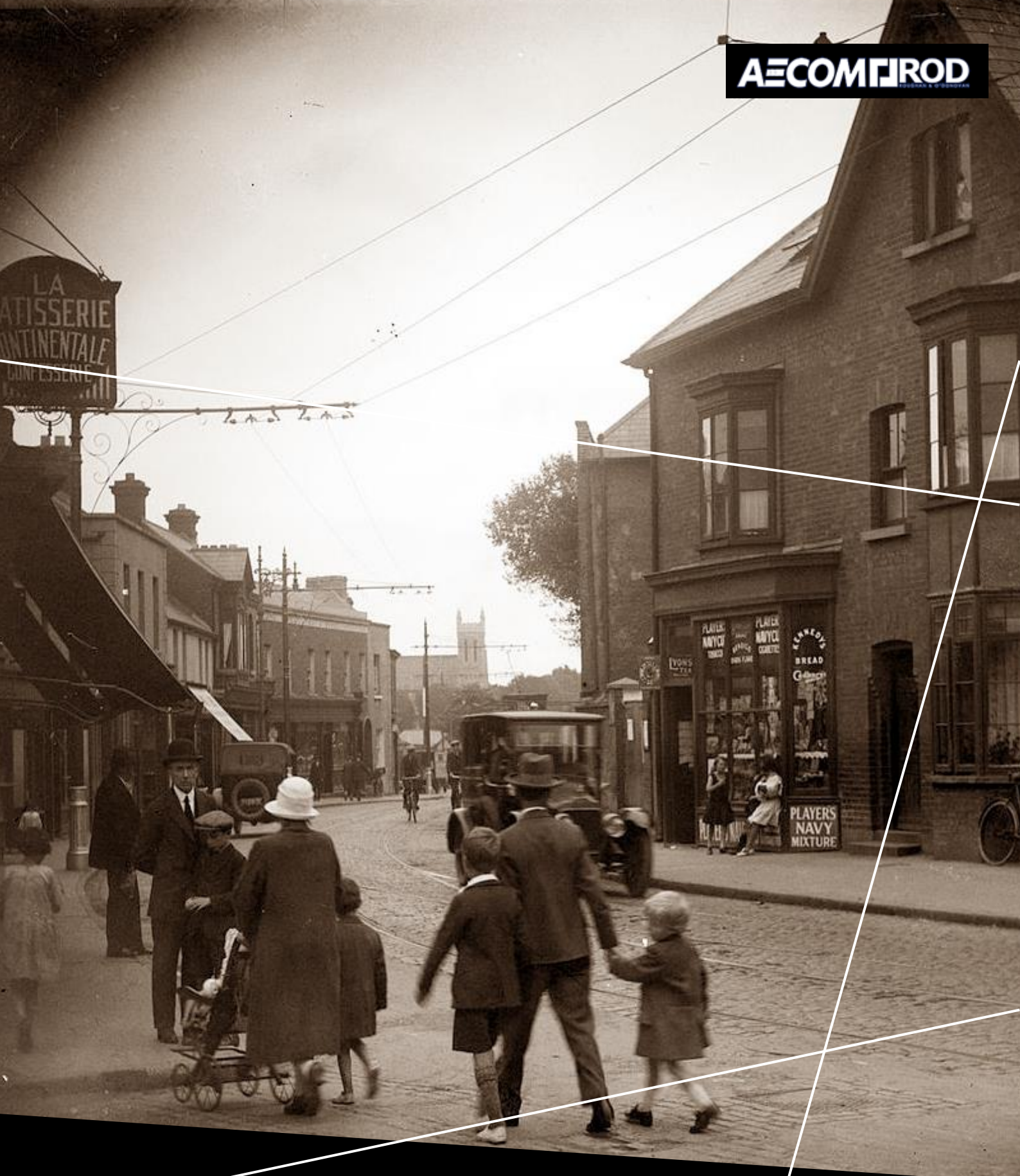




Appendix L
UCD to City Centre
Core Bus Corridor

Route Options
Assessment Study
Report



UCD to City Centre
(St. Stephen's Green) CBC

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Glossary of Terms

- **DTTAS:** Department of Transport, Tourism and Sport
- **NTA:** National Transport Authority
- **DCC:** Dublin City Council
- **DLRCoCo:** Dún Laoghaire – Rathdown County Council
- **CBC:** Core Bus Corridor
- **BRT:** Bus Rapid Transit
- **EPO:** Emerging Preferred Option
- **GDA:** Greater Dublin Area
- **GIS:** Geographic Information Systems
- **ITS:** Intelligent Transport Systems
- **LAP:** Local Area Plan
- **MCA:** Multi-Criteria Analysis
- **OSi:** Ordnance Survey Ireland
- **RMP:** Record of Monuments and Places
- **ROA:** Route Options Assessment
- **RTPI:** Real Time Passenger Information
- **SAC:** Special Area of Conservation
- **SPA:** Special Protection Area

Definitions

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

Citations

- The background mapping used frequently in figures in the report is based on maps which AECOM holds a licence for. The source is ArcGIS Viewer for Silverlight (ESRI).
- Residential, employment destination and education destination figures in the report are based on the Census 2011 Small Area Population Statistics (SAPS).

1. Introduction

1.1 Preamble

This report presents the findings of the options assessment work undertaken for the UCD to City Centre (St. Stephen's Green) Core Bus Corridor (CBC) and a recommendation on the **emerging preferred option** is made.

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

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

1.2 Report Structure

- **Section 2:** The strategic transport policy context which has led to the identification of a need for the delivery of a CBC on this corridor is discussed in this section.
- **Section 3:** The objectives of the CBC and the proposed scheme are presented in the section. Key constraints and opportunities within the Study Area are identified. Also assessed are the integration of the corridor with the wider public transport network and the compatibility with other road users.
- **Section 4:** The methodology for identifying and assessing the feasibility of the various route options potentially available within the Study Area is discussed in this section including:
 - the identification of a Study Area where practical route options have been considered and presentation of an initial network ("spider's web") of route sections examined;
 - the selection and determination of initial criteria for screening and assessing technically feasible route options, based on distinct, scheme-specific objectives; and
 - the definition of MCA criteria.
- **Sections 5 and 6:** Details the stages of the options assessment for each Study Area.
- **Section 7:** The Emerging Preferred Option is identified and described.
- **Section 8:** Presents a cost estimate for the concept design of the Emerging Preferred Scheme.
- **Section 9:** Discusses the Emerging Scheme Benefits.
- **Section 10:** Discusses the next steps.

2. Transport Context

2.1 Ireland 2040 – Our Plan

The ‘National Planning Framework: Ireland 2040 – Our Plan’ (Department of Housing Planning and Local Government, September 2017) sets the long-term context for Ireland’s physical development and associated progress in economic, social and environmental terms and in an island. The objectives of ‘National Planning Framework: Ireland 2040 – Our Plan’, in relation to public transport, include:

- *“Expand attractive public transport alternatives to car transport to reduce congestion and emissions and enable the transport sector to cater for the demands associated with longer term population and employment growth in a sustainable manner...”*
- *“The provision of a well-functioning, integrated public transport system, enhancing competitiveness, sustaining economic progress and enabling sustainable mobility choices.”*
- *“Deliver the key public transport objectives of the Transport Strategy for the Greater Dublin Area 2016-2035 by investing in projects such as New Metro North, DART Expansion Programme, BusConnects in Dublin and key bus based projects in the other cities and towns.”*

2.2 Greater Dublin Area Transport Strategy 2016 – 2035

The ‘Greater Dublin Area Transport Strategy 2016 – 2035’ (NTA, 2015) identifies a Core Bus Network for the GDA. This core network represents the most important bus routes in the GDA, which are generally characterised by a high frequency of bus services, high passenger volumes and with significant trip attractors located along the route. The ‘Greater Dublin Area Transport Strategy 2016 – 2035’ includes objectives to develop the Core Bus Network to achieve, as far as practicable, continuous priority for bus movements on the sections of the Core Bus Network within the Metropolitan Area, with the goal of making the overall bus system more efficient and attractive to users including the core principle, which states: *“Development in the GDA shall be directly related to investment in integrated high quality public transport services and focused on compact urban form.”*

Section 2.2.1 of the ‘Greater Dublin Area Transport Strategy 2016 – 2035’ also states, as a Primary Policy: *“The Strategy must therefore, promote, within its legislative remit, transport options which provide for unit reductions in carbon emissions. This can most effectively be done by promoting public transport, walking and cycling, and by actively seeking to reduce car use in circumstances where alternative options are available.”*

The identified core network comprises a number of radial, orbital and regional bus corridors.

2.3 BusConnects

‘BusConnects’ is a programme of priority investment for public transport in the 2018 budget, which plans to fundamentally transform Dublin’s bus system. The objective of ‘BusConnects’ is to develop the radial and orbital bus corridors as identified in the ‘Greater Dublin Area Transport Strategy 2016 – 2035’, so that each will have continuous bus priority; i.e., a continuous bus lane in each direction.

‘BusConnects’ seeks the development of a more attractive and convenient bus system with greater scope for interconnection between routes, where connecting passengers don’t necessarily have to travel to Dublin City Centre.

A section of the Blanchardstown to UCD corridor, which is identified as a continuous bus priority radial corridor, is proposed to be developed as a CBC between UCD and St. Stephen’s Green (Leeson Street Lower).

This Core Bus Corridor is shown in **Figure 2.1**.

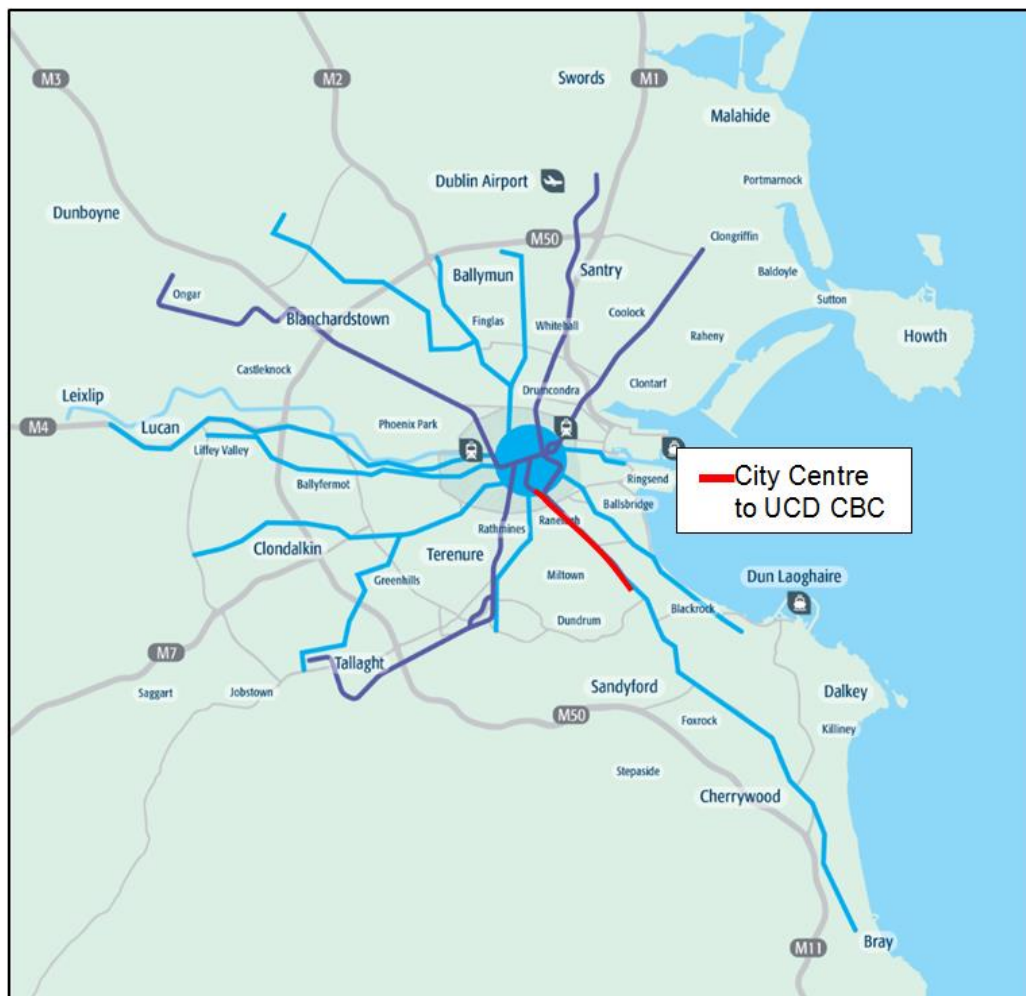


Figure 2.1: Radial Bus Corridors ('BusConnects' Next Generation Bus Corridors Fig. 1)

2.4 Integrated Implementation Plan 2013 – 2018

The NTA published the Integrated Implementation Plan 2013 – 2018 in February 2014. This report sets out the short term infrastructure investment programme for the GDA for a five year period up to 2018, including investment in existing bus services. The proposals in relation to bus investment are encompassed in four investment areas:

1. Bus Fleet Investment;
2. Bus Stop and Shelter Provision;
3. General Bus Network Improvements; and
4. Bus Rapid Transit Schemes.

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

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

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

2.5 Greater Dublin Area Cycle Network Plan

The GDA Cycle Network Plan (NTA, 2013) sets out the strategy for the development of an integrated cycle network. It identifies that the UCD to City Centre corridor forms part of the primary, secondary and greenway cycle networks and thus form a key part of the strategic cycle network – see **Figure 2.2**. It is therefore important that any upgrade to bus priority infrastructure along the corridor should take cognisance of these objectives and, where practical, provide cycle infrastructure to the appropriate level and quality of service required for a primary and secondary cycle route.



Figure 2.2: GDA Cycle Network Plan (extracts)

2.6 DCC Development Plan (2016 –2022)

The DCC Development plan outlines the following objectives:

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

2.7 DLRCoCo Development Plan (2016 – 2022)

This Development Plan seeks to protect and nurture the future growth of Dún Laoghaire-Rathdown both by serving and leading the community through creation of conditions that will attract and sustain social and economic development. It contains some objectives in relation to bus travel which are of general relevance to the scheme such as:

- An increased travel mode share for walking and cycling; this increase will be mainly related to local trips to work, schools, retail and leisure within the larger urban areas.
- An increased travel mode share for public transport for work trips to the main employment zones of Sandyford, Cherrywood and Dublin City Centre and between the other larger urban centres; there may be scope to improve public transport mode share to larger urban centres along the main bus and rail corridors, particularly where this improves access and interchange between bicycle and rail.
- Enhanced safety for all modes – especially for vulnerable road users.
- The delivery of major strategic transportation projects and infrastructural improvements such as, the Council Cycle Network, an expanded Bus Network, Luas Line B2 from Brides Glen to Fassaroe and the package of interventions to realise the full potential of the Sandyford Business District.

The continued expansion of the Bus Network is of the utmost importance. In addition, the continuation and improvement of existing bus services along radial and orbital routes, subject to sufficient demand and availability of finance, is also considered a priority. As part of the continuing development of the Bus Network in the County, the Council will facilitate the provision of radial and orbital bus priority schemes to integrate with established high quality and frequency bus and rail routes. The provision of bus priority measures on a route may include some, but not all, of the following measures:

- The deployment of advanced traffic management techniques and ITS applications, i.e. the provision of an urban traffic signalling systems such as SCATS (Sydney Coordinated Adaptive Traffic System), changes to the traffic signalling configuration, public transport traffic signal priority, route optimisation through traffic signal co-ordination, junction redesign.
- Reallocation of existing road space with increased levels of segregation from other vehicular traffic.
- Enhancement of nearby pedestrian and cycle facilities.
- High quality running surfaces.
- Widening of the roadway where appropriate.
- Traffic Management measures to include turning movement bans or a restriction on some, or all, other road vehicles on a section of road etc.

3. Corridor Audit and Scheme Objectives

3.1 Physical Constraints and Opportunities

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

- The developing Greater Dublin Area Cycle Network;
- Grand Canal and River Dodder (including protected structures);
- Existing and committed future development along the route, in particular in the city centre, much of which has heritage value, including particular Residential Conservation Areas;
- Existing protected monuments along the route;
- Significant street trees and other natural features along the route within the Study Area;
- Existing urban and sub-urban roads and street network;
- Availability of land in urban and suburban areas;
- Public parks including St. Stephen's Green;
- Donnybrook Stadium; and
- The need to maintain traffic flow for all modes during construction.

Further details on the engineering and construction issues are contained in the Route Audit Report, within **Appendix D**.

3.2 Interchange with Public Transport

As part of the scheme it is desirable to enhance interchange between the various modes of public transport operating in the city and wider metropolitan area, both existing and proposed. Route options have therefore been developed with this in mind and, in so far as possible seek to provide for improved interchange opportunities with other transport services, including:

- Luas Cross City and Green Luas Line at St Stephen's Green;
- DART services in proximity to southern section of the corridor;
- Other CBC routes; and
- Existing Dublin Bus services at numerous locations along the route.

The following report sections outline some of these opportunities in further detail.

3.2.1 Bus Network

The UCD to City Centre (St. Stephen's Green) will form an integral part of the reconfigured bus network. The introduction of the CBC, with the capacity that it provides, will allow for the rationalisation of existing bus services. This will provide for a more efficient network overall and improve the cost effectiveness of the scheme. No reduction in the overall level of public transport service will be made and capacity enhancements will be provided for by CBC along sections of the network.

Figure 3.1 illustrates the BRT Networks proposed within the GDA Transport Strategy. This identifies that the proposed scheme interfaces within the city centre with the following BRT Networks:

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

This CBC replaces the BRT service proposed for the UCD to City Centre section of the Blanchardstown to UCD BRT route.

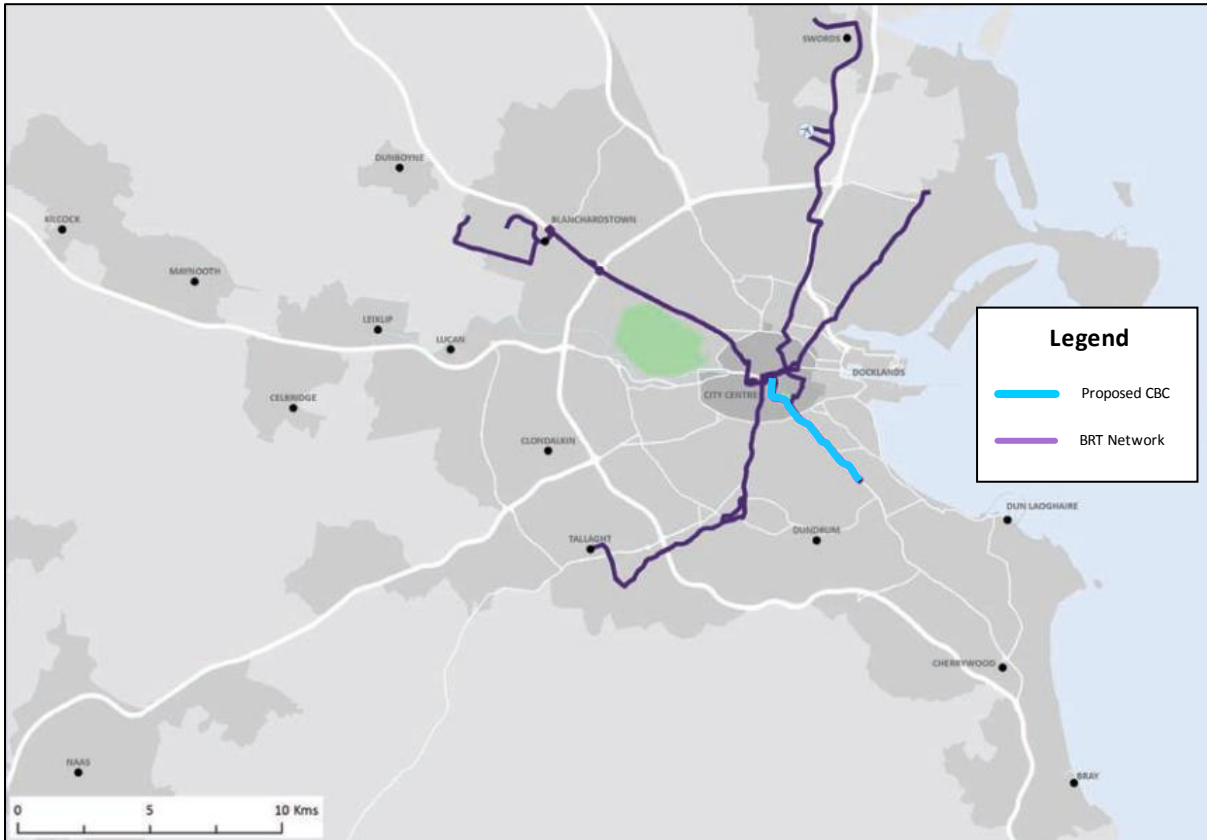


Figure 3.1: BRT Network (Source: Figure 5.5 Transport Strategy 2016 – 2035)

Figure 3.2 illustrates the Core Regional Bus Network within the Core Bus Network. This identifies that the proposed scheme interfaces with the Core Regional service of M11 / N11, which serves regional bus from Arklow, Wicklow and N11 corridor.



Figure 3.2: Core Regional Bus Network (Source: Transport Strategy 2016 – 2035)

Figure 3.3 illustrates the Orbital Networks within the Core Bus Network. This identifies that the proposed scheme interfaces with the following Orbital Networks: Dundrum – Finglas, Dundrum / UCD – Tallaght, and Ranelagh – Drumcondra.

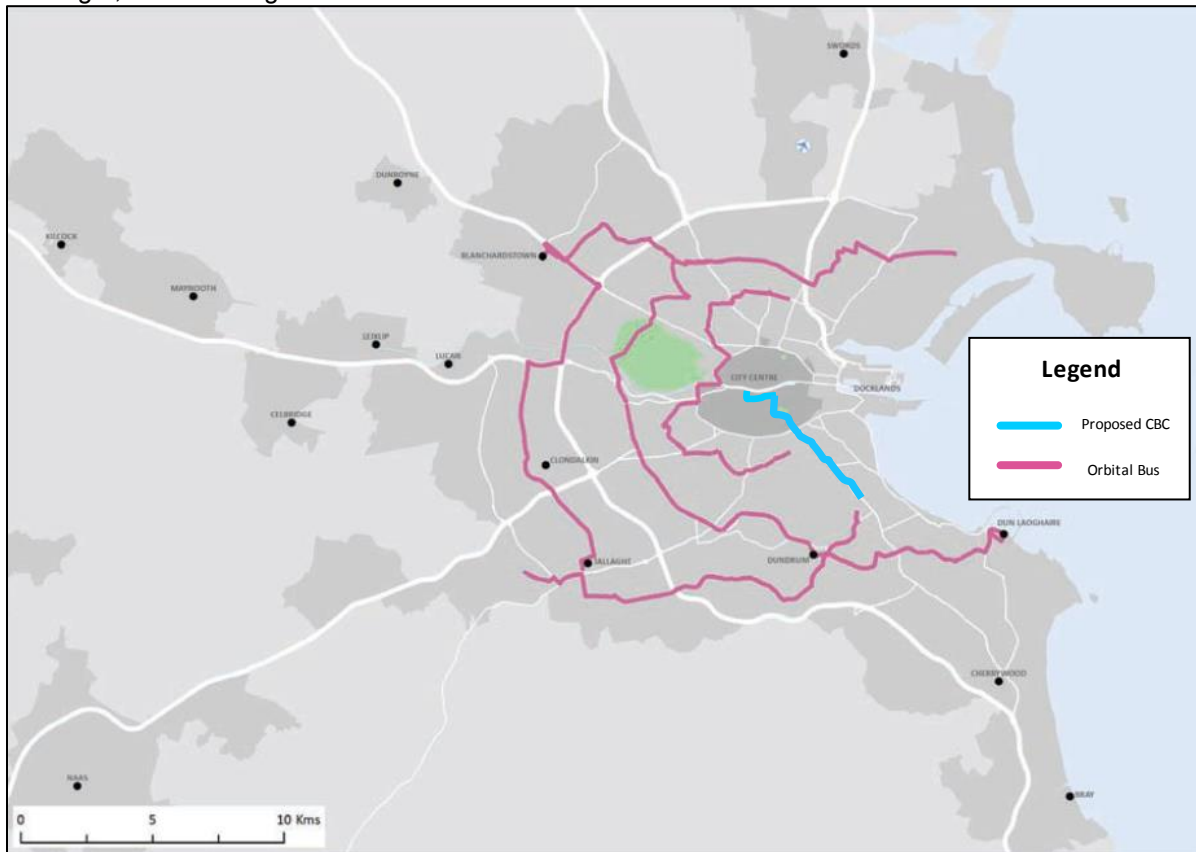


Figure 3.3: Orbital Corridors (Source: Figure 5.5 Transport Strategy 2016 – 2035)

3.2.2 Metropolitan Light Rail Network

Figure 3.4 illustrates the Light Rail network proposed within the GDA . This identifies that the proposed scheme interfaces with the Luas Cross City and Green Luas Line at St Stephen’s Green.

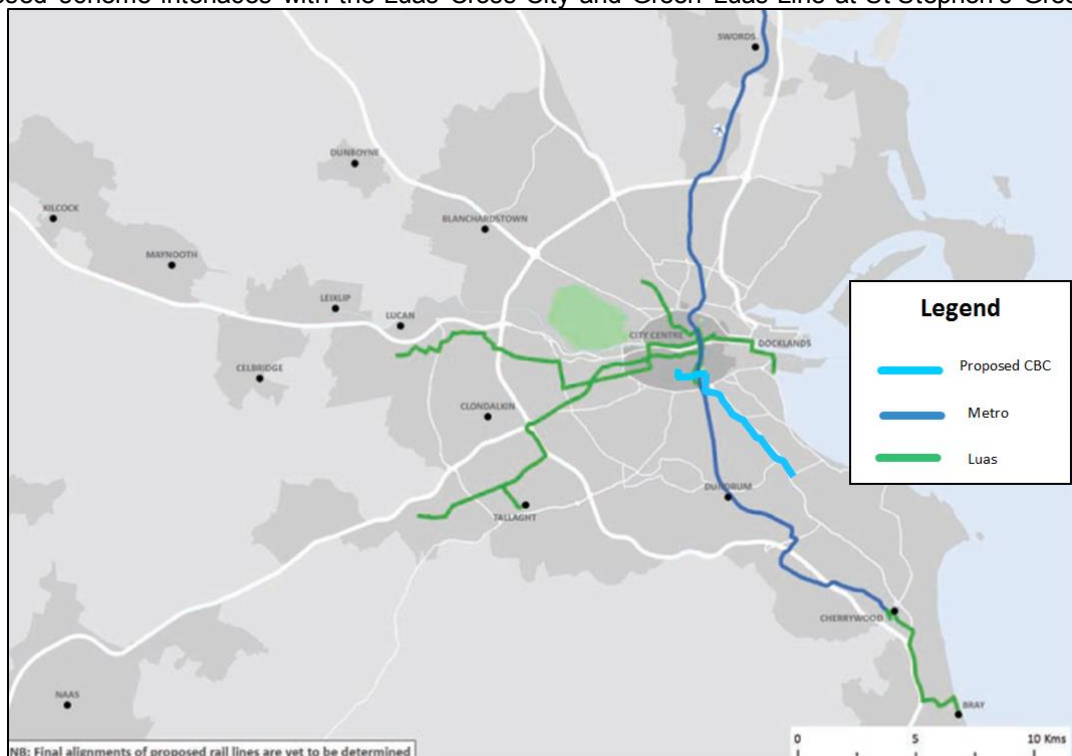


Figure 3.4: Light Rail Network (Source: Figure 5.5 Transport Strategy 2016 – 2035)

3.2.3 Metropolitan Heavy Rail Network

Figure 3.5 illustrates the DART and Commuter Rail proposed within the GDA Transport Strategy. This identifies that the proposed scheme interfaces with the DART services in proximity to southern section of the corridor.

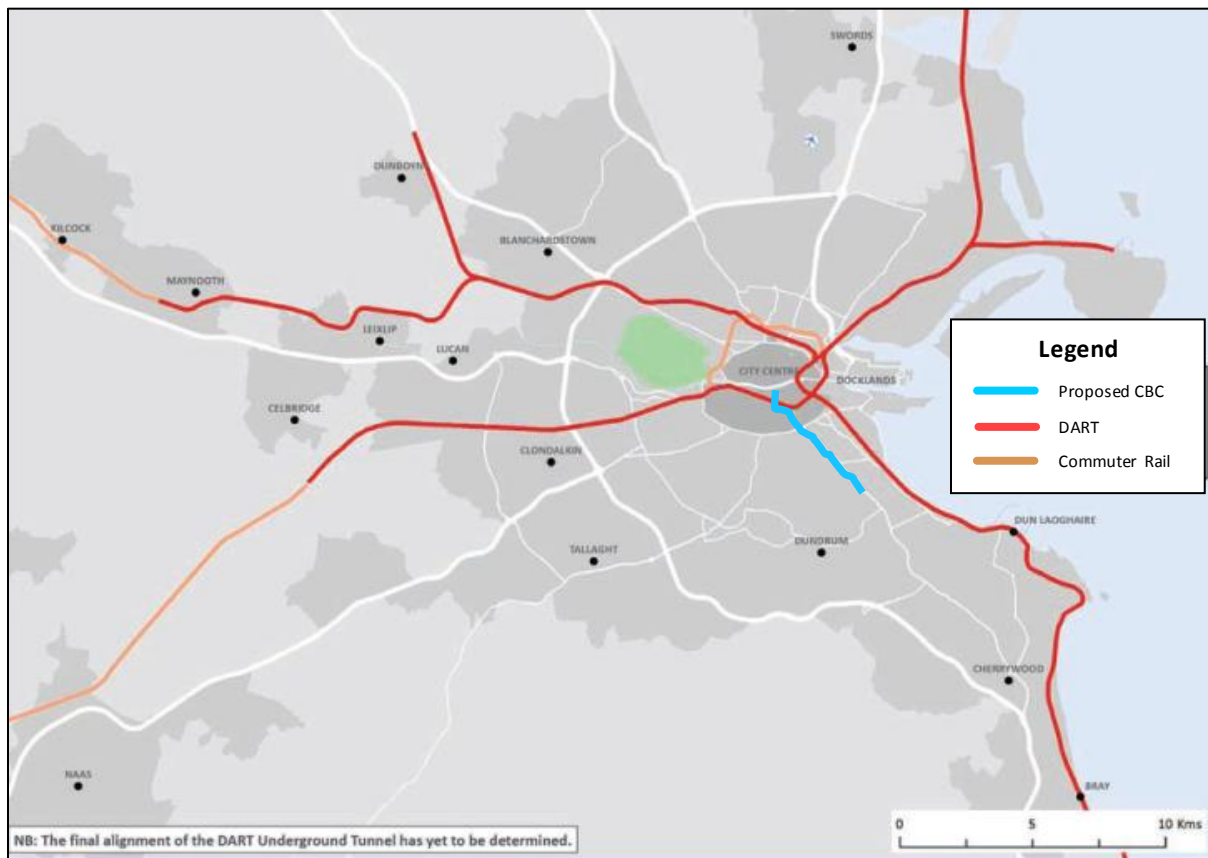


Figure 3.5: DART and Commuter Rail proposed within the GDA Transport Strategy

3.3 Compatibility with other users

A key objective of the proposed scheme is to improve pedestrian and cyclist facilities along the route (in line with the GDA cycle network). In general, suitable level of service should be proposed for these modes.

Where it is considered impractical to construct cycle facilities along a particular section of the CBC route, such facilities would need to be provided along suitable alternative routes and as required by the GDA Cycle Network Plan.

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

General traffic flow and local access will generally be maintained along the CBC corridor although it is inevitable that there will be impacts on traffic capacity along the route associated with the reallocation of road space to CBC priority and cycle lanes and the introduction of turning movement restrictions.

Reductions in traffic carrying capacity of the road network need, however, to be considered in the context of the overall significant increase in efficiency and reliability of the bus services that will be achieved.

3.4 Scheme Objectives

Having regard to the findings of the studies and plans set out in **Section 2** of the report, the following objectives were established for the UCD to City Centre (St. Stephen's Green) CBC:

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

4. Assessment Methodology

4.1 Introduction

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

A two-stage assessment process was adopted as follows:

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

4.2 Study Area

Arising from the transport policy context and scheme objectives set for the UCD to City Centre (St. Stephen’s Green) CBC, the broad Study Area identified for the proposed scheme is illustrated in red in **Figure 4.1**.

The Study Area is generally bounded to the north by St. Stephen’s Green (South East corner) and to the south by Booterstown and Goatstown.

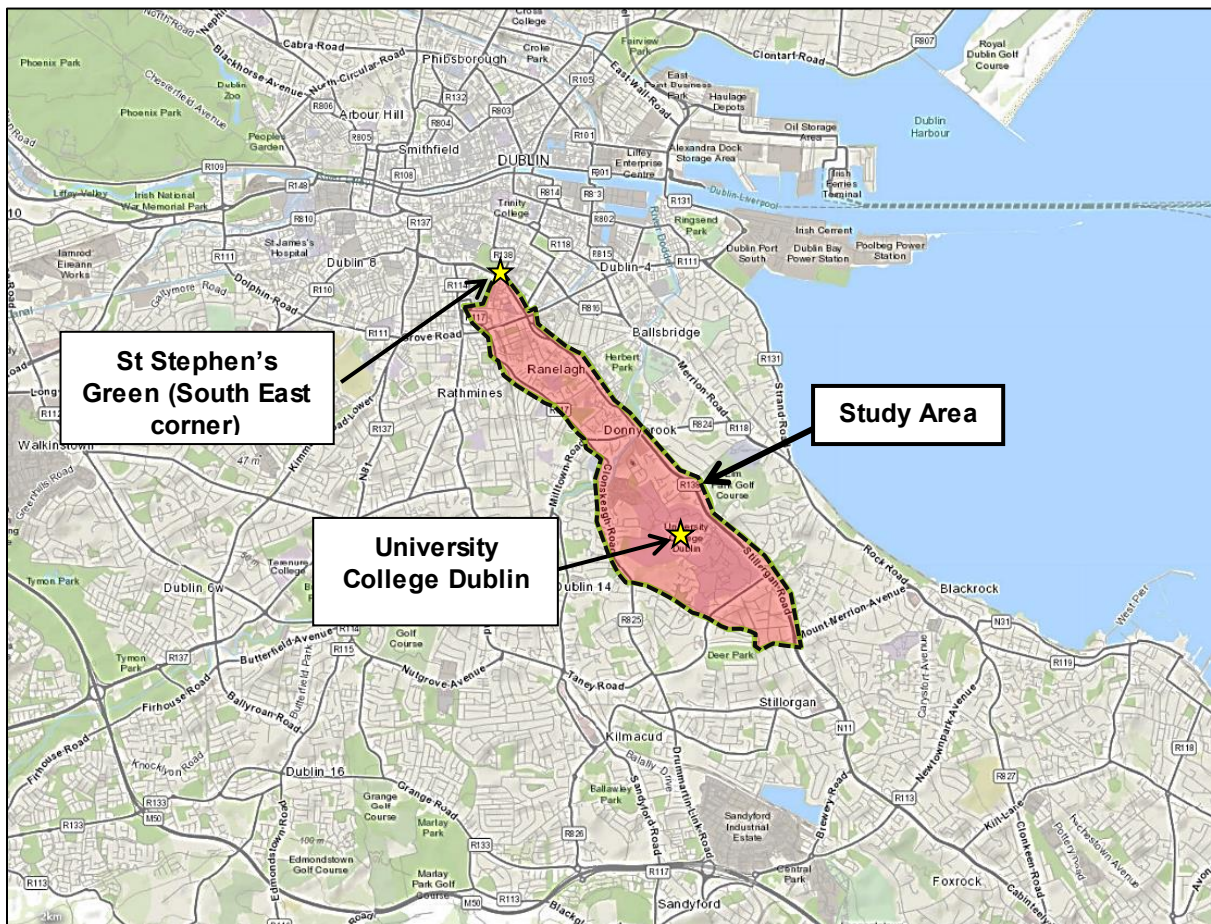


Figure 4.1: Study Area

4.3 Stage 1: Route Sections Assessment – Sifting Stage

4.3.1 “Spider’s Web”

An initial “spider’s web” of potential route sections that could possibly accommodate CBC service was identified for the Study Area.

This “spider’s web” of route sections was chosen with reference to the CBC characteristics and in order to meet the scheme objectives as set out in **Section 3.4** of this report.

Initial route sections identified also took cognisance of the physical constraints and opportunities present (**Section 3.1** of this report) and the ability to integrate with other public transport modes and routes (**Section 3.2** of this report).

Of particular relevance in developing the “spider’s web” was the potential for the road or route sections to facilitate fast and reliable journey times and thereby be able to practically accommodate CBC lane priority.

The resulting Study Area corridor “spider’s web” of route sections identified is presented in **Section 5** of this report.

4.3.2 Sifting Process

At the Stage 1, i.e. sifting stage, the initial “spider’s web” of route sections was narrowed down using a high level qualitative method based on professional judgement and a general appreciation for existing physical conditions / constraints within the Study Area from available survey information and site visits.

This exercise identified route sections that would either not achieve the scheme objectives or would be subject to significant cost and/or impact to achieve these objectives (e.g. excessive land-take).

4.4 Stage 2: Route Options Assessment – Detailed Assessment

Following completion of the Stage 1 assessment, the remaining potentially feasible route sections were progressed to Stage 2 of the assessment process.

This stage comprised a more detailed qualitative and quantitative assessment of scheme options identified along each potential route, using criteria established to compare scheme options.

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

After developing routes options, each was explored using different design concepts to identify the degree of facility provision and necessary infrastructure requirements. This process involved the development of typically two scheme options for each route within the Study Area.

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

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

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

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

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

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

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

Table 4.1: MCA criteria

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

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

4.4.1 Economy (Criterion 1)

4.4.1.1 Capital Cost (1.a.)

Capital cost estimates consist of both the indicative infrastructure cost estimate and land acquisition costs. This cost estimate was based on a range of per kilometre rates reflecting the extent of construction works required.

The following steps have been followed in order to derive cost estimates for each route option:

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

Criterion 1.a.i. Indicative Infrastructure Cost Estimate

1.a.i.i. Route Sections

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

Table 4.2: Construction Works for Corridor Sections

Construction Activity Level	Construction Works Assumption	€/km
Minor – Minor works locally	<ul style="list-style-type: none"> • Kerbs improvement locally (removal and replacement) • Footpaths improvement locally (breaking out/additional concrete) • Road resurfacing locally (milling/reinstatement or overlay) • Road markings (non-destructive removal of existing road markings, new road markings) • Signage (removal/relocation/replacement of existing and/or installation of new) 	€650,000
Moderate – Roadwaywidening (excluding private land acquisition)	<ul style="list-style-type: none"> • General site clearance (street furniture removal/relocation, etc.) • Safety barriers/guardrails (removal and new) • Services protection/relocation/diversion (power supply, communications) • Drainage works (removal of and installation of new drainage systems) • Limited earthworks • Pavement full depth reconstruction • Road markings (non-destructive removal of existing road markings, new road markings) • Kerbs footways and paved areas (removal and new) • Road lighting (relocation, cabling, ducting) • Signage (removal/relocation/replacement of existing and/or installation of new) • Street furniture removal/relocation • Landscaping works (top soiling, fence, trees relocation, hedges, road margins re-grading, etc.) 	€1,300,000

Construction Activity Level	Construction Works Assumption	€/km
Major – Roadway widening (including private land acquisition):	<ul style="list-style-type: none"> • General site clearance (street furniture removal/relocation, etc.) • Safety barriers/guardrails (removal and new) • Services protection/relocation/diversion (power supply, communications, water, gas) • Drainage works (removal of and installation of new drainage systems) • Earthworks (embankment treatments, retaining walls, slopes regrading, etc.) • Pavement full depth reconstruction • Kerbs footways and paved areas (removal and new) • Road markings (non-destructive removal of existing road markings, new road markings) • Signage (removal/relocation/replacement of existing and/or installation of new) • Road lighting (replacement, cabling, ducting) • Landscaping works (top soiling, fence, trees relocation, hedges, road margins, re-grading, etc.) • Property boundary reinstatement works (walls, gates, driveways landscaping etc.) 	€2,500,000

1.a.i.ii. Junctions

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

Table 4.3: Construction Works for Junctions

Construction Activity Level	Construction Works Assumption	€/junction
Minor – Modifications to existing signal controlled junctions to introduce bus priority (i.e. changing method of control, etc.), without significant alteration to their existing geometry and layout	<ul style="list-style-type: none"> • Road markings (non-destructive removal of existing road markings, new road markings) • Anti-skid surface • Signage (removal/relocation/replacement of existing and/or installation of new) • Dished kerbs and tactile paving • Guardrails/Bollards • Additional signal poles/heads • Additional traffic signals ducting, cabling and chambers • Modifications to the signal controller and associated traffic signal installation works (including electrical) • Additional loop detectors 	€70,000

Construction Activity Level	Construction Works Assumption	€/junction
Moderate – Upgrading existing minor/major junctions (including roundabouts) to signal control junctions, without significant alteration to their existing geometry and layout (excluding private land acquisition)	<ul style="list-style-type: none"> • Kerbs improvement locally (removal and new) • Footpaths improvement locally (breaking out and new) • Road markings (non-destructive removal of existing road markings, new road markings) • Signage (removal/relocation/replacement of existing and/or installation of new) • Anti-skid surface • Dished kerbs and tactile paving • Guardrails/Bollards • New signal poles/heads • New traffic signals ducting, cabling and chambers • New signal controller and associated traffic signal installation works (including electrical) • New loop detectors • Services protection/relocation/diversion (power supply, communications) • Limited earthworks • Pavement reconstruction • New road lighting (relocation, cabling, ducting) 	€230,000

Construction Activity Level	Construction Works Assumption	€/junction
Major – Significant modifications to existing signal controlled junctions (including private land acquisition)	<ul style="list-style-type: none"> • General site clearance (street furniture removal/relocation, etc.) • Safety barriers/guardrails (removal and new) • Services protection/relocation/diversion (power supply, communications, water, gas) • Drainage works (removal of and installation of new drainage systems) • Earthworks (embankment treatments, retaining walls, slopes re-grading, etc.) • Pavement full depth reconstruction • Kerbs footways and paved areas (removal and new) • Road markings (non-destructive removal of existing, new road markings) • Anti-skid surface • Signage (removal/relocation/replacement of existing and/or installation of new) • Dished kerbs and tactile paving • Guardrails/Bollards • Additional signal poles/heads • Additional traffic signals ducting, cabling and chambers • Modifications to the signal controller and installation works (including electrical) • Additional loop detectors • Road lighting (replacement, cabling, ducting) • Landscaping works (top soiling, fence, trees, hedges, margins re-grading, etc.) • Property boundary reinstatement works (walls, gates, driveways landscaping etc.) 	€1,000,000

1.a.i.iii. Bus Stops

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

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

Based on the above assumptions, outline costs for the bus stops were estimated to be €20,000/stop. These costs exclude VAT, professional fees and re-routing of services.

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

Criterion 1.a.ii. Land Acquisition Cost Estimate

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

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

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

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

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

The assessment considers the following.

Criterion 1.b.i. Journey Time

the extent to which journey time savings, and associated economic benefits, for public transport services, can be achieved on a route.

This would be practically achieved through the extent to which any or all of the following measures can be implemented;

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

Journey times for each route option have been calculated by comparing the time required by a bus to travel between common start and end points on each route.

The following assumptions have been made in calculating the comparative journey times along route options:

- Top operational speed (free-flow) of 50 kph in suburban areas and 30 kph in City Centre areas;
- Dwell time of 15 seconds per stop on average (assumes cashless fares i.e. Leap card. Assumes that on average, buses stop at every second stop i.e. 30 second delay at every second stop); and
- Delay of 15 seconds per junction on average (assumes buses stop at every second junction i.e. 30 second delay at every second junction)

These assumptions assume dedicated bus priority infrastructure or free-flowing traffic conditions along a route section by direction of travel.

Where the indicative scheme determined for a route suggests that this is not practically achievable, modified speeds and delay assumption are applied as appropriate.

These additional delays are estimated based on available queue length information, automatic vehicle location information from Dublin Bus and estimates of the impact of traffic management measures (such as queue relocation).

Criterion 1.b.ii. Number of Major Junctions

The number of major junctions / signalised crossings along each route have been compared.

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

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

While it is impossible to completely avoid major junctions on any route option, this risk of potential delay has been considered when comparing route options.

This feeds into the overall journey time calculations as indicated above.

Criterion 1.b.iii. Level of Bus Priority Provision

The level of bus priority achievable along route options has been considered and compared.

The level of priority is predominantly concerned with the degree to which road space can practically be allocated to buses, the amount of protection afforded to this priority, i.e. segregation, and the provision for buses at junctions such as bus lanes at the stop line.

This feeds into the overall journey time calculations as indicated above.

4.4.2 Integration (2)**4.4.2.1 Land-Use Integration (2.a.)**

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

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

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

This criterion compares the existing residential populations within 5, 10 and 15 minute walk catchments from bus stops and is representative of the number of potential bus users for a particular route option.

The assessment does not include future populations of zoned, but yet undeveloped residential development lands along route options.

The analysis involved extracting 2011 population statistics from the Central Statistics Office (CSO) 'small areas' dataset.

GeoDirectory was used to assist in calculating the proportional figures for the population within the specific contour bands for each of the routes.

This information was subsequently used to calculate the population living within the contours.

Criterion 2.b.ii. Employment Population Catchments

This criterion compares the existing employment populations within a 10 minute walk catchments.

The analysis involved extracting information from the 2011 POWSCAR (Place of Work, School or College - Census of Anonymised Records) data, which contains data on employment and school goers within specific areas.

The areas used for the analysis were taken from the NTA's multi-modal transport model of the Greater Dublin Area and correspond to the zones defined in the model.

These zones are effectively modified Central Statistics Office (CSO) boundaries.

GeoDirectory was used to assist in calculating the proportional figures for the employment units within the specific contour bands for each of the routes.

This information was subsequently used to calculate the number of people working within the contours.

As with the residential population catchments, the assessment does not quantitatively assess the future populations of zoned, but yet undeveloped commercial development lands along route options.

4.4.2.3 Transport Network Integration (2.c.)

This criterion identifies the extent to which route options would maximise wider public transport usage and reach in terms of facilitating efficient interchange between other transport routes and modes (e.g. other core / feeder bus routes, BRT routes, Luas, DART, suburban rail, future Metro).

Linked to this, is the availability of space at potential interchange locations for facilities such as cycle parking areas, covered interchange areas, safe walking areas to and from stops etc.

4.4.2.4 Cycle Network Integration (2.d.)

This criterion considers whether a route option forms part of the GDA Cycle Network Plan, with routes which overlap with designated Cycle Routes given a higher designation in terms of benefits arising where cycle infrastructure can be provided as part of the proposed scheme.

In some instances however it may be more appropriate to modify an existing or proposed cycle route as part of the GDA Cycle Network so that bus and cycle network objectives can both be achieved within the broader corridor area.

Consideration is also given to cycle routes intersecting with the bus route.

The quality of cycle provision practically achievable on route options has been assessed as this is considered to be a proxy for encouraging physical activity along the route.

For comparison purposes, the highest level of practical cycle provision achievable on each route has been determined and compared between route options.

4.4.2.5 Traffic Network Integration (2.e.)

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

This represents a high level assessment of the traffic impact of the route options considered in the Stage 2 MCA.

The anticipated traffic impact expected to be incurred by motorists using private vehicles as a result of the different route options will be assessed.

The disadvantages experienced by motorists in respect of reduced junction capacity and restricted movements will be considered.

4.4.3 Accessibility and Social Inclusion (3)

4.4.3.1 Key Trip Attractors (3.a.)

This assessment criterion identifies key trip attractors located within approximately 15 minute walk catchments which would generate significant demand for bus services but would not be otherwise picked up by either the employment or residential catchment analysis.

For the purposes of this assessment the following land-uses have been considered as key trip attractors:

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

4.4.3.2 Deprived Geographic Areas (3.b.)

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

4.4.4 Safety (4)

4.4.4.1 Road User Safety (4.a.)

Generally, the introduction of CBC will result in a reduction in road collisions due to people switching from private car to public transport. However, the reduction in collisions is unlikely to differ between various route options, particularly over the short sections being investigated as part of this assessment. Therefore, for the purposes of comparing route options, the number of junctions along the route has been used as a proxy for road safety.

The number of junctions is effectively a measure of the number of potential conflicts on the route and therefore a measure of the potential for a collision. The type of movement required by the bus at junctions on the route is also considered with routes where turning movements (either left or right) are required being assigned a lower ranking in terms of safety. Road User Safety also refers to cyclist and pedestrian safety such as segregated cycle facilities and safer pedestrian crossing facilities, in line with the National Cycle Manual and the Design Manual for Urban Roads and Streets.

4.4.5 Environmental (5)

The scope and methodology for the environmental assessment was established by considering what environmental aspects are likely to be impacted and are therefore of importance in evaluating the route options.

A list of the environmental topics considered is outlined in **Table 4.5** and **Table 4.5**.

Table 4.4: Environmental Aspects Considered – Aspects Scoped out of Environmental Assessment

Aspects Scoped out of Environmental Assessment	Rationale
Agronomy	Given the urban / suburban nature of the proposed scheme and the assumption that the CBC will run on predominantly existing road infrastructure, this aspect is not considered to be relevant to the assessment.
Hydrogeology	Hydrogeology is not considered to be a determining factor in the selection of the preferred route option. Also at this stage of the design process it is not possible to determine the quality, type or duration of these impacts, particularly as the location and type of structures e.g. underpasses, bridges etc. are unknown.
Property / Land Acquisition	This aspect has been considered separately as part of the Economy criterion in the overall MCA 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 MCA.

Table 4.5: Environmental Aspects Considered – Aspects Included in Environmental Assessment

Aspects Included in Environmental Assessment	Rationale
6.a./6.b. Archaeological, Architectural and Cultural Heritage	The provision of CBC infrastructure has the potential to impact on the archaeological, architectural and cultural heritage environment. At this stage of the assessment process, a conservative approach has been adopted in assessing the potential for impact and this is further described below.
6.c. Flora and Fauna	The provision of CBC infrastructure has the potential to impact on flora and fauna.
6.d. Soils and Geology	The provision of CBC infrastructure has the potential to impact on soil and geology as a result of land-take and possible ground excavation (including potential to encounter ground contamination).
6.e. Hydrology	The provision of CBC infrastructure has the potential to impact on surface water bodies as a result of land-take (with particular emphasis on floodplains and flood zones).
6.f. Landscape and Visual	The provision of CBC infrastructure has the potential to impact the townscape/streetscape along the CBC route.
6.g. Air Quality	The provision of CBC infrastructure has the potential to impact the air quality along the CBC route.
6.h. Noise & Vibration	The provision of CBC infrastructure has the potential to impact the noise environment along the CBC route.
6.i. Land Use Character	The provision of CBC infrastructure has the potential to impact on land use character through land-take, severance or reduction of viability which prevents or reduces it from being used for its intended use.

When preparing an Environmental Impact Assessment Report (EIAR) for the preferred route and scheme design, if necessary, the environmental topics that have been scoped out (and others that are not considered relevant for the route options assessment), will have to be reviewed and incorporated into the EIAR as appropriate.

4.4.5.1 Archaeological, Architectural and Cultural Heritage

As discussed above, 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 scheme option, 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 scheme option are also included within the scope of this assessment.

During the detailed design of the proposed scheme, the aim will be to avoid known constraints and/or minimise the number of constraints which may be directly or indirectly impacted by the proposed scheme.

Appropriate mitigation for construction will be included which will seek, where practicable, to ensure preservation in situ of archaeological remains and the avoidance of impacts on archaeological and cultural heritage constraints. A similar approach has been adopted in relation to the route options assessment for architectural heritage.

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

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

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

Within the City Centre, the selection of a viable route options will involve the running of the CBC service in the vicinity of numerous Protected Structures irrespective of which route section is preferred (archaeological, architectural and cultural heritage is only one of the criteria being considered as part of the MCA analysis).

The detailed design of the proposed scheme will seek to avoid and minimise impacts on architectural heritage.

4.4.6 Scheme Options Summary Table

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

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

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

For illustrative purposes, this five point scale is colour coded as presented in Table 4.6 with advantageous routes graded to 'dark green' and disadvantaged routes graded to 'dark red'.

Table 4.6: Scheme 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 compared to other options
	Significant disadvantages compared to other options

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

A qualitative appraisal of, and conclusions from, the route options assessment is then provided, highlighting the key issues considered in determining recommended scheme options ('preferred' and in some instances, where applicable, 'next preferred').

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 scheme options are then collated to provide the emerging preferred end-to-end scheme option.

4.4.7 Conclusion

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

5. Stage 1: Route Sections Assessment

5.1 Introduction

As outlined in **Section 4** of the report, the Study Area is generally bounded to the north by St. Stephen's Green (South East corner) and to the south by Booterstown and Goatstown.

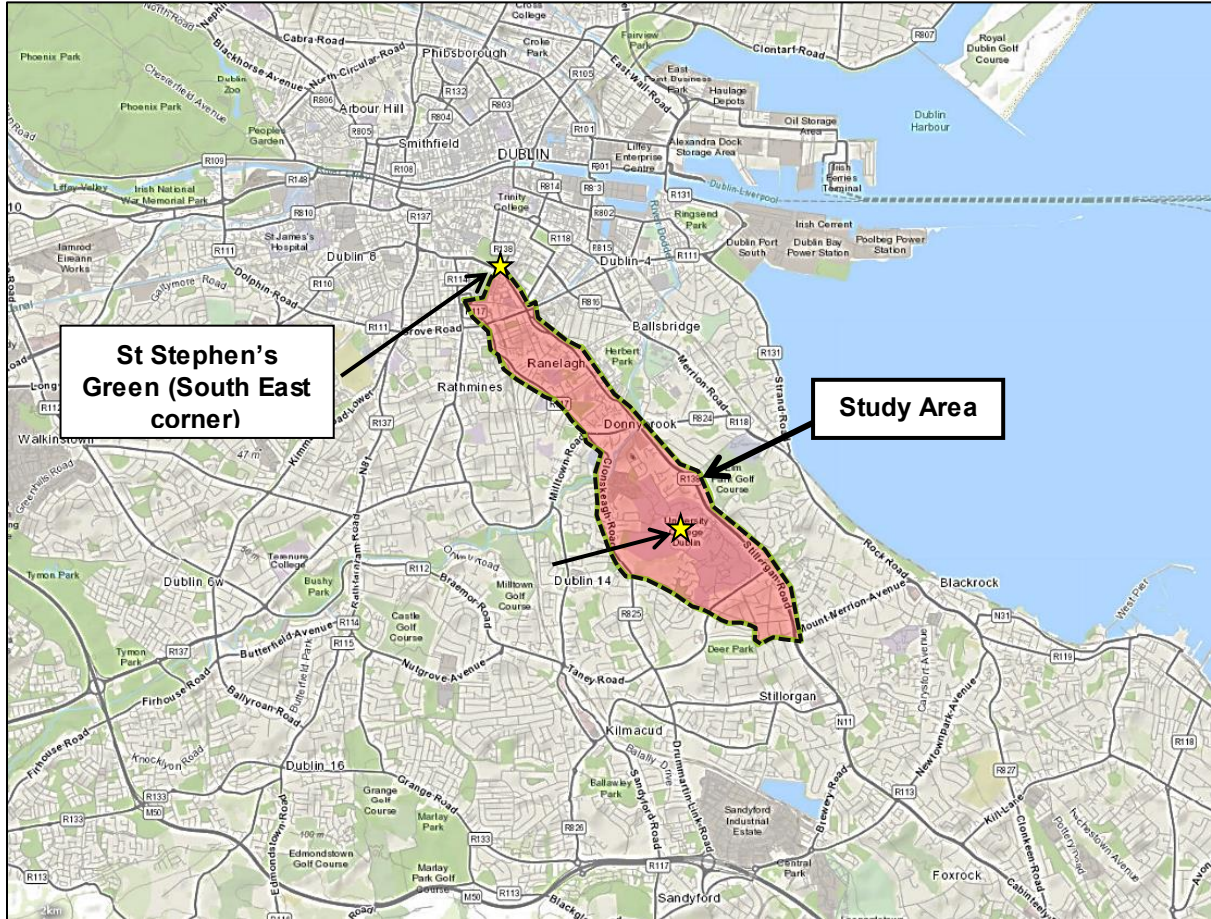


Figure 5.1: Study Area

5.2 UCD to St. Stephen's Green

There are a number of route sections which have been considered.

The roads available for CBC routing have been subdivided into shorter sections for the purposes of the Stage 1 route sections sifting process.

Following the route sifting process, remaining routes sections have been combined to form longer route options where possible.

Figure 5.2 presents the initial potential route sections identified.

A summary of the Stage 1 route sections sifting process is presented in **Table 5.1**.

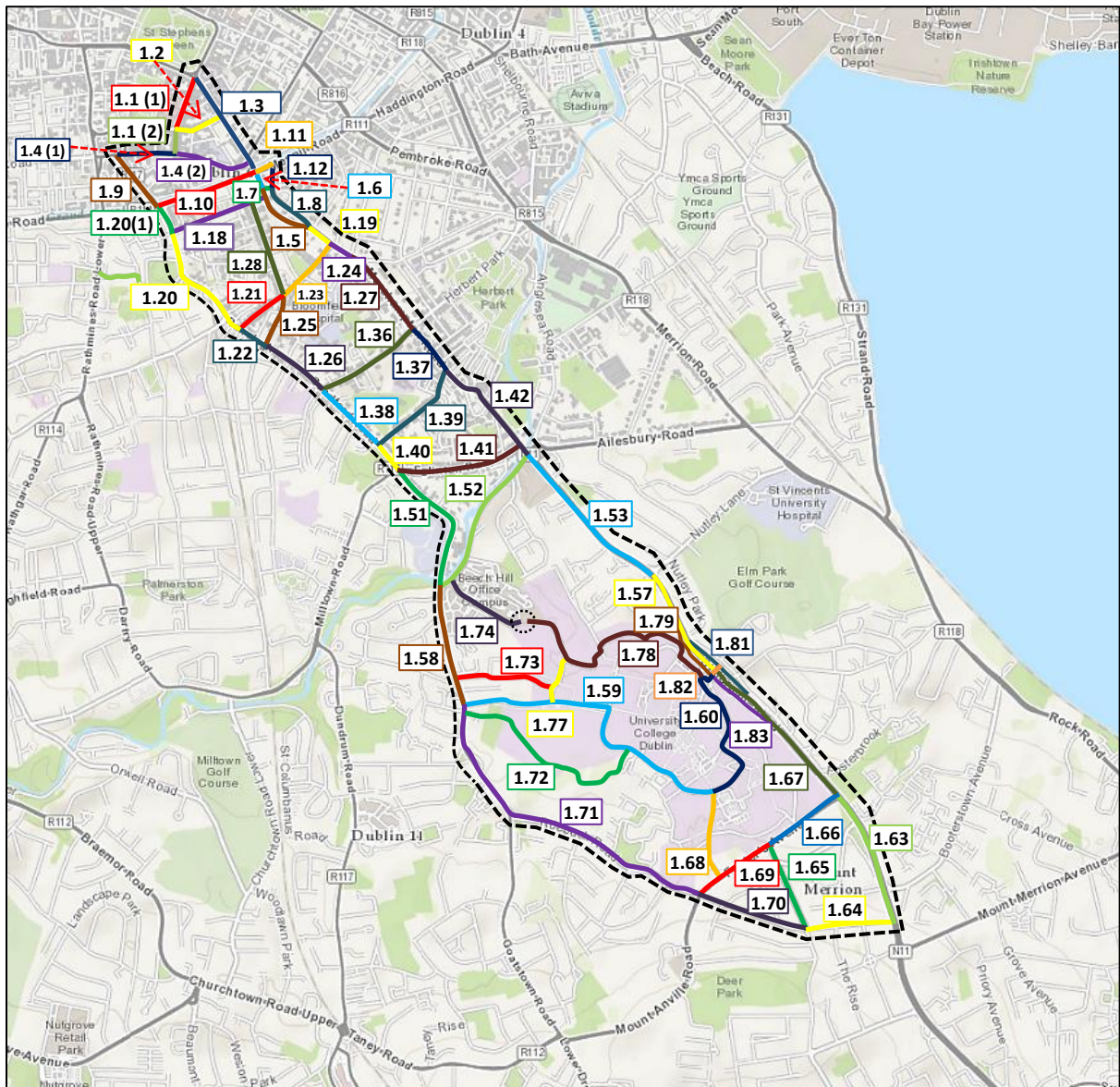


Figure 5.2: Route Sections – UCD to St. Stephen's Green

Table 5.1: Route Sections Sifting (Stage 1) Summary

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.1(1)	Earlsfort Terrace from St. Stephen's Green to Hatch Street (1.2)	Urban – Standard carriageway width. Wide footpaths and cyclist facilities on both sides of carriageway. Existing bus route in one direction. Existing on-street parking. Section bound on one side by Georgain Conservation Area.	Route has been identified as a Secondary route on the proposed GDA Cycle Network. There is sufficient width to accommodate full bus and cycle facilities. As a result this is a viable route.	Pass
1.1(2)	Earlsfort Terrace from Hatch Street (1.2) to Adelaide Road (1.4)	Urban – One-way wide carriageway width. Wide footpaths. Existing on-street parking. Section partially bound on one side by Georgain Conservation Area.	Route is not linked to the proposed GDA Cycle Network. There is sufficient width to accommodate full bus facilities. As a result this is a viable route.	Pass
1.2	Hatch Street Lower from Earlsfort Terrace (1.1) to Leeson St Lower (1.3)	Urban – two way standard carriageway width. Existing on-street parking on both sides. Section bound on both sides by Georgain Conservation Area.	Route is not linked to the proposed GDA Cycle Network. There is sufficient width to accommodate full bus facilities. As a result this is a viable route	Pass
1.3	Leeson street Lower from St. Stephen's Green to Grand Canal Bridge (1.6)	Urban – Wide carriageway width. Wide footpaths and cyclist facilities on both sides of carriageway. Existing bus route.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Existing carriageway width sufficient to accommodate full bus and cycle facilities. Existing link from City Centre to UCD As a result this is a viable route.	Pass
1.4(1)	Adelaide Road (Harcourt Road) from Charlemont Street to Earlsfort Terrace (1.1)	Urban – One-way, two lane standard carriageway width. Two-way LUAS tracks. Wide footpaths. Section partially bound on both sides by Georgain Conservation Area and Residential Conservation Areas.	Route has been identified as a Secondary route on the proposed GDA Cycle Network. There is insufficient width for bus and cycle facilities within the available road space. This is also a significant traffic route and oneway system. As a result this is not a viable route.	Fail
1.4(2)	Adelaide Road from Earlsfort Terrace (1.1) to Leeson Street Lower (1.3)	Urban – Wide carriageway width. Wide footpath. On-street parking provided on both sides. Tree lined carriageway. Section partially bound on both sides by Georgain Conservation Area and Residential Conservation Areas.	Route has been identified as a Secondary route on the proposed GDA Cycle Network. A number of pinch point along the section prevent full provision for bus and cycle facilities. In addition, the area is zoned as Georgian Conservation Area and Residential Conservation Area which provides further limitations on the extent of carriageway widening due to potential impact upon the heritage streetscape and features. As a result this is not a viable route	Fail

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.5	Leeson Street Upper from the northern Junction of Sussex Road (1.7) to the southern Junction of Sussex Road (1.19)	Urban – Standard carriageway width. Wide footpaths and on-street parking provided on both sides of carriageway. Semi-Mature trees on each side of carriageway. Existing bus route. On street parking provided along northern carriageway.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Existing carriageway width sufficient to accommodate one way bus and cyclist facilities (to match existing one-way system). Link can be established from City Centre to UCD As a result this is a viable route.	Pass
1.6	Leeson street Upper from Grand Canal Bridge to Sussex Road Junction (1.7/1.8)	Urban – Wide carriageway width. Wide footpaths and cyclist facilities on both sides of carriageway. Existing bus route.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Existing carriageway width sufficient to accommodate full bus and cycle facilities. Existing link from City Centre to UCD. As a result this is a viable route.	Pass
1.7/1.8	Sussex Road from Sussex Terrace (1.12) to Leeson Street Upper (1.19)	Urban – Standard carriageway width. Footpaths provided on both sides of carriageway. Cyclist facilities and bus lane on northern carriageway. Semi mature trees on both sides of section.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Existing carriageway width sufficient to accommodate one way CBC width (to match existing one-way system). Existing link from City Centre to UCD As a result this is a viable route.	Pass
1.9	Charlemont Street from Grande Parade (1.10) to Adelaide Road (Harcourt Road) (1.4)	Urban – Wide carriageway. Footpaths and cyclist facilities on both sides of section. Existing bus route. On-street parking.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Provision of CBC would improve reliability and bus journey times and enhance the existing public transport network along the route. Provision of full bus and cycle facilities would require widening along the section which would necessitate some land take. While landtake is required, a link may be established along this route linking Dublin City Centre and UCD. As a result this is a viable route.	Pass
1.10	Grand Parade from Ranelagh Road Junction (1.20[1]) to Leeson Street Upper Junction (1.6)	Urban – Standard Carriageway width. Wide footpaths both sides of carriageway. On road cycle facilities both sides of carriageway. Pinch point underneath bridge adjacent to Charlemont Luas station.	Route has been identified as a secondary route on the proposed GDA Cycle Network Plan. Limited scope to widen carriageway to provide full bus and cycle facilities due to pinch point identified under Luas line bridge and proximity of the Grand Canal to the north and buildings zoned in a Residential Conservation Area to the south. As a result this is not a viable route.	Fail

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.11	Mespil Road from Sussex Terrace (1.12) to Grand Parade Junction (1.3)	Urban – Standard carriageway width. Footpaths and cyclist facilities provided on both sides of carriageway. Semi mature trees on both sides of section. On street provided on both carriageways at various locations.	Route has been identified as a secondary route on the proposed GDA Cycle Network Plan. Limited scope to widen carriageway due to land zoned for Waterway Protection (The Grand Canal) along the north of the carriageway and Georgian Conservation Area and Residential Conservation Area along the south of the carriageway. As a result this is not a viable route.	Fail
1.12	Sussex Terrace from Mespil Road (1.11) to Sussex Road (1.7/1.8)	Urban – Wide carriageway width. Footpaths and on-street parking provided on both sides of carriageway. Trees along eastern side of section.	Route is not linked to the proposed GDA Cycle Network. Provision of full bus and cyclist design road width would require land take and removal of existing trees and on-street parking activity. As a result this is not a viable route.	Fail
1.18	Dartmouth Road/Dartmouth Square from Leeson Street Upper (1.5) to Ranelagh Road (1.20)	Urban – Standard carriageway width. Wide footpaths and on-street parking provided on both sides of carriageway. Mature trees on each side of carriageway. Not existing bus route.	Widening required, with limited scope to widen carriageway to provide full bus and cycle facilities due to proximity of buildings in several locations and also location of protected trees at Dartmouth Square. As a result this is not a viable route.	Fail
1.19	Leeson Street Upper from Burlington Road Junction to Appian Way (1.23)	Urban – wide carriageway width. Two traffic lanes on both northern and southern carriageways. Also bus lane on northern carriageway. On road cycle lane on southern carriageway. Tree lined section with footpaths on both sides. No on-street parking.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Some removal of trees may be required along this section. Link can be established from City Centre to UCD Existing carriageway width sufficient to accommodate full bus and cycle facilities. As a result this is a viable route.	Pass
1.20	Ranelagh Road from Dartmouth Road Junction (1.18) to Chelmsford Road Junction (1.21)	Urban – Standard carriageway width. On-road cyclist facilities on both carriageways for the majority of the section. Pinch points at several locations in Ranelagh village. Existing bus route. On-street parking throughout Ranelagh village.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Link to City centre and UCD may be determined. Full bus and cyclist facilities cannot be provided in Ranelagh village due to close proximity of buildings (forming pinch points) and road width beneath railway bridge. As a result this is not a viable route.	Fail

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.20(1)	Ranelagh Road from Dartmouth Road Junction (1.18) to Grand Parade (1.10)	Urban – Wide carriageway. Footpaths and Cyclist facilities on both sides of section. Mature trees in footpaths on both sides of carriageway. Some signage and street lighting. Residential accesses along section. Existing bus route.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Provision of CBC would improve reliability and bus journey times and enhance the existing public transport network along the route. Provision of full bus and cycle facilities would require widening along the section which would necessitate some land take. While landtake is required, a link may be established along this route linking Dublin City Centre and UCD As a result this is a viable route.	Pass
1.21	Chelmsford Road from Ranelagh Road (1.22) to Appian Way (1.23)	Urban – Narrow carriageway width. Due to pinch points, i.e. the close proximity of buildings along this section, bus and cyclist facilities cannot be provided.	Route has been identified as a secondary route on the proposed GDA Cycle Network. Limited scope to widen due to the close proximity of buildings and land take (negatively impacting private residential parking) in an area zoned Residential Conservation Area in the Dublin City Council Development Plan. As a result this is not a viable route.	Fail
1.22	Ranelagh Road from Chelmsford Road Junction (1.21) to Sallymount Avenue junction (1.25)	Urban - Narrow carriageway width. Pinch points at several locations in Ranelagh village. Existing bus route. On-street parking throughout Ranelagh village.	Route has been identified as a Primary route on the proposed GDA Cycle Network. Extensive land take required to provide bus and cyclist facilities. Bus and cyclist facilities cannot be provided at several locations due to pinch points. As a result this is not a viable route.	Fail
1.23	Appian Way from Leeson Street Upper (1.19) to Sallymount Avenue (1.25)	Urban - Narrow carriageway width. Existing bus route. On street parking at several locations along this section. Tree lined section with footpaths on both sides. No cyclist facilities.	Route has been identified as secondary route on the proposed GDA Cycle Network. Residential land take (negatively impacting private residential and commercial parking) required from a Residential Conservation Area to provide full bus and cyclist facilities. As a result this is not a viable route.	Fail
1.24	Leeson Street Upper from Appian Way (1.23) to Wellington Place (1.28)	Urban - Wide carriageway width. Two traffic lanes southern carriageway. Existing bus lane on northern carriageway. On road cycle lane on southern and northern carriageways Footpaths on both sides. No on-street parking.	Route has been identified as a Primary route on the proposed GDA National Cycle Plan Network. Existing link from Dublin City Centre to UCD Existing carriageway width sufficient to accommodate full bus and cycle facilities. As a result this is a viable route.	Pass

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.25	Sallymount Avenue from Ranelagh Road/Sandford Road (1.26) to Appian Way (1.23)	Suburban – Standard Carriagewaywidth. On street parking provided at several locations along this section. No cycle facilities. Due to pinch points, i.e. the close proximity of buildings along this section e.g. between the Bank of Ireland and No.6 Sallymount Avenue, bus and cyclist facilities cannot be provided.	Route has been identified as secondaryroute on the proposed GDA Cycle Network. Limited scope to widen due to land take (negatively impacting private residential parking) in an area zoned Residential Conservation Area in the Dublin City Council Development Plan and close proximity of buildings to each other. As a result this is not a viable route.	Fail
1.26	Ranelagh Road/Sandford Road from Sallymount Avenue Junction (1.25) to Marlborough Road Junction (1.36)	Urban – Standard Carriagewaywidth. Cyclist facilities provided on both carriageways.	Route has been identified as a Primary route on the proposed GDA National Cycle Plan Network. Limited scope to widen due to close proximity of buildings (pinch points) at various locations along the route. As a result this is not a viable route.	Fail
1.27	Morehampton Road from Wellington Place Junction (1.28) to Marlborough Road Junction (1.36)	Suburban – Wide carriagewaywidth. Bus lanes and on-road cycle facilities provided on both carriageways along the majority of the section. Wide footpaths with mature trees lining both carriageways.	Route has been identified as a Primary route on the proposed GDA National Cycle Plan Network. Some removal of trees may be required although for the majority of the route the existing infrastructure would be sufficient to accommodate full bus and cycle facilities. Existing link from Dublin City Centre to UCD As a result this is a viable route.	Pass
1.28	Leeson Park from Dartmouth Road Junction (1.18) to Sallymount Avenue Junction (1.25)	Suburban – Wide carriageway. On-street parking. Footpaths on both sides. Lined with trees in sections (mature trees present). No cycle or bus facilities.	This route has been identified as a secondaryroute on the GDA Cycle Network. Widening required, with limited scope to widen carriagewayto provide full bus and cycle facilities due to proximity of properties zoned in a Residential Conservation Area and from the Embassies of India and Nigeria located at the southern end of the route. As a result this is not a viable route.	Fail
1.36	Marlborough Road from Herbert Park Junction (1.35) to Sandford Road (1.38)	Suburban – Narrow Carriagewaywidth. Traffic calming measures in place. Pinch point on approach to Sandford Road junction due to close proximity of residential buildings. On street parking on southern carriageway. No cyclist facilities. Not an existing bus route.	Route is not linked to the proposed GDA Cycle Network Plan. Provision of full bus and cycle facilities dependant on residential land take (negatively impacting private residential parking) in an area zoned as Residential Neighbourhood Conservation Area in the Dublin City Council Development Plan. Full facilities would not be provided throughout due to close proximity of buildings at the Sandford road junction (pinch point). As a result this is not a viable route.	Fail

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.37	Morehampton Road/Donnybrook Road from the Herbert Park Junction (1.35) to the Belmont Avenue Junction (1.39)	Urban – Wide carriageway width. Traffic Islands in place at junctions within the section. Existing Bus Route. On-road cyclist facilities provided on both carriageways for the entirety of the section. Inbound and outbound bus lanes provided along the majority of the section. Wide footpaths with street furniture at several locations. Mature trees at several locations.	Route has been identified as a Primary route on the proposed GDA National Cycle Plan Network. Direct link may be established from Dublin City Centre and UCD. Some removal of trees and street furniture, may be required. Full bus and cyclist facilities can be provided without any land take. As a result this is a viable route.	Pass
1.38	Sandford Road from Marlborough Road Junction (1.36) to Belmont Avenue Junction (1.39)	Suburban – Standard carriageway width. On-road cycle lanes in both directions. Existing bus route. Semi mature trees at several locations along the section.	Route has been identified as a Primary route on the proposed GDA National Cycle Plan Network. Provision of full bus and cyclist facilities dependant on land take (negatively impacting private residential and commercial parking) along the majority of section in an area of mixed zonal objectives (Residential Neighbourhood Conservation Area, Amenity/Open Space/Green Network, Sustainable residential Neighbourhood). Landtake from Residential Conservation Area would be required. As a result this is not a viable route.	Fail
1.39	Belmont Avenue from Sandford Road (1.38) to Donnybrook Road (1.42)	Suburban – Narrow carriageway width. Narrow access to St. Mary's N.S. leads onto Belmont Avenue. Traffic calming measures and pedestrian crossings at several locations. Pinch points at several locations. Not existing bus route.	Route is not linked to the proposed GDA National Cycle Network Plan. Narrow carriageway, with limited scope to widen due to pinch points at several locations (e.g. between Tesco's and residential buildings and Donnybrook Hall and residential buildings). Some on-street parking activity. As a result this is not a viable route.	Fail
1.40	Sandford Road from Sandford Road Junction (1.38) to Street James's Junction (1.51)	Suburban – Three lane carriageway, two lanes heading south and one north. On-road cycle lanes in both directions. Footpaths on both sides. Existing bus stop in the direction of south. No bus lanes.	Route has been identified as primary route on the GDA Cycle Network. Capacity to widen on the west side of route but would require land take from land zoned for community and institutional. Land on east zoned as Residential Conservation Area. As a result this is a viable route.	Pass
1.41	Eglinton Road from Street James's Terrace/Clonskeagh Road (1.51) to Donnybrook Road (1.42)	Suburban – On-road cycle lanes in both directions. On-street parking and footpaths on both sides. Mature trees line the whole route. No existing bus stops or lanes.	This route has been identified as a feeder route on the GDA Cycle Network. There is limited scope to widen along the majority of the route. Land take, (which would impact on private residential parking) in an area zoned as Residential Neighbourhood Conservation Area in the Dublin City Council Development Plan, would be required order to provide full bus and cycle facilities. As a result this is not a viable route.	Fail

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.42	Donnybrook Road from Stillorgan Road Junction (1.53) to Morehampton Road Junction (1.37)	Suburban – Existing bus stops in both directions. Dedicated bus lane heading north. Off-road cycle lanes in both directions. Route passes through a district centre.	Route has been identified as primary route on the GDA Cycle Network. This route provides a direct link with the City Centre and UCD While there is a pinch point within this route section, an allowance has been made as it is a localised pinch point and a normal part of a village structure. Villages typically forming key catchment areas and arteries within an effective bus network. As a result this is a viable route.	Pass
1.51	Clonskeagh Road from Eglinton Junction (1.41) to Beech Hill Road junction (1.52)	Suburb – Standard carriageway. On-road cycle lanes. Footpaths on both sides. Bus stops in both directions. On-street parking. River Dodder to the southern end of route.	Route has been identified as a Primary route on the GDA Cycle Network. Widening required for the provision of bus and cycle facilities along the majority of this route. Land take required (private residential and commercial parking), with some landtake in area zoned as Residential Neighbourhood Conservation Area in the Dublin City Council Development Plan. In addition bridge widening required. As a result this is not a viable route.	Fail
1.52	Beech Hill Road/Beaver Row from Clonskeagh Road Junction (1.58) to Anglesea Road Junction (1.43)	Suburban - Standard carriageway. No footpaths in parts. No cycle lanes or bus facilities. Traffic calming measures in place. On-street parking. River Dodder runs along the west of road. Donnybrook bus depot located at Stillorgan Road junction. Central hatching in parts.	Southern half of route has been identified as a primary route on the GDA Cycle Network. Pinch points due to the river. No capacity to widen due to the adverse impacts that would occur to the River Dodder to the west and residential properties fronting onto the road to the east. As a result this is not a viable route.	Fail
1.53	Stillorgan Road from Donnybrook Road Junction (1.42) to Stillorgan Road Junction (1.57)	Suburban – Dual carriageway separated by a narrow grass verge lined with trees in parts. Three lanes in each direction. Dedicated bus lanes and stops in both directions. Off-road cycle lanes on both sides. Donnybrook bus depot is at the north west end of the route.	Route has been identified as a primary route on the GDA Cycle Network. Full bus and cyclist facilities can be provided without any land take. Direct link from City Centre to UCD. As a result this is a viable route.	Pass
1.57	Stillorgan Road from Nutley Lane Junction (1.54) to Woodbine Road/Trimleston Avenue Junction	Suburban – Seven lane carriageway. Four lanes heading north, three lanes heading south, with an existing bus lane and stops in both directions. Separated by a grass verge in the centre. On-road cycle lane heading south while north there is a slightly raised off-road cycle lane. Footpaths on both sides.	Route has been identified as a primary route on the GDA Cycle Network. This route provides a direct link with the City Centre and UCD Bus and cycle facilities are already present along the route. No widening or land take is required to provide full bus and cyclist facilities. As a result this is a viable route.	Pass

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.58	Clonskeagh Road from Beech Hill Road Junction (1.52) to Wynnsward Drive Junction (1.59)	Suburban – Standard carriageway. Footpath, cycle lanes and bus stops provided on both sides. Grass verges (wide in sections) along parts of route.	Route has been identified as a primary route on the GDA Cycle Network. There is scope to widen along the majority of the route. Minimal land take (minimal impact on private residential parking) would be required in some locations in order to provide full bus and cycle facilities. Capacity to widen in land zoned "to provide for economic development and employment". As result, this is a viable route.	Pass
1.59	Wynnsward Drive from Clonskeagh Road Junction (1.58) to Owenstown Park Junction (1.68)	Suburban – Route goes through UCD Campus. Existing bus route but no bus stops. Standard carriageway no cycle lanes. Footpaths along a majority of the route. Wide grass verge along majority of route.	The west section until the first roundabout has been identified as a primary route on the GDA Cycle Network. There is scope to widen along the majority of the route although this would require land take from the grounds of UCD Land take would be justifiable under the land zoning objective as outlined in the DLR Development Plan 2016-2022 i.e. "to facilitate and enhance the development of third level education institutions." As a result this is a viable route.	Pass
1.60	UCD Main Entrance from Stillorgan Road Junction (1.82) to Wynnsward Drive (1.59)	Suburban – Main entrance to UCD Campus. Standard carriageway. No cycle lanes. Footpaths on both sides. Existing bus lay-by. Bus & Coach Terminal providing a possible interchange.	Small section of the main entrance into UCD has been identified as a primary route on the GDA Cycle Network. There is scope to widen along the majority of the route although this would require land take from the grounds of UCD Land take would be justifiable under the land zoning objective as outlined in the DLR Development Plan 2016-2022 i.e. "to facilitate and enhance the development of third level education institutions." As a result this is a viable route.	Pass
1.63	Stillorgan Road from Greenfield Road (1.64) to Stillorgan Road Junction (1.67)	Suburban – Six lane carriageway. Three lanes in each direction separated by a grass verge down the middle. Dedicated bus lane in each direction. Existing bus stops. Off-road cycle lanes and footpaths on both sides.	Route has been identified as a primary route on the GDA Cycle Network. This route provides a direct link with the City Centre and UCD Existing bus and cycle facilities mean that widening is not needed. As a result this is a viable route.	Pass
1.64	Greenfield Road from Stillorgan Road (1.63) to Callary Road (1.70)	Suburban – Wide local access road. No road markings. On-street parking and footpaths on both sides.	Route has not been identified on the GDA Cycle Network. A link would have to be created where Greenfield Road meets Stillorgan Road to make this a viable option. Narrow existing carriageway, requiring significant landtake. Landtake would impact upon private residential parking; as a result this is not a viable route section.	Fail

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.65	North Avenue from Foster's Avenue Junction (1.69) to Greenfield Road Junction (1.64)	Suburban – Wide single carriageway separated by a grass verge lined with trees. On-street parking. Footpaths on both sides separated by a wide grass verge. Existing bus stops. No cycle lanes.	Route has been identified as a feeder route on the GDA Cycle Network. Wide carriageway, with tree lined median. Full bus and cyclist facilities can be provided with some land take. Land take would maintain private parking provision, but remove on-street parking. As a result this is a viable route.	Pass
1.66	Foster's Avenue from Stillorgan Road Junction (1.63) to North Avenue Junction (1.65)	Suburban – Standard width carriageway. Two lanes that converge to three. Footpaths on both sides. UCD campus to the north of route. Grass verges on one side with a number of mature trees. Central hatching at west end of route. Existing bus stops. No cycle lanes. Scope for widening.	Route has been identified as a primary route on the GDA Cycle Network. Full bus and cyclist facilities can be provided without any land take. Direct link from City Centre to UCD. As a result this is a viable route.	Pass
1.67	Stillorgan Road from Woodbine Road/Trimleston Avenue to Foster's Avenue (1.66)	Suburban - Carriageway with three lanes in each direction. Dedicated bus lane in each direction. Existing bus stops. Off-road cycle tracks on both sides.	Route has been identified as a primary route on the GDA Cycle Network. This route provides a direct link from the City Centre to UCD Full bus and cyclist facilities can be provided without any land take. As a result this is a viable route.	Pass
1.68	Owenstown Park from Wynnsward Drive (1.59) to Foster's Avenue (1.69)	Suburban – Standard carriageway. Footpaths on both sides. No bus or cycle facilities. On-street parking. Traffic calming measures in place. Provides a connection to the route that passes through the UCD campus.	Route is not linked to the GDA Cycle Network. Residential properties are within close proximity to the carriageway. Limited capacity as widening would require land take at this part. Narrow existing carriageway, requiring significant landtake. Landtake would impact upon private residential parking; as a result this is not a viable route section.	Fail
1.69	Foster's Avenue from Roebuck Road Junction (1.71) to North Avenue Junction (1.65)	Suburban – Standard width carriageway. Footpaths on both sides. UCD campus to the north of route. Grass verges on both sides with a number of semi-mature trees. Central hatching at west end of route. Existing bus stops. No cycle lanes. Scope for widening. Existing bus stops.	Route has been identified as a primary route on the GDA Cycle Network. Minimal land take (minimal impact on private residential parking) would be required in some locations in order to provide full bus and cycle facilities. May provide link from City Centre to UCD. As a result this is a viable route.	Pass
1.70	Callary Road from Foster's Avenue Junction (1.69) to Greenfield Road (1.64)	Suburban – Standard carriageway, wide in parts. Traffic calming measures in place. Footpaths and narrow grass verges lined with trees on both sides. Residential estate. No cycle facilities.	Route has not been identified on the GDA Cycle Network. Narrow existing carriageway, requiring significant landtake. Landtake would impact upon private residential parking; as a result this is not a viable route section.	Fail

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.71	Roebuck Road/Clonskeagh Road from Wynnsward Drive (1.59) to Foster's Avenue (1.69)	Suburban – Existing bus stops. Community infrastructure located along the route; Mosque, St Kilian's German School a small local centre. Central hatching in parts. Off and on-road cycle facilities along whole route. Wide footpaths and verges in parts. Carriageway is lined with trees in sections.	Route has been identified as a secondary route until the Roebuck Road junction then it becomes a primary route on the GDA Cycle Network. Narrow carriageway, with widening requiring land take. Pinch point formed by building facades. As a result this is not a viable route.	Fail
1.72	Roebuck Road from Clonskeagh Road (1.71) to Wynnsward Drive (1.59)	Suburban/UCD Campus – Very narrow carriageway adequate width for a single vehicle. Route is used for grounds keeping and access to a car park at the eastern end. No existing bus or cycle facilities. Footpath in parts. Tree lined route.	This route is not linked to the GDA Cycle Network. Very narrow carriageway. Widening would require the removal of trees and land take from playing pitches and at the west end would require land take from residential property and widening at the entrance through residential area. As a result this is not a viable route.	Fail
1.73	UCD Clonskeagh Entrance from Clonskeagh Road Junction (1.58) to UCD Local (1.77)	Suburban/UCD Campus – Standard carriageway used for access to the UCD educational facilities. Traffic calming measures in place. Tree lined on both sides in parts. Route passes through a car park at the eastern end. Footpath in parts. No existing bus or cycle facilities.	The route has not been identified on the GDA Cycle Network. Widening would require land take at the western end. Land take would be needed from Longwood Apartments. This part of the route becomes a pinch point due to the large UCD building. Limited scope to provide two-way bus and cycle facilities. As a result this is not a viable route.	Fail
1.74	Beech Hill Road from Beech Hill Road/Beaver Row (1.52) to UCD Campus	UCD Campus/Beech Hill Office Campus – Standard carriageway. Off-road cycle lanes for half of the route. Traffic calming measures in place. On-street parking. Pedestrian crossing. No bus facilities.	This route is not linked to the GDA Cycle Network Plan. Limited capacity to widen on both sides as this would require land take from the car parks located on both sides of the carriageway. A link would need to be created to connect with the UCD Campus at the eastern end of the route. As a result this is not a viable route.	Fail
1.77	UCD Local from UCD Campus Buildings (1.78) to Wynnsward Drive (1.59)	UCD Campus – Standard carriageway. No bus or cycle facilities. Footpath on one side. Traffic calming measures in place. Narrow grass verge on the west side. Verge with trees on the east side. Footpath only on the west side. Sports pitches on both sides of carriageway at the northern end. Wide grass verge towards the southern end. Existing bus stop. No cycle facilities. No bus lanes.	This route has not been identified on the GDA Cycle Network Plan for the GDA. This route would require the creation of a link to UCD Campus (1.78) in order to make this a viable option. There is limited scope to widen, due to proximity of 5-a side pitches and hockey pitches. As a result this is not a viable route.	Fail

Section No.	Description	Area Characteristics	Summary	Pass/Fail
1.78	UCD Campus (North Side) from UCD Main Entrance (1.60)	UCD Campus – Narrow carriageway. Restricted access at eastern end of the route. Traffic calming measures in place. Access for permitted vehicles and maintenance only.	This route has not been identified on the GDA Cycle Network Plan. This route would have to be widened considerably. Pinch points in areas due to the proximity of buildings. This route would also require a connection to be formed at the very western end to Beech Hill Road (1.74). As a result this is not a viable route.	Fail
1.79	Stillorgan Slip Road (towards City Centre) to Stillorgan Road (1.57) to UCD Main Entrance (1.60)	Suburban – One-way carriageway Existing bus stop and dedicated bus lane. Off-road cycle lane. Footpath only on the west side of the route.	This route has been identified as a primary route on the GDA Cycle Network. Land take would not be required as the necessary bus and cycle facilities are already in place. This route provides a direct link from UCD to Dublin City Centre. As a result this is a viable route.	Pass
1.81	Stillorgan Slip Road (towards UCD) from Stillorgan Road (1.57) to Stillorgan Road	Suburban – Standard carriageway, one-way system heading east. Route provides access from Stillorgan Road to UCD and to merge back to Stillorgan Road. Off-road cycle lane. Existing bus stop and bus lane. Tree lined route. Wide grass verge on both sides. Footpath only on the north side of the route.	This route has not been identified on the GDA Cycle Network Plan. Full bus and cyclist facilities can be provided within the existing carriageway. This route provides a link from Dublin City Centre to UCD. As a result this is a viable route.	Pass
1.82	UCD Overpass from Stillorgan Slip Road (1.81) to UCD Main Entrance (1.60)	Suburban – Dual carriageway. Divided by a narrow island. Two lanes in both directions. On-road cycle lanes. Footpaths on both sides. No bus stops or lanes.	This route has been identified as a Primary route on the GDA Cycle Network Plan. Full bus and cyclist facilities can be provided within the existing carriageway. This route Provides direct access to the UCD Main Entrance and also a link to Dublin City Centre. As a result this is a viable route	Pass
1.83	Stillorgan Slip Road (towards City Centre) to Stillorgan Road (1.57) to UCD Main Entrance (1.60)	Suburban – One-way carriageway. Existing bus lane. Off-road cycle lane. Footpath only on the west side of the route. Route provides access to UCD Main Entrance.	This route has not been identified on the GDA Cycle Network Plan. Provision of full bus and cyclist facilities would depend on widening of existing carriageway although this would not require any third party land take. As a result this is a viable route.	Pass

Following the Stage 1 sift, 34 of the 57 route sections assessed passed the initial sifting stage and were progressed to the next assessment stage.

These route sections are presented in **Figure 5.3**.

Passing route sections are shown in green and those which failed the Stage 1 sift are shown in red.

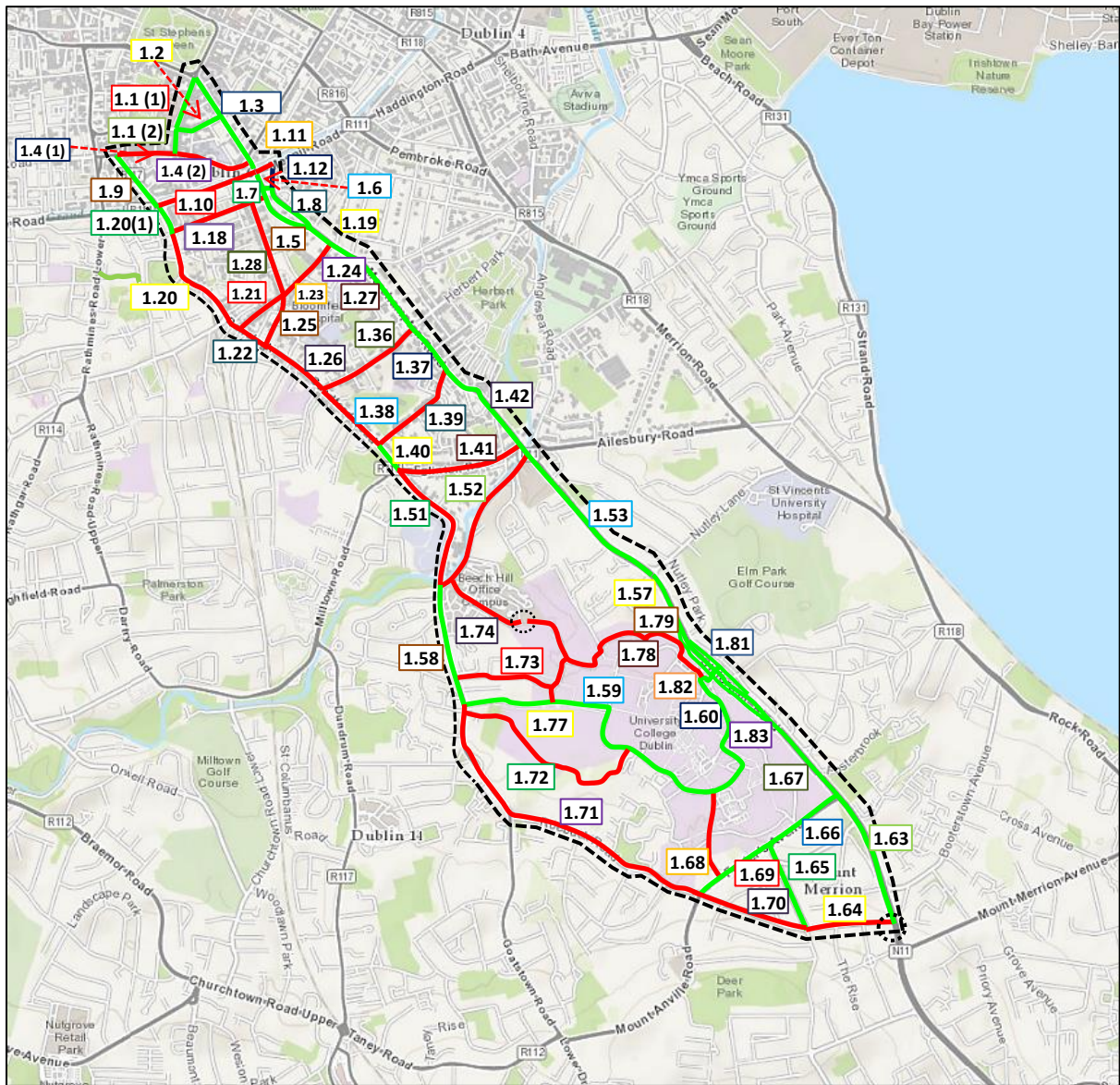


Figure 5.3: Route Sections passing Stage 1 Sift

6. Stage 2: Scheme Options Assessment

6.1 Introduction

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

6.2 UCD to Grand Canal

6.2.1 Route Description

Following the Stage 1 sift, the remaining 34 route sections were combined to form one cohesive route option (Route 1) as shown in

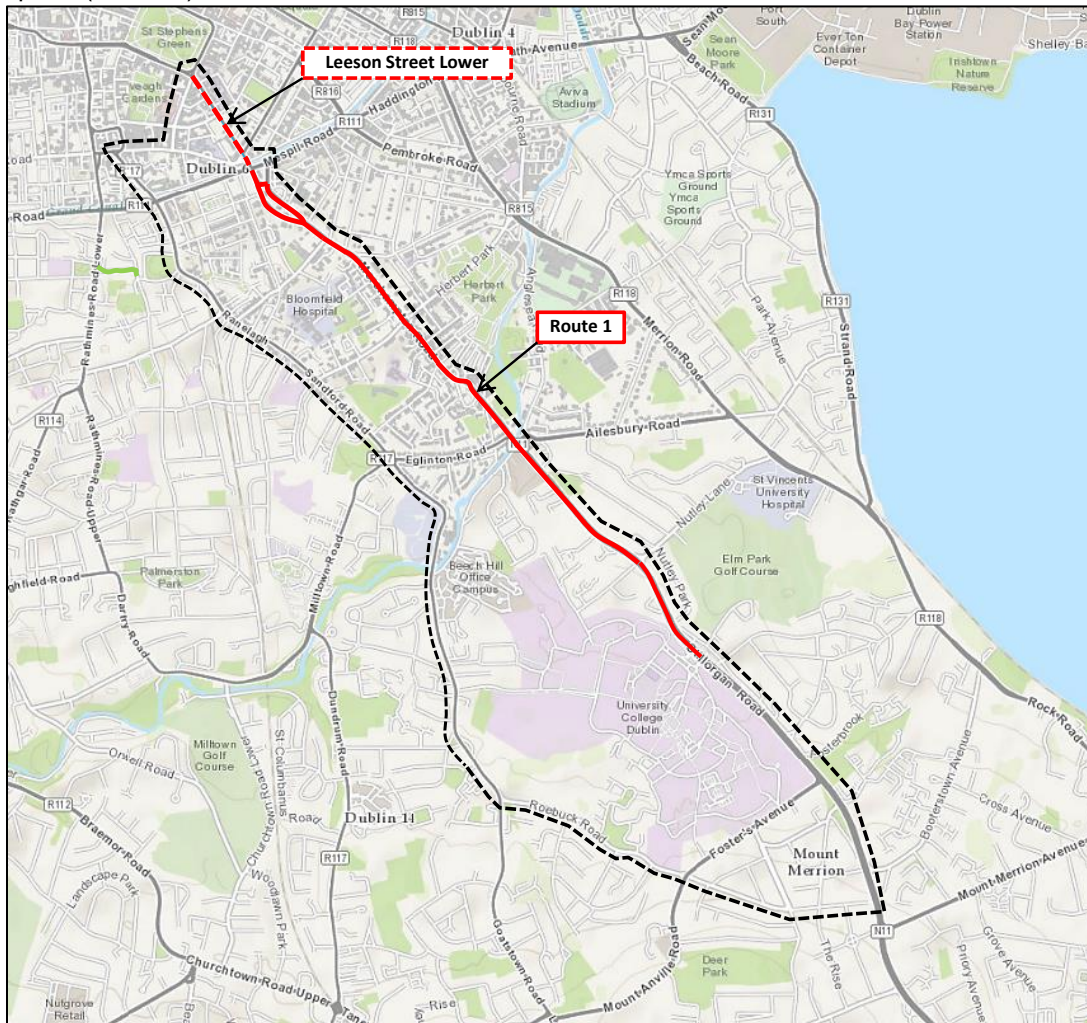


Figure 6.1 below.

Only a single reasonably direct route can be established between the Grand Canal and St. Stephen's Green, i.e. along Leeson Street Lower. After examining the local road network and taking cognisance of proposals to implement bus corridors along Dun laoghaire and Rathfarnham that originate from Stephen's Green (i.e. via Leeson Street Lower), it was decided not to include Leeson Street Lower in the route options development for the UCD to City Centre corridor.

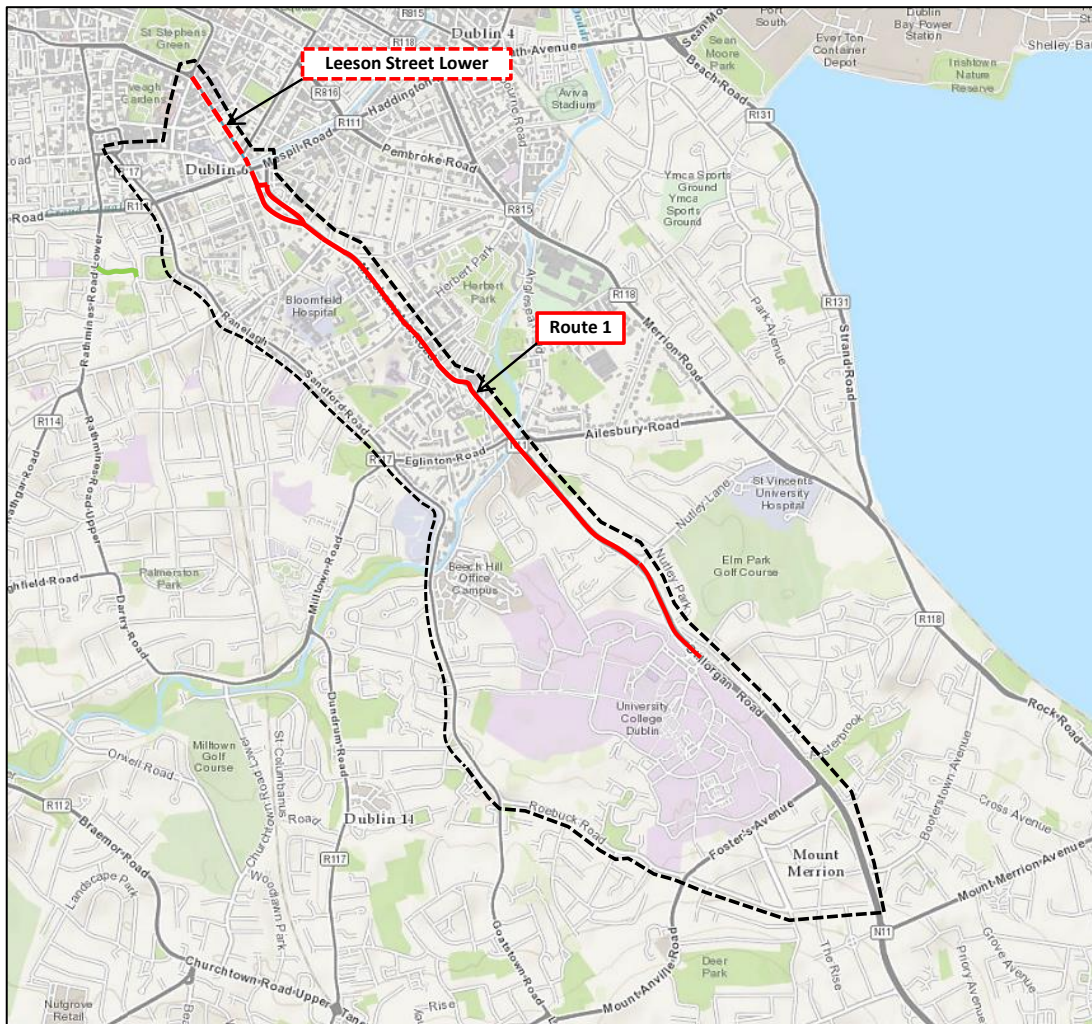


Figure 6.1: Route Options

6.2.1.1 Inbound and Outbound

Route 1 would connect UCD to Grand Canal via Donnybrook Road, Morehampton Road, Leeson Street Upper and Sussex Road.

The route is approximately 3.5km in each direction.

6.2.1.2 Stops

10 bus stops would be provided in each direction along this route – see Figure 6.2.

Bus stop locations closely align with the existing bus stops along the route and where appropriate, have been reconfigured to facilitate the route geometry.

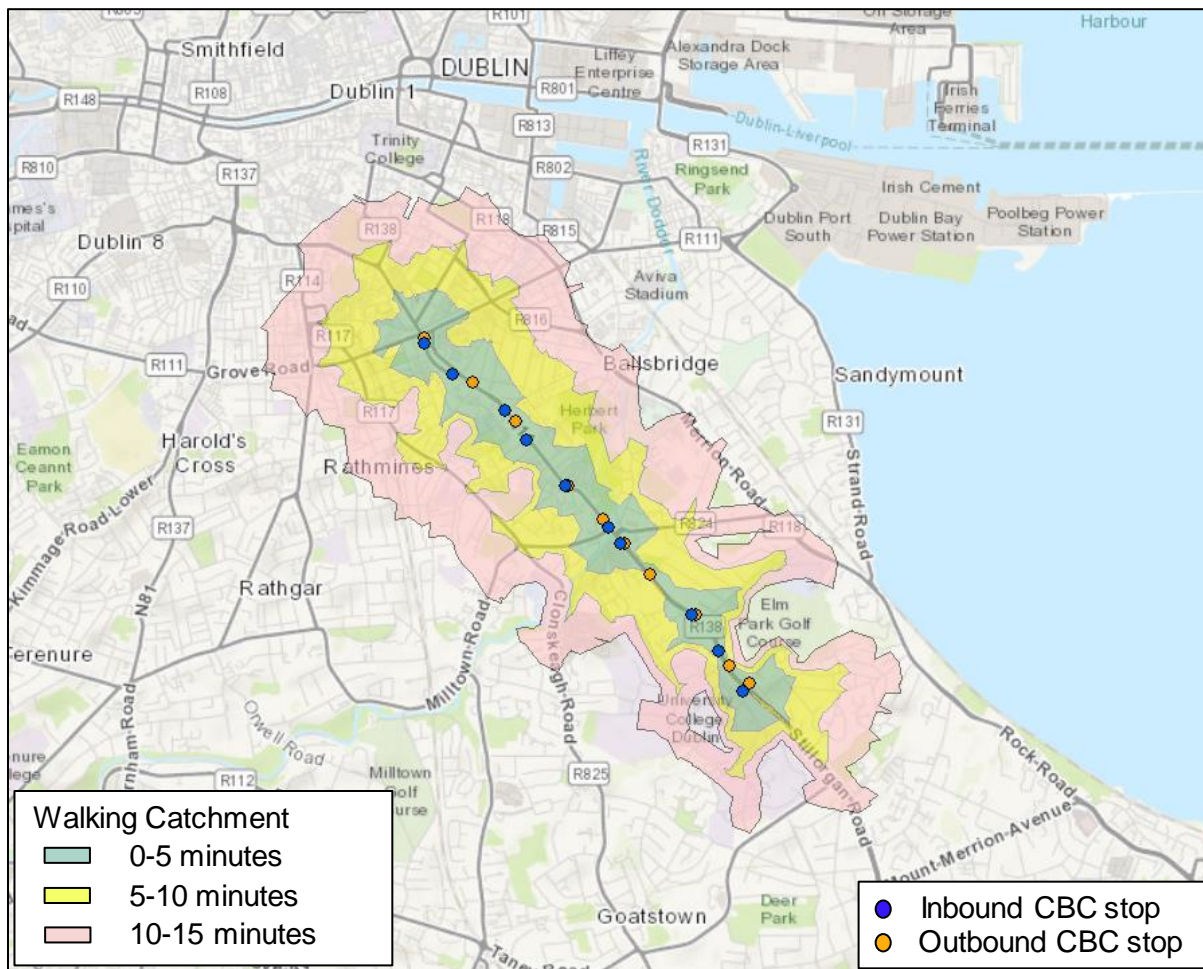


Figure 6.2: Walking distance catchment zones for Route 1A bus stops

6.2.2 Catchment

Figure 6.2 illustrates the population residing within the 5, 10 and 15 minute catchment zones of the existing and proposed bus stops along Route 1.

The outermost isochrone contour defines the perimeter within which the Route 1 nearest bus stop can be reached by pedestrians in 15 minutes or less at a typical walking pace.

The population residing within each of the isochrone contour areas is summarised below (to the nearest 1,000 residents):

- 5 minutes walking distance – 6,000 residents
- 5-10 minutes walking distance – 10,000 residents
- 10-15 minutes walking distance – 20,000 residents
- Total catchment within 15 minutes walking distance – 36,000 residents

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

6.2.2.1 Junctions

There are a total of 11 signalised junctions and 2 pedestrian crossings along Route 1 in each direction.

Though there are existing bus facilities both inbound and outbound along the majority of the Route 1 from the UCD to Grand Canal, ITS measures may be required to deliver the level of bus priority required for additional bus services.

6.2.2.2 Constraints

The following constraints would need to be considered if Route 1 is progressed:

- The presence of numerous entrances to existing residential properties and commercial establishments along the route option;
- The replacement of parallel parking along Leeson Street Upper, Sussex Road, Morehampton Road and Donnybrook Road;
- The presence of trees along Leeson Street Upper, Sussex Road, Morehampton Road and Donnybrook Road;
- Bridge crossing of River Dodder; and
- Bridge crossing of Grand Canal (Leeson Street Bridge).

6.2.2.3 Environmental Impact

The impacts are summarised in the MCA table in **Appendix A**.

6.3 Route 1 Scheme Options

Scheme options have been developed along various Segments of Route 1, as shown in **Figure 6.3**.

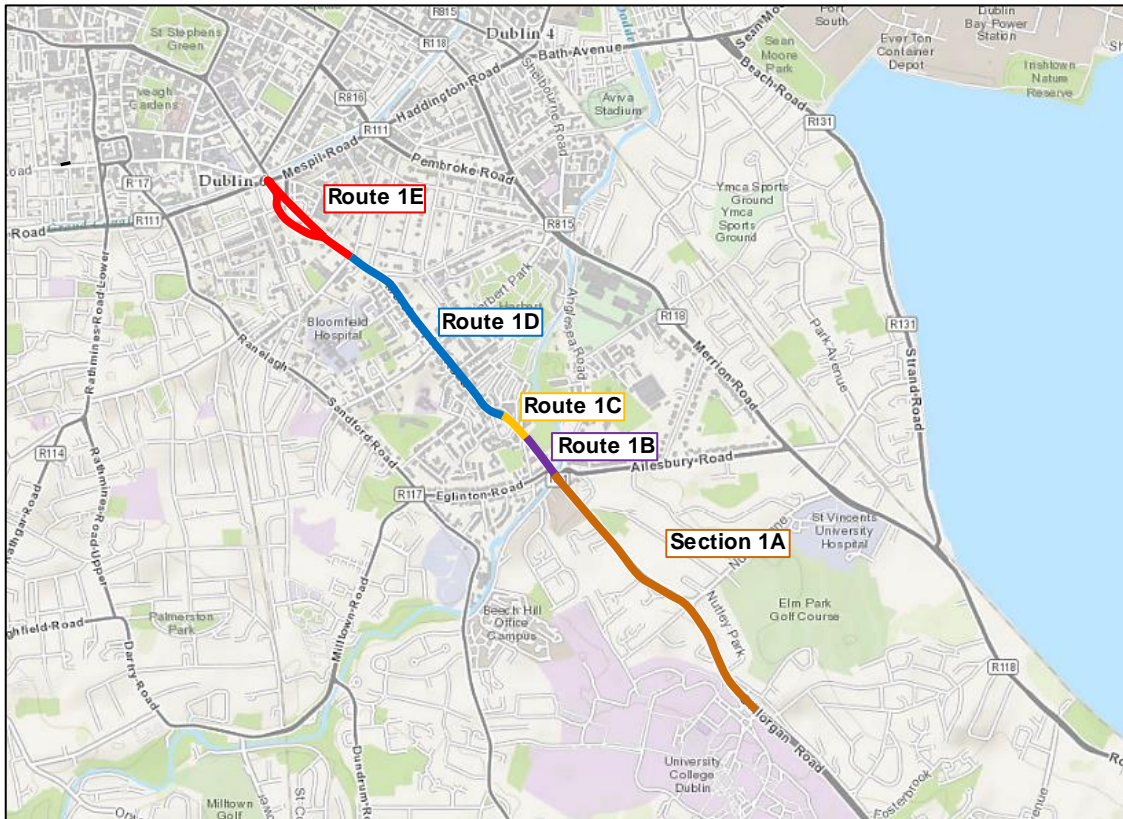


Figure 6.3: Route 1 sections

The scheme options considered in each Segment of Route 1 are listed in **Table 6.1** and described in full detail in the following Sections.

Table 6.1: Scheme Options Summary Table

Route Option	Route Segments	Scheme Options
Route 1	Route 1A	1A1
		1A2
	Route 1B	1B2
		1B2
		1B3
	Route 1C	1C1
		1C2
	Route 1D	1D1
		1D2
	Route 1E	1E1
1E2		
1E3		

6.3.1 Section 1A – Stillorgan Road / UCD to Anglesea Bridge

6.3.1.1 Existing facilities

Inbound and outbound bus and dedicated cyclist facilities are provided throughout this section, with no parking spaces.

6.3.1.2 Scheme Option 1A1

This scheme option would consolidate the existing facilities as shown in **Figure 6.4** and **Figure 6.5**. Resurfacing would be required along with the provision of segregated cycle lanes both inbound and outbound. There are no parking spaces identified in this section which would be affected by the proposed works. Refer to **Appendix H** for drawings.

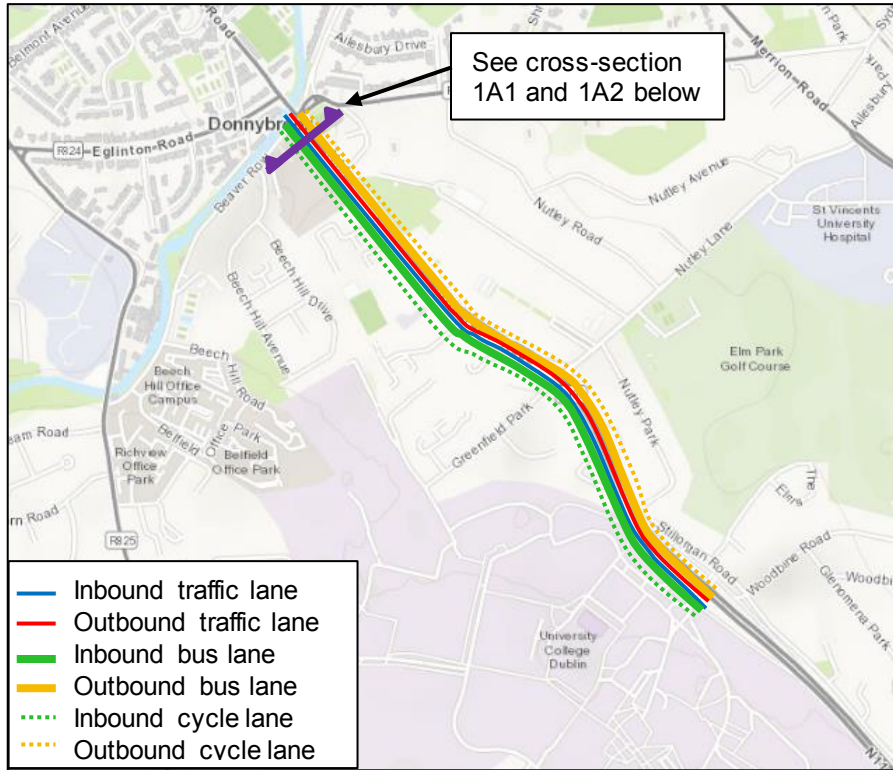


Figure 6.4: Scheme Option 1A1 and 1A2 bus and cycle facilities

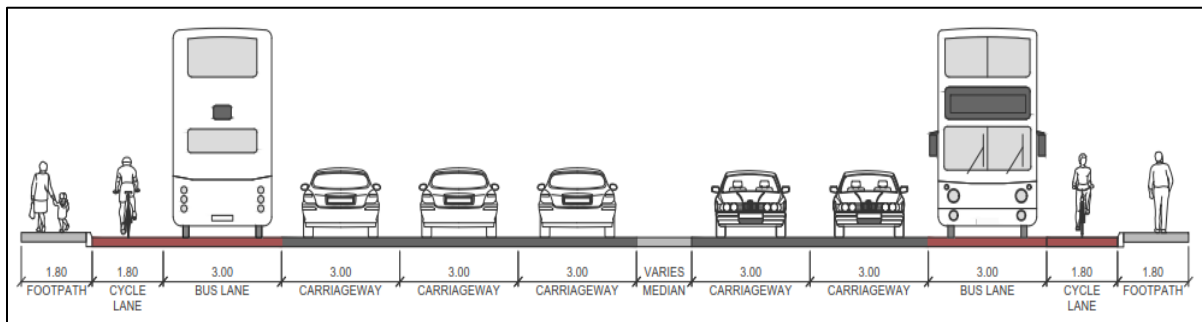


Figure 6.5: Scheme Option 1A1 – Cross-section at Donnybrook Church

6.3.1.3 Scheme Option 1A2

This scheme option would provide a new streetscape which would increase pedestrian facilities by widening the northern footpath in front of Donnybrook Parish Church, whilst maintaining full bus and cyclist facilities. Refer to **Appendix H** for drawings.

This would be achieved by extending the outbound one lane configuration by approximately 110m past the Stillorgan Road/Beaver Row/Anglesea Road junction before widening to two lanes. There are no parking spaces identified in this section which would be affected by the proposed works.

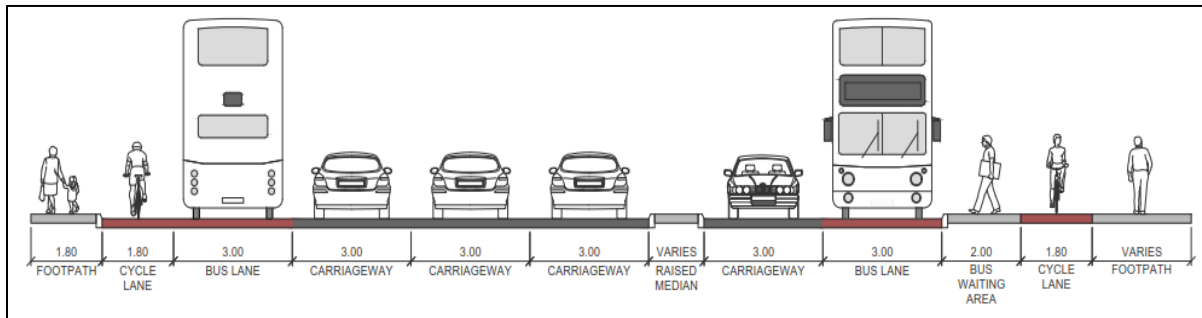


Figure 6.6: Scheme Option 1A2 – Cross-section at Donnybrook Church

6.3.1.4 Summary

Scheme Option 1A1 and 1A2 were brought forward to MCA to identify the most appropriate design for Route Segment 1A. A summary of the MCA results is presented in **Table 6.2**.

Neutral scoring sub-criteria are omitted from the summary table i.e. where scheme options score neutrally to other options.

The full MCA table including a justification for the sub-criteria scoring awarded to each scheme option is presented in **Appendix A**.

Scheme Option 1A2 would increase the northern footpath width, providing safer facilities for pedestrians and those accessing public transport.

Hence, 1A2 scores higher under Road Safety.

Additionally, 1A2 scores higher under Landscape and Visual due the wider pedestrian facility which would improve the streetscape in front of Donnybrook Parish Church.

Scheme Option 1A2 however, would reduce traffic lanes and hence scores lower under Traffic Network Integration.

Overall, Scheme Option 1A2 scores highest and hence will form part of Route 1.

Table 6.2: Route Segment 1A MCA Summary

MCA criteria	Assessment Sub-Criteria	Scheme Option 1A1	Scheme Option 1A2
Integration	2.e. Traffic Network Integration		
Safety	4.a. Road Safety		
Environment	6.f. Landscape and Visual		

6.3.2 Section 1B – Donnybrook Road / Anglesea Bridge to Rampart Lane

6.3.2.1 Existing Facilities

Inbound bus facilities are provided between the Eglinton Road junction and The Crescent junction.

On-road cyclist facilities are provided between Anglesea Bridge and Brookvale Road travelling on the inbound carriageway.

Cyclists then share the bus lane for the remainder of the section.

There are no exclusive bus lanes on the outbound carriageway between Rampart Lane and Anglesea Bridge. Continuous on-road cyclist facilities are provided along the outbound carriageway. There are numerous trees located adjacent to both carriageways along this section.

There are no on-street parking spaces on either carriageway in this section, with one on-street loading bay located near Brookevale Road junction. Refer to **Appendix H** for drawings.

6.3.2.2 Scheme Option 1B1

Scheme Option 1B1 would include cyclists and buses sharing exclusive lanes on both the inbound and outbound carriageways throughout the section. The provision of the exclusive lanes would require reducing the number of outbound traffic lanes from two to one. There are no parking spaces identified in this section which would be affected by the proposed works. Refer to **Appendix H** for drawings.

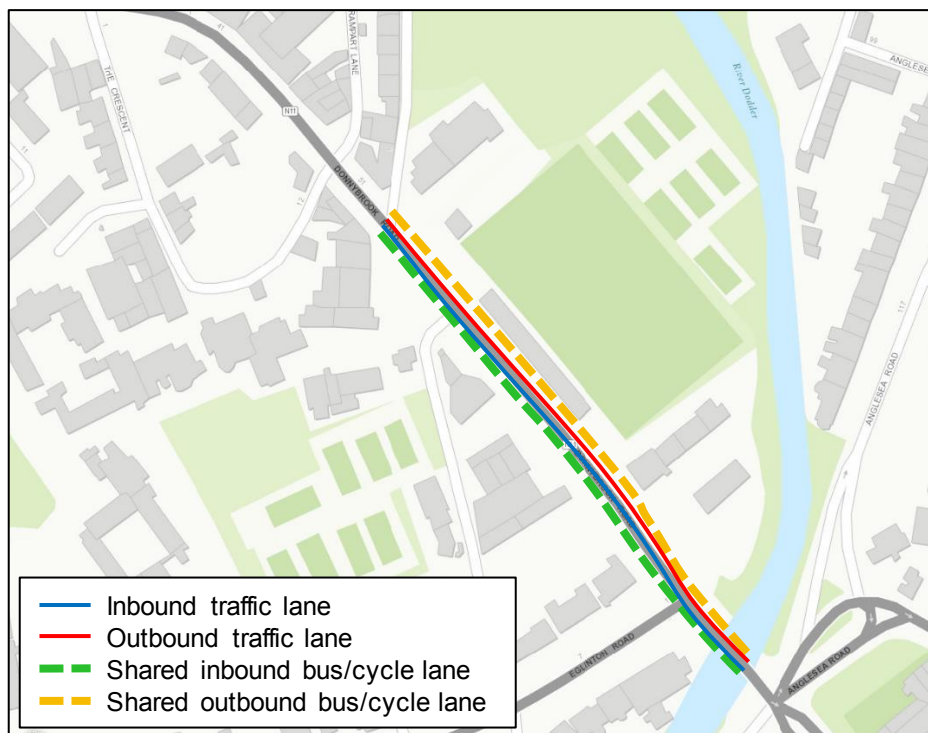


Figure 6.7: Scheme Option 1B1 bus and cycle facilities

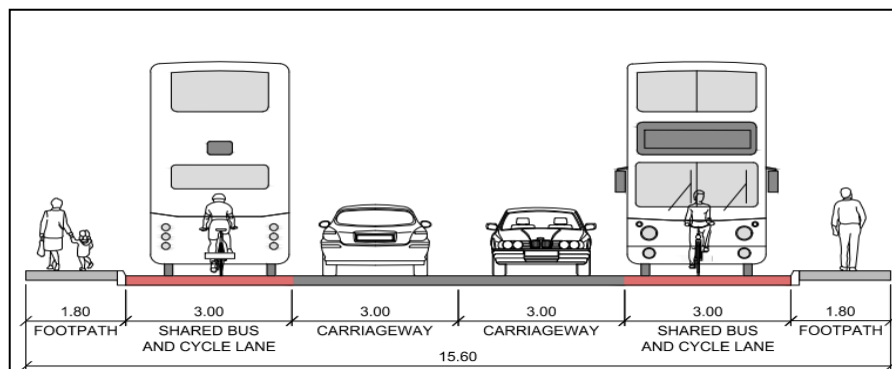


Figure 6.8: Scheme Option 1B1 – Typical Cross-section

6.3.2.3 Scheme Option 1B2

Scheme Option 1B2 would include segregated cyclist facilities and an exclusive bus lane on the inbound carriageway.

On the outbound carriageway cyclists and buses share an exclusive lane.

The provision of the exclusive lanes would require reducing the number of outbound traffic lanes from two to one and also require land take.

There are no on-street parking spaces identified in this section which would be affected by the proposed works. Refer to **Appendix H** for drawings.

One on-street loading bay would require relocation and some loss of adjacent parking.

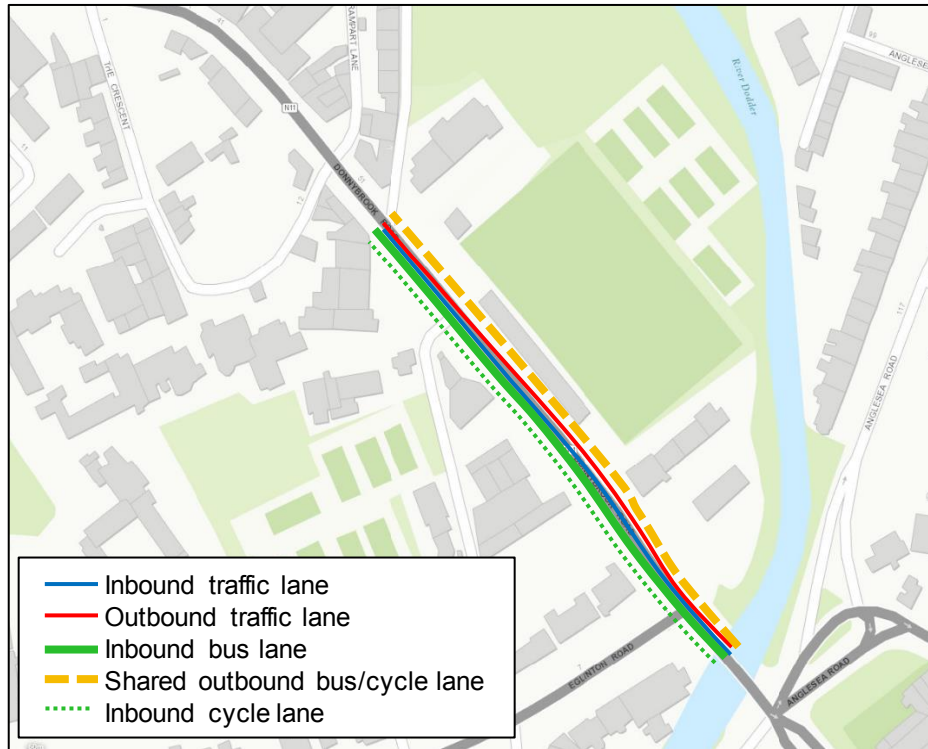


Figure 6.9: Scheme Option 1B2 bus and cycle facilities

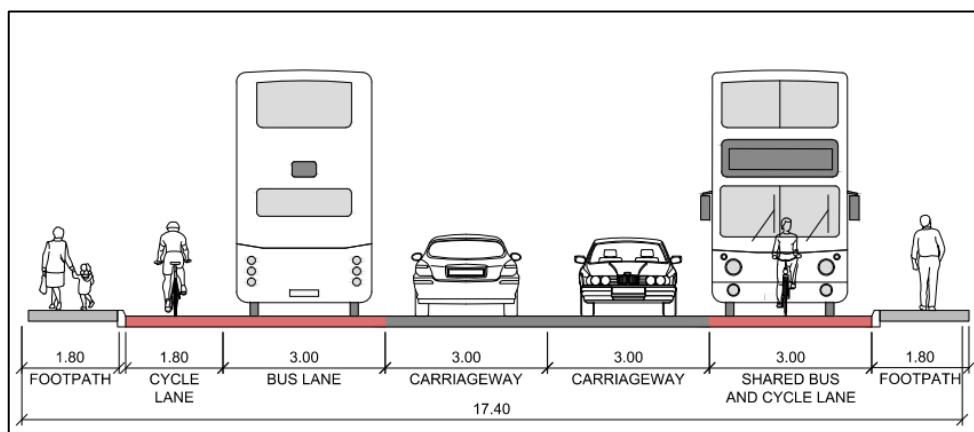


Figure 6.10: Scheme Option 1B2 – Typical Cross-section

6.3.2.4 Scheme Option 1B3

Scheme Option 1B3 would include segregated cyclist and bus facilities inbound and outbound.

The provision of the exclusive lanes would require reducing the number of outbound traffic lanes from two to one and also require land take.

There are no on-street parking spaces identified in this section which would be affected by the proposed works. Refer to **Appendix H** for drawings.

One on-street loading bay would require relocation and some loss of adjacent parking.

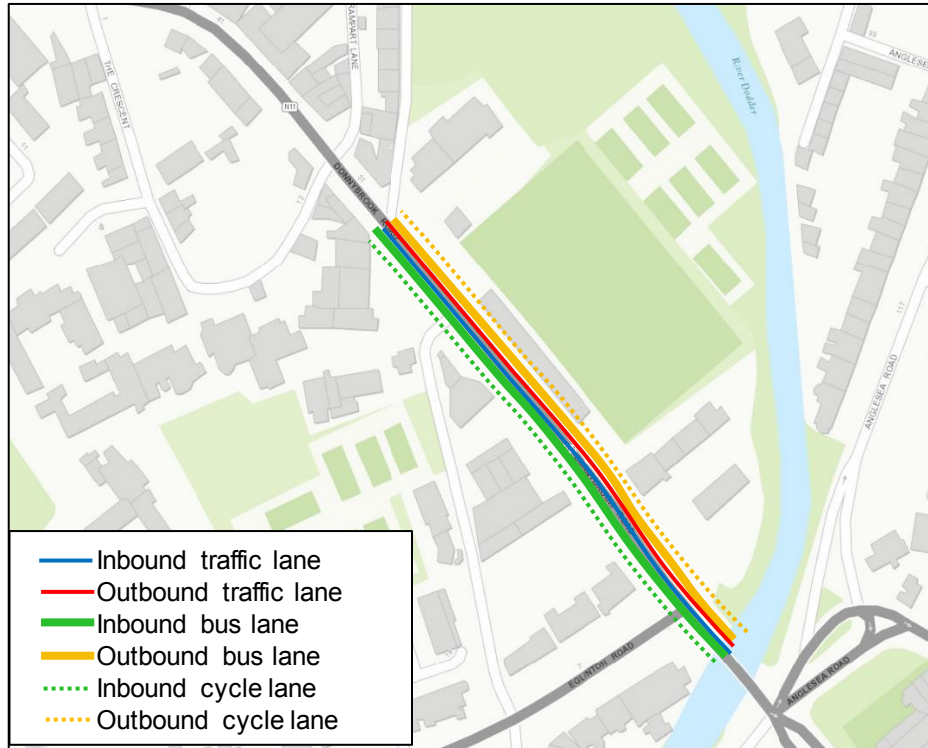


Figure 6.11: Scheme Option 1B3 bus and cycle facilities

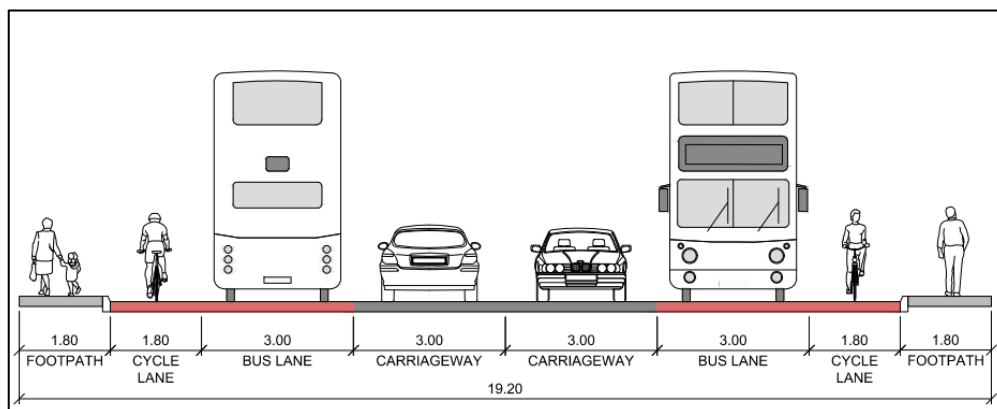


Figure 6.12: Scheme Option 1B3 – Typical Cross-section

6.3.2.5 Summary

All scheme options were brought forward to MCA to identify the most appropriate design for Route Segment 1B.

A summary of the MCA results is presented in **Table 6.3**.

Neutral scoring sub-criteria are omitted from the summary table, i.e. where scheme options score neutrally to other options.

The full MCA table including a justification for the sub-criteria scoring awarded to each scheme option is presented in Table 2 in **Appendix A**.

The three scheme options scores neutrally for some of the sub-criteria assessed.

In terms of Economy, Scheme Option 1B3 would be the most expensive due to the quantity of land take required to provide inbound and outbound cycle provision.

However, due to the segregation of buses and cyclists inbound and outbound provided by Scheme Option 1B3, this option scores higher under Transport Reliability and Quality, Cycle Network Integration and Road Safety. Scheme 1B1 scores highest under Flora and Fauna, Landscape and Visual and Land Use Character as it would have a lesser impact on existing trees, footpaths and parking.

Overall, Scheme Option 1B3 scores highest and hence will form part of Route 1.

Table 6.3: Route Segment 1B MCA Summary

MCA criteria	Assessment Sub-Criteria	Scheme Option 1B1	Scheme Option 1B2	Scheme Option 1B3
Economy	1.a. Capital Cost	Green	Yellow	Red
	1.b. Transport Reliability and Quality (Journey Time)	Red	Green	Green
Integration	2.d. Cycle Network Integration	Red	Green	Green
Safety	4.a. Road Safety	Red	Green	Green
Environment	6.c. Flora and Fauna	Green	Yellow	Yellow
	6.f. Landscape and Visual	Green	Yellow	Yellow
	6.i. Land Use Character	Green	Yellow	Yellow

6.3.3 Section 1C – Donnybrook Road / Rampart lane to Pembroke Cottages

6.3.3.1 Existing Facilities

Inbound exclusive bus facilities are provided between the Rampart Lane and past Pembroke Cottage junctions. There are no designated cyclist facilities at present. On the outbound carriageway buses and other vehicles share two traffic lanes. An on-road cycle lane is provided, although this lane is at a reduced width. There are no parking spaces on either carriageway in this section.

6.3.3.2 Scheme Option 1C1

To preserve the existing village streetscape, Scheme Option 1C1 would provide adequate bus and cycle facilities albeit within a reduced carriageway design width.

This scheme option would avoid the demolition of existing buildings and footpaths along with the ancillary works associated with demolition (i.e. the relocation of services etc.) by providing one traffic lane and one exclusive shared bus and cycle lane on both the inbound and outbound carriageways.

There are no parking spaces identified in this section which would be affected by the proposed works. Refer to **Appendix H** for drawings.

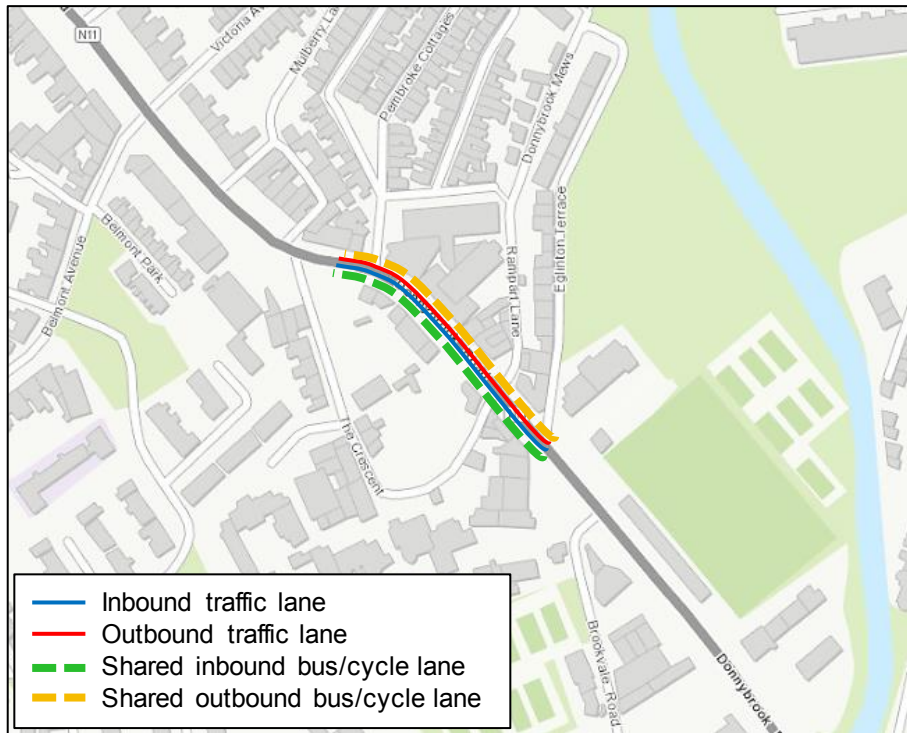


Figure 6.13: Scheme Option 1C1 bus and cycle facilities

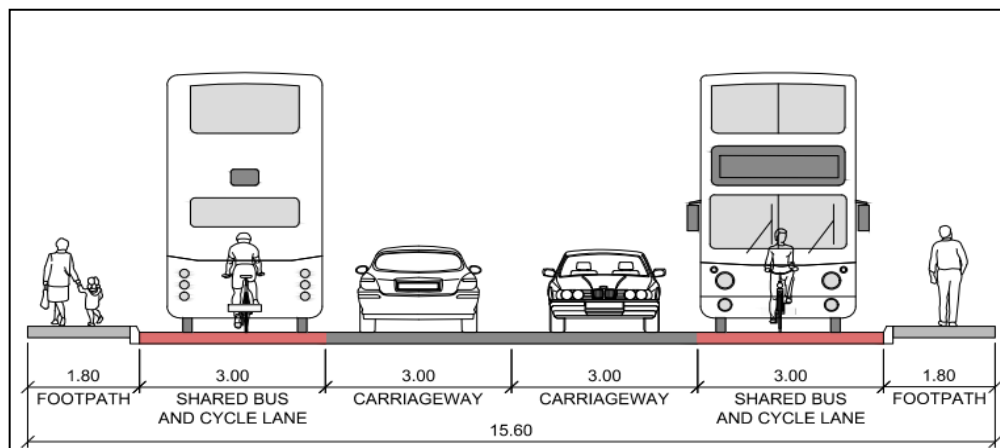


Figure 6.14: Scheme Option 1C1 – Typical Cross-section

6.3.3.3 Scheme Option 1C2

Provision of the design features within Scheme Option 1C2 involves the demolition of existing buildings on the northeast of carriageway to provide full bus and cycle facilities in both directions.

There are no parking spaces identified in this section which would be affected by the proposed works. Refer to **Appendix H** for drawings.

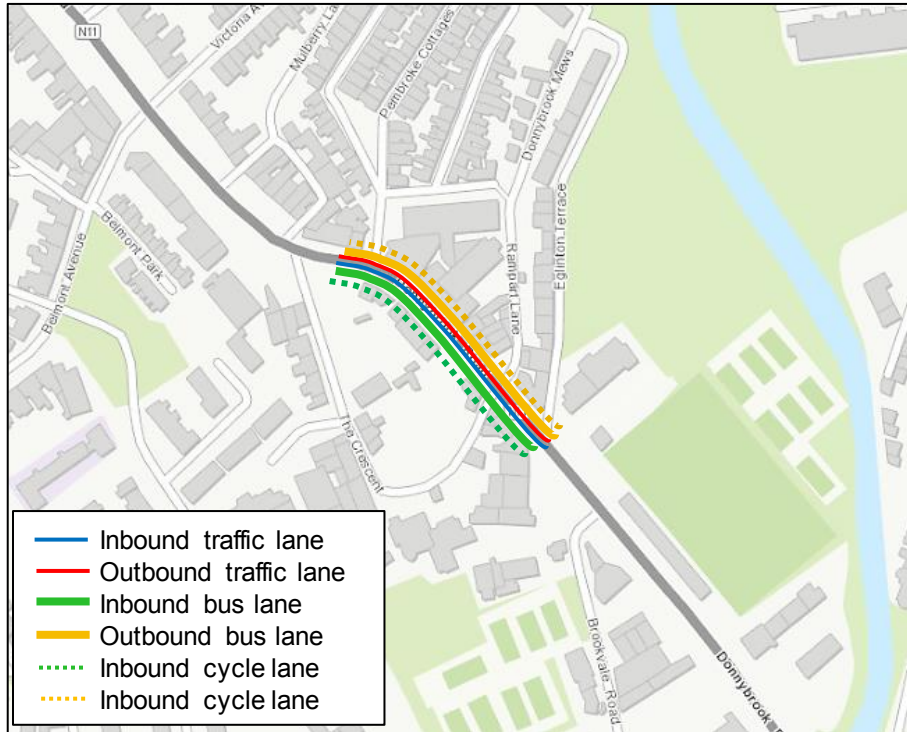


Figure 6.15: Scheme Option 1C2 bus and cycle facilities

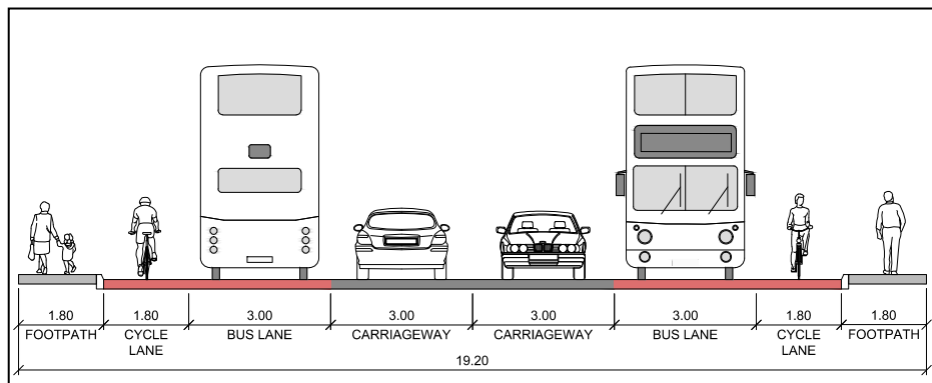


Figure 6.16: Scheme Option 1C2 - Typical Cross-section

6.3.3.4 Summary

Both scheme options were brought forward to MCA to identify the most appropriate design for Route Segment 1C.

A summary of the MCA results is presented in **Table 6.4**: Route Segment 1C MCA.

Neutral scoring sub-criteria are omitted from the summary table i.e. where scheme options score neutrally to other options.

The full MCA table including a justification for the sub-criteria scoring awarded to each scheme option is presented in Table 3 in **Appendix A**.

The two scheme options scores neutrally for some of the sub-criteria assessed.

Scheme Option 1C2 would require the demolition of a number of existing buildings and hence, scores lower under Capital Cost and Land Use Integration.

However, the segregated bus and cycle lanes proposed by Scheme Option 1C2 would facilitate a shorter and more reliable bus journey time than Scheme Option 1C1.

Additionally, Scheme Option 1C2 scores higher under Cycle Network Integration and Road Safety due to the proposed segregated cycle lane in each direction, which would align with primary route 12 as identified in the GDA Cycle Network Plan; see **Section 2.5** of the report, **Figure 2.2**.

Overall, Scheme Option 1C1 scores highest and hence will form part of Route 1.

Table 6.4: Route Segment 1C MCA Summary

MCA criteria	Assessment Sub-Criteria	Scheme Option 1C1	Scheme Option 1C2
Economy	1.a. Capital Cost	Green	Red
	1.b. Transport Reliability and Quality (Journey Time)	Yellow	Light Green
Integration	2.a. Land Use Integration	Light Green	Yellow
	2.d. Cycle Network Integration	Yellow	Light Green
Safety	4.a. Road Safety	Yellow	Light Green
Environment	6.f. Landscape and Visual	Green	Red

6.3.4 Section 1D – Morehampton Road / Pembroke Cottages to Appian Way

6.3.4.1 Existing facilities

For significant length of this section, along the inbound carriageway, an exclusive bus lane is in operation along with an on-road cycle lane. For approximately 160 metres on approach to Morehampton Terrace and from the Wellington Place junction to the Appian Way, buses share with traffic. On the outbound carriageway an exclusive bus lane operates between Waterloo Lane and Auburn Avenue. A continuous on road cycle lane is also provided outbound along this section. Car parking has been found along this section. The breakdown of the car parking facilities along Section 1D is as follows:

- On-street Formal Parking – Approximately 90 Spaces (7 are Loading Bays between 07:00 and 10:00, Monday – Friday and 1 disabled parking) .
- On-Street Informal Parking – Approximately 4 Spaces.
- Adjacent Parking (at The Crescent) – 15 Spaces.

6.3.4.2 Scheme Option 1D1

Scheme Option 1D1 would provide full bus and cycle facilities on both the inbound and outbound carriageways. This scheme option would provide a more direct route for cyclists, in comparison to Scheme Option 1D2 (see **Appendix H** for scheme option design), with cycle lanes running adjacent to the carriageway. This would have a greater impact on the existing trees that line the carriageway along Route Segment 1D. Most of the on-street formal and informal car parking spaces would be removed to facilitate the proposed works. The adjacent spaces in the car park located at the Crescent would not be affected by the proposed works.

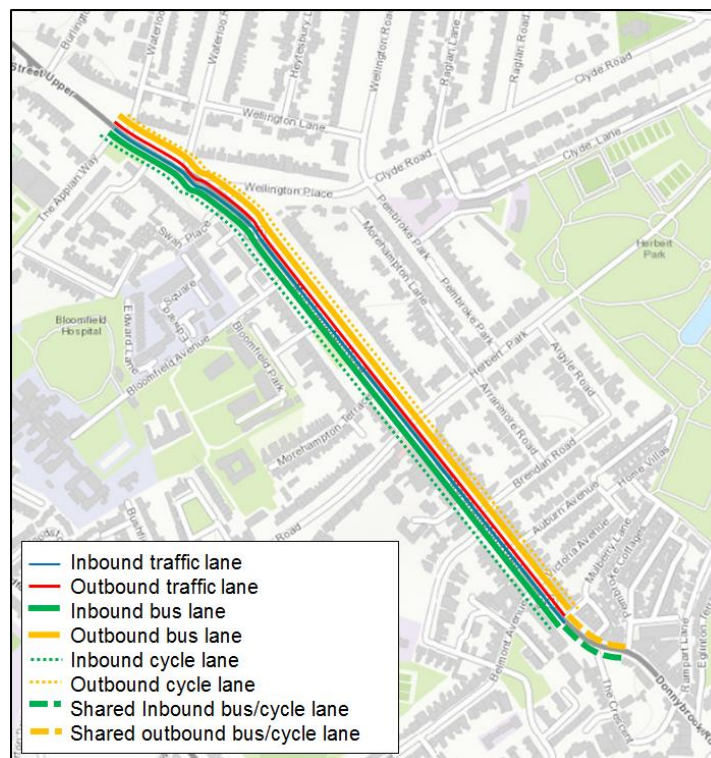


Figure 6.17: Scheme Option 1D1 bus and cycle facilities

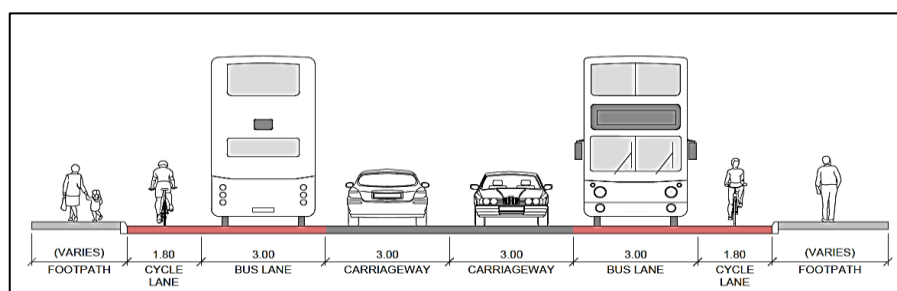


Figure 6.18: Scheme Option 1D1 – Typical Cross-section

6.3.4.3 Scheme Option 1D2

Scheme Option 1D2 would provide full bus and cycle facilities on both the inbound and outbound carriageways (see **Appendix H** for scheme option design).

This scheme option would preserve more trees and thus more of the existing streetscape along the route by altering the alignment of cycle lanes and configuration of bus stops.

Most of the on-street formal and informal car parking spaces would be removed to facilitate the proposed works.

The adjacent spaces in the car park located at the Crescent would not be affected by the proposed works.

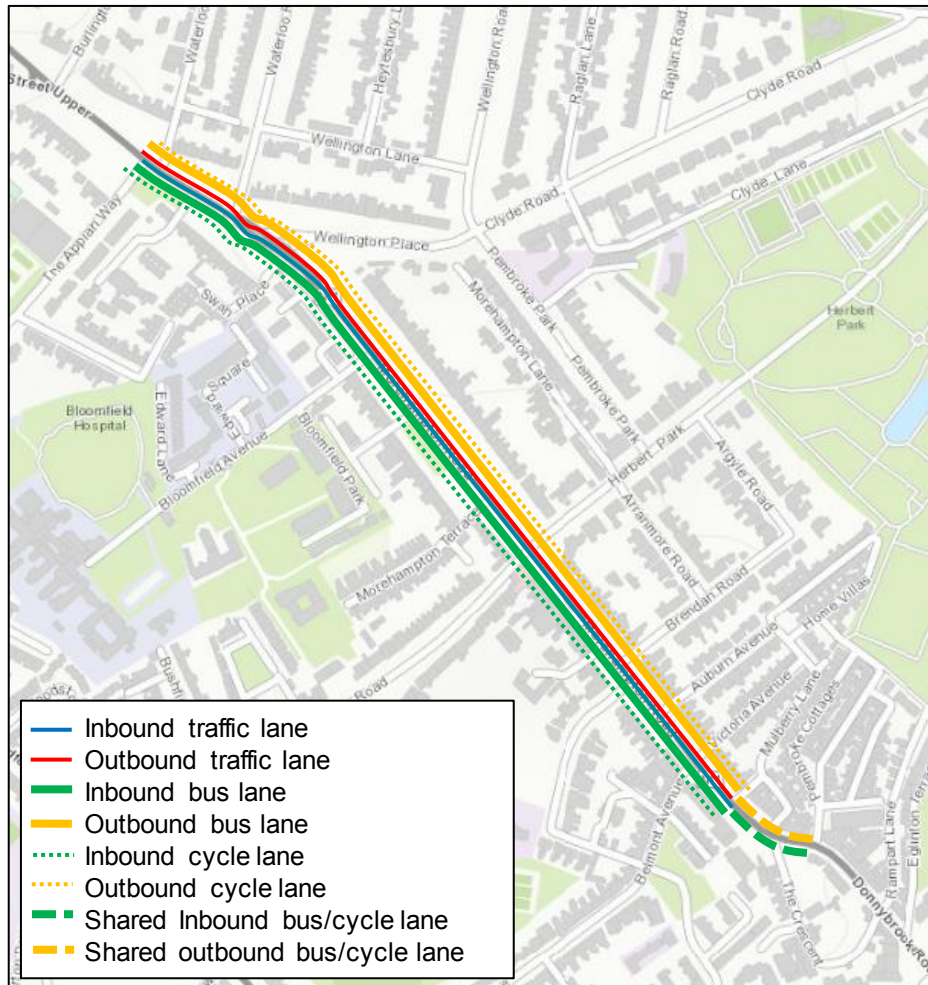


Figure 6.19: Scheme Option 1D2 bus and cycle facilities

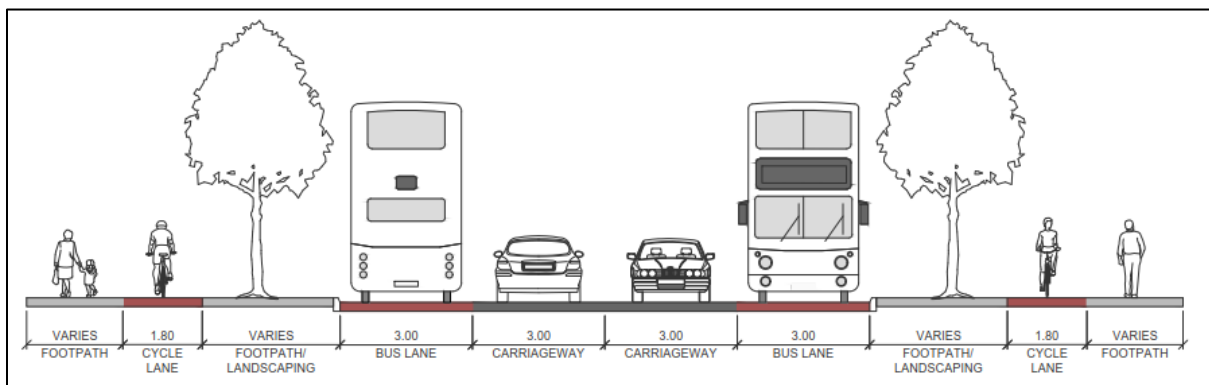


Figure 6.20: Scheme Option 1D2 – Typical Cross-section (when possible to maintain trees)

6.3.4.4 Summary

Both scheme options were brought forward to MCA to identify the most appropriate design for Route Segment 1D.

A summary of the MCA results is presented in **Table 6.5**.

Neutral scoring sub-criteria are omitted from the summary table i.e. where scheme options score neutrally to other options.

The full MCA table including a justification for the sub-criteria scoring awarded to each scheme option is presented in Table 4 in **Appendix A**.

The two scheme options scores neutrally for the majority of the sub-criteria assessed.

Scheme Option 1D2 scores higher under Flora and Fauna and Landscape and Visual as would preserve more of the existing trees and thus streetscape.

Similarly, Scheme Option 1D2 design takes consideration of the areas zoning as a Residential Neighbourhood (Conservation Area) by the Dublin City Development Plan 2016-2022, and as a result scores higher in Land Use Integration.

Overall, Scheme Option 1D2 scores highest and will form part of Route 1.

Table 6.5: Route Segment 1D MCA Summary

MCA criteria	Assessment Sub-Criteria	Scheme Option 1D1	Scheme Option 1D2
Integration	2.a. Land Use Integration		
Environment	6.c. Flora and Fauna		
	6.f. Landscape and Visual		

6.3.5 Section 1E – Leeson Street Upper / Appian Way to Grand Canal

6.3.5.1 Existing facilities

On the inbound carriageway from the Appian Way to the Leeson Street Upper junction at present buses share the carriageway with other traffic. Along Leeson Street Upper a one-way inbound system is in operation with a continuous exclusive bus lane which returns to shared traffic lanes at a distance of approximately 60m on approach to the Grand Parade junction to allow vehicles to turn left along Grand Parade.

A continuous on-road cycle lane is provided along the entirety of the section, along the inbound carriageway. Travelling outbound from the Grand Canal/Mespil Road/Leeson Street Upper junction a one-way system is in operation.

Outbound traffic travels along Sussex Road where an exclusive bus lane is in operation. An on-road cycle lane is also provided along the entirety of the section. The breakdown of the car parking facilities along Section 1E is as follows:

- Formal Parking – 77 (Of which there is 1 Disabled Parking) Spaces.
- Informal Parking – 9 Spaces.
- Adjacent Parking – 0 Spaces.
- Taxi Rank – Approximately 17 Spaces.

6.3.5.2 Scheme Option 1E1

This scheme option would consolidate the existing facilities.

Resurfacing would be required along with the provision of segregated bus and cycle lanes both inbound and outbound.

Some existing car parking spaces would be affected by the proposed works (see **Appendix H** for scheme option designs).

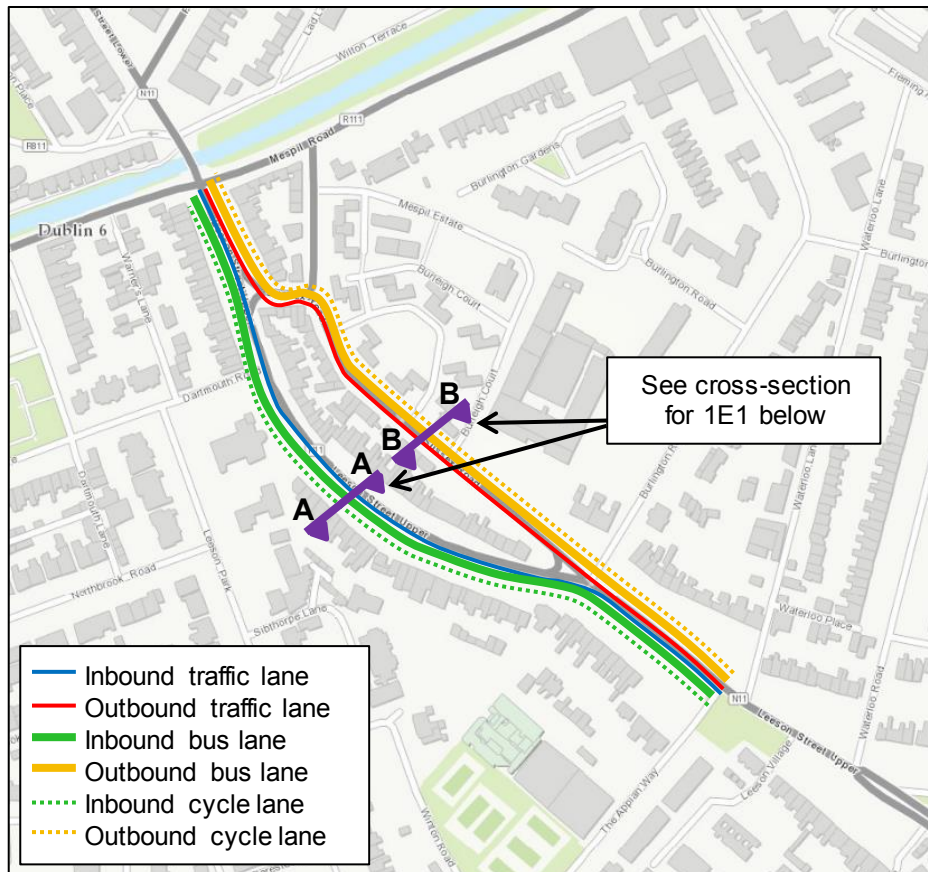


Figure 6.21: Scheme Option 1E1 bus and cycle facilities

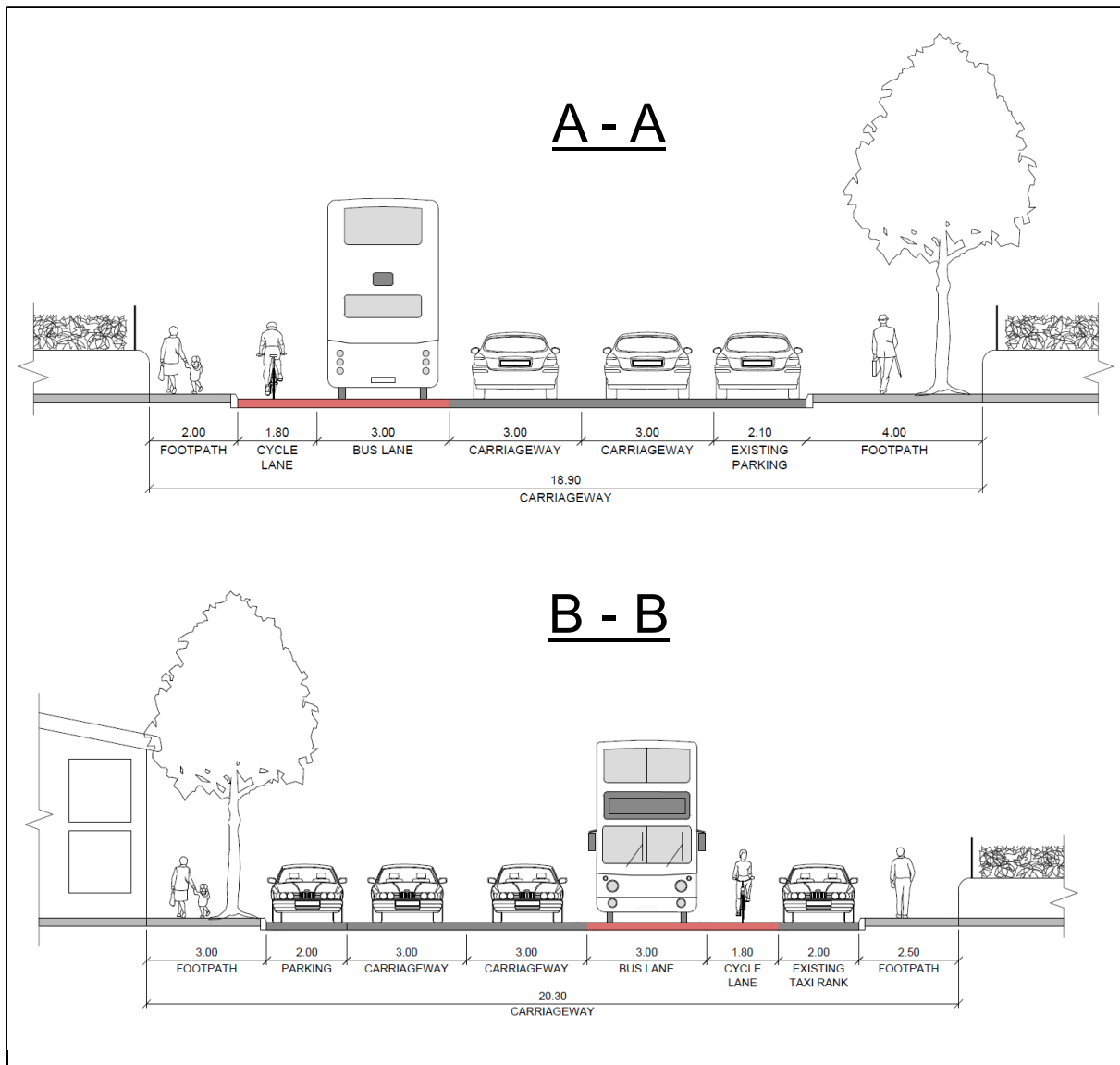


Figure 6.22: Scheme Option 1E1 Cross-Section

6.3.5.3 Scheme Option 1E2

This scheme option would use bus gates at both ends of Sussex Road to separate buses, cyclists and other forms of traffic along either Sussex Road or Leeson Street Upper i.e. to convert either of these streets into an exclusively bus and cyclist only section.

As the buses approach the bus gates, traffic signals stop traffic in both directions which allows buses and cyclists priority access through the junction.

This arrangement would involve either outbound or inbound (depending on whether Leeson Street Upper or Sussex Road is used for bus and cyclist exclusively) buses and cyclists to cross into/out of the exclusive section.

This priority movement (buses and cyclists) would require traffic in both directions to be stop to facilitate the cross-over at either end of Sussex Road, causing a significant impact on traffic.

Some existing car parking spaces would be affected by the proposed works (see **Appendix H** for scheme option designs).

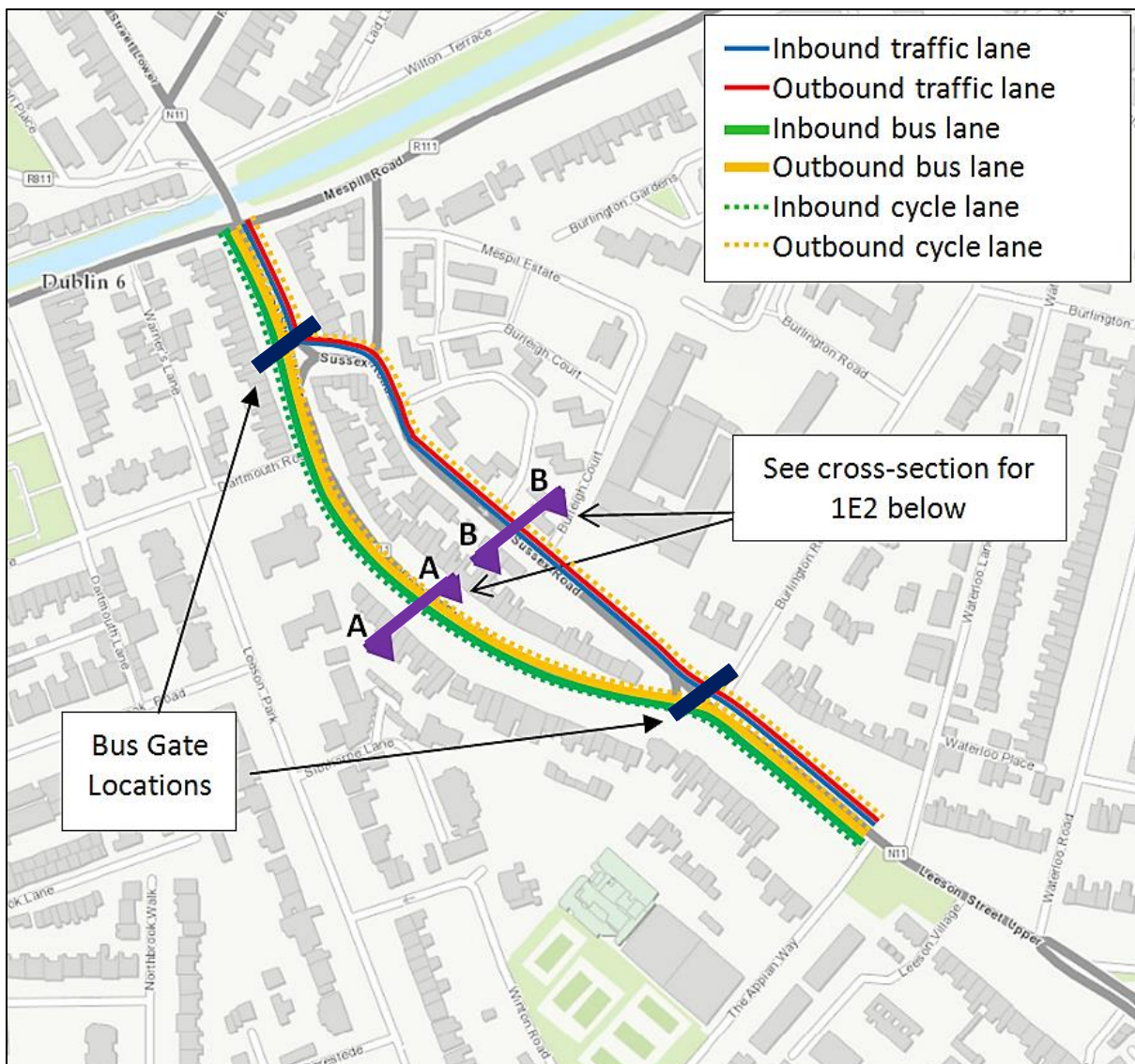


Figure 6.23: Scheme Option 1E2 bus and cycle facilities

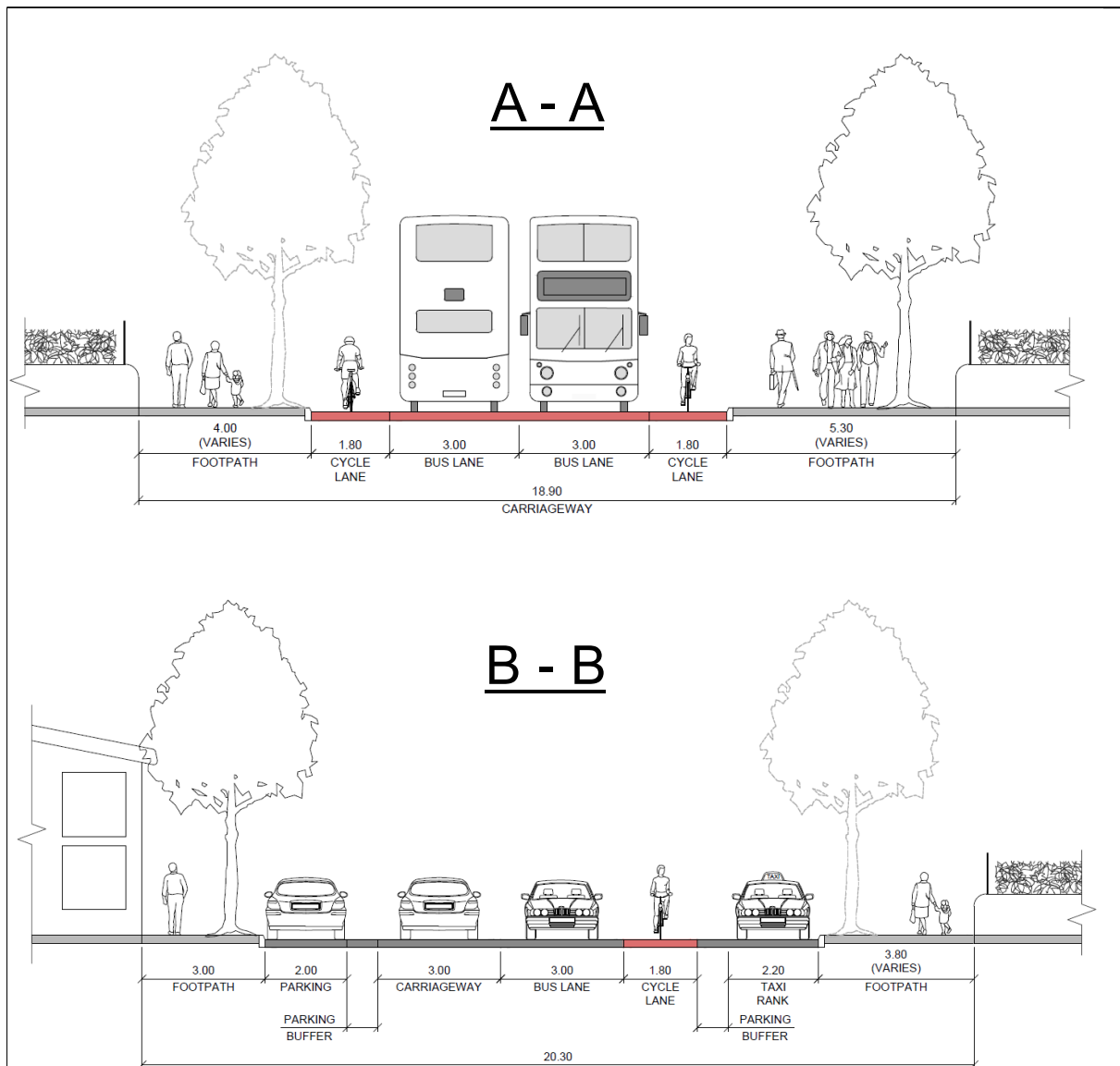


Figure 6.24: Scheme Option 1E2 Cross-Section

6.3.5.4 Scheme Option 1E3

This scheme option would extend the one way traffic lane further on both the inbound and outbound sections before widening to two lanes.

As a result, this option would have some impact upon the existing traffic flows.

Resurfacing would be required along with the provision of segregated bus and cycle lanes both inbound and outbound.

Existing car parking spaces would be least affected by this scheme option (see **Appendix H** for scheme option designs).

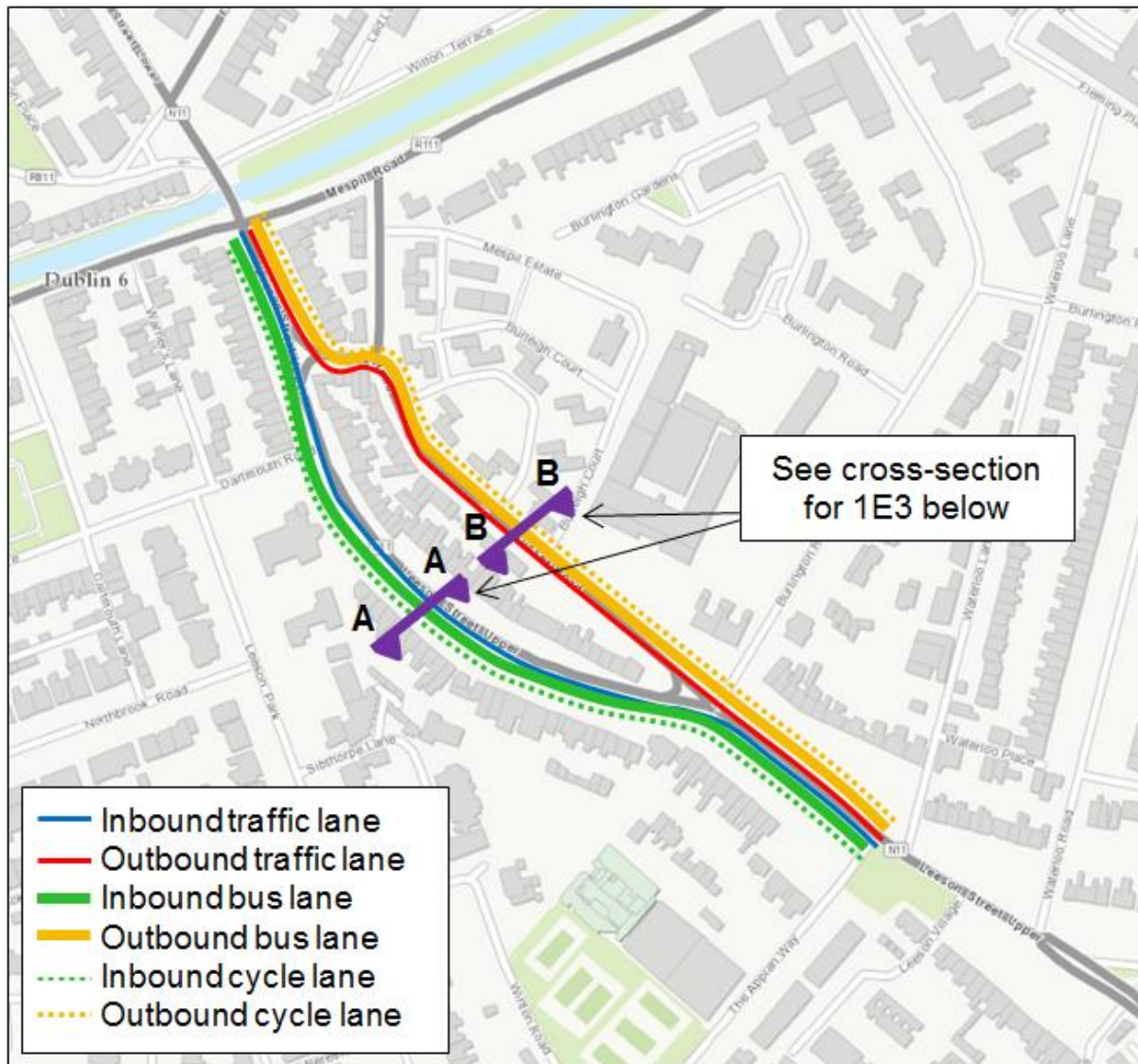


Figure 6.25: Scheme Option 1E3 bus and cycle facilities

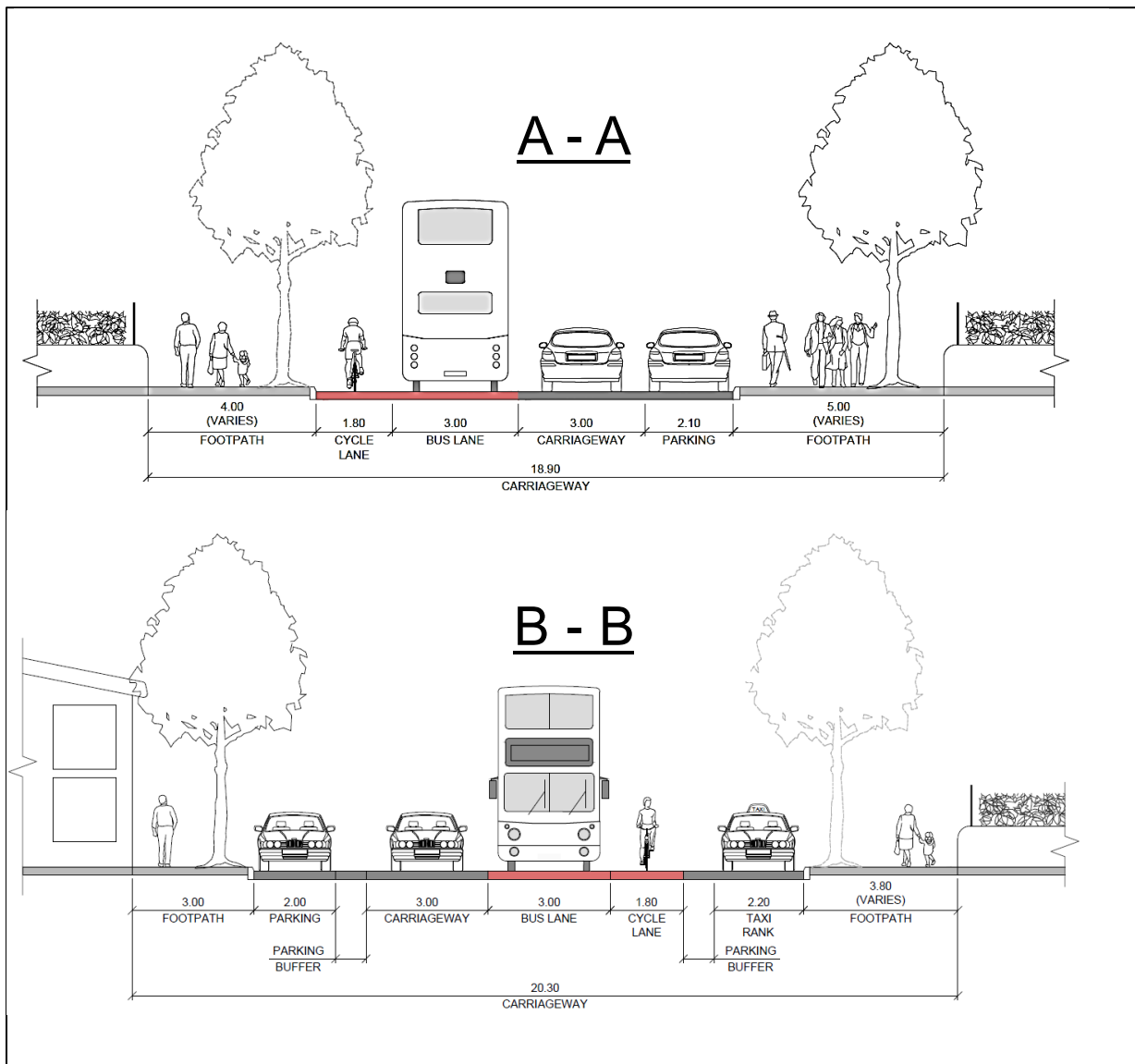


Figure 6.26: Scheme Option 1E3 Cross-Section

6.3.5.5 Summary

Scheme Option 1E1, 1E2 and 1E3 were brought forward to MCA to identify the most appropriate design for Route Segment 1E.

A summary of the MCA results is presented in **Table 6.6**.

Neutral scoring sub-criteria are omitted from the summary table i.e. where scheme options score neutrally to other options.

The full MCA table including a justification for the sub-criteria scoring awarded to each scheme option is presented in Table 5 in **Appendix A**.

The three scheme options scores neutrally for the majority of the sub-criteria assessed.

In terms of Economy, Scheme Option 1E2 would be the most expensive as it would require reconfiguring one road to exclusive use for buses and cyclists as well as introduction of cross-over junctions i.e. bus gates.

Scheme Option 1E1 would better integrate with the existing traffic network as it proposes to use existing bus lanes and maintain a similar number of traffic lanes.

Due to the segregation of buses and vehicular traffic along different routes, Scheme Option 1E2 would offer the greatest safety benefits, with Scheme Option 1E3 also offering safety benefits inferred from the reduction in traffic lanes.

Scheme Option 1E3 scores higher under Flora and Fauna and Landscape and Visual as it would preserve more of the existing trees and thus streetscape.

Similarly, Scheme Option 1E3 design takes consideration of the of the routes zoning as a Residential Neighbourhood (Conservation Area) by the Dublin City Development Plan 2016-2022, and as a result scores higher in Land Use Integration.

Scheme Option 1E2 scores lowest on Land Use Character as it would have the greatest negative impact on the existing car parking.

Overall, Scheme Option 1E3 scores highest and will form part of Route 1.

Table 6.6: Route Segment 1E MCA Summary

MCA criteria	Assessment Sub-Criteria	Scheme Option 1E1	Scheme Option 1E2	Scheme Option 1E3
Economy	1.a. Capital Cost	Green	Red	Green
Integration	2.a. Land Use Integration	Yellow	Yellow	Green
	2.e. Traffic Network Integration	Green	Red	Yellow
Safety	4.a. Road Safety	Red	Green	Green
Environment	6.c. Flora and Fauna	Yellow	Yellow	Green
	6.f. Landscape and Visual	Yellow	Yellow	Green
	6.i. Land Use Character	Green	Red	Green

7. Emerging Preferred Route

7.2 Introduction

This section of the report presents:

- the final conclusions from the assessment process, for the end-to-end route / scheme options considered; and
- recommends an emerging preferred scheme option, including a description of the scheme proposals, which include ancillary measures on other streets, if required.

7.3 Route Options Assessment Conclusions

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

7.4 Scheme Description

Based on the conclusions from the route options assessment process, the recommended emerging preferred scheme option comprises the route segments described below.

Refer to **Appendix H** for concept drawings.

7.4.1 Route Segment 1A2

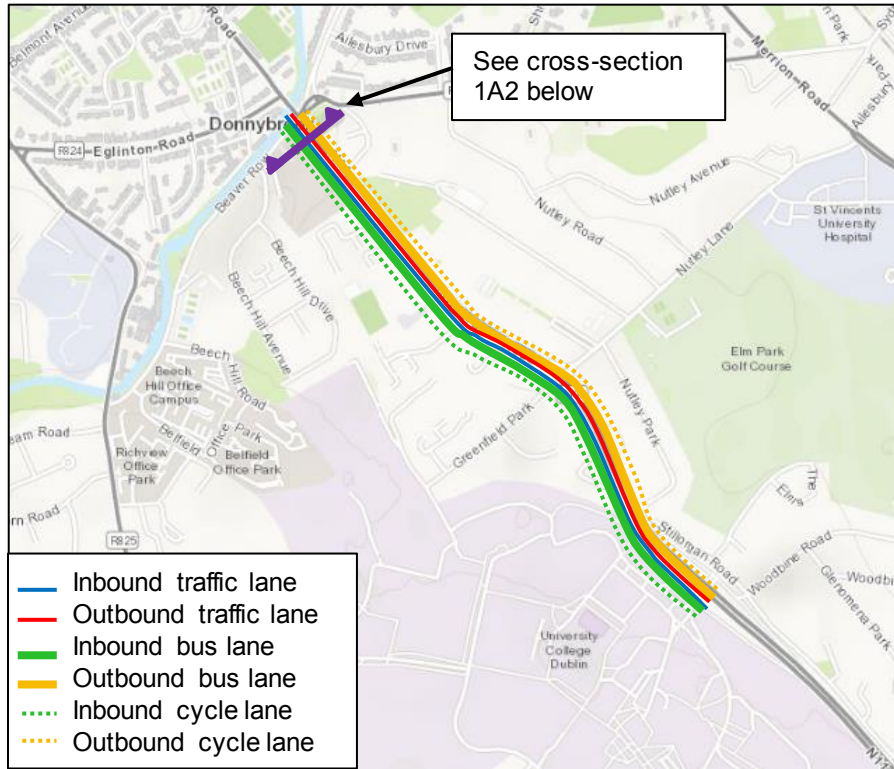


Figure 7.1: Scheme Option 1A2 bus and cycle facilities

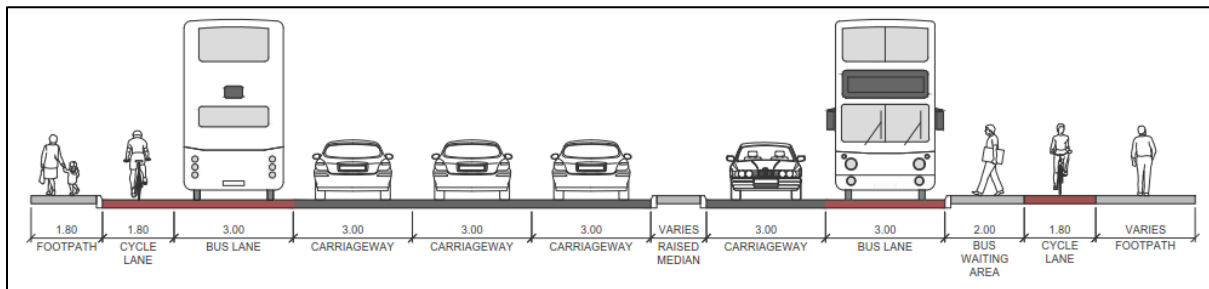


Figure 7.2: Scheme Option 1A2 – Cross-section at Donnybrook Church

This scheme option will provide a new streetscape which will increase pedestrian facilities by widening the northern footpath in front of Donnybrook Parish Church, whilst maintaining full bus and cyclist facilities.

This will be achieved by extending the outbound one lane configuration by approximately 110m past the Stillorgan Road/Beaver Row/Anglesea Road junction before widening to two lanes.

There are no parking spaces identified in this section which will be affected by the proposed works.

7.4.2 Route Segment 1B3

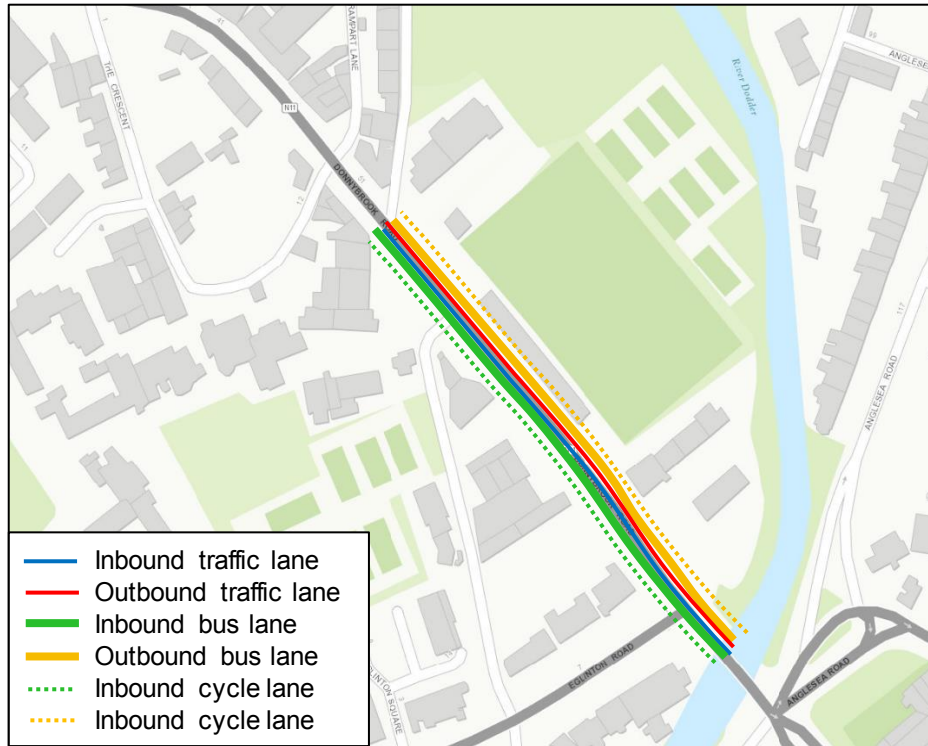


Figure 7.3: Scheme Option 1B3 bus and cycle facilities

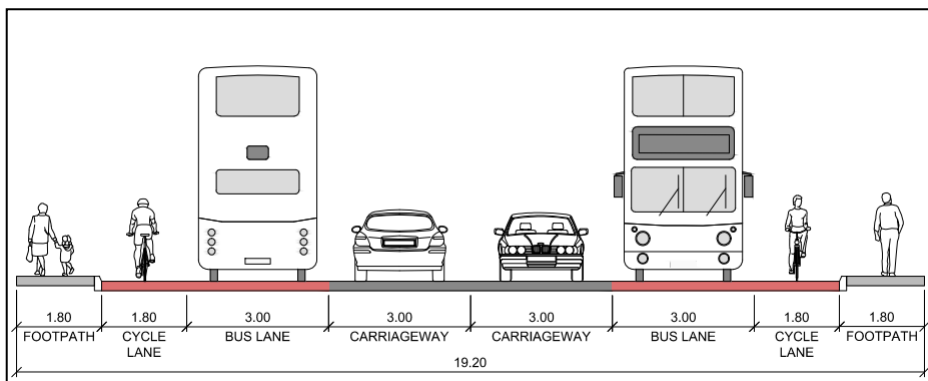


Figure 7.4: Scheme Option 1B3 – Typical Cross-section

Scheme Option 1B3 will include segregated cyclist and bus facilities inbound and outbound.

The provision of the exclusive lanes will require land-take and a reduction in the number of outbound traffic lanes from two to one.

There are no on-street parking spaces identified in this section which will be affected by the proposed works.

One on-street loading bay will require relocation and some loss of adjacent parking.

7.4.3 Route Segment 1C1

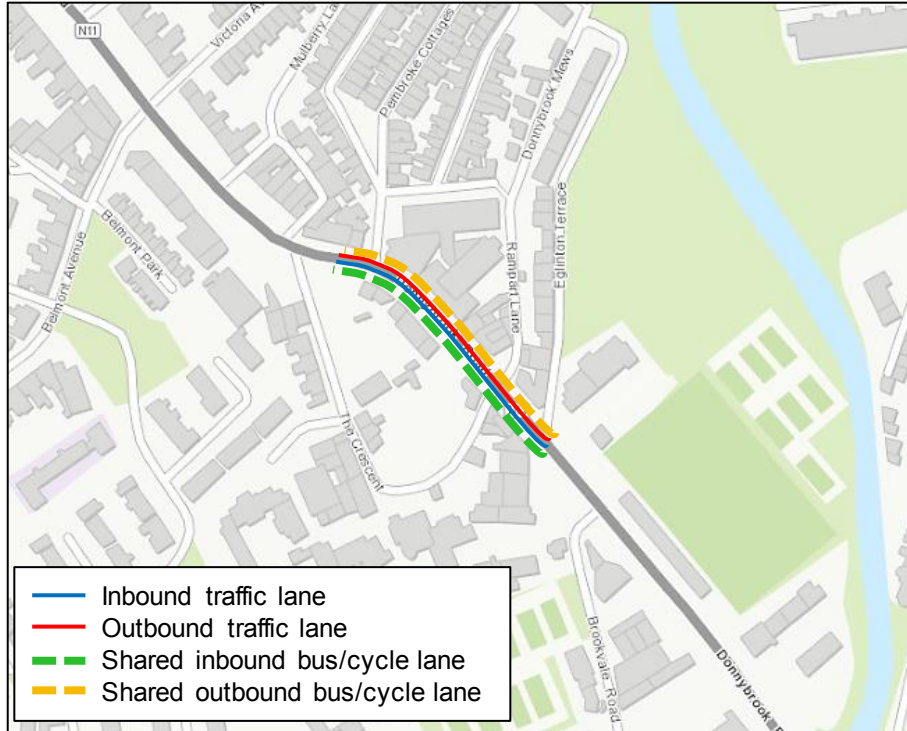


Figure 7.5: Scheme Option 1C1 bus and cycle facilities

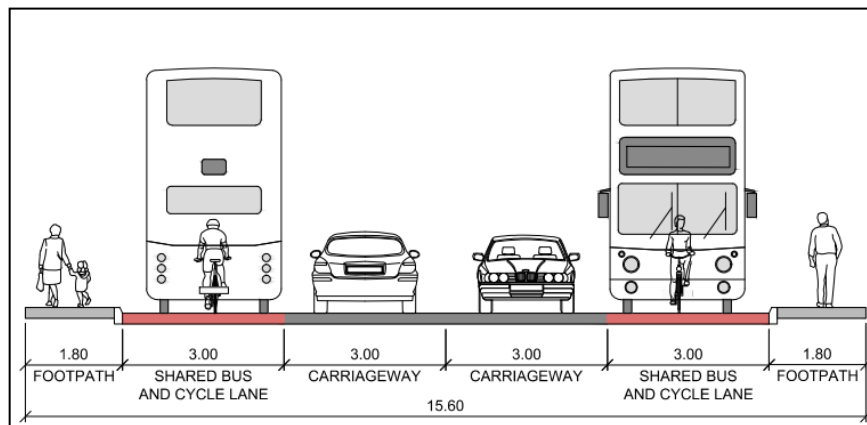


Figure 7.6: Scheme Option 1C1 – Typical Cross-section

To preserve the existing village streetscape, Scheme Option 1C1 will provide adequate bus and cycle facilities albeit within a reduced carriageway design width.

This scheme option will avoid the demolition of existing buildings and footpaths along with the ancillary works associated with demolition (i.e. the relocation of services etc.) by providing one traffic lane and one exclusive shared bus and cycle lane on both the inbound and outbound carriageways.

There are no parking spaces identified in this section will be affected by the proposed works.

7.4.4 Route Segment 1D2

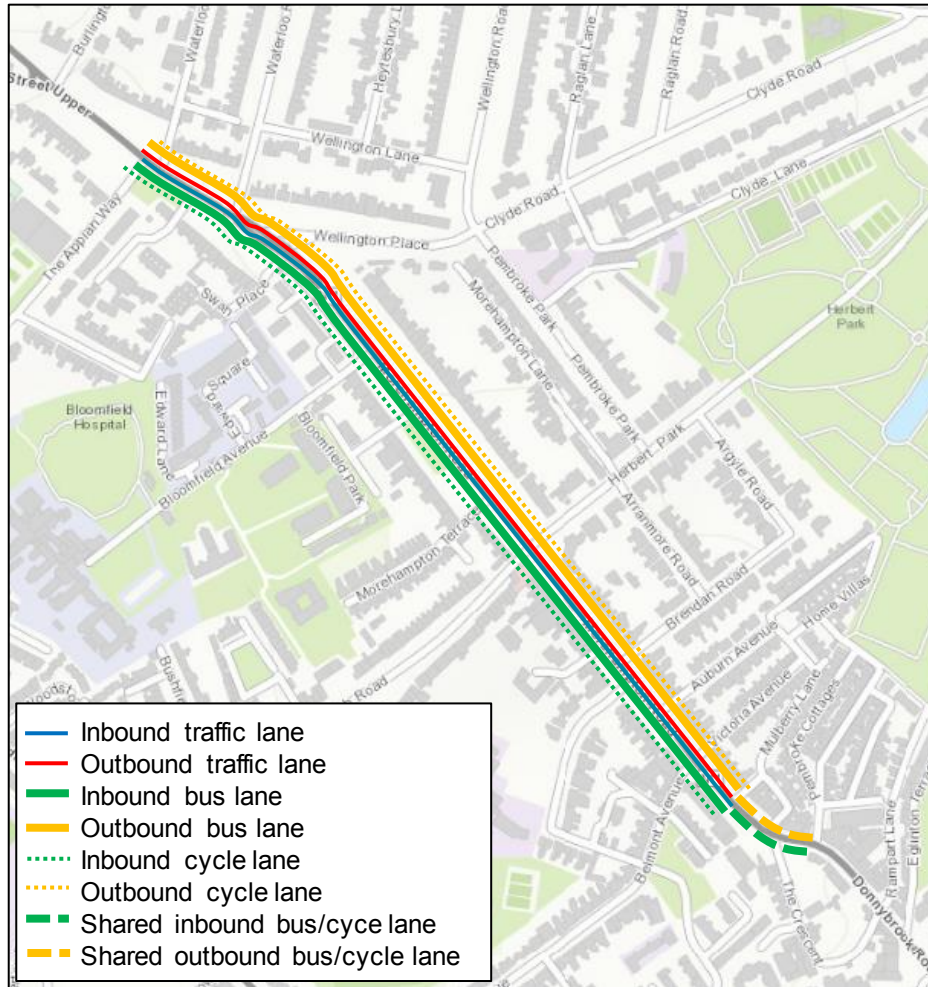


Figure 7.7: Scheme Option 1D2 bus and cycle facilities

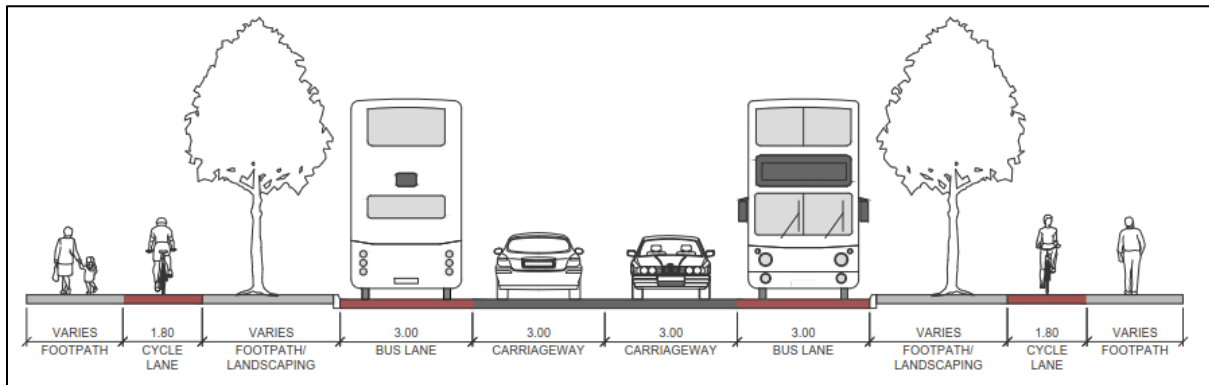


Figure 7.8: Scheme Option 1D2 – Typical Cross-section (when possible to maintain trees)

Scheme Option 1D2 will provide full bus and cycle facilities on both the inbound and outbound carriageways.

This scheme option will preserve trees (where possible), and thus most of the existing streetscape along the route, by altering the alignment of cycle lanes and configuration of bus stops.

Most of the on-street formal and informal car parking spaces will be removed to facilitate the proposed works.

The adjacent spaces in the car park located at the Crescent will not be affected by the proposed works.

7.4.5 Route Segment 1E3

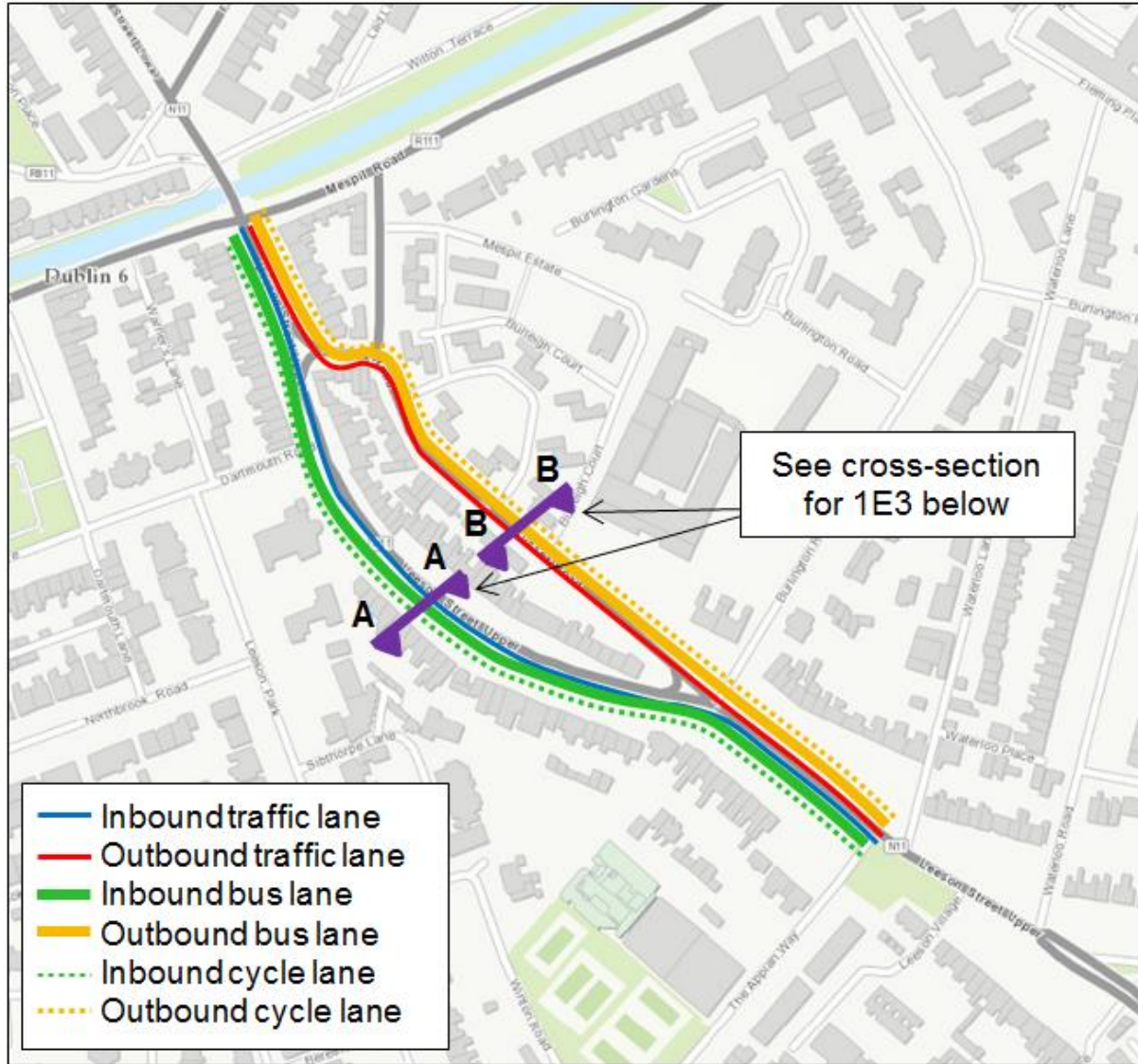


Figure 7.9: Scheme Option 1E3 bus and cycle facilities

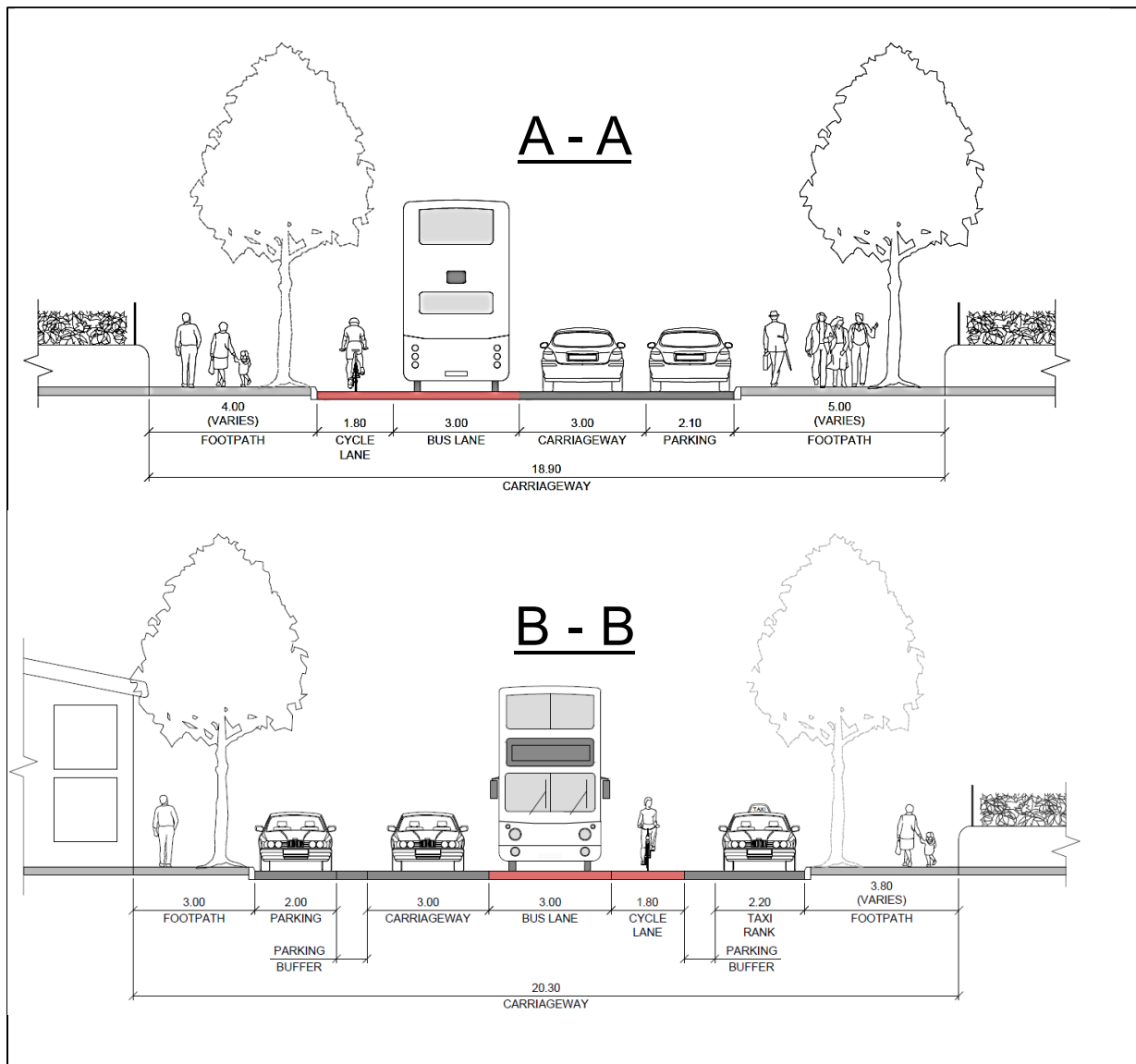


Figure 7.10: Scheme Option 1E3 –Cross-section

This scheme option will extend the one way traffic lane further on both the inbound and outbound sections before widening to two lanes (see **Appendix H** for scheme option design).

As a result, this option will have some impact upon the existing traffic flows.

Resurfacing will be required along with the provision of segregated bus and cycle lanes both inbound and outbound.

7.4.6 Traffic Staging

The junctions along the scheme route will be designed to prioritise bus movements. Proposals for the five main junctions along the route are illustrated in the figures below.

Figure 7.11 illustrates the proposed design for the Leeson Street Upper / Mespil Road junction. Buses travelling to UCD will be prioritised through a dedicated bus lane and a separate traffic signal stage. Buses travelling to City Centre will be prioritised through a dedicated bus lane and bus gate at the junction. Buses will be provide a separate traffic signal stage to other traffic movements, allowing them to cross the Grand Canal and rejoin a dedicated bus lane on Leeson Street Lower.

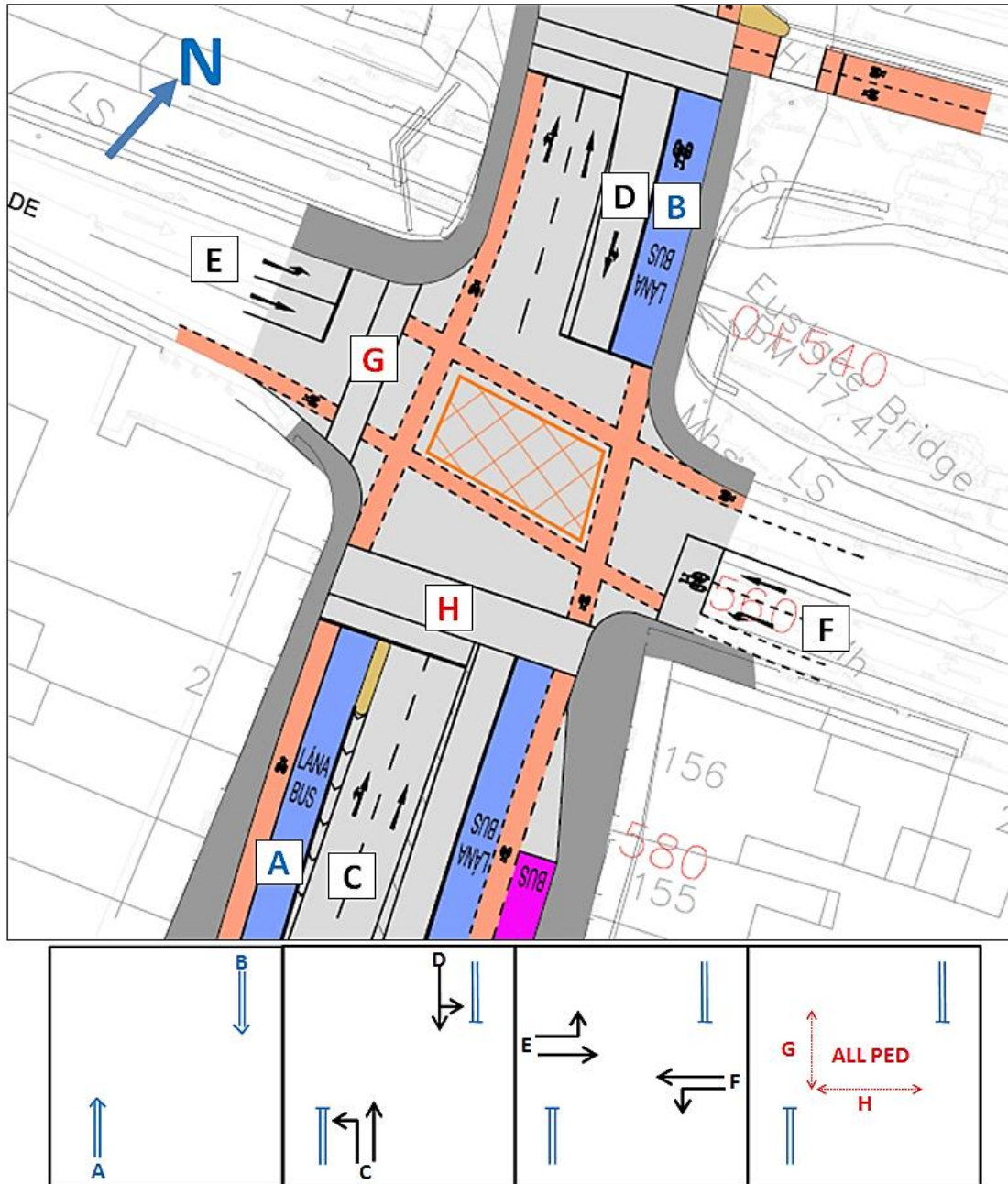


Figure 7.11: Leeson Street Upper / Mespil Road Junction Staging Diagram

Figure 7.12 illustrates the proposed design for the Donnybrook Road / Eglinton junction. Buses travelling to UCD will be prioritised through a dedicated bus lane and bus gate, which will provide a separate stage for buses to other traffic movements, together with a second stage with traffic. Buses travelling to City Centre will be prioritised through a dedicated bus lane and bus gate, which will provide a separate stage for buses to other traffic movements.

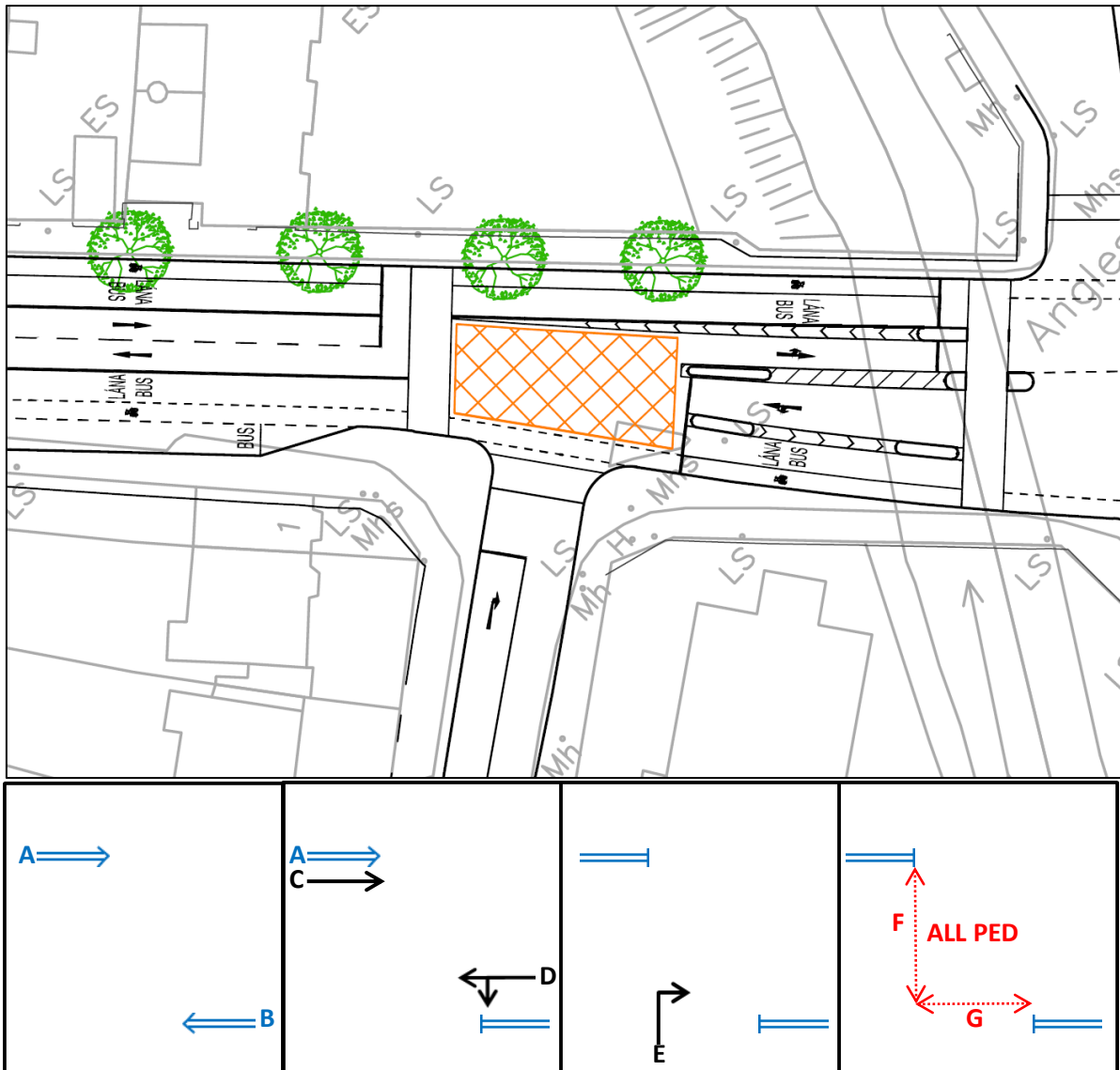


Figure 7.12: Donnybrook Road / Eglinton Junction Staging Diagram

Figure 7.13 illustrates the proposed design for the Stillorgan Road / Donnybrook Road junction. Buses travelling to UCD will be prioritised through a dedicated bus lane and bus gate, which will provide a separate stage for buses to other traffic movements. Buses travelling to City Centre will also be prioritised through a dedicated bus lane and bus gate, which will provide a separate stage for buses to other traffic movements.

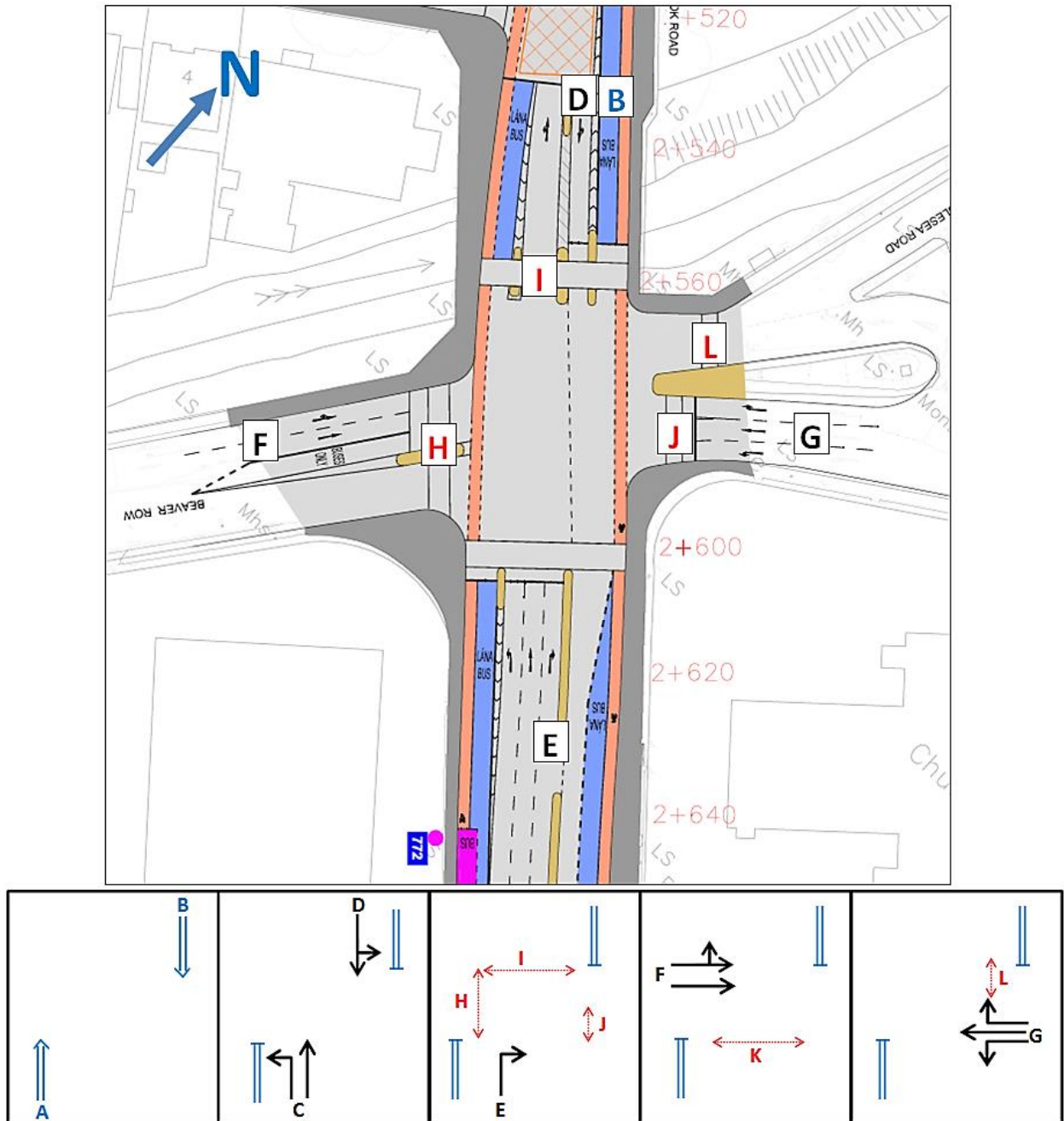


Figure 7.13: Stillorgan Road / Donnybrook Road Junction Staging Diagram

Figure 7.14 illustrates the proposed design for the Nutley Lane / Stillorggan Road junction. Buses travelling to UCD will be prioritised through a dedicated bus lane. Buses travelling to City Centre will be prioritised through a dedicated bus lane and bus gate, which will provide a separate stage for buses to other traffic movements.

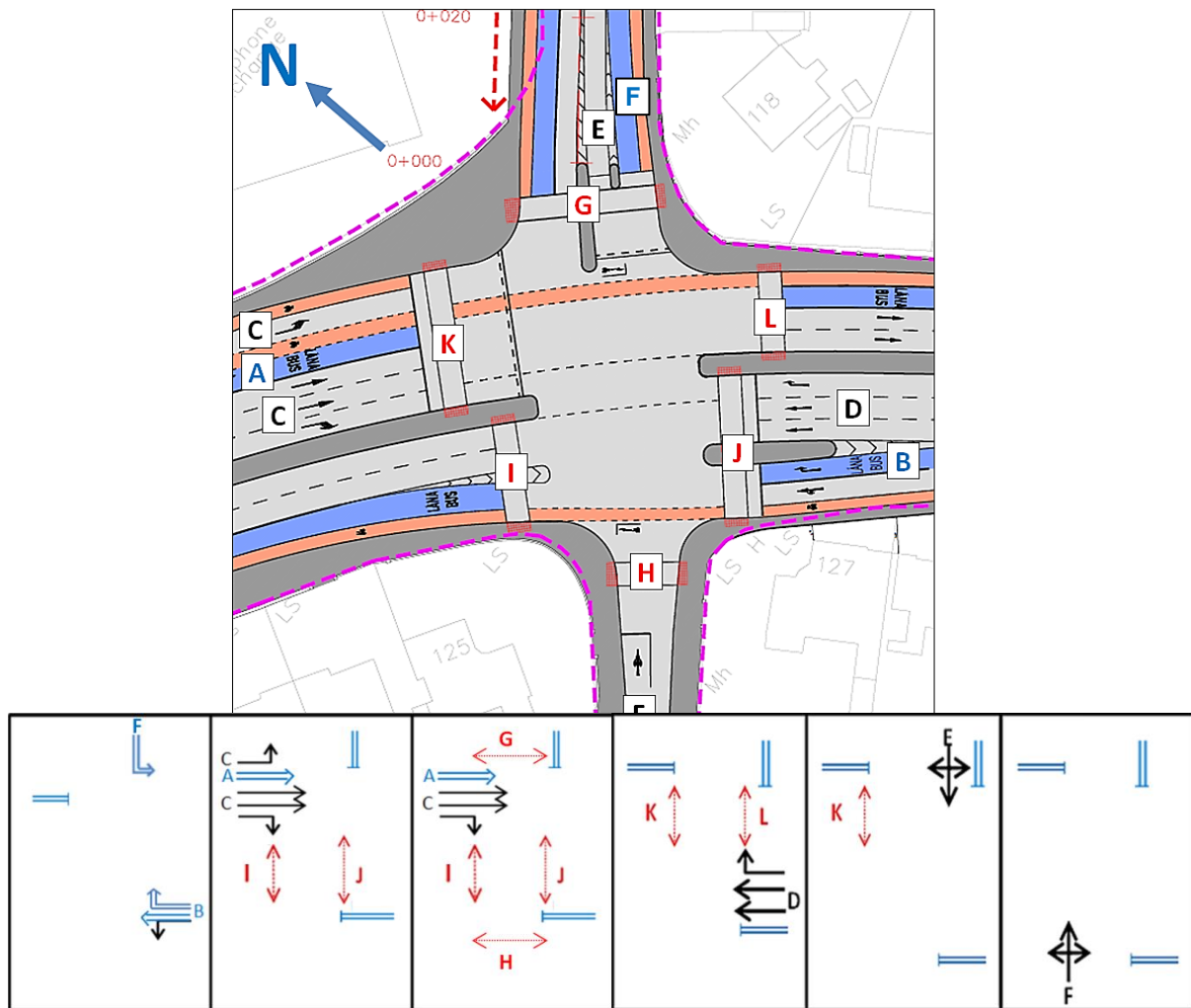


Figure 7.14: Nutley Lane / Stillorggan Road Junction Staging Diagram

Figure 7.15 illustrates the proposed design for the UCD / Stillorgan Road junction. Buses exiting UCD travelling to City Centre will be prioritised through a dedicated bus lane and bus gate, which will provide a separate stage for buses to other traffic movements.

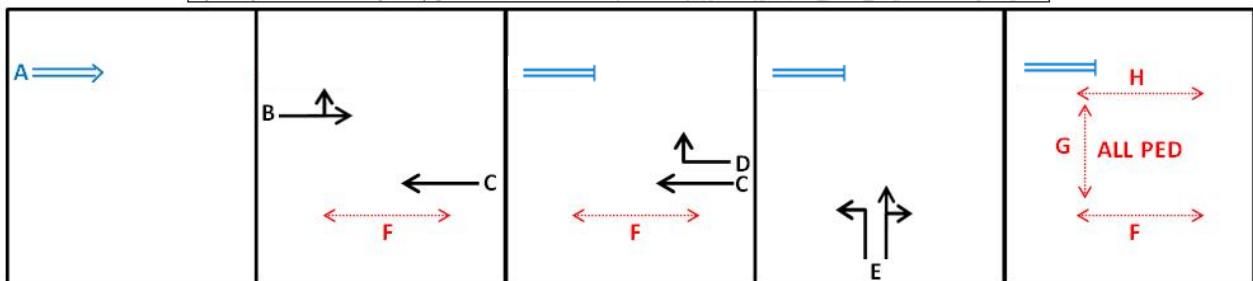
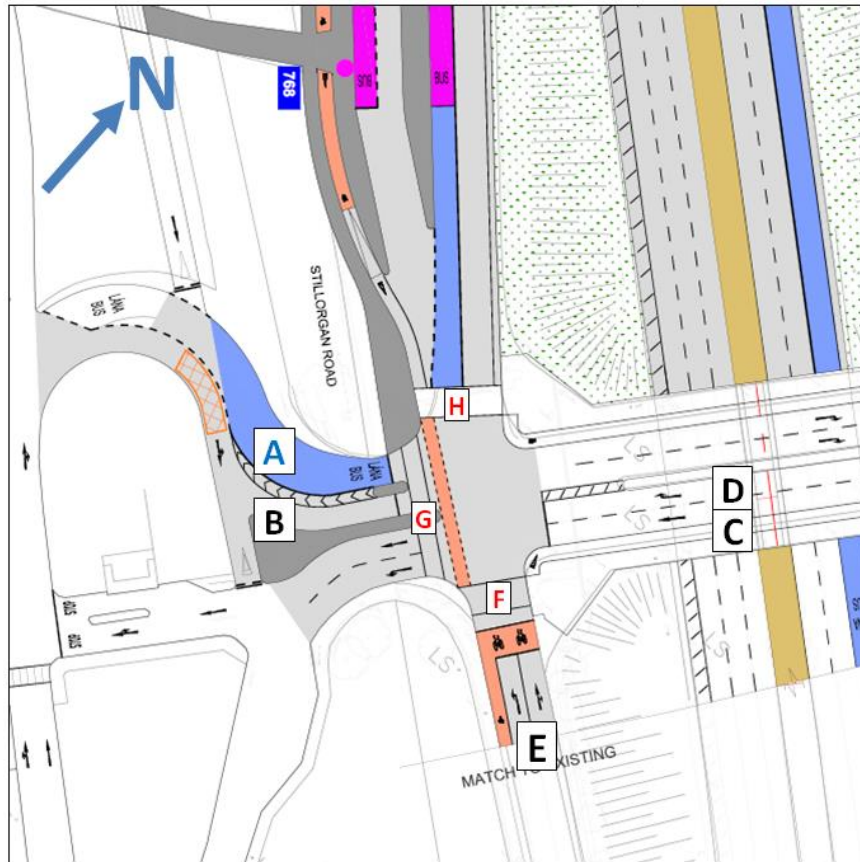


Figure 7.15: UCD / Stillorgan Road Junction Staging Diagram

7.4.7 Scheme Summary

The five Route Segments combine to form the overall emerging preferred scheme, illustrated in **Figure 7.16**.

With the exception of an approximately 155m section outbound and 175m section inbound, where buses mix with cyclists, segregated bus and cycle lanes are proposed in each direction along the entire route.

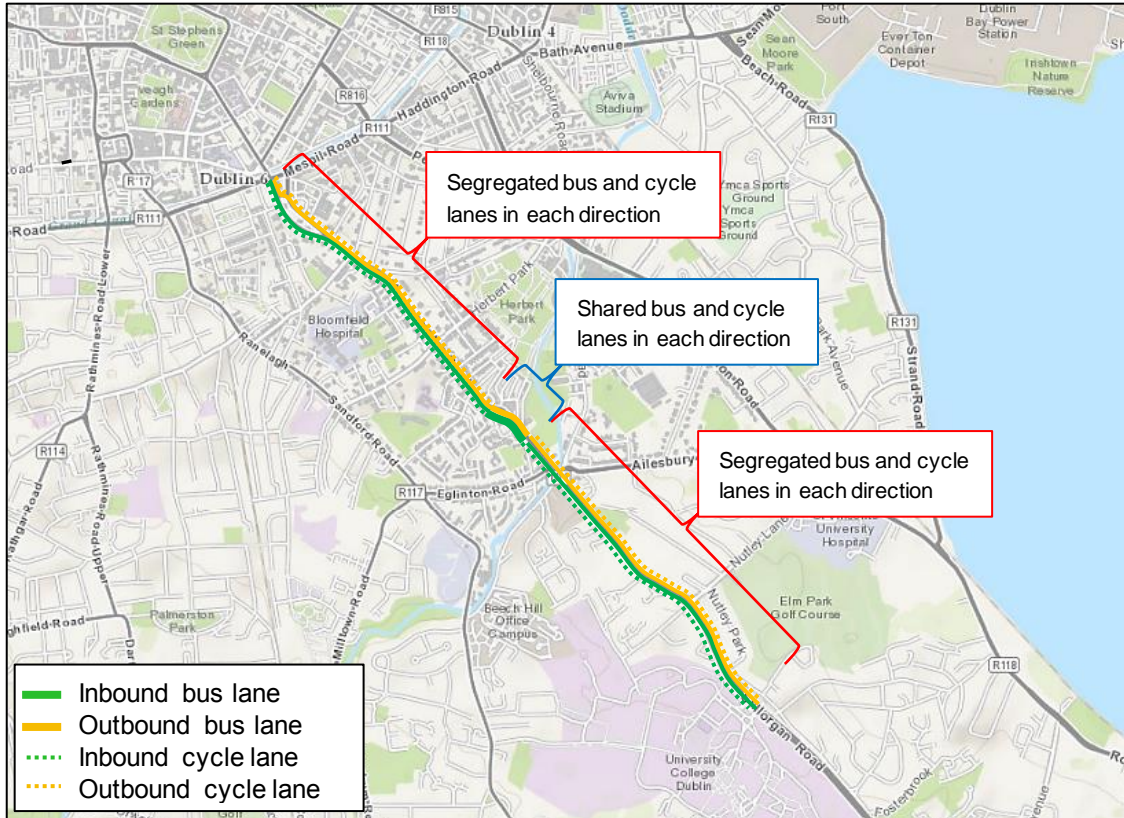


Figure 7.16: Overall Emerging Preferred Scheme

8. Feasibility Working Cost Estimate

8.1 High Level Cost Estimate

A cost estimate for the Emerging Preferred Option has been developed for the scheme and is indicated in **Table 8.1** below.

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

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

A detailed cost estimate and significant further work would be required to provide a more accurate cost at the subsequent stage of development.

This detailed estimate would need to allow for Risk, Contingencies and future inflation etc.

Table 8.1: Feasibility Working Cost Estimate for Emerging Preferred Scheme Option

Cost Type	Total Capital Cost Estimate
Infrastructural	€4.106M
Land Acquisition	€0.756M
Total	€4.862M

8.2 Exclusions

The high-level cost estimate for the emerging preferred route option does not consider:

- Land acquisition costs from parks and green spaces, including Waterville Park and Tolka Valley Park, have not been included;
- Professional Fees;
- Planning Costs;
- Marketing;
- Capital Contributions;
- Inflation;
- VAT;
- Costs associated with neighbouring proposed projects (e.g. Dun Laoghaire CBC);
- Potential city centre cellar works and acquisition of private landings;
- Administration and management costs; and
- Maintenance costs.

9. Emerging Preferred Scheme Benefits

The emerging preferred scheme option will deliver on-street infrastructure necessary to achieve practical continuous bus priority along the majority of the UCD to City Centre (St. Stephen's Green) CBC, though the provision of enhanced bus lanes.

This way, delays that currently occur along specific sections and at constrained locations will be removed/minimised enabling the bus to become a faster and more attractive alternative to car traffic along the route.

The bus system is envisaged to become more efficient and faster bus journeys mean that more people will be moved with the same level of vehicle and driver resources.

The emerging preferred scheme option will provide significantly enhanced cycle facilities with high Quality of Service along the route, as also required under the Greater Dublin Area Cycle Network Plan.

The emerging preferred scheme option design integrates with existing and future planned development and transport infrastructure schemes in the vicinity of the Study Area.

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

In summary, the emerging preferred scheme option will have the following benefits:

- Increased reliability and faster journey times due to bus priority in the vast majority of locations;
- Reduction of commuting time for public transport;
- Reduction of car congestion and enhancement of attractiveness of urban centres;
- Provision of safe cycling facilities and the opportunity for more people to cycle along the UCD to City Centre (St. Stephen's Green) CBC;
- Reconfiguration of existing junctions, which will provide considerable benefits for pedestrian accessibility and bus priority, making the bus routes more attractive;
- Interchange with neighbouring CBC routes i.e. Dun Laoghaire to City Centre Corridor via Ballsbridge to UCD bus connection;
- Ability to extend bus services southwards; and
- Serving important trip attractors.

10. Next Steps

This report has identified an emerging preferred scheme option for the bus infrastructure along this UCD to City Centre CBC (St. Stephen's Green) which a concept design has been developed.

The next project stage (The development of a Preliminary Design) will further refine and update the initial concept design along the route.

Further account will be taken of likely public transport service levels, particularly the bus service patterns and any changes to the overall bus network which may arise from the BusConnects Plan proposals.

The proposal will be amended, if and as required, to integrate any resultant changes.

The Preliminary Design will define the final practically achievable scheme for the bus corridor, taking into account more detailed studies of constraints, impacts and environmental assessment required at a local level.

Prior to finalisation of the UCD to City Centre (St. Stephen's Green) CBC scheme design, a public consultation process will be undertaken, with inputs and feedback received incorporated where practical and appropriate to do so.

The Preliminary Design will form the basis of the planning consent process for the scheme, which will require a development consent application to be made directly to An Bord Pleanála, due to the nature and extent of the proposed works.

Appendix A – Multi Criteria Analysis Tables

Table 1: SAS 1 Route 1A

MCA criteria	Assessment Sub-Criteria	Scheme Option 1A1	Scheme Option 1A2
Economy	1.a. Capital Cost	Capital Cost: €1.56M Length: 1.5km Cost/Km: 1.04M Indicative Scheme Infrastructure Works Cost - € 1.18M Land Acquisition Cost - € 0.38M - 252 sq.m. of residential land	Capital Cost: €1.56M Length: 1.5km Cost/Km: 1.04M Indicative Scheme Infrastructure Works Cost - € 1.18M Land Acquisition Cost - € 0.38M - 252 sq.m. of residential land
	Rank		
	1.b. Transport Reliability and Quality (Journey Time)	Journey Time: 4 mins both directions Length: 1.5km No. of signalised intersections: 2	Journey Time: 5 mins both directions Length: 1.5km No. of signalised intersections: 2
	Rank		
Integration	2.a. Land Use Integration	Integrates with existing / planned residential, medical and leisure uses in this established area.	Integrates with existing / planned residential, medical and leisure uses in this established area.
	Rank		
	2.b. Residential Population and Employment Catchments	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.
	Rank		
	2.c. Transport Network Integration	Potential for interchange with the Luas Green Line and neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.	Potential for interchange with the Luas Green Line and neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.
	Rank		
	2.d. Cycle Network Integration	Both directions of route 1A align with primary route 12 as identified in the GDA Cycle Network Plan. See report Section 2 Figure 2.2 and 2.3.	Both directions of route 1A align with primary route 12 as identified in the GDA Cycle Network Plan. See report Section 2 Figure 2.2 and 2.3.
	Rank		
2.e. Traffic Network Integration	This scheme option would consolidate existing facilities. Resurfacing would be required along with the provision of segregated cycle lanes both inbound and outbound. There are no parking spaces identified in this section which would be affected by the proposed works.	This scheme option would provide a new streetscape which would increase pedestrian facilities by widening the northern footpath whilst maintaining full bus and cyclist facilities. This is achieved by extending the outbound one lane configuration before widening to two lanes. There are no parking spaces identified in this section which would be affected by the proposed works. The extension of one lane would have some impact upon the existing traffic network.	
Rank			

Accessibility & Social Inclusion	3.a. Key Trip Attractors (Education/Health/Commercial/Employment)	Both scheme options follow the same route and hence, serve the same trip attractors.	Both scheme options follow the same route and hence, serve the same trip attractors.
	Rank		
	3.b. Deprived Geographic Areas	This option primarily serves areas considered affluent, marginally above and marginally below as identified in the Pobal Deprivation Index.	This option primarily serves areas considered affluent, marginally above and marginally below as identified in the Pobal Deprivation Index.
	Rank		
Safety	4.a. Road Safety	No. of Junctions: 2 <u>Turning movements:</u> Inbound: No turning movements required Outbound: 1 right turn movement required	No. of Junctions: 2 <u>Turning movements:</u> Inbound: No turning movements required Outbound: 1 right turn movement required Scheme Option 1A2 would increase footpath width, providing safer facilities for pedestrians and those accessing public transport. Hence, this scheme option scores higher.
	Rank		
Physical Activity	5.a Physical Activity	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.
	Rank		
Environment	6.a. Archaeology and Cultural Heritage	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.
	Rank		
	6.b. Architectural Heritage	1 protected structure fronting onto Stillorgan Road.	1 protected structure fronting onto Stillorgan Road.
	Rank		
	6.c. Flora & Fauna	No appreciable impacts	No appreciable impacts
	Rank		
	6.d. Soils and Geology	No appreciable impacts	No appreciable impacts
	Rank		
	6.e. Hydrology	No appreciable impacts	No appreciable impacts
	Rank		
	6.f. Landscape and Visual	Scheme Option 1A2 scored higher as it would provide a wider pedestrian facility, improving the streetscape in front of Donnybrook Parish Church	Scheme Option 1A2 scored higher as it would provide a wider pedestrian facility, improving the streetscape in front of Donnybrook Parish Church
	Rank		
	6.g. Air Quality	No appreciable impacts	No appreciable impacts
	Rank		
6.h. Noise & Vibration	No appreciable impacts	No appreciable impacts	
Rank			
6.i. Land Use Character	No appreciable impacts	No appreciable impacts	
Rank			

Table 2: SAS 1 Route 1B

MCA criteria	Assessment Sub-Criteria	Scheme Option 1B1	Scheme Option 1B2	Scheme Option 1B3
Economy	1.a. Capital Cost	Capital Cost: €0.33M Length: 0.3km Cost/Km: 1.1M Indicative Scheme Infrastructure Works Cost - € 0.33M Land Acquisition Cost - € 0 - 0 sq.m. of residential land	Capital Cost: €0.57M Length: 0.3km Cost/Km: 1.9M Indicative Scheme Infrastructure Works Cost - € 0.45M Land Acquisition Cost - € 0.12M - 81 sq.m. of land	Capital Cost: €0.87M Length: 0.3km Cost/Km: 2.9M Indicative Scheme Infrastructure Works Cost - € 0.49M Land Acquisition Cost - € 0.38m - 252 sq.m. of land
	Rank			
	1.b. Transport Reliability and Quality (Journey Time)	Journey Time: 2 mins both directions Length: 0.3km No. of signalised intersections: 1	Journey Time: 1 mins inbound and 2 mins outbound Length: 0.3km No. of signalised intersections: 1	Journey Time: 1 mins inbound and outbound Length: 0.3km No. of signalised intersections: 1
	Rank			
Integration	2.a. Land Use Integration	Integrates with existing / planned residential, educational, medical and leisure uses in this established area.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area.
	Rank			
	2.b. Residential Population and Employment Catchments	All scheme options follow the same route and hence, serve the same trip attractors.	All scheme options follow the same route and hence, serve the same trip attractors.	All scheme options follow the same route and hence, serve the same trip attractors.
	Rank			
	2.c. Transport Network Integration	All scheme options have potential for interchange with neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.	All scheme options have potential for interchange with neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.	All scheme options have potential for interchange with neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.
	Rank			
	2.d. Cycle Network Integration	Both directions of route 1B align with primary route 12 as identified in the GDA Cycle Network Plan. Cyclist share with buses in both directions. See report Section 2 Figure 2.2 and 2.3.	Both directions of route 1B align with primary route 12 as identified in the GDA Cycle Network Plan. Scheme Option 1B2 scores higher than 1B1 due to the proposed segregated inbound cycle lane. See report Section 2 Figure 2.2 and 2.3.	Both directions of route 1B align with primary route 12 as identified in the GDA Cycle Network Plan. Scheme Option 1B3 scores highest due to the proposed segregated inbound and outbound cycle lanes. See report Section 2 Figure 2.2 and 2.3.
	Rank			
2.e. Traffic Network Integration	Scheme Option 1B1 proposals include cyclists and buses sharing exclusive lanes on both the inbound and outbound carriageways throughout the section. The provision of the exclusive lanes would require reducing the number of outbound traffic lanes from two to one. There are no parking spaces identified in this section which would be affected by the proposed works.	Scheme Option 1B2 proposals include segregated cyclist facilities and an exclusive bus lane on the inbound carriageway. On the outbound carriageway cyclists and buses share an exclusive lane. The provision of the exclusive lanes would require reducing the number of outbound traffic lanes from two to one. There are no parking spaces identified in this section which would be affected by the proposed works.	Scheme Option 1B3 proposals include segregated cyclist and bus facilities inbound and outbound. The provision of the exclusive lanes would require reducing the number of outbound traffic lanes from two to one. There are no parking spaces identified in this section which would be affected by the proposed works.	
Rank				

Accessibility & Social Inclusion	3.a. Key Trip Attractors (Education/Health/Commercial/Employment)	All scheme options follow the same route and hence, serve the same trip attractors.	All scheme options follow the same route and hence, serve the same trip attractors.	All scheme options follow the same route and hence, serve the same trip attractors.
	Rank			
	3.b. Deprived Geographic Areas	This option primarily serves areas considered marginally above as identified in the Pobal Deprivation Index.	This option primarily serves areas considered marginally above as identified in the Pobal Deprivation Index.	This option primarily serves areas considered marginally above as identified in the Pobal Deprivation Index.
	Rank			
Safety	4.a. Road Safety	No. of Junctions: 1 <u>Turning movements:</u> Inbound: No turning movements required Outbound: No turning movements required Scheme Option 1B1 provides the lowest protection for cyclists, who share with buses inbound and outbound.	No. of Junctions: 1 <u>Turning movements:</u> Inbound: No turning movements required Outbound: No turning movements required Scheme Option 1B2 is safer than 1B1 due to the segregation of cyclists and buses in the inbound direction.	No. of Junctions: 1 <u>Turning movements:</u> Inbound: No turning movements required Outbound: No turning movements required Scheme Option 1B3 is the safest option due to the segregation of cyclists and buses in the inbound and outbound direction.
	Rank			
Physical Activity	5.a Physical Activity	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.
	Rank			
Environment	6.a. Archaeology and Cultural Heritage	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.
	Rank			
	6.b. Architectural Heritage	No appreciable impacts	No appreciable impacts	No appreciable impacts
	Rank			
	6.c. Flora & Fauna	Scheme Option 1B1 would impact on approximately existing tree.	Scheme Option 1B2 would impact on approximately two existing trees.	Scheme Option 1B3 would impact on approximately two existing trees.
	Rank			
	6.d. Soils and Geology	No appreciable impacts	No appreciable impacts	No appreciable impacts
	Rank			
	6.e. Hydrology	No appreciable impacts	No appreciable impacts	No appreciable impacts
	Rank			
	6.f. Landscape and Visual	Road widening would impact upon approximately one tree, affecting streetscape.	Road widening and landtake would impact upon approximately two trees, affecting streetscape. However, inbound cycle lane provides improved multi-modal streetscape.	Road widening and landtake would impact upon approximately two trees, affecting streetscape. However, inbound and outbound cycle lanes provide improved multi-modal streetscape.
	Rank			
	6.g. Air Quality	All scheme options would require reducing the number of outbound traffic lanes from two to one, thereby improving air quality.	All scheme options would require reducing the number of outbound traffic lanes from two to one, thereby improving air quality.	All scheme options would require reducing the number of outbound traffic lanes from two to one, thereby improving air quality.
	Rank			
6.h. Noise & Vibration	All scheme options would require reducing the number of outbound traffic lanes from two to one, thereby reducing noise and vibration.	All scheme options would require reducing the number of outbound traffic lanes from two to one, thereby reducing noise and vibration.	All scheme options would require reducing the number of outbound traffic lanes from two to one, thereby reducing noise and vibration.	
Rank				

	6.i. Land Use Character	No existing on-street parking.	No existing on-street parking. On-street loading bay maintained. Some impact on adjacent parking.	No existing on-street parking. On-street loading bay maintained. Some impact on adjacent parking.
	Rank			

Table 3: SAS 1 Route 1C

MCA criteria	Assessment Sub-Criteria	Scheme Option 1C1	Scheme Option 1C2
Economy	1.a. Capital Cost	<p>Indicative Scheme Infrastructure Works Cost</p> <ul style="list-style-type: none"> - € 0.0715M <p>Land Acquisition Cost</p> <ul style="list-style-type: none"> - € 0 - 0 sq.m. of residential land 	<p>Indicative Scheme Infrastructure Works Cost</p> <ul style="list-style-type: none"> - € 0.275M <p>Land Acquisition Cost</p> <p>In 2013, 2 no. properties (No. 30-32 and 34 Main Street, Donnybrook) were costed for full acquisition. The combined estimated total price for full acquisition of both properties was €2,725,000. There are a further 6 properties within and bordering 1C2 that would require consideration for acquisition to implement the configuration of Scheme Option 1C2.</p>
	Rank		
	1.b. Transport Reliability and Quality (Journey Time)	<p>Journey Time: 60 - 90 seconds both directions</p> <p>Length: 0.11km</p> <p>No. of signalised intersections: 0</p>	<p>Journey Time: 30 - 60 seconds both directions</p> <p>Length: 0.11km</p> <p>No. of signalised intersections:0</p>
	Rank		
Integration	2.a. Land Use Integration	Maintains existing land use characteristics.	Street widening will require landtake which will affect buildings to the east of Donnybrook. The buildings are zoned as Z4: To provide for and improve mixed-services facilities. Potential for likely significant impacts on property owners and businesses.
	Rank		
	2.b. Residential Population and Employment Catchments	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.
	Rank		
	2.c. Transport Network Integration	Both scheme options have potential for interchange with neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.	Both scheme options have potential for interchange with neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.
	Rank		
	2.d. Cycle Network Integration	<p>Both directions of route 1C align with primary route 12 as identified in the GDA Cycle Network Plan.</p> <p>See report Section 2 Figure 2.2 and 2.3.</p> <p>This scheme option proposes a shared bus and cycle lane in both directions and hence, scores lower than Scheme Option 1C2.</p>	<p>Both directions of route 1C align with primary route 12 as identified in the GDA Cycle Network Plan.</p> <p>See report Section 2 Figure 2.2 and 2.3.</p> <p>This scheme option proposes segregated inbound and outbound cycle lanes.</p>
	Rank		
2.e. Traffic Network Integration	Both scheme options would maintain one inbound traffic lane and reduce the existing two outbound traffic lanes to one.	Both scheme options would maintain one inbound traffic lane and reduce the existing two outbound traffic lanes to one.	
Rank			
Accessibility & Social Inclusion	3.a. Key Trip Attractors (Education/Health/Commercial/Employment)	Both scheme options follow the same route and hence, serve the same trip attractors.	Both scheme options follow the same route and hence, serve the same trip attractors.
	Rank		
	3.b. Deprived Geographic Areas	This option primarily serves an area considered affluent in the Pobal Deprivation Index.	This option primarily serves an area considered affluent in the Pobal Deprivation Index.
	Rank		

Safety	4.a. Road Safety	No. of Junctions: 0 (1 pedestrian crossing) <u>Turning movements:</u> Inbound: No turning movements required Outbound: No turning movements required Scheme Option 1C1 would mix cyclists with buses and hence, scores lower.	No. of Junctions: 0 (1 pedestrian crossing) <u>Turning movements:</u> Inbound: No turning movements required Outbound: No turning movements required Scheme Option 1C2 would segregate buses and cyclists and hence, scores higher.
	Rank		
Physical Activity	5.a Physical Activity	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.
	Rank		
Environment	6.a. Archaeology and Cultural Heritage	The following records are located adjacent to Donnybrook Rd; Enclosure DU018-060021, 16th/17th century DU018-060001, Ecclesiastical enclosure DU018-060009, House (fortified) DU018-060020 and Windmill DU018-060006. As further information is not available on the state of these records, it is unclear if they still exist. It is not likely that significant environmental affects will occur from the extent of the proposed works. An 18th/19th Century house (DU018-061) is also recorded on the corner of Morehampton Rd and Belmont Avenue and is marked as a Site of Archaeological Interest in the Dublin City Development Plan (DCDP) 2016-2022. Donnybrook Rd is also within a Zone of Archaeological Interest as designated in the DCDP. Ground works may therefore result in impacts.	The following records are located adjacent to Donnybrook Rd; Enclosure DU018-060021, 16th/17th century DU018-060001, Ecclesiastical enclosure DU018-060009, House (fortified) DU018-060020 and Windmill DU018-060006. As further information is not available on the state of these records, it is unclear if they still exist. It is not likely that significant environmental affects will occur from the extent of the proposed works. An 18th/19th Century house (DU018-061) is also recorded on the corner of Morehampton Rd and Belmont Avenue and is marked as a Site of Archaeological Interest in the Dublin City Development Plan (DCDP) 2016-2022. Donnybrook Rd is also within a Zone of Archaeological Interest as designated in the DCDP. Ground works may therefore result in impacts.
	Rank		
	6.b. Architectural Heritage	The houses along Belmont Avenue and Mount Eden Road are within an Architectural Conservation Area as illustrated in the DCDP zoning maps. Three protected structures are also indicated on the DCDP maps; a house at 2 Belmont Avenue, The Old Magdalene Laundry at The Crescent and The Irish Sisters of Charity Chapel at The Crescent. Significant impacts are not likely.	The houses along Belmont Avenue and Mount Eden Road are within an Architectural Conservation Area as illustrated in the DCDP zoning maps. Three protected structures are also indicated on the DCDP maps; a house at 2 Belmont Avenue, The Old Magdalene Laundry at The Crescent and The Irish Sisters of Charity Chapel at The Crescent. Significant impacts are not likely.
	Rank		
	6.c. Flora & Fauna	There are no trees along Route 1C which could be impacted.	There are no trees along Route 1C which could be impacted.
	Rank		
	6.d. Soils and Geology	No appreciable impacts	No appreciable impacts
	Rank		
	6.e. Hydrology	No appreciable impacts.	No appreciable impacts
	Rank		
6.f. Landscape and Visual	Maintains existing streetscape of Donnybrook Village.	No protected views will be affected. Widening of the street (R138) including the landtake of building fronts may have a significant impact due to the removal of well known, recognised establishments in a mature streetscape that have been present for decades.	
Rank			
6.g. Air Quality	There is expected to be minimal change in air quality due to increased bus load. Impacts may occur from construction and alteration of buildings.	There is expected to be minimal change in air quality due to increased bus load. Impacts may occur from construction and alteration of buildings.	
Rank			

	6.h. Noise & Vibration	There is expected to be minimal change in noise and vibration due to increased bus load. Short term impacts may occur from construction and demolition of buildings.	There is expected to be minimal change in noise and vibration due to increased bus load. Short term impacts may occur from construction and demolition of buildings.
	Rank		
	6.i. Land Use Character	There are no parking spaces along Route 1C which would be affected by the proposed works.	There are no parking spaces along Route 1C which would be affected by the proposed works.
	Rank		

Table 4 SAS 1 Route 1D

MCA criteria	Assessment Sub-Criteria	Scheme Option 1D1	Scheme Option 1D2
Economy	1.a. Capital Cost	Capital Cost: €1.38M Length: 1km Cost/Km: 1.38M Indicative Scheme Infrastructure Works Cost - € 1.38M Land Acquisition Cost - € 0 - 0 sq.m. of residential land	Capital Cost: €1.38M Length: 1km Cost/Km: 1.38M Indicative Scheme Infrastructure Works Cost - € 1.38M Land Acquisition Cost - € 0 - 0 sq.m. of residential land
	Rank		
	1.b. Transport Reliability and Quality (Journey Time)	Journey Time: 4 mins both directions Length: 1km No. of signalised intersections: 4	Journey Time: 4 mins both directions Length: 1km No. of signalised intersections: 4
	Rank		
Integration	2.a. Land Use Integration	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. However, Scheme Option 1D2 has been designed to take consideration of the areas zoning as a Residential Neighbourhood (Conservation Area) by the Dublin City Development Plan 2016-2022.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. Scheme Option 1D2 has been designed to take consideration of the areas zoning as a Residential Neighbourhood (Conservation Area) by the Dublin City Development Plan 2016-2022.
	Rank		
	2.b. Residential Population and Employment Catchments	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.
	Rank		
	2.c. Transport Network Integration	Both scheme options have potential for interchange with neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.	Both scheme options have potential for interchange with neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.
	Rank		
	2.d. Cycle Network Integration	Both directions of route 1D align with primary route 12 as identified in the GDA Cycle Network Plan. See report Section 2 Figure 2.2 and 2.3.	Both directions of route 1D align with primary route 12 as identified in the GDA Cycle Network Plan. See report Section 2 Figure 2.2 and 2.3.
	Rank		
2.e. Traffic Network Integration	Both scheme options maintain one lane of traffic in both directions.	Both scheme options maintain one lane of traffic in both directions.	
	Rank		
Accessibility & Social Inclusion	3.a. Key Trip Attractors (Education/Health/Commercial/Employment)	Both scheme options follow the same route and hence, serve the same trip attractors.	Both scheme options follow the same route and hence, serve the same trip attractors.
	Rank		

	3.b. Deprived Geographic Areas	This option primarily serves areas considered affluent and very affluent in the Pobal Deprivation Index.	This option primarily serves areas considered affluent and very affluent in the Pobal Deprivation Index.
	Rank		
Safety	4.a. Road Safety	No. of Junctions: 4 <u>Turning movements:</u> Inbound: No turning movements required Outbound: No turning movements required	No. of Junctions: 4 <u>Turning movements:</u> Inbound: No turning movements required Outbound: No turning movements required
	Rank		
Physical Activity	5.a Physical Activity	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.
	Rank		
Environment	6.a. Archaeology and Cultural Heritage	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.
	Rank		
	6.b. Architectural Heritage	Approx. 75 protected structures front onto Morehampton Road.	Approx. 75 protected structures front onto Morehampton Road.
	Rank		
	6.c. Flora & Fauna	The installation of cycle lanes running adjacent to the carriageway would require the removal of approximately 38 existing trees along the route segment. It unlikely that these trees are of roosting importance for bats.	This scheme option would remove approximately 15 trees along this route segment. It unlikely that these trees are of roosting importance for bats.
	Rank		
	6.d. Soils and Geology	No appreciable impacts	No appreciable impacts
	Rank		
	6.e. Hydrology	No appreciable impacts.	No appreciable impacts
	Rank		
	6.f. Landscape and Visual	The installation of cycle lanes adjacent to the carriageway would require the removal of the majority of the existing treeline that frames the route segment, impacting upon the streetscape.	This option would have a lesser impact on existing treeline which forms the streetscape.
	Rank		
	6.g. Air Quality	Existing route carries bus traffic already.	Existing route carries bus traffic already.
Rank			
6.h. Noise & Vibration	Existing route carries bus traffic already.	Existing route carries bus traffic already.	
Rank			
6.i. Land Use Character	Both scheme options require the removal of the majority of on-street car parking.	Both scheme options require the removal of the majority of on-street car parking.	
Rank			

Table 5: SAS 1 Route 1E

MCA criteria	Assessment Sub-Criteria	Scheme Option 1E1	Scheme Option 1E2	Scheme Option 1E3
Economy	1.a. Capital Cost	Capital Cost: €0.99M Length: 0.55km Cost/Km: 1.8M Indicative Scheme Infrastructure Works Cost - €0.99M Land Acquisition Cost - € 0 - 0 sq.m. of residential land	Capital Cost: €1.63M Length: 0.55km Cost/Km: 2.96M Indicative Scheme Infrastructure Works Cost - € 1.63M Land Acquisition Cost - € 0 - 0 sq.m. of residential land	Capital Cost: €0.99M Length: 0.55km Cost/Km: 1.8M Indicative Scheme Infrastructure Works Cost - €0.99M Land Acquisition Cost - € 0 - 0 sq.m. of residential land
	Rank			
	1.b. Transport Reliability and Quality (Journey Time)	Journey Time: 3 mins both directions Length: 0.55km No. of signalised intersections: 4	Journey Time: 3 mins both directions Length: 0.55km No. of signalised intersections: 4	Journey Time: 3 mins both directions Length: 0.55km No. of signalised intersections: 4
Rank				
Integration	2.a. Land Use Integration	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. However, Scheme Option 1E3 has been designed to take consideration of part of the routes zoning as a Residential Neighbourhood (Conservation Area) by the Dublin City Development Plan 2016-2022.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. However, Scheme Option 1E3 has been designed to take consideration of part of the routes zoning as a Residential Neighbourhood (Conservation Area) by the Dublin City Development Plan 2016-2022.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. Scheme Option 1E3 has been designed to take consideration of part of the routes zoning as a Residential Neighbourhood (Conservation Area) by the Dublin City Development Plan 2016-2022.
	Rank			
	2.b. Residential Population and Employment Catchments	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.	Both scheme options use the same bus stops, hence the residential and employment catchments are the same.
	Rank			
	2.c. Transport Network Integration	Potential for interchange with the Luas Green Line and neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.	Potential for interchange with the Luas Green Line and neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.	Potential for interchange with the Luas Green Line and neighbouring Core Bus Corridors i.e. Dun Laoghaire to City Centre CBC.
	Rank			
	2.d. Cycle Network Integration	Both directions of route 1E align with primary route 12 as identified in the GDA Cycle Network Plan. See report Section 2 Figure 2.2 and 2.3.	Both directions of route 1E align with primary route 12 as identified in the GDA Cycle Network Plan. See report Section 2 Figure 2.2 and 2.3.	Both directions of route 1E align with primary route 12 as identified in the GDA Cycle Network Plan. See report Section 2 Figure 2.2 and 2.3.
	Rank			
2.e. Traffic Network Integration	This scheme option would consolidate the existing facilities. Resurfacing would be required along with the provision of segregated bus and cycle lanes both inbound and outbound.	This scheme option proposes using bus gates at both ends of Sussex Road to separate buses, cyclists and other forms of traffic along either Sussex Road or Leeson Street Upper i.e. to convert either of these streets into an exclusively bus and cyclist only section. As the buses approach the bus gates, traffic signals stop traffic which allows buses and cyclists priority access through the junction. This arrangement would involve either outbound or inbound (depending on whether Leeson Street	This scheme option would extend the one way traffic lane further on both the inbound and outbound section before widening to two lanes. As a result, this option would have some impact upon the existing traffic flows. Resurfacing would be required along with the provision of segregated bus and cycle lanes both inbound and outbound.	

			Upper or Sussex Road is used for bus and cyclist exclusively) buses and cyclists to cross into/out of the exclusive section. This priority movement (buses and cyclists) would require traffic in both directions to be stop to facilitate the cross-over at either end of Sussex Road, causing a significant impact on traffic. Furthermore, an exclusive bus and cycle street would remove or restrict access for traffic to the existing side streets off either Leeson Street Upper or Sussex Road.	
	Rank			
Accessibility & Social Inclusion	3.a. Key Trip Attractors (Education/Health/Commercial/Employment)	Both scheme options follow the same route and hence, serve the same trip attractors.	Both scheme options follow the same route and hence, serve the same trip attractors.	Both scheme options follow the same route and hence, serve the same trip attractors.
	Rank			
	3.b. Deprived Geographic Areas	This option primarily serves areas considered affluent, very affluent and marginally above in the Pobal Deprivation Index.	This option primarily serves areas considered affluent, very affluent and marginally above in the Pobal Deprivation Index.	This option primarily serves areas considered affluent, very affluent and marginally above in the Pobal Deprivation Index.
	Rank			
Safety	4.a. Road Safety	No. of Junctions: 4 <u>Turning movements:</u> Inbound: No turning movements required Outbound: No turning movements required	No. of Junctions: 4 <u>Turning movements:</u> Inbound: 1 turning movements required Outbound: 1 turning movements required Due to the segregation of buses and cyclists from vehicular traffic along different routes, Scheme Option 1E2 offers greater safety benefits over other scheme options.	No. of Junctions: 4 <u>Tuning movements:</u> Inbound: No turning movements required Outbound: No turning movements required Due the reduction in traffic lanes from two lanes to one lane along parts of the route, there is an improvement in safety for road users.
	Rank			
Physical Activity	5.a Physical Activity	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.
	Rank			
Environment	6.a. Archaeology and Cultural Heritage	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.	Route 1 is in immediate proximity to 15 recorded monuments , including Stephen's Green, which is a National Monument . This scheme option would not impact on any of the recorded monuments.
	Rank			
	6.b. Architectural Heritage	Approx. 65 protected structures front onto Leeson St Upper.	Approx. 65 protected structures front onto Leeson St Upper.	Approx. 65 protected structures front onto Leeson St Upper.
	Rank			
	6.c. Flora & Fauna	Some impact on existing trees (approximately 16 trees removed).	Some impact on existing trees (approximately 16 trees removed).	Lesser impact on existing trees (approximately 6 trees removed).
	Rank			
	6.d. Soils and Geology	Minimum impact.	Minimum impact.	Minimum impact.
	Rank			

	6.e. Hydrology	Route crosses the Grand Canal. No appreciable impacts expected due to designs being within existing bridge width.	Route crosses the Grand Canal. No appreciable impacts expected due to designs being within existing bridge width.	Route crosses the Grand Canal. No appreciable impacts expected due to designs being within existing bridge width.
	Rank			
	6.f. Landscape and Visual	Some impact upon trees along the route and thus streetscape along the route (approximately 16 trees removed)..	Bus only street requiring introduction of new signage and road delineation strategy. In addition, some impact on tree and thus streetscape along the route (approximately 16 trees removed).	Lesser impact on existing trees line and thus scheme options maintains a key aspect of the existing streetscape (approximately 6 trees removed)..
	Rank			
	6.g. Air Quality	Minimum impact.	Minimum impact.	Minimum impact.
	Rank			
	6.h. Noise & Vibration	Minimum impact.	Minimum impact.	Minimum impact.
	Rank			
	6.i. Land Use Character	Some parking provisions affected by scheme option.	Some parking provisions affected by the scheme option. Furthermore, an exclusive bus and cycle street would remove traffic access to parking on either Leeson Street Upper or Sussex Road.	Some parking provisions affected by the scheme option.
	Rank			

Appendix B – Data Collection



1. Study area visit

Each of the route sections were visited / driven and audited to identify any constraints which may not have been evident from maps and drawings. The site visits enabled a comprehensive evaluation of the route options in terms of their capacity to accommodate of a core bus corridor.

2. Land Use and Planning

The land use assessment was carried out using GIS and examined private and public land along the different route options. This information was used for developing cost estimates for each of the route options, based on the area and nature (public or private) of the land acquisition required. The land use assessment results are presented in the MCA tables in Appendix A.

3. Existing Bus Lanes

A map indicating the existing bus lanes throughout the CBC study area was produced to highlight sections of the corridor already capable of accommodating segregated facilities. Blue routes indicate inbound bus lanes while red routes indicated outbound bus lanes.

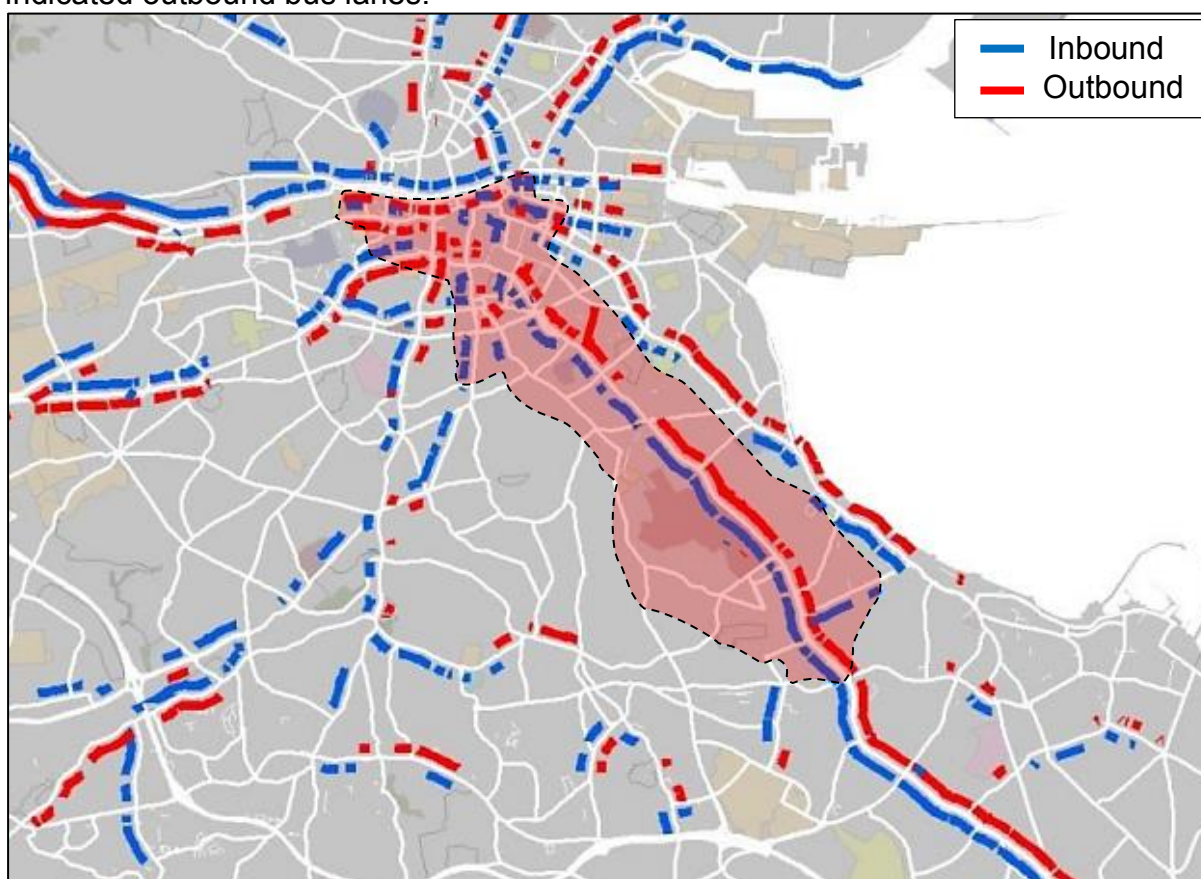


Figure 1: Existing bus lanes within the study area (Source: NTA Core Bus Network Report - Figure 4.1. Existing Bus Infrastructure – Metropolitan Area)

4. Bus Journey Times

The bus travel times for each scheme option were estimated based on a number of criteria, including;

- Length of segregated bus lane;
- Length of shared bus / traffic lane;
- Number of signalised junctions;
- Number of pedestrian crossings; and
- Number of bus stops.

Due to the large number of route options and calculations, the results of the bus journey time estimates are presented in Appendix C.

5. Road collision history

The Road Safety Authority database of personal injury accidents was examined to establish if there are any existing safety issues along the route options that were not evident from the site visits. The database provides accident records for the period 2005 to 2013; in terms of location, year, road user type involved (pedestrian, car, cyclist, motorcyclist, bus etc.), circumstances and severity of collision (minor, serious or fatal). The following bus collision history maps indicate the location of incidents along the route options identified within each Study Area Section.



Figure 2: Bus collision history along SAS 1 route options

6. Tree surveys

Dr. Phillip Blackstock was commissioned to carry out a detailed and high-level tree survey along the route options. The tree survey assessment identified the number and approximate location of all roadside trees along the route options, as well as trees and hedges growing on adjoining grounds where their canopy extends over the carriageway. It also noted the location of those trees that have trunks or limbs close to and or within 5.1m above the carriageway. Due to the large number of drawings received, the results of the tree survey are contained in a separate stand alone document.

7. Architectural and Archaeological information

Irish Archaeological Consultancy (IAC) and Roughan & O' Donovan (ROD) provided an environmental assessment of the different route options under the following criteria:

- Archaeology and Cultural Heritage
- Architectural Heritage
- Flora & Fauna
- Soils and Geology
- Hydrology
- Landscape and Visual
- Air Quality
- Noise & Vibration
- Land Use Character

The architectural and archaeological assessment results are presented in the MCA tables in Appendix A.

8. Route Audit

A detailed assessment of each route option was carried out to identify existing facilities and constraints. The results of this assessment are contained in a report in Appendix D.

9. Parking survey

A parking survey study was carried out to identify the parking conditions in the existing road network. Each route was assessed under the following criteria:

- *Formal Parking*: On-street parking in which marked spaces has been provided. These are spaces in which the Local Authority charges an hourly rate to use.
- *Informal Parking*: On-street parking in which spaces may or may not be marked and in which the Local Authority does not charge for use.
- *Adjacent Parking*: Parking which is accessible to the general public and is located in close proximity to the street. These are spaces in which the Local Authority charges an hourly rate to use.

The results of the parking survey assessment are contained in a report in Appendix E.

10. Cost estimates

A breakdown of the cost estimation process is presented in Appendix F.

Appendix C – Bus Journey Times



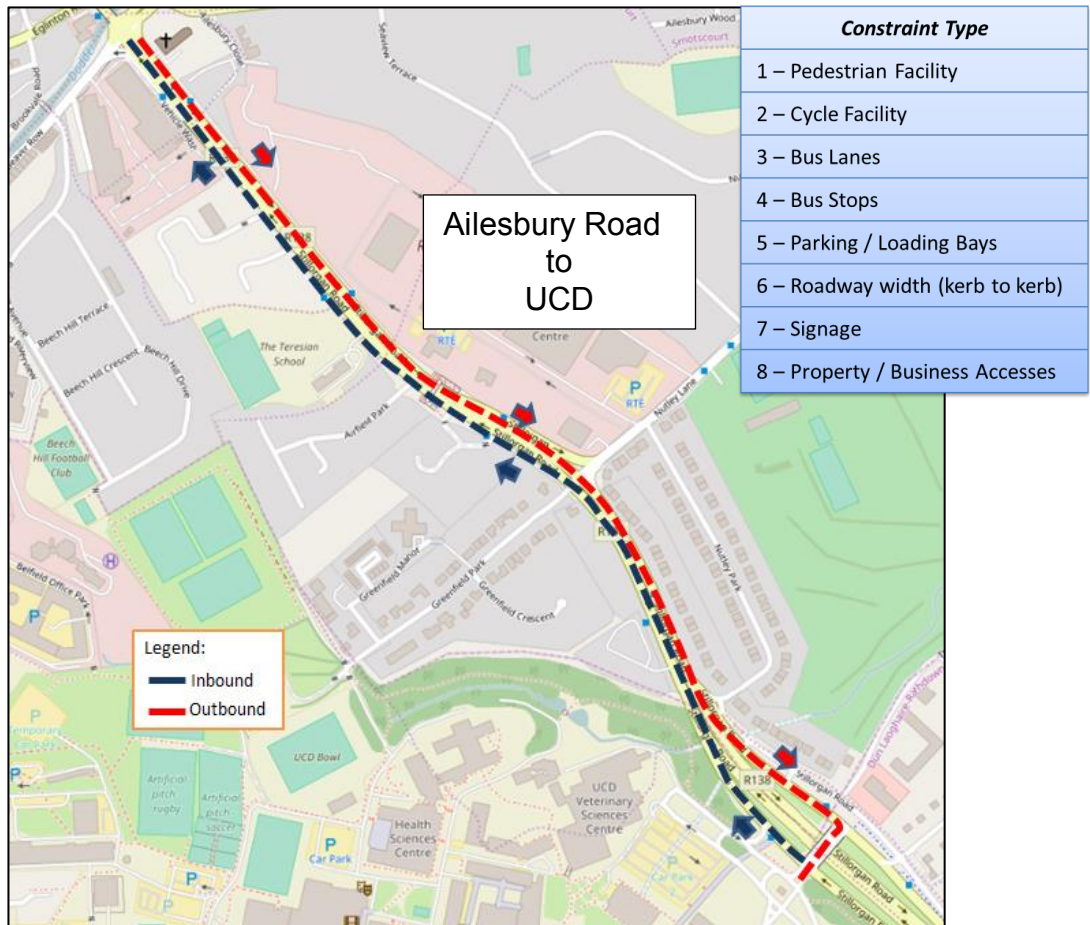
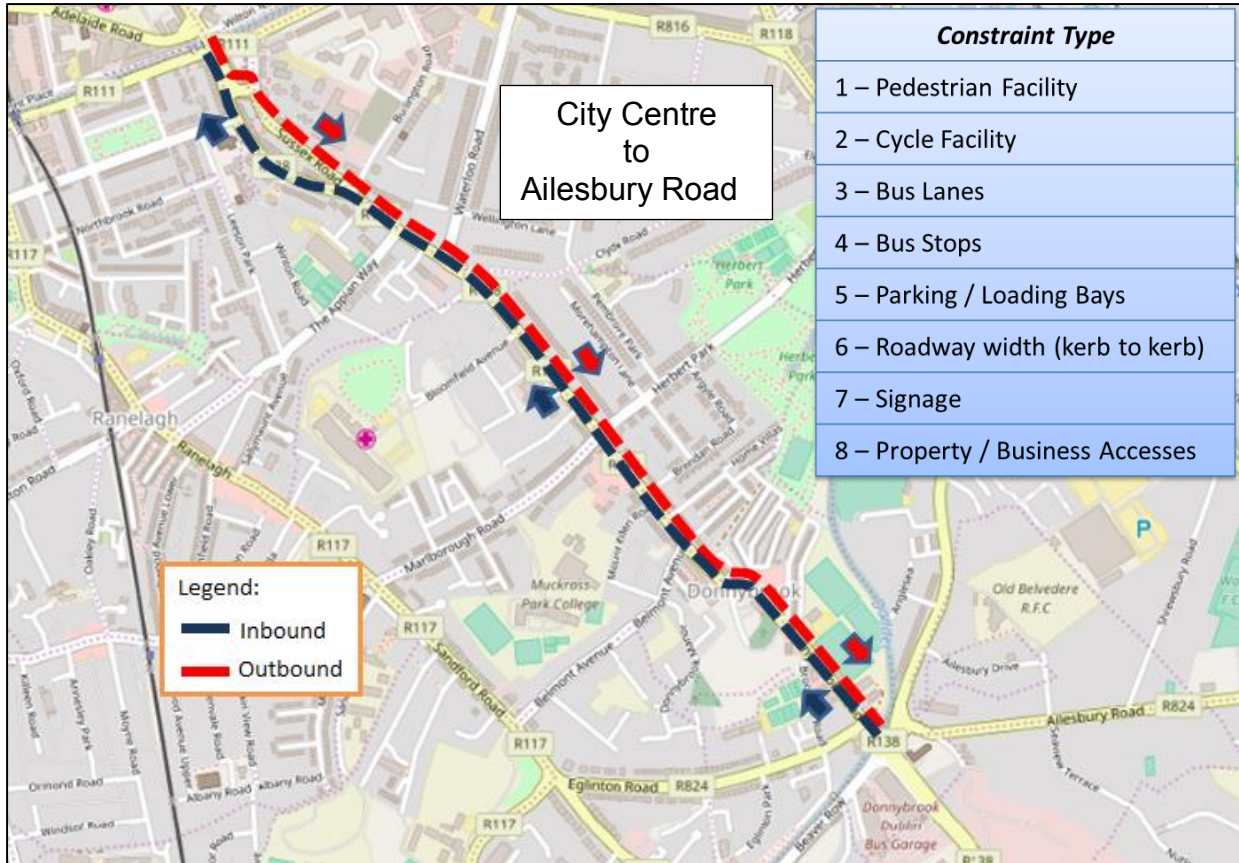
1. SAS 1 Journey Time

Route 1			Route Segment Scheme Options								
			1A inbound + outbound	1B1 inbound + outbound	1B2 inbound	1B2 outbound	1B3 inbound + outbound	1C1 inbound + outbound	1C2 inbound + outbound	1D inbound + outbound	1E inbound + outbound
	<i>KM per Hour</i>	<i>Average Delay (Minute)</i>	<i>Length (KM)/Nr Stops or Junctions</i>	<i>Length (KM)/Nr Stops or Junctions</i>	<i>Length (KM)/Nr Stops or Junctions</i>	<i>Length (KM)/Nr Stops or Junctions</i>	<i>Length (KM)/Nr Stops or Junctions</i>	<i>Length (KM)/Nr Stops or Junctions</i>	<i>Length (KM)/Nr Stops or Junctions</i>	<i>Length (KM)/Nr Stops or Junctions</i>	<i>Length (KM)/Nr Stops or Junctions</i>
Total Length			1.50	0.30	0.30	0.30	0.30	0.18	0.18	1.00	0.55
Fully Segregated Bus Lane (50kph top operational speed, travelling at average speed of 30kph)	30		1.50		0.30		0.30		0.18	1.00	0.55
Shared Bus/Cycle Lane	10			0.30		0.30		0.18			
Signalised Junction (Dwell time of 15 seconds per stop on average)		0.25	2	1	1	1	1	0	0	4	4
Pedestrian Crossing (15 second average)		0.25	0	0	0	0	0	1	1	2	0
Bus Stop Dwell Time (15 seconds average)		0.25	4	1	1	1	1	0	0	5	3
<i>Route Segment Journey Time (Nearest Minute)</i>			4	2	1	2	1	1	1	4	3

Appendix D – Route Audit



1. City Centre to UCD Route Audit



1.1 Leeson Street Upper to Wellington Place

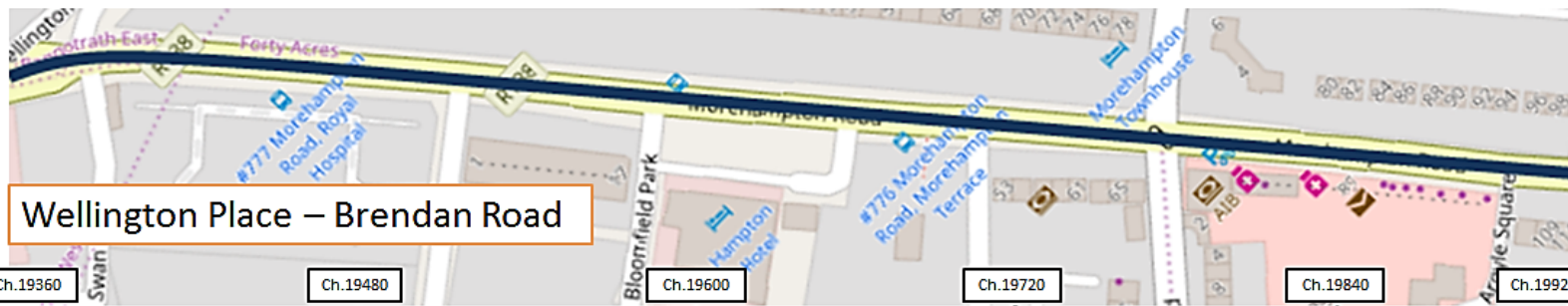
Section 1: Southbound	1	Wide Footpath Facilities along the majority of this section. Trees and street furniture located in footpath at various locations.					
	2	On road cycle lane on Sussex Street			No cycle Lane		Cycle Lane
	3	No Bus lane		Bus Lane (along Sussex Street to Wellington Place)			
	4	No Bus Stops	Bus Stops	No Bus Stops	BS Sussex Street	No Bus Stops	Bus Stop
	5	Parking provided at various locations along this section.					
	6	+3m wide carriageway. Trees in central reserve on Leeson Street Upper.					
	7	Traffic signs at various locations					
	8	Residential and Commercial area. Accesses at numerous locations.					



Section 1: Northbound	1	Wide Footpath Facilities along the majority of this section. Trees and street furniture located in footpath at various locations.					
	2	Cycle lane facilities along Leeson Street Upper			No cycle facilities		
	3	Bus Lane along majority of Leeson Street Upper			No Bus Lane		
	4	No Bus Stops	Bus Stop	No Bus Stops	Bus Stop	Bus Stop	Bus Stop
	5	Parking provided at various locations along this section.					
	6	+3m wide carriageway. Trees in central reserve on Leeson Street Upper.					
	7	Traffic signs at various locations					
	8	Residential and Commercial area. Accesses at numerous locations.					

1.2 Wellington Place to Brendan Road

Section 1: Southbound	1	Wide Footpath Facilities along the majority of this section. Trees and street furniture located in footpath at various locations.					
	2	Cycle lane facilities provided					
	3	Bus Lane along the majority of this section					
	4	No Bus Stops		Bus Stop	No Bus Stops		
	5	Parking provided at several locations along this section					
	6	+3m wide carriageway					
	7	Traffic signs at various locations					
	8	Residential and Commercial area. Accesses at numerous locations.					



Section 1: Northbound	1	Wide Footpath Facilities along the majority of this section. Trees and street furniture located in footpath at various locations.						
	2	Cycle lane facilities provided						
	3	Bus Lane along the majority of this section						
	4	No Bus Stops	Bus Stop	No Bus Stops	Bus Stop	No Bus Stops	Bus Stop	No Bus Stops
	5	Parking provided at several locations along this section						
	6	+3m wide carriageway						
	7	Traffic signs at various locations						
	8	Residential and Commercial area. Accesses at numerous locations.						

1.3 Brendan Road to Anglesea Bridge

Section 1: Southbound	1	Wide Footpath Facilities along the majority of this section. Trees and street furniture located in footpath at various locations.					
	2	On-road Cycle lane facilities					
	3	Bus lane					
	4	Bus Stop	No Bus Stops	Bus Stop		Bus Stop	
	5	Parking (formal and informal) provided at several locations along this section					
	6	+3m wide carriageway					
	7	Traffic signs at various locations					
	8	Residential and Commercial area. Accesses at numerous locations.					



Brendan Road – Anglesea Bridge



Section 1: Northbound	1	Wide Footpath Facilities along the majority of this section. Trees and street furniture located in footpath at various locations.					
	2	On-road Cycle lane facilities		No cycle facilities		On-road Cycle lane facilities	
	3	Bus Lane	No Bus Lane		Bus Lane		
	4	No Bus Stops	Bus Stop	No Bus Stops		Bus Stop	No Bus Stops
	5	Parking (formal and informal) provided at several locations along this section					
	6	+3m wide carriageway					
	7	Traffic signs at various locations					
	8	Residential and Commercial area. Accesses at numerous locations.					

1.4 Anglesea Bridge to Nutley Lane



Anglesea bridge – Nutley Lane



Section 1: North/Southbound	1	Wide Footpath Facilities along the majority of this section. Trees and street furniture located in footpath at various locations.						
	2	On road Cycle lane facilities	Segregated cycle lane facilities North and Southbound					
	3	Bus Lane on Northbound and Southbound Carriageways for entire length of this section of route						
	4	No Bus Stops	Bus Stops	No Bus Stops	Bus Stops	No Bus Stops	Bus Stops	No Bus Stops
	5	No allocated parking						
	6	Min. 10m wide carriageway. Central reserve containing trees and topsoil along majority of this section. Pedestrian flyover at RTE						
	7	Traffic signage at various locations particularly surrounding junctions						
	8	Residential accesses at various locations along this section						

1.5 Nutley Lane to UCD



Section 1: North/Southbound	1	Wide Footpath Facilities along the majority of this section.			
	2	On road Cycle lane facilities on both North and southbound carriageways			
	3	Bus lanes on North and Southbound carriageways along majority of this section			
	4	No Bus Stops	Bus Stop		Bus Stops
	5	No designated parking			
	6	Min. 10m wide carriageway. Central reserve containing trees and topsoil along majority of this section.			
	7	Traffic signage at various locations particularly surrounding junctions			
	8	Residential accesses at various locations along this section			

Appendix E – Parking Survey

1. Introduction






AECOM have been tasked by the National Transport Authority (NTA) to identify viable routes for a Core Bus Corridor which aims to provide ease of bus travel with the objective of improving bus journey times from University College Dublin (UCD) into Dublin City Centre.

This report shall seek to identify the parking conditions in the existing road network. Each route was assessed using criteria specified by the NTA. The assessment criteria for the existing parking on the separate routes are listed as follows:

- *Formal Parking*: On-street parking in which marked spaces has been provided. These are spaces in which the Local Authority charges an hourly rate to use.
- *Informal Parking*: On-street parking in which spaces may or may not be marked and in which the Local Authority does not charge for use.
- *Adjacent Parking*: Parking which is accessible to the general public and is located in close proximity to the street. These are spaces in which the Local Authority charges an hourly rate to use.
- *Taxi Facilities*: Parking which is used exclusively for taxis.

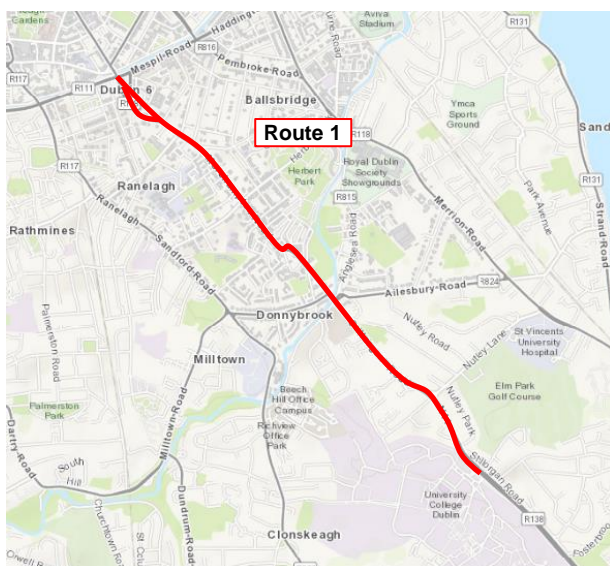
This report shall seek to quantify the impact on the existing parking conditions in the road network by the proposed scheme options.

2. Legend

-  - This colour represents sections along a route which has no parking facilities.
-  - This colour represents sections along a route which has formal parking facilities.
-  - This colour represents sections along a route which has informal parking facilities.
-  - This colour represents sections along a route which has adjacent parking facilities.
-  - This colour represents sections along a route which have taxi facilities.

3. UCD – Grand Parade

3.1.1 Route Map



3.1.2 Stillorgan Road

The survey has shown no car parking facilities along Stillorgan Road.

- Formal Parking – 0 Spaces.
- Informal Parking – 0 Spaces.
- Adjacent Parking – 0 Spaces.



3.1.3 Donnybrook Road

Following the survey formal, adjacent and informal car parking has been found on Donnybrook Road, the locations of which are as shown below. The breakdown of the car parking facilities along Donnybrook Road is as follows:

- Formal Parking – Approximately 35 (Of which 7 are Loading Bays between 07:00 and 10:00, Monday - Friday) Spaces.
- Informal Parking – Approximately 4 Spaces.
- Adjacent Parking – 15 Spaces.



All scheme options require full usage of almost the entire width of Donnybrook Road and as such, the formal parking spaces (approximately 35 No.) and all of the informal spaces (approximately 4 No.) will be removed as part of the proposed works. The adjacent spaces in the car park located at the Crescent, will not be affected by any of the proposed works.

3.1.4 Morehampton Road

The survey has shown formal car parking facilities along the entire length of Morehampton Road as shown below. There are no informal or adjacent parking spaces on Morehampton Road.

- Formal Parking – Approximately 55 (Of which 1 is Disabled Parking) Spaces.
- Informal Parking – 0 Spaces.
- Adjacent Parking – 0 Spaces.
- Taxi Rank – 0 Spaces.

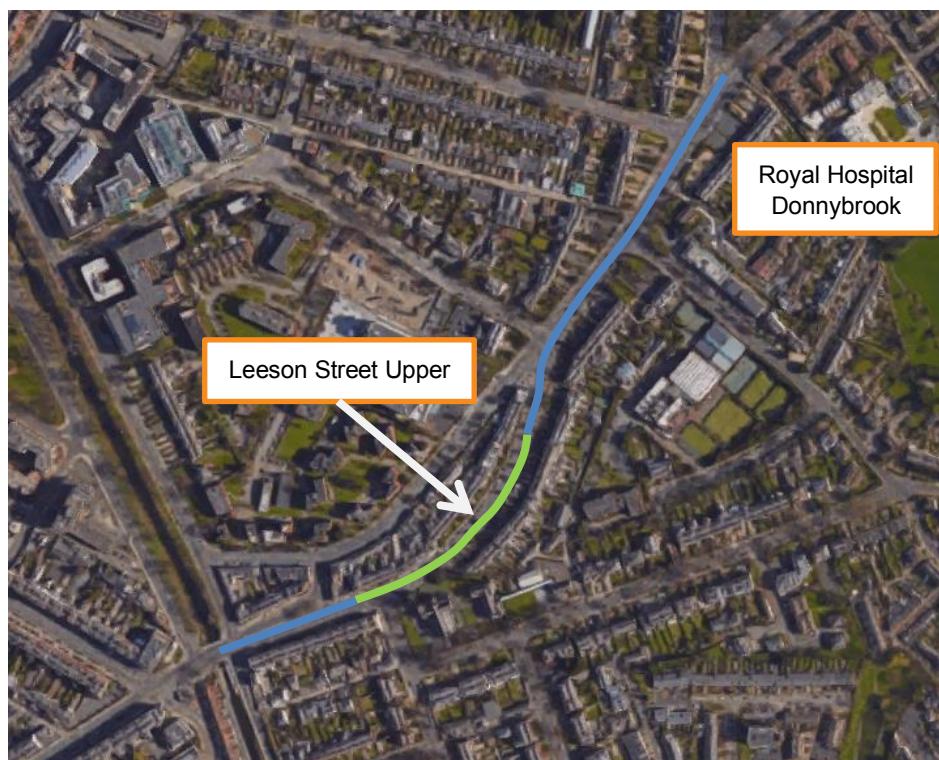


All scheme options require full usage of the entire width of Morehampton Road and as such, the formal parking spaces (approximately 55 No.) will be removed as part of the proposed works.

3.1.5 Leeson Street Upper

The survey has shown formal car parking facilities at certain locations along the length of Leeson Street Upper as shown below. There are no informal or adjacent parking spaces on Leeson Street Upper.

- Formal Parking – Approximately 40 Spaces.
- Informal Parking – 0 Spaces.
- Adjacent Parking – 0 Spaces.

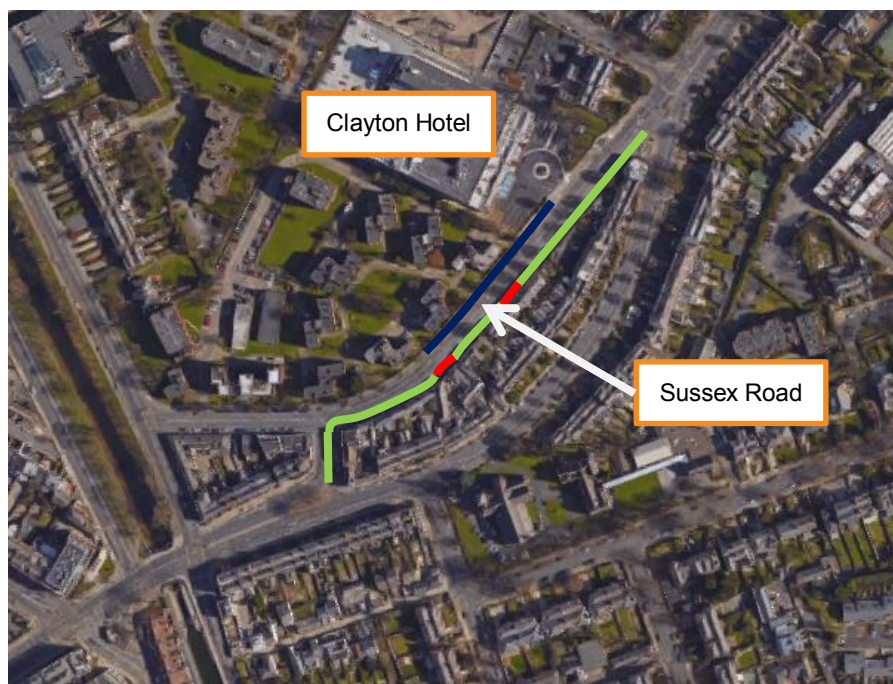


All scheme options can be contained within the existing conditions on Leeson Street Upper and as such, the formal parking spaces (approximately 40 No.) will not be removed as part of the proposed works.

3.1.6 Sussex Road

The survey has shown formal, informal and taxi rank car parking facilities at certain locations along the length of Sussex Road as shown below. The breakdown of the car parking facilities along Sussex Road is as follows:

- Formal Parking – Approximately 37 (Of which there is 1 Disabled Parking) Spaces.
- Informal Parking – Approximately 9 Spaces.
- Adjacent Parking – 0 Spaces.
- Taxi Rank – Approximately 17 Spaces.



All scheme options can be contained within the existing conditions on Sussex Road and as such, the formal parking spaces (approximately 37 No.), informal parking spaces (approximately 9 No.) and taxi rank spaces (approximately 20 No.) will not be removed as part of the proposed works.

Appendix F – Cost Estimate

Scheme Option 1A1					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.580			€ 377,000
2		0.340			€ 221,000
3				0.061	€ 152,500
4		0.203			€ 131,950
Total of Route Sections Cost					€ 882,450
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	1				€ 70,000
No of CL2		1			€ 230,000
No of CL3					€ 0
Total of Junctions Lower Costs					€ 300,000
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).		252		378,000 €	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					€ 378,000
Route: SA3 R1A1		Total Cost =		€ 1,560,450	

Scheme Option 1A2				
Route Sections	Route Section Cost Rates (EUR / km)			Route Section Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.580		€ 377,000
2		0.340		€ 221,000
3			0.061	€ 152,500
4		0.203		€ 131,950
Total of Route Sections Cost				€ 882,450
Junctions	Junction Cost Rates (EUR / junction)			Junctions Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	1			€ 70,000
No of CL2		1		€ 230,000
No of CL3				€ 0
Total of Junctions Lower Costs				€ 300,000
Land Acquisition	Average Land Value (EUR / sq.m.)		Land Take Cost	
	1,500 €			
Sum of Residential along Route (sq.m).	252		378,000 €	
Sum of Commercial along Route (sq.m).			0 €	
Sum of Agricultural along Route (sq.m).			0 €	
Sum of Industrial along Route (sq.m).			0 €	
Total of Route Junctions Cost				€ 378,000
Route: SA3 R1A1			Total Cost =	€ 1,560,450

Scheme Option 1B1					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.028			€ 18,200
2			0.085		€ 110,500
3		0.032			€ 20,800
4			0.085		€ 110,500
5					
6					
Total of Route Sections Cost					€ 260,000
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	1				€ 70,000
No of CL2					€ 0
No of CL3					€ 0
Total of Junctions Lower Costs					€ 70,000
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).				0 €	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					€ 0
Route: SA3 R1B1		Total Cost =		€ 330,000	

Scheme Option 1B2					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.028			€ 18,200
2				0.059	€ 147,500
3			0.072		€ 93,600
4				0.021	€ 52,500
5			0.051		€ 67,600
6					
Total of Route Sections Cost					€ 375,600
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	1				€ 70,000
No of CL2					€ 0
No of CL3					€ 0
Total of Junctions Lower Costs					€ 70,000
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).		81		€121,500	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					€ 121,500
Route: SA3 R1B2		Total Cost =		€ 567,100	

Scheme Option 1B3					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.028			€ 18,200
2				0.096	€ 240,000
3			0.034		€ 44,200
4				0.021	€ 52,500
5			0.051		€ 66,300
6					
Total of Route Sections Cost					€ 421,200
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1		1			€ 70,000
No of CL2					€ 0
No of CL3					€ 0
Total of Junctions Lower Costs					€ 70,000
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).		252		€378,000	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					€ 378,000
Route: SA3 R1B3					
Total Cost =				€ 869,200	

Scheme Option 1C1					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.110			€ 71,500
2					€ 0
Total of Route Sections Cost					€ 71,500
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1					€ 0
No of CL2					€ 0
No of CL3					€ 0
Total of Junctions Lower Costs					€ 0
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).				0 €	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					€ 0
Total Cost =					€ 71,500

Scheme Option 1C2					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)			0.110	€ 275,000
2					€ 0
Total of Route Sections Cost					€ 275,000
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1					€ 0
No of CL2					€ 0
No of CL3					€ 0
Total of Junctions Lower Costs					€ 0
Land Acquisition		Average Land Value (EUR / sq.m.)			Land Take Cost
Sum of Residential along Route (sq.m).		In 2013, 2 no. properties (No. 30-32 and 34 Main Street, Donnybrook) were costed for full acquisition. The combined estimated total price for full acquisition of both properties was €2,725,000. There is a further 6 properties within and bordering 1C2 that would require consideration for acquisition to implement the configuration of Scheme Option 1C2.			
Total of Route Junctions Cost					€ 0

Scheme Option 1D1					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)		0.105		€ 136,500
2			0.600		€ 780,000
11			0.125		€ 162,500
Total of Route Sections Cost					€ 1,079,000
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1		1			€ 70,000
No of CL2			1		€ 230,000
No of CL3					€ 0
Total of Junctions Lower Costs					€ 300,000
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).				0 €	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					€ 0
Total Cost =					€ 1,379,000

Scheme Option 1D2				
Route Sections	Route Section Cost Rates (EUR / km)			Route Section Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.105		€ 136,500
2		0.600		€ 780,000
3		0.125		€ 162,500
4				
5				
6				
Total of Route Sections Cost				€ 1,079,000
Junctions	Junction Cost Rates (EUR / junction)			Junctions Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	1			€ 70,000
No of CL2		1		€ 230,000
No of CL3				€ 0
Total of Junctions Lower Costs				€ 300,000
Land Acquisition	Average Land Value (EUR / sq.m.)		Land Take Cost	
	1,500 €			
Sum of Residential along Route (sq.m).			0 €	
Sum of Commercial along Route (sq.m).			0 €	
Sum of Agricultural along Route (sq.m).			0 €	
Sum of Industrial along Route (sq.m).			0 €	
Total of Route Junctions Cost				€ 0
Route: SA3 R1D2			Total Cost =	€ 1,379,000

Scheme Option 1E1					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)		0.131		€ 170,300
2		0.078			€ 50,700
3			0.356		€ 462,800
4		0.115			€ 74,750
5			0.076		€ 98,800
6		0.095			€ 61,750
Total of Route Sections Cost					€ 919,100
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	1				€ 70,000
No of CL2					€ 0
No of CL3					€ 0
Total of Junctions Lower Costs					€ 70,000
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).				0 €	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					€ 0
Route: SA3 R1E1		Total Cost =		€ 989,100	

Scheme Option 1E2				
Route Sections	Route Section Cost Rates (EUR / km)			Route Section Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)		0.521	€ 677,300
2			0.330	€ 429,000
3				€ 0
4				€ 0
5				€ 0
6				€ 0
Total of Route Sections Cost				€ 1,106,300
Junctions	Junction Cost Rates (EUR / junction)			Junctions Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	1			€ 70,000
No of CL2		2		€ 460,000
No of CL3				€ 0
Total of Junctions Lower Costs				€ 530,000
Land Acquisition	Average Land Value (EUR / sq.m.)		Land Take Cost	
	1,500 €			
Sum of Residential along Route (sq.m).			0 €	
Sum of Commercial along Route (sq.m).			0 €	
Sum of Agricultural along Route (sq.m).			0 €	
Sum of Industrial along Route (sq.m).			0 €	
Total of Route Junctions Cost				€ 0
Route: SA3 R1E2			Total Cost =	€ 1,636,300

Route: SA3 R1E3				
Route Sections	Route Section Cost Rates (EUR / km)			Route Section Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)		0.131	€ 170,300
2		0.078		€ 50,700
3			0.356	€ 462,800
4		0.115		€ 74,750
5			0.076	€ 98,800
6		0.095		€ 61,750
Total of Route Sections Cost				€ 919,100
Junctions	Junction Cost Rates (EUR / junction)			Junctions Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	1			€ 70,000
No of CL2				€ 0
No of CL3				€ 0
Total of Junctions Lower Costs				€ 70,000
Land Acquisition	Average Land Value (EUR / sq.m.)		Land Take Cost	
	1,500 €			
Sum of Residential along Route (sq.m).			0 €	
Sum of Commercial along Route (sq.m).			0 €	
Sum of Agricultural along Route (sq.m).			0 €	
Sum of Industrial along Route (sq.m).			0 €	
Total of Route Junctions Cost				€ 0
Route: SA3 R1E3			Total Cost =	€ 989,100

Appendix G – Infrastructural Cost Estimate

See separate report

1. Scheme Option 1A1

Minor modifications are required at the UCD/Stillorgan Road/Slip Road junction i.e. i.e. the works associated with this categorization include: laying of anti-skid surface, removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such no property boundary re-instatement works are needed.

For 580m approximately, from the UCD/Stillorgan Road/Slip Road junction travelling towards the City, the proposed works have been categorized as **minor** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

Moderate modifications are required at the Nutley Lane/Stillorgan Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No Land take is required at this junction and as such property boundary re-instatement works are not needed.

For the next 340m, from the Nutley Lane/Stillorgan Road junction travelling in the direction of the City, the proposed works have been categorized as **minor** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For the next 60m, approximately, the proposed works have been categorized as **major** i.e. the works associated with widening of the road to accommodate full bus and cyclist facilities include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water and gas) to be protected/relocated/diverted. To accommodate the road widening, a number of trees to be removed along the route and as such, limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage is to be removed/ relocated or replaced. Some land take is required and as such boundary re-instatement works (walls, gates, driveways, etc.) are needed. Existing road markings are to be removed and replaced. Local road re-surfacing needed along parts of the route.

For the next 205m, from the works at RTE travelling in the direction of the City, the proposed works have been categorized as **minor** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

2. Scheme Option 1A2

Minor modifications are required at the UCD/Stillorgan Road/Slip Road junction i.e. the works associated with this categorization include: laying of anti-skid surface,

removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such no property boundary re-instatement works are needed.

For 580m approximately, from the UCD/Stillorgan Road/Slip Road junction travelling towards the City, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

Moderate modifications are required at the Nutley Lane/Stillorgan Road junction. i.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No Land take is required at this junction and as such property boundary re-instatement works are not needed.

For the next 340m, from the Nutley Lane/Stillorgan Road junction travelling in the direction of the City, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For the next 60m, approximately, the proposed works have been categorized as **major**. i.e. the works associated with widening of the road to accommodate full bus and cyclist facilities include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water and gas) to be protected/relocated/diverted. To accommodate the road widening, a number of trees to be removed along the route and as such, limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage is to be removed/ relocated or replaced. Some land take is required and as such boundary re-instatement works (walls, gates, driveways, etc.) are needed. Existing road markings are to be removed and replaced. Local road re-surfacing needed along parts of the route.

For the next 205m, from the works at RTE travelling in the direction of the City, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

3. Scheme Option 1B1

Minor modifications are required at the Anglesea Road/Stillorgan Road/Beaver Row/Donnybrook Road junction. i.e. the works associated with this categorization include: laying of anti-skid surface, removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such property boundary re-instatement works are needed.

For the next 28m approximately, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For 85m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Some road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. To accommodate the proposed design a number of trees must be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. No land take is required along this section.

For the next 30m approximately, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For 85m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Some road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. To accommodate the proposed design a number of trees must be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. No land take is required along this section.

4. Scheme Option 1B2

Minor modifications are required at the Anglesea Road/Stillorgan Road/Beaver Row/Donnybrook Road junction. i.e. the works associated with this categorization include: laying of anti-skid surface, removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such property boundary re-instatement works are needed.

For the next 30m approximately, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For the next 60m, approximately, the proposed works have been categorized as **major**. i.e. the works associated with widening of the road to accommodate full bus and cyclist facilities include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water and gas) to be protected/relocated/diverted. To accommodate the road widening, a number of trees to be removed along the route and as such, limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage is to be removed/ relocated or replaced. Some land take is required and as such boundary re-instatement works (walls, gates, driveways, etc.) are needed. Existing road markings are to be removed and replaced. Local road re-surfacing needed along parts of the route.

For 70m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Some road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. To accommodate the proposed design a number of trees must be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. No land take is required along this section.

For the next 20m, approximately, the proposed works have been categorized as **major**. i.e. the works associated with widening of the road to accommodate full bus and cyclist facilities include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water and gas) to be protected/relocated/diverted. To accommodate the road widening, a number of trees to be removed along the route and as such, limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage is to be removed/ relocated or replaced. Some land take is required and as such boundary re-instatement works (walls, gates, driveways, etc.) are needed. Existing road markings are to be removed and replaced. Local road re-surfacing needed along parts of the route.

For 50m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Some road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. To accommodate the proposed design a number of trees must be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. No land take is required along this section.

5. Scheme Option 1B3

Minor modifications are required at the Anglesea Road/Stillorgan Road/Beaver Row/Donnybrook Road junction. i.e. the works associated with this categorization include: laying of anti-skid surface, removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such property boundary re-instatement works are needed.

For the next 30m approximately, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For the next 95m, approximately, the proposed works have been categorized as **major**. i.e. the works associated with widening of the road to accommodate full bus and cyclist facilities include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water and gas) to be protected/relocated/diverted. To accommodate the road widening, a number of trees to be removed along the route and as such, limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage is to be removed/ relocated or

replaced. Some land take is required and as such boundary re-instatement works (walls, gates, driveways, etc.) are needed. Existing road markings are to be removed and replaced. Local road re-surfacing needed along parts of the route.

For the next 20m, approximately, the proposed works have been categorized as **major**. i.e. the works associated with widening of the road to accommodate full bus and cyclist facilities include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water and gas) to be protected/relocated/diverted. To accommodate the road widening, a number of trees to be removed along the route and as such, limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage is to be removed/ relocated or replaced. Some land take is required and as such boundary re-instatement works (walls, gates, driveways, etc.) are needed. Existing road markings are to be removed and replaced. Local road re-surfacing needed along parts of the route.

For 50m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Some road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. To accommodate the proposed design a number of trees must be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. No land take is required along this section.

6. Scheme Option 1C1

For the next 100m approximately, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

7. Scheme Option 1C2

For 110m approximately the proposed works have been categorised as **major**. I.e. the works associated with widening of the road to accommodate full bus and cyclist facilities include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water and gas) to be protected/relocated/diverted. To accommodate the road widening, a number of trees to be removed along the route and as such, limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage is to be removed/ relocated or replaced. Some land take is required and as such boundary re-instatement works (walls, gates, driveways, etc.) are needed. Existing road markings are to be removed and replaced. Local road re-surfacing needed along parts of the route.

This scheme option also includes the proposed demolition of 8 No. buildings as part of the design.

8. Scheme Option 1D1

For 105m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Some road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. To accommodate the proposed design a number of trees must be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. No land take is required along this section.

Moderate upgrade modifications are required at the Donnybrook Road/Belmont Avenue/Victoria Avenue/Morehampton Road junction i.e. the works to accommodate the proposed design include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

For 600m approximately, works have been categorized as **moderate** due to the removal of kerbs, footways and central median with a width greater than 500mm and the removal/realignment of drainage systems and services. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water, gas) will have to be protected/relocated/diverted. To accommodate the proposed design a sizeable number of trees to be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. Safety barriers/guardrails are to be removed and relocated and/or replaced. Road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. No land take is required along this section.

Minor modifications are required at the Wellington Place/Leeson Street Upper junction. i.e. the works associated with this categorization include laying of anti-skid surface, removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such property boundary re-instatement works are needed.

For 125m approximately, travelling from Wellington Place to Appian Way, works have been categorized as **moderate** due to the removal of kerbs, central median and footways greater than 500mm and the removal/realignment of drainage systems and services. Road lighting (and associated works i.e. cabling and ducting) along the route are to be protected/relocated/diverted. Existing services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. No land take is required along this section.

9. Scheme Option 1D2

Although this scheme option proposal incorporates a design which seeks to avoid the removal of as many existing trees as possible, the costing proposals outlined in 1D1 above would also apply to this option as works include the following:

For 105m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Some road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. To accommodate the proposed design a number of trees must be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. No land take is required along this section.

Moderate upgrade modifications are required at the Donnybrook Road/Belmont Avenue/Victoria Avenue/Morehampton Road junction i.e. the works to accommodate the proposed design include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

For 600m approximately, works have been categorized as **moderate** due to the removal of kerbs, footways and central median with a width greater than 500mm and the removal/realignment of drainage systems and services. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water, gas) will have to be protected/relocated/diverted. To accommodate the proposed design a sizeable number of trees to be removed along the route and as such, major landscaping works are also required along with full depth pavement reconstruction and associated road markings. Safety barriers/guardrails are to be removed and relocated and/or replaced. Road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. No land take is required along this section.

Minor modifications are required at the Wellington Place/Leeson Street Upper junction. i.e. the works associated with this categorization include: laying of Anti-skid surface, removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such property boundary re-instatement works are needed.

For 125m approximately, travelling from Wellington Place to Appian Way, works have been categorized as **moderate** due to the removal of kerbs, central median and footways greater than 500mm and the removal/realignment of drainage systems and services. Road lighting (and associated works i.e. cabling and ducting) along the route are to be protected/relocated/diverted. Existing services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Road signage and road furniture (bins and bollards) are to be removed/ relocated or replaced. No land take is required along this section.

10. Scheme Option 1E1

For 130m approximately from the extents of the section in the direction of the city, works have been categorized as **moderate** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. Works associated with the construction of bus gate facilities (i.e. additional traffic signals including ducting, cabling and

chambers and additional signal poles/heads) would also require the protection/relocation/diversion of services (i.e. power supply, communications, water and gas) No land take is required along this section.

For the next 80m approximately along Leeson Street Upper, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For the next 355m approximately, works have been categorized as **moderate** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. Works associated with the construction of bus gate facilities (i.e. additional traffic signals including ducting, cabling and chambers and additional signal poles/heads) would also require the protection/relocation/diversion of services (i.e. power supply, communications, water and gas) No land take is required along this section.

Minor modifications are required at the Mespil Road/Wilton Terrace/Grand Parade/Fitzwilliam Place junction. i.e. the works associated with this categorization include: laying of Anti-skid surface, removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such property boundary re-instatement works are needed.

For 115m approximately outbound along Sussex Road, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For 75m approximately, works have been categorized as **moderate** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. Works associated with the construction of bus gate facilities (i.e. additional traffic signals including ducting, cabling and chambers and additional signal poles/heads) would also require the protection/relocation/diversion of services (i.e. power supply, communications, water and gas) No land take is required along this section.

For the next 95m approximately outbound along Sussex Road, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

11. Scheme Option 1E2

Moderate upgrade modifications are required at the Sussex Road/Leeson Street Upper junction to provide for proposed bus gates (2 No.) i.e. the works to accommodate the proposed design include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

For 515m approximately, works have been categorized as **moderate** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. Works associated with the construction of bus gate facilities (i.e. additional traffic signals including ducting, cabling and chambers and additional signal poles/heads) would also require the protection/relocation/diversion of services (i.e. power supply, communications, water and gas) No land take is required along this section.

For 330m approximately, works have been categorized as **moderate** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. Works associated with the construction of bus gate facilities (i.e. additional traffic signals including ducting, cabling and chambers and additional signal poles/heads) would also require the protection/relocation/diversion of services (i.e. power supply, communications, water and gas) No land take is required along this section.

Moderate upgrade modifications are required at the Sussex Road/Leeson Street Upper junction to provide for proposed bus gates i.e. the works to accommodate the proposed design include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

12. Scheme Option 1E3

For 130m approximately from the extents of the section in the direction of the city, works have been categorized as **moderate** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. Works associated with the construction of bus gate facilities (i.e. additional traffic signals including ducting, cabling and chambers and additional signal poles/heads) would also require the protection/relocation/diversion of services (i.e. power supply, communications, water and gas) No land take is required along this section.

For the next 80m approximately along Leeson Street Upper, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For the next 355m approximately, works have been categorized as **moderate** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. Works associated with the construction of bus gate facilities (i.e. additional traffic signals including ducting, cabling and chambers and additional signal poles/heads) would also require the protection/relocation/diversion of services (i.e. power supply, communications, water and gas) No land take is required along this section.

Minor modifications are required at the Mespil Road/Wilton Terrace/Grand Parade/Fitzwilliam Place junction. i.e. the works associated with this categorization include: laying of anti-skid surface, removal and replacement of existing road

markings, dished kerbs and tactile paving at all crossing points. No land take is required at this junction and as such property boundary re-instatement works are needed.

For 115m approximately outbound along Sussex Road, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

For 75m approximately, works have been categorized as **moderate** i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. Works associated with the construction of bus gate facilities (i.e. additional traffic signals including ducting, cabling and chambers and additional signal poles/heads) would also require the protection/relocation/diversion of services (i.e. power supply, communications, water and gas) No land take is required along this section.

For the next 95m approximately outbound along Sussex Road, the proposed works have been categorized as **minor**. i.e. the works associated with this section involve removing and replacing existing road markings and local resurfacing of both the carriageway and the cycle lanes. No land take is required along this section.

Appendix H – Concept Design Drawings and Staging Diagrams

1. MCA Scheme Options

2. Emerging Preferred Scheme Option

1. MCA Scheme Options

2. Emerging Preferred Scheme Option



Bus Interchange and Terminus in UCD Campus

Route Options Assessment

February 2018

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Glossary of Terms

- **CBC:** Core Bus Corridor
- **UCD:** University College Dublin
- **GDA:** Greater Dublin Area
- **NTA:** National Transport Authority

Definitions

- **CBC Infrastructure:** All physical facilities required to support the CBC system – stops, CBC lanes, public lighting, etc.
- **Options Assessment:** The assessment process for potentially viable 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 options assessment study is a recommendation for a preferred option for the proposed scheme.

1. Introduction

This report presents the findings of an Options Assessment study that has been undertaken to recommend on the preferred option for bus interchange/terminus facility in University College Dublin (UCD) Campus, which is envisaged as one of the key interchange/terminus locations as part of the 'BusConnects' plan for the Greater Dublin Area (GDA).

'BusConnects' plan comprises aspirations to transform Dublin's bus system, so that journeys by bus will be fast, reliable, punctual, convenient, affordable, and with greater scope for interconnection between routes (see **Figure 1.1**).

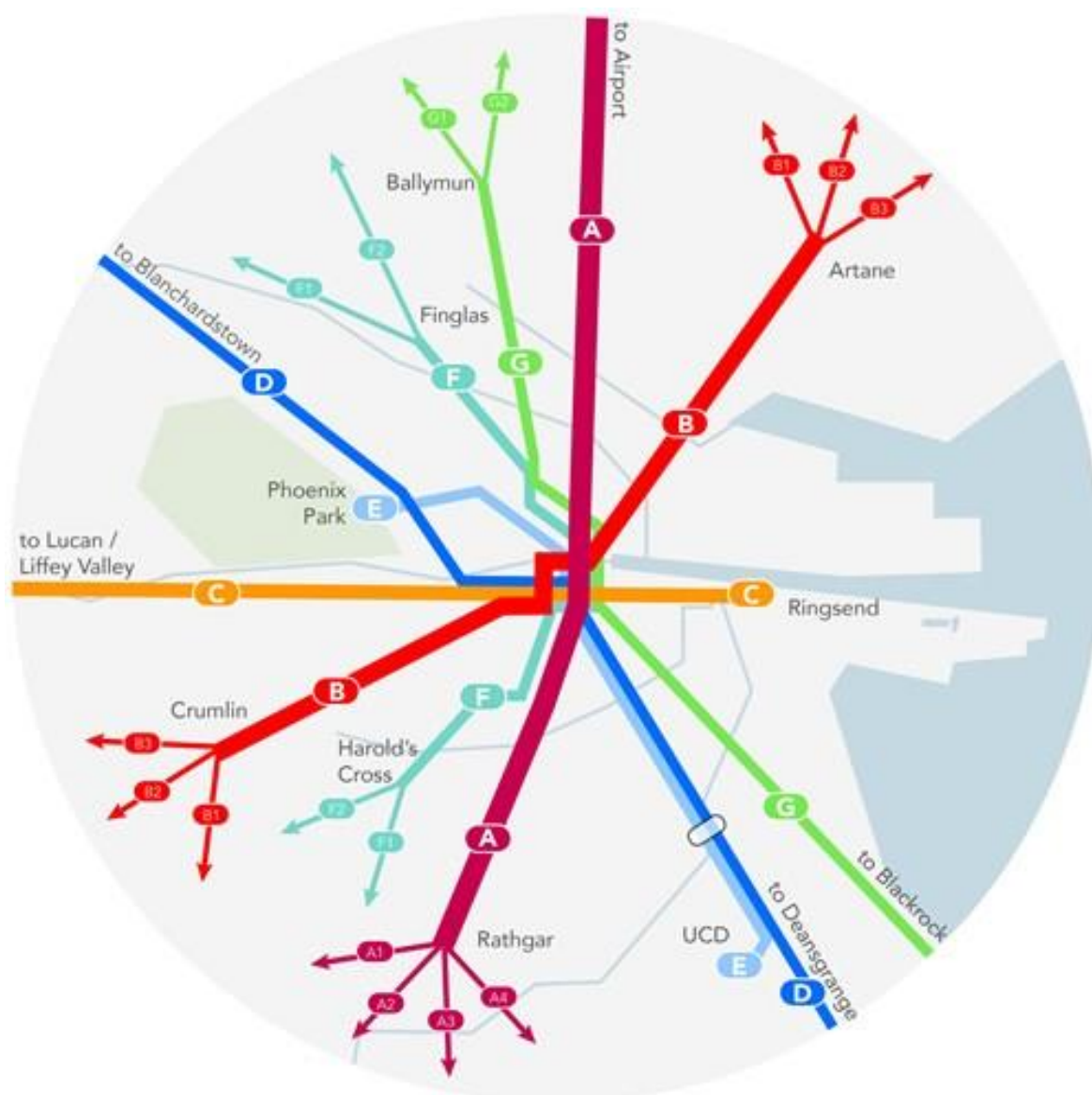


Figure 1.1: Fig. 64 in the Dublin Area Bus Network Redesign Choices Report ('BusConnects')

This Options Assessment study took into account:

- data from existing bus operators that serve UCD; and
- the proposed 'BusConnects' Next Generation Bus Corridors Transport plan.

This Options Assessment report discusses the study work undertaken identifying and assessing:

- bus route options between UCD gates; and
- layout options for a combined interchange/terminus facility at a "fixed" (i.e. confirmed) location in the UCD Campus.

2. Transport Context

2.1 Ireland 2040 – Our Plan

The 'National Planning Framework: Ireland 2040 – Our Plan' (Department of Housing Planning and Local Government, September 2017) sets the long-term context for Ireland's physical development and associated progress in economic, social and environmental terms and in an island. The objectives of 'National Planning Framework: Ireland 2040 – Our Plan', in relation to public transport, include:

- *“Expand attractive public transport alternatives to car transport to reduce congestion and emissions and enable the transport sector to cater for the demands associated with longer term population and employment growth in a sustainable manner...”*
- *“The provision of a well-functioning, integrated public transport system, enhancing competitiveness, sustaining economic progress and enabling sustainable mobility choices.”*
- *“Deliver the key public transport objectives of the Transport Strategy for the Greater Dublin Area 2016-2035 by investing in projects such as New Metro North, DART Expansion Programme, BusConnects in Dublin and key bus based projects in the other cities and towns.”*

2.2 Greater Dublin Area Transport Strategy 2016 – 2035

The 'Greater Dublin Area Transport Strategy 2016 – 2035' (NTA, 2015) identifies a Core Bus Network for the GDA. This core network represents the most important bus routes in the GDA, which are generally characterised by a high frequency of bus services, high passenger volumes and with significant trip attractors located along the route. The 'Greater Dublin Area Transport Strategy 2016 – 2035' includes objectives to develop the Core Bus Network to achieve, as far as practicable, continuous priority for bus movements on the sections of the Core Bus Network within the Metropolitan Area, with the goal of making the overall bus system more efficient and attractive to users including the core principle, which states: *“Development in the GDA shall be directly related to investment in integrated high quality public transport services and focused on compact urban form.”*

Section 2.2.1 of the 'Greater Dublin Area Transport Strategy 2016 – 2035' also states, as a Primary Policy: *“The Strategy must therefore, promote, within its legislative remit, transport options which provide for unit reductions in carbon emissions. This can most effectively be done by promoting public transport, walking and cycling, and by actively seeking to reduce car use in circumstances where alternative options are available.”*

The identified core network comprises a number of radial, orbital and regional bus corridors.

2.3 BusConnects

'BusConnects' is a programme of priority investment for public transport in the 2018 budget, which plans to fundamentally transform Dublin's bus system. The objective of 'BusConnects' is to develop the radial and orbital bus corridors as identified in the 'Greater Dublin Area Transport Strategy 2016 – 2035', so that each will have continuous bus priority; i.e., a continuous bus lane in each direction.

'BusConnects' seeks the development of a more attractive and convenient bus system with greater scope for interconnection between routes, where connecting passengers don't necessarily have to travel to Dublin City Centre.

A section of the Blanchardstown to UCD corridor, which is identified as a continuous bus priority radial corridor in the 'Greater Dublin Area Transport Strategy 2016 – 2035', is proposed to be developed as the following separate CBCs;

- Blanchardstown Town Centre to the Liffey Quays (Ellis Quay), through Ashtown; and
- UCD to City Centre at St Stephens Green (Leeson Street Lower).

Interchange facilities are proposed at the UCD gate and Terminus in UCD Campus, and also at Blanchardstown Town Centre, as shown indicatively in **Figure 2.1**.



Figure 2.1: Radial Bus Corridors (‘BusConnects’ Next Generation Bus Corridors Fig. 1)

2.4 Dún Laoghaire-Rathdown County Council Development Plan (2016 – 2022)

The ‘Dún Laoghaire-Rathdown County Council Development Plan (2016 – 2022)’ seeks to protect and nurture the future growth of Dún Laoghaire-Rathdown both by serving and leading the community by creating the conditions that will attract and sustain social and economic development.

It contains some objectives in relation to bus travel, which are of general relevance to the UCD interchange/terminus study, such as:

- “An increased travel mode share for walking and cycling; this increase will be mainly related to local trips to work, schools, retail and leisure within the larger urban areas.”
- “The delivery of major strategic transportation projects and infrastructural improvements such as, the Council Cycle Network and an expanded Bus Network.”

3. Existing UCD Terminus

UCD Campus is located 4km south of Dublin city centre and is a landscaped complex of architectural buildings, accommodating student residences and numerous leisure and sporting facilities.

Dublin Bus provides services to the Belfield campus. Aircoach operates a bus service from Dublin Airport to Leopardstown / Sandyford / Stillorgan which passes UCD. Several Bus Éireann services from the GDA directly serve UCD during morning peak.

It is confirmed that a bus interchange/terminus facility will be developed at the location of the existing bus terminus facility (see area in red circle in **Figure 3.1**), in parallel to the upgrade of CBC infrastructure, to facilitate the proposed step change in bus services in the GDA.



Figure 3.1: Existing bus terminus facility in UCD (2014)

The existing terminus facility is strategically located in the centre of the UCD Campus and in close proximity to the main buildings, thus, achieving maximum access convenience, patronage and bus interchange opportunities between any existing and future transport service requirements locally and regionally.

However, the existing facility layout (photo in **Figure 3.2**) does not provide for an optimum interchange in terms of bus vehicles movements, passenger facilities, access and drivers' welfare facilities.



Figure 3.2: Photo of the existing bus terminus facility in UCD

4. Scheme Objectives and Design Criteria

4.1 Introduction

This report section discusses the UCD interchange/terminus scheme key scheme objectives and their associated design criteria, which have been identified based on the 'BusConnects' plan, as listed and discussed in detail below:

- **Direct Bus Interchange;**
- **Improved Connectivity / Accessibility;**
- **Quality Passenger Waiting Facilities;** and
- **Efficient Operation.**

4.2 Direct Bus Interchange

Objective: A key objective of the proposed UCD interchange/terminus scheme is the maximisation of direct interchange between bus services.

Design Criteria: Route options within UCD Campus between gates and the fixed terminus location, as well as the proposed interchange/terminus facility design have been developed with this in mind and, in so far as possible, seek to provide for improved existing or new interchange opportunities between bus services.

4.3 Improved Connectivity and Accessibility

Objective: Another key objective of the scheme is to improve connectivity and accessibility for both buses and users; i.e. minimise walking distances within the facility and to the attractors in the UCD Campus and minimise conflict between pedestrian, cyclist and vehicle movements.

Design Criteria: The design issues that have been considered in developing layout options for the UCD interchange/terminus facility are:

- The existing/proposed road network; this determines the direction of bus vehicle flow within the interchange/terminus facility;
- The pedestrian desire lines to and from the interchange/terminus facility, so allowance for pedestrian movements can be designed accordingly; the design seeks to allow direct pedestrian movements to and from the waiting platforms, i.e. pedestrian crossing proposals maximise safety and minimise walking distances;
- Separation between pedestrians / cyclists and buses to improve safety and efficiency, as well as helping reduce potential conflicts (e.g. designated entrances and exits for buses); and
- Quality cycle facility design to ensure safe and direct cycle access paths and provide adequate bicycle parking space.

4.4 Improved Passenger Waiting Facilities

Objective: The new UCD interchange/terminus should be more than just a place to wait whilst transferring between bus services. Therefore, the aim is to provide safe and comfortable facilities, maximising quality, safety and security of the passenger and operating environment.

Design Criteria: The issues that have been considered in developing layout options for the UCD interchange/terminus facility are:

- Provision of adequate space to allow for comfortable and sheltered waiting areas, queuing, circulation, seating and any other facilities;
- Location of waiting areas as close as possible to bus boarding locations; and
- Orientation of waiting areas to be clearly visible from the surrounding road network (and adjacent buildings) and to provide clear views of buses arrivals and departures;

4.5 Efficient Operation

Objective: Provision of efficient movement of bus to and from the interchange/terminus facility is a key scheme objective.

Design Criteria: The issues that have been considered in developing layout options are:

- Provision for multiple bus services operating;
- Provision of space to allow buses to move independently of each other between and within the bus bays;
- Provision of space to accommodate bus convoys due to unexpected adverse traffic conditions;
- Provision of space for bus layovers, including temporary areas for terminating services, if required;
- Provision of staff welfare facilities (e.g. toilets); and
- Provision of bicycle facilities including bicycle paths leading to the interchange/terminus facility.

4.6 Design Assumptions

The 'BusConnects' plan has not been finalised at the time of this report being prepared (December 2017).

Therefore, a specific assumption has been made regarding the bus services the interchange/terminus facility is catering for; i.e.:

- maximum four high-frequency bus services utilising the facility simultaneously;
- frequency of 3-5 minutes; and
- double decker bus vehicles

5. Route Options

5.1 Introduction

This report section discusses the assessment of route options between UCD gates 1 and 2 (shown in red circles in **Figure 5.1**) and the fixed interchange/terminus location.

UCD gates 1 and 2 provide access to/from the R138 (Stillorgan Road). Therefore, they maximise bus operational efficiency, as they provide a more direct link to the existing / planned bus network, which uses the R138 (Stillorgan Road), than other UCD gates (shown in **Figure 5.1** in blue circles).

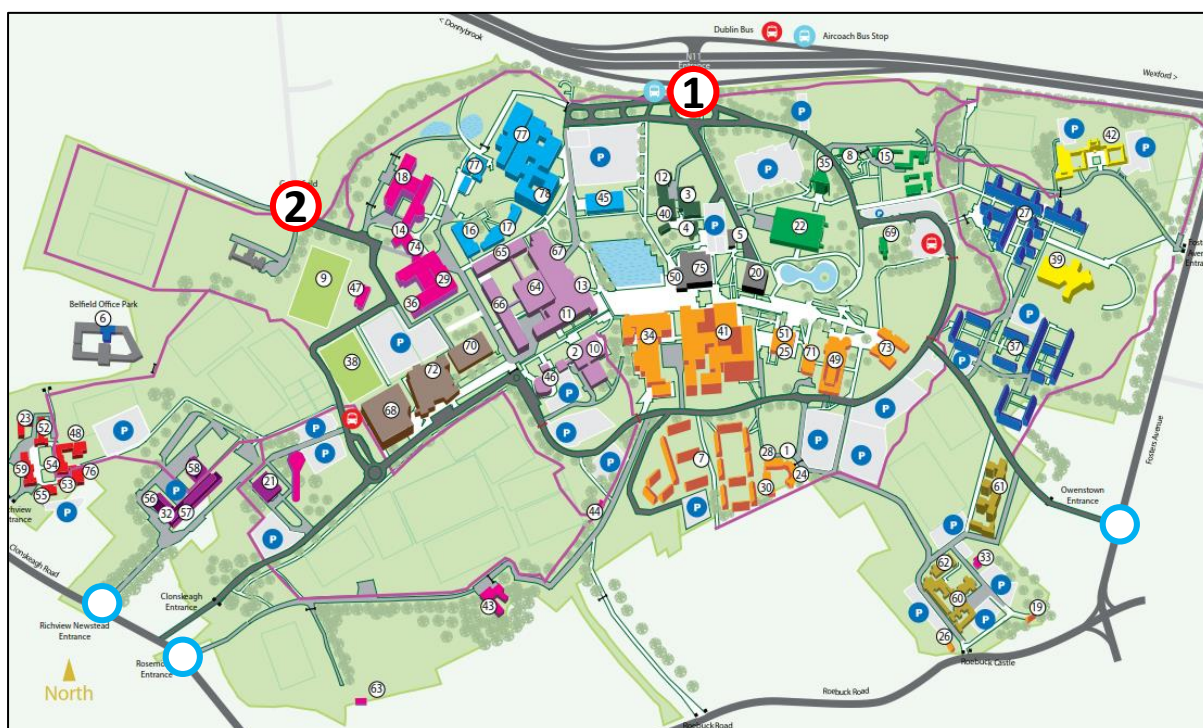


Figure 5.1: UCD gates that provide access to/from Stillorgan Road

5.2 Route Options Identification Assumption

The identification of routes options through UCD Campus was based on the assumption that a future bus service operation would be following the principles of a ‘Root & Branch’ operation type; i.e. a service operation that would enable services from the wider locality converge on an interchange/terminus location and, similar to the existing situation, provide for certain services to terminate, while others could continue onto bus service routes.

5.3 Proposed Route Options

In light of the above and following on from an assessment of the existing road network in the UCD Campus, four route options have been developed and assessed:

The route options examined are listed and discussed below:

- **Option 1A;**
- **Option 1B;**
- **Option 2A;** and
- **Option 2B.**

Route Option 1A

- Route Option 1A is illustrated in **Figure 5.2**.
- This route option would involve buses accessing UCD Campus through the main N11 vehicular entrance.
- Buses would circulate following the existing traffic management around the existing information point hut, which is located near the N11 entrance.
- Buses would then travel two-way onto the internal main Campus road that traverses the campus north – east, as far as the existing bus terminus location.

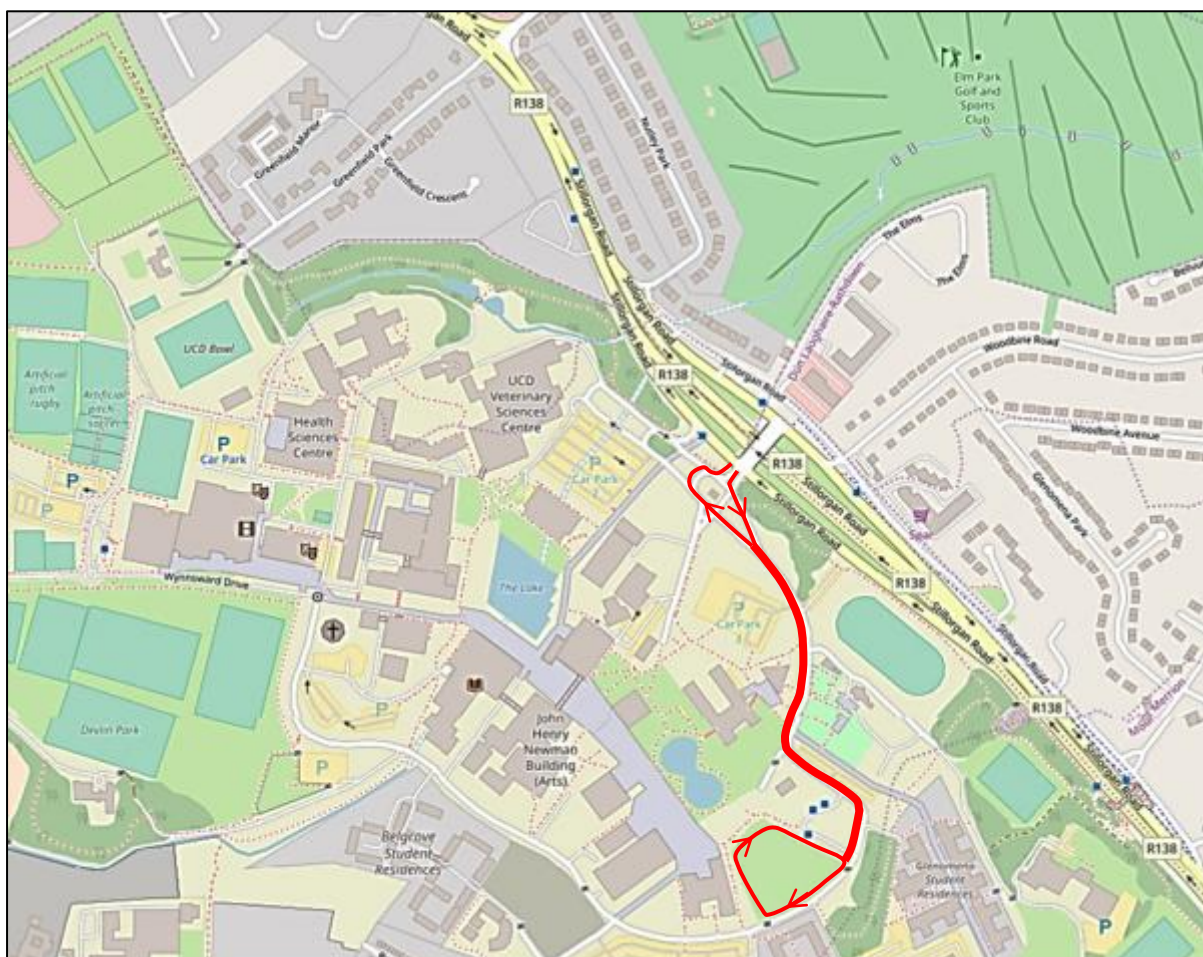


Figure 5.2: Route Option 1A

Route Option 1B

- Route Option 1B is illustrated in **Figure 5.3**.
- This route option would involve buses accessing UCD Campus through the main N11 vehicular entrance.
- However, buses would circulate following the existing car parking access / egress management.
- Buses would then travel two-way onto the internal main Campus road that traverses the campus north – east, as far as the existing bus terminus location.



Figure 5.3: Route Option 1B

Option 2A

- Route Option 2A is illustrated in **Figure 5.4**.
- This route option would involve buses entering UCD Campus through the main N11 vehicular entrance and exiting the Campus through the Greenfield Entrance, which is located on the western periphery of the Campus, following the existing car parking access / egress circulation.
- Buses would then travel two-way onto the internal main Campus road that traverses the campus north – east, as far as the existing bus terminus location.

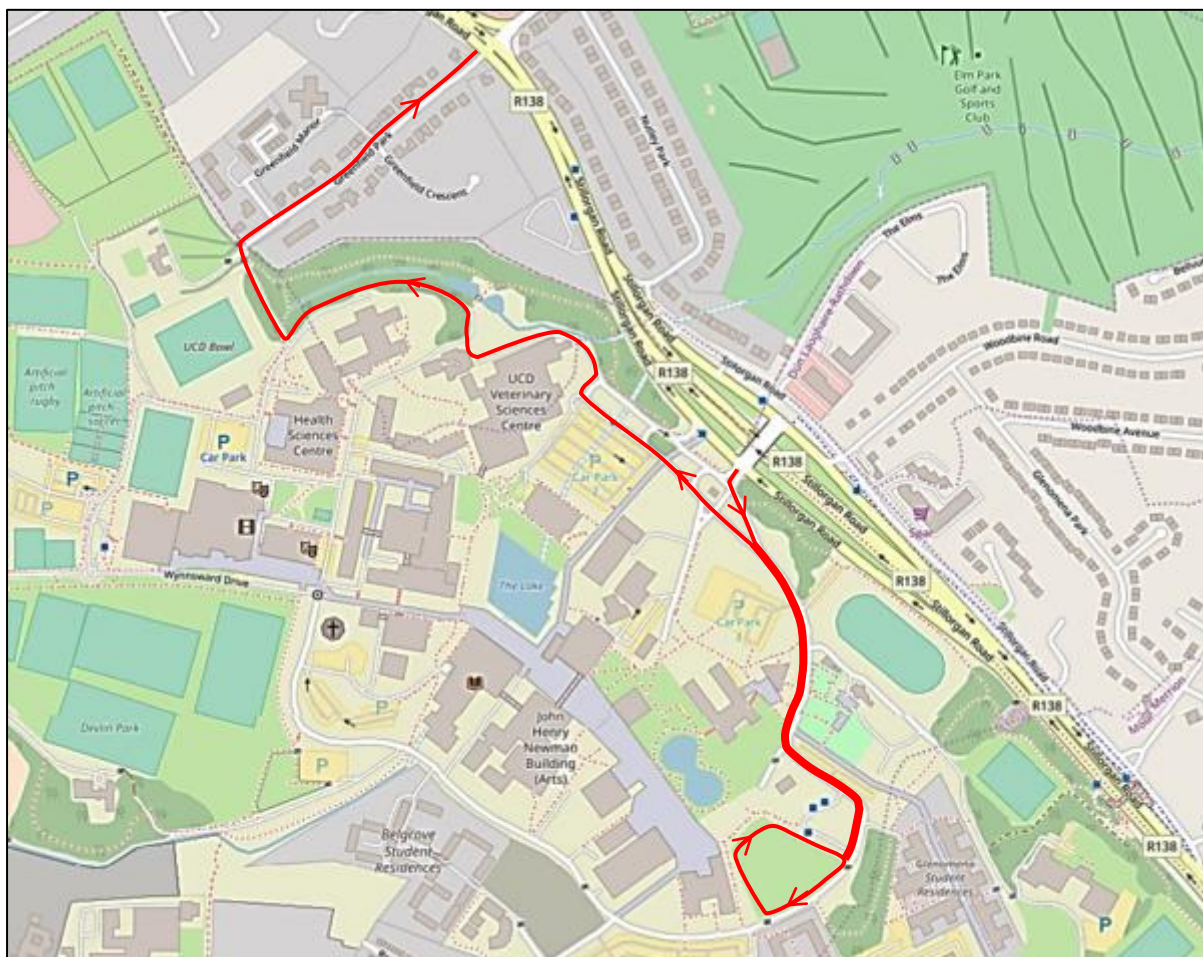


Figure 5.4: Route Option 2A

Option 2B

- Route Option 2B is illustrated in **Figure 5.5**.
- This route option would involve buses entering and exiting UCD Campus through the Greenfield Entrance, which is located on the western periphery of the Campus, following the existing car parking access / egress circulation.
- Buses would travel two-way onto the internal main Campus road that traverses the campus north – east, as far as the existing bus terminus location.

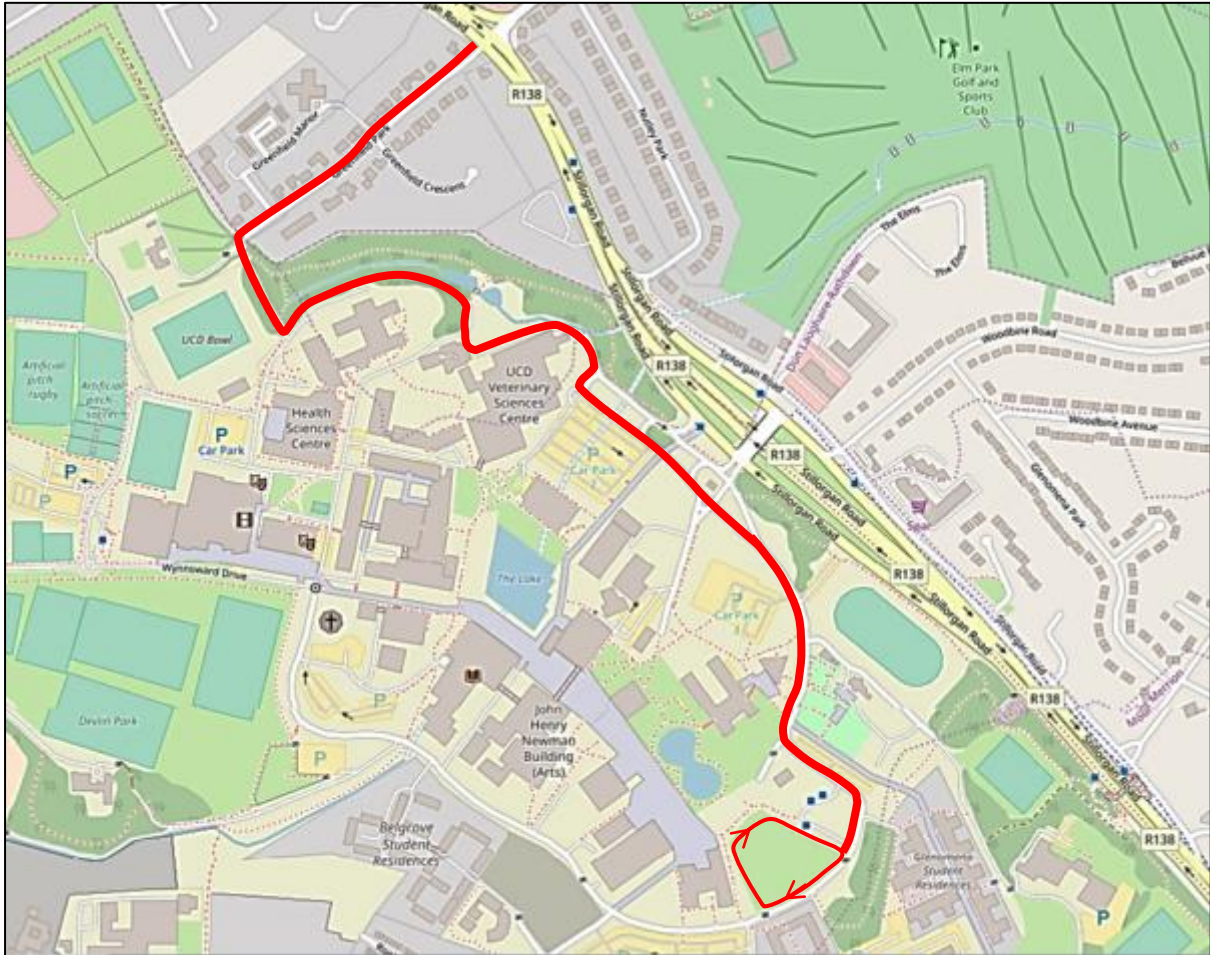


Figure 5.5: Route Option 2B

5.4 Assessment of Route Options

The route options have been assessed based on the following criteria:

- Directness of route;
- Impact on UCD Campus traffic management; and
- Bus services operational efficiency.

Table 5.1 shows the route options assessment ranking.

Table 5.1: Route Options Assessment

Criteria	Option 1A	Option 1B	Option 2A	Option 2B
Directness				
Impact on traffic management				
Operational efficiency				
Colour	Description			
	Significant advantages over the other options			
	Some advantages over other options			
	Neutral compared to other options			
	Some disadvantages compared to other options			
	Significant disadvantages compared to other options			

5.5 Preferred Route

When comparing the identified Route Options 1A, 1B, 2A and 2B, based on distance and impact on the receiving environment, Option 1A is deemed to be the preferred route because:

- it is the most direct route between the N11 entrance and the terminus facility; and
- impacts less upon the existing UCD Campus traffic management.

Also, Option 1A:

- ensures optimum bus operational efficiency; and
- links directly to the main UCD N11 entrance.

6. Interchange/Terminus Layout Options

6.1 Introduction

This report section discusses the assessment of layout options prepared for the proposed interchange/terminus facility in UCD, located in the existing bus terminus facility area, see **Figure 6.1**.



Figure 6.1: Existing bus terminus facility in UCD (2014)

6.2 Interchange/Terminus Design Considerations

The terminus layout design options have been developed based on the key considerations:

- requirement for layover;
- vehicle movements;
- pedestrian movements;
- provision of cycle parking;
- provision of welfare facilities for bus drivers; and
- minimisation of the impact on local road network, which could otherwise impact on bus schedules and service consistency.

6.3 Proposed Layout Options

Following on from an assessment of the existing site, three bus interchange/terminus layout options have been developed and assessed:

- **Option 1:** 4 Bays / 6 Layover;
- **Option 2:** 4 Bays / 2 Layover; and
- **Option 3:** 4 Bays / 4 Layover.

Appendix A includes drawings of all design options.

Layout Option 1: 4 Bays / 6 Layover

Layout Option 1, as shown in **Figure 6.2**, would provide the following features:

- 4 bus bays;
- 6 bus layover spaces; and
- Separate access and egress for buses.

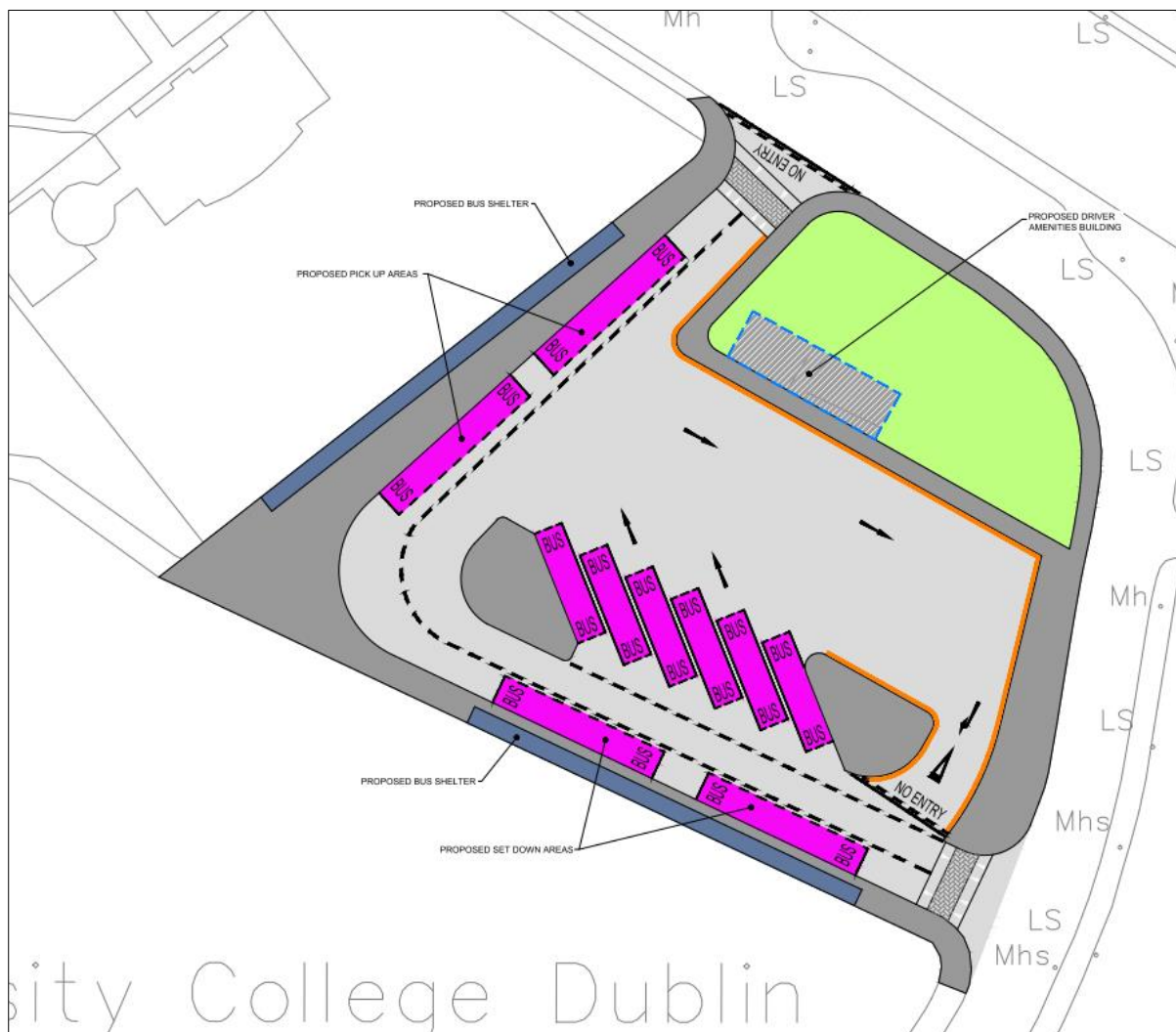


Figure 6.2: Interchange/Terminus Layout Option 1

Layout Option 2: 4 Bays

Layout Option 2, as shown in **Figure 6.3**, would provide the following features:

- 4 bus bays; and
- Separate access and egress for buses.



Figure 6.3: Interchange/Terminus Layout Option 2

Layout Option 3: 4 Bays / 4 Layover

Layout Option 3, as shown in **Figure 6.4**, would provide the following features:

- 4 bus bays;
- 4 layover spaces; and
- Separate access and egress for buses.

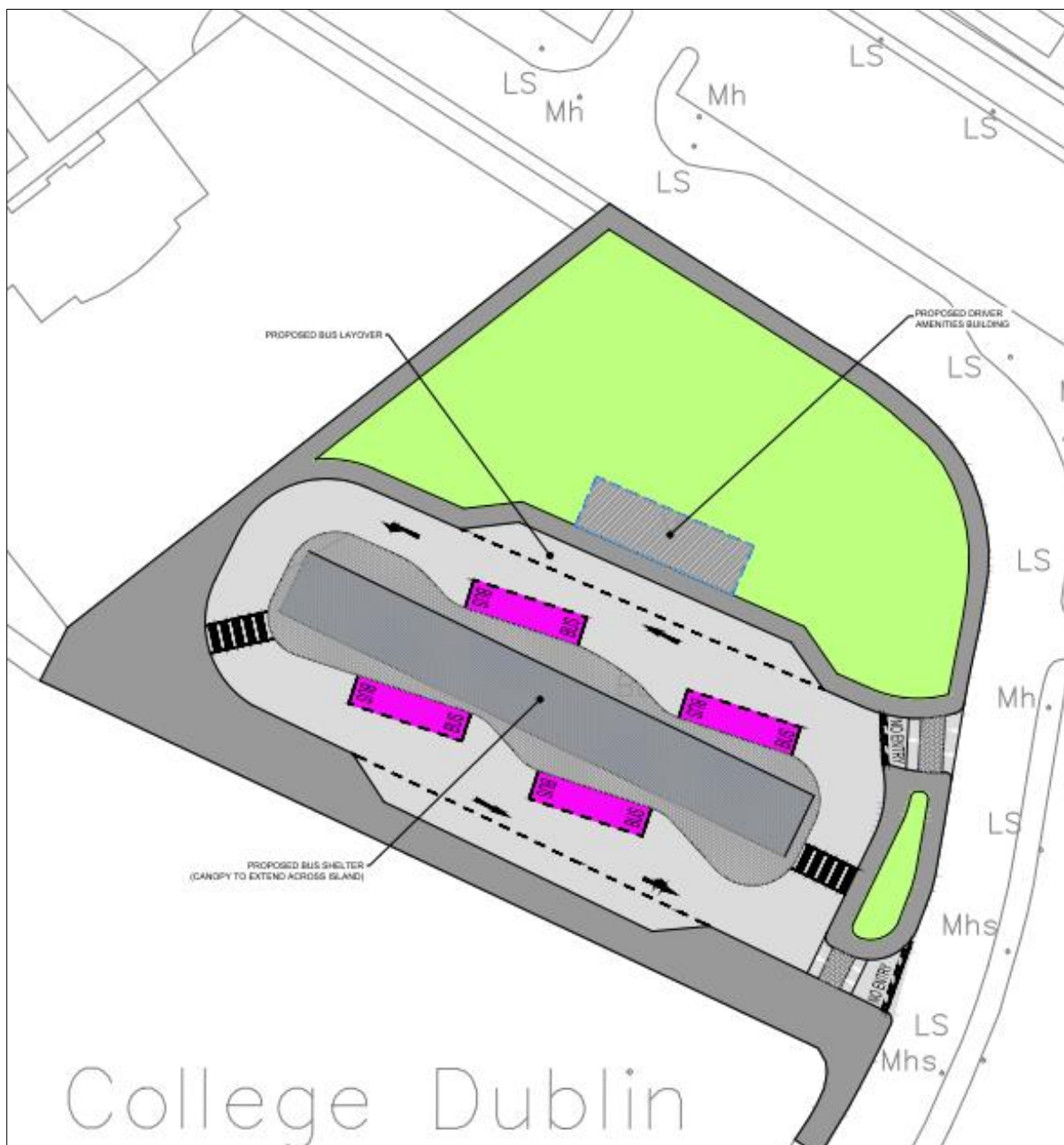


Figure 6.4: Interchange/Terminus Layout Option 3

6.4 Assessment of Layout Options

The route options have been assessed based on the following criteria:

- Infrastructure Works Cost;
- Layover Space;
- Bus Vehicle Movements;
- User Safety; and
- Traffic Impact.

Table 6.1 shows the layout options assessment ranking.

Table 6.1: Layout Options Assessment

Criteria	Option 1	Option 2	Option 3
Infrastructure Works Cost			
Layover Space			
Bus Vehicle Movements			
User Safety			
Traffic Impact			
Colour	Description		
	Significant advantages over the other options		
	Some advantages over other options		
	Neutral compared to other options		
	Some disadvantages compared to other options		
	Significant disadvantages compared to other options		

6.5 Preferred Layout Option

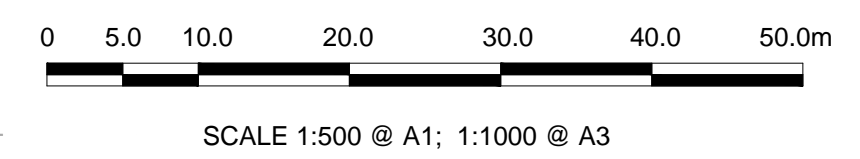
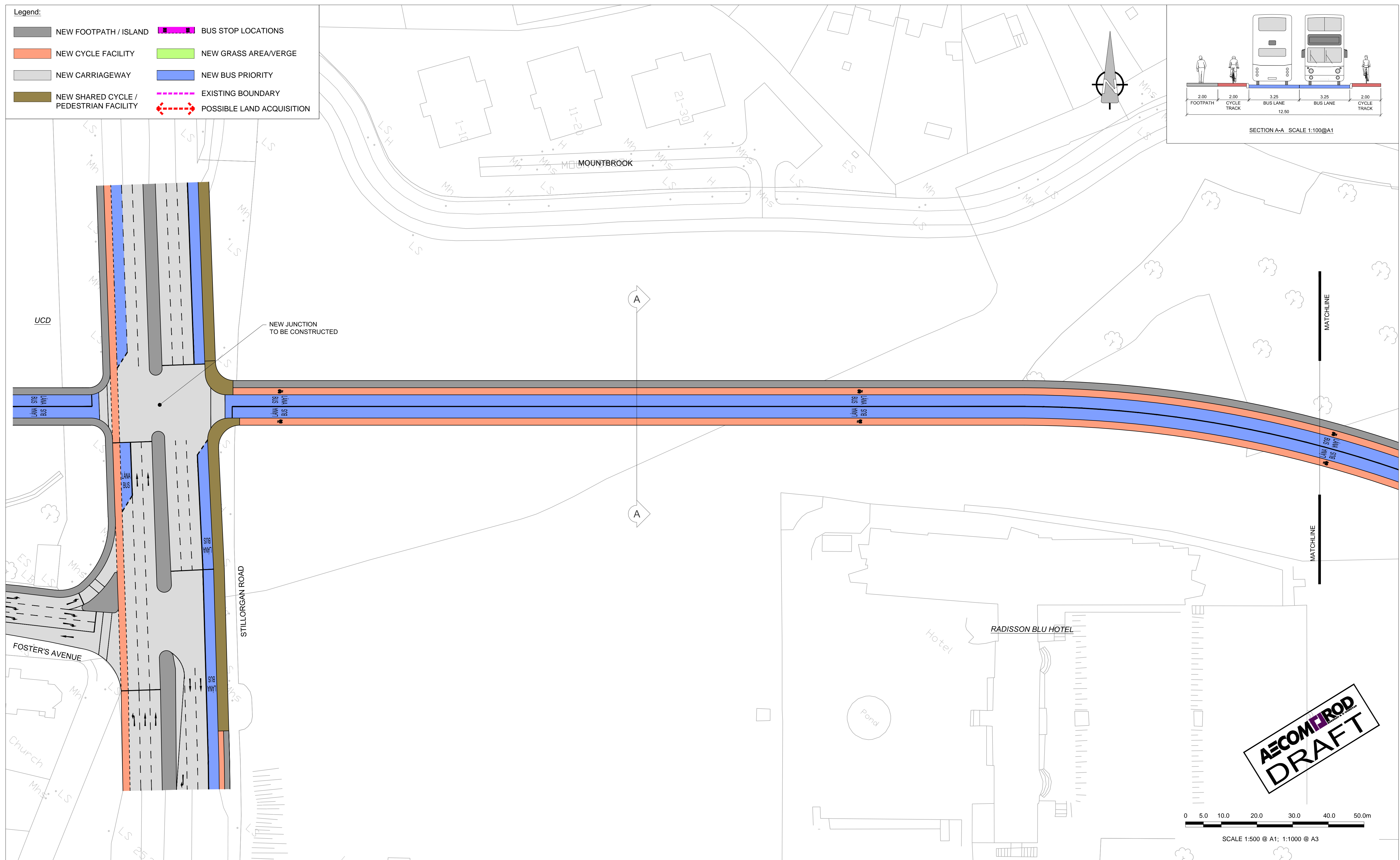
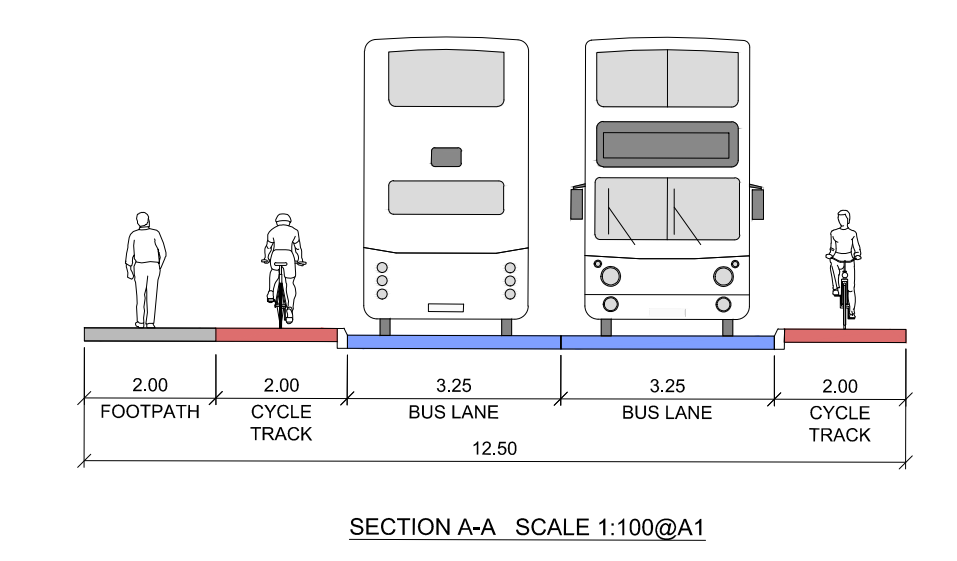
When comparing the layout Options 1, 2 and 3, and based on the key design criteria identified for a bus terminus layout in UCD, Option 1 is deemed to be the preferred option.

Compared to Options 2 and 3, Option 1:

- can be implemented at a lower infrastructure works cost than Options 2 and 3;
- achieves optimum space for layover;
- provides adequate space for bus movements than Options 2 and 3;
- ensures pedestrian / cyclists safety; and
- minimises impact on local road network.

Appendix A Drawings

- Legend:**
- NEW FOOTPATH / ISLAND
 - NEW CYCLE FACILITY
 - NEW CARRIAGEWAY
 - NEW SHARED CYCLE / PEDESTRIAN FACILITY
 - BUS STOP LOCATIONS
 - NEW GRASS AREA/VERGE
 - NEW BUS PRIORITY
 - EXISTING BOUNDARY
 - POSSIBLE LAND ACQUISITION



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Designed: -- Checked: -- Approved: -- Status: EMERGING PREFERRED ROUTE

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Drawing Title		PROPOSED EASTERN BYPASS ROUTE OPTION 2A SHEET 1 OF 3	
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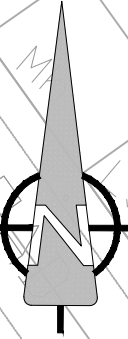
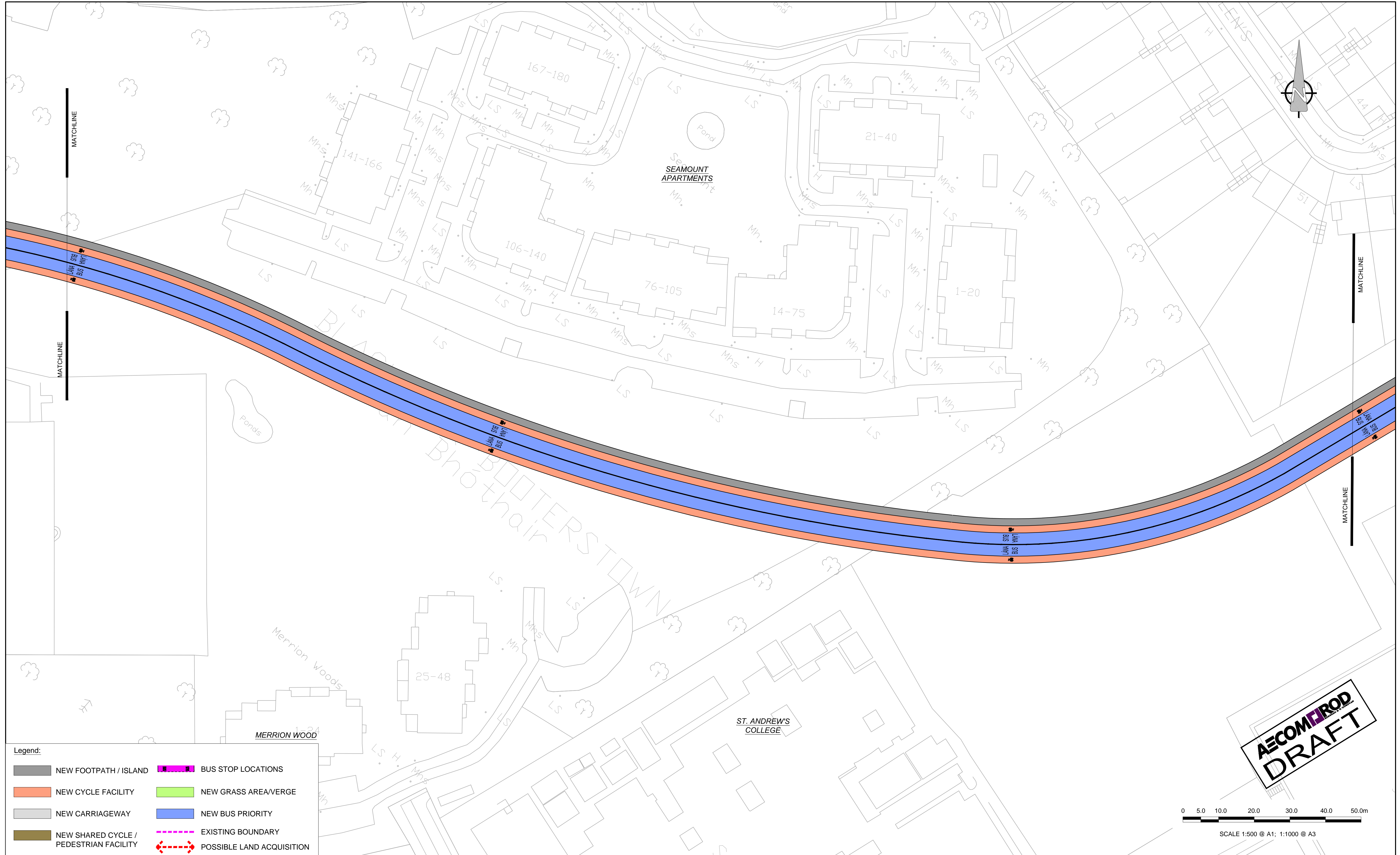
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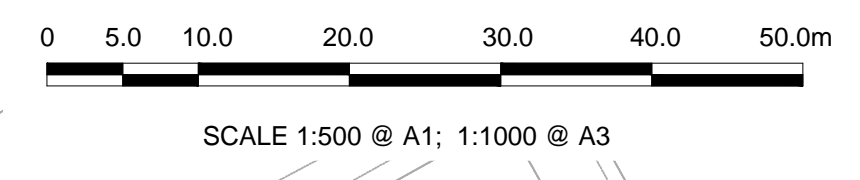
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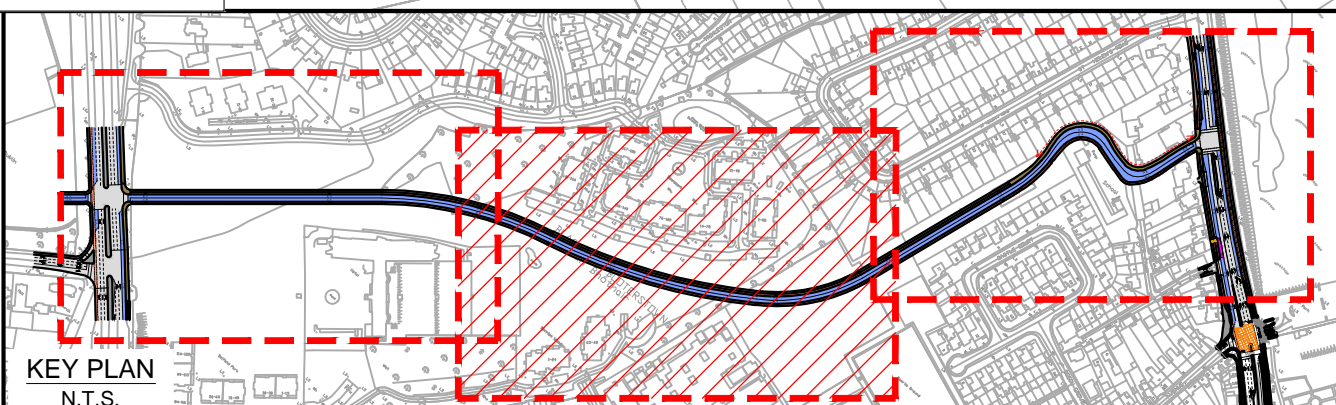


Legend:

	NEW FOOTPATH / ISLAND		BUS STOP LOCATIONS
	NEW CYCLE FACILITY		NEW GRASS AREA/VERGE
	NEW CARRIAGEWAY		NEW BUS PRIORITY
	NEW SHARED CYCLE / PEDESTRIAN FACILITY		EXISTING BOUNDARY
			POSSIBLE LAND ACQUISITION



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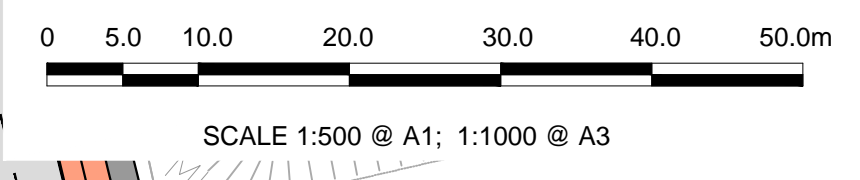
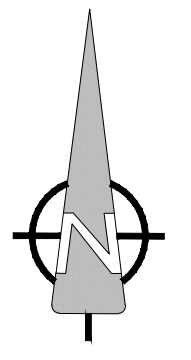
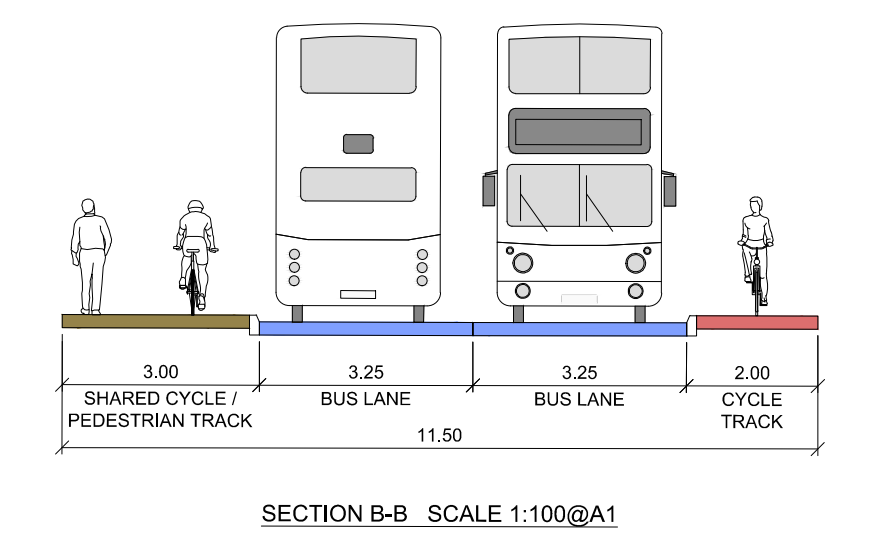
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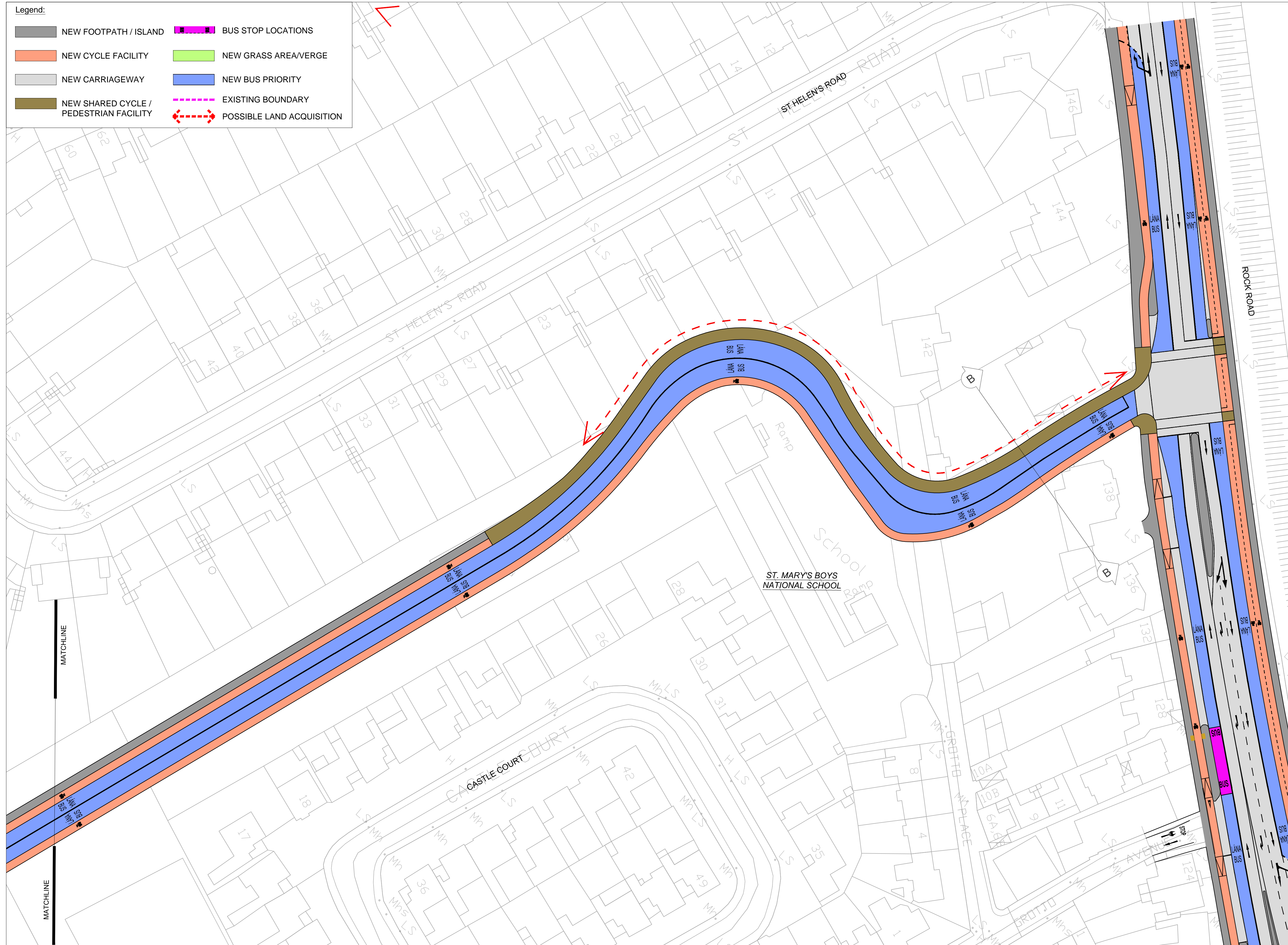
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- Legend:**
- NEW FOOTPATH / ISLAND
 - NEW CYCLE FACILITY
 - NEW CARRIAGEWAY
 - NEW SHARED CYCLE / PEDESTRIAN FACILITY
 - BUS STOP LOCATIONS
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