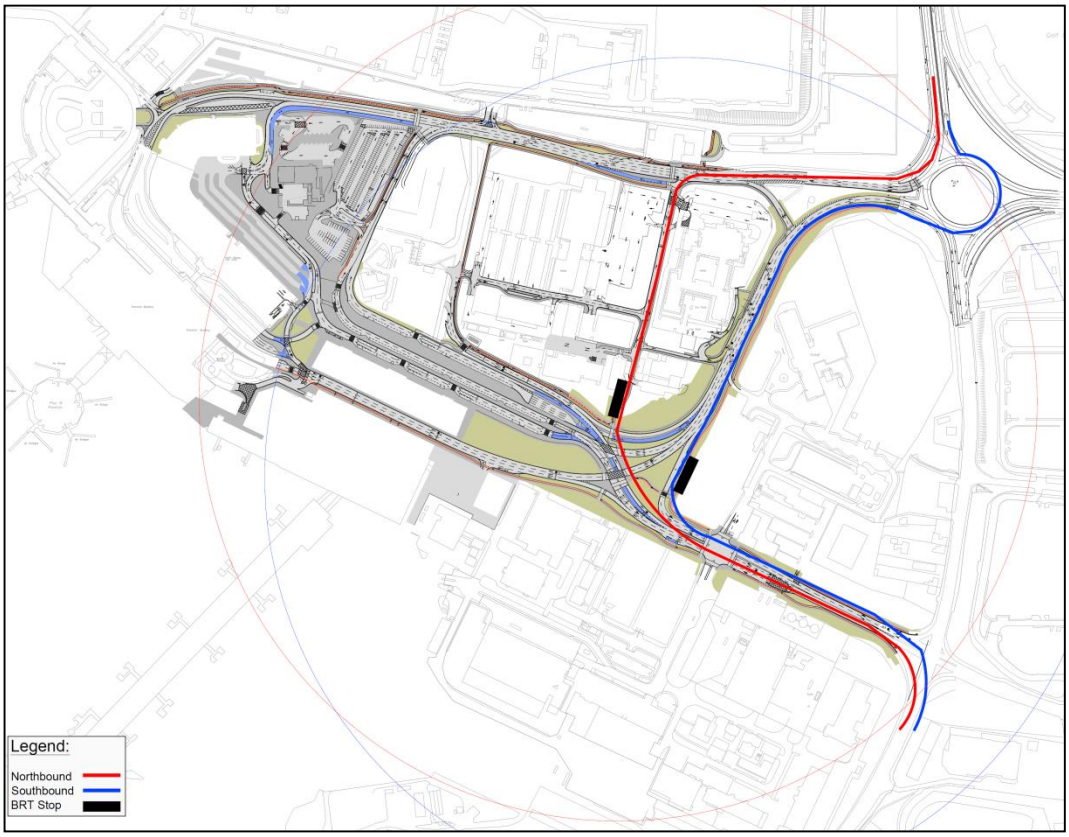

Figure 7.3: Route Option DA1

7.4.3 Route Option DA2 (Service Option 2)

This route option is presented in **Figure 7.4**.

This route option would provide for a two-way Swiftway service through the airport campus with both northbound and southbound vehicles following the same route.

Northbound Swiftway vehicles would enter onto Corballis Road South. After travelling through the East Link Road junction, vehicles would pass onto the Terminal 2 (T2) Parking Road and Old West Link Road where a new 'Swiftway-only' access would be created onto Corballis Road North. Swiftway vehicles would travel across Corballis Road North onto Castlemoate Road re-joining the R132 at Cloghran Roundabout.

A number of options could be explored to connect back to the R132 including via the Naul Road, a new junction on the R132 between the Airport Roundabout and Cloghran or a new arm at the Cloghran junction.

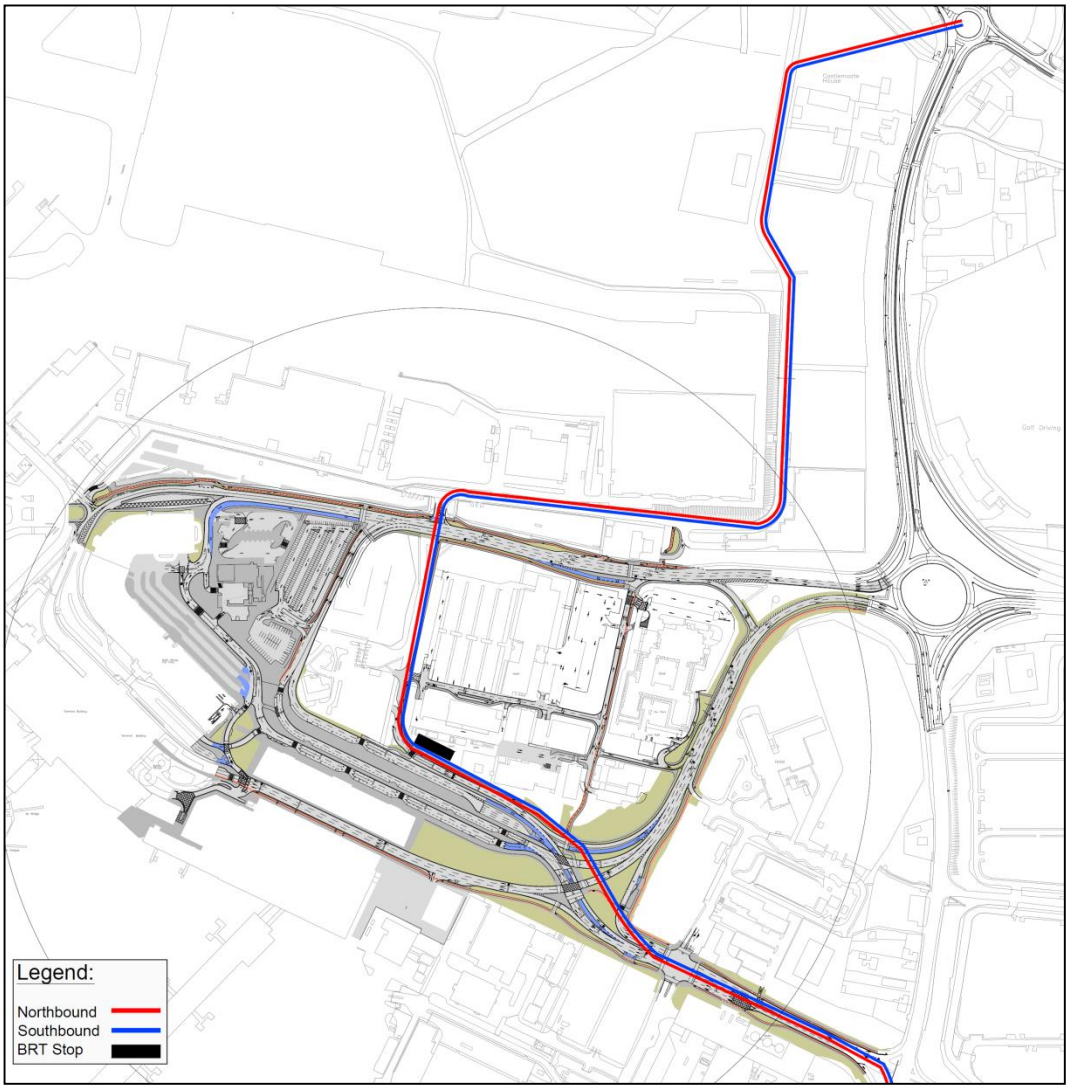

Figure 7.4: Route Option DA2

7.4.4 Route Option DA3 (Service Option 2, 3 as a variant)

This route option is presented in **Figure 7.5**.

Northbound, Swiftway vehicles would travel along Corballis Road South, the T2 Arrivals Road and the new West Link Road where the Swiftway stop could be located. A combined northbound and southbound stop would be provided adjacent to the planned 'ground transport hub' at this location. Northbound vehicles would exit onto the R132 via Corballis Road North.

Southbound, Swiftway vehicles would enter via Corballis Road North and East Link Road using T2 Arrivals Road to access the Stop on New West Link Road. From here Swiftway vehicles would exit onto the R132 using Corballis Road North, East Link Road and Corballis Road South.

This route option would most likely be accommodated on the existing road infrastructure within the airport campus (i.e. no additional bus priority measures required).

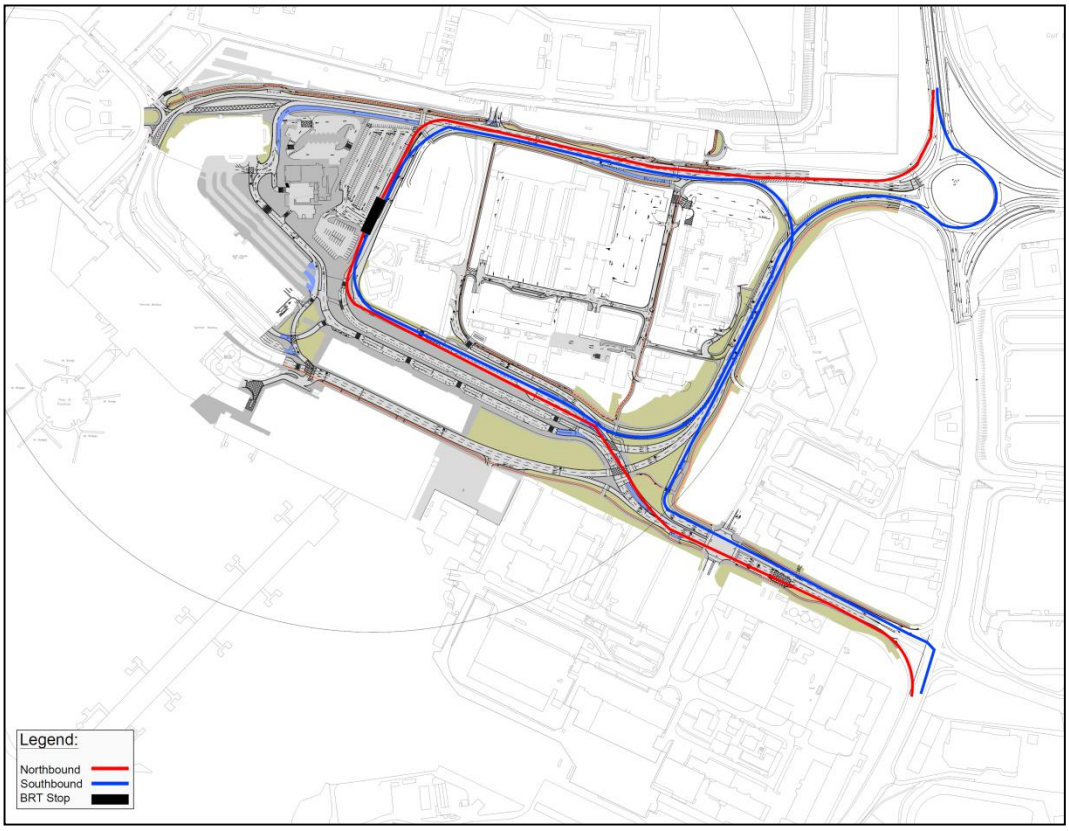

Figure 7.5: Route Option DA3

7.4.5 Route Option DA4 (Service Option 2, 3 as a variant)

This route option is presented in **Figure 7.6**.

Northbound, Swiftway vehicles would travel along Corballis Road South and Atrium Road to enter the ground transport hub. A combined northbound and southbound stop would be provided in the ground transport hub. Northbound vehicles would exit onto the R132 via Corballis Road North.

Southbound, Swiftway vehicles would enter via Corballis Road North and East Link Road using Atrium Road to access the stop in the ground transport hub. From here Swiftway vehicles would exit onto the R132 using Corballis Road North, East Link Road and Corballis Road South.

This route option would likely be accommodated on the existing road infrastructure within the Airport Campus (i.e. no additional bus priority measures).

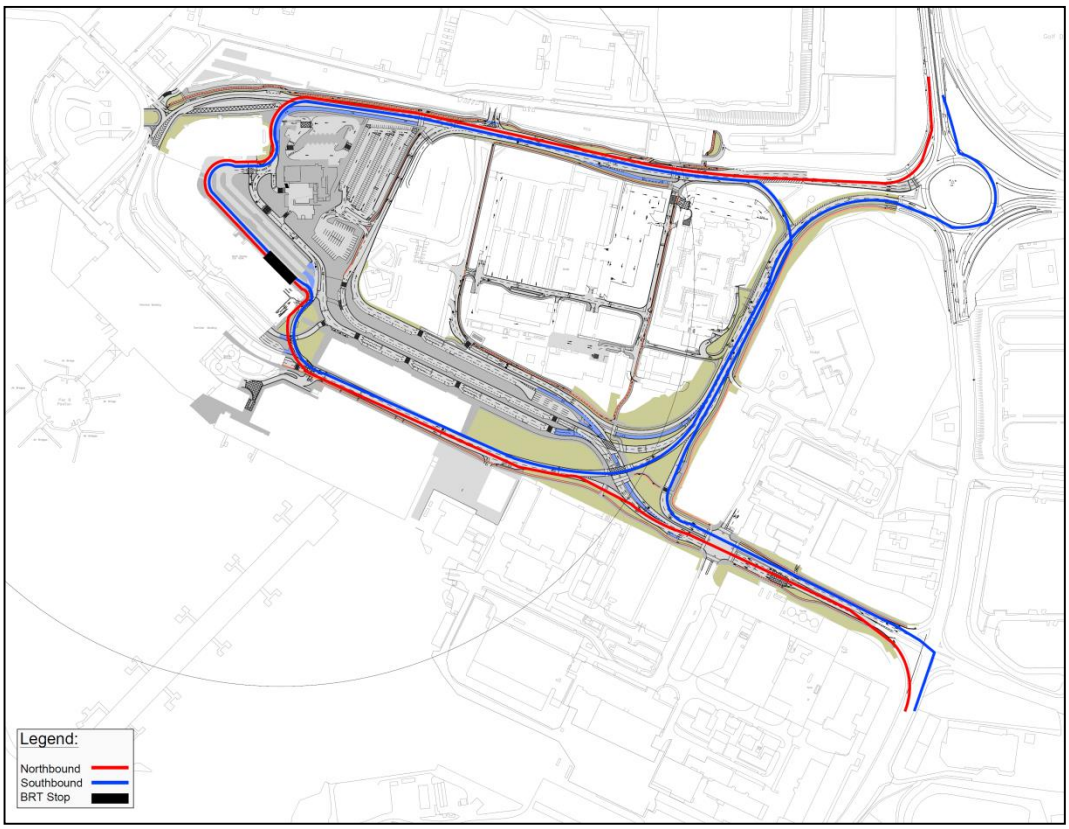

Figure 7.6: Route Option DA4

7.4.6 Route Option DA5 (Service Option 2)

This route option is presented in **Figure 7.7**.

Northbound, Swiftway vehicles would travel along Corballis Road South and T2 Premium Departures Road where the T2 Swiftway stop would be located. From here Swiftway vehicles would continue to Terminal 1 (T1) via Atrium Road and Arrivals Road where the T1 stop would be located. Northbound vehicles would exit onto the R132 via Corballis Road North.

Southbound, Swiftway vehicles would enter via Corballis Road North and East Link Road using T2 Premium Departures Road to access the T2 stop and on to the T1 stop along the same route as for northbound vehicles. From here Swiftway vehicles would exit onto the R132 using Corballis Road North, East Link Road and Corballis Road South.

This route option would likely be accommodated on the existing road infrastructure within the airport campus (i.e. no additional bus priority measures).

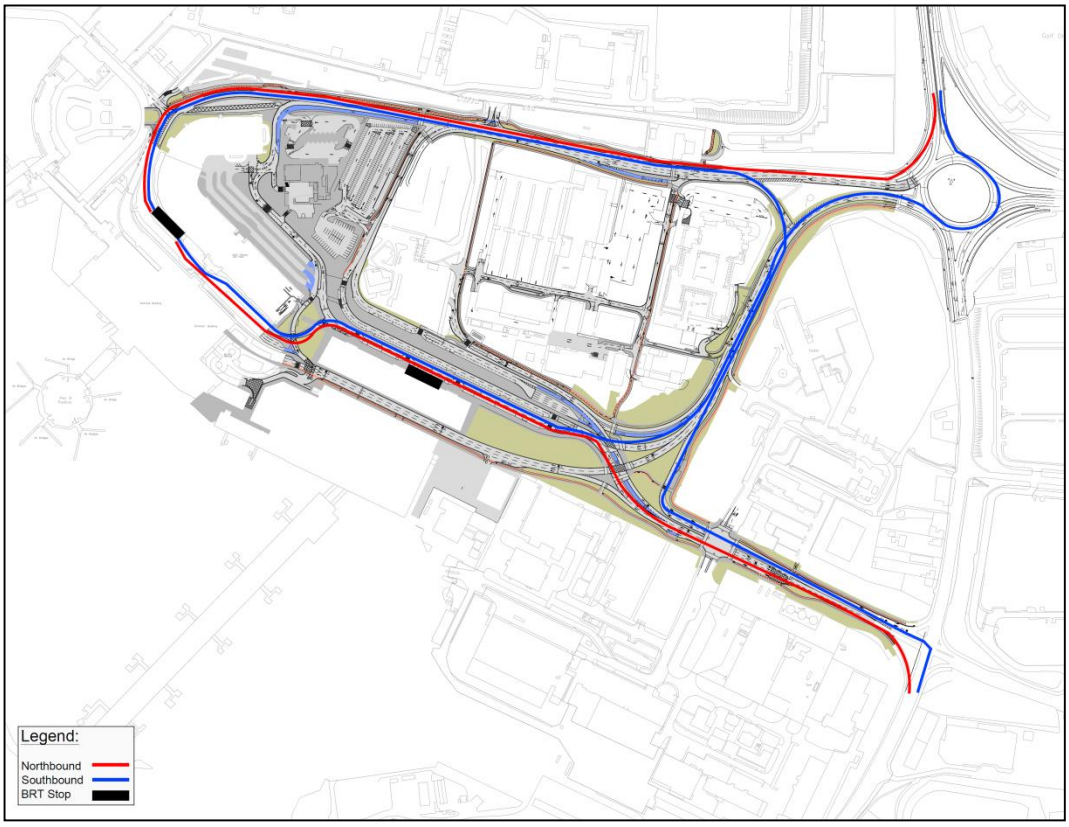

Figure 7.7: Route Option DA5

7.4.7 Route Option DA6 (Service Option 2, 3 as a variant)

This route option is presented in **Figure 7.8**.

This route option is a slight variant of route option DA5. The only difference between this route option and DA5 is the way southbound vehicles would exit onto the R132. Rather than using East Link Road and Corballis Road South, using route option DA6, Swiftway vehicles would exit directly onto the R132 on Corballis Road North at the Airport Roundabout.

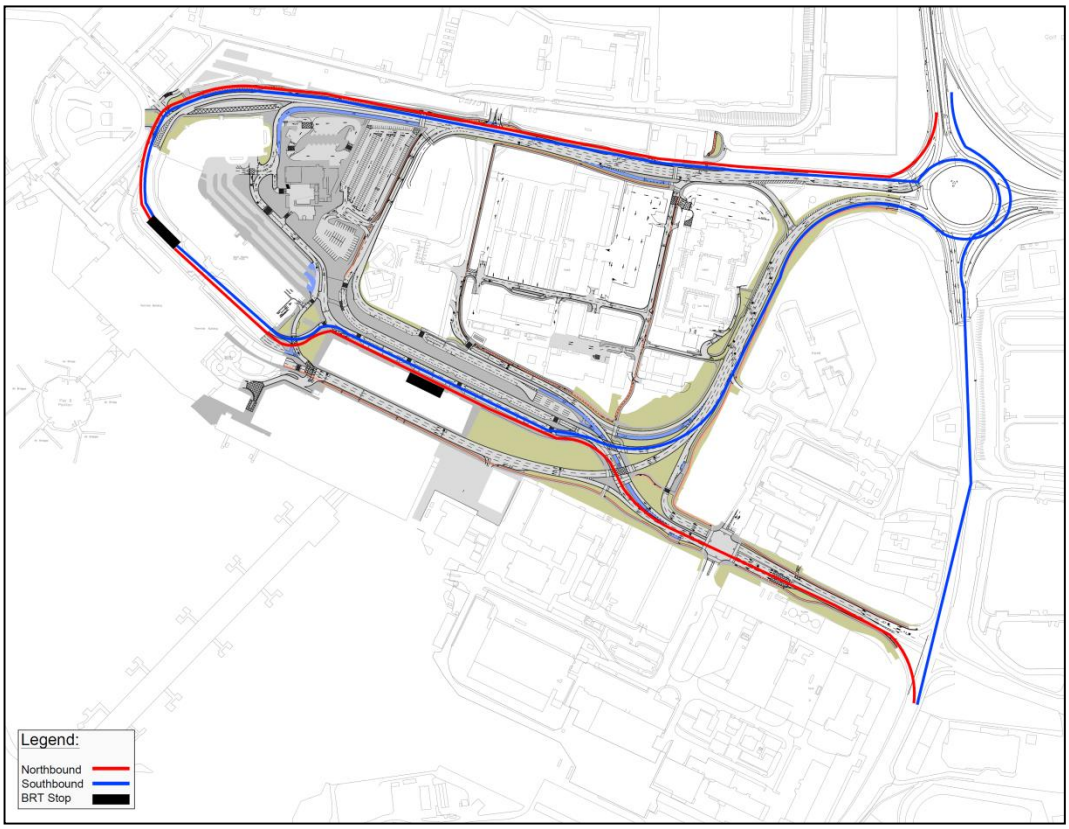

Figure 7.8: Route Option DA6

7.4.8 Route Option DA7 (Service Option 2, 3 as a variant)

This route option is presented in **Figure 7.9**.

This route option is a variation of route options DA2. Northbound Swiftway vehicles would enter onto Corballis Road South. After travelling through the East Link Road junction, vehicles would pass onto the T2 Parking Road and Old West Link Road where a new 'Swiftway-only' access would be created onto Corballis Road North. Swiftway vehicles turn onto Corballis Road North before exiting onto the R132.

Southbound Swiftway vehicles travel the same route in the opposite direction using a contra flow lane on Corballis Road North.

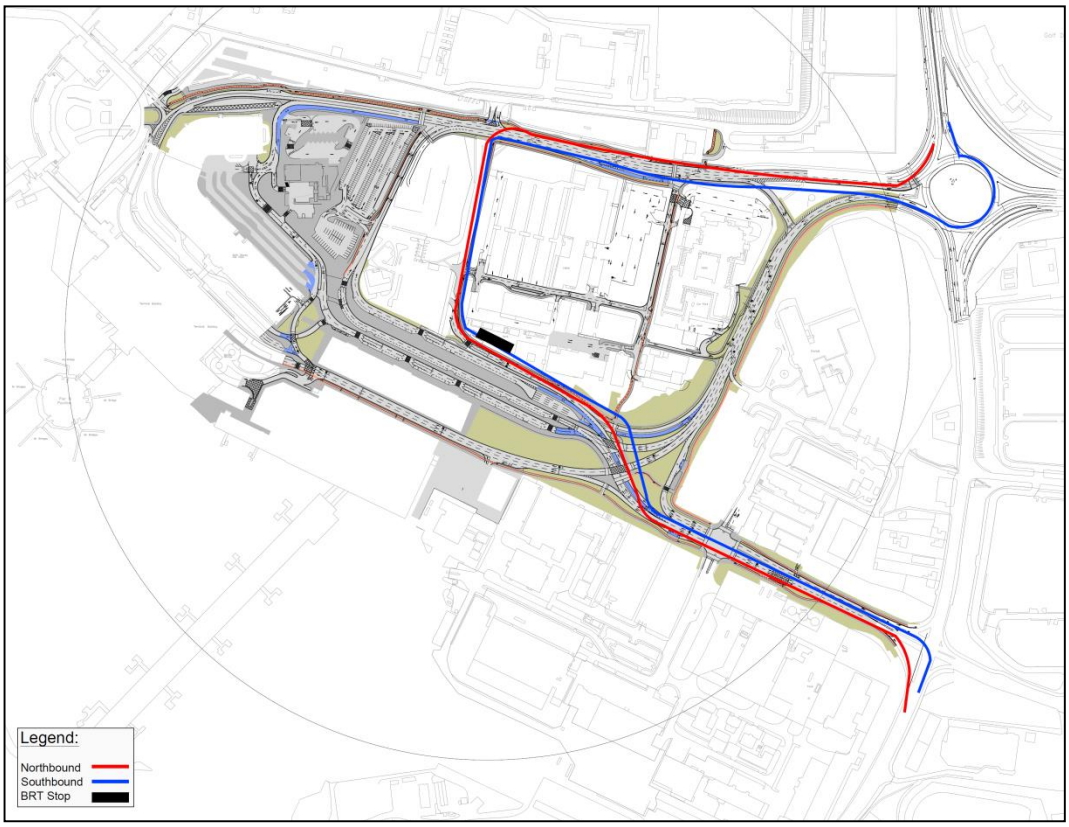

Figure 7.9: Route Option DA7

7.5 Assessment Methodology

A single stage route options assessment process was adopted to determine the optimum route option for Swiftway services running through / terminating in the airport.

Given the specific nature of the airport and the factors which are likely to distinguish between route options, a set of criteria was developed which are different in some aspects to those used for other sections of the study area;

- **Swiftway priority infrastructure**: as discussed in report Section 5.3;
- **Swiftway journey time (mins):** as discussed in report Section 5.3;

- **Walk distance to terminals:** distance between the Swiftway stop(s) and each of the terminals;
- **Capital cost:** the degree of capital investment required, described as low, medium or high;
- **Swiftway interaction with airport traffic:** the degree to which the Swiftway route option would interact with other Airport traffic within the Airport campus (e.g. potential delays to service if Swiftway uses roads immediately adjacent drop-off/pick-up facilities or passes through the ground transport hub);
- **Risk to Swiftway journey time reliability:** the degree to which the Swiftway journey time reliability is compromised - linked to the criteria regarding interaction with Airport traffic and the level of Swiftway priority infrastructure available or which could be provided;
- **Impact on existing airport operations:** the degree to which the existing Airport operations are impacted i.e. are changes required to the existing operations, are bus stops required to be relocated etc.; and
- **Impact on airport commercial lands (planned Airport LAP being prepared by FCC):** the degree to which the Swiftway proposals would impact on master-plan proposals for Airport commercial development and associated LAP (currently under development).
- **Environmental:** the degree to which the Swiftway route options impact on each of the environmental criteria described in Section 5.3.5.

All route options are compared against the above criteria and ranked using the colour ranking system described in report Section 5.3.6.

7.6 Airport Route Options Assessment

The Stage 2 route options assessment summary table for the Airport route options is presented in **Appendix A4**.

Route option DA0, which would accommodate Service Option 1, clearly has minimal impact on the internal airport campus by virtue of not going into the airport. The route option is however less than desirable in terms of providing a Swiftway service to the airport, given the distance from the R132 stop to the terminals and existing commercial development. However, this route option could be provided as part of a split service pattern. This route option and service would also be attractive in the future for the planned commercial development expansion adjacent to the R132.

Of the route options considered which penetrate into or through the airport campus, route option DA3 is the most attractive on that basis that:

- It has minimal impact on existing and future airport ground transport operations;
- It provides a good Swiftway stop location only a short walk from both Terminal 1 and Terminal 2. The stop location also provides direct interchange opportunity between Swiftway and regional (and some national) bus services;

- It has a low cost compared to other options as it largely uses existing bus priority infrastructure within the airport campus; and
- It can facilitate service options 2 and 3, subject to demand.

7.7 Service Options Testing

Initial transport modeling of Airport Swiftway service options was undertaken using the NTA's Greater Dublin Area Multimodal model, based on 2012 travel demand.

The first step was to assess the sensitivity of passengers north of the airport to the additional journey time imposed on a service as a result of routing via the airport.

The second step in this process was to develop a series of scenario tests which represented the various options that are available for routing the Swiftway service into Dublin Airport and also along the R132. The purpose of this exercise was to assess whether a single service (Service Option 2) or 'split service' (Service Option 3) was the most beneficial to passengers and in terms of the wider economic benefits generated by Swiftway.

The final step in the process was to assess the frequency of service in each of the scenario tests using the NTA's multimodal transport model. The following notional scenarios (note that the model scenarios are not detailed enough to pick up on all of the minor differences between the detailed route options however the modeling accounts for variances in access times) have been modelled:

- Do Minimum: This scenario represents the existing situation where no Swiftway service is present. The results for this modelling scenario are presented to demonstrate the benefits of each scenario against the existing situation.
- Scenario A: Routing the Swiftway service along the northern entry road to the airport and providing a stop to the east of T2 (equivalent to route option DA1);
- Scenario B: Routing the Swiftway service along the southern entry road to the airport and providing a stop at T2 (equivalent to route option DA3);
- Scenario C: Routing the Swiftway service along the southern entry road to the airport and providing stops at both T1 and T2 (equivalent to route option DA5 and DA6); and
- Scenario D: Routing the Swiftway service along the R132 only without entering the airport campus (equivalent to route option DA0).

Figure 7.10 below presents these routing option scenarios that were assessed.

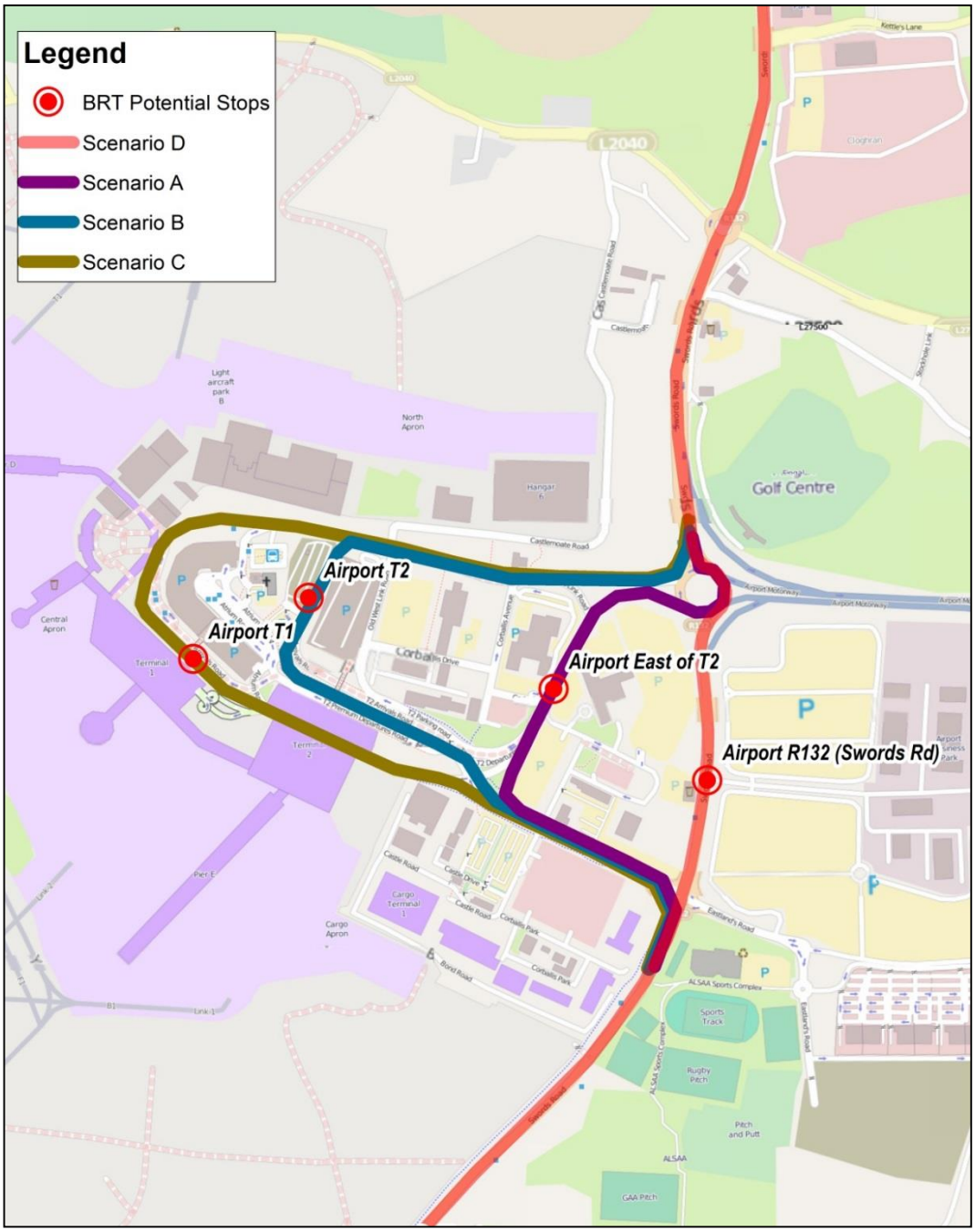

Figure 7.10 –Proposed Scheme – Airport Routing Options

Each of the scenarios tests were coded into the NTA multimodal model and the outputs from each model run were assessed in order to establish:

1. Whether the Swiftway service was providing a benefit to public transport carrying capacity;
2. Whether the various airport routing options facilitated an improved uptake of the Swiftway service;
3. Whether the journey time penalty associated with routing the system into the airport resulted in a net overall reduction in Swiftway demand; and

4. Whether any synergies existed between the airport routing scenarios and overall public transport demand (i.e. which scenario facilitated the greatest access to the GDA public transport network).

The results of this analysis for the peak morning commuter period for the Greater Dublin Area, from 07:00 to 10:00, are presented in **Table 7.1**.

Table 7.1: Total Public Transport (PT), Dublin Bus & Swiftway Boardings All Scenarios 07:00 to 10:00

Transport Mode	Do Minimum	Do Scenario A	Do Scenario B	Do Scenario C	Do Scenario D
PT Boardings	280,300	283,500	283,600	283,600	283,400
Swiftway Boardings	n/a	13,200	12,800	12,500	13,700
Dublin Bus Boardings	141,200	132,700	133,000	133,200	132,100

**The above have been extracted from the NTA's GDA Model and not based on operator data.*

The Swiftway service can be seen to have a positive impact on public transport (PT) boardings in the AM peak hours with boardings increasing in all of the scenarios assessed relative to the Do Minimum scenario. Scenario B shows the greatest increase in PT boardings, with PT boardings increasing from 280,300 in the Do Minimum Scenario to 283,600 in Scenario B.

Of particular interest is the fact that Swiftway boardings are seen to decrease in each of the airport routing scenarios (Scenarios A, B & C) relative to the airport by-pass scenario (Scenario D). The delay experienced by the Swiftway in entering the airport can therefore be seen as having a negative effect on overall Swiftway patronage. In fact commuters are seen to transfer back to Dublin Bus services as a result of the routing of the Swiftway service into Dublin Airport. This is illustrated in **Figure 7.11**.

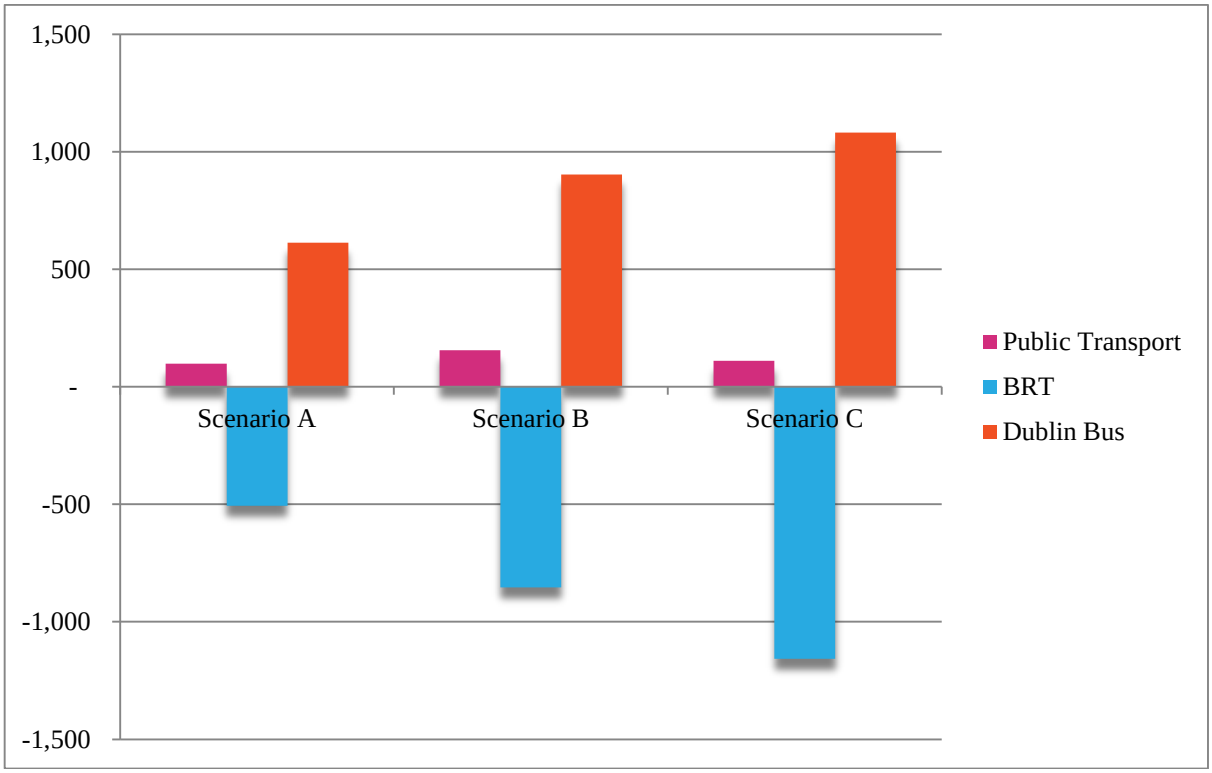

Figure 7.11 – Change in Public Transport, Swiftway and Dublin Bus Boardings Relative to Scenario D (07:00 to 10:00)

This would point towards Scenario D (having the Swiftway service routed along the R132 and not entering the Airport) being the most favourable in terms of attracting passengers to/from areas north of the Airport.

However, a key objective of the proposed scheme is to serve Dublin Airport. It was therefore evident that further analysis was required in order to develop an optimum scenario which maximised the public transport carrying capacity globally whilst maintaining maximum Swiftway ridership and achieving the scheme objective of providing additional public transport service connectivity to Dublin Airport.

The next step in the assessment process examined why the routing of the Swiftway service in Dublin Airport was having a negative impact on Swiftway patronage and how the service could be altered in order to achieve the 'optimum scenario' for the corridor.

Through interrogation of Swiftway boarding and alighting figures for all of the scenarios assessed, it was evident that Dublin Airport is a key destination on the Swiftway service. However the journey time delay associated with routing the service into the airport impacts on Swiftway demand, particularly north of the airport (i.e. at the Swords stops). It was therefore decided to model the impacts of a Swiftway 'split service'. Initially two main service options were assessed for a 'split service' for the proposed scheme. These were:

- Scenario E - A staggered service from Swords via the Airport to the City (every second Swiftway vehicle enters the airport). Scenario E was tested using a service frequency of 8 mins each for the Swords Direct and Swords via Airport services; and
- Scenario F - Maintaining the Swiftway service along the R132 Swords Road and providing a separate Airport Swiftway service from the Airport to the City Centre. Scenario F looked at a 4 min frequency for the Swords Direct service and an 8 minute frequency for the Airport Direct service.

Tables 7.2 presents the model outputs for Scenarios E and F, relative to Scenario D for the total number of public transport boardings, Dublin Bus boardings and Swiftway boardings for the AM Commuter peak (07:00 to 10:00.)

Table 7.2: Swiftway Optimum Scenario Test Results

Transport Mode	Do Min	Scenario D	Scenario E	Scenario F
PT Boardings	280,300	283,400	283,100	283,900
Dublin Bus Boardings	141,200	132,100	132,400	130,400
Swiftway Boardings	n/a	13,700	13,100	15,800

**The above have been extracted from the NTA's GDA Model and not based on operator data.*

The key factor in assessing the Swiftway optimum scenario test results was examining whether the service scenarios considered had a positive impact on Swiftway patronage relative to Scenario D. The assessment of the results revealed that Scenario E (the split service from Swords with every second Swiftway entering the airport), did not result in an improvement in Swiftway patronage relative to Scenario D (the scenario with a Swiftway stop outside the airport), with a reduction predicted by the modelling as indicated in **Table 7.2**.

Scenario F is seen to have a higher overall Swiftway patronage while maintaining an overall increase in PT boardings across the network, albeit with some reduction in Dublin Bus boardings across the network due to increased BRT patronage.

7.8 Conclusions and Recommendations

Conclusions arising from the route options assessment can be summarised as follows:

- Route option DA0, which would accommodate service option 1 (i.e. bypassing the Airport on the R132), clearly has minimal impact on the internal airport campus by virtue of not going into the airport. The route option is however less than desirable in terms of providing a Swiftway service to the airport, given the distance from the R132 stop to the terminals and existing commercial development. The route option and service would be attractive in the future for the planned commercial development expansion adjacent to the R132.
- Of the route options considered which penetrate into or through the airport campus, route option DA3 is the most attractive on that basis that:
  - It has minimal impact on existing and future airport ground transport operations;
  - It provides a good Swiftway stop location only a short walk from both Terminal 1 and Terminal 2. The stop location also provides direct interchange opportunity between Swiftway and regional (and some national) bus services;
  - It has a low cost compared to other options as it largely uses existing bus priority infrastructure within the airport campus; and
  - It can facilitate service options 2 and 3, subject to demand.

The conclusion arising from the initial transport modelling assessment of Airport Swiftway service options assessment is that the scenario that resulted in the greatest level of public transport and Swiftway demand globally was the provision of a 'split' service between the City Centre and Swords and Dublin Airport respectively.

Further analysis work will be required to fully determine the optimum Swiftway frequencies for both the Swords and Airport services to be provided, for both peak and off peak periods throughout the day. However a high frequency will be maintained along with main trunk route between Swords and the City Centre with a lower frequency provided from the Airport dependent on demand.

8 Study Area Section 2: Dublin Airport to Royal Canal

8.1 Stage 1: Route Options Assessment

Within this study area section, there are a limited amount of practical or feasible route options which can be considered. These have been assessed initially at a high level as described in report Section 5.2 of this report. **Figure 8.1** presents the various route options assessed in this area. A summary of the 'Stage 1' route options sifting process is presented in **Table 8.1**.

Figure 8.1: Section 2 Route Options – Dublin Airport to Royal Canal

Table 8.1: Section 2 Route Option Sifting (Stage 1) Summary – Dublin Airport to Royal Canal

Route Option Number	Comments	Pass/Fail
SY1	This is a potentially feasible route option which travels through the centre of Santry village. This route option would involve significant public and private land-take to achieve any degree of Swiftway priority which would deliver journey time reliability as required by the scheme objectives. Progressed to Stage 2 to assess further as the route option potentially serves a large catchment and key trip attractors.	Pass
SY2	This is a potentially feasible route option which travels along the N50, bypassing Santry village. Sufficient space is available to provide Swiftway priority within the road corridor but public land-take may be required along Coolock Lane and the off ramp from the N50 to Coolock lane.	Pass
SY3	This is a potentially feasible route option which provides a linkage between any route option on the N50/M1 and the R132. Public land-take may be required to provide Swiftway priority.	Pass
SY4	This is a potentially feasible route option which travels along the R132 utilising the existing QBC route as far as the Airport Roundabout. Land-take would be required along sections of the route option to provide Swiftway priority.	Pass
SY5	This route option is not considered suitable as it would miss out on serving existing catchments along the R132. There is also a safety concern associated with Swiftway vehicles using the M1 motorway with standing passengers. Also, it would not be possible to locate a stop on this route.	Fail
F1	This is a fixed route option along the R132 (existing QBC route as far as Belvidere Road) where no logical/feasible alternative exists within the study area.	Pass

All route options explored as part of the sifting stage, except SY5, passed the Stage 1 assessment and were progressed to the next assessment stage. As route option SY2 is the only remaining route option which requires route option SY3, this has been combined to form a part of route option SY2 for the 'Stage 2' assessment.

As the route south of Santry to the Royal Canal (F1) is a fixed section where no feasible alternative exists, the 'Stage 2' assessment considers Santry route options only.

8.2 Stage 2: Santry Route Options Assessment

8.2.1 Introduction

Following the 'Stage 1' sift for Dublin Airport to Royal canal study area, two route options for Santry were brought forward to the Stage 2 assessment:

- A route option via the centre of Santry village; and
- A route option via N50 bypassing Santry village.

8.2.2 Route Option SY1: Santry village

Route option SY1 via Main Street through Santry village is presented in **Figure 8.2.**

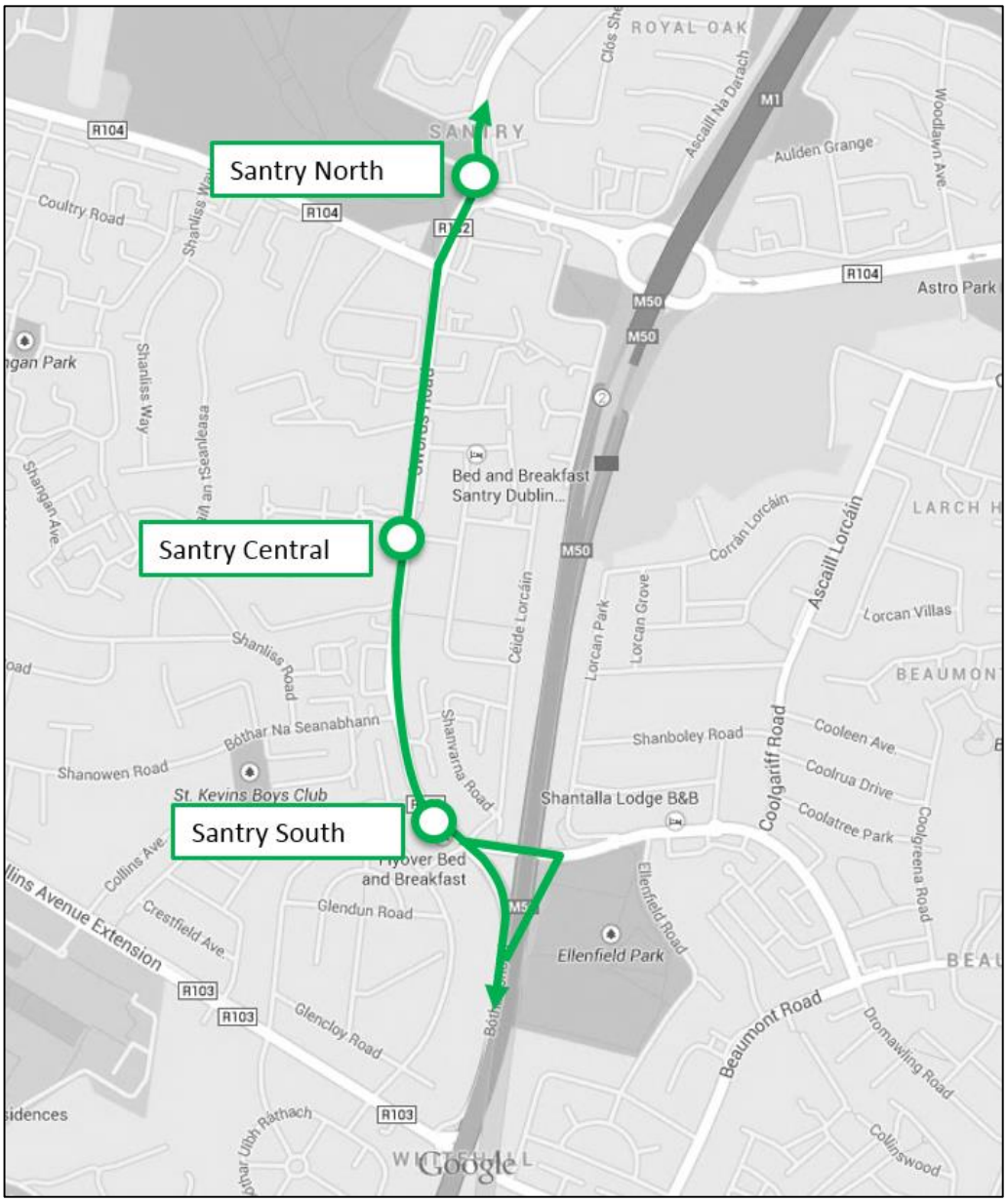

Figure 8.2: Route Option SY1 Santry village

Northbound: North of Collins Avenue the Swiftway service would continue along the R132 diverging left via the Santry village 'Shantalla' slip road and continue through the centre of Santry village along the R132.

To facilitate Swiftway priority through the village, significant land-take would be required from adjacent property owners including a large number of residential properties. There would also be some loss of on-street car parking.

Southbound: The Swiftway vehicles would travel along the R132, through the centre of Santry village. South of the village, Swiftway vehicles would travel along the Shantalla Road over bridge, turning right onto the southbound slip road and continue along the Swords Road past Whitehall Church towards the City Centre. To facilitate Swiftway priority through the village, significant land-take would be required from adjacent property owners including a large number of residential properties. There would also be some loss of on-street car parking and a reduction in capacity for general traffic (for example the right turn pocket from the R132 onto Shanowen Road would need to be removed).

Stops: Three Swiftway stops would be provided in this route option. One would be located to the south of the village near the Shantalla overpass, one would be located in the centre of the village (e.g. near the Omni Shopping Centre) and one would be provided just north of the R132/Coolock Lane junction.

The journey time for this route option from the Shantalla Interchange to the R132 just north of Coolock Lane is 4-5 minutes over a distance of approximately 1.7 km.

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

- Significant land acquisition would be required to provide Swiftway service, with associated boundary works and adjacent accommodation works including:
  - retaining structures;
  - steps and ramps (to residential properties); and
  - re-grading of impacted front gardens and hard standing areas.
- Full reconstruction of existing road carriageway would likely be required;
- All the services/utilities that are currently buried in the existing footway/road margin would need to be set back under the new proposed footway;
- A new public lighting system would be required throughout Santry; and
- In order to construct Swiftway infrastructure on this route option, it would require extensive traffic management measures during construction (including the potential need for diversion of traffic away from route).

The Santry village route option would clearly require a significant amount of land acquisition and boundary works and would encroach on approximately 95 properties (predominantly residential).

8.2.3 Route Option SY2: N50 Santry Bypass

Route option SY2 for Santry routing along the N50 is presented in **Figure 8.3**.

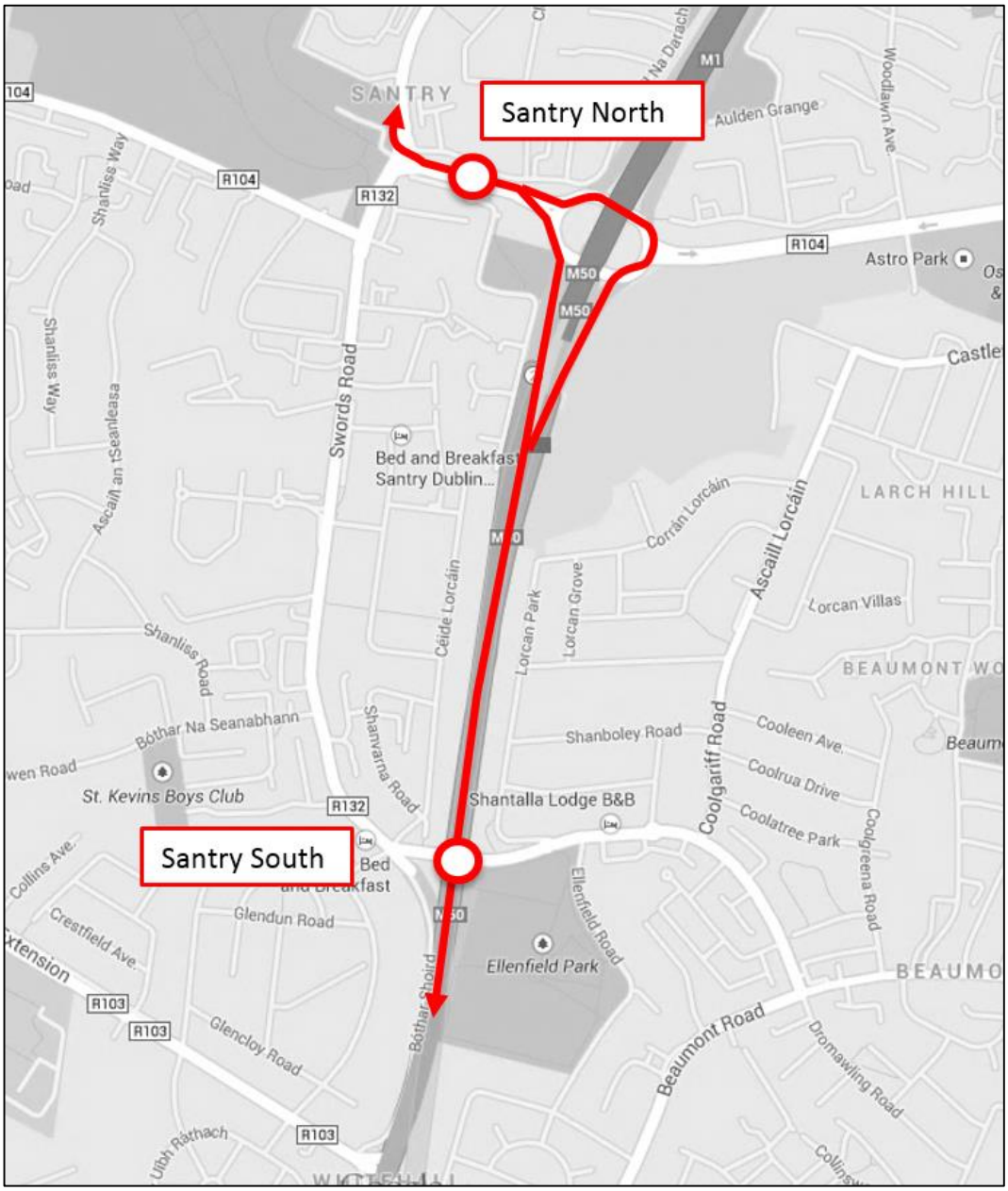

Figure 8.3: Route Option SY2 N50 Santry Bypass

Northbound: North of Collins Avenue, this route option would continue along the N50 before turning off at the Coolock Lane Junction (Junction 2), joining the R132 immediately north of Santry village. In order to facilitate Swiftway priority along the Coolock Lane Junction slip lane, it would be necessary to widen the road to the west and to reconstruct an existing retaining wall structure. From the slip-road, the Swiftway service would cross to the north-side of Coolock Lane between the junction and the Oak Park Avenue junction. The Swiftway would then continue on a segregated section of two-way 'Swiftway-only' road immediately to the north of Coolock Lane as far as the R132 before reverting to lateral BRT lanes along the R132. The R132/Coolock Lane junction would require upgrading to facilitate priority for Swiftway vehicles travelling through it.

Southbound: The Swiftway service would turn left from the R132 onto a dedicated a segregated section of two-way' Swiftway-only' road immediately to the north of Coolock Lane. At the junction with the N50, Swiftway vehicles would circulate the 'gyratory' in dedicated BRT lanes.

It would be necessary to partially signalise the junction to facilitate Swiftway vehicles circulating through it.

There is insufficient space to provide a dedicated BRT lane on the N50 off-ramp from the Coolock Lane junction and, as such, it would be necessary to route Swiftway vehicles through the undeveloped lands to the west of the N50 before joining the N50 to the south of the Dublin Port Tunnel maintenance building. There is an expired planning permission for these lands which are zoned as Z12 land (Z12 – *To ensure the existing environmental amenities are protected in any future use of these lands. These are lands, the majority of which are in institutional use, which could possibly be developed by others*).

Stops: Stops would be provided to the north (along Coolock Lane) and south of Santry village, either side of the N50 Shantalla overbridge.

The journey time for this route option from the Shantalla Overbridge to the R132 just north of Coolock Lane is 3-4 minutes. The distance for this route option is approximately 1.7 km.

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

- Northbound, the retaining wall structure adjacent to the Coolock Lane slip lane may need to be set back. However there is space available within Oak Park Avenue west of the existing retaining structure to accommodate the BRT lane;
- New traffic management arrangements would be required along Coolock Lane to accommodate the northbound and southbound Swiftway vehicle movements and to provide priority;
- The Dublin Port Tunnel maintenance building at the end of the southbound slip road limits available width necessitating a need to route through adjacent undeveloped lands;
- Pedestrian connection between northbound and southbound stops would likely require a direct connection to the N50 Shantalla overpass from the 'Santry South' stop;
- This route option would also require ancillary measures within Santry village to provide improved bus priority for other scheduled services retained on this route and improve cycle facilities along GDA Cycle Network Route 2A; and
- Opportunity to improve cycle route connectivity southbound from Shantalla Road through Elmfield Park.

8.2.4 Route Options Assessment

The 'Stage 2' route options assessment summary table for the Santry route options is presented in **Appendix A5**.

The relative ranking of route options against the scheme assessment sub-criteria is summarised in **Table 8.2**.

Table 8.2: Santry Route Options Assessment Summary (Sub-Criteria)

Assessment Criteria	Assessment Sub-Criteria	SY1	SY2
Economy	Capital Cost		
	Operation and Maintenance Cost		
	Transport Reliability and Quality of Service		
Integration	Land Use Integration		
	Residential Population and Employment Catchments		
	Transport Network Integration		
	Cycling Integration		
Accessibility & Social Inclusion	Key Trip Attractors		
	Deprived Geographic Areas		
Safety	Road Safety		
	Pedestrian Safety		
Environment	Archaeology and Cultural Heritage		
	Architectural Heritage		
	Flora and Fauna		
	Soils and Geology		
	Hydrology		
	Landscape and Visual		
	Air Quality		
	Noise & Vibration		
	Land Use Character		

In terms of 'Economy', the primary differentiator between route options is the capital cost. Route option SY1 would cost significantly more than route option SY2, largely due to the quantity of private land-take required and infrastructure construction costs.

In terms of transport reliability and quality of service, route option SY2 is more attractive than route option SY1 due to a combination of the number of junctions along the route and the extent to which priority can practically be delivered on the route.

In terms of 'Integration', the primary driver is residential catchments which would be served by the route. Route option SY1 serves a higher catchment in closer proximity than route option SY2. Route option SY2 serves more people within a 15 minute walk catchment and therefore this sub-criterion is considered to be neutral overall. Route option SY2 has the potential to encourage future development in the undeveloped lands to the east of the N50 south of Coolock Lane and therefore ranks higher under land use integration. Therefore, on balance, route option SY2 is considered to rank higher than route option SY1 under the 'Integration' criterion.

There is relatively little to differentiate between route options in this section of the study area under the 'Accessibility and Social Inclusion' criterion.

Under 'Safety', route option SY1 which requires one less turn movement than SY2, is considered to rank slightly higher than SY2.

In terms of 'Environment', route option SY1 through Santry village is generally considered to be less attractive in terms of potential for environmental impacts, such as impact on landscape and visual, archaeology and cultural heritage, architectural heritage, and land use character.

A summary of the assessment and relative ranking of route options against the five main assessment criteria is presented in **Table 8.3**.

Table 8.3: Santry Route Options Assessment Summary (Main Criteria)

Assessment Criteria	SY1	SY2
Economy		
Integration		
Accessibility & Social Inclusion		
Safety		
Environment		

Based on the assessment undertaken, it is apparent that route option SY2, which would route the Swiftway along the N50, bypassing Santry village, offers the most practical, deliverable route option for the following reasons:

- The lower capital cost compared to Santry village route;
- Avoids impacting on a significant number of residential and commercial properties which introduces planning risk, significant scheme cost and construction disruption;

- Would provide shorter journey times while maximising the residential catchment through Swiftway stop locations (specifically to the east of the N50);
- Has less of an environmental impact, preserving the townscape environs of Santry;
- Doesn't preclude ancillary improvement works for bus priority through Santry village;
- An additional stop (southbound) could be provided in the future to serve potential future development lands to the southeast of Coolock Lane Interchange where the Swiftway service would be routed. This could be connected to a northbound stop on the N50 via a new pedestrian overbridge; and
- Would see cyclists continue to route through Main Street in Santry village in accordance with the GDA Cycle Network Plan.

Route option SY1 is not considered to be a feasible option and as such, **only route option SY2 taken forward for consideration in the transport assessment** in Section 10.

9 Study Area Section 3: Royal Canal to St. Stephens Green

9.1 Introduction

This section is broadly referred to as the City Centre and generally covers the area between the Royal and Grand Canals to the north and south and the Samuel Beckett and O'Donovan - Rossa Bridges (and their associated approach roads) to the east and west. There is a potential 'spiders web' of route options possible within this area due to the dense layout of the City Centre street network. These streets will be assessed, initially at a high level, and then in greater detail, to rule out streets unsuitable for the Swiftway service and identify an optimal routing for the scheme. It is an objective of the scheme to extend the existing Swords bus service into the southeast City Centre in order to serve this significant employment zone. It is a further objective that the scheme should be interoperable with the future Blanchardstown to UCD Swiftway service that is anticipated to run along South Great George's Street, St. Stephen's Green South and Leeson Street.

The routing options for the City Centre area have been developed to ensure interchange opportunities exist between other Swiftway lines currently planned for the city as well as existing and other future planned transport modes where practical.

9.2 City Centre Route Corridors (Bridge Crossings)

The City Centre route choice is largely determined by the available bridge crossings over the River Liffey, which are as follows (Note that pairs of adjacent bridges carrying opposing traffic flows are identified thus below):

- Option A: Samuel Beckett Bridge;
- Option B: Butt Bridge / Talbot Memorial Bridge;
- Option C: O'Connell Bridge; and
- Option D: Grattan Bridge / O'Donovan – Rossa Bridge.

The location of these bridges and associated potential route corridors is illustrated in **Figure 9.1**.

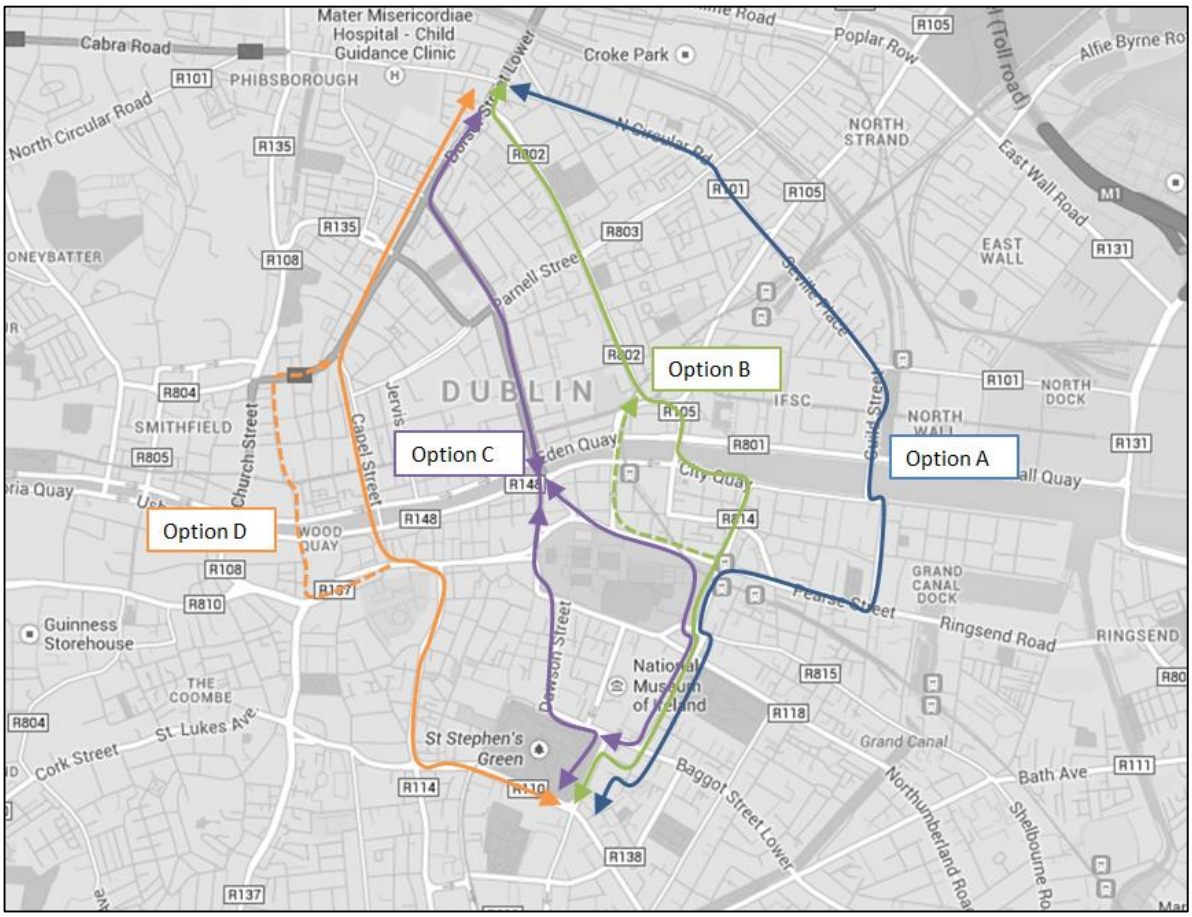

Figure 9.1: Section 3 Bridge Crossing Options

The other bridge crossings of the River Liffey east and west of these options are too remote from the City Centre to warrant consideration. An initial sifting exercise has been undertaken based on the most direct available route to these river crossings, as outlined below:

- **Option A:** This comprises a far easterly option at Samuel Beckett Bridge with direct access on the north side via North Circular Road, Seville Place and Guild Street, but more circuitous routing on the south side via Macken Street, Pearse Street and Westland Row to Merrion Square and onward to St. Stephen's Green. This route option gives access to the main employment zones in the Docklands and southeast City Centre area, but it misses the main commercial and retail heart of the city entirely. The overall route length is 4.4km from the junction of North Circular Road and Dorset Street to the Earlsfort Terrace corner of St. Stephen's Green.
- **Option B:** This comprises an 'east-central' route option via Gardiner Street to cross the river at the Talbot Memorial and Butt Bridges in opposing directions, with links to Westland Row via City Quay and Lombard Street on the basis of a northbound bus contra-flow lane, or else via Pearse Street and Tara Street in the same direction as general traffic. This route option passes along the eastern edge of the main commercial and retail zone in the north inner city, and is within 400 m of O'Connell Street at its nearest point, which is 5 minutes walking time.

The overall route length is 3.4 km from the junction of North Circular Road and Dorset Street to the Earlsfort Terrace corner of St. Stephen's Green.

- **Option C:** This comprises the most 'central' route option via O'Connell Street and either College Green and Dawson Street, or Pearse Street/Townsend St and Westland Row, to St. Stephen's Green. This route option goes directly through the commercial and retail heart of the City Centre on both sides of the river. The overall route length is 3.4 km from the junction of North Circular Road and Dorset Street to the Earlsfort Terrace corner of St. Stephen's Green.
- **Option D:** This comprises a far westerly route option via Dorset Street, Bolton Street, Capel Street and Grattan Bridge to Dame Street and George's Street in the southbound direction, and returning northbound from Dame Street via Winetavern Street to cross the river at O'Donovan Rossa Bridge and then via Chancery Place and Greek Street west of the markets to North King Street and Dorset Street. This route option skirts the western edge of the commercial and retail heart of the city and passes within 600 m of O'Connell Street at its nearest point. However, this route would only serve the main office district at the route turnaround point and is otherwise remote from most of the main employment zones. The overall route length is 3.4 km from the junction of North Circular Road and Dorset Street to the Earlsfort Terrace corner of St. Stephen's Green.

Preliminary comparative analysis concluded that Option A is too far east of the main destinations in the City Centre to properly serve the combined demands of peak time access for employment trips and off-peak access for commercial and retail trips. It also concluded that Option D serves the main office district at its terminal point, but is comparatively further from the O'Connell Street retail area than Options B and C and is therefore considerably less attractive as a route option when compared to others.

In terms of length and journey time, most of the routes are of a relatively similar length, at approximately 3.4km, with the exception of Option A, which is 1km longer at 4.4km long.

In conclusion, the bridge crossing sifting process eliminated Options A and D from further consideration with Options B and C progressing for further evaluation. Further variant route options that cross the Liffey on these bridges are considered as part of the next stage of the route options assessment process. Variants on Options B and C availing of the Rosie Hackett Bridge between O'Connell Bridge and Butt Bridge are also considered.

In order to make the assessment of route options more manageable in the complex City Centre environment, and to allow for various possible sub-options, corridor Section 3 has been split into two sub-sections for the 'Stage 1' route sifting exercise:

- 3A - Royal Canal to River Liffey – North City; and
- 3B - River Liffey to St. Stephen's Green – South City.

9.3 Stage 1: North City Route Options Assessment

Within this study area section, any route option that can achieve a reasonably direct connection to the bridges identified in report Section 9.1 has been considered, with the exception of narrower laneways or streets that would form part of an excessively circuitous route (e.g. Summerhill).

Due to the large number of potential 'end-to-end route' options within study area Section 3, the streets available for Swiftway routing have been subdivided into shorter sections for the purposes of the 'Stage 1' sift. Following the 'Stage 1' sifting process, remaining route options have been combined to form longer route options where possible.

The 'Stage 1' route option sifting process assesses all route options considered within the study area section at a high level as described in report Section 5.2. **Figure 9.2** presents the initial potential route options identified in study area Section 3A. A summary of the Stage 1 assessment sifting process is presented in **Table 9.1**.

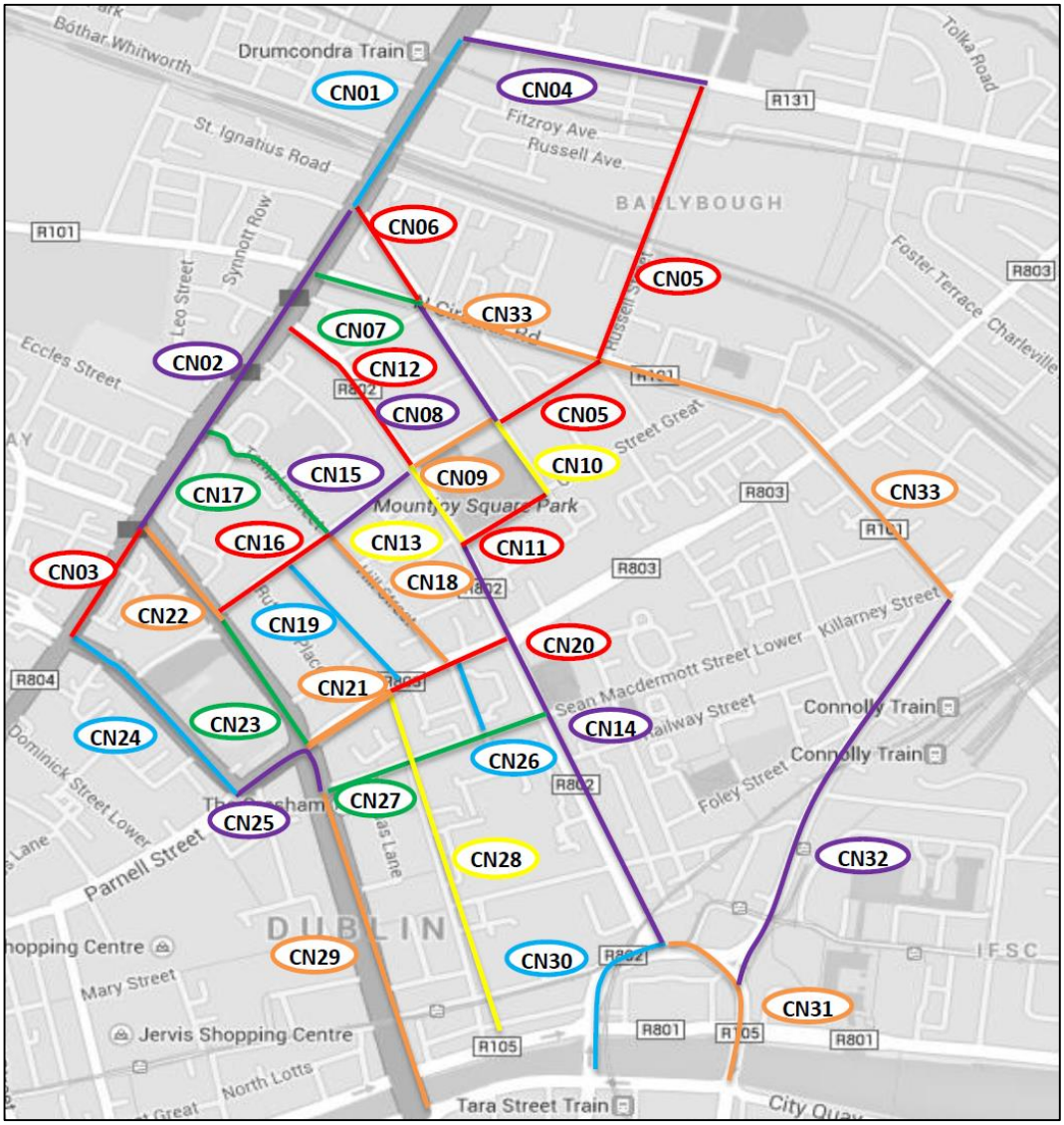

Figure 9.2: Section 3A Route Options – Royal Canal to River Liffey

Table 9.1: Section 3A Route Option Sifting (Stage 1) Summary – Royal Canal to River Liffey

Route Option Number	Description	Comments	Pass/Fail
CN1	Dorset Street (Royal Canal to Belvidere Road)	Dorset Street is sufficiently wide with existing bus lanes that may be upgraded. This route option forms part of the existing Swords Road QBC. The introduction of some turning movement restrictions for general traffic may be required to increase bus and Swiftway priority along this route option.	Pass
CN2	Dorset Street (Belvidere Road to North Frederick Street)	Dorset Street is sufficiently wide with existing bus lanes that may be upgraded. This route option forms part of the existing Swords Road QBC. The introduction of some turning movement restrictions for general traffic may be required to increase bus and Swiftway priority along this route option.	Pass
CN3	Dorset Street (North Frederick Street to Granby Row)	Dorset Street is sufficiently wide with an existing bus lane northbound that may be upgraded. Swiftway would follow the existing one-way bus service routing northbound along Granby Row and this section of Dorset Street, with the southbound service routed via North Frederick Street. Hence, this route option would need to be accessed via Parnell Street West, where a conflict with Luas exists (see CN25) and therefore fails this initial assessment.	Fail
CN4	Clonliffe Road (Dorset Street to Jones's Road)	Clonliffe Road is insufficiently wide to accommodate bus lanes in each direction, even with extensive removal of on-street parking. There are limited east-west orbital routes for general traffic available in this part of the city and all experience some degree of peak hour congestion due to demand. Furthermore, there is extensive residential development fronting onto the road, which would make traffic flow changes difficult to implement.	Fail
CN5	Jones's Road / Russell Street / Fitzgibbon Street	Jones's Road and Russell Street are insufficiently wide to accommodate bus lanes in each direction, even with extensive removal of on-street parking. It would be impracticable to remove traffic from the street due to extensive residential development. Fitzgibbon Street would not be suitable for any other approach due to the acute turn that would be required from North Circular Road and has therefore been ruled out as part of this route option.	Fail
CN6	Belvidere Road	Belvidere Road currently carries traffic between the Swords Road corridor and North Circular Road. There is on-street parking and cycle lanes on both sides of the street. It is considered feasible to amend the road cross-	Pass

Route Option Number	Description	Comments	Pass/Fail
		section to accommodate some degree of bus priority.	
CN7	North Circular Road (Dorset Street to Belvidere Road)	The corner between Dorset Street and North Circular Road is considered to be too acute to accommodate easy passage of Swiftway vehicles. The swept paths of the vehicles northbound and southbound would occupy the adjacent lanes, requiring all other traffic movements to be stopped and long intergreen clearance times. This would not be acceptable from a traffic capacity perspective.	Fail
CN8	Belvidere Place	Belvidere Place currently carries light traffic volumes. There is on-street parking on both sides of the street. It is considered feasible to amend the road cross section to accommodate some degree of bus priority.	Pass
CN9	Mountjoy Square North	Mountjoy Square North currently carries light traffic volumes. There is on-street parking on both sides of the street. It is considered feasible to amend the road cross section to accommodate some degree of bus priority.	Pass
CN10	Mountjoy Square East	Mountjoy Square East currently carries light traffic volumes. There is on-street parking on both sides of the street. It is considered feasible to amend the road cross section to accommodate some degree of bus priority.	Pass
CN11	Mountjoy Square South	Mountjoy Square South currently carries light traffic volumes. There is on-street parking on both sides of the street. It is considered feasible to amend the road cross section to accommodate some degree of bus priority.	Pass
CN12	Gardiner Street Upper (Dorset Street to Mountjoy Square)	Gardiner Street Upper currently carries heavy traffic flows and there is limited bus priority provision along the street, with the carriageway only wide enough to accommodate three lanes for much of its length. There is also on-street parking along this route option – part time within the bus lane. The corner from Dorset Street onto Gardiner Street Upper is quite acute. There is considerable residential frontage development along the street that would render traffic flow changes difficult to implement. On that basis, Gardiner Street Upper is not considered for Swiftway.	Fail
CN13	Mountjoy Square West	Mountjoy Square West currently carries heavy traffic volumes and existing bus routes. There is also on-street parking along this route option. However, it is considered feasible to amend the road cross section to accommodate some further degree of bus priority.	Pass

Route Option Number	Description	Comments	Pass/Fail
CN14	Gardiner Street Middle / Lower (Mountjoy Square to Beresford Place)	Gardiner Street currently carries heavy traffic volumes and existing bus routes. There is also on-street parking along this route option. However, it is considered feasible to amend the road cross section to accommodate some further degree of bus priority.	Pass
CN15	Gardiner Place	Gardiner Place currently carries light traffic volumes. There is on-street parking on both sides of the street. It is considered feasible to amend the road cross section to accommodate some degree of bus priority.	Pass
CN16	Great Denmark Street	Great Denmark Street currently carries light traffic volumes. There is on-street parking on both sides of the street. It is considered feasible to amend the road cross section to accommodate some degree of bus priority.	Pass
CN17	Temple Street	Any route option via Temple Street would have to connect to either: • Great Denmark Street (CN16) - corner too tight for Swiftway vehicles; or • Parnell Street (CN20/21) - ruled out because of conflict with Luas; or • Cumberland Street North (CN26) - ruled out because of indirectness and unsuitability of northbound routing. As no suitable approach route exists, this route option has not been considered further.	Fail
CN18	Hill Street	Any route option via Hill Street would have to connect to either: • Parnell Street (CN20/21) - ruled out because of conflict with Luas; or • Cumberland Street North (CN26) -ruled out because of indirectness and unsuitability of northbound routing. As no suitable approach route exists, this route option has not been considered further.	Fail
CN19	North Great Georges Street	Any route option via North Great George's Street would have to connect to either: • Parnell Street (CN20/21) - ruled out because of conflict with Luas; or • Cumberland Street North (CN26) - ruled out because of indirectness and unsuitability of northbound routing. As no suitable approach route exists, this route option has not been considered further.	Fail
CN20	Parnell Street (Gardiner Street to Marlborough Street)	Any route option along this section of Parnell Street would have to connect to either: • the next section of Parnell Street to the west (CN20/21), ruled out because of conflict with Luas);	Fail

Route Option Number	Description	Comments	Pass/Fail
		• Cumberland Street North (CN26), ruled out because of indirectness and unsuitability of northbound routing); or • Marlborough Street (CN28), ruled out because of conflict with Luas).	
CN21	Parnell Street (Marlborough Street to O'Connell Street)	This section of Parnell Street is to be reconfigured to accommodate Luas cross-city. Luas will have maximum priority on this section of street and will have to negotiate the difficult corner onto Marlborough Street. Parnell Street will continue to carry heavy westbound traffic towards Parnell Street west. It is not considered appropriate to seek to accommodate a two-way Swiftway along this section of the street, and there is no obviously available nearby option for split routing, without introducing an excessive gap between northbound and southbound routes, or introducing conflicts with Luas Cross-City.	Fail
CN22	North Frederick Street	North Frederick Street currently carries light traffic volumes and southbound buses. There is on-street parking on the west side of the street. It is considered feasible to amend the road cross-section to accommodate some degree of bus priority in both directions.	Pass
CN23	Parnell Square East / Cavendish Row	Parnell Street East and Cavendish Row currently carry southbound traffic only. However, the introduction of Luas Cross-City across the top of O'Connell Street will require changes to local traffic circulation and it is anticipated that this would enable the reconfiguration of the street to accommodate some degree of bus priority in both directions.	Pass
CN24	Granby Row / Parnell Square West	Parnell Square West and Granby Row currently carry northbound bus services. Dorset Street has an existing bus lane northbound that may be upgraded. Swiftway would have to follow existing one-way bus routing with southbound service on North Frederick Street. However, this route option would have to be accessed via Parnell Street West, which has a conflict with Luas Cross-City.	Fail
CN25	Parnell Street West (O'Connell Street to Parnell Square West)	Luas Cross-City will occupy two lanes on the north side of the street and will leave room for one wide or two narrow traffic lanes only. As such, there appears to be no scope for bus priority.	Fail
CN26	North Cumberland Street	North Cumberland Street is wide enough to accommodate the proposed scheme and could be accessed via Parnell Street southbound. However, the right turn at the O'Connell Street / Cathal Brugha Street junction will be blocked by the construction of a Luas Stop platform. Therefore, northbound routing is not possible.	Fail

Route Option Number	Description	Comments	Pass/Fail
		There is no obviously available nearby option for split routing, without introducing an excessive gap between northbound and southbound routes, or introducing conflicts with Luas Cross-City.	
CN27	Sean MacDermott Street / Cathal Brugha Street	The right turn at the O'Connell Street / Cathal Brugha Street junction will be blocked by the construction of a Luas Stop platform. Therefore, northbound routing is not possible. There is no obviously available nearby option for split routing, without introducing an excessive gap between northbound and southbound routes, or introducing conflicts with Luas Cross-City.	Fail
CN28	Marlborough Street	Marlborough Street currently carries two traffic lanes southbound. Following the construction of Luas Cross City, there will be one Luas only lane and one southbound traffic lane. There is no scope for northbound Swiftway services on the street, requiring the northbound movement to be accommodated on either O'Connell Street or Gardiner Street. Luas Cross-City will be the priority service on the street and Swiftway would therefore have to operate on secondary priority. It is likely that Luas services and Swiftway services would cause each other delays if both were routed along this corridor and it has therefore not been considered further.	Fail
CN29	O'Connell Street	O'Connell Street is the city's main thoroughfare and one of its widest streets. Luas Cross City's northbound tracks will be laid on O'Connell Street, partially within the road carriageway and partially outside (northern end). There are various car access restrictions to the street at present and further restrictions are likely to be introduced. As such, competition with private car transport is minimal. On that basis, there is scope to accommodate a Swiftway service on the street, notwithstanding the presence of Luas in the northbound carriageway.	Pass
CN30	Beresford Place	Beresford Place currently carries four lanes of northbound traffic. Two of these lanes pass under one span of the Loop Line Bridge towards Gardiner Street, while the other two continue under another span towards Memorial Road and Amiens Street. Gardiner Street carries one lane of traffic northbound and there is therefore an imbalance of lanes – leaving scope to provide bus priority. The link to Memorial Road widens to three lanes under the Loop Line Bridge, meaning there is also scope to provide bus priority on that link.	Pass

Route Option Number	Description	Comments	Pass/Fail
CN31	Memorial Road	Memorial Road currently carries four lanes of southbound traffic. These four lanes are not fully utilised and there is scope to introduce bus priority on this link.	Pass
CN32	Amiens Street	Amiens Street currently carries one traffic lane and one bus lane northbound and a varying number of lanes southbound – a minimum of one under the Loop Line Bridge and a maximum of three approaching Memorial Road. While the railway bridge is a significant constraint, it is considered feasible to provide improved two-directional bus priority on this route option.	Pass
CN33	North Circular Road / Portland Row (Belvidere Road to Amiens Street)	North Circular Road currently carries one traffic lane and a cycle lane in each direction. Substantial sections of the street also have on-street parking on one or both sides. It may be feasible to provide bus priority along the street through reconfiguration of the road cross section.	Pass

Following the 'Stage 1' sift, 18 of the 33 links explored passed the initial sifting stage and were progressed to the next assessment stage. These route options are presented in **Figure 9.3**.

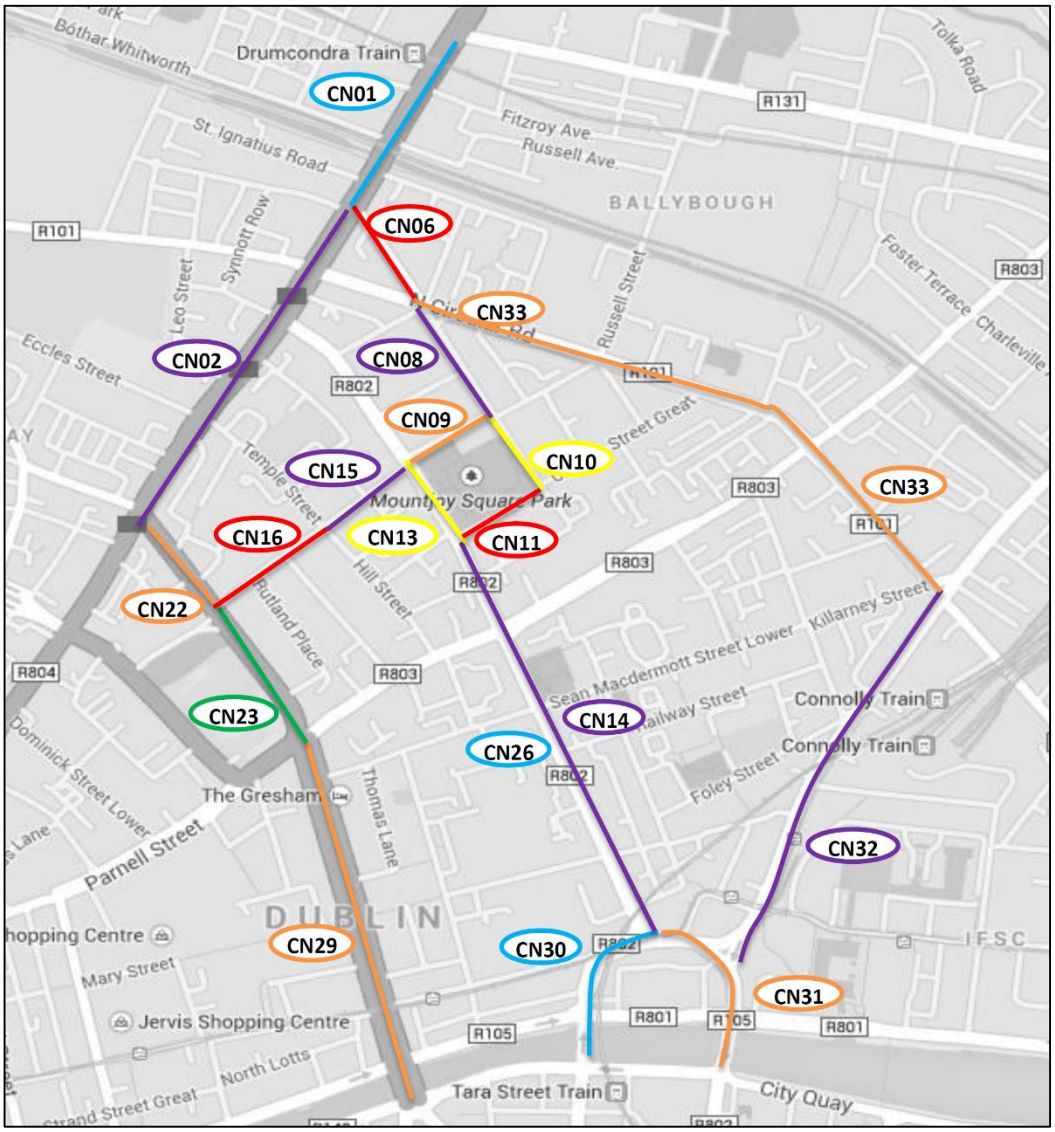

Figure 9.3: Section 3A Route Options Remaining After Stage 1 Assessment

9.4 Stage 2: North City Route Options Assessment

9.4.1 Introduction

Following the Stage 1 sift for the North City Centre area, the remaining route options were combined to form 4 cohesive route options between the R132 and the bridge crossings across the Liffey. These route options are presented in **Figures 9.4** to **9.7** and discussed in the following section.

- N1) Dorset Street – Belvidere Road – North Circular Road – Portland Row – Amiens Street – Beresford Place / Memorial Road;
- N2) Dorset Street – Belvidere Road – Belvidere Place – Mountjoy Square – Gardiner Street – Beresford Place / Memorial Road;
- N3) Dorset Street – North Frederick Street – Parnell Square East – Cavendish Row – O'Connell Street;

- N4) Dorset Street – Belvidere Road – Belvidere Place – Mountjoy Square North – Gardiner Place – Great Denmark Street – Parnell Square East – Cavendish Row – O'Connell Street

9.4.2 Route Option N1: NCR / Amiens Street

Route option N1 via North Circular Road / Amiens Street is presented in **Figure 9.4.**

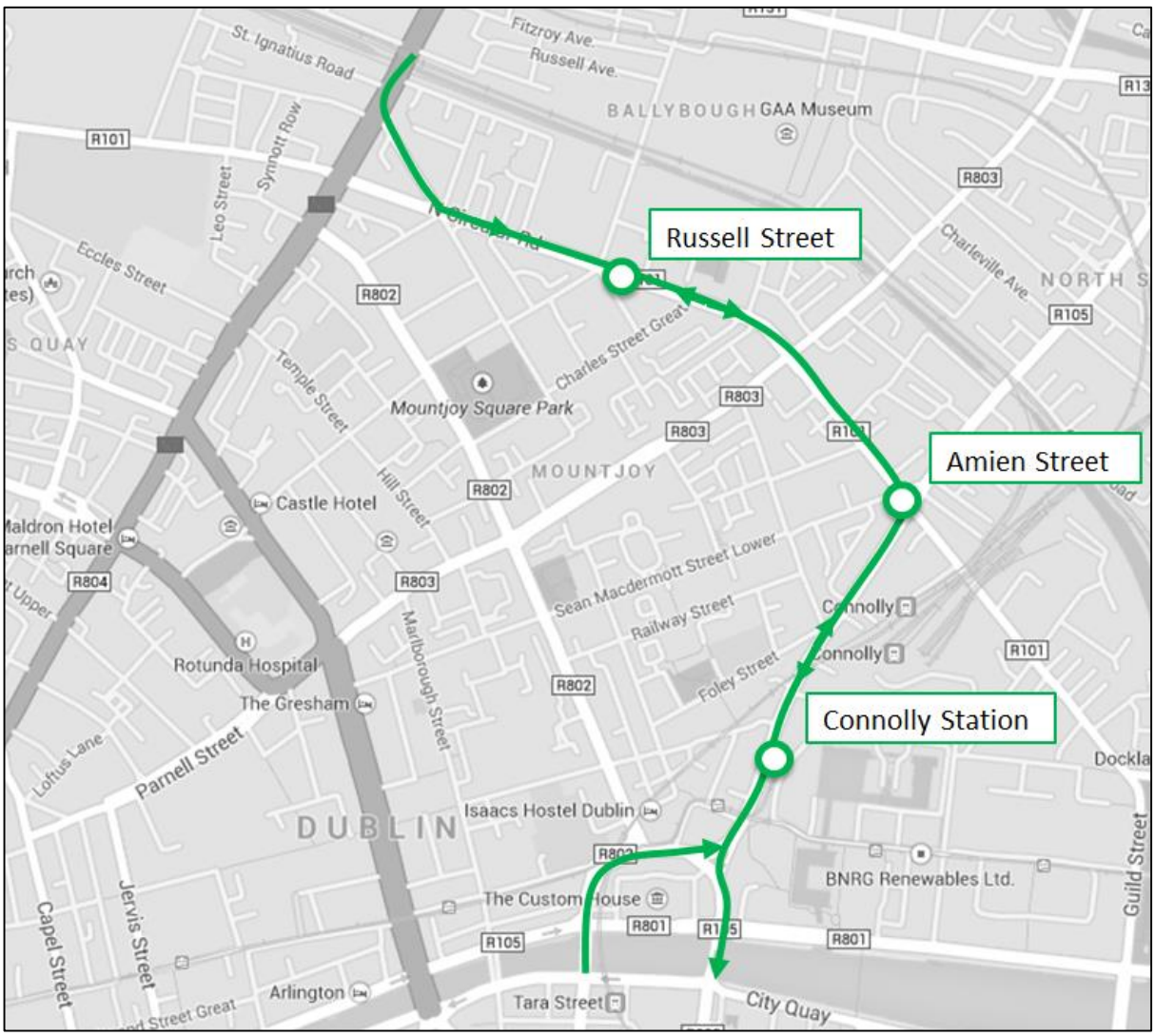

Figure 9.4: Route Option N1 NCR / Amiens Street

Route option N1 would commence at Lower Drumcondra Road and run southbound along Dorset Street to the Belvidere Road junction. This route option would turn left onto Belvidere Road and left again onto North Circular Road, continuing to the Five Lamps junction via Portland Row.

The route option would turn right at the Five Lamps junction onto Amiens Street, continuing to Memorial Road and Talbot Memorial Bridge.

The northbound routing would follow the same streets except at the Beresford Place area, where it would follow the existing gyratory traffic system via Beresford Place West to connect Butt Bridge to Amiens Street.

Stops: A total of 3 stops would most likely be provided, at Russell Street (North Circular Road), Amiens Street (Five Lamps) and Connolly Station.

The distance for this route option is approximately 2.2 km and the journey time would be between 7 and 8 minutes.

The roads followed generally have cycling facilities present, either separate or within bus lanes. Bus lanes are present on Dorset Street and Amiens Street.

There is frontage residential access onto all streets traversed except for Amiens Street and Beresford Place / Memorial Road. There is some retail activity on Dorset Street and Amiens Street, as well as associated on-street commercial parking and loading facilities.

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

- Considerable reconfiguration of street cross-sections to achieve continuous high-quality provision for Swiftway and cyclists;
- The need to reconfigure and / or rationalise existing bus stopping patterns;
- Extensive removal of on-street parking, in particular on North Circular Road, Portland Row and Amiens Street; and
- The need to maintain access, residential parking, some commercial parking and essential loading facilities.

9.4.3 Route Option N2: Belvidere Road / Mountjoy Square / Gardiner Street

Route option N2 via Belvidere Road / Mountjoy Square / Gardiner Street is presented in **Figure 9.5**.

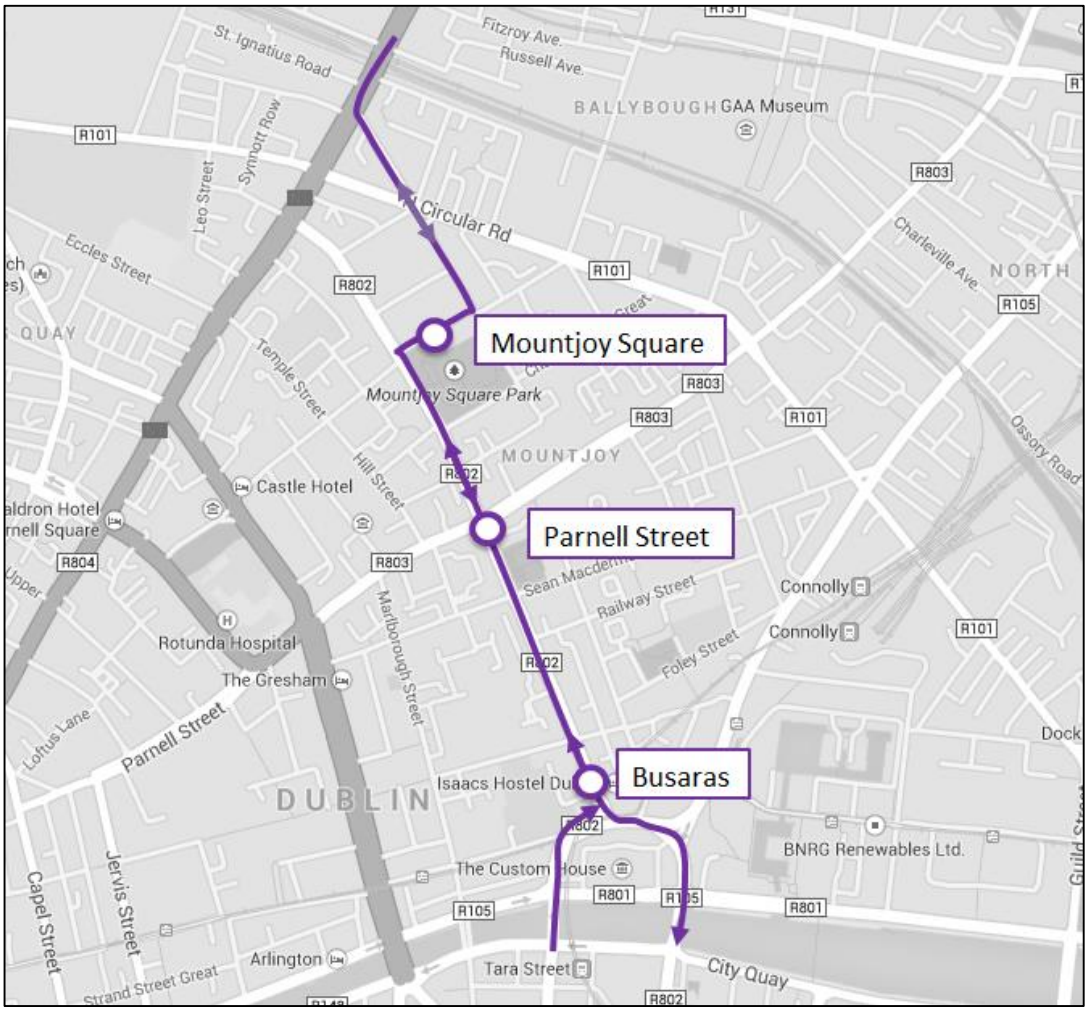

Figure 9.5: Route Option N2 Belvidere Road / Mountjoy Square / Gardiner Street

Route option N2 would commence at Lower Drumcondra Road and run southbound along Dorset Street to the Belvidere Road junction. This route option would turn left onto Belvidere Road and onto Belvidere Place before turning right onto either Mountjoy Square North or South. The route option would then turn left onto Gardiner Street as far as Beresford Place, continuing to Memorial Road and Talbot Memorial Bridge.

The northbound routing would follow the same streets except at the Beresford Place area, where it would follow the existing gyratory traffic system via Beresford Place West to connect Butt Bridge to Gardiner Street.

Stops: A total of 3 stops would most likely be provided, at Mountjoy Square, Parnell Street and Busáras.

The distance for this route option is approximately 1.9 km and the journey time would be between 7 and 8 minutes.

Cyclists are accommodated within the bus lanes on Dorset Street and there are sections of bus and bus / cycle lane on Gardiner Street.

There is limited frontage residential access along the route – except on Dorset Street Upper and Gardiner Street Upper. There is some retail activity on Dorset Street, as well as associated on-street commercial parking and loading facilities.

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

- Considerable reconfiguration of street cross-sections to achieve continuous high-quality provision for Swiftway and cyclists;
- The need to reconfigure and / or rationalise existing bus stopping patterns;
- Removal of some on-street parking; and
- The need to maintain access, residential parking, some commercial parking and essential loading facilities.

9.4.4 Route Option N3: Dorset Street / Frederick Street North / O'Connell Street

Route option N3 via Dorset Street / Frederick Street North / O'Connell Street is presented in **Figure 9.6**.

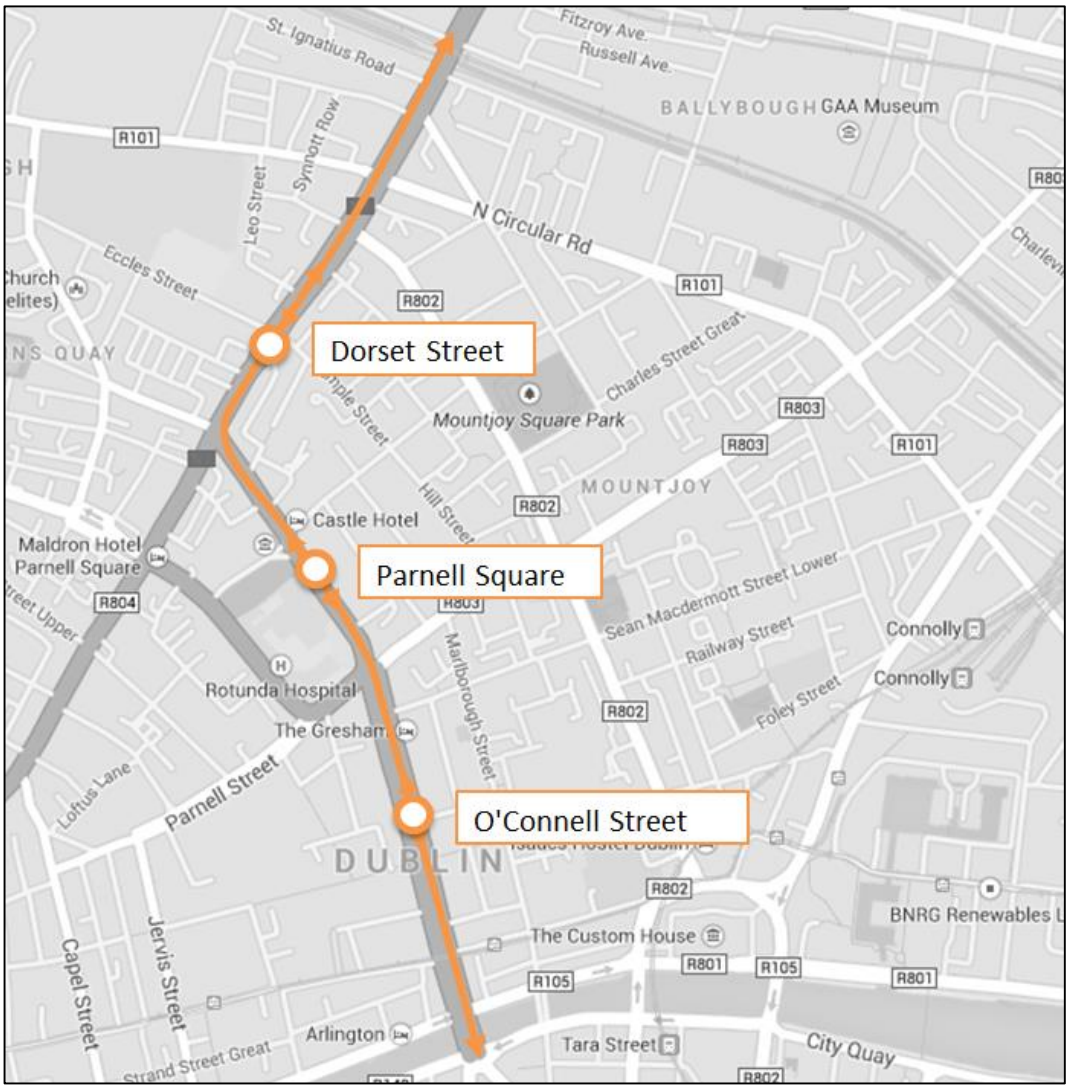

Figure 9.6: Route Option N3 Dorset Street / Frederick Street North / O'Connell Street

Route option N3 would commence at Lower Drumcondra Road and run southbound along Dorset Street to the North Frederick Street junction. The route option would turn left onto North Frederick Street and would continue to O'Connell Street via Parnell Square East and Cavendish Row. The route would connect to O'Connell Bridge at the southern end of O'Connell Street.

The northbound routing would follow the same streets, which would require amendments to Cavendish Row and Parnell Square East to accommodate northbound movements from O'Connell Street.

Stops: A total of 3 stops would most likely be provided, at Dorset Street, Parnell Square and O'Connell Street.

The distance for this route option is approximately 1.8 km and the journey time would be between 6 and 7 minutes.

Cyclists are accommodated within the bus lanes on Dorset Street and there are bus and cycle lanes on O'Connell Street. General traffic is permitted to turn right only at the bottom of Parnell Square, with buses and cyclists permitted to travel straight and left.

There is limited frontage residential access along the route – except on Dorset Street Upper and North Frederick Street. There is some retail activity on Dorset Street, as well as associated on-street commercial parking and loading facilities. There is significant retail activity on O'Connell Street, but associated parking and loading facilities are provided separately on side streets.

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

- Considerable reconfiguration of street cross-sections to achieve continuous high-quality provision for Swiftway and cyclists;
- The need to reconfigure and / or rationalise existing bus stopping patterns;
- Interaction with Luas Cross-City on O'Connell Street;
- The need to reconfigure Parnell Square East and Cavendish Row to establish a direct northbound route for buses from O'Connell Street. The treatment of the junction of Parnell Street and O'Connell Street would be significant for this route option, because of the multiple interactions with Luas Cross-City at the junction;
- Removal of some on-street parking; and
- The need to maintain access, residential parking, some commercial parking and essential loading facilities.

9.4.5 Route Option N4: Belvidere Road / Mountjoy Square / Great Denmark Street / O'Connell Street

Route option N4 via Belvidere Road / Mountjoy Square / Great Denmark Street / O'Connell Street is presented in **Figure 9.7**.

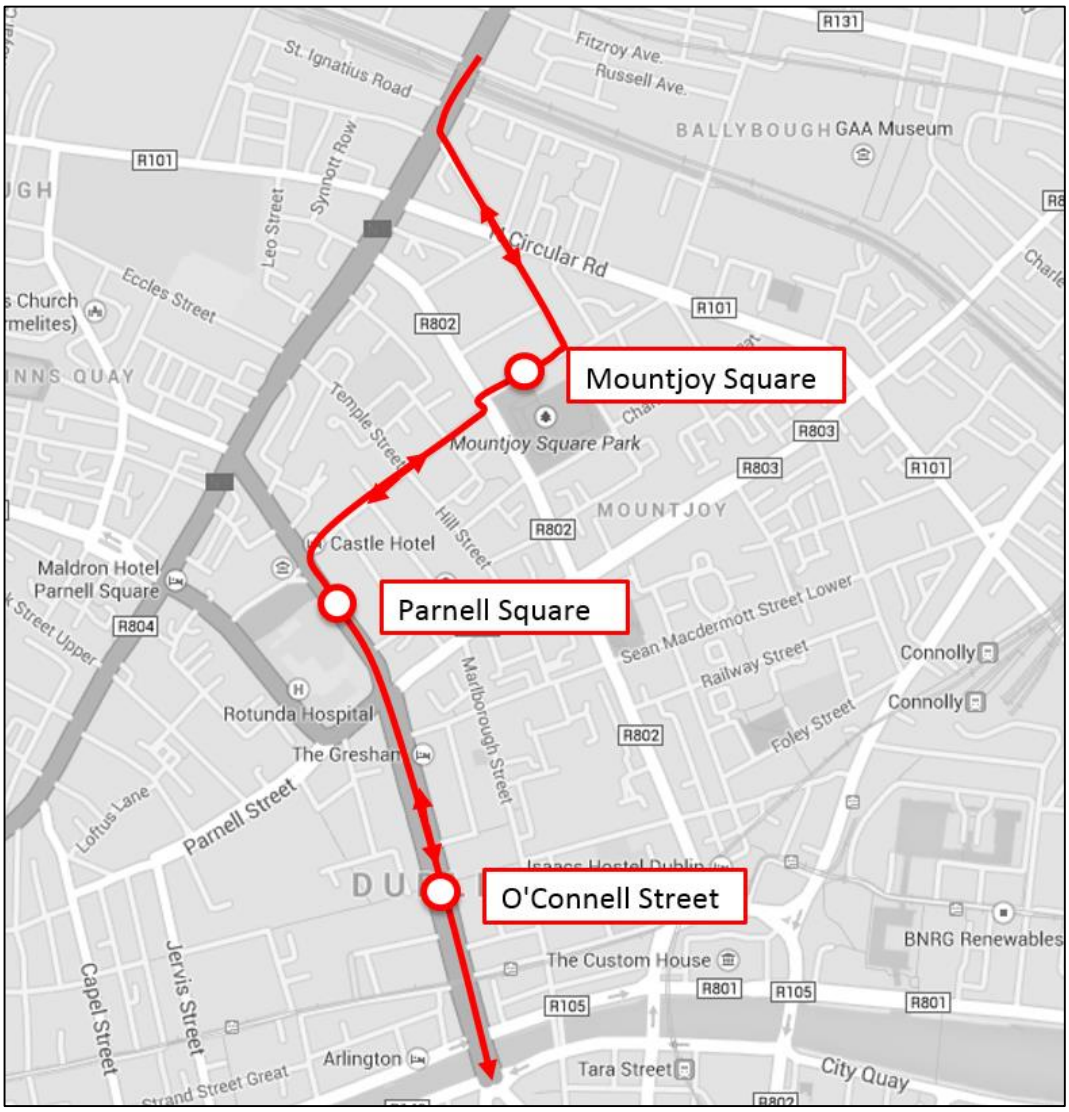

Figure 9.7: Route Option N4 Belvidere Road / Mountjoy Square / Great Denmark Street / O'Connell Street

Route option N4 would commence at Lower Drumcondra Road and run southbound along Dorset Street to the Belvidere Road junction. This route option would turn left onto Belvidere Road and onto Belvidere Place before turning right onto Mountjoy Square North. The route option would then continue onto Gardiner Place and then to Great Denmark Street. The route option would turn left onto Parnell Square East and onto Cavendish Row. The route would connect to O'Connell Bridge at the southern end of O'Connell Street.

The northbound routing would follow the same streets, which would require amendments to Cavendish Row and Parnell Square East to accommodate northbound movements from O'Connell Street.

Stops: A total of 3 stops would most likely be provided, at Mountjoy Square, Parnell Square and O Connell Street.

The distance for this route option is approximately 2.0 km and the journey time would be between 7 and 8 minutes.

The roads followed generally have cycling facilities present, either separate or within bus lanes. Cyclists are accommodated within the bus lanes on Dorset Street and there are bus and cycle lanes on O'Connell Street. General traffic is permitted to turn right only at the bottom of Parnell Square, with buses and cyclists permitted to travel straight and left.

There is frontage residential access along the route on Dorset Street Upper, Belvidere Road, Mountjoy Square North and Gardiner Place. There is some retail activity on Dorset Street, as well as associated on-street commercial parking and loading facilities. There is significant retail activity on O'Connell Street, but associated parking and loading facilities are provided separately on side streets.

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

- Considerable reconfiguration of street cross-sections to achieve continuous high-quality provision for Swiftway and cyclists;
- The need to reconfigure and / or rationalise existing bus stopping patterns;
- Interaction with Luas Cross-City on O'Connell Street;
- The need to reconfigure Parnell Square East and Cavendish Row to establish a direct northbound route for buses from O'Connell Street. The treatment of the junction of Parnell Street and O'Connell Street would be significant for this route option, because of the multiple interactions with Luas Cross-City at the junction;
- Removal of some on-street parking; and
- The need to maintain access, residential parking, some commercial parking and essential loading facilities.

9.4.6 Stage 2 Route Options Assessment

The 'Stage 2' route options assessment summary table for the North City Centre route options is presented in **Appendix A6**.

The relative ranking of route options against the scheme assessment sub-criteria is summarised in **Table 9.2**.

Table 9.2: Section 3A - North City Centre Route Options Assessment Summary (Sub-Criteria)

Assessment Criterion	Assessment Sub-Criterion	N1 (NCR / Amiens Street)	N2 (Dorset / Gardiner Street)	N3 (Dorset / O'Connell Street)	N4 (Mountjoy / O'Connell Street)
Economy	Capital Cost				
	Operation & Maintenance				
	Transport Reliability and Quality of Service				
Integration	Land Use Integration				
	Residential Population and Employment Catchments				
	Transport Network Integration				
	Cycling integration				
Accessibility and Social Inclusion	Key Trip Attractors				
	Deprived Geographic Areas				
Safety	Road Safety				
	Pedestrian Safety				
Environment	Archaeology and Cultural Heritage				
	Architectural Heritage				
	Flora and Fauna				
	Soils and Geology				
	Hydrology				
	Landscape and Visual				
	Air Quality				
	Noise & Vibration				
	Land Use Character				

In terms of 'Economy', route options N1 and N4 have a higher capital cost compared to other options considered. They also have higher associated operation and maintenance costs. In terms of transport reliability and quality of service, route option N3 offers slightly quicker journey times but all route options are considered to be neutral under this sub-criterion.

In terms of 'Integration', route option N1 which travels along North Circular Road and Amiens Street, would serve slightly lower residential catchments across all bands and significantly lower employment numbers. All other route options would serve similar numbers of residential populations and employment numbers. Route options N3 and N4 are also considered to integrate better with the transport network with better opportunity for interchange between modes and better integration with the cycle network.

Under the 'Accessibility and Social Inclusion' criterion, route options N3 and N4 rank better under the key trip attractors sub-criterion, while N1 and N2 better serve the Dublin North East Inner City RAPID area. Therefore on balance, all routes are considered to be neutral under the 'Accessibility and Social Inclusion' criterion.

Under 'Safety', route option N3 which requires one less turn movement than other route options, is considered to rank slightly higher than other route options.

In terms of 'Environment', route options N1 and N2 are considered to have less potential for environmental impacts. The proximity of route option N4 to a large number of protected structures as well as the routing adjacent to Mountjoy Square lowers the rank of this route option. Similarly, route N3 ranks lower against archaeology and cultural heritage, and landscape and visual.

A summary of the assessment and relative ranking of route options against the five main assessment criteria is presented in **Table 9.3**.

Table 9.3: Section 3A - North City Centre Route Options Assessment Summary (Main Criteria)

Assessment Criteria	N1	N2	N3	N4
Economy				
Integration				
Accessibility & Social Inclusion				
Safety				
Environment				

Based on the assessment undertaken, it is apparent that route option N3, offers the most practical, deliverable route option for the following reasons:

- The lower capital cost and operation and maintenance cost compared to other route options;
- It has low and reliable journey times (6-7 minutes);

- It better integrates with the existing and planned transportation network for the city;
- It is consistent with, and would deliver part of the GDA cycle network;
- It serves a higher number of key trip attractors and greater population and employment catchments; and
- While it ranks lower than some other route options with respect to potential for environmental impact, these impacts can be mitigated through design.

Route option N3 was therefore identified as preferred for the North City Centre study area section, subject to the outcome of the assessment of the South City Centre route options assessment and confirmation that a viable continuation exists.

Route option N2 provides an alternative corridor to O'Connell Street to bring the Swiftway service to the South City Centre and on that basis has also been taken forward for further consideration in the transport assessment in Section 10.

9.5 City Centre Turnaround Options Assessment

In assessing options for extending the proposed Swords Swiftway service to the South City Centre, the first key consideration is the identification of possible southern route vehicle turnaround points. While it is not intended to lay-over Swiftway vehicles in the City Centre, provision is required to turn the 18-24 m long vehicles around for the return journey towards Swords. The driving factors that influenced the choice of potential southern vehicle turnaround locations are as follows:

a) To serve the office employment district in the Southeast City Centre around Merrion Square, Baggot Street and Leeson Street, which extends beyond the Grand Canal towards Ballsbridge and Burlington Road;

b) To serve the South City Centre retail core (Grafton Street) area;

c) To facilitate interchange with the planned Blanchardstown to UCD Swiftway service, (BxU) potentially in the vicinity of St. Stephen's Green or Leeson Street; and

d) To accommodate a suitable turning route for Swiftway vehicles.

Interchange with the Luas Green Line may also be desirable depending on the final route choice in the North City Centre. The initial route options assessment for the North City Centre described above has identified a preferred route option on O'Connell Street, which would accommodate direct interchange at that location.

A total of nine different possible turnaround options have been identified and assessed based on the above criteria and other relevant considerations (e.g. conflicting proposals by others). This has been used to determine the range of possible route options for consideration in the South City Centre. Potential turnaround locations assessed are presented in **Figure 9.8**.

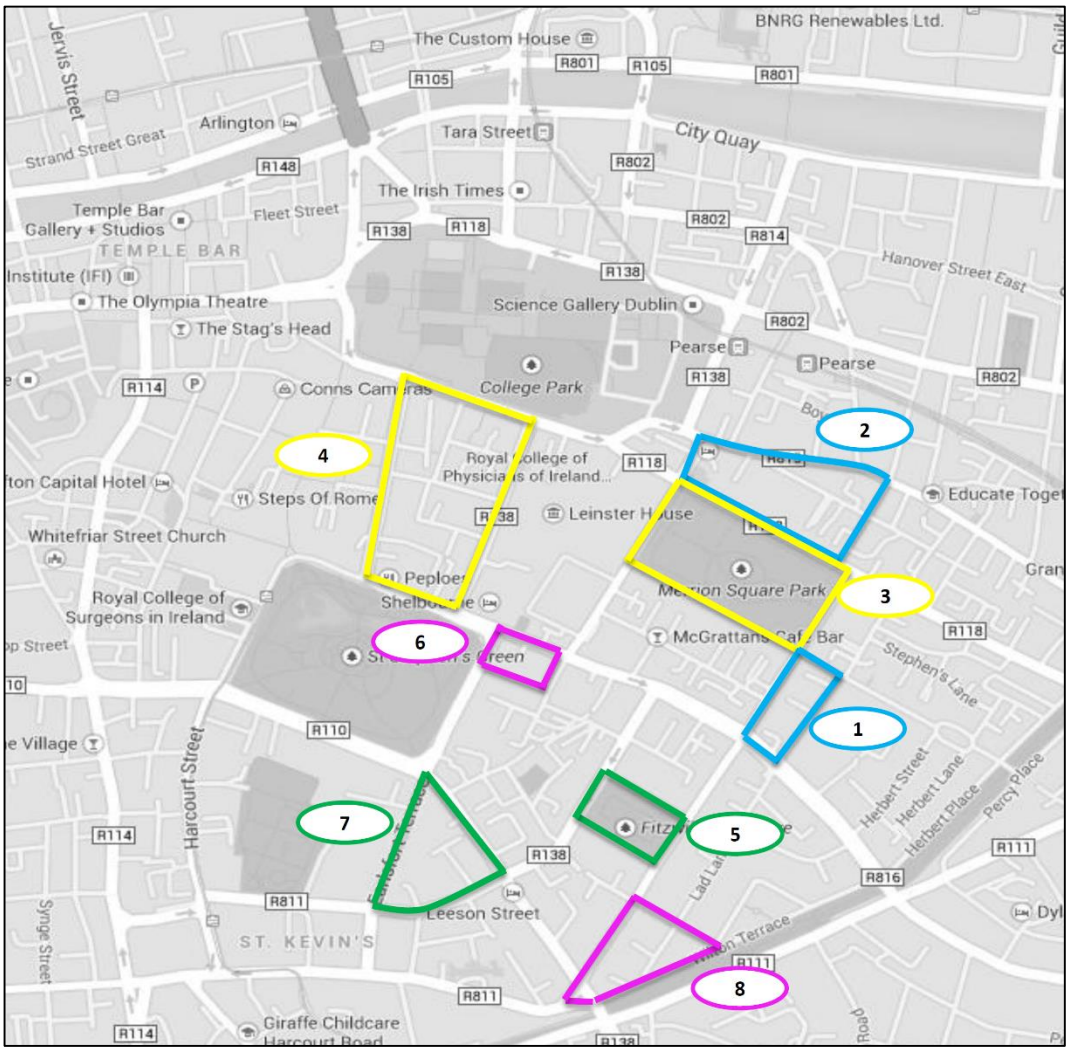

Figure 9.8: Possible Terminus Locations

A summary of the 'Stage 1' southern terminus / turnaround location options assessment sifting process is presented in **Table 9.4**.

Table 9.4: City Centre Southern Turnaround Location Options Assessment Sifting Summary

Option	Location	Assessment	Conclusion
1	James' Street East accessed via Fitzwilliam Street Baggot Street Mount Street Upper	Pros • Serves the Southeast City Centre employment zone. Cons • Remote from South City Centre retail core at Grafton Street area; • Does not facilitate interchange with BxU, unless future extension of scheme and adaptation of service pattern can be accommodated; • Very difficult geometry for Swiftway vehicles due to acute angles of turn and narrowness of James's Street East; and • Difficult to accommodate long Swiftway vehicles without obstructing entrances.	Fail
2	Fenian Street accessed via Lincoln Place, Merrion Square North, Holles Street Hogan Place	Pros • Serves the Southeast City Centre employment zone. • Geometry suited to Swiftway vehicles. Cons • Does not facilitate interchange with BxU, unless future extension of scheme and adaptation of service pattern can be accommodated; • Long walk time to South City Centre retail core at Grafton Street area; and • Local shared running with major traffic route on Holles Street, which is too narrow to accommodate Swiftway priority.	Fail
3	Merrion Square	Pros • Serves the Southeast City Centre employment zone; and • Geometry suited to Swiftway vehicles. Cons • Does not facilitate interchange with BxU, unless future extension of scheme and adaptation of service pattern can be accommodated; • Long walk time to South City Centre retail core at Grafton Street area; and • Local shared running with major traffic route on constrained section of Fitzwilliam Street.	Fail

Option	Location	Assessment	Conclusion
4	Kildare Street / Dawson Street	Pros • Serves South City Centre retail core at Grafton Street area; and • Geometry suited to Swiftway vehicles. Cons • Does not directly serve Merrion Square area and remote from the broader southeast City Centre employment zone, which extends towards Ballsbridge; • Does not facilitate interchange with BxU, unless future extension of scheme and adaptation of service pattern can be accommodated; and • Shared running with Luas on Dawson Street, where priority cannot be assured.	Fail
5	Fitzwilliam Square accessed via Merrion Street Baggot Street Pembroke Street; return via Fitzwilliam Street Merrion Square South.	Pros • Serves the Southeast City Centre employment zone; and • Geometry suited to Swiftway vehicles. Cons • Does not serve South City Centre retail core at Grafton Street area; • Does not facilitate direct interchange with BxU (although short walking distance via Pembroke Street); • Difficult turn for Swiftway vehicles at Merrion Street / Baggot Street; and • Local shared running with major traffic route on Baggot Street.	Fail
6	Hume Street accessed via Ely Place; return via Merrion Row, Merrion Street	Pros • Serves Southeast City Centre employment zone and South City Centre retail core at Grafton Street area. Cons • Does not facilitate direct interchange with BxU (although short walking distance via St. Stephen's Green East); and • Very difficult geometry for Swiftway vehicles due to acute angles of turn and narrowness of Merrion Row. This would also require traffic restrictions on Merrion Row.	Fail
7	Earlsfort Terrace	Pros	

Option	Location	Assessment	Conclusion
	return via Leeson Street or Harcourt Street	• Serves Southeast City Centre employment zone and South City Centre retail core at Grafton Street area; • Interchange with BxU on Leeson Street; and • Geometry suited to Swiftway vehicles. Cons • May require traffic circulation changes in the area.	Pass
8	Wilton Terrace accessed via Leeson Street; Cumberland Road, Fitzwilliam Street.	Pros • Serves southeast City Centre employment zone; • Interchange with BxU on Leeson Street; and • Geometry suited to Swiftway Vehicles. Cons • Remote from Grafton Street retail quarter – although this could be addressed by appropriate upstream routing; and • Local shared running with major traffic routes on Leeson Street and Fitzwilliam Street.	Pass
9	Leeson Street Upper / Sussex Road	Pros • Serves southeast City Centre employment zone; and • Interchange with BxU on Leeson Street. Cons • Remote from Grafton Street retail quarter – although this could be addressed by appropriate upstream routing; • Very difficult turn for Swiftway vehicles turning from Sussex Road onto Leeson Street that may require traffic restrictions; and • Local shared running with major traffic routes on Leeson Street and Fitzwilliam Street.	Fail

Only two of the turnaround options considered achieve the four objectives identified for the turnaround facility. Therefore, these options have been retained for further consideration. Each would require modifications to the surrounding road network to achieve Swiftway priority while retaining essential traffic access and egress capacity to and from the central city area.

The southern turnaround options will be considered in the context of the route options that emerge from the Stage 1 sifting process for the South City Centre below.

9.6 Stage 1: South City Route Options Assessment

Having identified possible turnaround options for the proposed scheme in the South City Centre, a range of route options that can link these to the River Liffey was then identified for assessment.

Within this study area section, any route option that can achieve a reasonably direct connection to and from the bridges identified in report Section 9.1 has been considered, with the exception of narrower laneways or streets that would form part of an excessively circuitous route (e.g. Fenian Street).

The 'Stage 1' route option sifting process assesses route options within the study area section at a high level as described in report Section 5.2. **Figure 9.9** presents the initial potential route options identified in study area Section 3B. A summary of the route options sifting process is presented in **Table 9.5**.

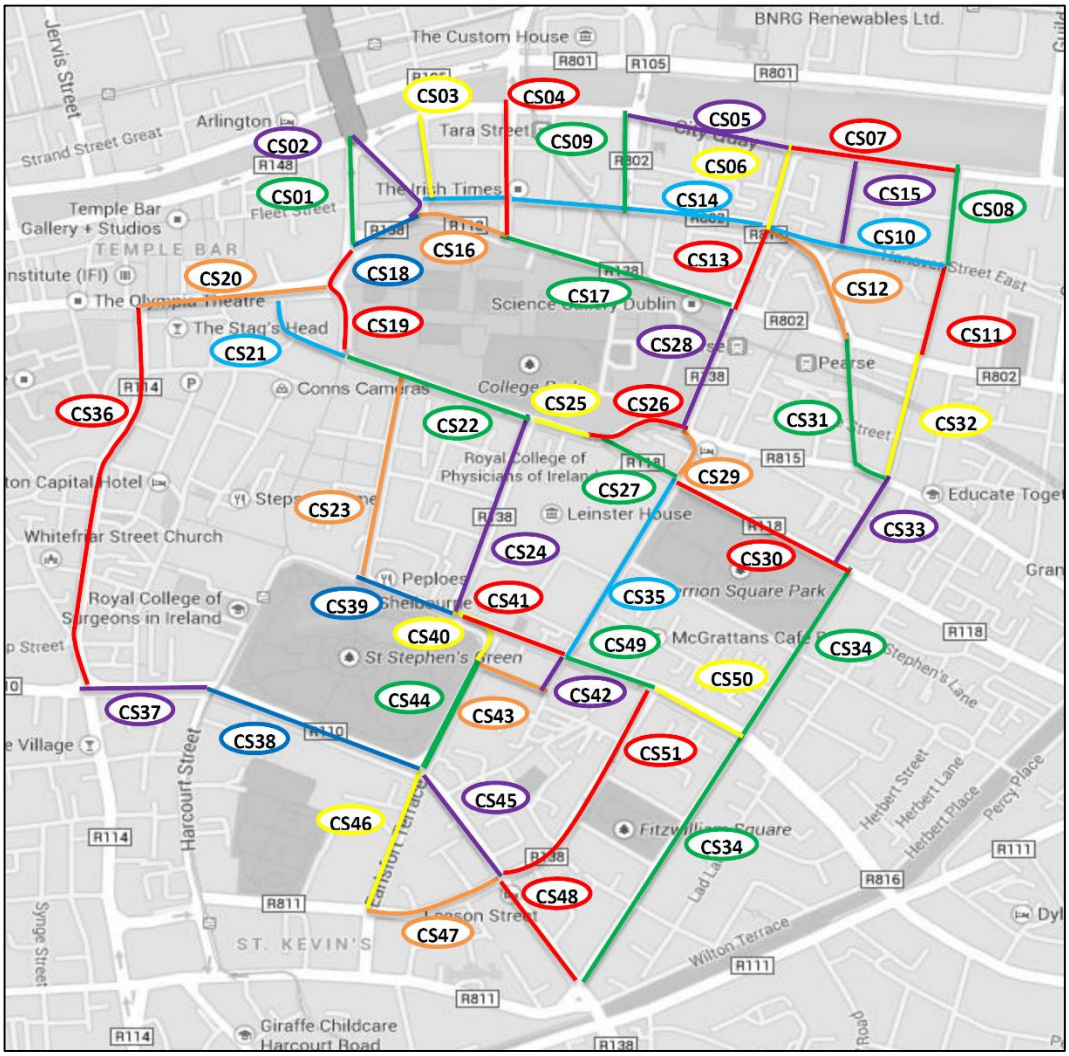

Figure 9.9: Section 3B Route Options – River Liffey to St. Stephen's Green

Table 9.5: Section 3B Route Option Sifting (Stage 1) Summary – River Liffey to St. Stephen's Green

Route Number	Description	Comments	Pass/Fail
CS1	Westmoreland Street	Westmoreland Street is sufficiently wide to accommodate a Swiftway scheme, notwithstanding that Luas Cross City will remove one lane of traffic. The bus gate at College Green limits general traffic access to the area and the current traffic capacity is more than what is required.	Pass
CS2	D'Olier Street	D'Olier Street is adequately wide to accommodate a Swiftway scheme. The bus gate at College Green limits general traffic access to the area and the current traffic capacity is more than what is required.	Pass
CS3	Hawkins Street	Hawkins Street currently carries two traffic lanes southbound. Following the construction of Luas Cross City, there will be one Luas only lane and one southbound traffic lane. There is no scope for a northbound Swiftway on the street, requiring the northbound movement to be accommodated on a parallel street. Luas will be the priority service on the street and Swiftway would therefore have to operate on secondary priority. It is likely that Luas and Swiftway would cause each other delays if both were routed along this street and it has therefore not been considered further.	Fail
CS4	Tara Street	Tara Street currently carries between three and four northbound lanes of traffic linking Pearse Street to Gardiner Street and Amiens Street. The general through traffic movement is two lanes of traffic, with additional lanes provided for turning traffic. With rationalisation of the lane arrangements at junctions, it is considered possible to reconfigure the road cross section to remove one traffic lane and provide a bus / BRT lane northbound without having a significant adverse impact on traffic. It would not be possible to also accommodate a southbound Swiftway service on this link, given the other demands for limited road space and it would therefore be necessary to retain the existing gyratory arrangement with southbound traffic routed via City Quay and Lombard Street to Pearse Street.	Pass
CS5	City Quay (Moss Street to Lombard Street)	City Quay currently carries between two and three eastbound lanes of traffic linking Talbot Memorial Bridge to Lombard Street. Upstream access to City Quay is from either Memorial Road or Custom House Quay via Talbot Memorial Bridge. The configuration of these approaches is such that approaching traffic never exceeds one traffic lane's capacity.	Pass

Route Number	Description	Comments	Pass/Fail
		On that basis, it is considered possible to reconfigure the road cross section to remove one traffic lane and provide a bus / BRT lane in its place without having a significant adverse impact on traffic. It would not be possible to accommodate a westbound Swiftway service on this street and it would therefore be necessary to retain the existing gyratory arrangement with northbound traffic routed via Pearse Street and Tara Street.	
CS6	Lombard Street East (City Quay to Townsend Street)	Lombard Street East currently carries between two and three southbound lanes of traffic linking City Quay to Sandwith Street and Westland Row. The configuration of the upstream route approaches is such that approaching traffic never exceeds a single lane of traffic. On that basis, it is considered possible to reconfigure the road cross-section to remove one traffic lane and provide a bus / BRT lane in its place without having a significant adverse impact on traffic. It would not be possible to accommodate a northbound Swiftway service on this street and it would therefore be necessary to retain the existing gyratory arrangement with northbound traffic routed via Pearse Street and Tara Street.	Pass
CS7	City Quay / Sir John Rogerson's Quay (Lombard Street to Erne Street)	Any route option along this section of City Quay would require Swiftway vehicles to negotiate either the corner of City Quay and Lime Street or the corner of City Quay and Creighton Street. The latter in particular is prohibitively tight and both are too tight to accommodate two-way Swiftway movements. The Lime Street route option would require the Swiftway to pass beneath the railway bridge on Erne Street Upper, which has a height constraint of 3.24m that would require the Swiftway vehicle to traverse only the central 3m of the span. Furthermore, this Swiftway route option would need to continue onto Holles Street, which is a very heavily trafficked orbital route with a hospital on one side. This latter route option is not considered appropriate to carry Swiftway vehicles, as it would not be possible to provide the requisite priority for a Swiftway route.	Fail
CS8	Lime Street	Refer to CS7 above.	Fail
CS9	Moss Street	Moss Street affords a possible alternative to a southbound Swiftway service on Lombard Street or a northbound Swiftway service on Tara Street, subject to amendments to local traffic circulation arrangements.	Pass

Route Number	Description	Comments	Pass/Fail
		Should a route option traversing the Pearse Street / Tara Street / City Quay / Lombard Street emerge as preferred, local alternative routing along Moss Street and Shaw Street should be considered and compared to determine if their use as part of a revised local traffic circulation system would offer any additional benefits.	
CS10	Townsend Street East / Hanover Street East (Lombard Street to Erne Street)	This route option would require Swiftway vehicles to negotiate the corner of Hanover Street East and Erne Street, which is too tight to accommodate two-way Swiftway movements. This route option would also require the Swiftway to pass beneath the railway bridge on Erne Street Upper, which has a height constraint of 3.24m that would require the Swiftway vehicle to traverse only the central 3m of the span. Furthermore, this route option would need to continue onto Holles Street, which is a very heavily trafficked orbital route with a hospital on one side. This latter route option is not considered appropriate to carry Swiftway vehicles, as it would not be possible to provide the requisite priority for a Swiftway route.	Fail
CS11	Erne Street Lower	See CS10 above.	Fail
CS12	Sandwith Street Lower	This route option is wide enough to accommodate Swiftway. This route option would require the Swiftway vehicles to pass under the railway bridge on Sandwith Street Upper, however, it appears the profile of the soffit of the bridge, which has clearance of 3.68m over the central 3m is adequate to accommodate two Swiftway vehicles passing each other beneath through the central 6m. However, this Swiftway route option would necessarily continue onto Holles Street, which is a very heavily trafficked orbital route with a hospital on one side. This latter route option is not considered appropriate to carry Swiftway vehicles, as it would not be possible to provide the requisite priority for a Swiftway route.	Fail
CS13	Lombard Street East (Townsend Street to Pearse Street)	Lombard Street East currently carries two southbound lanes of traffic between Townsend Street and Pearse Street, as well as a cycle lane and parking on both sides. The configuration of the upstream access route approaches is such that approaching traffic never exceeds a single lane of traffic. On that basis, it is considered possible to reconfigure the road cross section to remove one traffic lane and provide a bus / BRT lane in its place without having a significant adverse impact on traffic.	Pass

Route Number	Description	Comments	Pass/Fail
		It would not be possible to accommodate a northbound Swiftway on this link and it would therefore be necessary to retain the existing gyratory arrangement with northbound traffic routed via Pearse Street and Tara Street.	
CS14	Townsend Street (Tara Street to Lombard Street)	Townsend Street currently carries two eastbound traffic lanes, forming part of a local gyratory system with Pearse Street. However, while Pearse Street carries significant through traffic, Townsend Street does not, with upstream approaching traffic constrained by inter alia, traffic lights, lane configuration and the bus gate at College Green. On that basis, it is considered possible to reduce traffic capacity to one traffic lane and designate the other lane as a bus lane. There is no scope to accommodate two-way Swiftway services on this street and the westbound movement would have to be accommodated on Pearse Street.	Pass
CS16	Creighton Street	The corner of City Quay and Creighton Street is too tight for two Swiftway vehicles to pass and the southbound manoeuvre is particularly challenging. Furthermore, this Swiftway route option would need to continue onto Holles Street, which is a very heavily trafficked orbital route with a hospital on one side. This latter route option is not considered appropriate to carry Swiftway vehicles, as it would not be possible to provide the requisite priority for a Swiftway route.	Fail
CS16	Pearse Street (Tara Street to College Street)	This section of Pearse Street is currently restricted to Bus and Garda vehicle access only. There is extensive parking provision for Garda vehicles outside Pearse Street Garda Station. It is considered that the latter could be rationalised to provide more space for public transport services.	Pass
CS17	Pearse Street (Westland Row to Tara Street)	This section of Pearse Street carries between three and four westbound lanes, one of which is currently designated a bus lane. Sections of parking are currently being removed to allow for a second bus lane westbound and retention of two general traffic lanes. Therefore, there is sufficient provision for Swiftway westbound on this street. It would not be possible to accommodate an eastbound Swiftway service on this route option due to the various other demands on the available road space, and it would therefore be necessary to retain the existing gyratory arrangement with eastbound traffic routed via Townsend Street or City Quay and Lombard Street.	Pass

Route Number	Description	Comments	Pass/Fail
CS18	College Street	College Street currently carries three to four westbound lanes, two of which are designated as bus lanes. One of the latter is to be removed to accommodate Luas Cross-City's southbound track. The extension of the College Green bus gate traffic restriction will significantly restrict general traffic access to the area and it is considered possible to accommodate Swiftway in the remaining road space after the construction of Luas Cross-City.	Pass
CS19	Lower Grafton Street	Lower Grafton Street currently carries two traffic lanes southbound. Both the northbound and southbound tracks of Luas Cross-City are to run along this street. Luas will be the priority service on the street and Swiftway would therefore have to operate on secondary priority. It is likely that Luas and Swiftway would cause each other delays if both were routed along this corridor and it has therefore not been considered further.	Fail
CS20	Dame Street (College Green to George's Street)	Dame Street is adequately wide to accommodate the Swiftway route. The bus gate at College Green limits general traffic access to the area and the current traffic capacity is more than what is required. The interface crossing the Luas line at College Green would require detailed consideration. However, provision for regular bus service(s) to cross the Luas line is required in any event and it is anticipated that Swiftway could avail of the same provision. However, as George's Street has not been considered for the Swords / Airport to City Centre Swiftway Scheme (refer to CS36), this option has not been considered further.	Fail
CS21	Suffolk Street	Suffolk Street is currently only accessible via Nassau Street West. Both the northbound and southbound tracks of Luas Cross-City are to run along the latter. Luas will be the priority service on the street and Swiftway would therefore have to operate on secondary priority. It is likely that Luas and Swiftway would cause each other delays if both were routed along this corridor and this route option has therefore not been considered further.	Fail
CS22	Nassau Street	Both the northbound and southbound tracks of Luas Cross-City are to run along Nassau Street West. Luas will be the priority service on the street and Swiftway would therefore have to operate on secondary priority. It is likely that Luas and Swiftway would cause each other delays if both were routed along this corridor and this route option has therefore not been considered further.	Fail

Route Number	Description	Comments	Pass/Fail
CS23	Dawson Street	Dawson Street currently carries two traffic lanes northbound. Following the construction of Luas Cross City, there will be one Luas / Bus lane and another lane alternating between carrying northbound and southbound traffic. There is therefore no scope for Swiftway on the street, as Luas and Swiftway would cause each other delays if both were routed along this corridor and it has therefore not been considered further.	Fail
CS24	Kildare Street	Kildare Street currently carries 2 southbound traffic lanes but is to be reconfigured to carry one lane in each direction. The northbound direction may carry a bus only restriction north of Molesworth Street. The corner of Kildare Street and Leinster Street is too tight to accommodate simultaneous two-way Swiftway movements through. Finally, the area in front of Dáil Éireann is prone to closure for demonstrations on a regular basis. For these reasons, this route option is not considered to be workable for a Swiftway service.	Fail
CS25	Leinster Street	Any route option via Leinster Street would have to continue via Kildare Street, as Nassau Street West and Dawson Street will be occupied by Luas. As Kildare Street has been ruled out (see CS24), this route option has not been considered further.	Fail
CS26	Lincoln Place (Leinster Street to Westland Row)	This section of Lincoln Place could be required to link a Swiftway route on Westland Row to either Leinster Street or Merrion Street. Leinster Street has been ruled out (see CS25). In terms of connection to Merrion Street, the turn from Clare Street would require a very wide swept path, requiring revisions to the existing traffic circulation regime. In conjunction with changes to the upstream and downstream traffic circulation regime, which will be required to achieve Swiftway priority on Westland Row (refer to CS28), this is considered feasible.	Pass
CS27	Clare Street	A route option along Clare Street could be required to link a Swiftway route on Westland Row to either Leinster Street or Merrion Street. Leinster Street has been ruled out (see CS25). In terms of connection to Merrion Street, the turn from Clare Street would require a very wide swept path, requiring revisions to the existing traffic circulation regime. In conjunction with changes to the upstream and downstream traffic circulation regime, which will be required to achieve Swiftway	Pass

Route Number	Description	Comments	Pass/Fail
		priority on Westland Row (refer to CS28), this is considered feasible.	
CS28	Westland Row	Westland Row currently carries a general traffic lane in each direction, a bus lane northbound and a cycle lane southbound. The footpaths are quite narrow and there is no scope to further narrow them. However, there is a very limited range of north-south route options past Trinity College, and Grafton Street Lower and Holles Street have already been ruled out. Westland Row offers the greatest potential of the route options east of Trinity to accommodate a Swiftway route but certain traffic circulation restrictions will be required upstream and downstream to reduce the existing traffic flows on the street and to encourage private car traffic to direct to other routes further east.	Pass
CS29	Lincoln Place (Westland Row to Merrion Street Lower) / Merrion Street Lower	Merrion Street Lower currently has excessive width and there is scope to provide two-way Swiftway priority. However the short section of Lincoln Place between Merrion Street and Westland Row is too narrow to accommodate the swept path of two Swiftway vehicles through simultaneously and it is likely therefore that any route option through this area would either follow the existing gyratory arrangement via Clare Street or operate on a shuttle basis. Subject to implementation of traffic circulation amendments in the area, it would be possible to link Merrion Street to Westland Row for a Swiftway route through this area.	Pass
CS30	Merrion Square North	Merrion Square North currently carries a bus lane and a traffic lane in each direction, with car parking along the side of the park and is therefore suitable for the Swiftway route. A route option along Merrion Square North would connect to Fitzwilliam Street.	Pass
CS31	Sandwith Street Upper / Hogan Place (Pearse Street to Holles Street)	This street is wide enough to accommodate Swiftway. This route option would require the Swiftway vehicles to pass under the railway bridge on Sandwith Street Upper, however, it appears the profile of the soffit of the bridge, which has clearance of 3.68m over the central 3m is adequate to accommodate two Swiftway vehicles passing each other through the central 6m of the span beneath. However, this Swiftway route option would need to continue onto Holles Street, which is a very heavily trafficked orbital route with a hospital on one side. This latter route option is not considered appropriate to carry Swiftway vehicles, as it would not be possible to provide the requisite priority for a Swiftway route.	Fail

Route Number	Description	Comments	Pass/Fail
CS32	Upper Erne Street	This route option would require the Swiftway to pass beneath the railway bridge on Erne Street Upper, which has a height constraint of 3.24m that would require the Swiftway vehicle to traverse only the central 3m of the span. Furthermore, this Swiftway route would need to continue onto Holles Street, which is a very heavily trafficked orbital route with a hospital on one side. This latter route option is not considered appropriate to carry Swiftway vehicles, as it would not be possible to provide the requisite priority for a Swiftway route).	Fail
CS33	Holles Street	Holles Street is a very heavily trafficked orbital route with a hospital on one side. Cars regularly stop indiscriminately along the side of the road – something which is to be expected and almost certainly uncontrollable outside a maternity hospital. The road is insufficiently wide to provide a bus lane on each side and traffic would have to be diverted off the route. As this link facilitates key orbital movement around the city centre, it would be problematic to implement this change, with no obvious alternative route available. For the above reasons, this route option has been ruled out from further consideration.	Fail
CS34	Fitzwilliam Street	Fitzwilliam Street is a wide street with one very wide traffic lane in each direction and nose to kerb parking on each side. There is ample width to reconfigure the carriageway to accommodate four lanes, and perhaps amending the parking to a parallel arrangement. Bus lanes could therefore be accommodated on this route option.	Pass
CS35	Merrion Street (Merrion Square North to Baggot Street)	Merrion Street is a very wide street, narrowing slightly at the Baggot Street end. It currently carries between one and two lanes southbound and one wide lane northbound. There is nose to kerb parking along the wider part of the street at Merrion Square. There is ample room to accommodate bus lanes on Merrion Street, if required. However, it would be desirable that any street reconfiguration would include footpath enhancements. The area in front of Dáil Éireann is somewhat prone to closure for demonstrations – albeit not as frequently as Kildare Street. It may be possible to widen the pedestrian areas sufficiently to accommodate demonstrations on the street while not requiring full road closures. There will however remain occasional requirements for full closures for more major demonstrations and events – e.g. the St. Patrick's Day Festival. However, Swiftway is	Pass

Route Number	Description	Comments	Pass/Fail
		more flexible than Luas and could potentially be occasionally rerouted for such occasions.	
CS36	South Great George's Street / Aungier Street	The NTA has identified that George's Street / Aungier Street is the most suitable route for the proposed Blanchardstown to UCD Swiftway Scheme. It is not considered practicable to achieve the requisite level of priority to convey more than one Swiftway service along the same street without imposing significant traffic restrictions, which would be extremely difficult to implement on George's Street due to the need to maintain access to parking and loading facilities. This route option has therefore not been considered further for the Swords / Airport to City Centre Swiftway scheme.	Fail
CS37	Cuffe Street	The Swords / Airport Swiftway service would only run along Cuffe Street if it were routed along George's Street – which has been ruled out (refer to CS36 above). This route option has therefore not been considered further.	Fail
CS38	St. Stephen's Green South	The Swiftway service would only run along St. Stephen's Green South if it were routed along George's Street – which has been ruled out (refer to CS36 above). This route option has therefore not been considered further.	Fail
CS39	St, Stephen's Green North (Dawson Street to Kildare Street)	As both Dawson Street and Kildare Street have been ruled out for Swiftway, this route option has not been considered.	Fail
CS40	St. Stephen's Green East (Hume Street to Merrion Row)	St. Stephen's Green North has been ruled out for Swiftway – See CS39. Merrion Row is also considered unsuitable – See CS41. On that basis, there is no demand for Swiftway on this section of St. Stephen's Green East.	Fail
CS41	Merrion Row	Merrion Row currently carries two traffic lanes and a partial bus lane westbound. Traffic conditions on the street are turbulent at best. Any increase in bus priority along the street would require restricting general traffic capacity, which is undesirable, at least in the short term pending more widespread traffic circulation amendments in the City Centre. Merrion Row is therefore not considered suitable for Swiftway in the short to medium term.	Fail
CS42	Ely Place	Ely Place is a residential / commercial street. It currently carries two lanes of traffic southbound, connecting to Hume Street, and providing access from the Merrion Square area towards St. Stephen's Green for cars and buses. There is parallel parking on both sides of the street. Almost all pedestrian activity is concentrated on Merrion Row and there is	Pass

Route Number	Description	Comments	Pass/Fail
		relatively little pedestrian traffic via Ely Place and Hume Street. On that basis, the street is considered suitable for Swiftway.	
CS43	Hume Street	Hume Street currently carries a traffic lane and a bus lane westbound with parking on both sides of the street. It is similar to Ely Place in character and is considered suitable for Swiftway.	Pass
CS44	St. Stephen's Green East	St. Stephen's Green East currently carries two very wide lanes of traffic northbound with a contraflow bus and cycle lane. There is parking on the St. Stephen's Green side. The park and surrounding footpath is a National Monument and the OPW is likely to resist any kerbline changes. However, the very wide carriageway has scope for reconfiguration to accommodate greater bus priority. This route option is considered suitable for Swiftway.	Pass
CS45	Lower Leeson Street	Lower Leeson Street currently carries 1-2 lanes of traffic and a partial bus lane inbound and a contraflow bus/cycle lane. The width of the street varies with a pinchpoint at Hourican's pub. It is envisaged that, in the medium term, the introduction of the Blanchardstown to UCD Swiftway service will require extensive revisions to general traffic circulation in the area to achieve a sufficient level of priority on this link for a Swiftway service. In the interim, adequate priority can be achieved for a single Swiftway service without requiring such extensive changes.	Pass
CS46	Earlsfort Terrace	Earlsfort Terrace is a wide street with wide lanes at present. Traffic demand is low due to upstream restrictions. There is scope to provide Swiftway priority on this route option.	Pass
CS47	Hatch Street	Hatch Street has a traffic lane in each direction and parking on both sides of the road. Traffic flows are very light and there is scope to provide Swiftway priority on this route option.	Pass
CS48	Upper Leeson Street	Upper Leeson Street currently carries a bus lane and a traffic lane in each direction and can accommodate Swiftway.	Pass
CS49	Baggot Street (Merrion Street to Pembroke Street)	This section of Baggot Street is quite narrow with narrow footpaths – very similar in character to Pembroke Street. There are various pubs and restaurants along this section of street and it faces many of the same issues as Merrion Row – see CS41. On that basis, it is not considered suitable for Swiftway.	Fail

Route Number	Description	Comments	Pass/Fail
CS50	Baggot Street (Pembroke Street to Fitzwilliam Street)	This section of Baggot Street has parking on both sides and a tree lined median. There are two narrow lanes of traffic in each direction. It is not considered practicable to remove all of the parking on the street and, on that basis, it is not considered possible to accommodate a standard BRT lane and a standard traffic lane without removing the median. The trees in the median are old and large – and are considered important to the conservation status of the street - and it is therefore considered that it would be an unacceptable impact on the street to remove them.	Fail
CS51	Pembroke Street	Any Swiftway service on Pembroke Street would be required to run on Baggot Street, which has been ruled out.	Fail

Following the 'Stage 1' sift, 25 of the 51 links explored passed the initial sifting stage and were progressed to the next assessment stage. These route options are presented in **Figure 9.10**.

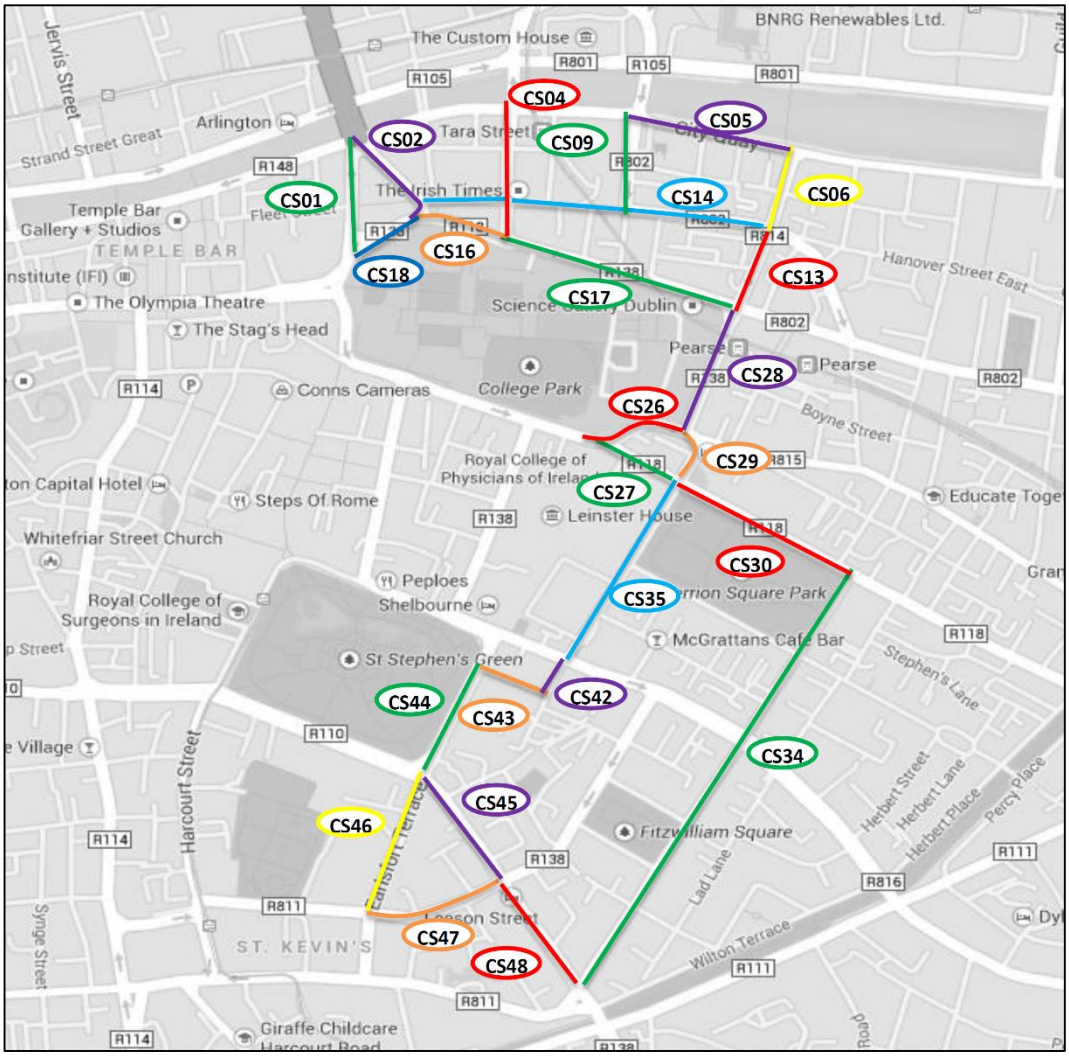

Figure 9.10: Section 3B Route Options Remaining After Stage 1 Assessment

9.7 Stage 2: South City Route Options Assessment

9.7.1 Introduction

Following the Stage 1 sift for the South City Centre area, the remaining route options were combined to form 4 cohesive route options between the bridge crossings and the across the turnaround facility as follows:

S1 - Westmoreland Street / College Street / D'Olier Street – Townsend Street / Lombard Street / Pearse Street – Westland Row – Merrion Square North – Fitzwilliam Street (with a turnaround either at Wilton Place or Sussex Road);

S2 - Westmoreland Street / College Street / D'Olier Street – Townsend Street / Lombard Street / Pearse Street – Westland Row – Merrion Street – Ely Place – Hume Street – St. Stephen's Green East (with a turnaround at Earlsfort Terrace / Hatch Street / Leeson Street);

S3 – Tara Street / Pearse Street / City Quay / Lombard Street – Westland Row – Merrion Square North – Fitzwilliam Street (with a turnaround either at Wilton Place or Sussex Road);

S4 - Tara Street / Pearse Street / City Quay / Lombard Street – Westland Row – Merrion Street – Ely Place – Hume Street – St. Stephen's Green East (with a turnaround at Earlsfort Terrace / Hatch Street / Leeson Street).

The route options for detailed assessment in the South City Centre are presented in **Figures 9.11** and **9.14** and discussed in the following section.

9.7.2 Route Option S1: O'Connell Bridge / Pearse St / Merrion Square / Fitzwilliam St

Route option S1 via O'Connell Bridge / Pearse Street / Merrion Square / Fitzwilliam Street is presented in **Figure 9.11**.

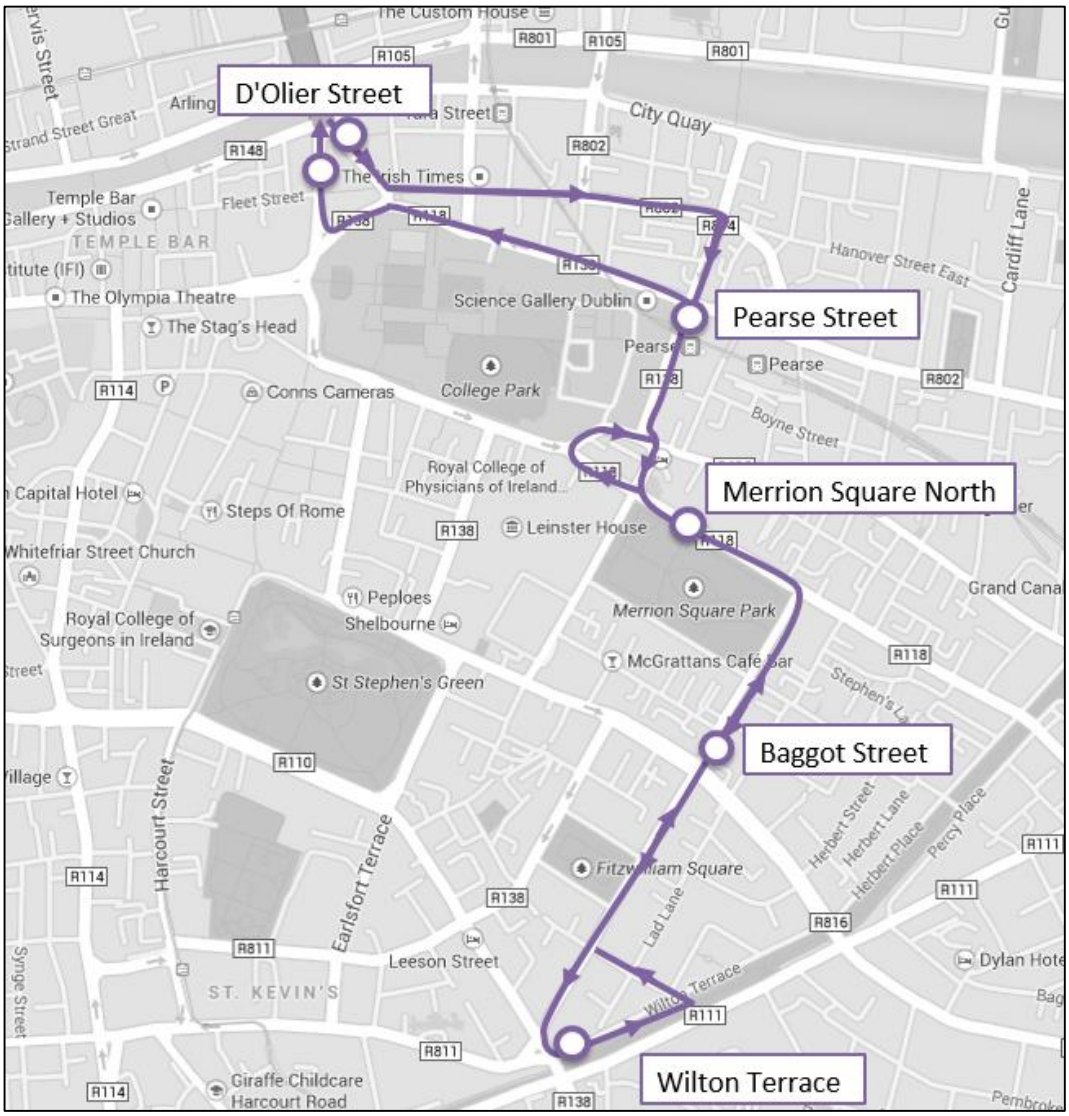

Figure 9.11: Route Option S1 O'Connell Bridge / Pearse St. / Merrion Sq. / Fitzwilliam St.

Route option S1 would commence at O'Connell Bridge and run southbound along D'Olier Street before turning left onto Townsend Street. The route option would follow Townsend Street to the Lombard Street junction before turning right onto Lombard Street and continuing straight ahead onto Westland Row and Merrion Street Lower.

The route would turn left onto Merrion Square North then right onto Fitzwilliam Street, continuing to the Leeson Street junction. Turnaround would be accommodated at Wilton Terrace.

The northbound routing would follow the same streets as far as Merrion Street Lower, where it would either operate on a shuttle basis or follow the existing gyratory system around Clare Street and Lincoln Place. At the northern end of Westland Row, the route would turn left onto Pearse Street, continuing onto College Street before turning right onto Westmoreland Street.

Stops: A total of 5 stops would most likely be provided, at Westmoreland Street / D'Olier Street, Pearse Station, Merrion Square, Fitzwilliam Street and Wilton Terrace.

The distance for this route option is approximately 3.0km and the journey time would be between 10 and 11 minutes.

There are bus lanes on Westmoreland Street, College Street (double bus lane), D'Olier Street, Pearse Street, Westland Row (northbound) and Merrion Square North. There are relatively few cycle facilities along the route but cyclists can share the bus lanes. There is a southbound cycle lane on Westland Row.

There is frontage residential access onto Pearse Street, Westland Row, Merrion Square North and Fitzwilliam Street. There is some retail activity on Westmoreland Street / D'Olier Street, Pearse Street and Westland Row, but associated parking and loading facilities are generally provided separately on side streets.

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

- Considerable reconfiguration of street cross-sections to achieve continuous high-quality provision for Swiftway and cyclists;
- The need to reconfigure and / or rationalise existing bus stopping patterns;
- Interaction with Luas Cross-City on Westmoreland Street;
- The need to reroute general traffic away from Westland Row to achieve public transport service journey reliability along the route. This would be achieved by restricting access from Merrion Street (northbound) and Lombard Street (southbound). The former would be achieved by a left turn ban at the Merrion Row / Merrion Street junction, while the latter would be achieved by a bus only restriction southbound on Lombard Street;
- Removal of some on-street parking; and
- The need to maintain access, residential parking, some commercial parking and essential loading facilities.

9.7.3 Route Option S2: O'Connell Bridge / Pearse St / Merrion Street / St. Stephens Green East

Route option S2 via O'Connell Bridge / Pearse St / Merrion Street / St. Stephens Green East is presented in **Figure 9.12**.

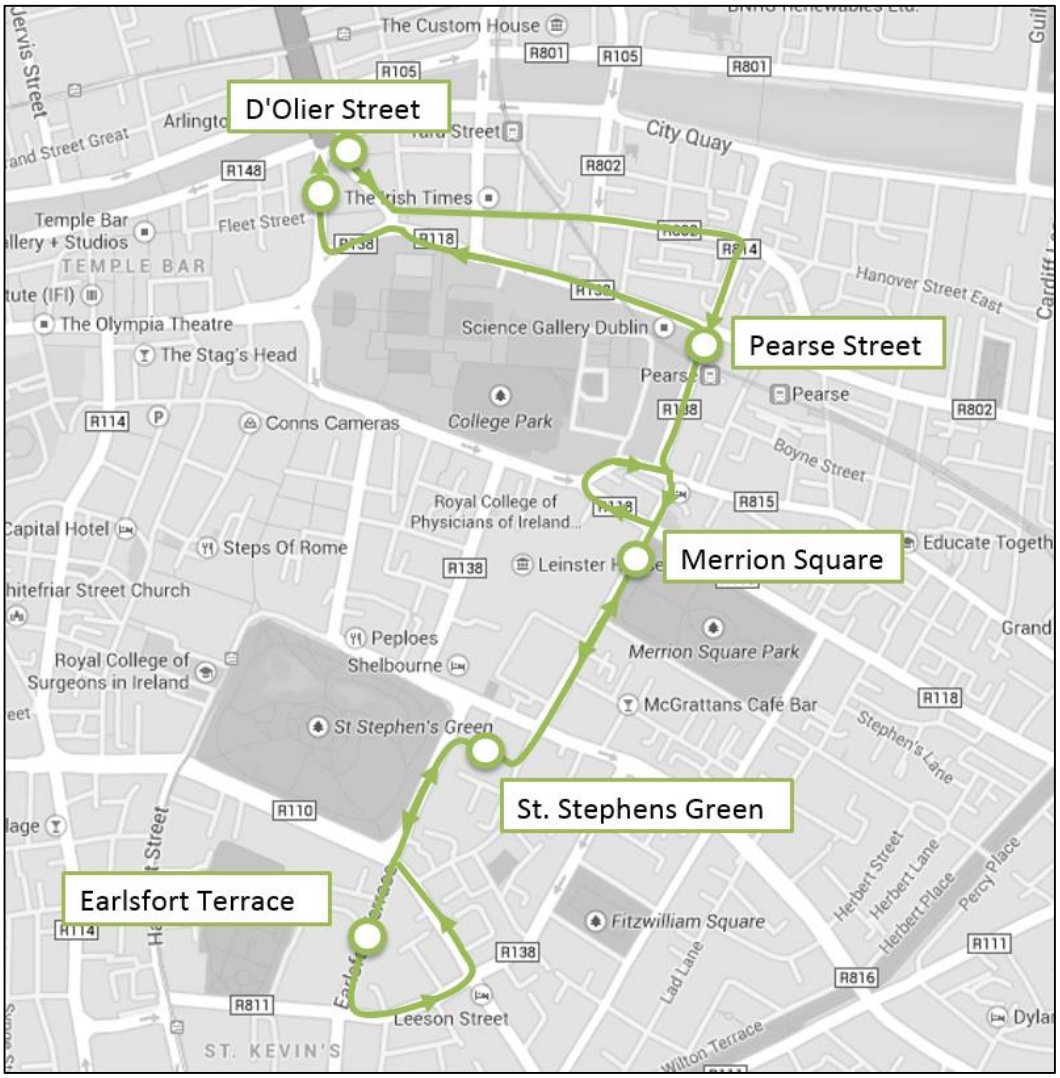

Figure 9.12: Route Option S2 O'Connell Bridge / Pearse St / Merrion Street / St. Stephens Green East

Route option S2 would commence at O'Connell Bridge and run southbound along D'Olier Street before turning left onto Townsend Street. The route option would follow Townsend Street to the Lombard Street junction before turning right onto Lombard Street and continuing straight ahead onto Westland Row and Merrion Street. The route would continue onto Ely Place, right onto Hume Street and left onto Earlsfort Terrace, returning via left turns onto Hatch Street and Leeson Street and a right turn onto St. Stephen's Green East.

The northbound routing would follow the same streets as far as Merrion Street Lower, where it would either operate on a shuttle basis or follow the existing gyratory system around Clare Street and Lincoln Place. At the northern end of Westland Row, the route would turn left onto Pearse Street, continuing onto College Street before turning right onto Westmoreland Street.

Stops: A total of 5 stops would most likely be provided, at Westmoreland Street / D'Olier Street, Pearse Station, Merrion Square, Hume Street and Earlsfort Terrace.

The distance for this route option is approximately 2.8km and the journey time would be between 9 and 10 minutes.

There are bus lanes on Westmoreland Street, College Street (double bus lane), D'Olier Street, Pearse Street, Westland Row (northbound), Hume Street (westbound), St. Stephen's Green East (southbound), Earlsfort Terrace (northbound) and Leeson Street. There are relatively few cycle facilities along the route but cyclists can share the bus lanes. There is a southbound cycle lane on Westland Row and a southbound cycle lane on St. Stephen's Green East. There are cycle lanes in both directions on Earlsfort Terrace.

There is frontage residential access onto Pearse Street, Westland Row, Ely Place, Hume Street and Hatch Street. There is some retail activity on Westmoreland Street / D'Olier Street, Pearse Street, Westland Row and Merrion Street, but associated parking and loading facilities are generally provided separately on side streets.

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

- Considerable reconfiguration of street cross-sections to achieve continuous high-quality provision for Swiftway and cyclists;
- The need to reconfigure and / or rationalise existing bus stopping patterns;
- Interaction with Luas Cross-City on Westmoreland Street;
- The need to reroute general traffic away from Westland Row to achieve public transport service journey reliability along the route. This would be achieved by restricting access from Merrion Street (northbound) and Lombard Street (southbound). The former would be achieved by a left turn ban at the Merrion Row / Merrion Street junction, while the latter would be achieved by a bus only restriction southbound on Lombard Street;
- Removal of some on-street parking; and
- The need to maintain access, residential parking, some commercial parking and essential loading facilities.

9.7.4 Route Option S3: Butt Bridge – Talbot Memorial Bridge / Pearse St / Merrion Square / Fitzwilliam St

Route option S3 via Butt Bridge – Talbot Memorial Bridge / Pearse St / Merrion Square / Fitzwilliam St is presented in **Figure 9.13**.

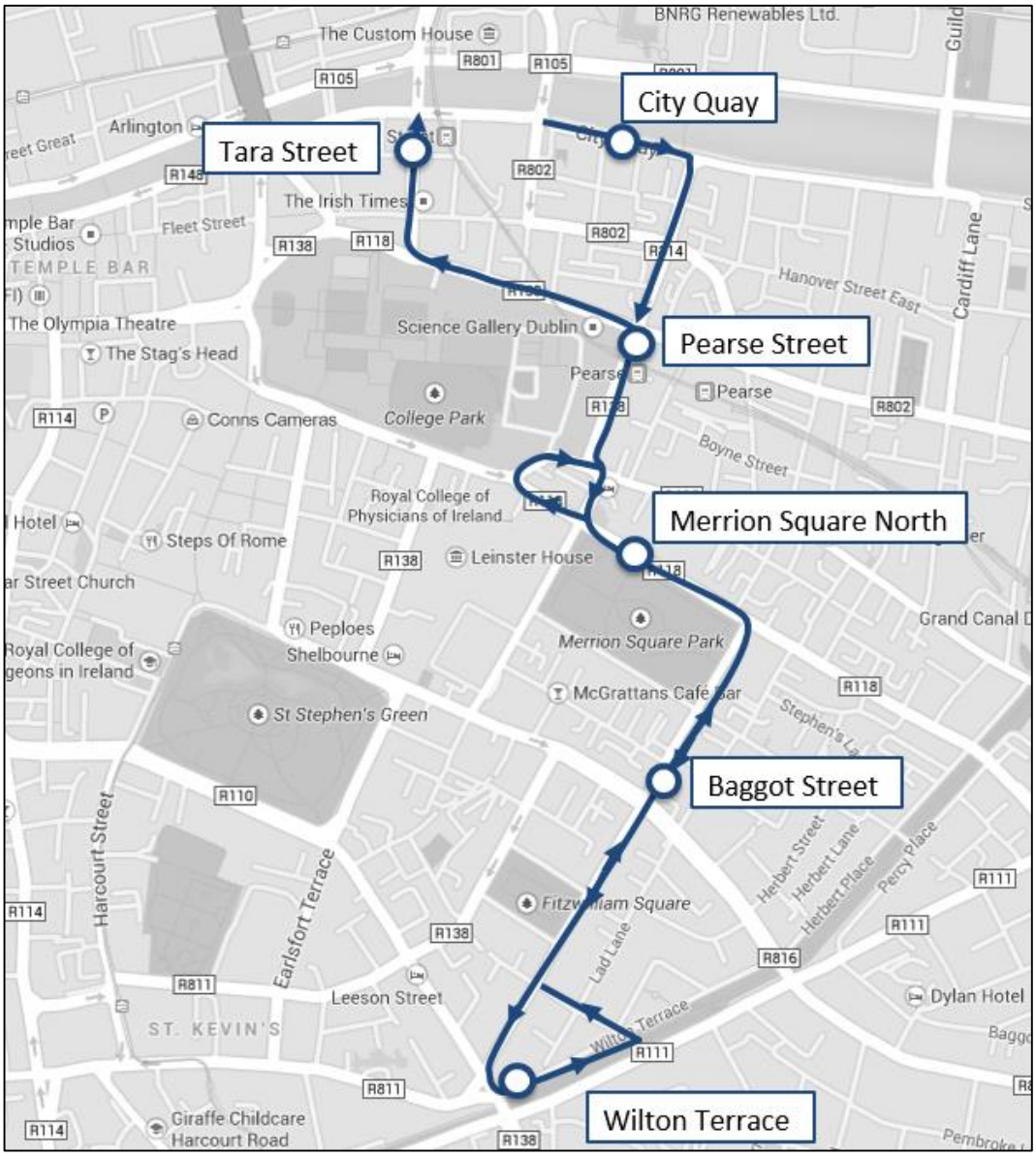

Figure 9.13: Route Option S3 Butt Bridge – Talbot Memorial Bridge / Pearse St. / Merrion Sq. / Fitzwilliam St.

Route option S3 would commence at Talbot Memorial Bridge and run westbound along City Quay. The route option would follow City Quay to the Lombard Street junction before turning right onto Lombard Street and continuing straight ahead onto Westland Row and Merrion Street Lower.

The route would turn left onto Merrion Square North then right onto Fitzwilliam Street, continuing to the Leeson Street junction. Turnaround would be accommodated at Wilton Terrace.

The northbound routing would follow the same streets as far as Merrion Street Lower, where it would either operate on a shuttle basis or follow the existing gyratory system around Clare Street and Lincoln Place. At the northern end of Westland Row, the route would turn left onto Pearse Street before turning right onto Tara Street and crossing the Liffey at Butt Bridge.

Stops: A total of 5 stops would most likely be provided, at City Quay / Tara Street, Pearse Station, Merrion Square, Fitzwilliam Street and Wilton Terrace.

The distance for this route option is approximately 3.0 km and the journey time would be between 10 and 11 minutes.

There are bus lanes on Pearse Street, Westland Row (northbound) and Merrion Square North. There are relatively few cycle facilities along the route but cyclists can share the bus lanes. There is an eastbound cycle track along City Quay, although it is understood that there is an imminent project to convert it to a two-way cycle track. There is a southbound cycle lane on Lombard Street and Westland Row.

There is frontage residential access onto Pearse Street, Lombard Street, Westland Row, Merrion Square North and Fitzwilliam Street. There is some retail activity on Tara Street, Pearse Street and Westland Row, but associated parking and loading facilities are generally provided separately on side streets.

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

- Considerable reconfiguration of street cross-sections to achieve continuous high-quality provision for Swiftway and cyclists;
- The need to reconfigure and / or rationalise existing bus stopping patterns;
- The need to reroute general traffic away from Westland Row to achieve public transport service journey reliability along the route. This would be achieved by restricting access from Merrion Street (northbound) and Lombard Street (southbound). The former would be achieved by a left turn ban at the Merrion Row / Merrion Street junction, while the latter would be achieved by a bus only restriction southbound on Lombard Street;
- Removal of some on-street parking; and
- The need to maintain access, residential parking, some commercial parking and essential loading facilities.

9.7.5 Route Option S4: Butt Bridge – Talbot Memorial Bridge / Pearse St / Merrion Street / St. Stephens Green East

Route option S4 via Butt Bridge – Talbot Memorial Bridge / Pearse St / Merrion Street / St. Stephens Green East is presented in **Figure 9.14**.

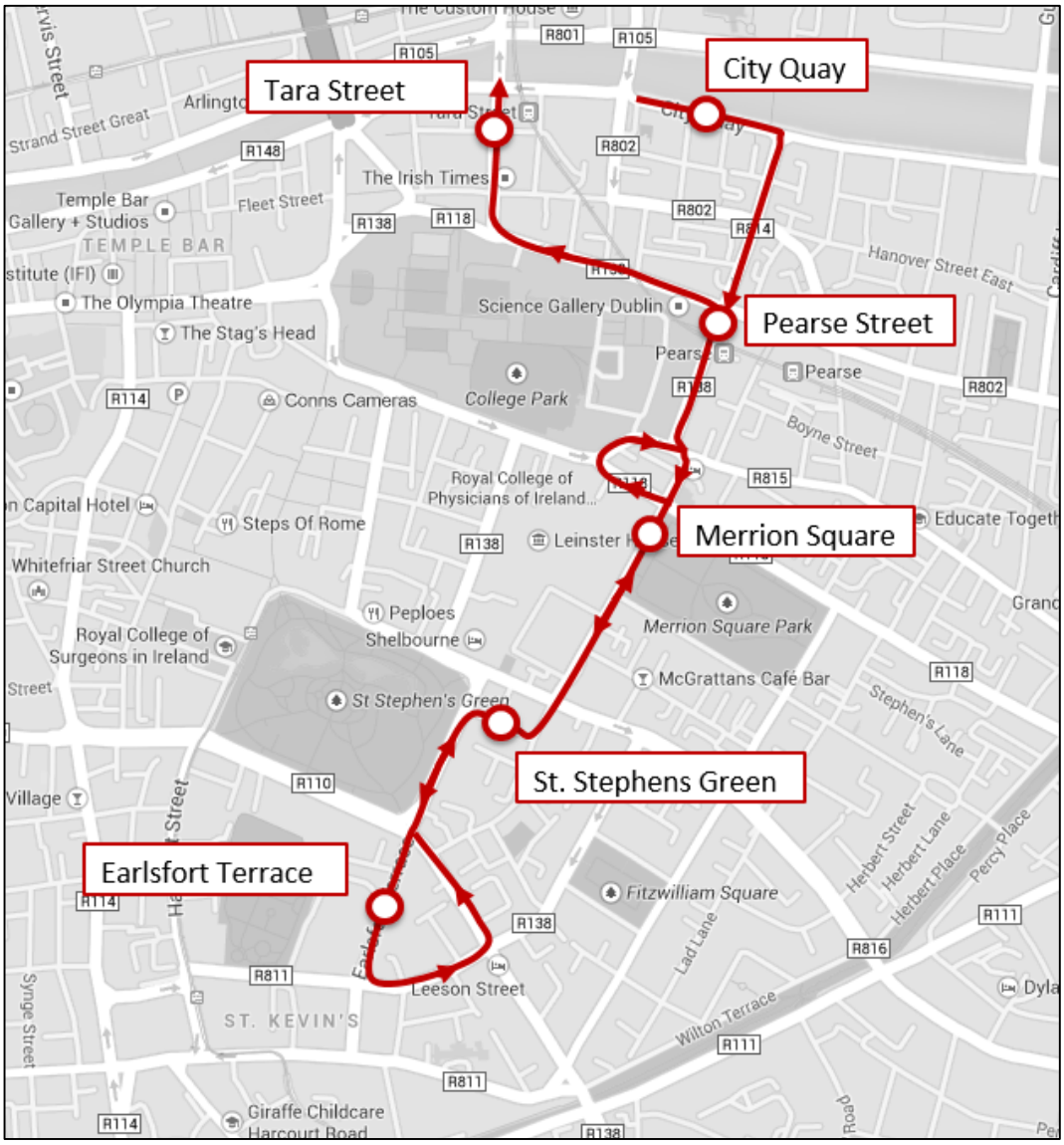

Figure 9.14: Route Option S4 Butt Bridge – Talbot Memorial Bridge / Pearse St / Merrion Street / St. Stephens Green East

Route option S4 would commence at Talbot Memorial Bridge and run westbound along City Quay. The route option would follow City Quay to the Lombard Street junction before turning right onto Lombard Street and continuing straight ahead onto Westland Row and Merrion Street. The route would continue onto Ely Place, right onto Hume Street and left onto Earlsfort Terrace, returning via left turns onto Hatch Street and Leeson Street and a right turn onto St. Stephen's Green East.

The northbound routing would follow the same streets as far as Merrion Street Lower, where it would either operate on a shuttle basis or follow the existing gyratory system around Clare Street and Lincoln Place. At the northern end of Westland Row, the route would turn left onto Pearse Street before turning right onto Tara Street and crossing the Liffey at Butt Bridge.

Stops: A total of 5 stops would most likely be provided, at City Quay / Tara Street, Pearse Station, Merrion Square, Hume Street and Earlsfort Terrace.

The distance for this route option is approximately 2.8 km and the journey time would be between 9 and 10 minutes.

There are bus lanes on Pearse Street, Westland Row (northbound), Hume Street (westbound), St. Stephen's Green East (southbound), Earlsfort Terrace (northbound) and Leeson Street. There are relatively few cycle facilities along the route but cyclists can share the bus lanes. There is an eastbound cycle track along City Quay, although it is understood that there is an imminent project to convert it to a two-way cycle track. There is a southbound cycle lane on St. Stephen's Green East. There are cycle lanes in both directions on Earlsfort Terrace.

There is frontage residential access onto Lombard Street, Pearse Street, Westland Row, Ely Place, Hume Street and Hatch Street. There is some retail activity on Tara Street, Pearse Street, Westland Row and Merrion Street, but associated parking and loading facilities are generally provided separately on side streets.

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

- Considerable reconfiguration of street cross-sections to achieve continuous high-quality provision for Swiftway and cyclists;
- The need to reconfigure and / or rationalise existing bus stopping patterns;
- The need to reroute general traffic away from Westland Row to achieve public transport service journey reliability along the route. This would be achieved by restricting access from Merrion Street (northbound) and Lombard Street (southbound). The former would be achieved by a left turn ban at the Merrion Row / Merrion Street junction, while the latter would be achieved by a bus only restriction southbound on Lombard Street;
- Removal of some on-street parking; and
- The need to maintain access, residential parking, some commercial parking and essential loading facilities.

9.7.6 Stage 2 Route Options Assessment

The Stage 2 route options assessment summary table for the South City Centre route options is presented in **Appendix A7**.

The assessment and relative ranking of route options against identified criteria is summarised in **Table 9.6.**

Table 9.6: Section 3B - South City Centre Route Options Assessment Summary (Sub-Criteria)

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Memorial Bridge - Pearse Street – Westland Row – Merrion Street)
Economy	Capital Cost				
	Operation & Maintenance Cost				
	Transport Reliability and Quality of Service				
Integration	Land Use Integration				
	Residential Population and Employment Catchments				
	Transport Network Integration				
	Cycle Network Integration				
Accessibility & Social Inclusion	Key Trip Attractors				
	Deprived Geographic Areas				
Safety	Road Safety				
	Pedestrian Safety				
Environment	Archaeology and Cultural Heritage				
	Architectural Heritage				
	Flora and Fauna				
	Soils and Geology				
	Hydrology				
	Landscape and Visual				
	Air Quality				
	Noise & Vibration				
	Land Use Character				

In terms of 'Economy', route options which travel along Westland Row and Merrion Street are seen to be more beneficial with both S2 and S4 ranking higher than S1 and S3 for each of the sub-criteria. This is mainly due to the fact that these route options are shorter in length.

In terms of 'Integration', the primary driver is residential and employment catchments which would be served by the route. Each route option serves a similar number of residential populations within a 5 minute walk catchment but route options S3 and S4 serve 3,000 – 4,000 more people who are within a 5-10 minute walk of stops along the route. For this reason, these route options rank higher than route options S1 and S2. However S1 and S2 rank higher for both land use integration and transport network integration owing to better opportunities to foster regeneration in City Centre areas and better public transport interchange opportunities. For this reason S1 and S2 are considered to rank higher than S3 and S4 for 'Integration'.

There is relatively little to differentiate between route options in this section of the study area under the 'Accessibility and Social Inclusion' and 'Safety' criteria.

In terms of the 'Environment' criterion, the main differentiators are archaeology and cultural heritage, architectural heritage, and landscape and visual. The proximity of route options S2 and S4 to St. Stephens Green results in a lower ranking for archaeology and cultural heritage sub-criterion. Similarly, route options S1 ranks lower as the route passes a larger number of protected structures and sites of architectural and industrial heritage merit.

It is important to note that a worst case scenario approach has been adopted at this stage of assessment with regard to the evaluation of architectural heritage, e.g., where a route options passes through an Architectural Conservation Area. A similar approach has been taken with respect to archaeological heritage as for instance, the National Monuments legislation also legally protects access and the visual amenity associated with these monuments and also requires consent from the Minister for invasive works in the vicinity in their vicinity. Consequently, each Recorded Monument and National Monument and its associated constraint area is considered to be of very high importance. Further detailed assessment will be undertaken at EIS preparation stage and appropriate mitigation strategies will developed where necessary.

In relation to landscape and visual, routes S1 and S3 are considered to have some disadvantages compared S2 and S3.

On balance, route option S4 could be considered to offer slightly lower potential for environmental impact.

A summary of the assessment and relative ranking of route options against five main assessment criteria is presented in **Table 9.7**.

Table 9.7: Section 3B - South City Centre Route Options Assessment Summary (Main Criteria)

Assessment Criteria	S1	S2	S3	S4
Economy				
Integration				
Accessibility & Social Inclusion				
Safety				
Environment				

Based on the assessment undertaken, it is apparent that route option S2, offers the most practical, deliverable route option for the following reasons:

- The lower capital cost and operation and maintenance cost compared to other route options;
- The likelihood of being able to deliver shorter overall Swiftway route journey times and assurances on Swiftway service journey time reliability when compared to the other route options;
- It better integrates with the existing and planned transportation network for the city;
- It serves a high number of key trip attractors and large population and employment catchments; and
- While it ranks lower than one other route option with respect to potential for environmental impact, it is considered that impacts can be avoided or mitigated through careful design.

Route option S2 was therefore identified as preferred for the South City Centre study area section. Route option S4 scores next best and offers an alternative connection to the north side connecting into the second best route option north of the river. Given the minor nature of the differences between the route options, both have been carried forward for further consideration in the transport assessment in Section 10.

The preferred routing in the City Centre, subject to the results of the transport assessment, is therefore a combination of route option N3 in the north city and route option S2 in the south city running along:

> Dorset Street – North Frederick Street – Parnell Square East – Cavendish Row – O'Connell Street – O'Connell Bridge – Westmoreland / D'Olier / College Streets – Pearse / Townsend / Lombard Streets – Westland Row – Lincoln Place – Merrion Street – Ely Place – Hume Street – St. Stephen's Green West with a turnaround facility provided via Earlsfort Terrace, Hatch Street and Leeson Street.

Should the transport assessment demonstrate that route option N2 is preferable to route option N3 in the North City Centre, the preferred routing would follow N2 and S4 (which is a variant on S2).

Sensitive multi-disciplinary design will be required to ensure that any adverse impacts on sensitive receptors such as the O'Connell Street and Merrion Street Civic Quarters are minimised and that opportunities for complementary enhancements (at reasonable cost) are included in the works – such as the enhancement of existing inadequate or substandard footpaths and pedestrian crossings.

10 Transport Demand and Economic Appraisal

10.1 Introduction

Transport Demand and Economic Appraisal is a key element of the Route Options Assessment process and follows on from previous work in Sections 6, 8 and 9 to define route options for the various route sections along the proposed scheme corridor. These route sections were combined to give a total of four 'end-to-end' route options which were brought forward for further evaluation and appraisal.

This section of the report discusses the transport demand modelling and comparative economic assessment that was undertaken to inform the Route Options Assessment of the proposed Swords/Airport to City Centre scheme.

In order to assess the likely patronage, travel time savings and economic impacts of each of the route options, a transport modelling exercise was undertaken utilising the NTA's multimodal transport model for the Greater Dublin Area (GDA). Broadly, the steps involved in this process are outlined below;

- A Do Minimum model was developed representing the transport network prior to the proposed opening of the proposed Swiftway scheme in 2018. This model assumed all public transport and highway interventions associated with Luas Cross City were in operation in advance of the proposed scheme;
- Opening year demand matrices for 2018 were derived based on linear growth between the 2006 and forecast year of 2033 demand matrices developed by the NTA. These matrices have been developed to represent the 'central' growth forecasts and are in line with Central Statistics Office (CSO) forecasts;
- A total of four 'end-to-end' route options were analysed using the model. The analysis was undertaken in two stages with Stage 1 taking account of the altered public transport network only for each Route Option and Stage 2 taking account of changes to both the public transport and highway network to represent each of the Swiftway route options; and
- Various outputs for both 'Public Transport' and 'Highway' were extracted from the model. These included travel time per person, average network speed, boardings, alightings, stop loading, overall patronage and total delays.

Travel patterns for all zones in the full GDA model in the form of 'matrix skims' were extracted for travel demand, travel time, distance and costs (fares, tolls). These 'skims' were used as inputs for the comparative Cost Benefit Analysis (CBA).The outputs from the Transport Demand and Economic Appraisal process will be brought forward to be incorporated into the overall Multi-Criteria Analysis to determine the Preferred Route.

10.2 Transport Modelling

10.2.1 NTA Transport Model

As outlined earlier, the transport demand analysis was conducted using the NTA's multimodal transport model for the Greater Dublin Area (GDA). The analysis was undertaken utilising the 2006 Base Year, 2018 Opening Year and 2033 Forecast Year demand matrices. The demand forecasting focused on the AM-peak period (07:00 to 10:00am) which is one of the key drivers for daily patronage. It is considered appropriate to use the AM peak period only for a comparative analysis of the route options however both the AM and Off Peak periods will be modelled for the Preferred Route as part of the next stage.

The NTA's multimodal model utilises public transport assignment in the TRIPS / CUBE software and highway assignment in the SATURN software modelling package. Data is passed between the highway and public transport assignment models to ensure peoples' travel choices are reflected in the model outputs. In terms of the Proposed Scheme, the scheme is coded initially into the public transport network and subsequently into both the public transport and highway networks, with the public transport model utilising highway travel costs from the SATURN model as part of the mode choice model.

The scenarios assessed were the Do-Minimum scenario and the four Do-Something scenarios which represented the implementation of the four different 'end-to-end' route options and their indicative stop locations. The aim of this process is to analyse the cumulative impact of the proposed scheme route options upon the Do Minimum network.

10.2.2 Do Minimum Scenario

When assessing the different route options, a 2018 opening year land-use demand matrices were utilised. These matrices were derived by linearly interpolating between the 2006 'Base Year' and 2033 'Forecast Year' demand forecasts developed by the NTA.

A Do Minimum model, representing the transport network prior to the opening of the Proposed Scheme in 2018, was developed which assumed all public transport and highway interventions associated with Luas Cross City were in place in the model. All existing Dublin Bus services were maintained, including those travelling along the Swiftway corridor for the purposes of this high level modelling exercise. It is likely that bus services will be reorganised as a result of the implementation of the proposed Swiftway scheme to ensure the overall transport network is optimised for passengers. As part of the next phase of the project a study will be undertaken, in consultation with Dublin Bus, to develop a more efficient, optimised bus network along the route and wider scheme corridor which takes account of the improved service provision afforded by the introduction of the proposed Swiftway scheme.

10.2.3 Route Option Testing

The demand forecasting aspect of the NTA model works by predicting travel time and generalised costs associated with utilising different modes of transport for

trips between each zone in the model. When the Swiftway service is offering improved travel times and reduced costs relative to existing modes of transport, the model will reallocate demand from existing modes to the Swiftway service as passengers will derive a benefit from switching modes.

10.2.4 Do Something Scenarios

For the Route Options Assessment, the transport modelling tests assume two Swiftway services, one between Swords and the City Centre operating at a 4 minute frequency during the AM peak period and another between the Airport and the City Centre operating at an 8 minute frequency during the AM peak period.

A maximum bus capacity of 120 passengers was assumed in the modelling. Based on the above headways, the resultant Swiftway carrying capacities are 1,800 persons per direction per hour (ppdph) in the AM peak period north of the Airport and 2,700ppdph south of the Airport.

Prior to conducting a detailed run time analysis target BRT speeds were adopted for different sections of the proposed route options as outlined in **Figure 10.1**.

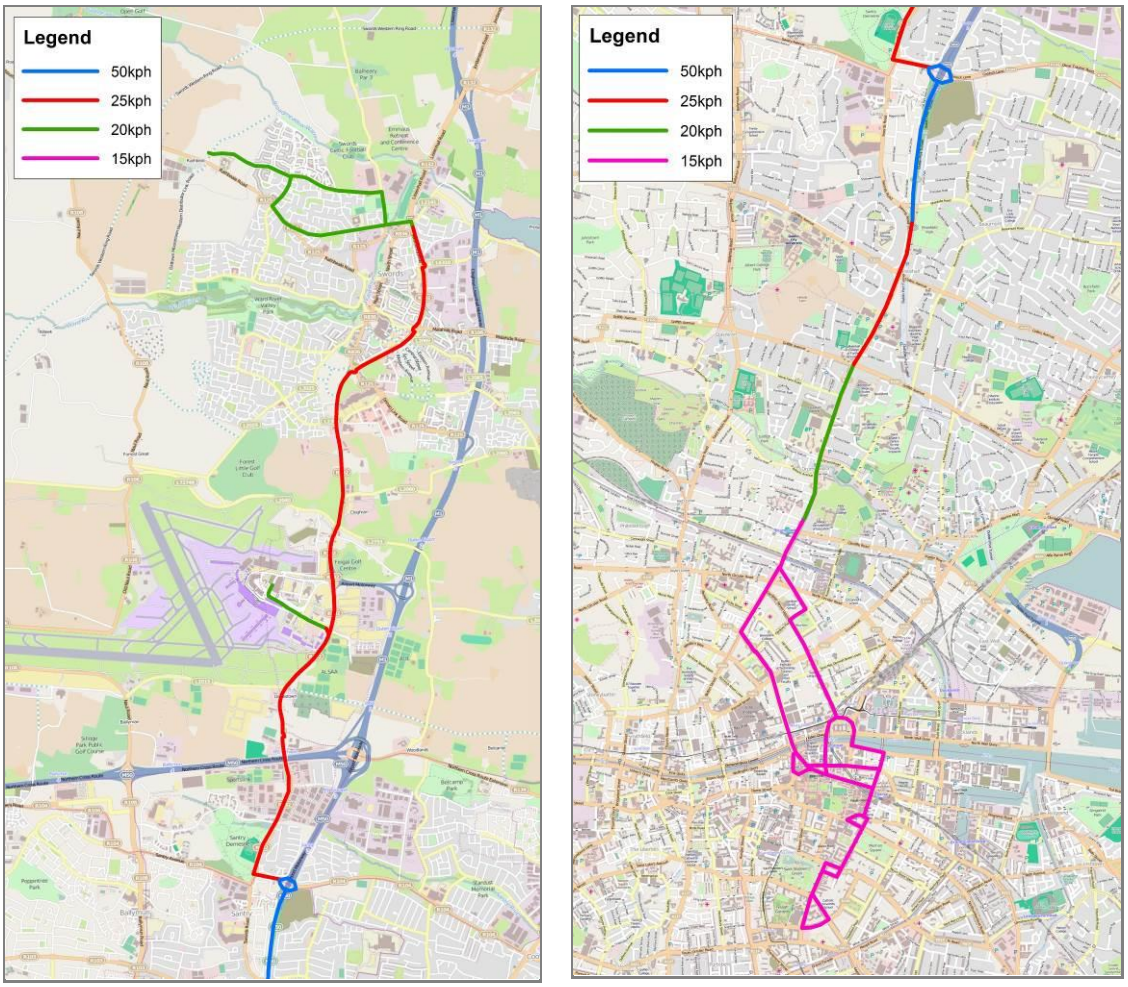

Figure 10.1: Modelling Minimum Speeds for Swiftway

The minimum Swiftway bus speeds in the model take account of current travel speeds from the calibrated NTA multi modal model, the number of BRT stops, and the number of traffic signalised junctions along each of the route options.

Dwell times at stops, and delay times at signalised junctions were applied to the target speed to give an average 'run-time' for each section of the proposed route options.

To ensure the Swiftway service takes account of delays at junctions the model utilises the travel speeds shown in Figure 10.1 as minimum travel speeds whilst assuming general traffic speeds for the Swiftway service where they are higher than the minimum speeds.

Additionally, a distance based fare structure similar to that used by Dublin Bus was assumed for the modelling. The assumption used in the modelling analysis is that the proposed Swiftway scheme will be a higher quality service, with characteristics more in line with a light rail service than the existing bus service. As a result, the modelling parameters used to define the Swiftway service are more comparable to rail based modes than bus (i.e. crowding curves, transfer penalties etc.).

The route option variants included in the transport demand assessment are shown in **Figures 10.2 to 10.5** below. Each of the two route options in Swords has been modelled with each of the two city centre route options to give four options overall.

10.2.4.1 Route Option 1

In Swords this route option would deviate from the R132 at the existing Estuary R132 roundabout junction, taking the Swiftway system into the residential areas in North-west Swords. Swiftway vehicles would travel along the R125, Balheary Road and Glen Ellan Road. This route option would terminate on the Glen Ellan Road extension in Oldtown. Southbound Swiftway vehicles would travel the same route as taken by northbound vehicles.

The city centre section of this route option north of the River Liffey would commence at Lower Drumcondra Road and run southbound along Dorset Street to the Belvedere Road junction. This route option would continue left onto Belvidere Road and onto Belvedere Place before turning right onto either Mountjoy Square North or South. The route option would then turn left onto Gardiner Street as far as Beresford Place, continuing to Memorial Road and Talbot Memorial Bridge. The northbound routing would follow the same streets except for the Beresford Place area, where it would follow the existing gyratory traffic system

Continuing south of the River Liffey this route option would commence at Talbot Memorial Bridge and run westbound along City Quay. The route option would follow City Quay to the Lombard Street junction before turning right onto Lombard Street and continuing straight ahead onto Westland Row and Merrion Street. The route would continue onto Ely Place, right onto Hume Street and left onto Earlsfort Terrace, returning via left turns onto Hatch Street and Leeson Street and a right turn onto St. Stephen's Green East. The northbound routing would follow the same streets as far as Merrion Street Lower, where it would either operate on a shuttle basis or follow the existing gyratory system around Clare Street and Lincoln Place. At the northern end of Westland Row, the route would turn left onto Pearse Street before turning right onto Tara Street and crossing the Liffey at Butt Bridge.

Route Option 1 is presented in **Figure 10.2**.

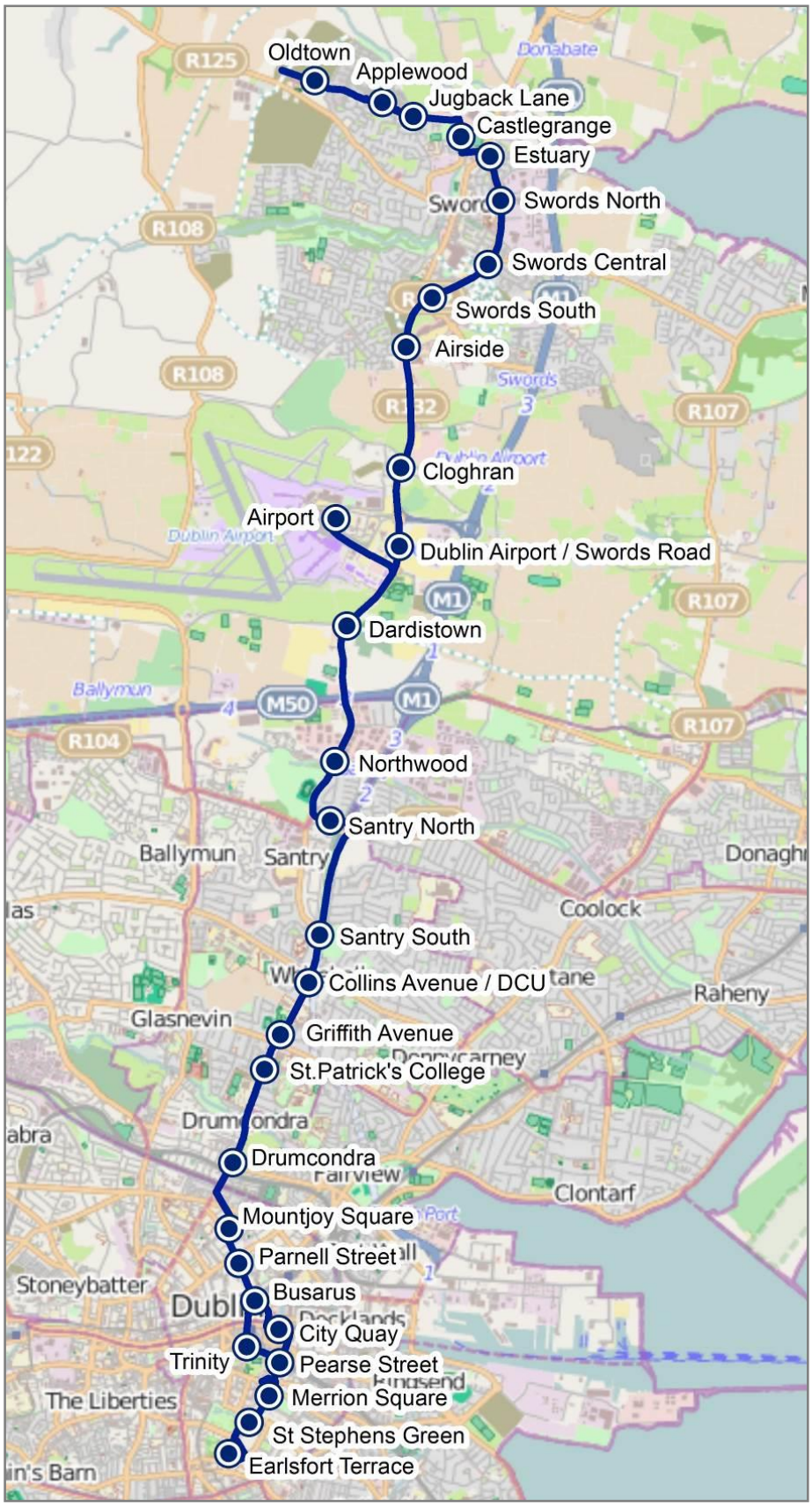

Figure 10.2: Route Option 1

10.2.4.2 Route Option 2

In Swords this route option would deviate from the R132 at the existing Estuary R132 roundabout junction, taking the Swiftway system into the residential areas in North-west Swords. Swiftway vehicles would travel along the R125, Balheary Road and Glen Ellan Road. This route option would terminate on the Glen Ellan Road extension in Oldtown. Southbound Swiftway vehicles would travel the same route as taken by northbound vehicles.

In the city centre, the section north of the River Liffey would commence at Lower Drumcondra Road and run southbound along Dorset Street to the North Frederick Street junction. The route option would turn then left onto North Frederick Street and would continue to O'Connell Street via Parnell Square East and Cavendish Row. The route would connect to O'Connell Bridge at the southern end of O'Connell Street. The northbound routing would follow the same streets, which would require amendments to Cavendish Row and Parnell Square East to accommodate northbound movements from O'Connell Street.

Continuing south of the River Liffey this route option would commence at O'Connell Bridge and run southbound along D'Olier Street before turning left onto Townsend Street. The route option would follow Townsend Street to the Lombard Street junction before turning right onto Lombard Street and continuing straight ahead onto Westland Row and Merrion Street. The route would continue onto Ely Place, right onto Hume Street and left onto Earlsfort Terrace, returning via left turns onto Hatch Street and Leeson Street and a right turn onto St. Stephen's Green East. The northbound routing would follow the same streets as far as Merrion Street Lower, where it would follow the existing gyratory system around Clare Street and Lincoln Place. At the northern end of Westland Row, the route would turn left onto Pearse Street, continuing onto College Street before turning right onto Westmoreland Street.

Route Option 2 is presented in **Figure 10.3**.

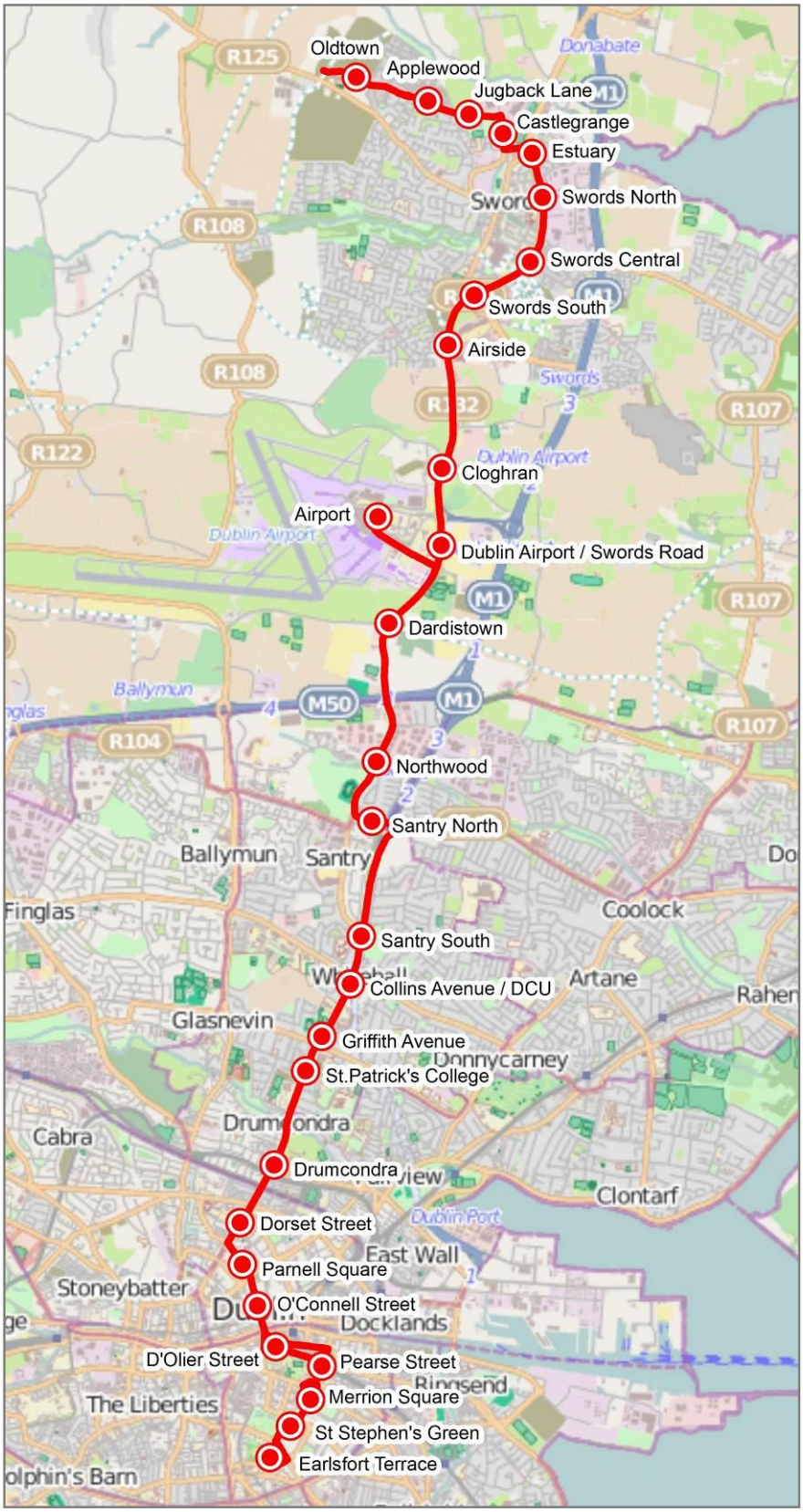

Figure 10.3: Route Option 2

10.2.4.3 Route Option 3

In Swords this route option travels along the R125, Castlegrange Green, a new 'Swiftway' link joining Castlegrange Green to Broadmeadow Road, Broadmeadow Road, a new 'Swiftway-only' link joining Broadmeadow Road to Pine Grove Park, Pine Grove Park, Rathbeale Road, Glen Ellan Road and terminate on the Glen Ellan Road Extension in Oldtown. In the southbound direction the Swiftway vehicles would travel the same route as taken by northbound vehicles. The city centre section is as per Route Option 1 via Gardiner Street.

Route Option 3 is presented in **Figure 10.4**.

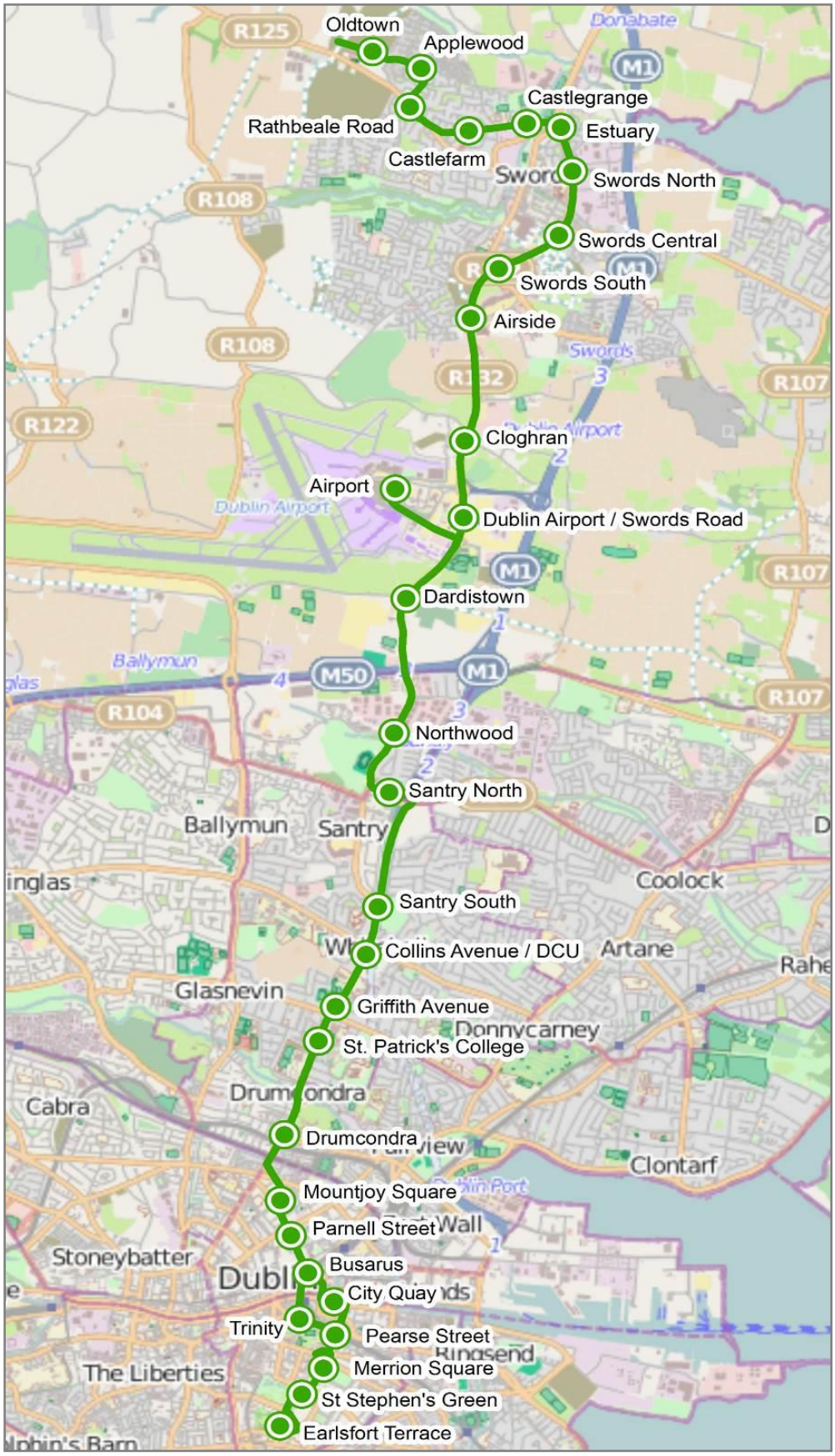

Figure 10.4: Route Option 3

10.2.4.4 Route Option 4

In Swords this route option travels along the R125 onto Castlegrange Green. From Castlegrange Green the route continues along a new 'Swiftway' link joining Castlegrange Green to Broadmeadow Road. After traversing Broadmeadow Road the route travels along a new 'Swiftway-only' link joining Broadmeadow Road to Pine Grove Park. From Pine Grove Park the route connects onto Rathbeale Road and subsequently Glen Ellan Road and terminates on the Glen Ellan Road Extension in Oldtown. In the southbound direction the Swiftway vehicles would travel the same route as taken by northbound vehicles. The city centre section is as per Route Option 2 via O'Connell Street.

Route Option 4 is presented in **Figure 10.5**.

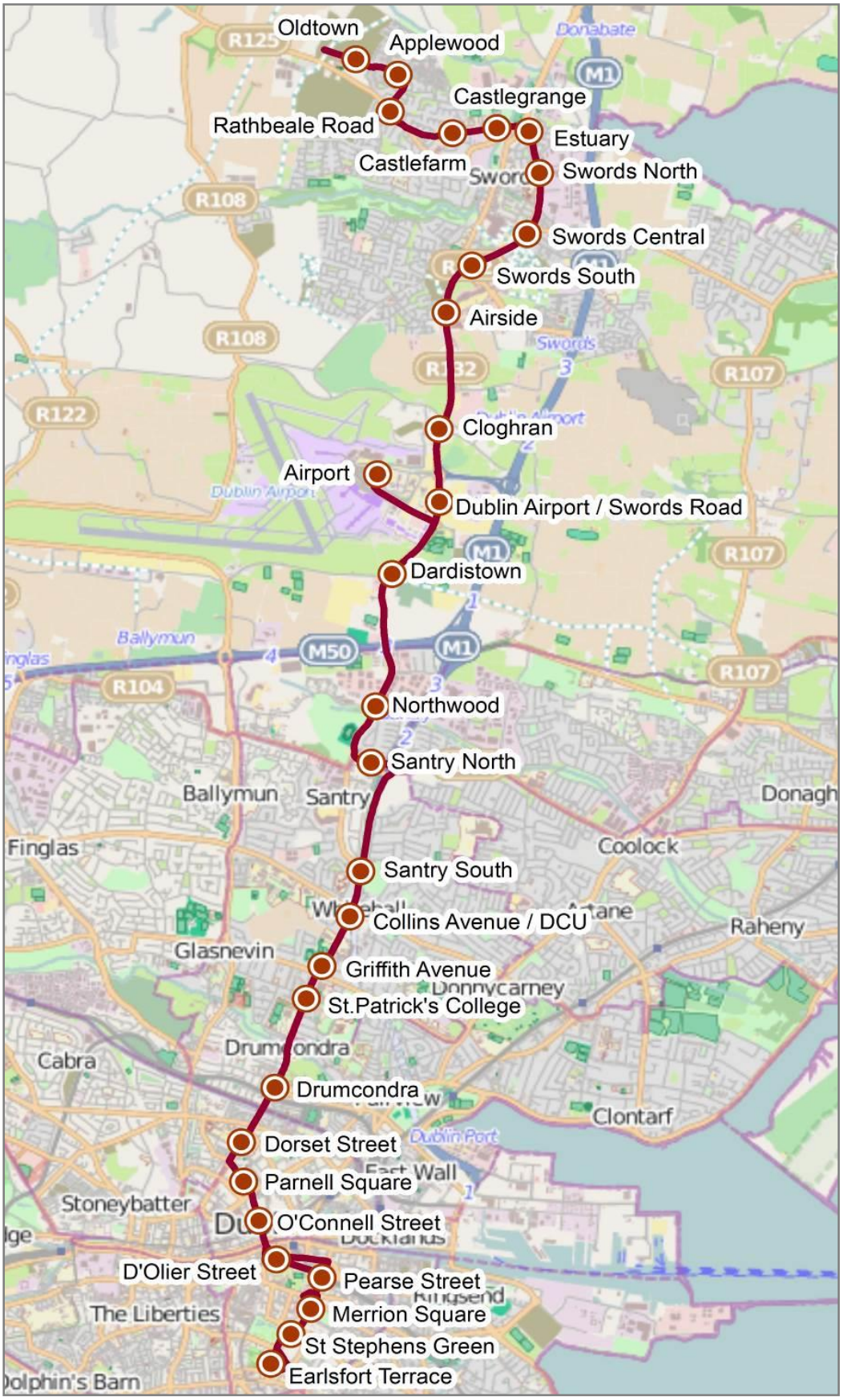

Figure 10.5: Route Option 4

10.2.5 Transport Analysis Process

In undertaking the Route Option Assessment Transport Demand and CBA analysis a two stage process has been implemented.

- The first stage in the process involved undertaking a comparative analysis of the public transport user benefits of the four 'end to end' route options as outlined in Section 10.2.4. The public transport benefits were derived through use of the NTA's multimodal model. As part of this process each of the four end to end route options was coded separately into the public transport element of the full multimodal model. The model was then run for an opening year of 2018 and a forecast year of 2033. The relative public transport travel time savings of each of the four scenarios together with daily boardings, annual demand and demand per kilometre were assessed against the Do Minimum scenario. A comparative CBA was then undertaken, which applied monetary values to the travel time savings for each of the scenarios set against the costs of implementing the proposed scheme. The route options that emerged as being most favourable, from a Public Transport benefits point of view, from this stage of CBA were then taken forward to a second and more refined stage of CBA; and
- The second stage in the process involved a further and more detailed analysis of the remaining route options, again using the NTA's multi-modal model. In this stage of modelling, all highway changes likely to be implemented to facilitate the Swiftway scheme on each route option were coded into the highway element of the multimodal model along with the coding of each of the scheme route options in the public transport element. Undertaking this detailed modelling allowed any potential disbenefits, in terms of increased travel time or distance, to existing highway users to be included in the comparative CBA. This process allowed a more detailed picture of the 'global' benefits of each remaining schemes to be compared and the preferred route option identified.

10.2.6 Cost-Benefit Analysis

As set out in Section 5.3 of the report the Cost Benefit Analysis (CBA) forms one element of the multi criteria analysis (MCA) process for transport infrastructure projects. The Stage 2 assessment comprises of a 'Multi-Criteria Analysis' (MCA) of route options under the following main criteria:

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

As part of the Route Option Assessment Process, an outline CBA has been undertaken as part of a two stage process to give a comparative indication of the performance of each route option and to identify a preferred route option in terms of CBA which will be incorporated into the overall MCA. The identification of the Preferred Route is based on a number of variables of which the CBA is one.

The CBA analysis undertaken as part of the Route Options Assessment is indicative in nature and is being used for comparative purposes only. As the proposed scheme is further refined, additional analysis and appraisal will be carried out based on more detailed cost estimates, operational cost savings, design refinements and benefits derived from the enhanced cycle network being delivered as part of the proposed scheme.

The approach to appraisal is grounded in, and consistent with, the Department of Transport, Tourism and Sports' guidance in the area namely, the *'Guidelines on a Common Appraisal Framework for Transport Projects and Programmes'* (CAF) [1]and the Department of Public Expenditure and Reforms' *'Public Spending Code'*[2]. Economic parameter values have been taken from CAF where available and from the NRA *'Project Appraisal Guidelines, 2011'* which are based on the CAF and provide the most up to date Irish parameter values for undertaking CBA.

10.2.7 TUBA Assessment

The benefits and costs of the proposed route options have been assessed using the Transport User Benefit Assessment (TUBA) cost benefit analysis program. TUBA utilises outputs from the transport modelling together with scheme cost data and compares the "Do-Minimum" scenario (i.e. a scenario without a scheme) with each "Do-Something" scenario (i.e. a scenario with a scheme option in place). It determines whether benefits resulting from the provision of the scheme will outweigh the costs of implementation including construction and operation. In order to calculate the benefits of a proposed scheme, TUBA uses matrix based outputs (skims) directly from the Do-Minimum and Do-Something transport models. As such, the modelled area used in the TUBA assessment is identical to the modelled area developed for the transport model.

As part of this route options CBA assessment a discount rate of 4% was utilised as set out in CAF, with all outputs discounted back to a base year of 2009 for comparison purposes.

It is envisaged that the preliminary business case, to be prepared as part of the next stage of the project, will undertake sensitivities using both 4% and 5% discount rates.

The route options have been appraised over 30 years as set out in relevant guidelines for major transport schemes. The 'residual value' is a measure of the net present value of the infrastructure over a specified period beyond the 30-year appraisal period. In this case a residual value period of 30 years is applied based on the guidance outlined in the Department of Transports Common Appraisal Framework published in 2009.

CBA annualisation factors are used to convert the benefits from the modelled peak time periods to annual benefits. The benefits to the economy are derived from each of the modelled time period are multiplied by the annualisation factor and then summed to give annual benefits for these modelled peak periods only. The annualisation factor used to convert peak period benefits to annual benefits is 52 x 5 x 1.83 = 476, as there are 52 weeks (with 5 working days) per annum and two peak periods (AM/PM). A scaling factor of 1.83 was applied to represent the

[1] *Guidelines on a Common Appraisal Framework for Transport Projects and Programmes, Department of Transport, 2009*

[2] *Public Spending Code, Department of Public Expenditure and Reform*

proportionally lower volume of trips in the evening peak period relative to the morning peak. For the purposes of this Route Options Assessment no benefits outside of the peak periods have been assessed.

All general parameters such as value of time, value of time growth rates, discount rates, fuel cost changes, fuel consumption, vehicle operating costs fuel/non fuel, trip purpose distribution, tax rates, change in tax rates, vehicle occupancy rates and vehicle proportions were taken from the National Parameters Value Sheets contained within the DoT CAF where available and the NRA Project Appraisal Guidelines. Fuel efficiency was taken from UK WebTAG guidance as no guidance is currently available in Ireland whilst fleet fuel type proportions were available from the Department of Environment.

10.2.8 Capital Costs

Outline scheme costs were input into TUBA for each route option based on the basic assumptions presented in Section 5.3.1.1.

10.2.9 Operating and Maintenance Cost Estimate

In order to estimate the Operating and Maintenance (O&M) costs of each route option, a refined model developed by the RPA for Luas was utilised. The Luas O&M model was developed by the RPA and is based on models developed by Transport for London (TfL). The model was updated to reflect outturn budgets for 2010 and costs were adjusted to 2009 prices using the Consumer Price Index (CPI).

At this Route Assessment Stage, the same O&M costs were used for each of the Route Options as the same fleet size, similar route lengths and number of stops are assumed for each option.

The proposed Swiftway scheme is being developed to deliver a similar quality of service to the existing Luas systems in Dublin and as such certain aspects of the operational costs associated with Luas have been retained in developing the operational and maintenance costs for the Swiftway scheme.

The numbers of drivers and operational staff required for the operation of the proposed Swiftway service, have been estimated based on the methodology for current Luas light rail systems. It is envisaged there will be some operational savings identified as part of the Dublin Bus reorganisation on the Swords corridor.

The cost of maintaining the proposed Swiftway scheme has been assumed to be in line with those for the 2010 Dublin Bus fleet (updated to 2014 costs). An allowance has been made for a higher specification of Swiftway vehicles relative to Dublin Bus vehicles. Swiftway stops will have similar infrastructure to light rail stops including ticket vending machines, passenger information display systems etc. therefore the costs of maintaining these assets are assumed to be similar to light rail costs. Additionally costs associated with vandalism, stop cleaning etc. are assumed to be similar to light rail costs.

Other overhead costs such as rates, insurance, marketing and advertising etc. are assumed to be similar to light rail costs.

10.2.10 Scheme Costs

A cost estimate has been developed on a per kilometre basis for the Swiftway route options assessment. It should be noted that at this route option assessment stage the preliminary cost estimates were developed specifically as a basis for assessing the relative merits of the potential route options.

Table 10.1 summarises the cost of each route option appraised in terms of capital cost and annual operation and maintenance costs using the service pattern modelled to estimate demand as set out in Section 10.0.4 of the report. At this stage a lower and upper bound kilometre rate was developed inclusive of capital investment which included for the depot and control centre, land costs and fleet acquisition, these rates were €10.2m/km lower and €11.33m/km upper.

Table 10.1: Capital Costs and Annual O & M Costs

Route Option	CAPEX including Vehicles (2014 € Millions)		Annual O & M Costs (2010 € Millions)
	Lower	Upper	
1	€215.2	€239.1	€20.35
2	€214.2	€237.9	
3	€219.3	€243.6	
4	€218.3	€242.5	

10.2.11 Transport Demand Analysis Results – Stage 1

Tables 10.2 and 10.3 below presents a summary of the Stage 1 demand analysis. These tables provide information on the AM peak period boarding figures, forecast annual demand, annual demand per kilometre of the Swiftway route options and the average public transport travel time savings for each route option.

Table 10.2: Summary of Results – Opening Year – 2018

Option	Total AM (7-10) Boarding's BRT	Annual BRT Demand (Millions)[1]	Route Length (km)	Annual BRT Demand Per Km (Millions)	Ave Travel Time difference PT (pp, secs) [2]
1	18,223	23.11	23.2	0.99	-15
2	18,613	23.60	23.1	1.02	-18
3	18,876	23.93	23.6	1.01	-15
4	19,311	24.49	23.5	1.04	-17

1. Demand is annualised based on AM peak period factor of 1,268 as derived from 2006 GDA Household Survey Data
2. PT travel time includes access, waiting time etc.
It is anticipated that demand will increase following a reorganisation of Dublin Bus routes
Results presented are for full GDA model area, not only Swords corridor.

Table 10.3: Summary of Results – Forecast Year – 2033

Option	Total AM (7-10) Boarding's BRT	Annual BRT Demand (Millions)[1]	Route Length (km)	Annual BRT Demand Per Km (Millions)	Ave Travel Time difference PT (pp, secs) [2]
1	21,294	27.00	23.2	1.16	-18
2	21,759	27.59	23.1	1.19	-18
3	21,844	27.70	23.6	1.17	-18
4	22,495	28.52	23.5	1.21	-18

1. Demand is annualised based on AM peak period factor of 1,268 as derived from 2006 GDA Household Survey Data
2. PT travel time includes access, waiting time etc.
It is anticipated that demand will increase following a reorganisation of Dublin Bus routes
Results presented are for full GDA model area, not only Swords corridor.

Tables 10.2 and 10.3 show annual boardings of between 23 – 25 million for 2018 rising to between 27 – 28.5 million for 2033. As outlined earlier this is based on the assumption that the existing Dublin Bus network remains in place. A comparison between the route options shows that all routes generate similar levels of BRT patronage in both the opening year, 2018 and forecast year, 2033, with Route Option 4 generating the greatest level of PT patronage per kilometre followed closely by Route Option 2.

In terms of average travel time Route Options 2 and 4 emerge as providing the highest savings for the opening year of 2018 with all Route Options providing similar savings for the forecast year of 2033. Overall, Route Option 2 and 4 provide highest overall reductions, this will be accounted for as part of the Stage 1 CBA. An analysis of the annual demand per kilometre suggest that Route Options 2 and 4 perform strongest with Route Options 1 and 3 resulting in lower Annual Demand per km relative to Route Options 2 and 4 despite having similar boarding demand as the other Route Options. This is partly due to the increased journey times along the Gardiner Street/North Quays route in comparison to the O'Connell Street route. In addition, a comparison of station demand suggests that Options 2 and 4, with stops at Trinity and O'Connell, bring people closer to their destinations in the city centre resulting in reduced walking time.

Upon completion of the initial transport demand analysis modelling the results of the modelling tests were taken forward to the Stage 1 CBA.

10.2.12 Stage 1 CBA Results

The Stage 1 CBA results for the route options are presented in **Table 10.4**, taking account of benefits derived by users of the proposed scheme. The results in Tables 10.1 and 10.2 show that annual boardings across all options differ by 5-6%. In addition, the impact of increased public transport travel time along the differing route options, in particular the City Centre route options along Gardiner Street, lead to significant differences in the overall benefit to cost ratio (BCR) for each route option.

Table 10.4: Summary of Economic Appraisal – Stage 1 CBA

Route Option	CAPEX including vehicles (2014 €Millions)		Annual O & M Costs (2010 €Millions)	BCR (Lower Bound)	BCR (Higher Bound)
	Lower	Upper			
1	€215.2	€239.1	€ 20.35	2.29	2.18
2	€214.2	€237.9	€ 20.35	3.13	3.00
3	€219.3	€243.6	€ 20.35	2.05	1.96
4	€218.3	€242.5	€ 20.35	3.20	3.10

** Costs and Benefits were brought back to 2009 prices and values as part of the CBA*

The CBA results derived from this comparative analysis indicate that all of the options assessed pass high level value for money tests with Route Options 2 and 4 delivering the greatest benefit to cost ratio. Based on the Stage 1 CBA assessment, Route Options 2 and 4 have the strongest BCR's and therefore warrant being brought forward for further more refined transport modelling and appraisal. The refined modelling and Stage 2 CBA takes account of impacts from the changes to the highway network and the knock on impact this may have on bus routes.

10.2.13 Detailed Transport Demand Analysis – Stage 2

The second stage of the process was to examine the public transport demand and travel time savings likely to be generated by the remaining Route Options in addition to any disbenefits incurred to highway users as a result of reduced junction capacity at some locations. Route Options 2 and 4, were coded into the public transport element of the NTA's multi modal model with any highway changes likely to be implemented to facilitate the Swiftway scheme along each route option being coded into the highway element of the model.

Upon completion of the detailed modelling runs the results in terms of boardings, alightings and cumulative load at each stop along Route Option 2 and 4 were examined.

10.2.14 Route Option 2 Results

The AM peak hour passenger loads for Route Option 2 in the opening year of 2018 are shown in **Figures 10.6 and 10.7**.

Figure 10.6 shows the passenger demand profile is strong at all stops along the route. The passenger demand peaks at Drumcondra with a demand of 1,500 passengers in the opening year of 2018. These demands are within a 15 vehicles per hour (vph) service capacity (1,800 pphpd) but it should be noted that these assume the existing Dublin Bus network is in place. **Figure 10.7** shows that demand in the northbound direction peaks at Drumcondra and decreases significantly north of this stop. It is evident that northbound loadings are higher than southbound which would differ from the usual pattern where commuters travel into the city from the suburbs however it is in line with future employment forecasts which predict large increases in employment in areas such as Dardistown, the Airport and Swords. In the longer term these passengers may relocate their place closer to these areas of employment.

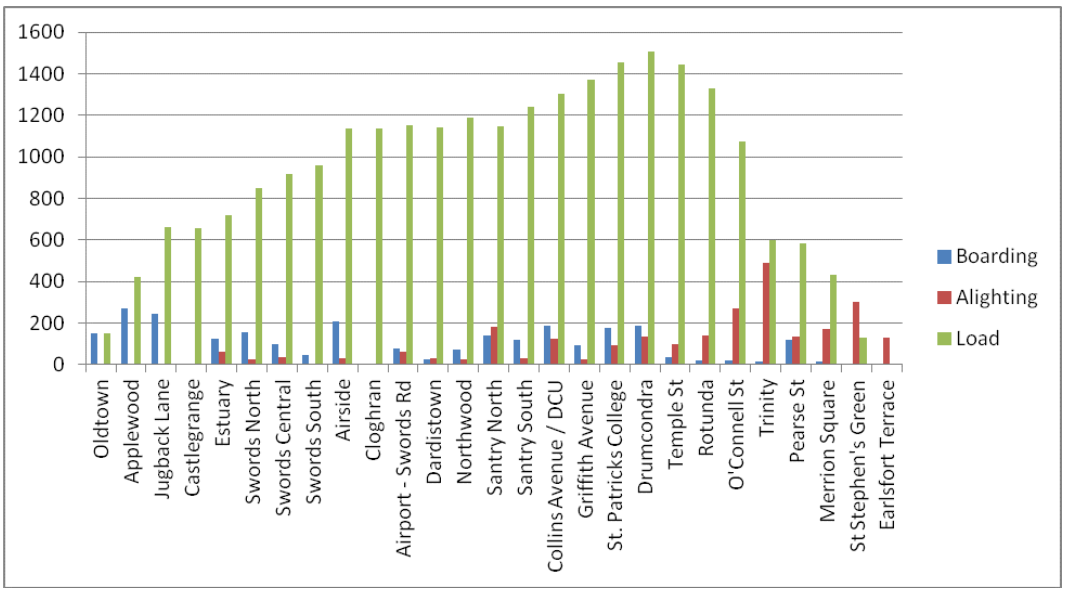

Figure 10.6: 2018 Option 2 AM Peak (08 to 09) - Southbound - Swords to City Centre Line

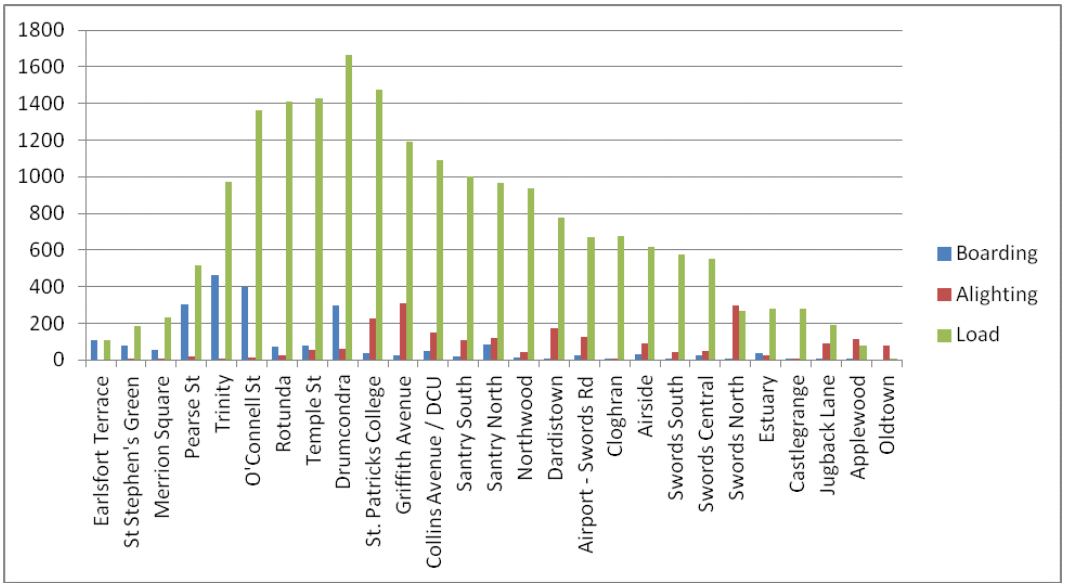

Figure 10.7: 2018 Option 2 AM Peak (08 to 09) - Northbound - Swords to City Centre Line

Figures 10.8 and 10.9 show the passenger loading on the Airport service. The figures highlight the strong demand to/from the airport together with reasonably strong demand along the various stops on the route.

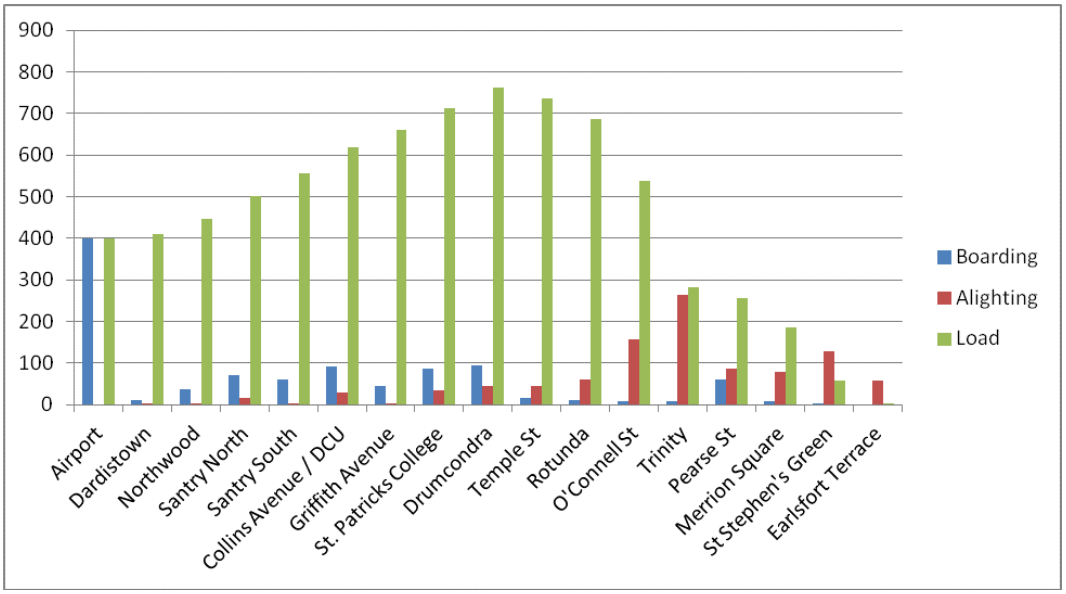

Figure 10.8: 2018 Option 2 AM Peak (08 to 09) - Southbound - Airport to City Centre Line

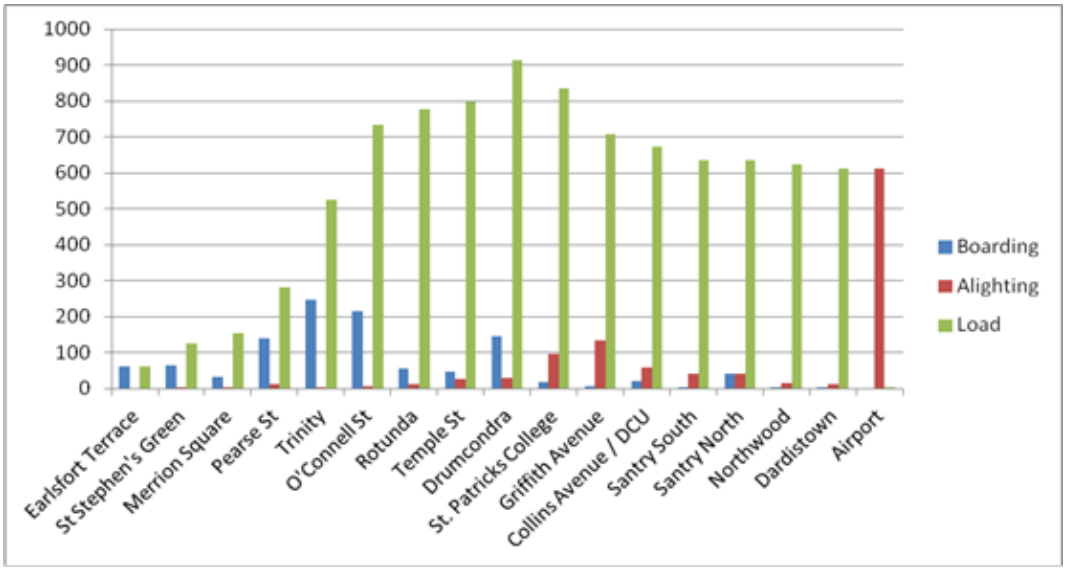

Figure 10.9: 2018 Option 2 AM Peak (08 to 09) - Northbound - Airport to City Centre Line

The combined Swords and Airport service loadings at each stop are presented in **Figures 10.10 and 10.11** below. The profile shows that loadings peak at Drumcondra in both directions with loadings of 2,300 southbound and 2,500 northbound which are both below the initial assumed combined service capacity of 2,700 passengers per hour (22.5vph).

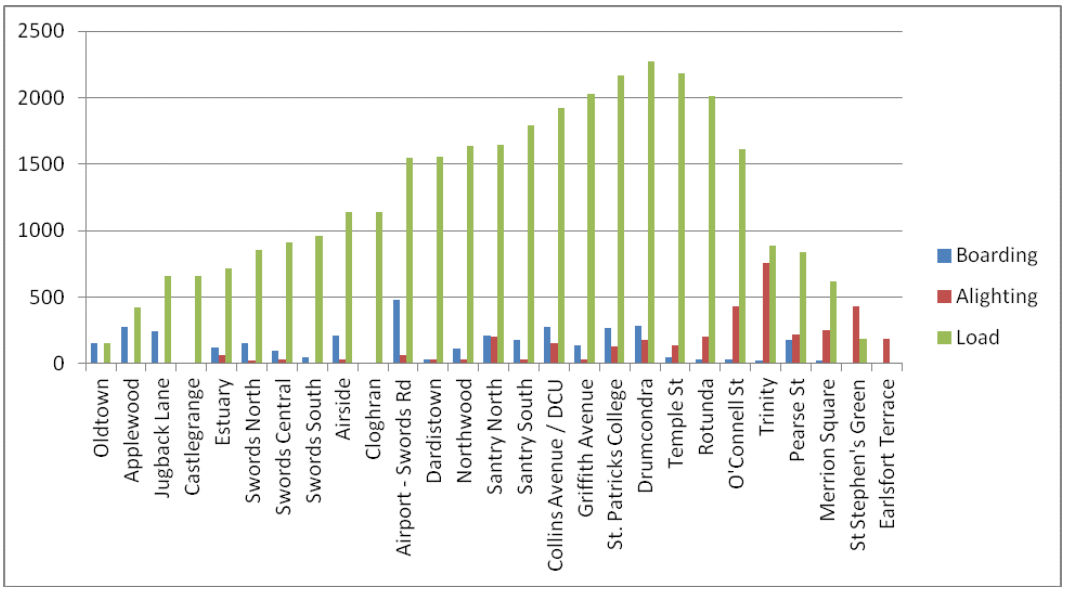

Figure 10.10: 2018 Option 2 AM Peak (08 to 09) - Southbound – Combined Swords/Airport

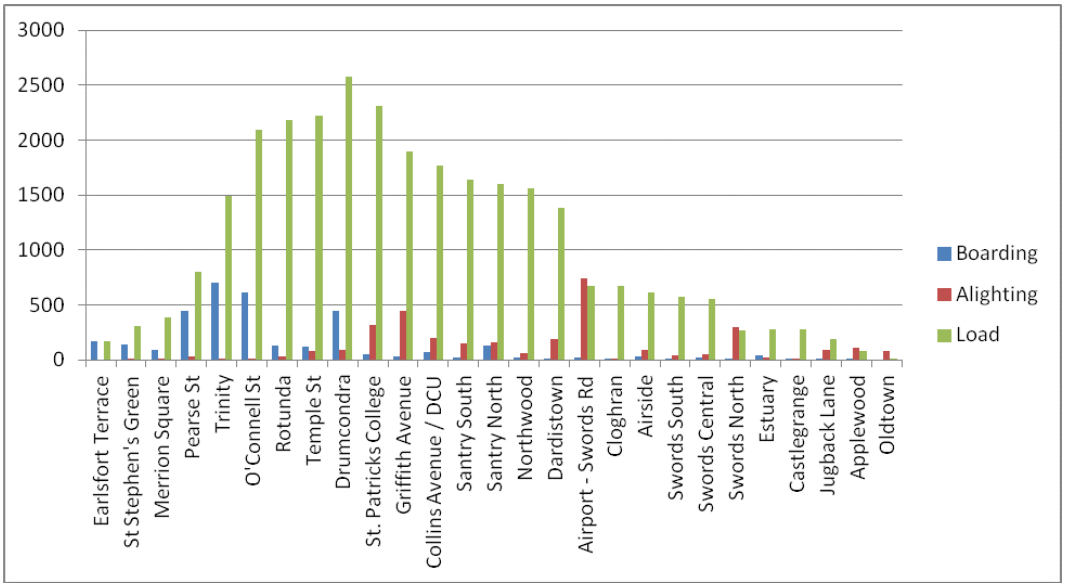

Figure 10.11: 2018 Option 2 AM Peak (08 to 09) - Northbound - Combined Swords/Airport

The AM peak hour passenger loads for Route Option 2 in the forecast year of 2033 are given in **Figures 10.12 and 10.13** below.

Again a strong demand is shown at the Drumcondra stop with forecast passenger loads of up to 1,900 passengers being seen in southbound direction which is slightly above the 1,800 passenger capacity that would be provided by 15vph.

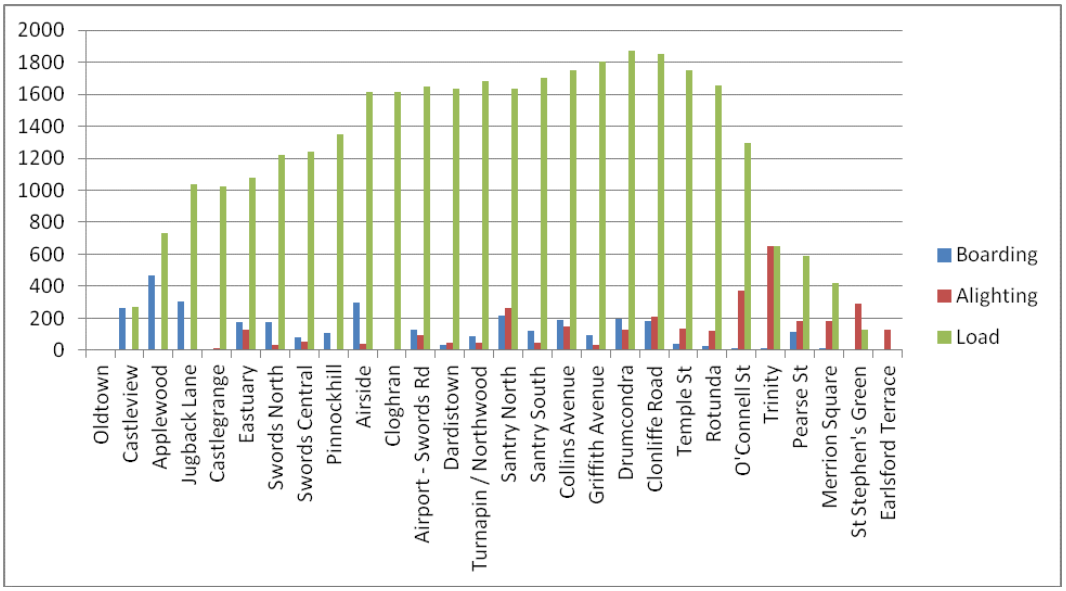

Figure 10.12: 2033 Option 2 AM Peak (08 to 09) - Southbound - Swords to City Centre Line

Figure 10.13 gives the Route Option 2 AM peak northbound line-flow for the Swords to City Centre service. It shows that demand peaks at Drumcondra with demand in excess of 2,000 passengers in the forecast year of 2033. These demands are in excess of the capacity (1,800 pphpd) provided by 15 vph but below 2,700 pphpd capacity assumed along this section which is served by both the Swords and Airport services.

It should be noted that these outputs assume that the existing Dublin Bus network is in place, reorganisation of this network could further increase demand on the proposed scheme.

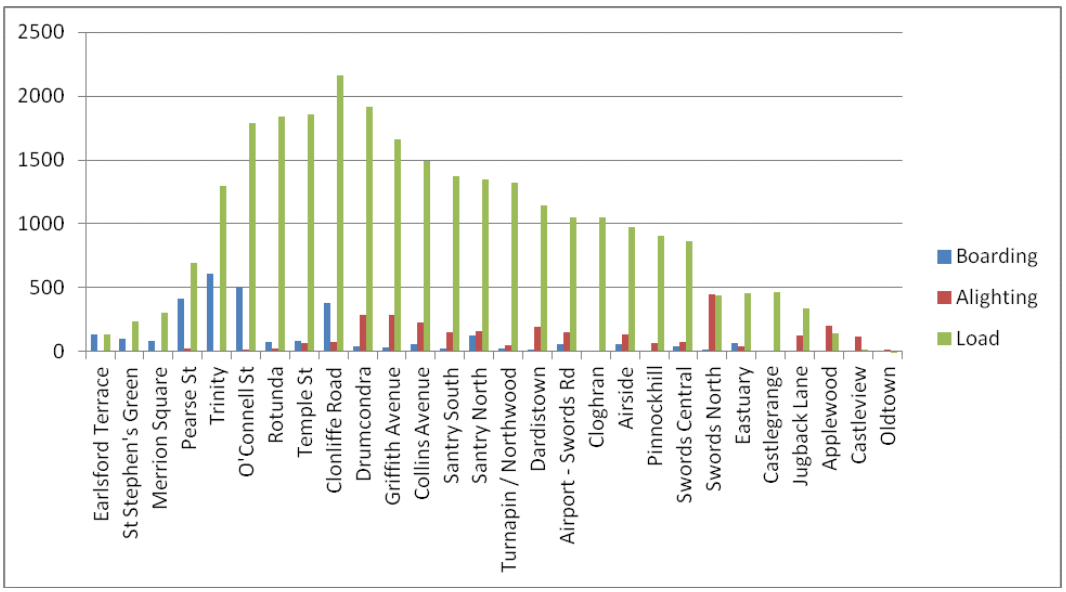

Figure 10.13: 2033 Option 2 AM Peak (08 to 09) - Northbound - Swords to City Centre Line

Figure 10.14 and 10.15 highlight the strong demand to/from the airport together with reasonably strong demand along the various stops on the route. Demand to/from the Airport is slightly higher than that forecast for Route Option 1.

As with the Swords service there is a strong demand at the Drumcondra/Clonliffe stops with forecast passenger loads of up to 1,100 passengers being seen in northbound direction which combined with the 2,000 passengers on the Swords service brings loading at that stop over the combined assumed service capacity of 2,700pphpd. It should be noted however that this analysis assumes no other transport measures are implemented prior to 2033.

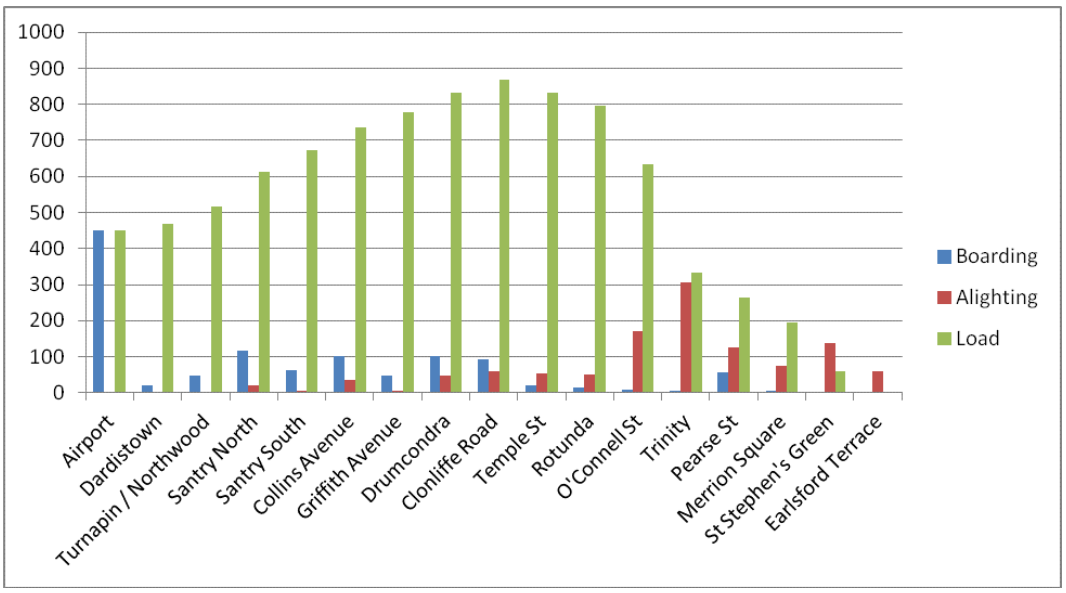

Figure 10.14: 2033 Option 2 AM Peak (08 to 09) – Southbound - Airport to City Centre Line

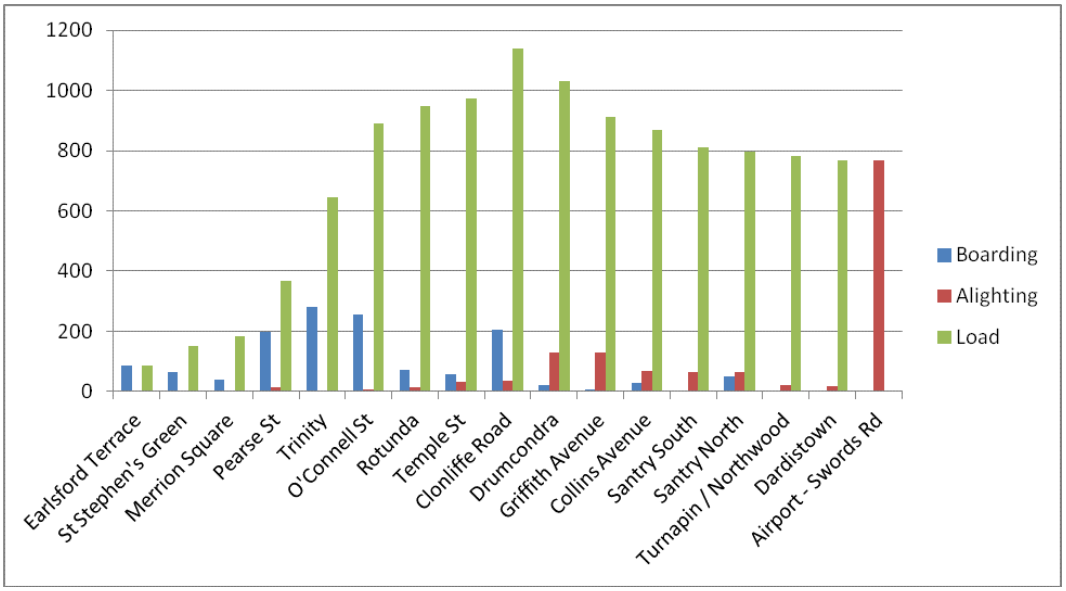

Figure 10.15: 2033 Option 2 AM Peak (08 to 09) – Northbound - Airport to City Centre Line

Figures 10.16 and 10.17 present the combined loading along Route Option 2 for the forecast year of 2033. The profile is similar to that seen in 2018 however passenger loading at Drumcondra has increased to 2,600 and 3,300 in the southbound and northbound directions respectively. Whilst the loading is in excess of the assumed capacity of 2,700ppdph it is within the longer term potential capacity of 3,600 ppdph (30vph).

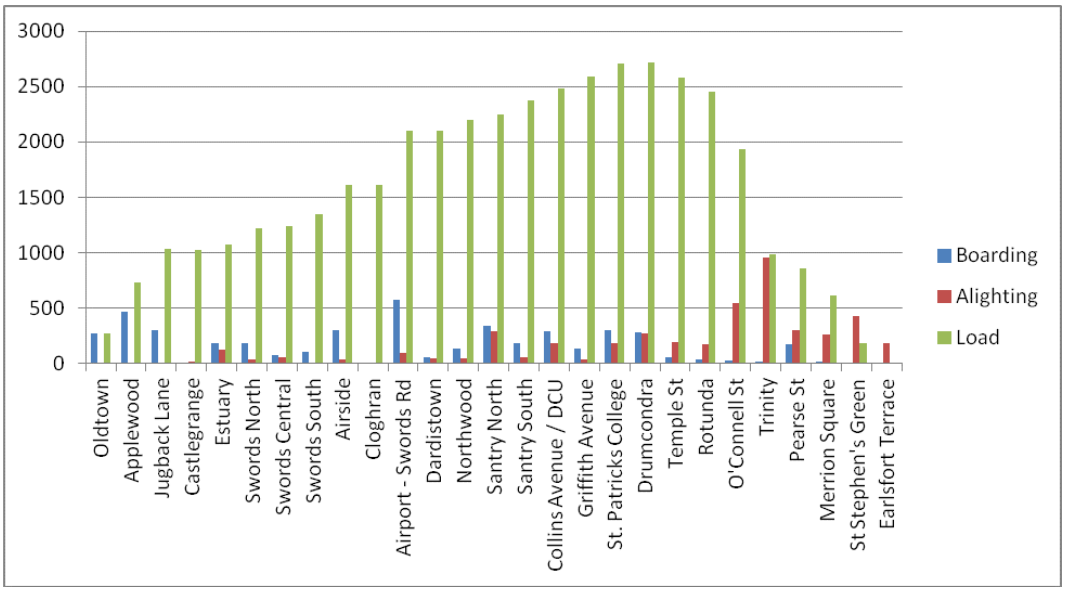

Figure 10.16: 2033 Option 2 AM Peak (08 to 09) – Southbound – Combined Swords/Airport

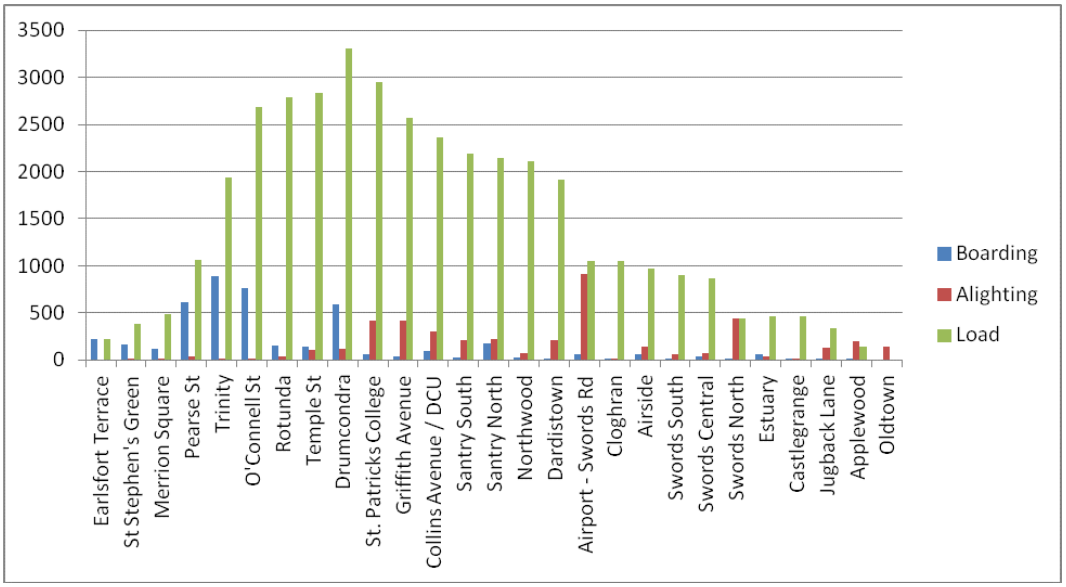

Figure 10.17: 2033 Option 2 AM Peak (08 to 09) – Northbound - Combined Swords/Airport

Each of the four end to end route options was coded separately into the public transport element of the full multimodal model. The model was then run for an opening year of 2018 and a forecast year of 2033. Upon completion of the model runs the results in terms of BRT boardings, maximum load and average travel time savings for each Swiftway Route Option scenarios were examined.

10.2.15 Route Option 4 Results

Route Option 4 is similar to Route Option 2 with the exception of Swords area where Route Option 4 travels along the R125 onto Castlegrange Green, Broadmeadow Road and new 'Swiftway' links which connect into Pine Grove Road and Rathbeale Road before terminating at Glen Ellan Road.

Figure 10.18 shows a similar passenger profile to Route Option 2 as the Route Option 4 south city stops, such as O'Connell and Trinity, are common to both. The southbound passenger demand for Route Option 4 peaks at Drumcondra with loading of nearly 1,500 passengers in the opening year of 2018. These demands are within a 15 vehicles per hour (vph) service capacity (1,800 pphpd) but it should be noted that this assumes the existing Dublin Bus network is in place.

Figure 10.19 shows that demand in the northbound direction peaks at Drumcondra and decreases significantly north of this stop.

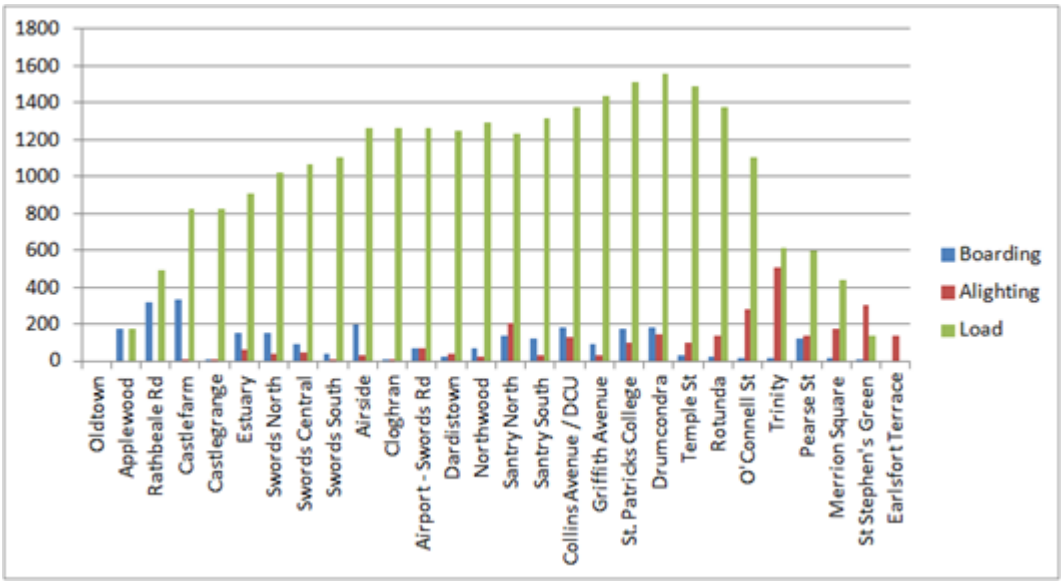

Figure 10.18: 2018 Option 4 AM Peak (08 to 09) – Southbound - Swords to City Centre Line

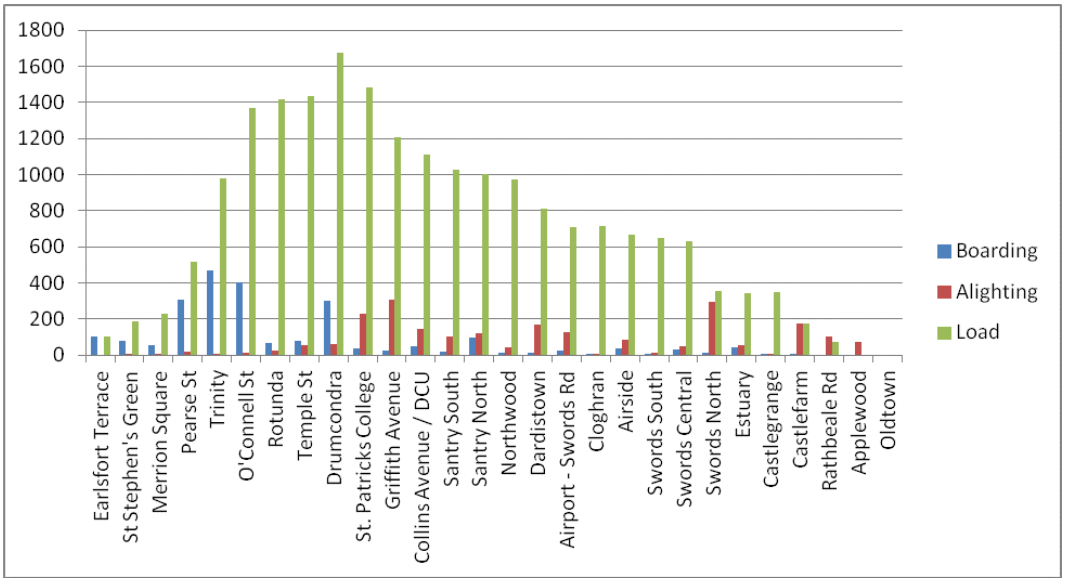

Figure 10.19: 2018 Option 4 AM Peak (08 to 09) – Northbound - Swords to City Centre Line

Figures 10.20 and 10.21 show demand along the Airport service for Route Option 4, the demand profile is similar to Option 2 with northbound and southbound loading peaking at Drumcondra.

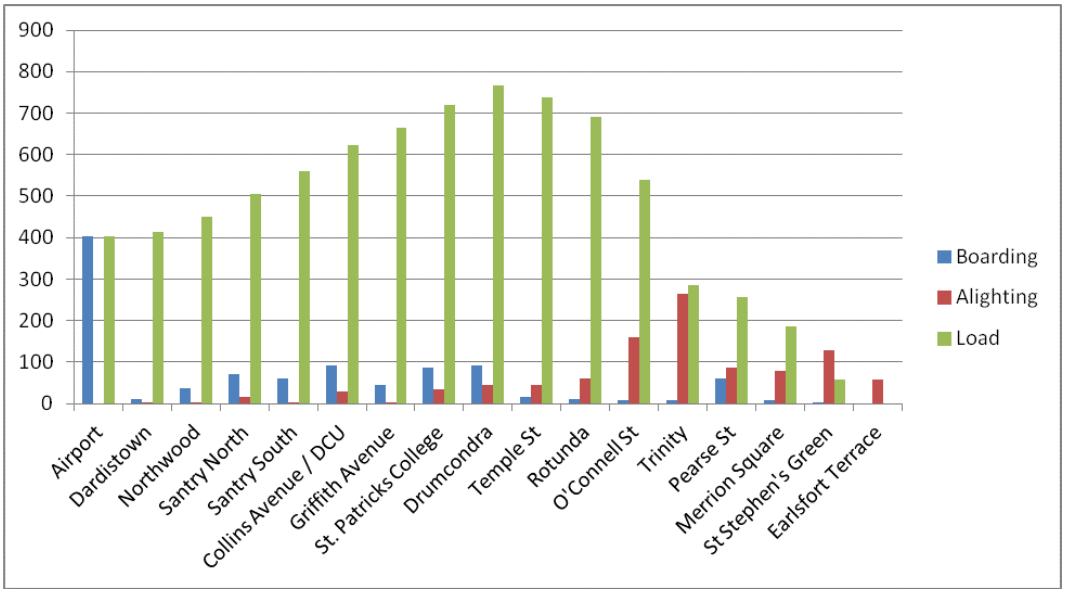

Figure 10.20: 2018 Option 4 AM Peak (08 to 09) – Southbound - Airport to City Centre Line

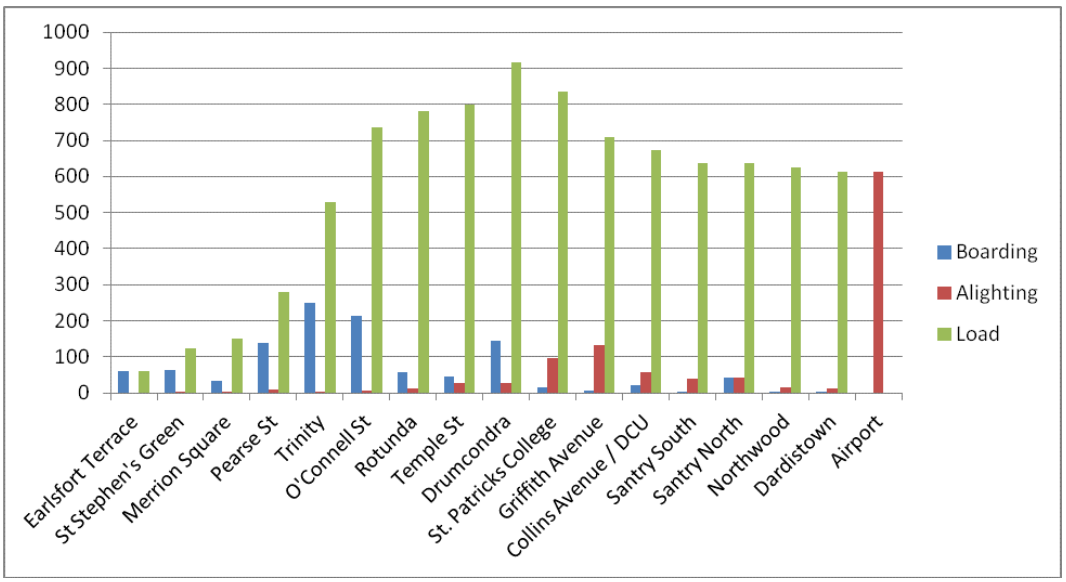

Figure 10.21: 2018 Option 4 AM Peak (08 to 09) – Northbound - Airport to City Centre Line

Figures 10.22 and 10.23 below show the loading profile of the combined Swords and Airport services. The figures show that in the southbound direction the maximum passenger load is nearly 2,300 whilst the maximum load in the northbound direction is slightly above 2,500, these maximum are similar to loadings presented for Route Option 2 above.

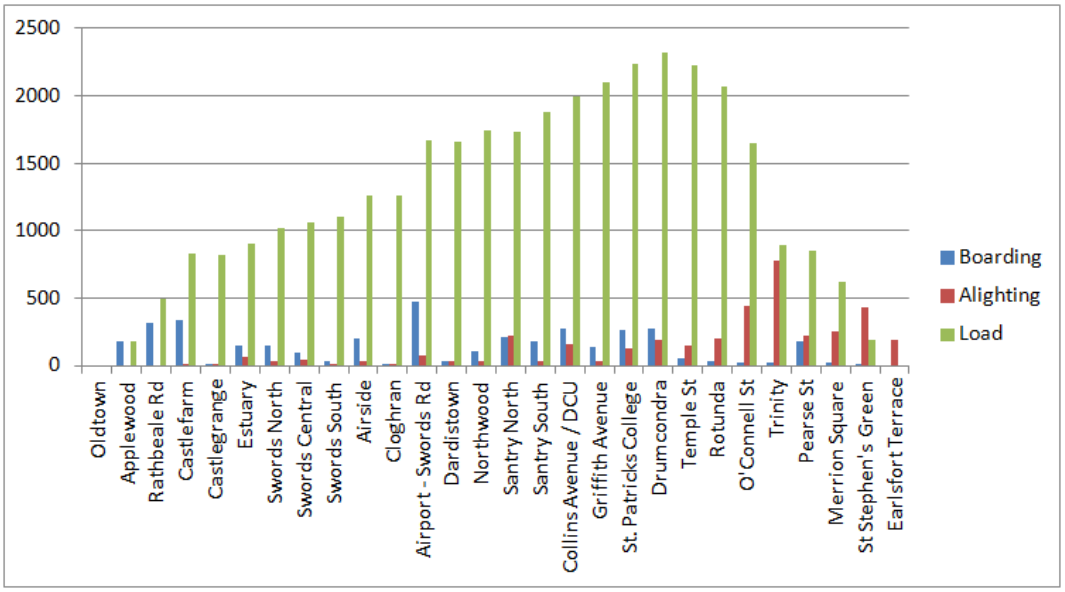

Figure 10.22: 2018 Option 4 AM Peak (08 to 09) – Southbound – Combined Swords/Airport

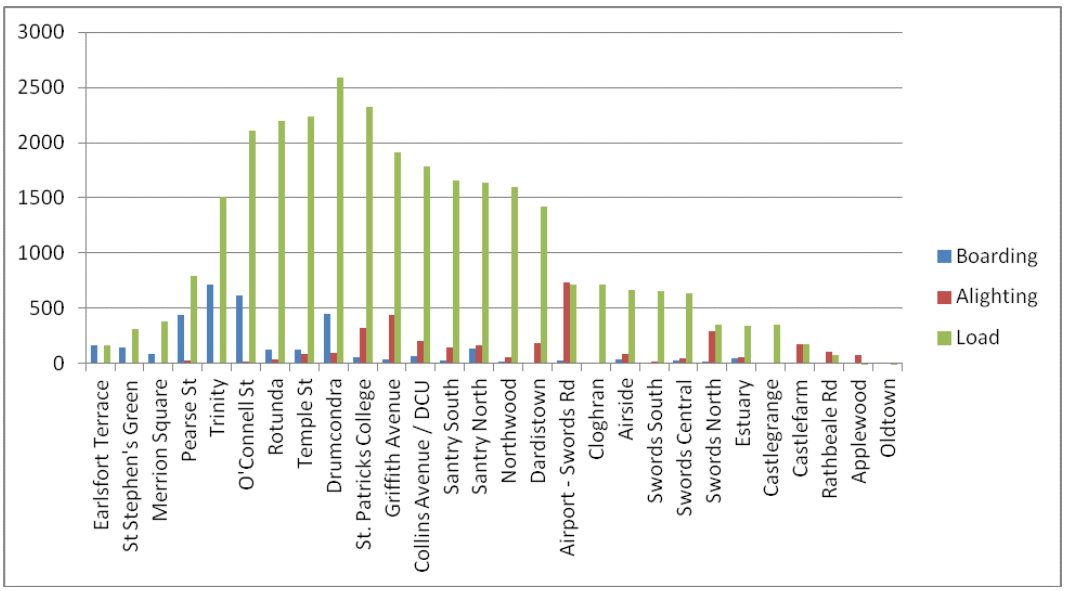

Figure 10.23: 2018 Option 4 AM Peak (08 to 09) – Northbound – Combined Swords/Airport

The AM peak hour passenger loads for Option 4 in the forecast year of 2033 are outlined in **Figure 10.24**. The results show that as per Option 2 the southbound demand peaks at Drumcondra with passenger demand loadings in excess of 1,800 passengers.

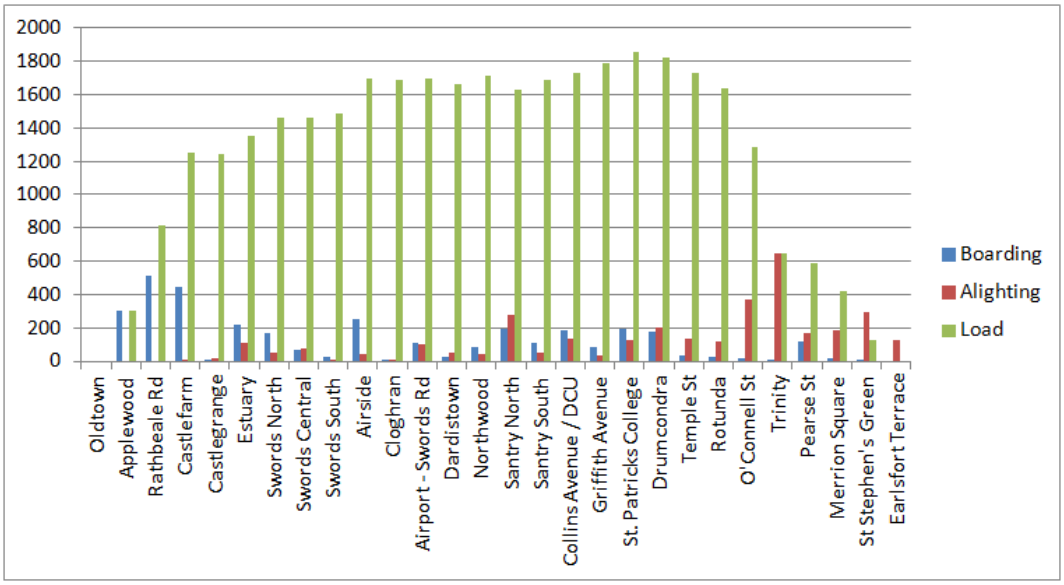

Figure 10.24: 2033 Option 4 AM Peak (08 to 09) – Southbound – Swords to City Centre Line

Figure 10.25 shows the northbound line-flow for Route Option 4. The model outputs suggest that demand will peak at the Drumcondra stop with a demand in excess of 2,000 passengers in the forecast year of 2033.

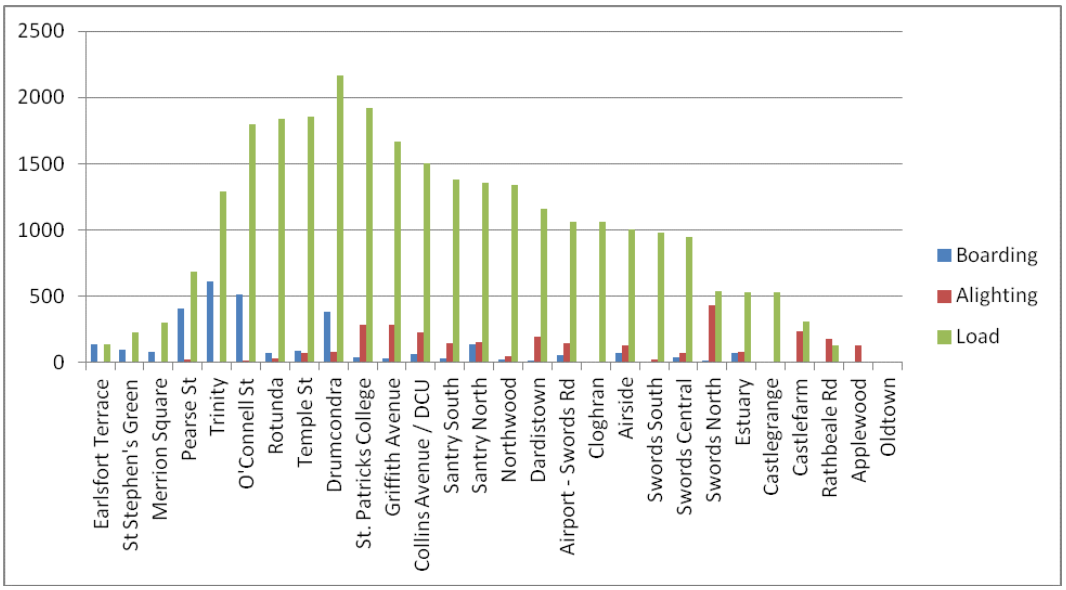

Figure 10.25: 2033 Option 4 AM Peak (08 to 09) – Northbound – Swords to City Centre Line

Figures 10.26 and 10.27 highlight the strong demand to/from the airport together with reasonably strong demand along the various stops on the route.

As per the Swords service there is a strong demand on the Airport service at the Drumcondra stop with forecast passenger loads of up to 1,200 passengers being seen in northbound direction which combined with the 2,000 passengers on the Swords service brings loading at that stop over the combined assumed service capacity of 2,700pphpd. As mentioned previously, however it should be noted however that this analysis conservatively assumes no other transport measures are implemented prior to 2033.

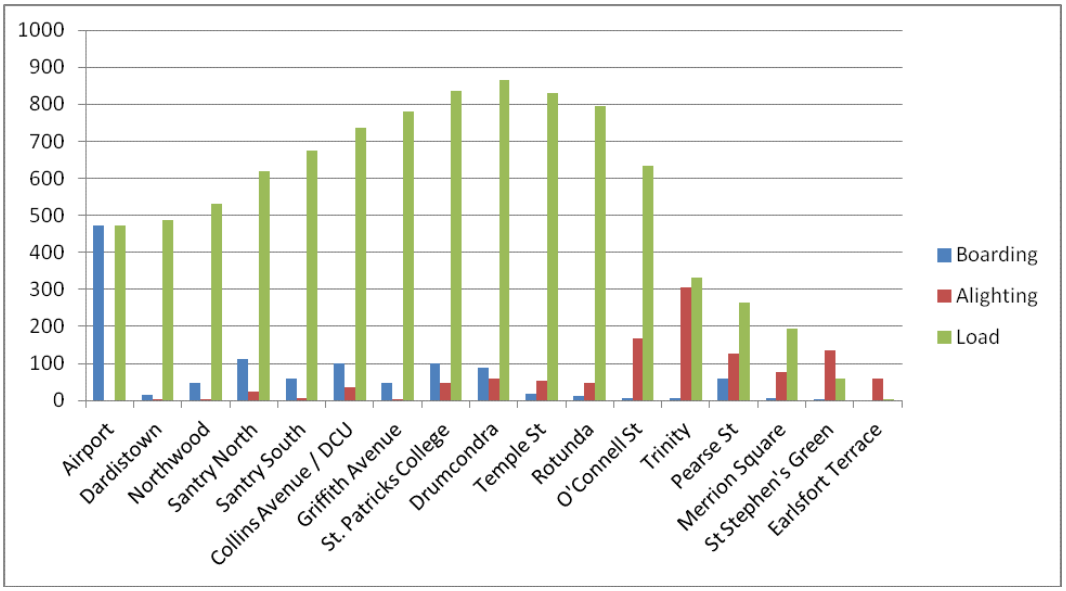

Figure 10.26: 2033 Option 4 AM Peak (08 to 09) – Southbound - Airport to City Centre Line

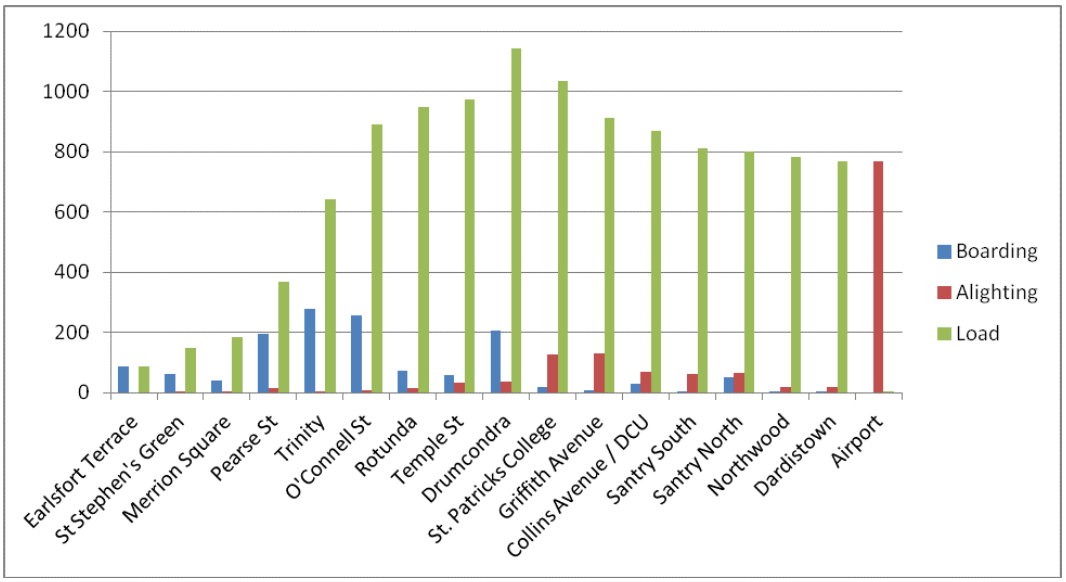

Figure 10.27: 2033 Option 4 AM Peak (08 to 09) – Northbound - Airport to City Centre Line

Figures 10.28 and 10.29 present the combined loading along Route Option 4 for the forecast year of 2033. The profile is similar to that seen in Route Option 2 with passenger loading peaking at Drumcondra with 2,700 and 3,300 in the southbound and northbound directions respectively. Whilst the loading is in excess of the assumed capacity of 2,700ppdph it is within a longer term potential capacity of 3,600 ppdph (30vph).

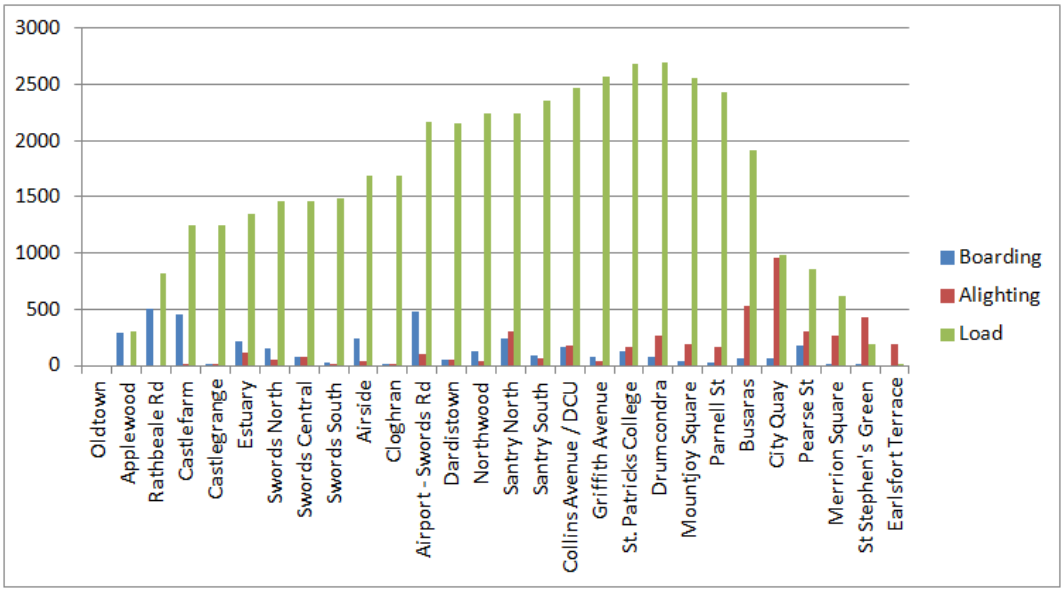

Figure 10.28: 2033 Option 4 AM Peak (08 to 09) – Southbound – Combined Swords/Airport

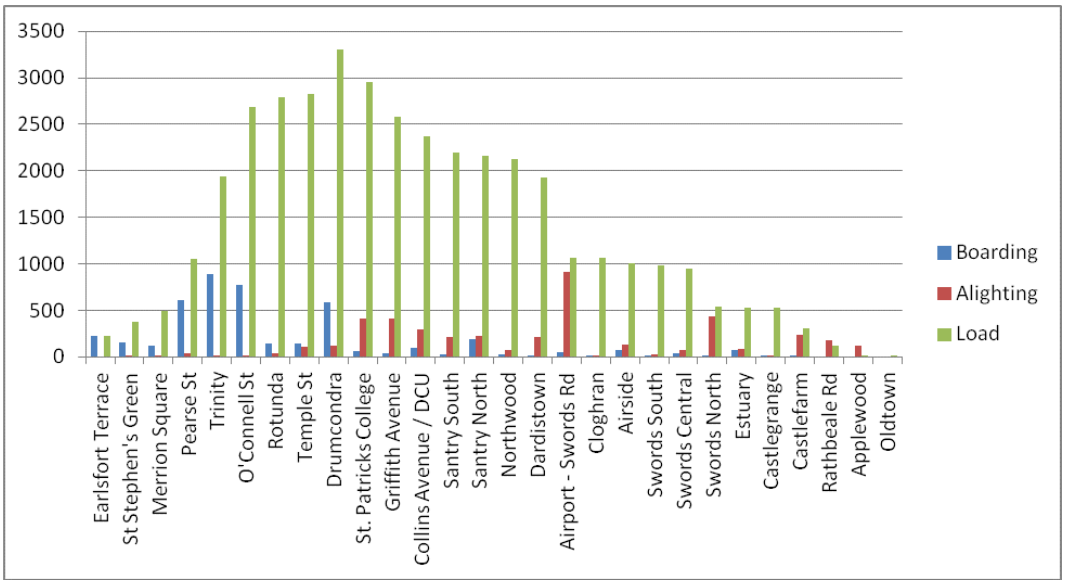

Figure 10.29: 2033 Option 4 AM Peak (08 to 09) – Northbound - Combined Swords/Airport

10.2.16 Transport Demand Analysis Results – Stage 2

Tables 10.5 and 10.6 below present a summary of the results of the Stage 2 transport demand analysis. These tables provide information on the AM peak period boarding figures, max load and forecast annual demand for Route Options 2 and 4.

Table 10.5: Summary of Results – Opening Year - 2018

Route Option	Total AM (7-10) Boarding's BRT	Annual BRT Demand (Millions)[1]	Annual BRT Demand Per Km (Millions)	Route Length (km)	Max Load (Combined Lines, Persons)	Ave Travel Time difference PT (pp, secs) [2]
2	19,432	24.64	1.07	23.1	2,577	-32 secs
4	19,973	25.33	1.08	23.5	2,592	-25 secs

1. Demand is annualised based on AM peak period factor of 1,268 as derived from 2006 GDA Household Survey Data
2. PT travel time includes access, waiting time etc.
It is anticipated that demand will increase following a reorganisation of Dublin Bus routes
Results presented are for full GDA model area, not only Swords corridor.

Table 10.6: Summary of Results – Forecast Year - 2033

Route Option	Total AM (7-10) Boarding's BRT	Annual BRT Demand (Millions)[1]	Annual BRT Demand Per Km (Millions)	Route Length (km)	Max Load (Combined Lines, Persons)	Ave Travel Time difference PT (pp, secs) [2]
2	22,972	29.13	1.26	23.1	3,301	-45 secs
4	23,382	29.65	1.26	23.5	3,306	-43 secs

1. Demand is annualised based on AM peak period factor of 1,268 as derived from 2006 GDA Household Survey Data
2. PT travel time includes access, waiting time etc.
It is anticipated that demand will increase following a reorganisation of Dublin Bus routes
Results presented are for full GDA model area, not only Swords corridor.

Tables 10.5 and 10.6 above show annual boardings of between 24 – 25.5 million for 2018 rising to between 29 – 30 million for 2033. These figures are a significant increase on the number of annual boardings predicted in the initial modelling which did not take account of highway changes, as detailed in section 10.2.5. This indicates that whilst highway network changes result in some disbenefit to existing highway users they have resulted in improved uptake of the Swiftway service. As outlined earlier this is based on the assumption that the existing Dublin Bus network remains in place. Whilst the comparison between the route options shows that Route Options 2 and 4 result in very similar outputs in terms of Annual Demand, Annual Demand per km and Max Load, Route Option 2 provides the highest travel time savings for public transport users.

Upon completion of the detailed transport demand analysis modelling the results of the modelling tests were taken forward to the Stage 2 CBA.

10.2.17 Stage 2 - CBA Results

The Stage 2 CBA takes account of any potential disbenefits, in terms of increased travel time or distance, to existing highway users as a result of highway changes likely to be implemented to facilitate the Swiftway scheme. In undertaking the Stage 2 CBA analysis the preliminary scheme costs as set out in Section 10.2.10 of this report were used.

The Stage 2 CBA results for the route options are presented in **Tables 10.7 and 10.8**. These results take account of benefits derived by users of the proposed scheme and also account for any disbenefits to highway users due to reduced junction capacity at some locations.

Table 10.7: Summary of Economic Appraisal – Stage 2 CBA - Lower Bound Costs

Route Option	Discounted Scheme Costs (2009 values €M)	Discounted Scheme Benefits (2009 values €M)	Discounted Scheme Residual Value (2009 values €M)	BCR
2	258,561	323,159	230,388	2.14
4	263,166	299,184	214,058	2.0

** Costs and Benefits were brought back to 2009 prices and values as part of the CBA*

Table 10.8: Summary of Economic Appraisal – Stage 2 CBA - Upper Bound Costs

Route Option	Discounted Scheme Costs (2009 values €M)	Discounted Scheme Benefits (2009 values €M)	Discounted Scheme Residual Value (2009 values €M)	BCR
2	275,972	323,159	230,388	2.01
4	280,996	299,184	214,058	1.90

** Costs and Benefits were brought back to 2009 prices and values as part of the CBA*

The Stage 2 CBA assessment, as presented in Tables 10.7 and 10.8, found that whilst both options have strong business cases, Route Option 2 emerges as the preferred route option in terms of monetary benefits to the economy with a **Benefit to Cost Ratio of 2.0 - 2.1**. While both Route Options have similar demand profiles, the disbenefits arising from the highway changes in northwest Swords in Route Option 4 are slightly greater than Route Option 2, which, together with higher scheme costs, leads to a higher BCR for Route Option 2.

As set out earlier, the results presented in this section are based on the preliminary designs and costings for the various route options.

It is envisaged that further refinement of the design will be undertaken for the preferred route based on outputs from local models to improve travel times for both public transport and general traffic. It is proposed to undertake a financial appraisal of the preferred scheme in terms of internal rate of return etc. as part of the Preliminary Business Case once the costings, fares etc. are finalised.

10.2.18 Summary

The transport demand modelling and CBA undertaken as part of the route options assessment showed that whilst all route options pass the value for money tests, **Route Option 2** emerges as the most economically beneficial with a **Benefit to Cost Ratio of 2.0 – 2.1**.

It should be reiterated that the above Benefit to Cost ratios are preliminary for the purpose of undertaking a comparative assessment of the route options under consideration. At this stage they do not include all of the economic benefits arising from the project and exclude such items as;

- Benefits arising from off peak periods outside of the AM and PM peak periods;
- Benefits arising from operational savings and potential increased patronage from the reorganised bus service;
- Benefits arising from further refinement of the scheme to improve bus journey times and reduce highway delays at junctions;

- Benefits arising from the improved utility and safety of the associated cycle network which is being delivered as part of the scheme; and
- Other relevant benefits appropriate for inclusion in a cost benefit analysis.

11 Proposed Scheme

11.1 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.

11.2 Route Options Assessment Conclusions

Sections 6 to 9 of this report presented an appraisal of each of the potential route options for each of the three study area sections identified, including Dublin Airport. Within each study area section, where potential route options were considered to be available, they have been assessed in accordance with the methodology set out in Chapter 5 including a 'Multi-Criteria Analysis' under the headings of Economy, Integration, Accessibility and Social Inclusion, Safety and Environment.

Following this appraisal, emerging preferred route sections were combined to create end-to-end route options and taken forward for more detailed transport demand and economic appraisal in Chapter 10. In total, four end to end route options were considered, based on combinations of route variants GE1 (Section 6.3.2) and PG1 (Section 6.3.7) in northwest Swords and N2 (Section 9.4.3) and N3 (Section 9.4.4) in the north City centre.

The findings from the transport demand and economic appraisal gives a clear differentiation and preference for route options along the O'Connell Street corridor (Route Options 2 and 4) over Gardiner Street (Route Options 1 and 3) in terms of BCR. This is also consistent with the conclusions from the study area section MCA which also on balance preferred Route N3 over N2 (Section 9.4.6).

Route Options 2 and 4 are relatively similar in terms of the benefit to cost ratios derived from the transport demand and economic appraisal process, with Route Option 2 being slightly more beneficial overall. When looking at the study area section appraisal, Route Option GE1 has clear advantages over PG3 in terms of the MCA undertaken (Section 6.3.8), particularly in terms of the potential for environmental impacts, which outweighs the relative similarities in terms of likely patronage and overall BCRs derived from the comparative economic appraisal.

On this basis, Route Option 2 is therefore preferred over Route Option 4, taking account of the preference locally for Route GE1 over PG3 in North-west Swords. This is further supported through the CBA undertaken, with Route Option 2 emerging as the most economically beneficial with a **Benefit to Cost Ratio of 2.0 – 2.1**.

11.3 Recommended Preferred Route

Based on the conclusions from the route options assessment process, as set out in Section 11.3, the recommended preferred route for the proposed scheme is **Route Option 2**. This route is presented in **Figure 11.1**.

Figure 11.1: Swords / Airport to City Centre Swiftway Scheme Preferred Route

11.4 Preferred Route

This scheme is intended to serve the busy corridor between Swords and the City Centre, with 26 stops at key locations along the route and a potential two additional future stops identified.

The preferred route starts on the Glen Ellan Extension Road in Oldtown in the northwest of Swords. A terminus for Swiftway vehicles, comprising layover space and drive welfare facilities, will be provided at the western edge of Oldtown. The first stop will be located in the developing neighbourhood centre of Oldtown serving the surrounding residential estates and the Swords Educate Together and Brian Bóroimhe schools.

The preferred route continues along Glen Ellan Road Extension Road towards Applewood where the next stop will be located close to the junction with the Ashton Distributor Road. This stop will serve residents in the Castleview and Applewood areas as well as those living south of the preferred route along Rathbeale Road. This stop will also serve the Thornleigh Educate Together National School and is in close proximity to Applewood Main Street.

The next stop will be located adjacent to Jugback Lane and will serve eastern parts of Applewood, St. Finian's Community College and residents living in the Broadmeadow area south of the preferred route.

From Jugback Lane, the preferred route continues along Glen Ellan Road before turning onto Balheary Road where the next stop is located. This stop will serve the Swords Business Campus and the Castlegrange residential neighbourhood.

The preferred route then turns onto Castlegrange Road before following the R132, along the Swords Bypass, with stops provided at the Estuary, Seatown (Swords North), Malahide Road (Swords Central) and Pinnock Hill (Swords South) junctions. These stops will serve residential areas along the corridor as well as the retail and commercial centre of Swords, including Swords Pavilions. The Swords Central stop will also serve future development lands to the east of the R132 (i.e. the Barrysparks LAP lands).

South of Swords, the preferred route continues along the R132 stopping at Airside Retail Park. The Airside stop will serve residents in the River Valley area as well as passengers travelling to Airside Retail Park.

From Airside, the preferred route continues along the R132 towards Dublin Airport with potential for a future stop at Cloghran to serve development lands to the south of Clonshaugh Road.

It is anticipated that Swiftway services from Swords will stop at an Airport stop located on the R132 with a separate Swiftway service to/from the City Centre entering the airport, providing more direct access to the terminals and airport campus.

From the airport, the preferred route follows the R132, with a future stop identified at Dardistown (subject to demand). A stop will also be located at the entrance to Northwood to cater for existing residential and employment demand in the area.

The preferred route continues along the R132 towards Santry, turning onto Coolock Lane where a stop (Santry North) will be located to serve central and northern areas of Santry as well as western areas of Coolock. From here, Swiftway vehicles will be routed via the N50 before stopping at a 'Santry South' stop located below the Shantalla Road overpass. This stop will serve central and southern areas of Santry as well as being the closest stop to Beaumont Hospital.

Continuing southwards, the next stop is located at the R132/Collins Avenue junction and will serve Dublin City University.

A stop will be located at Griffith Avenue, while at the northern end of Drumcondra, a stop will be located outside St. Patricks College serving the college as well as the retail centre of Drumcondra. A second stop will be located at the southern end of Drumcondra next to Clonliffe Road, to facilitate interchange with suburban rail services at the nearby Drumcondra rail station. This stop is also the closest stop to Croke Park.

The preferred route continues southwards along Dorset Street with a stop located to the south of Gardiner Street. This stop will serve residential areas in the vicinity as well as the Mater Hospital.

From Dorset Street, the preferred route turns onto North Frederick Street and continues onto Parnell Square East where the next stop is located. As well as serving north inner city residential and retail areas, this stop will serve the Rotunda Hospital and Gate Theatre.

The preferred route will continue from Parnell Square East onto O'Connell Street where a stop will be located to serve the North City Centre commercial core and provide opportunity for interchange with Luas (Red Line and Cross City Line) and other bus services.

South of the River Liffey, a one-way loop system is envisaged around D'Olier Street, College Street, and Westmoreland Street. Southbound, the preferred route runs along D'Olier Street, and travelling northbound the preferred route travels along College Street and Westmoreland Street.

The southbound stop will be located on D'Olier Street with the corresponding northbound stop located on Westmoreland Street to serve the South City Centre area including Temple Bar and Trinity College. These stops will provide opportunity for interchange with Luas and other bus services.

From here, the preferred route travels along Townsend Street / Lombard Street before turning onto Westland Row. The return trip for northbound vehicles along this section will be made via Pearse Street. A stop will be located at the junction of Pearse Street and Westland Row serving Trinity College and providing interchange with DART and suburban rail services at Pearse Street rail station.

The preferred route continues south along Westland Row, along Merrion Street Lower and onwards to Merrion Square West where the next stop is located. This stop will serve the south east business district, Grafton Street retail core and areas of interest such as the National Gallery of Ireland, National Museum of Ireland and Government Buildings.

From Merrion Square, the preferred route continues straight through Ely Place and onto Hume Street to the next stop (St Stephen's Green).

This stop will serve the South City Centre retail and commercial core as well as retail areas along Baggot Street Lower.

The preferred route turns from Hume Street onto St. Stephens Green East and continues onto Earlsfort Terrace where the final stop will be located across from the National Concert Hall. This stop will serve commercial offices in the vicinity as well as the National Concert Hall, Iveagh Gardens and several nearby hotels.

Swiftway vehicles will use Hatch Street and Leeson Street Lower to return to St. Stephens Green East and commence the northbound service back to Swords.

11.5 Proposed Stop Locations

The choice of stop locations is guided by spacing (400 m – 500 m optimal for the City Centre section, 800 m for suburban areas), demand centres along the route and availability of sufficient width for 3 m wide platforms. Key passenger trip generators have been identified along the Swiftway route and the stop locations have been positioned as close as practicable to them along the selected route. These include:

- Urban centres;
- Airport;
- Educational Facilities (e.g. Universities, Colleges etc.);
- Hospitals;
- Shopping Centres;
- Key Transport Interchanges (e.g. Bus, Luas, DART and Rail stops);
- Generators of Large Employment (e.g. Council Offices, Business / Retail Parks);
- Sports / Events Venues;
- Places of interest/tourist destinations; and
- Parks.

A total of 28 stops have been identified along the route, 2 of which would be future stops. These stops have been located so as to maximise accessibility to the Swiftway service and serve major trip attractors (shopping centres, offices, residential neighbourhoods).

The stop locations are illustrated in **Figure 11.1** and are described in **Table 11.1**.

Table 11.1: Swiftway Stop Locations and Descriptions

Stop Name	Location	Stop Description
Oldtown	Glen Ellan Road Extension Road, just east of entrance into the Swords Educate Together National School	Directly serves Oldtown Town centre, the Swords Educate Together National School and Gaelscoil Bhrian Bóroimhe and new residential neighbourhoods in Oldtown.
Applewood	Glen Ellan Road Extension, just west of Castleview Avenue.	Serves retail centre on Applewood Main Street and surrounding residential neighbourhoods.
Jugback Lane	Glen Ellan Road, at Jugback Lane junction	Serves catchment to south of Glen Ellan Road and retail centre on Applewood Main Street
Castlegrange	Balheary Road, midway between Glen Ellan Road and Castlegrange Road	Serves Swords Business Campus, St. Finian's Community College and the Castlegrange residential area neighbourhood.
Estuary	R132, just south of Castlegrange Road	Serves residential neighbourhoods to the east of the R132 and retail area along North Street. Potential for interchange with regular Dublin Bus services.
Swords North (Seatown)	R132, just north of Seatown Road for northbound stop and just south of Seatown Road for southbound stop	Serves Swords Business Park to the east of R132 and Final Community College, St. Colmcille's National School, Swords Main Street and surrounding residential neighbourhoods to the west of the R132.
Swords Central (Pavilions)	R132, just south of Malahide Road Roundabout	Serves Swords Pavilions and Barrysparks development lands adjacent to the R132. Stop could be modified in the future to integrate with the Metro proposals. Potential for interchange with other bus services.
Swords South (Pinnock Hill)	R132, just north of Dublin Road for northbound stop and just south of Dublin Road for southbound stop	Serves southern parts of Swords town centre along Dublin Road as well as Airside Business Park. Opportunity in future to integrate with proposed Metro park and ride. Potential for interchange with other bus services.
Airside	R132, just north of Bóroimhe Road	Serves Airside retail park and the River Valley residential area. Potential for interchange with other bus services.

Stop Name	Location	Stop Description
Cloghran *(Future)*	R132, just north of Naul Road for northbound stop and just south of Naul Road for southbound stop	Potential future stop. Currently little demand generated by nearby Metropoint Business Park and the National Show Centre. Potential for development of land to southeast of Cloghran roundabout which may warrant new stop in the future.
Dublin Airport	New West Link Road, midway between T2 Premium Departures Road and Corballis Road North	Stop likely to be located on the 'New West Link Road' creating a public transport hub, centrally located within the Airport, providing opportunity for interchange with regional bus services
Dublin Airport/Swords Road	R132, midway between Corballis Road South and Corballis Road North	Stop would serve passengers bound for areas within the Airport, not necessarily the terminals (e.g. existing and future office development, hotels etc.)
Dardistown *(Future)*	R132, midway between the Old Airport Road and the M50 flyover	Will serve future Dardistown LAP lands
Northwood	R132, just north of Northwood Avenue	Will serve the Airport Business Campus and Northwood residential/commercial areas.
Santry North	R104 Coolock Lane, just east of R132	Will serve residential areas in Santry north and northern parts of the village.
Santry South	N50, just north of R132 overpass for southbound stop and just south of R132 overpass for northbound stop	Serves residential areas in Santry south and southern parts of Santry village. Also serves residential areas east of the N50 and Our Lady of Mercy College and Margaret Aylward Community College. This stop is also the closest Swiftway stop to Beaumont Hospital.
Collins Avenue/DCU	R132, just south of Collins Avenue	Primary stop for passengers travelling to DCU. Potential for interchange with orbital routes providing more direct public transport access to DCU and Beaumont Hospital. Also serves Larkhill Primary School, Whitehall Church and St. Aidans CBS.
Griffith Avenue	R132, just north of Griffith Downs	Serves residential areas in northern Drumcondra as well as Whitehall College of Further Education, Plunkett College, Home

Stop Name	Location	Stop Description
		Farm Football Club, Regency Hotel and Highfield Hospital
St. Patricks College	R132, just north of Church Avenue	Primary stop for passengers travelling to St Patricks College, All Hallows College and Tolka Park Stadium. Also serves Drumcondra commercial centre and several schools including Dominican College Secondary School, Corpus Christi National School and Pobalscoil Rosmini Community School.
Drumcondra	R132, just north of Clonliffe Road	Serves residential areas in southern Drumcondra as well as providing good interchange with commuter rail services at Drumcondra rail station. This stop will also serve passengers travelling to Croke Park.
Dorset Street	Dorset Street, just south of Gardiner Street	Serves residential areas in the north inner city as well as the Mater Hospital, Temple Street Hospital and a number of schools.
Parnell Square	Parnell Square East, just south of Parnell Square North.	Serves residential areas in the north inner city as well as the Rotunda Hospital, the Gate Theatre and parts of the north inner city retail centre.
O'Connell Street	O'Connell Street, just north of Cathedral Street	Serves the main commercial core in the North City Centre. Opportunity for interchange with Luas Red and Cross City Lines and numerous Dublin bus routes. Located a short walk from key employment areas such as the IFSC.
D'Olier Street	Northbound stop on Westmoreland St. and southbound stop on D'Olier Street close to O'Connell Bridge.	Serves parts of the north inner city and south inner city including Trinity College, Temple Bar and the north and south quays.
Pearse Street	Northbound stop located on Lombard Street just north of Pearse Street. Southbound stop located on Westland Row, just south of Pearse Street.	Serves Pearse Street residential areas and eastern parts of the Trinity College campus. Also provides interchange with DART and suburban rail services at Pearse Street rail station.
Merrion Square	Merrion Square West, just south of Merrion Square North	Serves several places of interest for tourists including the National Gallery of Ireland, the National Museum of Ireland and Government buildings.

Stop Name	Location	Stop Description
St. Stephens Green	Hume Street, between St Stephens Green East and Ely Place	Serves South City Centre retail core as well as retail areas along Baggot Street Lower
Earlsfort Terrace	Earlsfort Terrace, just north of Hatch Street	Serves South City Centre residential areas as well as several commercial offices and the National Concert Hall.

Residential and employment catchments (5, 10, 15 minute walk distances) along the preferred route, based on the stop locations identified, are presented in **Figure 11.2**.

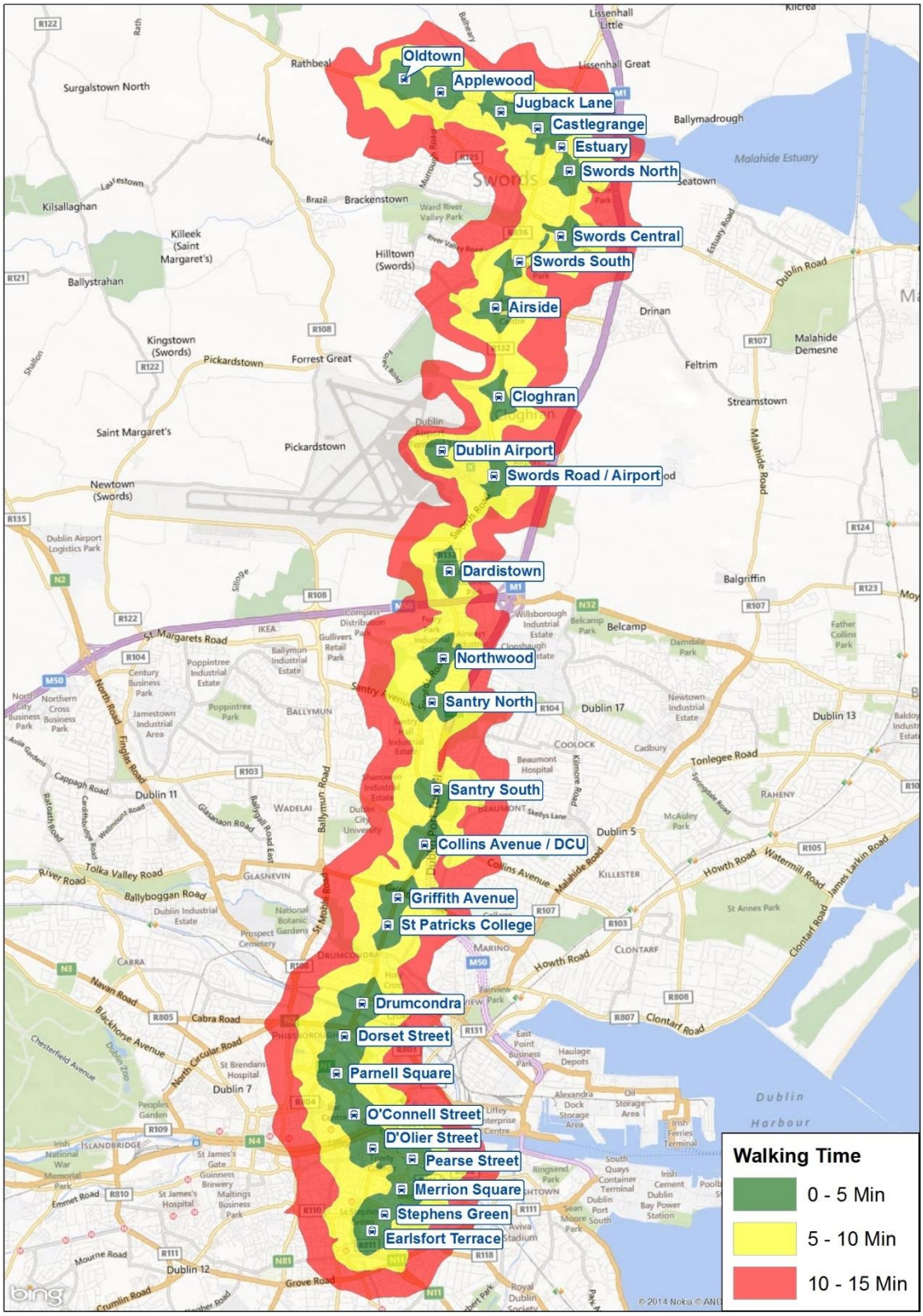

Figure 11.2: Preferred route walk catchments

Table 11.2 presents a summary of existing catchment populations along the route, derived from 2011 Census and POWSCAR data.

Table 11.2: Preferred Route – Residential and Employment Population Catchments

Walk Distance from Swiftway Stop	Residential Population	Employment Population
0-5 mins	24,900	52,000
5-10mns	49,000	81,900
10-15 mins	61,900	49,800
15 mins (total)	**91,700**	**183,700**

11.6 Provision for Cyclists

The Draft Greater Dublin Area Cycle Network Plan identifies the existing Swords QBC corridor as part of the primary cycle network (Route 2A) and thus form a key part of the strategic cycle network. It is therefore important that the Swiftway design along the corridor takes cognisance of this and it is intended that the proposed Swiftway scheme incorporates, where practical, the cycle infrastructure required to provide a high quality of service, a minimum QoS of B in accordance with the National Cycle Manual, as required for a Primary Cycle Route.

The National Cycle Manual advises against shared use of bus lanes by cyclists where the bus lane width is between 3.0 m and 4.5 m. BRT lanes will generally be within this range. Furthermore, shared use of road space by vulnerable cyclists and long articulated vehicles (up to 24 m long vehicles) should be avoided where possible. At a minimum, a quality cycle facility should be provided at areas of high activity such as Swiftway stops and junctions.

It is not realistic that cyclists will choose to share a heavily trafficked general traffic lane outside of an adjacent bus lane. Therefore, shared use of traffic lanes is generally avoided.

Segregated cycling facilities are therefore generally preferred along the Swiftway corridor. Preliminary scheme design has indicated that this is generally achievable, with the exception of a number of isolated locations.

However, there are sections where Swiftway is proposed along routes which do not form part of the GDA Cycle Network Plan. In these instances, there is a reduced requirement to provide cycle facilities. These locations are as follows:

- N50 – Santry Bypass – the Swiftway bypasses Santry along the N50 from Coolock Lane to Shantalla Road, which is not part of the Cycle Network, while Cycle Route 2A travels through Santry Village. As such, cycle facilities, will be provided in Santry Village along the Swords Road and none provided along the N50; and

- R132 – Swords Bypass – The Swiftway bypasses Swords along the R132 from Pinnock Hill roundabout to Estuary Roundabout, a link which does not form part of the Cycle Network. Cycle Route 2A and SW1 use Swords Main Street and as such, cycle facilities, where required will be provided here.

11.7 Interaction with Other Buses

The typical dwell time for regular buses at stops can range from 10 seconds to well over one minute, depending on the number of passengers alighting and boarding, due to single door boarding and on-board ticketing. This variability is one major reason for the difficulty in achieving consistent journey times and scheduling for regular bus services. By contrast a Swiftway service operates in the same way as a tram with a consistent 15 to 20 second stop dwell time, regardless of passenger numbers alighting and boarding, due to off-board ticketing and multi-door access. For a Swiftway service, it is not therefore appropriate to share stops with regular buses as that will lead to variable and unpredictable impedance of a Swiftway vehicle caught behind a regular bus at a stop.

While it may be desirable and feasible to fully segregate the Swiftway service from other bus services in some places so as to ensure optimal operation and reliability, this is not realistic everywhere in the City Centre (or even inner suburbs) where multiple routes converge and there are very limited alternative route options available. Thus some sharing of the corridor will be necessary. In such cases there will need to be segregation of bus stops and Swiftway stops, with indented lay-bys for regular buses so that Swiftway vehicles can pass unimpeded.

On the other hand, the Swiftway stops generally need to be in-line so as to suit the pull-in to the platform by Swiftway vehicles. A stopped Swiftway vehicle will therefore impede a regular bus following behind. However, such delays to regular buses will be brief due to the short dwell times at the Swiftway stops. In addition there will be other journey time benefits for regular buses sharing the Swiftway line due to continuous lane segregation and priority at junctions. Each street will have to be subject to its own assessment but it would appear, in principle, that for lesser trafficked bus lanes, where indented bus stops can be accommodated between building frontages, regular buses can be permitted to share the Swiftway route without impedance to Swiftway operations.

The initial design development along the route has identified Swiftway stop locations at key locations, as set out in Section 11.3. Suitable locations for indented regular bus stops have also been identified where appropriate to allow Swiftway vehicles and other buses to pass stopped vehicles.

12 Next Steps

A flow chart illustrating the next stages in the project development, up to and including the statutory planning process, is presented in **Figure 12.1**.

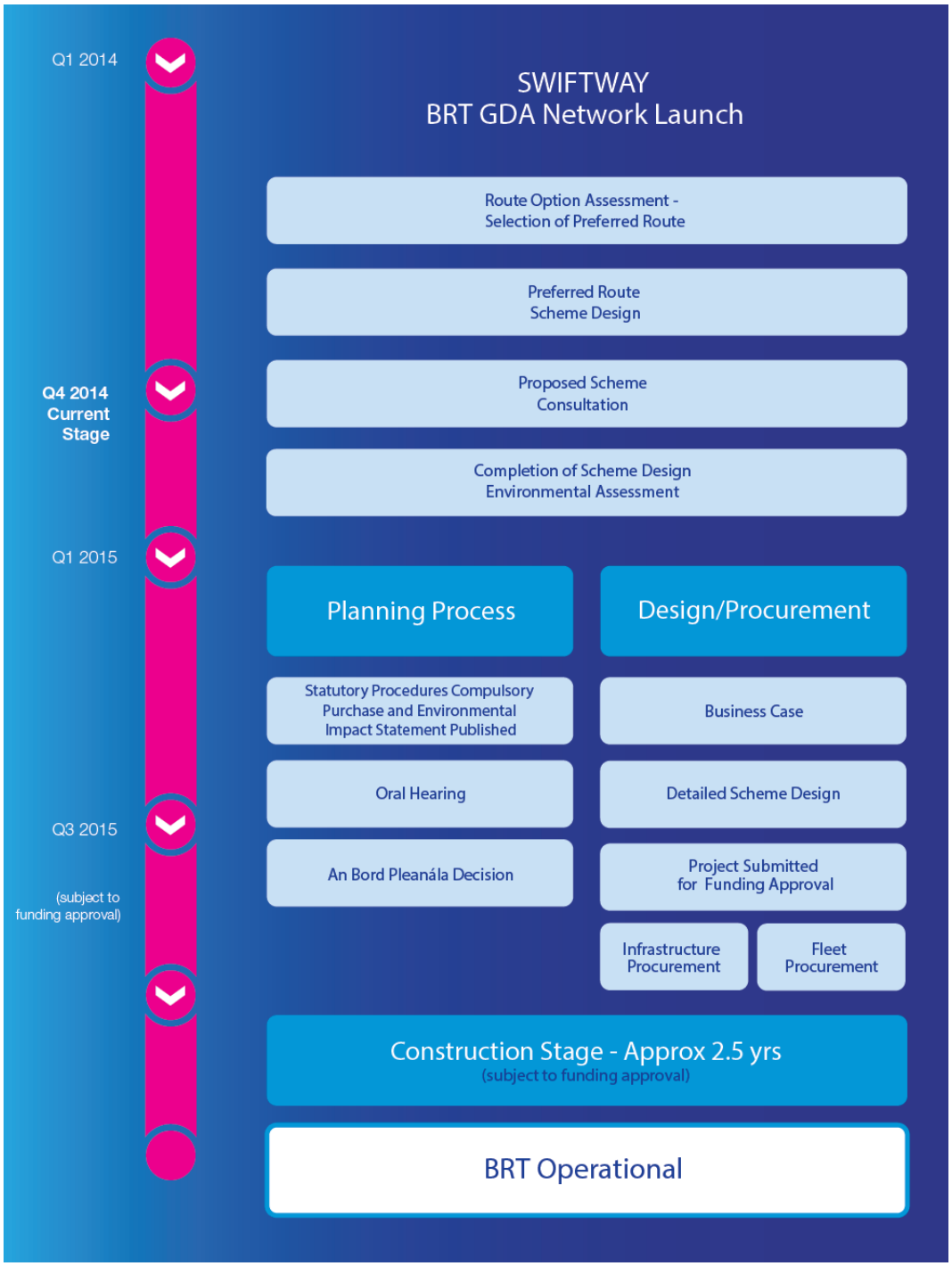

Figure 12.1: Swords / Airport to City Centre Swiftway Next Steps

Preliminary scheme design is progressing for the preferred route identified from the Route Options Assessment process. An initial outline scheme design has been prepared for the preferred route and will be presented to the public as part of the 'Proposed Scheme Public Consultation' scheduled to run through October and November 2014.

A final preliminary scheme design will be completed, taking on board feedback from the public consultation process where practical, to confirm a preferred scheme for the BRT, including land acquisition requirements where necessary.

This preferred scheme will be the subject of a detailed environmental impact assessment and progressed through the Statutory Planning and Compulsory Purchase Order (for land acquisition) processes.

Subsequent to the planning stage, the detailed scheme design will be finalised and tender documents for infrastructure procurement, associated systems and vehicle fleet acquisition will be prepared.

Subject to funding approval, the proposed scheme could then proceed to procurement and construction stages. It is anticipated that, if approval to proceed is granted, the construction period would be about two and a half years.

Appendix A

Route Options Assessment Summary Tables

A1 North-West Swords Route Options Assessment Summary (GE1 to GE3)

Assessment Criteria	Assessment Sub-Criteria	Route Option GE1	Route Option GE2	Route Option GE3
Economy (Cost Assessment and Transport Economic Indicators)	Capital Cost	€26.9m ***Indicative Scheme Infrastructure* Works Cost** (€17.2m): - Upgrade Castlegrange Road/R132 junction to traffic signals - Reconstruct/widen existing culvert/bridge along Castlegrange Road between the R132 and Balheary Road - Realign Balheary Road/Castlegrange Road junction - Realign Balheary Road/Glen Ellan Road junction - Upgrade the Glen Ellan Road/Applewood Main St and Glen Ellan Road/ Ashton Distributor roundabouts to traffic signals - Construct additional lane in each direction along route option to facilitate Swiftway priority - Glen Ellan Road/Western Distributor Road junction upgraded to facilitate Swiftway priority - Provision of cycle tracks and improved pedestrian facilities along route option ***Land Acquisition Cost*** (€9.7m) - 32,070sqm Public Land	€33.6m ***Indicative Scheme Infrastructure* Works Cost** (€24.4m): - Upgrade Castlegrange Road/R132 junction to traffic signals - Reconstruct/widen existing culvert/bridge along Castlegrange Road between the R132 and Balheary Road - Realign Balheary Road/Castlegrange Road junction - Realign Balheary Road/Glen Ellan Road junction - Upgrade the Glen Ellan Road/Applewood Main St and Glen Ellan Road/Ashton Distributor roundabouts to traffic signals - Modify Rathbeale Road/Glen Ellan Road junction to facilitate Swiftway priority - Upgrade Murrough Road/Brackenstown Road to traffic signals to facilitate Swiftway movements - Construct additional lane in each direction along route option to facilitate Swiftway priority - Provision of cycle tracks and improved pedestrian facilities along route option ***Land Acquisition Cost*** (€9.2m)	€29.3m ***Indicative Scheme Infrastructure* Works Cost** (€19.8m): - Upgrade Castlegrange Road/R132 junction to traffic signals - Reconstruct/widen existing culvert/bridge along Castlegrange Road between the R132 and Balheary Road - Realign Balheary Road/Castlegrange Road junction - Realign Balheary Road/Glen Ellan Road junction - Upgrade the Glen Ellan Road/Applewood Main St and Glen Ellan Road/ Ashton Distributor roundabouts to traffic signals - Modify Rathbeale Road/Glen Ellan Road junction to facilitate Swiftway priority - Glen Ellan Road/Western Distributor Road junction upgraded to facilitate Swiftway priority - Rathbeale Road/Western Distributor Road junction upgraded to facilitate Swiftway priority - Provision of cycle tracks and improved pedestrian facilities along route option ***Land Acquisition Cost*** (€9.5m)

Assessment Criteria	Assessment Sub-Criteria	Route Option GE1	Route Option GE2	Route Option GE3
		- 6,460 sqm Private Land - 15 private properties affected	- 45,730sqm Public Land - 6,160sqm Private Land - 38 private properties affected	- 33,490sqm Public Land - 6,320sqm Private Land 26 private properties affected
	Rank			
	Operation & Maintenance Cost	€2.6m	€3.7m	€3.0m
	Rank			
	Transport Reliability and Quality of Service	Journey Time: 6 - 7 mins Length: 2.6km No. of Junctions: 4 Full priority provided between R132 and Oldtown resulting in good journey time reliability for Swiftway services. Full priority along final section to terminus in Oldtown may require changes to the recently constructed Glen Ellan Road Extension.	Journey Time: 8 - 9 mins Length: 3.7km No. of Junctions: 6 Full priority provided between R132 and along Glen Ellan Road resulting in good journey time reliability for Swiftway services. Section from Glen Ellan Road along the Murrough and Brackenstown Road may prove difficult to achieve full priority without significant land acquisition and property impact.	Journey Time: 7 - 8 mins Length: 3.0km No. of Junctions: 5 Full priority provided between R132 and along Oldtown resulting in good journey time reliability for Swiftway services. Rathbeale Road, west of the Murrough Road would require significant upgrading and widening to achieve priority.
	Rank			
Integration	Land Use Integration	This route option has advantages in so far as it has the potential to facilitate sustainable public transport linkages to expanding residential development lands within the Oldtown/Mooretown area.	This route option does not directly serve new developing residential lands within the Oldtown/Mooretown area. Under this route option, these new development lands would be serviced by complementary bus routes.	Potential to facilitate and encourage on-going development in the Oldtown/Mooretown LAP lands with Swiftway terminating at the western end of the developing lands in Oldtown. However, route option does not directly serve the highest density areas of the LAP lands.
	Rank			

Assessment Criteria	Assessment Sub-Criteria	Route Option GE1	Route Option GE2	Route Option GE3
	Residential Population and Employment Catchments	***Residential Population Catchments*** - 5 minute walk catchment of approximately 2,900 - 10 minute walk catchment of approximately 8,000 - 15 minute walk catchment of approximately 13,300 - Note that these are existing residential populations. When new populations associated with developing lands at Oldtown are added, the walk-time catchments on this route would increase considerably ***Employment catchments*** 15 minute walk catchment of approximately 6,800	***Residential Population Catchments*** - 5 minute walk catchment of approximately 4,700 - 10 minute walk catchment of approximately 15,000 - 15 minute walk catchment of approximately 19,300. ***Employment catchments*** 15 minute walk catchment of approximately 7,000	***Residential Population Catchments*** - 5 minute walk catchment of approximately 2,000 - 10 minute walk catchment of approximately 7,300 - 15 minute walk catchment of approximately 14,100 ***Employment catchments*** 15 minute walk catchment of approximately 6,800
	Rank			
	Transport Network Integration	Route option (for sections) follows that of a number of existing bus services. Potential to be extended into the Oldtown/Mooretown LAP lands. Likely to result in rationalisation/ modification to existing Dublin Bus services operating in the area. Local improvements to pedestrian and cycle accessibility to stops would be required.	Route option (for sections) follows that of a number of existing bus services. Likely to result in rationalisation/ modification to existing Dublin Bus services operating in the area. Local improvements to pedestrian and cycle accessibility to stops would be required.	Potential to be extended further into the Oldtown/Mooretown LAP lands. Likely to result in rationalisation/modification to existing Dublin Bus services operating in the area. Local improvements to pedestrian and cycle accessibility to stops would be required.
	Rank			
	Cycling integration	This route option, as far as the edge of existing Applewood development, is identified as forming part of primary/secondary route SW7 in	This route option is identified as forming parts of primary/secondary routes SW7, SW6 and SW3 in the GDA Cycle Network Plan. Route option also intersects routes SW4, FG3.	This route option is identified as forming parts of primary/secondary routes SW7, SW6 and SW4 in the GDA Cycle Network Plan. Route option also intersects route FG3.

Assessment Criteria	Assessment Sub-Criteria	Route Option GE1	Route Option GE2	Route Option GE3
		the GDA Cycle Network Plan and intersects with route SW6. Shared cycle/pedestrian space can practically be provided in each direction along the length of the route, with some land acquisition required.	Shared cycle/pedestrian space could be provided in each direction along the length of the route, but land additional acquisition would be required to deliver. This may prove impractical along Murrough Road however and the alternative would be for cyclists to mix with Swiftway vehicles and / or general traffic.	Shared cycle/pedestrian space can practically be provided in each direction along the majority of the route option length, with some land acquisition required. It may be difficult to achieve standard shared area width (3m) along Glen Ellan Road between Rathbeale Road and Glen Ellan Road Extension and local pinchpoints may be required.
	Rank			
Accessibility and Social Inclusion	Key Trip Attractors (Education/Health / Commercial /Employment)	***Education*** - Fingal Community College - St. Colmcille's National School - Thornleigh Educate Together National School - Gaelscoil Bhrian Bóroimhe - Swords Educate Together National School - St Finian's Community College - Old Borough National School - New school in Mooretown ***Retail / Leisure*** - Applewood Retail Centre - JC's Supermarket - Swords Main Street Shopping - Swords Pavilions Shopping Centre ***Employment*** - Swords Business Campus	***Education*** - Fingal Community College - St. Colmcille's National School - Thornleigh Educate Together National School - Gaelscoil Bhrian Bóroimhe - Swords Educate Together National School - St Finian's Community College - Old Borough National School - New school in Mooretown ***Retail / Leisure*** - Applewood Retail Centre - JC's Supermarket - Swords Main Street Shopping - Swords Pavilions Shopping Centre ***Employment*** - Swords Business Campus	***Education*** - Fingal Community College - St. Colmcille's National School - Thornleigh Educate Together National School - Gaelscoil Bhrian Bóroimhe - Swords Educate Together National School - St Finian's Community College - Old Borough National School - New school in Mooretown ***Retail / Leisure*** - Applewood Retail Centre - JC's Supermarket - Swords Main Street Shopping - Swords Pavilions Shopping Centre ***Employment*** - Swords Business Campus
	Rank			
	Deprived Geographic Areas	Route option does not directly serve any RAPID area.	Route option does not directly serve any RAPID area.	Route option does not directly serve any RAPID area.

Assessment Criteria	Assessment Sub-Criteria	Route Option GE1	Route Option GE2	Route Option GE3
	Rank			
Safety	Road Safety	No. of Junctions: 4 2 turn movements required in each direction (1 left turn and 1 right turn in each direction)	No. of Junctions: 6 4 turn movements required in each direction (2 left turns and 2 right turns in each direction)	No. of Junctions: 5 4 turn movements required in each direction (2 left turns and 2 right turns in each direction)
	Rank			
	Pedestrian Safety	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road.	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road
	Rank			
Environment	Archaeology and Cultural Heritage	One Recorded Monument and one site of archaeological and cultural heritage merit were identified within the assessment area. GE1 would involve widening of the existing road. Archaeological monitoring for the existing road has already been undertaken	No recorded monuments of sites of archaeological and cultural heritage merit were identified within the assessment area.	One Recorded Monument and one site of archaeological and cultural heritage merit were identified within the assessment area. GE3 would involve widening of the existing road. Archaeological monitoring for the existing road has already been undertaken
	Rank			
	Architectural Heritage	One protected structure and two sites of architectural heritage merit were identified within the assessment area.	One protected structure and two sites of architectural heritage merit were identified within the assessment area.	One protected structure and two sites of architectural heritage merit were identified within the assessment area.
	Rank			
	Flora & Fauna	Land-take may impact on areas of amenity grassland, undeveloped agricultural land and hedgerows. Route option crosses an ecological corridor along the Ward River which is used by otter. The area is known to support three species of foraging bats which are likely to use ecological features in the area.	Land-take may impact on areas of amenity grassland, undeveloped agricultural land and hedgerows. Route option crosses an ecological corridor along the Ward River which is used by otter. The area is known to support three species of foraging bats which are likely to use ecological features in the area.	Land-take may impact on areas of amenity grassland, undeveloped agricultural land and hedgerows in particular along the western end of the route which is bounded by hedgerows and treelines of high ecological value. Route option crosses an ecological corridor along the Ward River which is used by otter.

Assessment Criteria	Assessment Sub-Criteria	Route Option GE1	Route Option GE2	Route Option GE3
				The area is known to support three species of foraging bats which are likely to use ecological features in the area.
	Rank			
	Soils and Geology	Minimal potential for impacts to soils and geology. Alluvial soils along portions of this route option which traverse water courses, with potential for soft ground in places. Historic gravel pits are located at the eastern end of this route option and possibility of landfilling is unknown.	Minimal potential for impacts to soils and geology. Alluvial soils along portions of this route option which traverse water courses, with potential for soft ground in places. Historic gravel pits are located at the eastern end of this route option and possibility of landfilling is unknown	Minimal potential for impacts to soils and geology. Alluvial soils along portions of this route option which traverse water courses, with potential for soft ground in places. Historic gravel pits are located at the eastern end of this route option and possibility of landfilling is unknown.
	Rank			
	Hydrology	Eastern extent falls within an area identified as being at risk of flooding in the event of a 1-100 year and a fluvial extreme event. This route option traverses surface water bodies at four locations and a new structure is required at one location.	Eastern extent falls within an area identified as being at risk of flooding in the event of a 1-100 year and a fluvial extreme event. This route option traverses surface water bodies at four locations and a new structure is required at one location.	Eastern extent falls within an area identified as being at risk of flooding in the event of a 1-100 year and a fluvial extreme event. This route option traverses surface water bodies at four locations and a new structure is required at one location.
	Rank			
	Landscape and Visual	Makes use of existing road corridors Potential impacts on Open Space and GAA grounds on opposite side of Balheary Road Passes through residential areas along Glen Ellan Road Terminates in mixed use development / open space area (partly under construction) within Oldtown/Mooretown LAP	Makes use of existing road corridors Potential impacts on Open Space and GAA grounds on opposite side of Balheary Road Passes through residential areas along Glen Ellan Road, Murrough Road, and Brackenstown Road.	Makes use of existing road corridors Potential impacts on Open Space and GAA grounds on opposite side of Balheary Road Passes through residential areas along Glen Ellan Road, Murrough Road and Rathbeale Road. Crosses open space between Pine Grove / Mooretown with direct impacts on these open spaces.

Assessment Criteria	Assessment Sub-Criteria	Route Option GE1	Route Option GE2	Route Option GE3
	Rank			
	Air Quality	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations.
	Rank			
	Noise & Vibration	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise.
	Rank			
	Land Use Character	Route option has a relatively small impact on existing land use. For the most part, land acquisition is taken from open space along residential estates. There are however some potential impacts on car parking which would need to be considered further as part of the scheme design. It may also be necessary to modify some of the street proposals within the Oldtown / Mooretown LAP to accommodate Swiftway priority	The extent of land use impact is dependent on the degree of Swiftway priority (and cycle/pedestrian provision) achieved and associated resulting land-take requirements / property impacts. If Swiftway priority is assumed along the full length of the route then this route option may have higher land use impacts than other options	Route option has a relatively small impact on existing land use. For the most part, land acquisition is taken from open space along residential estates. There are however some potential impacts on car parking which would need to be considered further as part of the scheme design. It may also be necessary to modify some of the street proposals within the Oldtown / Mooretown LAP to accommodate Swiftway priority
	Rank			

A2 North-West of Swords Route Options Assessment Summary (PG1 to PG3)

Assessment Criteria	Assessment Sub-Criteria	Route Option PG1	Route Option PG2	Route Option PG3
Economy (Cost Assessment and Transport Economic Indicators)	Capital Cost	€32.9m ***Indicative Scheme Infrastructure* Works Cost** (€17.2m): - Upgrade Castlegrange Road/R132 junction to traffic signals - Reconstruct/widen existing culvert/bridge along the Castlegrange Road between the R132 and Balheary Road - Convert existing green strip between Castlegrange Green and Broadmeadow Road to a two-way 'Swiftway-only' road link. - Introduce a two-way 'Swiftway-only' road through the green between Broadmeadow Road and Pine Grove Park - Modify Rathbeale Road/Glen Ellan Road junction to facilitate Swiftway priority - Upgrade Pine Grove Park/Rathbeale Road junction to traffic signals - Glen Ellan Road/Western Distributor Road junction upgraded to facilitate Swiftway priority - Provision of cycle tracks and improved pedestrian facilities along route option ***Land Acquisition Cost*** (€15.7m)	€26.0m ***Indicative Scheme Infrastructure* Works Cost** (€21.1m): - Upgrade Castlegrange Road/R132 junction to traffic signals - Reconstruct/widen existing culvert/bridge along the Castlegrange Road between the R132 and Balheary Road - Convert existing green strip between Castlegrange Green and Broadmeadow Road to a two-way 'Swiftway-only' road link. - Introduce a two-way 'Swiftway-only' road through the green between Broadmeadow Road and Pine Grove Park. - Upgrade Pine Grove Park/Rathbeale Road junction to traffic signals. - Modify Rathbeale Road/Glen Ellan Road junction to facilitate Swiftway priority - Upgrade Murrough Road/Brackenstown Road to traffic signals to facilitate Swiftway movements - Provision of cycle tracks and improved pedestrian facilities along route option ***Land Acquisition Cost*** (€4.9m)	€26.9 ***Indicative Scheme Infrastructure* Works Cost** (€20.5m): - Upgrade Castlegrange Road/R132 junction to traffic signals - Reconstruct/widen existing culvert/bridge along the Castlegrange Road between the R132 and Balheary Road - Convert existing green strip between Castlegrange Green and Broadmeadow Road to a two way 'Swiftway-only' road link - Introduce a two-way 'Swiftway-only' road through the green between Broadmeadow Road and Pine Grove Park - Upgrade Pine Grove Park/Rathbeale Road junction to traffic signals. - Modify Rathbeale Road/Glen Ellan Road junction to facilitate Swiftway priority - Upgrade the Glen Ellan Road/Ashton Distributor roundabout to signals - Glen Ellan Road/Western Distributor Road junction upgraded to facilitate Swiftway priority - Provision of cycle tracks and improved pedestrian facilities along route option ***Land Acquisition Cost***

Assessment Criteria	Assessment Sub-Criteria	Route Option PG1	Route Option PG2	Route Option PG3
		- 15,590sqm Public Land - 10,460sqm Private Land - 5 private properties affected	- 27,830sqm Public Land - 3,300sqm Private Land - 21 private properties affected	(€6.4m) - 21,380sqm Public Land - 4,300sqm Private Land - 18 private properties affected
	Rank			
	Operation & Maintenance Cost	€2.6m	€3.2m	€3.1m
	Rank			
	Transport Reliability and Quality of Service	Journey Time: 6 - 7 mins Length: 2.6km No. of Junction: 4 Full Swiftway priority provided between R132 and the terminus not practically achievable, with sections of the route option having Swiftway vehicles share with general traffic on residential roads (approximately 15% of route). Rathbeale Road, west of the Murrough Road would require significant upgrading and widening to achieve priority. Sharing with general traffic has the potential to negatively affect the Swiftway journey time reliability.	Journey Time: 7 - 8 mins Length: 3.2km No. of Junction: 5 Full Swiftway priority provided between R132 and the terminus not practically achievable, with sections of the route option having Swiftway vehicles share with general traffic on residential roads (approximately 15% of route). Sharing with general traffic has the potential to negatively affect the Swiftway journey time reliability.	Journey Time: 7 - 8 mins Length: 3.1km No. of Junction: 5 Full Swiftway priority provided between R132 and the terminus not practically achievable, with sections of the route having Swiftway vehicles share with general traffic on residential roads (approximately 15% of route). Sharing with general traffic has the potential to negatively affect the Swiftway journey time reliability.
	Rank			
Integration	Land Use Integration	Potential to facilitate and encourage development in the Oldtown/Mooretown LAP lands with Swiftway terminating at the western end of the zoned lands in Oldtown. This route option doesn't pick up as large a catchment within Oldtown when compared to route options via Glen Ellan Road.	This route option does not directly serve planned new zoned development within the Oldtown/Mooretown LAP lands. Under this route option, these new development lands would be serviced by complementary bus routes.	Potential to facilitate and encourage development in the Oldtown/Mooretown LAP lands with Swiftway terminating at the western end of the zoned lands in Oldtown.
	Rank			

Assessment Criteria	Assessment Sub-Criteria	Route Option PG1	Route Option PG2	Route Option PG3
	Residential Population and Employment Catchments	***Residential Population Catchments*** - 5 minute walk catchment of approximately 1,500 - 10 minute walk catchment of approximately 6,800 - 15 minute walk catchment of approximately 16,800 - Impermeability of residential estates is an issue in terms of Swiftway stop accessibility - Note that these are existing residential populations. When new populations associated with developing lands at Oldtown are added, the walk-time catchments on this route option increases considerably ***Employment catchments*** 15 minute walk catchment of approximately 7,700	***Residential Population Catchments*** - 5 minute walk catchment of approximately 3,400 - 10 minute walk catchment of approximately 11,300 - 15 minute walk catchment of approximately 18,900 ***Employment catchments*** 15 minute walk catchment of approximately 7,700	***Residential Population Catchments*** - 5 minute walk catchment of approximately 2,800 - 10 minute walk catchment of approximately 10,500 - 15 minute walk catchment of approximately 16,900 ***Employment catchments*** 15 minute walk catchment of approximately 7,700
	Rank			
	Transport Network Integration	Potential to be extended further into the Oldtown/Mooretown LAP lands. Likely to result in rationalisation/modification to existing Dublin Bus services operating in the area. Local improvements to pedestrian and cycle accessibility to stops would be required.	Likely to result in rationalisation/modification to existing Dublin Bus services operating in the area. Local improvements to pedestrian and cycle accessibility to stops would be required.	Potential to be extended further into the Oldtown/Mooretown LAP lands. Likely to result in rationalisation/modification to existing Dublin Bus services operating in the area. Local improvements to pedestrian and cycle accessibility to stops would be required.
	Rank			
	Cycling integration	This route option is predominantly identified in the GDA Cycle Network Plan as a greenway route but is partially covered by	This route option is predominantly identified in the GDA Cycle Network Plan as a greenway route but is partially covered by	This route option is predominantly identified in the GDA Cycle Network Plan as a greenway route but is partially covered by

Assessment Criteria	Assessment Sub-Criteria	Route Option PG1	Route Option PG2	Route Option PG3
		primary/secondary routes SW7 and SW4. Route option also intersects route FG3 Segregated cycle track can be provided in each direction along the majority of the route option. Where it cannot be provided, cyclists would share with general traffic (occurs on low speed, low volume residential roads)	primary/secondary routes SW7, SW6, SW4 and SW3. Route option also intersects route FG3 Shared cycle/pedestrian space could be provided in each direction along the length of the route option, but additional land acquisition would be required to deliver the section along Murrough Road for example. The alternative would be for cyclists to mix with Swiftway vehicles and / or general traffic.	primary/secondary routes SW7, SW6 and SW4. Route option also intersects route FG3 Shared cycle/pedestrian space can practically be provided in each direction along the majority of the route length, with some land acquisition required. It may be difficult to achieve standard shared area width (3m) along Glen Ellan Road between Rathbeale Road and Glen Ellan Road Extension and local pinchpoints may be required.
	Rank			
Accessibility and Social Inclusion	Key Trip Attractors (Education/Health / Commercial /Employment)	***Education*** - Fingal Community College - St. Colmcille's National School - Thornleigh Educate Together National School - Gaelscoil Bhrian Bóroimhe - Swords Educate Together National School - St Finian's Community College - Old Borough National School - New Mooretown School ***Retail / Leisure*** - Applewood Retail Centre - JC's Supermarket - Swords Main Street Shopping - Swords Pavilions Shopping Centre ***Employment*** - Swords Business Campus	***Education*** - Fingal Community College - St. Colmcille's National School - Thornleigh Educate Together National School - Gaelscoil Bhrian Bóroimhe - Swords Educate Together National School - St Finian's Community College - Old Borough National School - New Mooretown School ***Retail / Leisure*** - Applewood Retail Centre - JC's Supermarket - Swords Main Street Shopping - Swords Pavilions Shopping Centre ***Employment*** - Swords Business Campus	***Education*** - Fingal Community College - St. Colmcille's National School - Thornleigh Educate Together National School - Gaelscoil Bhrian Bóroimhe - Swords Educate Together National School - St Finian's Community College - Old Borough National School - New Mooretown School ***Retail / Leisure*** - Applewood Retail Centre - JC's Supermarket - Swords Main Street Shopping - Swords Pavilions Shopping Centre ***Employment*** - Swords Business Campus
	Rank			

Assessment Criteria	Assessment Sub-Criteria	Route Option PG1	Route Option PG2	Route Option PG3
	Deprived Geographic Areas	Route option does not directly serve any RAPID area.	Route option does not directly serve any RAPID area.	Route option does not directly serve any RAPID area.
	Rank			
Safety	Road Safety	No. of Junctions: 4 1 turn movements required in each direction (1 right turn in outbound direction and 1 left turn in inbound direction)	No. of Junctions: 5 3 turn movements required in each direction (2 right turns and 1 left turn outbound and 1 right turn and 2 left turns inbound)	No. of Junctions: 5 3 turn movements required in each direction (2 right turns and1 left turn outbound and 1 right turn and 2 left turns inbound)
	Rank			
	Pedestrian Safety	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road
	Rank			
Environment	Archaeology and Cultural Heritage	One Recorded Monument and one site of archaeological and cultural heritage merit were identified within the assessment area. The site of archaeological and cultural heritage merit comprises an extensive archaeological complex. The site is bisected by Rathbeale Road and extends northwards towards Glen Ellan Road. Route option PG1, which would involve the widening of Rathbeale Road, is considered to have greater potential for archaeological impact than route option GE1.	No Recorded Monuments or sites of archaeological and cultural heritage merit were identified within the assessment area.	One Recorded Monument and one site of archaeological and cultural heritage merit were identified within the assessment area. PG3 would involve widening of the existing road, but this area has been subject to archaeological monitoring as part of other projects which did not identify significant archaeology
	Rank			
	Architectural Heritage	No Protected Structures were identified within the assessment area. One site of architectural heritage merit was identified.	No protected structures were identified within the assessment area. One site of architectural heritage merit were identified within the assessment area.	No protected structures were identified within the assessment area. One site of architectural heritage merit was identified.
	Rank			

Assessment Criteria	Assessment Sub-Criteria	Route Option PG1	Route Option PG2	Route Option PG3
	Flora & Fauna	This route option passes through an area of public green consisting of amenity grassland, scattered trees and shrubs and treelines which is likely to be of importance for foraging bats. The western end of this route option is bounded by some hedgerows and treelines of high ecological value which may be lost through road widening. This route option crosses an ecological corridor along the Ward River which is used by otter and the Swords Town Park. The general area is known to support three species of foraging bats.	This route option passes through an area of public green consisting of amenity grassland, scattered trees and shrubs and treelines which is likely to be of importance for foraging bats. The western end of the route is bounded by some hedgerows and treelines of high ecological value which may be lost through road widening. This route option crosses an ecological corridor along the Ward River which is used by otter and the Swords Town Park. The general area is known to support three species of foraging bats.	This route option passes through an area of public green consisting of amenity grassland, scattered trees and shrubs and treelines which is likely to be of importance for foraging bats. This route option crosses an ecological corridor along the Ward River which is used by otter and the Swords Town Park. The general area is known to support three species of foraging bats.
	Rank			
	Soils and Geology	Minimal potential for impacts to soils and geology. Alluvial soils along portions of this route option which traverse water courses with potential for soft ground in places. Historic gravel pits are located at the eastern end of this route option and the possibility of landfilling is unknown.	Minimal potential for impacts to soils and geology. Alluvial soils along portions of this route option which traverse water courses with potential for soft ground in places. Historic gravel pits are located at the eastern end of this route option and the possibility of landfilling is unknown.	Minimal potential for impacts to soils and geology. Alluvial soils along portions of the route which traverse water courses with potential for soft ground in places. Historic gravel pits are located at the eastern end and the possibility of landfilling is unknown.
	Rank			
	Hydrology	Eastern extent falls within an area identified as being at risk of flooding in the event of a 1-100 year and a fluvial extreme event. This route option traverses surface water bodies at two locations and a new structure is required at one location.	Eastern extent falls within an area identified as being at risk of flooding in the event of a 1-100 year and a fluvial extreme event. This route option traverses surface water bodies at two locations and a new structure is required at one location.	Eastern extent falls within an area identified as being at risk of flooding in the event of a 1-100 year and a fluvial extreme event. This route option traverses surface water bodies at two locations and a new structure is required at one location.
	Rank			

Assessment Criteria	Assessment Sub-Criteria	Route Option PG1	Route Option PG2	Route Option PG3
	Landscape and Visual	Requires short road link from Balheary Road to Broadmeadow Road to Rathbeale Road. Crosses open space between Pine Grove / Mooretown and Broadmeadow / Castlefarm. Crosses linear green space linking Broadmeadow Road and Castlegrange Green. Passes through residential areas along, Rathbeale Road, Pine Grove, Mooretown, Broadmeadow, Castlefarm and Castlegrange. Direct impact on open spaces between Pine Grove / Mooretown and Broadmeadow / Castlegrange.	Requires link from Balheary Road to Broadmeadow Road to Rathbeale Road. Crosses linear green space linking Broadmeadow Road and Castlegrange Green. Crosses open space between Pine Grove / Mooretown and Broadmeadow / Castlefarm. Passes through residential areas along Castlegrange, Castlefarm, Broadmeadow, Mooretown, Pine Grove, R125 Rathbeale Road, Murrough Road and Brackenstown Road. Direct impact on open spaces between Pine Grove / Mooretown and Broadmeadow / Castlegrange.	Requires link from Balheary Road to Broadmeadow Road to Rathbeale Road. Crosses open space between Pine Grove / Mooretown and Broadmeadow / Castlefarm Crosses linear green space linking Broadmeadow Road and Castlegrange Green. Passes through residential areas along Glen Ellan Road, Rathbeale Road, Pine Grove, Mooretown, Broadmeadow, Castlefarm and Castlegrange. Direct impact on open spaces at Broadmeadow / Castlegrange. Terminates in mixed use development / open space area (partly under construction) within Oldtown/Mooretown LAP.
	Rank			
	Air Quality	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations. This section requires the construction of a new section of road on an existing green strip between Castlegrange Green and Broadmeadow Road to accommodate Swiftway only. The air quality impacts associated with the construction works would be greater than the on-line works for the other route options on this section but are also not considered to be significant.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations. This section requires the construction of a new section of road on an existing green strip between Castlegrange Green and Broadmeadow Road to accommodate Swiftway only. The air quality impacts associated with the construction works would be greater than the on-line works for the other route options on this section but are also not considered to be significant.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations. This section requires the construction of a new section of road on an existing green strip between Castlegrange Green and Broadmeadow Road to accommodate Swiftway only. The air quality impacts associated with the construction works would be greater than the on-line works for the other route options on this section but are also not considered to be significant.
	Rank			

Assessment Criteria	Assessment Sub-Criteria	Route Option PG1	Route Option PG2	Route Option PG3
	Noise & Vibration	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise. This section requires the construction of a new section of road on an existing green strip between Castlegrange Green and Broadmeadow Road to accommodate Swiftway only. The noise and vibration impacts associated with these works would be greater than the on-line works for the other route options on this section.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise. This section requires the construction of a new section of road on an existing green strip between Castlegrange Green and Broadmeadow Road to accommodate Swiftway only. The noise and vibration impacts associated with these works would be greater than the on-line works for the other route options on this section.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise. This section requires the construction of a new section of road on an existing green strip between Castlegrange Green and Broadmeadow Road to accommodate Swiftway only. The noise and vibration impacts associated with these works would be greater than the on-line works for the other route options on this section.
	Rank			
	Land Use Character	Route option travels through existing public green dividing it in two and therefore potentially restricting its use. Loss of large part of front gardens for some property owners on Rathbeale Road	As with route option PG1, PG2 travels through existing public green dividing it in two and therefore potentially restricting its use Loss of large part of front gardens for some property owners on Rathbeale Road to achieve Swiftway priority. As with GE2, if Swiftway priority is assumed along the sections of this route option along the Murrough Road and Brackenstown Road then this route option may have higher land use impacts than other options.	Route option travels through existing public green dividing it in two and therefore potentially restricting its use. Loss of large part of front gardens for some property owners on Rathbeale Road.
	Rank			

A3 Swords Central Route Options Assessment Summary

Assessment Criteria	Assessment Sub-Criteria	Route Option SW16	Route Option SW17
Economy (Cost Assessment and Transport Economic Indicators)	Capital Cost	€16.0m ***Indicative Infrastructure Works Cost Estimate*** (€11.2m) - Upgrade Pinnock Hill and Seatown roundabouts to traffic signal controlled junctions - Widen carriageway to provide 4 lanes through Swords Main Street and along Seatown Road if full Swiftway priority is to be achieved - Removal of car parking along Main Street required - All the services/utilities that are currently buried in the existing footway/road margin would need to be set back under the new proposed footway. - A new public lighting system would be required throughout Swords. - Would require extensive traffic management measures during construction (potentially need for diversion of traffic away from route) and associated disruption to town centre commercial activity ***Land Acquisition Cost*** (€4.8m) - 10,500sqm Public Land - 3,200sqm Private Land - 35 private properties affected including 2 which are potentially required to be demolished.	€11.2m ***Indicative Infrastructure Works Cost Estimate*** (€11.2m) - Upgrade Pinnock Hill, Malahide Road and Seatown roundabouts to traffic signal controlled junctions - Upgrade hard shoulder to accommodate traffic - Remove existing pedestrian overbridge at Malahide Road roundabout - A new public lighting system would be required. ***Land Acquisition Cost*** (€0m) - No appreciable land-take necessary. - The final capital cost may however be higher depending on the extent of segregation provided for the Swiftway along the R132 (e.g. utilisation of side running hard shoulders and bus lanes versus dedicated central Swiftway lanes)
	Rank		
	Operation & Maintenance Cost	€1.7m	€1.7m
	Rank		
	Transport Reliability and Quality of Service	4 - 5 minute Length – 1.7km No. of Junction – 6 Restricted priority likely through Swords town centre which will negatively impact on Swiftway journey time reliability.	3 - 4 minutes Length – 1.7km No. of Junction - 4 Almost full practical Swiftway priority achievable along length of route option resulting in reliable journey times for Swiftway services.

Assessment Criteria	Assessment Sub-Criteria	Route Option SW16	Route Option SW17
			Further consideration required to be given to R132 treatments
	Rank		
Integration	Land Use Integration	Potential to facilitate and encourage development in the Swords Pavilions Shopping Centre expansion.	Potential to facilitate and encourage development in the Barrysparks LAP lands and the Swords Pavilions Shopping Centre expansion
	Rank		
	Residential Population and Employment Catchments	***Residential Population Catchments*** - 5 minute walk catchment of approximately 600 - 10 minute walk catchment of approximately 2,800 - 15 minute walk catchment of approximately 8,100 - Accessibility could be improved by creating direct pedestrian links from adjoining residential areas along the R132. - Overall catchment can be improved by rationalising the local bus service and providing feeder buses. ***Employment Population Catchments*** 15 minute walk catchment of approximately 6,200	***Residential Population Catchments*** - 5 minute walk catchment of approximately 400 - 10 minute walk catchment of approximately 2,400 - 15 minute walk catchment of approximately 4,700 - Overall catchment can be improved by rationalising the local bus service and providing feeder buses. ***Employment Population Catchments*** 15 minute walk catchment of approximately 6,300
	Rank		
	Transport Network Integration	Potential for interchange with regional and local bus services. Provision of cycle parking possible at stops.	Potential for interchange with regional and local bus services and the future Metro North rail service. Provision of cycle parking possible at stops.
	Rank		
	Cycling integration	Cyclist facilities would be provided through Swords town centre. This route option is identified as Dublin primary route 2A and Swords primary/secondary route SW1 the GDA cycle network plan. Route option would also intersect with routes SW8, SW9, SW3, SW4 and SW7. Likely to consist of shared traffic/cycle lane due to space constraints in the town centre	Segregated cycle facilities could be provided in each direction along the length of this route option. May be difficult to achieve without removal of trees. This route option is not identified as a cycle route in the GDA cycle network plan. Likely that cyclists would be routed through Swords town centre in accordance with the GDA Cycle Network Plan (route 2A and SW1). Route option would also intersect with routes SW8, SW9, SW3, SW4 and SW7. Likely to consist of shared traffic/cycle lane due to space constraints in the town centre
	Rank		

Assessment Criteria	Assessment Sub-Criteria	Route Option SW16	Route Option SW17
Accessibility & Social Inclusion	Key Trip Attractors (Education/Health/ Commercial /Employment)	***Education*** - Fingal Community College - St. Colmcille's National School - Old Borough National School - Coláiste Choilm CBS - St. Cronan's National School ***Retail / Leisure*** - Swords Main Street Shopping Precinct - Swords Pavilions Shopping Centre ***Employment*** - North Dublin Corporate Park - Swords Business Park - Airside Business Park	***Education*** - Fingal Community College - St. Colmcille's National School - Old Borough National School - Coláiste Choilm CBS ***Retail / Leisure*** - Swords Main Street Shopping Precinct - Swords Pavilions Shopping Centre ***Employment*** - North Dublin Corporate Park - Swords Business Park - Airside Business Park
	Rank		
	Deprived Geographic Areas	Route option does not directly serve any RAPID area.	Route option does not directly serve any RAPID area.
	Rank		
Safety	Road Safety	No. of Junction – 6 3 turn movements required in each direction (1 right turn and 2 left turns outbound and 1 right turn and 2 left turns inbound)	No. of Junction – 4 0 turn movements required
	Rank		
	Pedestrian Safety	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road
	Rank		
Environment	Archaeology and Cultural Heritage	There is one National Monument and three Recorded Monuments within the assessment area. This route option would pass immediately adjacent and within the ZAP of Swords Castle National Monument which is located at the junction of North Street and Seatown Road. This route option would also pass through the centre of the historic medieval town of Swords (RMP DU011-035----) and its associated ZAP. A holy well (RMP DU011-034013-) is located in the west of Well Road.	No sites of archaeological or cultural heritage merit were identified within the assessment area.
	Rank		
	Architectural Heritage	The town of Swords contains a number of Protected Structures. There are eight Protected Structures and	No Protected Structures or sites of architectural heritage merit were identified within the assessment area.

Assessment Criteria	Assessment Sub-Criteria	Route Option SW16	Route Option SW17
		seven sites of architectural heritage merit in the assessment area.	
	Rank		
	Flora & Fauna	It is considered that extensive land-take would be required to the Main Street in order to facilitate this route option which could result in significant losses to treelines in the area.	There are significant hedgerows and treelines of value along the existing carriageway which may be impacted. .
	Rank		
	Soils and Geology	Minimal potential for impacts to soils and geology however rock is very shallow along the central portion of the route option. An historic gravel pit and several quarries are located along this route option. The status of these features and any backfilling is unknown meaning possible landfilling may have taken place.	Minimal potential for impacts to soils and geology and no historical industries noted that could give rise to potential contamination. This route option crosses an unknown stream south of Pinnock Hill roundabout. This stream is diverted beneath the roadway via a pipe culvert. Soft alluvial soils may be encountered for any road widening works.
	Rank		
	Hydrology	This route option passes close to the convergence of the Ward River and Swords Glebe stream which has been identified by the OPW in the PFRA (OPW, 2011) as being at risk of flooding in the event of both a 1-100 year and an extreme fluvial event.	This route crosses an unknown stream east of Lakeshore Drive. A historical flood event has been documented in the vicinity of Pinnockhill roundabout. There is a potential for impacts if any works are carried out which may change the hydraulic regime in the area.
	Rank		
	Landscape and Visual	Makes use of existing road corridors. Passes through centre (Main Street) of Swords. Passes through residential areas alongside Old Dublin Road and Seatown Road. Objectives to protect and preserve trees. Protected Structures along Main Street Swords.	Makes use of existing R132 road corridor. Strong tree / vegetation – lined corridor with landscaped median and managed hedgerow. Objective to protect and preserve trees, woodland and hedgerows within northern and southern quadrant of Malahide roundabout. Passes access to Pavilion Shopping Centre off R132 northbound Passes access to Swords Business Park off R132 southbound
	Rank		
	Air Quality	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening.

Assessment Criteria	Assessment Sub-Criteria	Route Option SW16	Route Option SW17
		Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations.	Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations.
	Rank		
	Noise & Vibration	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise.
	Rank		
	Land Use Character	Carriageway increased from 2 lanes to 4. On-street parking is removed and footpath width reduced resulting in a change to the Main Street character and potentially impacting on its use.	Negligible impact on existing and future land-use.
	Rank		

A4 Dublin Airport Route Options Assessment Summary

Criteria	Route Option DA0	Route Option DA1	Route Option DA2	Route Option DA3	Route Option DA4	Route Option DA5	Route Option DA6	Route Option DA7
Swiftway Priority Infrastructure	BRT lanes in both directions along R132	BRT lanes likely to be provided on internal roads	2-way BRT roadway running through campus Possible reduction in road space for general traffic.	BRT lanes not likely to be provided except on Corballis Road North and Corballis Road South	BRT lanes not likely to be provided except on Corballis Road North and Corballis Road South	BRT lanes not likely to be provided except on Corballis Road North and Corballis Road South	BRT lanes not likely to be provided except on Corballis Road North and Corballis Road South	Contraflow BRT lane for S/B movement.
Rank								
Swiftway Journey Time (mins)	N/B: 2 mins S/B: 2 mins	N/B: 5.2 mins S/B: 3.7 mins	N/B: 5.5 mins S/B: 5.5 mins	N/B: 6.8 mins S/B: 8.1 mins	N/B: 7.6 mins S/B: 9.5 mins	N/B: 8.8 mins S/B: 10.1 mins	N/B: 8.8 mins S/B: 10.8 mins	N/B: 7 mins S/B: 7 mins
Rank								
Walk Distance to Terminals (metres)	T1 N/B: >1000 T2 N/B: >500 T1 S/B: >1000 T2 S/B: >500	T1 N/B: >500 T2 N/B: <500 T1 S/B: >500 T2 S/B: <500	T1 N/B: <500 T2 N/B: <500 T1 S/B: <500 T2 S/B: <500	T1 N/B: <500 T2 N/B: <500 T1 S/B: <500 T2 S/B: <500	T1 N/B: <500 T2 N/B: <500 T1 S/B: <500 T2 S/B: <500	T1 N/B: 0 T2 N/B: 0 T1 S/B: 0 T2 S/B: 0	T1 N/B: 0 T2 N/B: 0 T1 S/B: 0 T2 S/B: 0	T1 N/B: <500 T2 N/B: <500 T1 S/B: <500 T2 S/B: <500
Rank								
Capital Cost	Low	Medium	High	Low	Low	Low	Low	High
Rank								

Criteria	Route Option DA0	Route Option DA1	Route Option DA2	Route Option DA3	Route Option DA4	Route Option DA5	Route Option DA6	Route Option DA7
Swiftway Interaction with Airport Traffic	Negligible *Does not enter Airport Campus so minimal interaction with airport traffic*	Low *Avoids main core of airport campus and areas of major activity.*	Low *BRT lanes likely to be segregated from general traffic*	Medium *Would interact with taxis and buses manoeuvring to/from kerb at T2*	Medium *Would interact with manoeuvring buses in the GTC*	High *Would interact with car pick-up at T2 and manoeuvring buses and taxis at T1 as well as busy pedestrian crossings at both locations*	High *Would interact with car pick-up at T2 and manoeuvring buses and taxis at T1 as well as busy pedestrian crossings at both locations*	Low *BRT lanes likely to be segregated from traffic*
Rank								
Risk to Swiftway Journey Reliability	Low	Low	Low	Medium	Medium	High	High	Low
Rank								
Impact on Existing Airport Operations	Negligible *Does not enter Airport Campus so minimal impact on Airport Operations*	Low *May require adjustments to lane arrangements on Corballis Avenue* *Amendments to Corballis Road South/East link*	Medium *Interferes with future proposal to make Old West Link Road the main access road to T3.* *In conflict with pedestrian plaza proposal at the*	Medium *May require signalisation of slip road from Corballis Road North onto East Link Road* *Would require loss of car parking north of*	Medium *May require signalisation of slip road from Corballis Road North onto East Link Road* *Would require relocation of existing long-term*	Medium *May require signalisation of slip road from Corballis Road North onto East Link Road* *Would require loss of premium*	Medium *May require signalisation of slip road from Corballis Road North onto East Link Road* *Would require loss of premium*	Medium *May require signalisation of slip road from Corballis Road North onto East Link Road. Would* *Require loss of existing bus stop opposite garage.*

Criteria	Route Option DA0	Route Option DA1	Route Option DA2	Route Option DA3	Route Option DA4	Route Option DA5	Route Option DA6	Route Option DA7
			Southern end of West Link Road	*GTC to facilitate Swiftway stop*	*car park bus bay in GTC*	*bus bays at both T1 and T2*	*bus bays at both T1 and T2*	
Rank								
Physical Impact on Airport Commercial Lands	None	High impact – splits development but likely not until future phases development	None	None	None	None	None	Medium impact – potentially impacts on proposed pedestrian plaza
Rank								
Archaeology and Cultural Heritage	No recorded monuments or sites of archaeological or cultural heritage merit were identified within the assessment area.	No recorded monuments or sites of archaeological or cultural heritage merit were identified within the assessment area.	No recorded monuments or sites of archaeological or cultural heritage merit were identified within the assessment area.	No recorded monuments or sites of archaeological or cultural heritage merit were identified within the assessment area.	No recorded monuments or sites of archaeological or cultural heritage merit were identified within the assessment area.	No recorded monuments or sites of archaeological or cultural heritage merit were identified within the assessment area.	No recorded monuments or sites of archaeological or cultural heritage merit were identified within the assessment area.	No recorded monuments or sites of archaeological or cultural heritage merit were identified within the assessment area.
Rank								
Architectural Heritage	No protected structures or sites of architectural heritage merit were identified	No protected structures or sites of architectural heritage merit were identified	One protected structure was identified within the study area (Castlemoate House).	No protected structures or sites of architectural heritage merit were identified	One site of architectural heritage merit was identified (Corballis House), however, this site	One site of architectural heritage merit was identified (Corballis House), however, this site	One site of architectural heritage merit was identified (Corballis House), however, this site	No protected structures or sites of architectural heritage merit were identified

Criteria	Route Option DA0	Route Option DA1	Route Option DA2	Route Option DA3	Route Option DA4	Route Option DA5	Route Option DA6	Route Option DA7
	within the assessment area.	within the assessment area.		within the assessment area.	was removed as part of the construction of T2 at Dublin Airport.	was removed as part of the construction of T2 at Dublin Airport.	was removed as part of the construction of T2 at Dublin Airport.	within the assessment area.
Rank								
Flora and Fauna	No sites of international or national conservation value were identified within the assessment area.	No sites of international or national conservation value were identified within the assessment area.	No sites of international or national conservation value were identified within the assessment area.	No sites of international or national conservation value were identified within the assessment area.	No sites of international or national conservation value were identified within the assessment area.	No sites of international or national conservation value were identified within the assessment area.	No sites of international or national conservation value were identified within the assessment area.	No sites of international or national conservation value were identified within the assessment area.
Rank								
Soils and Geology	Minimal potential for impacts to soils and geology. No historical industries that could give rise to contamination were identified within the assessment area.	Minimal potential for impacts to soils and geology. No historical industries that could give rise to contamination were identified within the assessment area.	Minimal potential for impacts to soils and geology; however rock is shallow along the west of the route. An historic quarry is located at the western end and possibility of landfilling is unknown.	Minimal potential for impacts to soils and geology; however rock is shallow along the west of the route. An historic quarry is located at the western end and possibility of landfilling is unknown.	Minimal potential for impacts to soils and geology; however rock is shallow along the west of the route. An historic quarry is located at the western end and possibility of landfilling is unknown.	Minimal potential for impacts to soils and geology; however rock is shallow along the west of the route. An historic quarry is located at the western end and possibility of landfilling is unknown.	Minimal potential for impacts to soils and geology; however rock is shallow along the west of the route. An historic quarry is located at the western end and possibility of landfilling is unknown.	Minimal potential for impacts to soils and geology; however rock is shallow along the west of the route. An historic quarry is located at the western end and possibility of landfilling is unknown.

Criteria	Route Option DA0	Route Option DA1	Route Option DA2	Route Option DA3	Route Option DA4	Route Option DA5	Route Option DA6	Route Option DA7
Rank								
Hydrology	This route option traverses surface water bodies at one location.	This route option traverses surface water bodies at one location.	This route option traverses surface water bodies at one location.	This route option traverses surface water bodies at one location.	This route option traverses surface water bodies at one location.	This route option traverses surface water bodies at one location.	This route option traverses surface water bodies at one location.	This route option traverses surface water bodies at one location.
Rank								
Landscape and Visual	Makes use of existing road corridors with no particular landscape and visual sensitivities	Makes use of existing road corridors with no particular landscape and visual sensitivities	Makes use of existing road corridors with no particular landscape and visual sensitivities	Makes use of existing road corridors with no particular landscape and visual sensitivities	Makes use of existing road corridors with no particular landscape and visual sensitivities	Makes use of existing road corridors with no particular landscape and visual sensitivities	Makes use of existing road corridors with no particular landscape and visual sensitivities	Makes use of existing road corridors with no particular landscape and visual sensitivities
Rank								
Air Quality	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in pollutant concentrations.
Rank								

Criteria	Route Option DA0	Route Option DA1	Route Option DA2	Route Option DA3	Route Option DA4	Route Option DA5	Route Option DA6	Route Option DA7
Noise and Vibration	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors and there may be an increase in noise.
Rank								

A5 Santry Route Options Assessment Summary

Assessment Criteria	Assessment Sub-Criteria	Route Option SY1	Route Option SY2
Economy (Cost Assessment and Transport Economic Indicators)	Capital Cost	€18.0m ***Main Scheme Infrastructure*** (€10.6m) - Significant boundary works including - retaining structures - steps and ramps to properties - re-grading of impacted front gardens and hard standing areas - New carriageway full depth reconstruction - Significant services / utilities relocation and protection works. - New public lighting would be required throughout route length. - Extensive traffic management required during construction (potentially need for diversion of traffic away from route). ***Land Acquisition*** (€7.4) - 6,200sqm Public Land - 4,900sqm Private Land - 105 private properties affected	€11.2m ***Main Scheme Infrastructure*** (€11.2m) - Northbound, the retaining wall structure adjacent to the Coolock Lane Interchange slip lane would need to be set back. - New traffic management arrangements, including a new set of traffic signals, required along Coolock Lane to accommodate the northbound and southbound Swiftway movements and priority - New southbound BRT lane required through undeveloped lands adjacent to the N50 southbound on-ramp - New segregated section of 2-way 'Swiftway-only' roadway required along Coolock lane between the N50 and R132 junctions. - Coolock Lane/R132 junction required to be upgraded to facilitate Swiftway priority. - Pedestrian connection between northbound and southbound stops would require direct connection (steps and ramps) to the N50 Shantalla overpass for the 'Santry South' stop - This route option would also include ancillary measures within Santry village to provide improved bus priority and cycle facilities. ***Land Acquisition*** (€0m) - 20,500sqm Public Land - 0sqm Private Land
	Rank		
	Operation and Maintenance Cost	€1.6m	€1.7m
	Rank		
	Transport Reliability and Quality of Service	Journey Time: 4 - 5 min Length: 1.6km	Journey Time: 3 - 4 mins Length: 1.7km

Assessment Criteria	Assessment Sub-Criteria	Route Option SY1	Route Option SY2
		No. of Junction: 5 Significant land-take required to achieve an acceptable level of Swiftway priority through the centre of Santry. May be mixed with traffic northbound along slip lane from N50 at Shantalla Rd overbridge. This would reduce journey time reliability for Swiftway services.	No. of Junction: 3 Swiftway priority generally achievable along full length of route option resulting in reliable journey times for Swiftway services.
	Rank		
Integration	Land Use Integration	Route option is already substantially developed with little opportunity to encourage further development	Potential to facilitate and encourage development of vacant plot to the east of the N50 south of Coolock Lane. Potential to include a southbound stop in future within the development lands
	Rank		
	Residential Population and Employment Catchments	***Residential Population Catchments*** - 5 minute walk catchment of approximately 1,600 - 10 minute walk catchment of approximately 5,500 - 15 minute walk catchment of approximately 16,600 Accessibility could be improved by creating direct pedestrian links from adjoining residential areas along the R132. ***Employment Population Catchments*** 15 minute walk catchment of approximately 5,300	***Residential Population Catchments*** - 5 minute walk catchment of approximately 900 - 10 minute walk catchment of approximately 5,800 - 15 minute walk catchment of approximately 17,800 ***Employment Population Catchments*** 15 minute walk catchment of approximately 5,600
	Rank		
	Transport Network Integration	Potential for interchange with Dublin Bus services. Provision of cycle parking possible at both potential stop locations.	Potential for interchange with Dublin Bus services. Provision of cycle parking possible at both potential stop locations.
	Rank		
	Cycling integration	This route option is identified as a primary route 2A in the GDA Cycle Network Plan. Route option intersects with route 2B and NO5. Vertically segregated cycle tracks and dedicated lanes in northbound direction through Santry village. Southbound cyclists would share with bus lanes.	N50 is not appropriate for cyclists and is not identified as a cycle route in the GDA Cycle Network. Route option intersects with route 2B and NO5. Therefore, vertically segregated cycle tracks and dedicated lanes in northbound direction through Santry village would be required. Southbound cyclists would share with bus lanes. This routing would form part primary route 2A in the GDA Cycle Network Plan
	Rank		

Assessment Criteria	Assessment Sub-Criteria	Route Option SY1	Route Option SY2
Accessibility & Social Inclusion	Key Trip Attractors (Education/Health/ Commercial /Employment)	***Education*** - Larkhill Primary School - Margaret Aylward Community College - Our Lady of Mercy College ***Retail / Leisure*** - Omni Shopping Centre - Santry village Shops ***Employment*** - Shanowen Business Park	***Education*** - Larkhill Primary School - Margaret Aylward Community College - Our Lady of Mercy College ***Retail / Leisure*** - Omni Shopping Centre - Santry village Shops ***Employment*** - Shanowen Business Park
	Rank		
	Deprived Geographic Areas	Route option travels close to both the Ballymun and Kilmore/Darndale RAPID areas.	Route option travels close to both the Ballymun and Kilmore/Darndale RAPID areas.
	Rank		
Safety	Road Safety	No. of Junction: 5 1 turn movements required in each direction (1 right turn outbound and 1 left turn inbound)	No. of Junction: 5 2 turn movements required in each direction (1 left turn and 1 right turn in each direction)
	Rank		
	Pedestrian Safety	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road
	Rank		
Environment	Archaeology and Cultural Heritage	One site of archaeological and cultural heritage merit was identified within the assessment area.	No sites of archaeological and cultural heritage merit were identified within the assessment area.
	Rank		
	Architectural Heritage	Two sites of architectural heritage merit and one CA were identified within the assessment area. No Recorded Monuments or Protected Structures were identified within the study area of this route option.	No Recorded Monuments or Protected Structures. One site of architectural merit was identified within the assessment area.
	Rank		
	Flora & Fauna	This route option does not cross or run adjacent to any site of international or national conservation value or any area of floral diversity or area of known importance to fauna. This route option does not pass over or adjacent to any water bodies.	It is considered that land-take required to give Swiftway priority would result in the loss of some verge planting associated with the existing N50 and Coolock Lane.
	Rank		
	Soils and Geology	Minimal potential for impacts to soils and geology and no historical industries noted that could give rise to potential contamination.	Minimal potential for impacts to soils and geology and no historical industries noted that could give rise to potential contamination.

Assessment Criteria	Assessment Sub-Criteria	Route Option SY1	Route Option SY2
	Rank		
	Hydrology	This route option travels through Santry village. The route option does not pass over or adjacent to any water bodies.	This route option avoids Santry village by turning off the R132 onto the R104 and following the N50 to rejoin the R132 just south of Santry village. This route option would cross the outfall of the Naniken Siphon which is routed underneath the N50, N50 slip lanes and the Port Tunnel.
	Rank		
	Landscape and Visual	Makes use of existing R132 road corridor. Extensive residential development along R132 Swords Road. Open Space along sections of R132 road corridor. Narrow sub-urban road character	Makes use of existing R104 / N50 road corridors. Open Space alongside R104 Coolock Lane corridor. Residential areas and church grounds along part of R104 Coolock Lane corridor and along Loran Park facing N50.
	Rank		
	Air Quality	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in pollutant concentrations.
	Rank		
	Noise &Vibration	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise.	There will be some instances where the proposed scheme will result in traffic being relocated closer to sensitive receptors due to road widening. Should traffic be moved closer to sensitive receptors (or traffic volumes increase), there may be an increase in noise.
	Rank		
	Land Use Character	Carriageway increased from 3 lanes to 4. On-street parking is removed and footpath width reduced resulting in a change to the Main Street character and potentially impacting on its use. Loss of large part of front gardens for some property owners through Santry village.	Negligible impact on existing and future land-use character.
	Rank		

A6 North City Centre Route Options Assessment Summary

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
Economy (Cost Assessment and Transport Economic Indicators)	Capital Cost	***Indicative Scheme Infrastructure* Works Cost** €14.5m - Upgrade Dorset Street between Clonliffe Road and Belvidere Road to overcome current delays by reconfiguring roadway to provide fewer traffic lanes and continuous bus / BRT lanes; - Upgrade Belvidere Road and implement traffic management measures to reduce traffic demand and allow retention of some on street parking; - Upgrade North Circular Road & Portland Row to provide bus priority or virtual bus priority along full extent of this route option between Belvidere Road and Amiens Street; - Upgrade Amiens Street to provide continuous bus / BRT lanes in either direction. Possible bus gate required inbound at Loop Line Railway overbridge;	***Indicative Scheme Infrastructure* Works Cost** €12.5m - Upgrade Dorset Street between Clonliffe Road and Belvidere Road to overcome current delays by reconfiguring roadway to provide fewer traffic lanes and continuous bus / BRT lanes; - Upgrade Belvidere Road and Belvidere Place and implement traffic management measures to reduce traffic demand and allow retention of some on street parking; - Provide bus priority or virtual bus priority along Mountjoy Square North – subject to architectural heritage assessment; - Provide continuous bus / BRT lanes along Mountjoy Square West, Gardiner Street Middle and Gardiner Street Lower. Implement necessary turning and parking restrictions to ensure bus priority.	***Indicative Scheme Infrastructure* Works Cost** €11.9m - Upgrade Dorset Street between Clonliffe Road and North Frederick Street to overcome current delays by reconfiguring roadway to provide fewer traffic lanes and continuous bus / BRT lanes. Some left turning restrictions and reorganisation of existing bus stops required along Dorset Street. - Reconfigure North Frederick Street to provide continuous bus / BRT lane southbound and virtual bus priority northbound; - Rearrange Parnell Square East and Cavendish Row to provide a bus / BRT lane in each direction. Local access traffic only to be accommodated northbound from Rutland Place; - Adjust locations of bus stops on O'Connell Street to accommodate BRT stations; - Provision of cycle tracks and improved pedestrian facilities	***Indicative Scheme Infrastructure* Works Cost** €13.2m - Upgrade Dorset Street between Clonliffe Road and Belvidere Road to overcome current delays by reconfiguring roadway to provide fewer traffic lanes and continuous bus / BRT lanes; - Upgrade Belvidere Road and Belvidere Place and implement traffic management measures to reduce traffic demand and allow retention of some on street parking; - Provide bus priority or virtual bus priority along Mountjoy Square North – subject to architectural heritage assessment; - Provide virtual Swiftway priority along Gardiner Place and Great Denmark Street by implementation of a revised traffic circulation system allowing local access traffic only onto these streets;

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
		- Remove one traffic lane on Beresford Place and Memorial Road to provide continuous bus / BRT lanes around Custom House gyratory system; - Provision of cycle tracks and improved pedestrian facilities along route or along suitable parallel routes where space is constrained. ***Land Acquisition Cost*** n/a	- Remove one traffic lane on Beresford Place and Memorial Road to provide continuous bus / BRT lanes around Custom House gyratory system; - Provision of cycle tracks and improved pedestrian facilities along route or along suitable parallel routes where space is constrained. ***Land Acquisition Cost*** - n/a	along route or along suitable parallel routes where space is constrained. ***Land Acquisition Cost*** - Terrace of the Temple Inn Public House fronting onto Dorset Street to be acquired but larger compensatory additional space to be provided on Temple Street frontage. Specialist input required to determine costs (if any).	- Rearrange Parnell Square East and Cavendish Row to provide a bus / BRT lane in each direction. Local access traffic only to be accommodated northbound from Rutland Place; - Adjust locations of bus stops on O'Connell Street to accommodate Swiftway stations; - Provision of cycle tracks and improved pedestrian facilities along route or along suitable parallel routes where space is constrained. ***Land Acquisition Cost*** - Terrace of the Temple Inn Public House fronting onto Dorset Street to be acquired but larger compensatory additional space to be provided on Temple Street frontage. Specialist input required to determine costs (if any).
	Rank				
	Operation & Maintenance Cost	€2.2m	€1.9m	€1.8m	€2.0m
	Rank				
	Transport Reliability and Quality of Service	Journey Time: 7 - 8 mins Length: 2.2km	Journey Time: 7 - 8 mins Length: 1.9km	Journey Time 6 - 7 mins Length: 1.8km	Journey Time: 7 - 8 mins Length: 2.0km

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
		No. of Junctions: 8 Major junctions to be negotiated at: • Dorset / Belvidere; • Belvidere / North Circular; • North Circular / Russell; • North Circular / Summerhill; • Five Lamps; • Luas Crossing; • Amiens / Memorial • Memorial / Quays	No. of Junctions: 8 Major junctions to be negotiated at: • Dorset / Belvidere; • Dorset / North Circular; • Dorset / Gardiner; • Gardiner / Summerhill; • Gardiner / Sean McDermott; • Gardiner / Talbot; • Gardiner / Memorial; • Memorial / Quays.	No. of Junction: 8 Major junctions to be negotiated at: • Dorset / Belvidere; • Dorset / North Circular; • Dorset / Gardiner; • Dorset / Eccles; • Dorset / North Frederick; • O'Connell / Parnell; • O'Connell / Abbey; • O'Connell / Quays	No. of Junction: 8 Major junctions to be negotiated at: • Dorset / Belvidere; • Belvidere / North Circular; • Mountjoy Sq. N / Gardiner; • Gardiner Place / Hill St; • Denmark / Parnell Sq. • O'Connell / Parnell; • O'Connell / Abbey; • O'Connell / Quays
	Rank				
Integration	Land Use Integration	Could foster further development and regeneration of North Circular Road and Amiens Street areas.	Could foster regeneration of Mountjoy Square and Gardiner Street areas.	Could complement on-going regeneration of O'Connell Street and public realm plans for Parnell Square, including the provision of a new City Library on Parnell Square North and general streetscape enhancement works.	Could foster regeneration of Mountjoy Square; Could complement on-going regeneration of O'Connell Street and public realm plans for Parnell Square, including the provision of a new City Library on Parnell Square North and general streetscape enhancement works.
	Rank				
	Residential Population and Employment Catchments	***Residential Population Catchments*** - 5 minute walk catchment of approximately 7,900 - 10 minute walk catchment of approximately 24,300	***Residential Population Catchments*** - 5 minute walk catchment of approximately 9,400 - 10 minute walk catchment of approximately 26,300	***Residential Population Catchments*** - 5 minute walk catchment of approximately 7,400 - 10 minute walk catchment of approximately 25,200	***Residential Population Catchments*** - 5 minute walk catchment of approximately 7,500 - 10 minute walk catchment of approximately 26,700

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
		- 15 minute walk catchment of approximately 43,700 ***Employment catchments*** 15 minute walk catchment of approximately 54,100	- 15 minute walk catchment of approximately 43,400 ***Employment catchments*** 15 minute walk catchment of approximately 63,200	- 15 minute walk catchment of approximately 45,000 ***Employment catchments*** 15 minute walk catchment of approximately 66,100	- 15 minute walk catchment of approximately 44,300 ***Employment catchments*** 15 minute walk catchment of approximately 64,000
	Rank				
	Transport Network Integration	New bus / BRT lanes could conflict with major orbital traffic route on North Circular Road; The introduction of some turning movement restrictions for general traffic may be required to increase bus and Swiftway priority along the route; Provides opportunity for interchange with the Clongriffin – Tallaght Swiftway route on Amiens Street; Deflects Swords bus services away from currently served catchment at O'Connell Street. Integration with rail and Luas Red Line at Connolly Station,	New bus / BRT lanes could conflict with major north – south traffic route on Gardiner Street; The introduction of some turning movement restrictions for general traffic may be required to increase bus and Swiftway priority along the route. Follows northbound routing of current Swords bus services but deflects southbound bus services away from currently served catchment at O'Connell Street. Interchange with Luas Red Line at Talbot Street; Does not directly serve main locus of public transport activity at O'Connell Street;	The introduction of some turning movement restrictions for general traffic may be required to increase bus and Swiftway priority along the route. Follows southbound routing of current Swords bus services; Interchange with Red and Green Luas Lines on O'Connell Street; Directly serves existing Swords QBC corridor.	The introduction of some turning movement restrictions for general traffic may be required to increase bus and Swiftway priority along the route. Interchange with Luas Red and Green Lines on O'Connell Street; Almost directly serves existing Swords QBC corridor.
	Rank				
	Cycling integration	Maintaining provision for cyclists along North Circular Road would be challenging in the context of the provision of further bus priority.	Dorset Street is identified as route 2A on the GDA Cycle Network plan. Maintaining provision for cyclists along Gardiner Street would be	Dorset Street is identified as route 2A on the GDA Cycle Network plan, while O'Connell Street is identified as Route 3. It is feasible to accommodate cycling facilities	This route coincides with Secondary Route C8 and Primary Routes 2A, 2B and 3 of the GDA Cycle Network Plan. Maintaining provision for cyclists along North

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
		Maintaining provision for cyclists along Amiens Street would be challenging in the context of the provision of further bus priority. It is noted that both of the above routes are identified on the GDA Cycle Network Plan – Amiens Street as Primary 1 and North Circular Road as Secondary C8. This route option also intersects routes Primary Routes 2A, 2B and Secondary Routes 1D and C4.	challenging in the context of the provision of further bus priority. However, this route is not shown on the GDA Cycle Network Plan. It is feasible to accommodate cycling facilities on Dorset Street with reconfiguration of the existing traffic lanes. This route option also intersects routes Primary Route 2B and Secondary Routes 1D, C8 and C4.	on Dorset Street with reconfiguration of the existing traffic lanes. It would be possible to maintain the existing cyclist provision on O'Connell Street while accommodating Swiftway priority. This route option also intersects routes Primary Route 2B and Secondary Routes 1D, C8 and C4.	Circular Road and Gardiner Place / Great Denmark Street would be challenging in the context of the provision of further bus priority. It would be possible to maintain the existing cyclist provision on O'Connell Street while accommodating Swiftway priority. This route option also intersects routes Secondary Routes 1D and C4.
	Rank				
Accessibility and Social Inclusion	Key Trip Attractors (Education/Health /Commercial/Employment)	***Hospitals*** - Temple Street Hospital - Mater Hospital - Rotunda Hospital ***Education*** - Belvedere College - Delphin English School Dublin - Lourdes Parish Schools ***Retail / Leisure*** - Food Outlets / Restaurants / Shops on Drumcondra Road / Dorset Street - Gate Theatre Parnell Square - Ambassador Theatre Parnell Square - Savoy Cinema O'Connell Street	***Hospitals*** - Temple Street Hospital - Mater Hospital - Rotunda Hospital ***Education*** - Belvedere College - Delphin English School Dublin - Lourdes Parish Schools - Mount Carmel's Girls Secondary School - DIT Bolton Street ***Retail / Leisure*** - Food Outlets / Restaurants / Shops on Drumcondra Road / Dorset Street - Gate Theatre Parnell Square	***Hospitals*** - Temple Street Hospital - Mater Hospital - Rotunda Hospital ***Education*** - Belvedere College - Delphin English School Dublin - Lourdes Parish Schools - Mount Carmel's Girls Secondary School - DIT Bolton Street - St Paul's CBS Secondary School - Future DIT Grangegorman Campus - George's Hill School ***Retail / Leisure***	***Hospitals*** - Temple Street Hospital - Mater Hospital - Rotunda Hospital ***Education*** - Belvedere College - Delphin English School Dublin - Lourdes Parish Schools - Mount Carmel's Girls Secondary School - DIT Bolton Street - St Paul's CBS Secondary School - Future DIT Grangegorman Campus - George's Hill School ***Retail / Leisure***

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
		- O'Connell Street / Henry Street retail areas; - Abbey Theatre Abbey Street ***Employment*** - City Centre generally	- Ambassador Theatre Parnell Square - Savoy Cinema O'Connell Street - O'Connell Street / Henry Street retail areas; - Abbey Theatre Abbey Street - Cineworld / Parnell Centre ***Employment*** - City Centre generally	- Food Outlets / Restaurants / Shops on Drumcondra Road / Dorset Street - Gate Theatre Parnell Square - Ambassador Theatre Parnell Square - Savoy Cinema O'Connell Street - O'Connell Street / Henry Street retail areas; - Abbey Theatre Abbey Street - Cineworld / Parnell Centre ***Employment*** - City Centre generally	- Food Outlets / Restaurants / Shops on Drumcondra Road / Dorset Street - Gate Theatre Parnell Square - Ambassador Theatre Parnell Square - Savoy Cinema O'Connell Street - O'Connell Street / Henry Street retail areas; - Abbey Theatre Abbey Street - Cineworld / Parnell Centre ***Employment*** - City Centre generally
	Rank				
	Deprived Geographic Areas	This route option directly serves the Dublin North East Inner City RAPID Area.	This route option directly serves the Dublin North East Inner City RAPID Area.	This route option skirts the Dublin North East Inner City RAPID Area	This route option skirts the Dublin North East Inner City RAPID Area
	Rank				
Safety	Road Safety	No. of Junctions: 8 2 left turn movements and 1 right turn movement inbound; 1right turn movements and 2 left turn movement outbound.	No. of Junctions: 8 2 left turn move inbound; 1right turn movements and 1 left turn movement outbound.	No. of Junctions: 8 1 left turn move inbound; 1right turn movements outbound.	No. of Junctions: 8 2 left turn movements and 1 right turn movement inbound; 2right turn movements and 2 left turn movement outbound.
	Rank				
	Pedestrian Safety	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road.	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road.	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road.	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
	Rank				
Environment	Archaeology and Cultural Heritage	Four Recorded Monuments along route option. There are no sites of archaeological or cultural heritage merit within the assessment area.	Four Recorded Monuments along route option. There are no sites of archaeological or cultural heritage merit within the assessment area	Three National Monuments; four Recorded Monuments. There are no sites of archaeological heritage merit within the assessment area.	There are three National Monuments; two Recorded Monuments and no sites of archaeological heritage merit within the assessment area.
	Rank				
	Architectural Heritage	137 Protected Structures; and three sites of architectural heritage merit. This route option traverses a designated Conservation Area under the Dublin City Development Plan.	150 Protected Structures; and four sites of architectural and industrial heritage along route option. This route option traverses the Mountjoy Square Architectural Conservation Area and a designated Conservation Area under the Dublin City Development Plan.	144 Protected Structures; seven sites of architectural heritage merit along route option. This route option traverses the O'Connell Street Architectural Conservation Area and a designated Conservation Area under the Dublin City Development Plan.	188 Protected Structures; eight sites of architectural heritage merit along route option. This route option traverses the Mountjoy Square and O'Connell Street Architectural Conservation Areas and a designated Conservation Area under the Dublin City Development Plan.
	Rank				
	Flora & Fauna	Given the developed urban nature of this route option, overall impacts on flora/fauna from this route option are assessed as neutral.	Given the developed urban nature of this route option, overall impacts on flora/fauna from this route option are assessed as neutral.	Given the developed urban nature of this route option, overall impacts on flora/fauna from this route option are assessed as neutral.	Given the developed urban nature of this route option, overall impacts on flora/fauna from this route option are assessed as neutral.
	Rank				
	Soils and Geology	Minimal potential for impacts to soils and geology however the presence of a number of historic industries along this route option could give rise to potential residual contamination.	Minimal potential for impacts to soils and geology however the presence of a number of historic industries along the south section of this route option could give rise to potential residual contamination.	Minimal potential for impacts to soils and geology however there are permeable glacial gravels and sands in the Parnell Square area.	Minimal potential for impacts to soils and geology however there are permeable glacial gravels and sands in the Parnell Square area. Historic industries near the north portion of this route option could

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
				Historic industries near this route option could give rise to potential residual contamination	give rise to potential residual contamination
	Rank				
	Hydrology	This criterion is assessed as neutral.	This criterion is assessed as neutral.	This criterion is assessed as neutral.	This criterion is assessed as neutral.
	Rank				
	Landscape and Visual	Conservation areas at Royal Canal and at Busáras / Custom House. Protected structures along sections of North Circular Road, Portland Row, Amiens Street, and Custom House. Z9 zoning (To preserve, provide and improve recreational amenity and open space & green networks) at Royal Canal, Custom House. Protected views east along the Liffey to Custom House and Quays (as per Fig. 4 Views and Prospects DCC Dev Plan). Dorset Street, North Circular Road, Amiens Street and surrounds of Custom House are significant in terms of broad urban structure, townscape character, quality of buildings and public function. Dorset Street, North Circular Road, Amiens Street and surrounds of Custom House are existing	Conservation areas at Royal Canal and along full extent of this route option from Belvidere Place. Z8 zoning (To protect existing architectural/civic design character, allow only limited expansion consistent with the conservation objective) and protected structures along Belvidere Place, Mountjoy Square North and West and Gardiner Street South, Custom House. Z9 zoning (To preserve, provide and improve recreational amenity and open space and green networks) at Royal Canal, Mountjoy Square, Gardiner Street/Sean MacDermott Park, Custom House. Protected views south along Gardiner Street to Custom House; and east along the Liffey to Custom House and Quays (as per Fig. 4 Views and Prospects DCC Dev Plan).	Conservation areas at Royal Canal and along full extent of this route option from Frederick Street North. Architectural Conservation Area along Cavendish Row, O'Connell Street, O'Connell Bridge. Z8 zoning (To protect existing architectural/civic design character, allow only limited expansion consistent with the conservation objective) and protected structures along majority of this route option from Frederick Street North. Z9 zoning (To preserve, provide and improve recreational amenity and open space & green networks) at Royal Canal, Garden of Remembrance. Protected views along O'Connell Street and to Spire south from Parnell Square, north from O'Connell Bridge and east from Henry Street; east along the Liffey to Custom House and Quays (as per	Conservation areas at Royal Canal and along full extent of this route option from Belvidere Place. Architectural Conservation Area along Cavendish Row, O'Connell Street, O'Connell Bridge Z8 zoning (To protect existing architectural/civic design character, allow only limited expansion consistent with the conservation objective) and protected structures along majority of this route option. Z9 zoning (To preserve, provide and improve recreational amenity and open space & green networks) at Royal Canal, Mountjoy Square, Garden of Remembrance. Protected views along O'Connell Street and to Spire south from Parnell Square, north from O'Connell Bridge and east from Henry Street; east along the Liffey to Custom House and Quays (as per Fig. 4 Views and Prospects DCC Dev Plan).

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
		significant transport corridors within the City Centre.	Mountjoy Square, Gardiner Street and surrounds of Custom House are significant in terms of broad urban structure, townscape character, quality of buildings and public function. Dorset Street, Gardiner Street and surrounds of Custom House are existing significant transport corridors within the City Centre.	Fig. 4 Views and Prospects DCC Dev Plan). Parnell Square, O'Connell Street are significant cultural, amenity and open space assets. These streets are significant in terms of broad urban structure, townscape character, quality of buildings and public function. Majority of the streets, but particularly Dorset Street, Parnell Square East and O'Connell Street, are also existing significant transport corridors within the City Centre	Mountjoy Square, Parnell Square, O'Connell Street and are significant cultural, amenity and open space assets. These streets are significant in terms of broad urban structure, townscape character, quality of buildings and public function. Belvidere Road, Belvidere Place, Gardiner Place, Great Denmark Street and Gardiner Row are connecting urban streets with often narrower and/or terraced residential character. Majority of the streets, but particularly Dorset Street, Parnell Square East and O'Connell Street, are also existing significant transport corridors within the City Centre
	Rank				
	Air Quality	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the potential to impact on localised air quality.	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the potential to impact on localised air quality.	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the potential to impact on localised air quality.	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the potential to impact on localised air quality.
	Rank				
	Noise & Vibration	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the

Assessment Criterion	Assessment Sub-Criterion	Route Option N1 (NCR / Amiens Street)	Route Option N2 (Dorset / Gardiner Street)	Route Option N3 (Dorset / O'Connell Street)	Route Option N4 (Mountjoy / O'Connell Street)
		potential to impact on the local noise environment.	potential to impact on the local noise environment.	potential to impact on the local noise environment.	potential to impact on the local noise environment.
	Rank				
	Land Use	Neutral	Neutral	Neutral	Neutral
	Rank				

A7 South City Centre Route Options Assessment Summary

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
Economy (Cost Assessment and Transport Economic Indicators)	Capital Cost	***Indicative Scheme Infrastructure* Works Cost** €19.8m[3] - Upgrade Westmoreland Street, College Street and D'Olier Street to provide fewer traffic lanes, enhanced pedestrian areas and continuous bus / Swiftway priority; - Upgrade Townsend Street to provide continuous bus lane eastbound; - Enhance existing bus lane on Pearse Street; - Upgrade Lombard Street to restrict traffic access for through traffic but maintain local access traffic; - Upgrade Westland Row and revise circulation arrangements at Clare Street / Lincoln Place;	***Indicative Scheme Infrastructure* Works Cost** €18.5m[1] - Upgrade Westmoreland Street, College Street and D'Olier Street to provide fewer traffic lanes, enhanced pedestrian areas and continuous bus / Swiftway priority; - Upgrade Townsend Street to provide continuous bus lane eastbound; - Enhance existing bus lane on Pearse Street; - Upgrade Lombard Street to restrict traffic access for through traffic but maintain local access traffic; - Upgrade Westland Row and revise circulation arrangements at Clare Street / Lincoln Place;	***Indicative Scheme Infrastructure* Works Cost** €19.8m[4] - Reconfigure the Pearse Street – Tara Street – City Quay – Lombard Street gyratory system to provide a bus lane continuously around. Retain two traffic lanes on Pearse Street and Tara Street and one traffic lane on City Quay and Lombard Street; - Upgrade Lombard Street to restrict traffic access for through traffic but maintain local access traffic; - Upgrade Westland Row and revise circulation arrangements at Clare Street / Lincoln Place; - Reconfigure Merrion Square North and Fitzwilliam Street to	***Indicative Scheme Infrastructure* Works Cost** €18.5m[1] - Reconfigure the Pearse Street – Tara Street – City Quay – Lombard Street gyratory system to provide a bus lane continuously around. Retain two traffic lanes on Pearse Street and Tara Street and one traffic lane on City Quay and Lombard Street; - Upgrade Lombard Street to restrict traffic access for through traffic but maintain local access traffic; - Upgrade Westland Row and revise circulation arrangements at Clare Street / Lincoln Place; - Reconfigure Merrion Street to accommodate Swiftway priority and enhance pedestrian areas;

[3] Cost of upgrading Pearse Street and Townsend Street reduced by 50% each to account for one-way running.
[4] Cost of upgrading Pearse Street and Townsend Street reduced by 50% each to account for one-way running.

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
		- Reconfigure Merrion Square North and Fitzwilliam Street to accommodate Swiftway priority; - Upgrade roads at turnaround location either at Sussex Road or Wilton Terrace. - Provision of cycle tracks and improved pedestrian facilities along route or along suitable parallel routes where space is constrained. ***Land Acquisition Cost*** n/a	- Reconfigure Merrion Street to accommodate Swiftway priority and enhance pedestrian areas; - Reconfigure Ely Place and Hume Street to accommodate Swiftway priority. - Reconfigure St. Stephen's Green East to provide two-way bus / Swiftway priority. - Upgrade roads at turnaround location at Earlsfort Terrace / Hatch Street / Leeson Street - Provision of cycle tracks and improved pedestrian facilities along route or along suitable parallel routes where space is constrained. ***Land Acquisition Cost*** - n/a	accommodate Swiftway priority; - Upgrade roads at turnaround location either at Sussex Road or Wilton Terrace. - Provision of cycle tracks and improved pedestrian facilities along route or along suitable parallel routes where space is constrained. ***Land Acquisition Cost*** n/a	- Reconfigure Ely Place and Hume Street to accommodate Swiftway priority. - Reconfigure St. Stephen's Green East to provide two-way bus / Swiftway priority. - Upgrade roads at turnaround location at Earlsfort Terrace / Hatch Street / Leeson Street - Provision of cycle tracks and improved pedestrian facilities along route or along suitable parallel routes where space is constrained. ***Land Acquisition Cost*** n/a
	Rank				
	Operation & Maintenance Cost	€3.0m[5]	€2.8m[2]	€3.0m[6]	€2.8m[2]
	Rank				

[5] Cost of one-way running only where route split
[6] Cost of one-way running only where route split

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
	Transport Reliability and Quality of Service	Journey Time: 10 - 11 mins Length: 3.0km No. of Junctions: 8 Major junctions to be negotiated at: • South Quays • D'Olier / Pearse • Pearse / Westland • Westland / Lincoln Place • Merrion Sq. N / Clare St • Merrion Sq. N / Holles St • Fitzwilliam / Baggot • Fitzwilliam / Leeson	Journey Time: 9 - 10 mins Length: 2.8km No. of Junctions: 8 Major junctions to be negotiated at: • South Quays • D'Olier / Pearse • Pearse / Westland • Westland / Lincoln Place • Merrion Sq. N / Clare St • Merrion St / Merrion Row • St. Stephen's Green / Hume • Leeson / Earlsfort	Journey Time: 10 - 11 mins Length: 3.0km No. of Junctions: 8 Major junctions to be negotiated at: • Townsend / Lombard or Tara / Townsend • Tara / South Quays • Pearse / Westland • Westland / Lincoln Place • Merrion Sq. N / Clare St • Merrion Sq. N / Holles St • Fitzwilliam / Baggot • Fitzwilliam / Leeson	Journey Time: 9 - 10 mins Length: 2.8km No. of Junctions: 8 Major junctions to be negotiated at: • Townsend / Lombard or Tara / Townsend • Tara / South Quays • Pearse / Westland • Westland / Lincoln Place • Merrion Sq. N / Clare St • Merrion St / Merrion Row • St. Stephen's Green / Hume • Leeson / Earlsfort
	Rank				
Integration	Land Use Integration	Could foster regeneration of Pearse Street, Townsend Street and Fitzwilliam Street areas. Opportunity for public realm enhancement at Westmoreland Street / D'Olier Street	Could foster regeneration of Pearse Street and Townsend Street areas. Opportunity for public realm enhancement at Westmoreland Street / D'Olier Street, Merrion Street and Earlsfort Terrace	Could foster regeneration of Pearse Street, Townsend Street and Fitzwilliam Street areas.	Could foster regeneration of Pearse Street and Townsend Street , Opportunity for public realm enhancement at Merrion Street and Earlsfort Terrace
	Rank				

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
	Residential Population and Employment Catchments	***Residential Population Catchments*** - 5 minute walk catchment of approximately 5,300 - 10 minute walk catchment of approximately 17,700 - 15 minute walk catchment of approximately 47,500. ***Employment catchments*** 15 minute walk catchment of approximately 133,300	***Residential Population Catchments*** - 5 minute walk catchment of approximately 5,200 - 10 minute walk catchment of approximately 17,200 - 15 minute walk catchment of approximately 46,900. ***Employment catchments*** 15 minute walk catchment of approximately 132,800	***Residential Population Catchments*** - 5 minute walk catchment of approximately 5,500 - 10 minute walk catchment of approximately 21,900 - 15 minute walk catchment of approximately 50,800. ***Employment catchments*** 15 minute walk catchment of approximately 132,200	***Residential Population Catchments*** - 5 minute walk catchment of approximately 4,700 - 10 minute walk catchment of approximately 20,600 - 15 minute walk catchment of approximately 49,500. ***Employment catchments*** 15 minute walk catchment of approximately 132,000
	Rank				
	Transport Network Integration	Interchange with other public transport services at D'Olier Street / College Street Interchange with East Coast Railway Line / DART at Pearse Street Station Interchange with BxU Swiftway at Leeson Street	Interchange with other public transport services at D'Olier Street / College Street Interchange with East Coast Railway Line / DART at Pearse Street Station Interchange with BxU Swiftway at St. Stephen's Green	Interchange with East Coast Railway Line / DART at Pearse Street and Tara Street Station Interchange with BxU Swiftway at Leeson Street	Interchange with East Coast Railway Line / DART at Pearse Street and Tara Street Station Interchange with BxU Swiftway at St. Stephen's Green
	Rank				
	Cycling integration	Coincides with Primary Route 11 along Westmoreland Street and 13 along Westland Row and Merrion Square North and Secondary Route C7 along Fitzwilliam Street and	Coincides with Primary Route 11 along Westmoreland Street and 13 along Westland Row and C5 along Merrion Street, Hume Street and St. Stephen's Green and Secondary Routes C5 along Earlsfort Terrace	Coincides with Primary Route 13 along City Quay, Lombard Street, Westland Row and Merrion Square North and Secondary Route C7 along Fitzwilliam Street and 13E	Coincides with Primary Route 13 along City Quay, Lombard Street, Westland Row and Merrion Square and C5 along Merrion Street, Hume Street and St. Stephen's Green and Secondary Routes C5 along

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
		13E along Pearse Street. It should be feasible to accommodate cycling facilities along these streets as part of the proposed scheme. The route option also intersects routes Primary Routes 12 and 13A and Secondary Routes C2 and 13B.	and 13E along Pearse Street. It should be feasible to accommodate cycling facilities along these streets as part of the proposed scheme The route option also intersects routes Primary Routes 12 and 13A and Secondary Routes C2 and 13B.	along Pearse Street. It should be feasible to accommodate cycling facilities along these streets as part of the proposed scheme. The route option also intersects routes Primary Routes 12 and 13A and Secondary Routes C2 and 13B	Earlsfort Terrace and 13E along Pearse Street. It should be feasible to accommodate cycling facilities along these streets as part of the proposed scheme The route option also intersects routes Primary Routes 12 and 13A and Secondary Routes C2 and 13B.
	Rank				
Accessibility and Social Inclusion	Key Trip Attractors (Education/Health /Commercial/Employment)	***Hospitals*** - Dublin Dental School and Hospital - National Maternity Hospital Holles Street - Baggot Street Community Hospital - Royal Victoria Eye and Ear Hospital ***Education*** - Trinity College Dublin - Hibernia College - Dublin Institute of Technology - School of English - Guitar Lessons Dublin - Royal College of Physicians of Ireland	***Hospitals*** - Dublin Dental School and Hospital - National Maternity Hospital Holles Street - Baggot Street Community Hospital - Royal Victoria Eye and Ear Hospital - The Meath Community Service ***Education*** - Trinity College Dublin - Hibernia College - Dublin Institute of Technology - School of English - Guitar Lessons Dublin	***Hospitals*** - Dublin Dental School and Hospital - National Maternity Hospital Holles Street - Baggot Street Community Hospital - Royal Victoria Eye and Ear Hospital ***Education*** - Trinity College Dublin - Hibernia College - Dublin Institute of Technology - School of English - Guitar Lessons Dublin - Royal College of Physicians of Ireland	***Hospitals*** - Dublin Dental School and Hospital - National Maternity Hospital Holles Street - Baggot Street Community Hospital - Royal Victoria Eye and Ear Hospital ***Education*** - Trinity College Dublin - Hibernia College - Dublin Institute of Technology - School of English - Guitar Lessons Dublin - Royal College of Physicians of Ireland

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
		- Royal Irish Academy of Music - Loreto College - The Institute of Education - Dublin Institute for Advanced Studies - Fás - St. Mary's Secondary School - Ranelagh Multi-Denomination School - Portobello College - Christian Brothers Secondary School - MLI International Schools ***Retail / Leisure*** - Screen Cinema - Trinity Sports Centre - Smock Alley Theatre - Temple Bar - Grafton Street Retail Quarter - Powerscourt Centre - St. Stephen's Green Shopping Centre - Gaiety Theatre - Grand Canal Theatre - National Concert Hall	- Royal College of Physicians of Ireland - Royal Irish Academy of Music - Loreto College - The Institute of Education - Whitefriar Street National School - Fás - St. Mary's Secondary School - Portobello College - Christian Brothers Secondary School - MLI International Schools - St. Audoen's National School ***Retail / Leisure*** - Screen Cinema - Trinity Sports Centre - Smock Alley Theatre - Temple Bar - Grafton Street Retail Quarter - Powerscourt Centre - St. Stephen's Green Shopping Centre - Gaiety Theatre - Grand Canal Theatre	- Royal Irish Academy of Music - Loreto College - The Institute of Education - Dublin Institute for Advanced Studies - Fás - St. Mary's Secondary School - Ranelagh Multi-Denomination School - Portobello College - Christian Brothers Secondary School - MLI International Schools ***Retail / Leisure*** - Screen Cinema - Trinity Sports Centre - Smock Alley Theatre - Temple Bar - Grafton Street Retail Quarter - Powerscourt Centre - St. Stephen's Green Shopping Centre - Gaiety Theatre - Grand Canal Theatre - National Concert Hall	- Royal Irish Academy of Music - Loreto College - The Institute of Education - Dublin Institute for Advanced Studies - Fás - St. Mary's Secondary School - Ranelagh Multi-Denomination School - Portobello College - Christian Brothers Secondary School - MLI International Schools ***Retail / Leisure*** - Screen Cinema - Trinity Sports Centre - Smock Alley Theatre - Temple Bar - Grafton Street Retail Quarter - Powerscourt Centre - St. Stephen's Green Shopping Centre - Gaiety Theatre - Grand Canal Theatre - National Concert Hall

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
		- The Sugar Club ***Employment*** - City Centre generally	- National Concert Hall - The Sugar Club ***Employment*** - City Centre generally	- The Sugar Club ***Employment*** - City Centre generally	- The Sugar Club ***Employment*** - City Centre generally
	Rank				
	Deprived Geographic Areas	The route option directly serves the large section of the South East Inner City RAPID area centred on Townsend Street and is also within 15 minute walk of the section centred on Charlemont Street	The route option directly serves the large section of the South East Inner City RAPID area centred on Townsend Street and is also within 15 minute walk of the section centred on Charlemont Street	The route option directly serves the large section of the South East Inner City RAPID area centred on Townsend Street and is also within 15 minute walk of the section centred on Charlemont Street	The route option directly serves the large section of the South East Inner City RAPID area centred on Townsend Street and is also within 15 minute walk of the section centred on Charlemont Street
	Rank				
Safety	Road Safety	No. of Junctions: 8 5 left turn movements and 3 right turn movement inbound; 3 right turn movements and 3 left turn movement outbound.	No. of Junctions: 8 5 left turn movements and 3 right turn movement inbound; 3 right turn movements and 3 left turn movement outbound.	No. of Junctions: 8 5 left turn movements and 3 right turn movement inbound; 3 right turn movements and 3 left turn movement outbound.	No. of Junctions: 8 5 left turn movements and 3 right turn movement inbound; 3 right turn movements and 3 left turn movement outbound.
	Rank				
	Pedestrian Safety	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road.	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road.	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road.	Pedestrian crossings located within 50m of stops and footpaths provided on both sides of the road.
	Rank				

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
Environment	Archaeology and Cultural Heritage	13 Recorded Monuments along route option. The ZAP for the historic town of Dublin in also located within the assessment area for this option.	One National Monument and 19 Recorded Monuments along route option. The ZAP for the historic town of Dublin in also located within the assessment area for this option.	10 Recorded Monuments are located within the assessment area for this option. The ZAP for the historic town of Dublin in also located within the assessment area for this option.	One National Monument and 16 Recorded Monuments and are located within the assessment area for this option. The ZAP for the historic town of Dublin in also located within the assessment area for this option.
	Rank				
	Architectural Heritage	352 Protected Structures; and 15 sites of architectural and industrial heritage merit along route option. The route option traverses two Architectural Conservation Areas and the Dublin Conservation Area	291 Protected Structures; and 12 sites of architectural heritage merit along route option. The route option traverses one Architectural Conservation Area and the Dublin Conservation Area.	301 Protected Structures and 15 sites of architectural and industrial heritage merit are located within the assessment area for this route. The route option traverses one Architectural Conservation Area and the Dublin Conservation Area	238 Protected Structures and 12 sites of architectural and industrial heritage merit are located within the assessment area for this route. The route option traverses the Dublin Conservation Area.
	Rank				
	Flora & Fauna	Given the developed urban nature of this route option overall impacts on flora/fauna from this route option are assessed as neutral.	Given the developed urban nature of this route option overall impacts on flora/fauna from this route option are assessed as neutral	Given the developed urban nature of this route option overall impacts on flora/fauna from this route option are assessed as neutral.	Given the developed urban nature of this route option overall impacts on flora/fauna from this route option are assessed as neutral
	Rank				
	Soils and Geology	Minimal potential for impacts to soils and geology that could give rise to potential contamination however the presence of a number	Minimal potential for impacts to soils and geology however the presence of a number of historic industries along parts of the route	Minimal potential for impacts to soils and geology that could give rise to potential contamination however the presence of a number	Minimal potential for impacts to soils and geology however the presence of a number of historic industries along parts of the route

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
		of historic industries along the route could give rise to potential residual contamination.	could give rise to potential contamination.	of historic industries along the route could give rise to potential residual contamination.	could give rise to potential contamination.
	Rank				
	Hydrology	This route option does not cross any surface water bodies and it is not considered that significant road works would be required to facilitate Swiftway therefore the potential impact is considered to be neutral.	This route option may cross the Gallows Stream and the Stein River which are underground and form part of DCC's combined sewer and surface drainage systems, respectively. The potential impact is considered to be neutral.	This route option does not cross any surface water bodies and it is not considered that significant road works would be required to facilitate Swiftway therefore the potential impact is considered to be neutral.	This route option may cross the Gallows Stream and the Stein River which are underground and form part of DCC's combined sewer and surface drainage systems, respectively. The potential impact is considered to be neutral.
	Rank				
	Landscape and Visual	Architectural Conservation Area: O'Connell Bridge, D'Olier Street and Westmoreland Street. Architectural Conservation Area around Fitzwilliam Square and adjoining areas. Conservation Areas along Liffey Quays; and between Merrion Square – Fitzwilliam Square and Leeson Street. Z8 use zoning and Protected Structures along majority of route south of Pearse Street.	Architectural Conservation Area O'Connell Bridge, D'Olier Street and Westmoreland Street. Conservation Area along majority of route Z8 use zoning and Protected Structures along majority of route Z9 use zoning at Merrion Square St. Stephen's Green Protected views east along the Liffey (to Custom House and Quays); and north along O'Connell Street from O'Connell Bridge (as per Fig. 4 Views and Prospects DCC Dev Plan)	Architectural Conservation Area around Fitzwilliam Square and adjoining areas. Conservation Areas along Liffey Quays; and between Merrion Square – Fitzwilliam Square and Leeson Street. Z8 use zoning and Protected Structures along majority of route south of Pearse Street. Z9 use zoning at Liffey Quays, Merrion Square, at Church on Pearse Street Protected views east and west along the Liffey Quays; and north along	Conservation Area along majority of route Z8 use zoning and Protected Structures along majority of route Z9 use zoning at Merrion Square St. Stephen's Green Protected views east along the Liffey (to Custom House and Quays); and north along O'Connell Street from O'Connell Bridge (as per Fig. 4 Views and Prospects DCC Dev Plan) O'Connell Bridge, Liffey Quays, Merrion Square and St. Stephen's

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
		Z9 use zoning at Liffey Quays, Merrion Square, at Church on Pearse Street Protected views east and west along the Liffey Quays; and north along Fitzwilliam Place – Fitzwilliam Street Upper and Lower and Merrion Square East (as per Fig. 4 Views and Prospects DCC Dev Plan) Liffey Quays and bridges, Merrion Square and Fitzwilliam Square are significant cultural, amenity and open space assets Majority of the streets are significant in terms of broad urban structure, townscape character, quality of buildings and public function Majority of the streets are also existing significant transport corridors within the City Centre.	O'Connell Bridge, Liffey Quays, Merrion Square and St. Stephen's Green are significant cultural, amenity and open space assets The streets are significant in terms of broad urban structure, townscape character, quality of buildings and public function The streets are also existing significant transport corridors within the City Centre	Fitzwilliam Place – Fitzwilliam Street Upper and Lower and Merrion Square East (as per Fig. 4 Views and Prospects DCC Dev Plan) Liffey Quays and bridges, Merrion Square and Fitzwilliam Square are significant cultural, amenity and open space assets Majority of the streets are significant in terms of broad urban structure, townscape character, quality of buildings and public function Majority of the streets are also existing significant transport corridors within the City Centre.	Green are significant cultural, amenity and open space assets The streets are significant in terms of broad urban structure, townscape character, quality of buildings and public function The streets are also existing significant transport corridors within the City Centre
	Rank				
	Air Quality	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the

Assessment Criterion	Assessment Sub-Criterion	Option S1 (O'Connell Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S2 (O'Connell Bridge - Pearse Street – Westland Row – Merrion Street)	Option S3 (Butt / Talbot Bridge - Pearse Street – Westland Row – Fitzwilliam Street)	Option S4 (Butt / Talbot Bridge - Pearse Street – Westland Row – Merrion Street)
		potential to impact on localised air quality.	potential to impact on localised air quality.	potential to impact on localised air quality.	potential to impact on localised air quality.
	Rank				
	Noise & Vibration	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the potential to impact on the local noise environment.	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the potential to impact on the local noise environment.	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the potential to impact on the local noise environment.	It is possible that significant variations could occur due to the redistribution of traffic from one route to another. This has the potential to impact on the local noise environment.
	Rank				
	Land Use	Neutral	Neutral	Neutral	Neutral
	Rank				