

Dún Laoghaire to City Centre Core Bus Corridor Options Study

Feasibility and Options Assessment Report **Executive Summary**

National Transport Authority

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R 001

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Executive Summary

Introduction

This report presents the findings of the route options assessment work undertaken for the Dún Laoghaire to City Centre Core Bus Corridor (CBC) and a recommendation on the emerging preferred option is made. The study was commissioned by the National Transport Authority (NTA) and undertaken by AECOM Roughan and O'Donovan (ROD) Consulting Engineers.

Core Bus Network

The Transport Strategy for the Greater Dublin Area 2016 – 2035 identified a core bus network for the Greater Dublin Area (GDA). This core network represents the most important bus routes in the region, which are generally characterised by a high frequency of bus services, high passenger volumes and with significant trip attractors located along the route. The identified core network comprises sixteen radial bus corridors, three orbital bus corridors and six regional bus corridors. The Dun Laoghaire - City Centre corridor represents one of the 16 radial bus corridors (Core Bus Corridors) forming the Core Bus Network.

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

Scheme Objectives

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

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

The Study Area

Arising from the transport policy context and scheme objectives set for the Dun Laoghaire CBC, the broad study area identified for the proposed scheme is illustrated in red in Figure (i) below. The study area includes the road network in the vicinity of the existing bus routes and extends to include additional potentially feasible route options. The study area is generally bounded to the north by the City Centre and to the south by Sallynoggin/Glenageary. Due to other studies examining the R138/N11 corridor as a bus route (Blanchardstown to UCD BRT and Bray to City

Centre CBC); the Dún Laoghaire to City Centre CBC study area does not include the R138/N11 corridor.

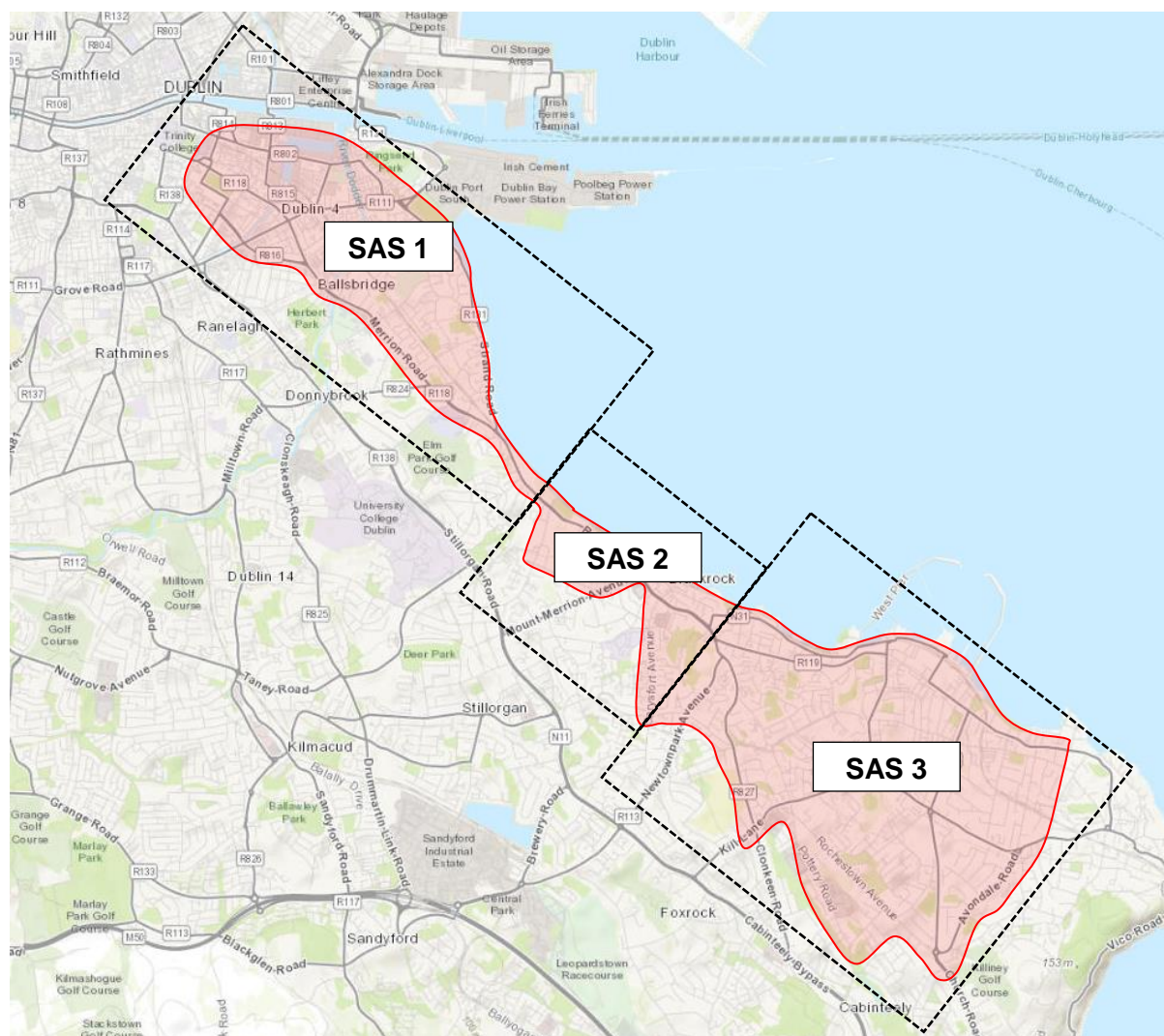


Figure (i) Study Area

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

- Study Area Section (SAS) 1 – City Centre to Booterstown;
- Study Area Section (SAS) 2 – Booterstown to Blackrock; and
- Study Area Section (SAS) 3 – Blackrock to Dun Laoghaire.

The extent of each of these corridor sections is presented in Figure (i) above.

Assessment Process

An initial ‘spiders-web’ of potential route sections that could accommodate a CBC was identified for each Study Area Section. This ‘spiders-web’ of route sections was chosen with reference to the CBC characteristics and in order to meet the scheme objectives as listed above.

Initial route sections identified also took cognisance of the physical constraints and opportunities present and the ability to integrate with other public transport modes and routes, including:

- Existing Dublin Bus services at numerous locations along the route;
- Existing DART service along the route;
- Proposed Blueline BRT from Sandyford to Sydney Parade via UCD; and
- Eastern Bypass infrastructural proposals are also noted.

Of particular relevance in developing the spiders-web was the potential for the road or route sections to facilitate fast and reliable journey times and thereby be able to practically accommodate bus lane priority.

The resulting spiders-web of route sections identified in the study area is presented in Figure (ii).

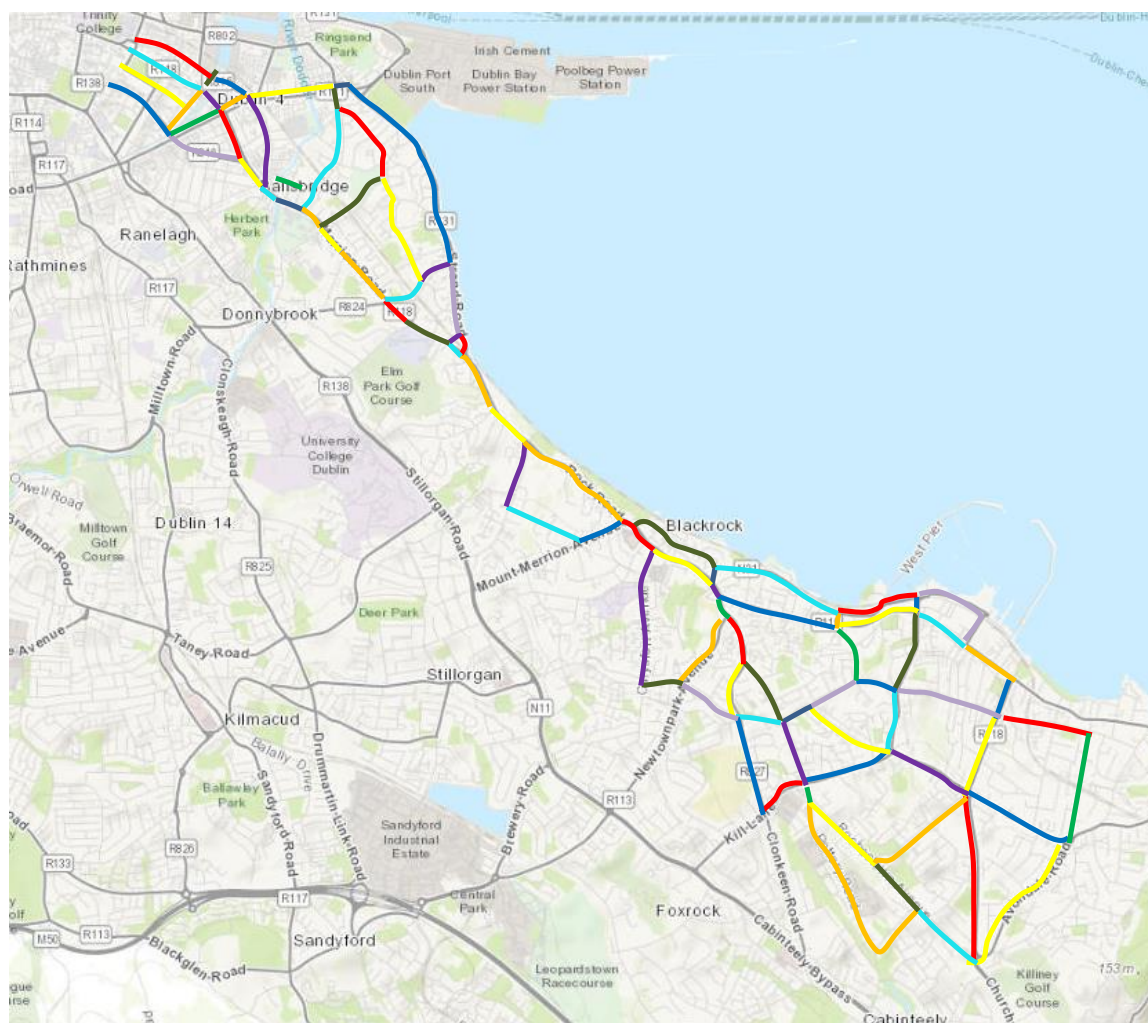


Figure (ii) Spider's Web of Route Sections

A two-stage assessment of the 'spiders-web' route sections was adopted:

Stage 1

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

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

Stage 2

Following completion of the 'Stage 1' assessment, the remaining potentially feasible route sections were progressed to Stage 2 of the assessment process which comprised a more detailed qualitative and quantitative assessment.

The first step in the Stage 2 assessment involved combining shorter route sections which passed the Stage 1 assessment to form longer end-to-end potential routes within each SAS. The resulting route options are presented in Figure (iii) below.

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 several scheme options for each route option within the three Study Area Sections.

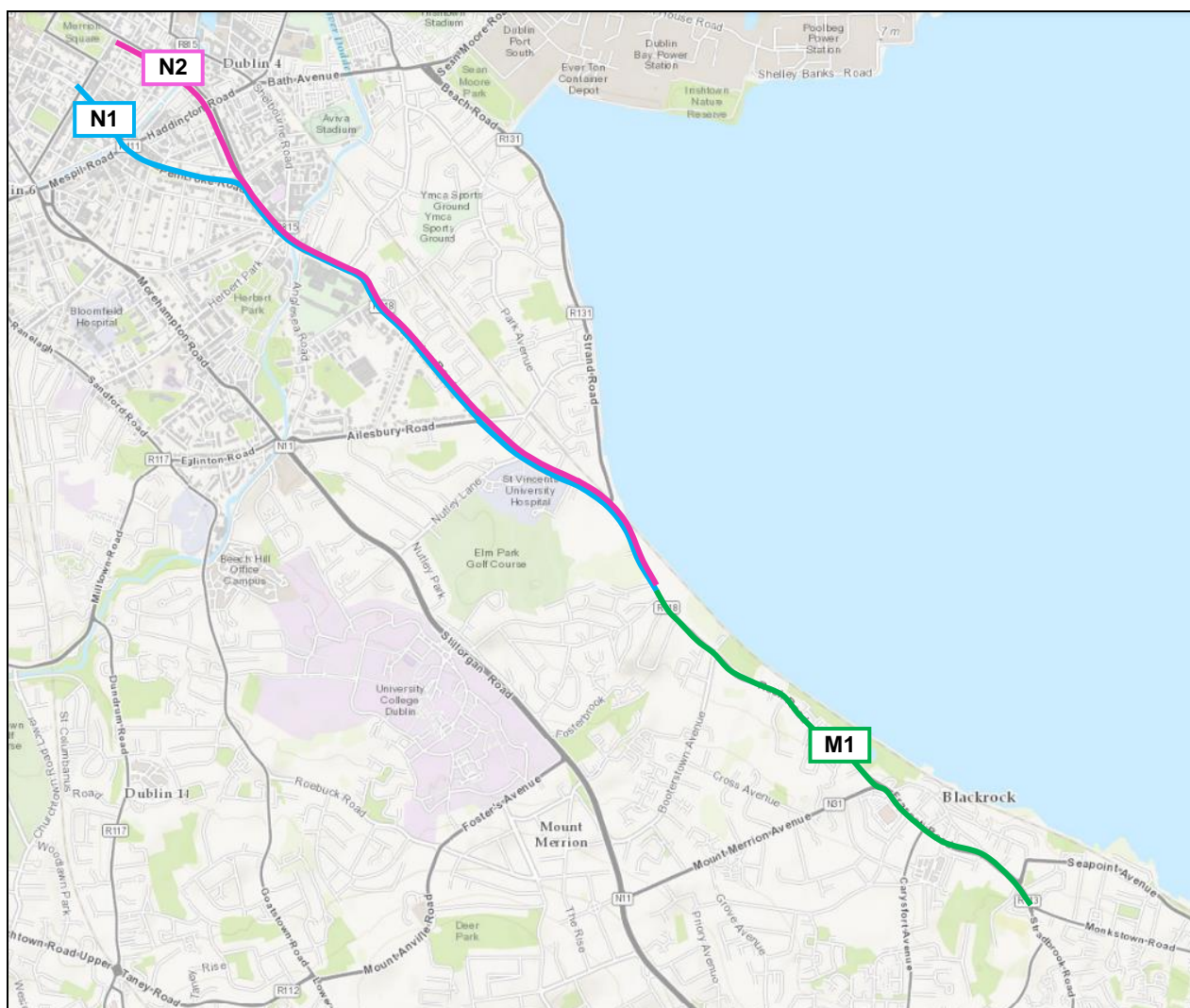


Figure (iii): Study area route options

The scheme options developed for each route option 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.

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

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

MCA assessment

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

Table (i) MCA criteria

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

Each sub-criterion in the MCA table is evenly weighted and the scheme option which achieved the highest average score overall (within each Study Area Section) formed part of the overall preferred route for the Dun Laoghaire to City Centre CBC.

The following scheme options scored highest in each Study Area Section:

- SAS1 - Route N1 Option 2; A route design along Merrion Road, Pembroke Road and Baggot Street Lower.
- SAS2 - Route M1 Option 1; A route design along Frascati Road (N31) and Rock Road (R118).

The Preferred CBC Route

Based on the conclusions from the route options assessment process, the recommended preferred route for the proposed scheme is presented in Figure (iv).

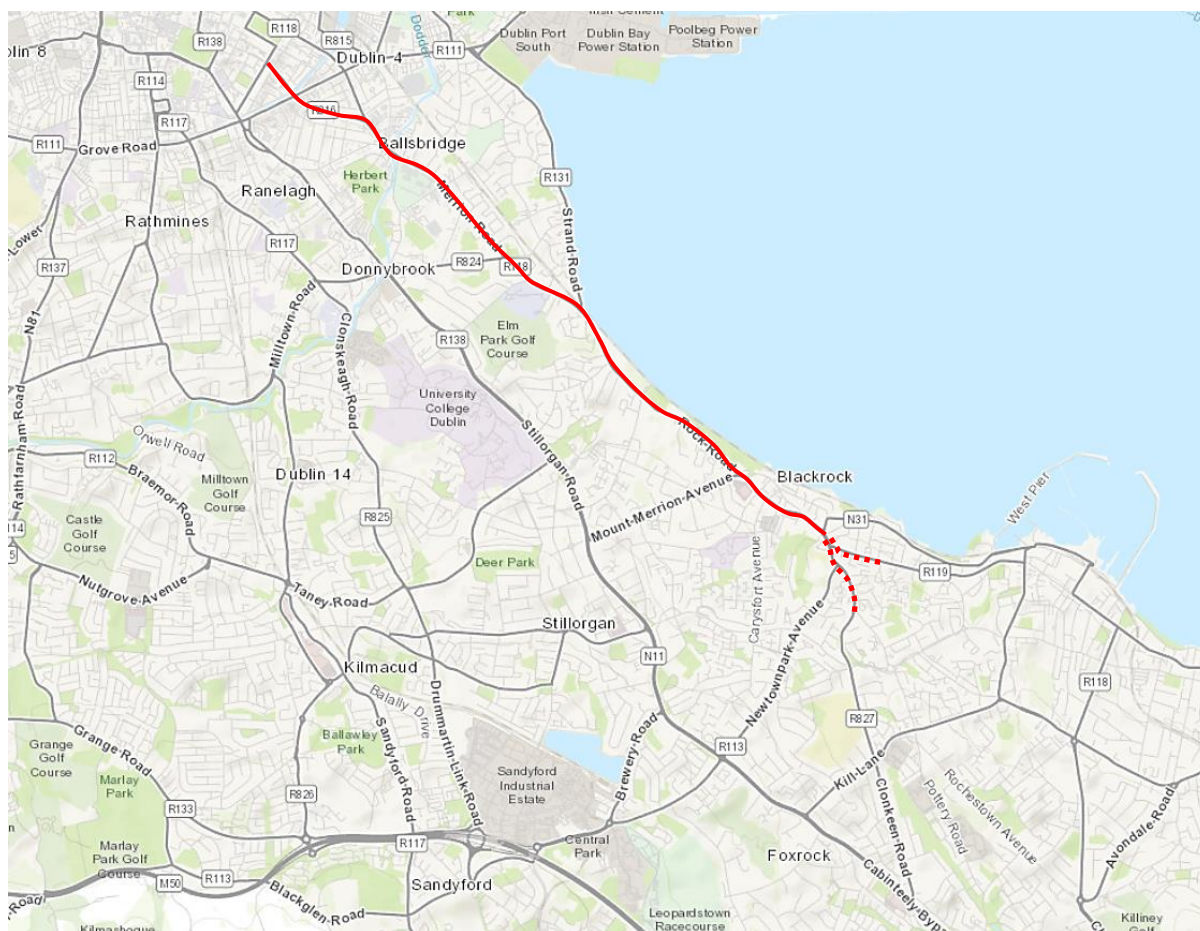


Figure (iv): Dun Laoghaire to City Centre CBC Scheme Preferred Route

This scheme is intended to serve the Dun Laoghaire to City Centre Corridor with stops at key locations along the route. The preferred route starts on Baggot Street Lower and connects to Booterstown via Pembroke Road and Merrion Road. From Booterstown, the CBC continues southwards to Blackrock via Rock Road and Frascati Road ending at Temple Hill Junction.

The proposed design incorporates the provision of inbound and outbound bus lanes, traffic lanes and cycle lanes whilst also providing inbound and outbound footpath facilities for a distance of approximately 7 kilometres from Baggot Street Lower /Fitzwilliam Street signalised junction to the signalised junction at Temple Hill/Monkstown Road.

Traffic light sequences shall also be amended at existing signalised junctions to allow bus lane priority along the prescribed route. The proposed bus and cycle infrastructure along the CBC is illustrated in Figure (v) below.

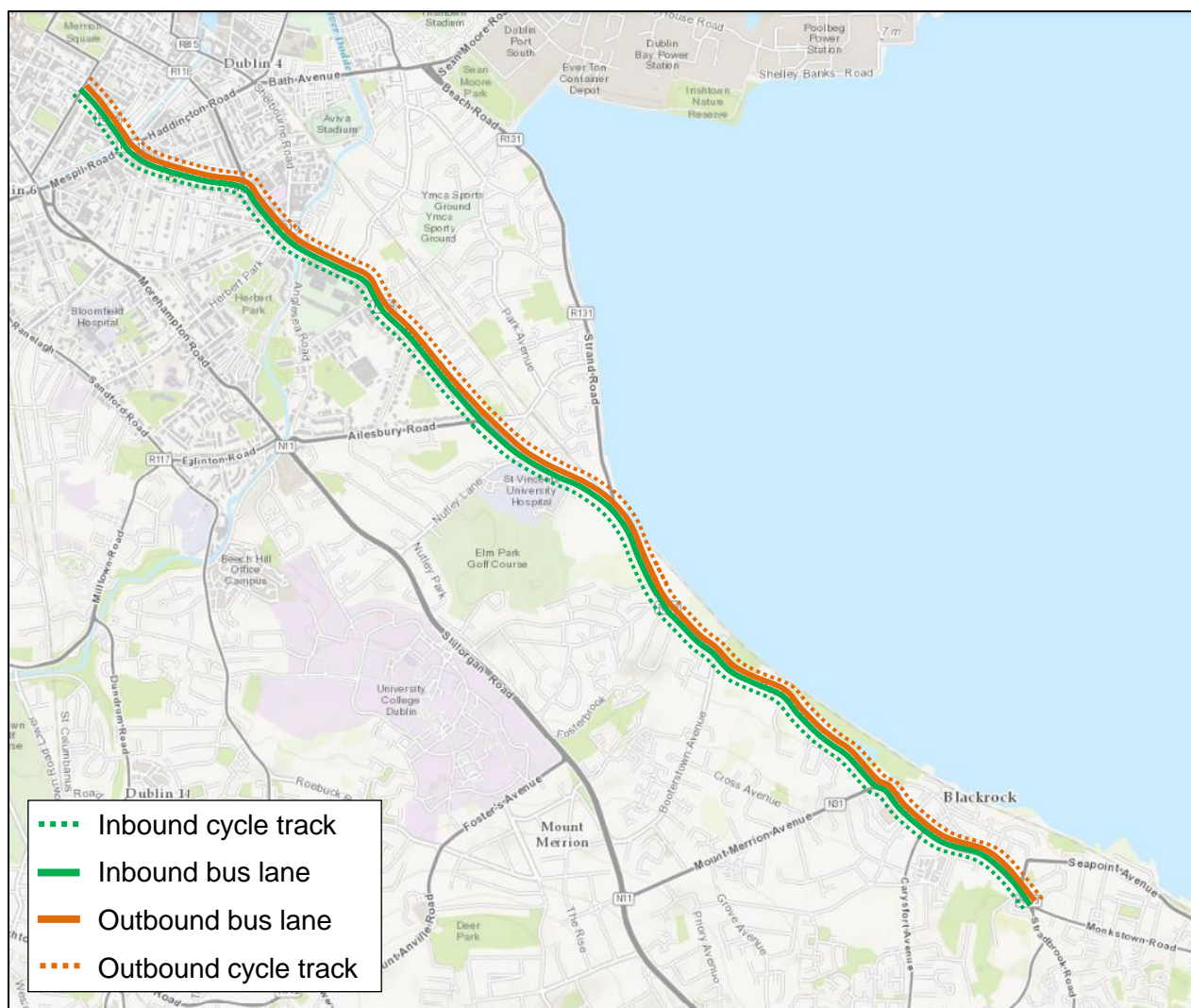


Figure (v): Bus and cycle infrastructure along the CBC

Bus stop locations have been optimised for the route to facilitate the route geometry and optimise catchment based on population and employment destinations.

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

- 5 minutes walking distance – 10,479 residents
- 5-10 minutes walking distance – 14,156 residents
- 10-15 minutes walking distance – 27,304 residents
- Total catchment within 15 minutes walking distance – 51,939 residents

These figures are based on the Census 2011 Small Area Population Statistics (SAPS). Furthermore, there are a total of 112,677 people working or attending an educational institution within the 15 minute walking catchment of the CBC stops i.e. 91,202 in employment and 21,475 in education.

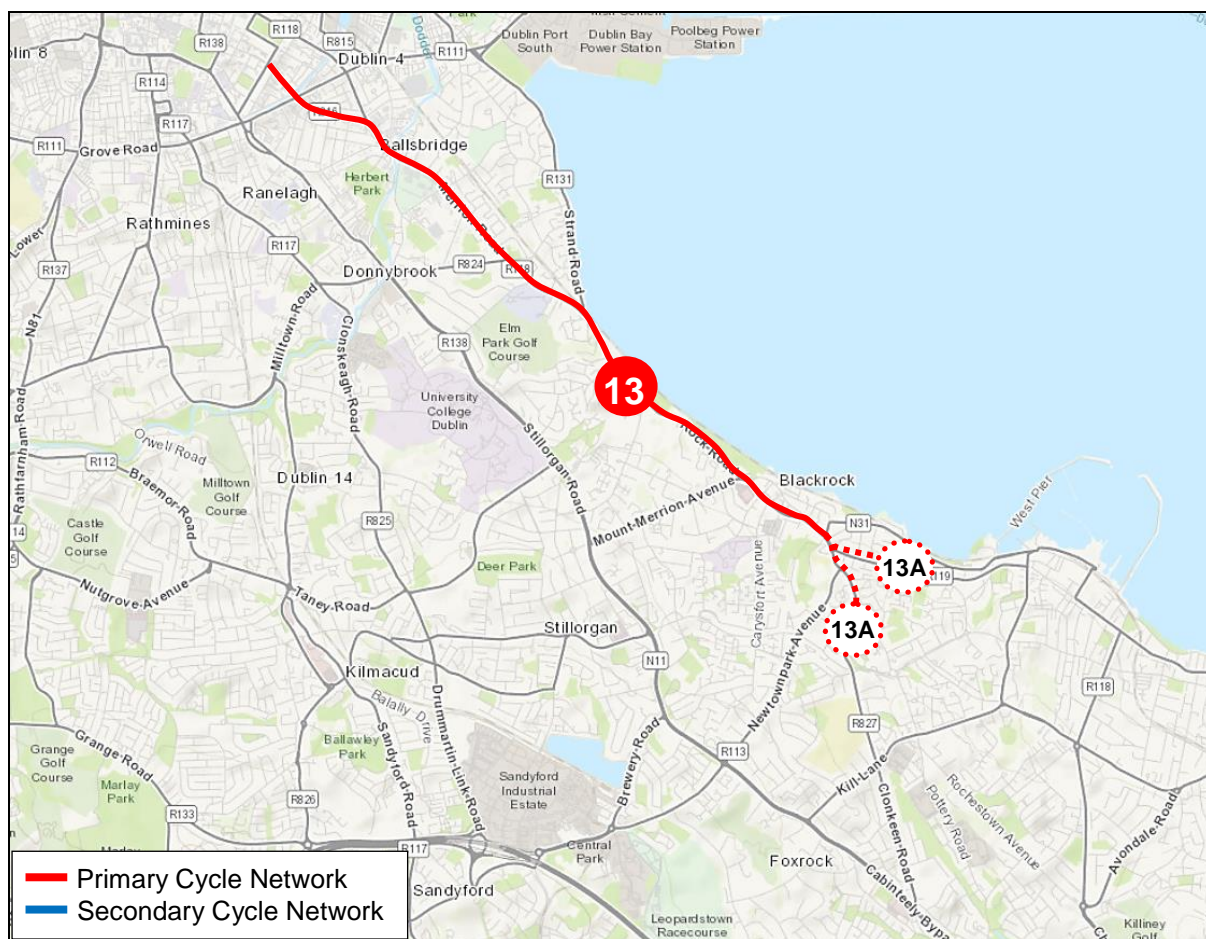


Figure (vi): GDA Cycle Network Plan along the EPO

The proposed design requires the introduction of entry raised treatments at a number of entrances along the route e.g. the entrances to Helens Road, Grotto Avenue, Booterstown train station, Blackrock College Car Park, main and rear entrances to Willow Terrace, The Willows, Castledawson Avenue, Seafort Parade, Emmett Square, Phoenix Terrace, Sion Hill and Ben Inagh Park to reduce the speed of traffic approaching the route via side street accesses, whilst allowing pedestrians to free flow through junction entry's/exits. All proposed inbound and outbound footpaths exceed the minimum standard width of 1.8 metres.

Summary

The following summarises the main features of the proposed EPO:

Table (ii): Summary table of preferred route

Route length	7 km
Length of bus priority (outbound)	7 km
Length of bus priority (inbound)	7 km
Length of dedicated cycle lane in each direction	7 km
Number of bus stops (outbound)	26
Number of bus stops (inbound)	25
Residential catchment area (within 15 mins walking distance of nearest bus stop)	76,600
Number of people working or attending an educational institution within the 15 minute catchment area	123,000
Journey Time outbound, peak time * conservative calculation: buses stop at every junction and pedestrian crossing for the maximum time, accordingly, see Appendix C	44 minutes
Journey Time inbound, peak time * conservative calculation: buses stop at every junction and pedestrian crossing for the maximum time, accordingly, see Appendix C	45 minutes

Feasibility Working Cost Estimate

A cost estimate for the Emerging Preferred Option has been developed for the scheme and is indicated in Table (iii) below. It was developed primarily based on standard rates that AECOM-ROD have available from similar types of projects in Dublin

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

Table (iii) Initial Cost Estimate for EPO

<i>Study Area Section</i>	<i>Total Capital Cost Estimate</i>
SAS 1 (N1 Option 2)	€13.6M
SAS 2 (M1 Option 2)	€3.8M
SAS 3 (First 300 meters)	€2.4M
Total	€19.8M
<i>Study Area Section</i>	<i>Total Capital Cost Estimate</i>
SAS 1 (N1 Option 2)	€13.6M
SAS 2 (M1 Option 2)	€3.8M
SAS 3 (First 300 meters)	€2.4M
Total	€19.8M

Emerging Preferred Scheme Benefits

In summary, the Emerging Preferred Scheme 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;
- 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 Dun Laoghaire to City Centre Core CBC;
- Reconfiguration of existing junctions, which will provide considerable benefits for pedestrian accessibility and bus priority, making the bus routes more attractive;
- Proposed new bus stops, which increase the attractiveness and catchment area of the bus route in this Study Area;

- Interchange with DART – including complementary footpath upgrade and wayfinding proposals as part of the scheme design;
- Ability to extend bus services southwards; and
- Serving important trip attractors.

Next Stages of Design Development

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

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