

DUBLIN REPLACEMENT UNDERGROUND CABLE PROGRAMME

Route Options Assessment – CP1146 Carrickmines to Poolbeg

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1 INTRODUCTION

1.1 The Project

Dublin's electricity infrastructure is ageing and reaching its end of life. Work must be done to transform and modernise the city's electricity infrastructure, so Dublin can continue to develop and thrive, while increasingly using power from renewable sources.

The Dublin Replacement Underground Cable Programme is a critical programme that will strengthen key electricity infrastructure in Dublin and the surrounding areas, making the city 'renewable ready.' This programme is set to replace and upgrade five 220kV circuits across Dublin city and the surrounding areas.



Figure 1-1: Existing 220kV circuits in Dublin, with the study area shown in pink

The 220kV circuits which are to be replaced are detailed in Table 1-1.

Table 1-1: Dublin Replacement Cable Projects in the Dublin Area

Project Name	Existing Circuit Route Length
CP1146 Carrickmines - Poolbeg	11.9 km
CP1150 Inchicore – Poolbeg	14.5 km
CP1157 Inchicore – Poolbeg	14.5 km
CP1216 North Wall – Poolbeg	4.6 km
CP1100 Finglas – North Wall	11.3 km

EirGrid proposes to replace all the existing circuits with cross-linked polyethylene (XLPE) cable primarily on an offline route, to minimize power outages on the existing circuits. These XLPE cables are more efficient and robust, which will enable the grid to carry more power.

Replacing the existing circuits in an offline route means the new circuit follows a separate route to the existing circuit. The advantage of this is that there are minimal disruptions to the existing circuit and no, or very few, planned outages would be needed during construction.

The alternative to this is online replacement where the new circuit follows the existing circuit route. The old circuit is decommissioned as the new circuit is laid. For this method, a circuit outage of the existing circuit would be required for the entire construction period.

Due to the electricity needs of Dublin, an online replacement is not feasible. For this reason, offline installation will be considered for the replacement of this circuit.

1.2 Purpose of this Report

The Dublin Replacement Underground Cable Programme is following EirGrid’s Framework for Grid Development, which is an end-to-end process for all EirGrid’s grid development projects. The framework takes projects from their conception - the identification of a need to develop the electricity transmission grid - to their eventual construction and subsequent energisation. The framework is explained in EirGrid’s “Have your Say” document and is illustrated in Figure 1-2.

This approach facilitates engagement and consultation with stakeholders and the public which helps to explore options fully and make more informed decisions. Previous studies by EirGrid have brought the Dublin Replacement Underground Cable Programme through Steps 1, 2 and 3 of their Framework for Grid Development and the project is currently at Step 4. It is noted that as the project progresses through to Step 5, there is a possibility that the replacement of underground electricity transmission cables may be classified as exempted development, meaning planning permission is not required. This is subject to the specific assessment of the project including and meeting specific criteria including environmental and ecological criteria.

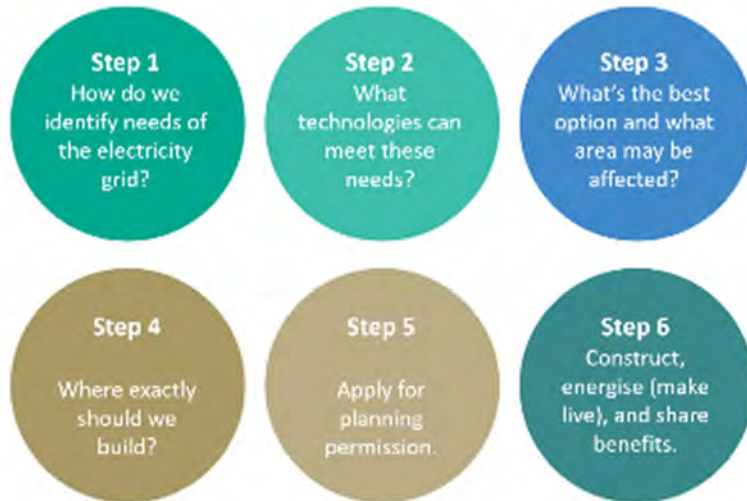


Figure 1-2: EirGrid's Six-Step Framework for Grid Development

As part of Step 4, four route options were developed to replace the existing Carrickmines - Poolbeg 220kV circuit. To analyse the route options, they were broken down into smaller sections between nodes where the proposed route options cross or divert from each other. The sections between nodes were then analysed using EirGrid's five multi-criteria assessment categories. These are shown in Figure 1-3.



Figure 1-3: EirGrid's Five Multi-Criteria Assessment Categories

This Route Options Assessment report describes all the potential route options, the methodology used to identify these route options, and how the route options were broken down into sections. Each section is then assessed according to the five categories listed above and the best possible sections are used to build new routes that will perform well in the multi-criteria assessment. From these routes, the Emerging Best Performing Routes are selected to progress and develop further.

To aid in the selection of a Best Performing Route, there will be site investigation along the Emerging Best Performing Routes to supplement the desk research that has been done on these routes. There are two types of site investigations proposed: non-invasive and invasive investigations.

Non-invasive investigations are performed to gain an accurate design of the above and below ground environments. These include:

- Surveys of the landscape
- Inspecting manholes
- Using sonic and radar devices with Cable Avoidance Tool (CAT) and Genny and Ground Penetrating Radar (GPR) and other geophysical methods.

Invasive investigations will be conducted to confirm the location of below ground services where non-invasive methods are unsuccessful and where ground conditions are important. This involves slit trenching and H trenching, trial pitting and ground sampling using boreholes.

- Slit trenches are long narrow trenches used to identify and confirm the position of existing underground utilities. H trenches are H-shaped trenches performed where Joint Bays are proposed.
- At sites where trenchless methods such as Horizontal Directional Drilling (HDD) is proposed to cross existing services, infrastructure or natural features, borehole may be needed to analyse soil and ground conditions to inform the feasibility and detailed design of the crossing.

2 METHODOLOGY AND APPROACH

2.1 Introduction

The purpose of this report is to assess the various route options and determine the Emerging Best Performing Route Option to develop further in the Best Performing Option Report and through Step 5 to completion. This section outlines the methodology applied to achieve this.

Initial route options were identified using high-level considerations as listed below, in Chapter 2.2, following the identification of constraints within the study area. The constraints identified in the study area were primarily based on a review of publicly available datasets, as well as route walkover surveys.

The data sources include but are not limited to the following:

- Development Plans – Fingal County Council and Dublin City Council
- Myplan.ie Mapping
- Central Statistics Office, CSO
- National Parks and Wildlife Services, NPWS
- Irish Ramsar Wetland Committee
- Environmental Protection Area (EPA) mapping
- Geological Survey Ireland, GSI
- National Monuments Service
- Heritage Mapping
- Corine 2018 and 2012 data (sourced from the EPA). This dataset was used with aerial imagery and supplemented with datasets obtained directly from other sources covering the Dublin area, to determine land use.
- Digital terrain mapping was sourced by EirGrid from the Ordnance Survey Ireland (OSI) for the study area. An orthographical map of the study area, sourced from OSI, was also reviewed.
- Information from local authorities, asset owners and utility providers.

To help minimise disruption and work as efficiently as possible, this project will coordinate with other state-owned utilities, transport providers and local authorities through the Dublin Infrastructure Forum (DIF). The forum meets quarterly.

The DIF has also setup three working groups at operational level:

- Stakeholder engagement and communications;
- Technical expertise; and
- Planning and environment.

While the initial focus of the work of the DIF has been on the **Powering Up Dublin** programme, it is intended to work more broadly across other major infrastructure projects being delivered in the area such as water, gas and transport.

2.2 Identification of Route Options

Potential route options for the Carrickmines - Poolbeg circuit were identified following high-level considerations under the following headings:

- Environmental

- Ecology
- Water bodies
- Social
 - Residential, amenity, commercial
 - Archaeology/Cultural heritage
- Economic
 - Land ownership
 - Length of route
- Technical
 - Major obstacles (crossings that may require trenchless techniques)
 - Route geometry (width, straight sections, sharp bends)
- Deliverability
 - Land availability
 - Road access

This led to the identification of 4 potential route options, however the route options are not completely unique. There is some overlap between various sections on each route option.

2.3 Definition of Sections

To assist with the multi-criteria assessment of each route, and to ensure each section assessed was distinct and no section was duplicated in the assessment, the route options were broken down into sections. These sections ran between two nodes along the route. A node was created wherever two routes crossed or diverted from each other. The sections are labelled according to the nodes they run between, for example the section running between Node A and Node B was labelled Section A-B.

2.4 Route Building

The advantage of breaking up the route options into smaller sections as described in Chapter 2.3 above is that these sections can then be combined in new ways to build an optimised route. This methodology grants a lot more freedom to build the best possible route, using sections that rank the best during the multi-criteria assessment.

This also allows certain constraints to be avoided more easily, by selecting alternative sections that bypass the constraint.

Each section was assessed using the multi-criteria assessment outlined in Chapter 2.5.

2.5 Criteria Used for Comparison of Options

The route sections were assessed using EirGrid's five multi-criteria assessment categories. These are as follows:

- Technical
- Deliverability
- Economic
- Socio-Economic
- Environmental

The categories were further divided into subcategories which are described below. For each subcategory, the section was ranked according to the colour scale shown in Table 2-1.

Table 2-1: Colour coding of Risk / Significance / Sensitivity levels

Colour Key	Level of Risk / Significance / Sensitivity
Yellow	Low
Green	Low-Moderate
Dark Green	Mid-Level / Moderate
Blue	Moderate-High
Dark Blue	High

2.5.1 Technical

Table 2-2: Technical Subcategories for the Multi-Criteria Assessment

Subcategory	Description
Technical Operating Risk	Will the route lead to areas which are difficult to access to complete maintenance activities, examples include access to railways, motorways, fast lanes of major roads, etc.
Compliance with EirGrid Functional Specification for 220kV	Considers the limitations imposed by the specification in terms of routing with existing roadways, cable rating
Expansion/Extendibility	Considers the possibility of future extension of the network (would also consider the impact of the use of a particular route on future advised EirGrid routes).
Geotechnical conditions	Considers the impact of known ground conditions (from GSI data or other available datasets), this would include depth to bedrock, likely water table depth, known areas of poor ground / marsh.

2.5.2 Deliverability

Table 2-3: Deliverability Subcategories for the Multi-Criteria Assessment

Subcategory	Description
Road Access	Road access to the sites to be considered, specifically the ability to deliver plant and cable to a site (low bridges, narrow roads, load limits on roads/bridges)
Outage Impact	This item considers the requirement to deenergise existing cables to construct the new circuits.
Route Geometry	The number of acute bends or overall “bendiness” of a particular route should be considered against other routes Topography, topology etc.
Land Availability	Land availability for the construction of the circuit and specifically the joint bays and working space during cable pulling
Planning and other statutory requirements	Considers the requirement for planning, foreshore licenses or other statutory requirements
Material Assets	Considers the impact of the route on existing EirGrid assets. Number of crossings of canals, motorway, Luas, DART and feasibility of these, major utility infrastructure.
Utility Congestion	Considers the extent of existing utilities based on available datasets (risk of inaccuracy of existing datasets to be noted)
Working Time Constraints	Considers the working time restrictions which will apply to the route, this data will most likely come from the Traffic Impact Number, however other

Subcategory	Description
	sources may be considered (work in residential areas, at sports grounds etc.)
Reinstatement Requirements	Considers the technical / time impact of reinstatement on the proposed route, has the road been recently resurfaced, is the road of concrete construction are there special paving or surface treatments in place which will need to be reinstated
Dependence on other projects	Considers the likely interface, both positive and negative on the cable routes (Metro North and others)

2.5.3 Economic

Table 2-4: Economic Subcategories for the Multi-Criteria Assessment

Subcategory	Description
Length of Route	Comparison of route length against a baseline of the existing route length.
Number of Crossings	Quantity of non-standard crossings, HDD, Microtunnel, River Crossing etc.
Reinstatement Costs	Considers the cost impact of reinstatement on the proposed route, has the road been recently resurfaced, is the road of concrete construction are there special paving or surface treatments in place which will need to be reinstated
Utility Diversion Requirements	Considers the requirement to arrange for the diversion of known utilities to prevent a clash or to open a circuit corridor. This would be for significant utilities such as high-pressure gas mains etc.
Bespoke Circuit Trench Requirements	Sections where non-standard trenches cannot be achieved – e.g., Bridge deck crossings or similar.

2.5.4 Socio-Economic

Table 2-5: Socio-Economic Subcategories for the Multi-Criteria Assessment

Subcategory	Description
Cultural heritage	Considers the potential impact / proximity to areas (and specific points) of Cultural Heritage.
Proximity to critical services	Services that will have a critical socio-economic impact if affected (i.e., business parks, schools, smaller healthcare centres, etc)
Duration of the works	The overall duration of the works in a particular area should be considered, however it should be noted that some low impact routes may have long durations whilst some high impact routes may be completed quickly
Settlements and Communities	Proximity to buildings, specifically the number of buildings within a 50m buffer of the route
Amenity	Impact on recreational activities (e.g., fishing, sports) and tourism during and after construction, that are not included in the other sub-criteria.
Traffic and Transport	Considers the impact of the route on traffic, specifically on bus routes, on-street parking and cycle lanes. When the route has been selected, it is important to note that a full Traffic Management Plan (TMP) will be created and implemented throughout the construction phase of this project. Any openings in the road will comply fully

Subcategory	Description
	with the Guidelines for Managing Openings in Public Roads and will be licenced accordingly.
Emergency services	Considers the impact to Ambulance, Fire Engine and Garda dispatch points / depots as well as to Emergency Hospitals / ERs

2.5.5 Environmental

Table 2-6: Environmental Subcategories for the Multi-Criteria Assessment

Subcategory	Description
Planning policy and land use	Considers if the project is allowable under the development plan.
Biodiversity, Flora and Fauna	Considers the possible impact of the selected route on biodiversity – based on the significance from constraints mapping
Landscape and Visual	Considers the impact of the route on landscape – based on the significance from constraints mapping.
Contaminated land	Considers the risk of encountering and dealing with the impacts of contaminated ground. Based on constraints mapping and known areas of contamination such as landfills, historic landfills etc.
Flood risk	Considers the risk of flooding, this will be most applicable to the construction stage – based on the significance from constraints mapping.
Water Impact	Considers the risk arising from proximity to water bodies – based on the significance from constraints mapping. Number of crossings, proximity of circuits etc.
Probability of triggering NIS requirements	Considers the risk of a particular route or section of a route triggering an NIS, in particular proximity to a Natura 2000 site (or pathway link) or similar.

3 ROUTE OPTIONS

This chapter looks at the location of the existing Carrickmines - Poolbeg 220kV circuit, four route options identified using the methodology outlined in Chapter 2.2 and the sections these route options have been broken down into.

3.1 Summary of Existing Route

The existing Carrickmines – Poolbeg 220kV circuit was constructed in 1971 and is a low-pressure Self-Contained Fluid Filled (SCFF) cable circuit approximately 14.5km in length. This cable is reaching its end of life, but the circuit is vital for the transmission grid in Dublin. To minimise the disruption to the grid, the circuit needs to be replaced in an offline route as discussed in Chapter 1.1.

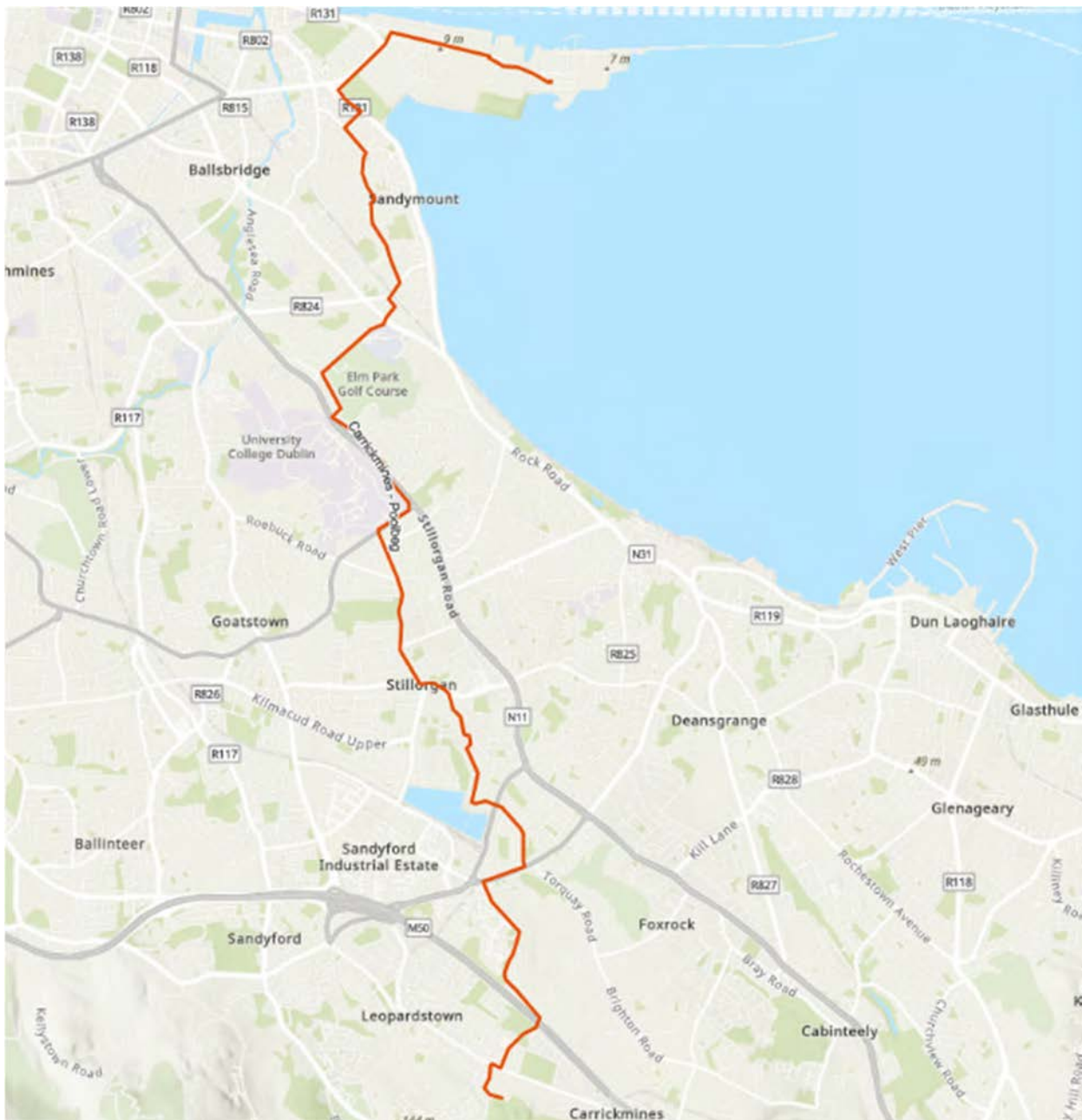


Figure 3-1: Map of the existing Carrickmines - Poolbeg 220kV SCFF cable circuit

3.2 Option Selection Overview

Potential route options were developed according to the high-level criteria outlined in Chapter 2.2. Four route options were developed. These route options are all shown in Figure 3-.

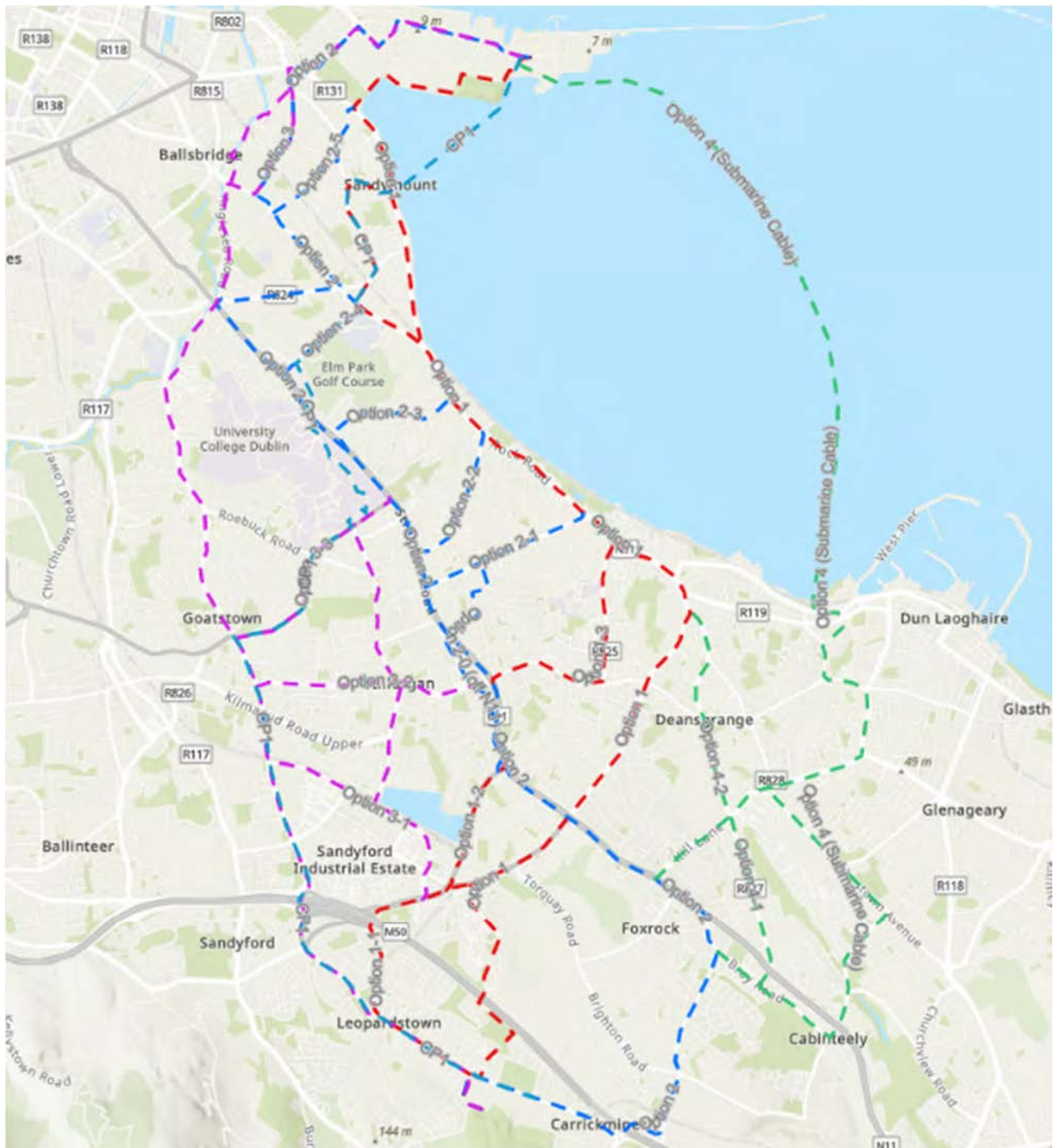


Figure 3-2: All route options developed in the Carrickmines to Poolbeg Study Area

Individual route options are described and shown in Chapters 3.2.1 to 3.2.5.

3.2.1 Route Option 1

Route Option 1-0 leaves the Carrickmines Substation and travels in a generally easterly route from Carrickmines Substation, crosses Ballyogan Road onto Drinaghmore Close and crosses the M50 at the

Leopardstown Racecourse overbridge. The Route then passes through Leopardstown Racecourse to join the R113 (Leopardstown Road) and proceeds Northeast to the N31 (Rascati Road) and then Northwest along the R118 (Rock Road) to the level crossing with the DART at Merrion Gates. The route then follows the R131 (Strand Road) to Sean Moore Park where it turns to the East and skirts the park and follows the route of the shoreline toward the Poolbeg Substation.

There are four alternative sections on this route described below:

- Route 1-1

This route does not pass through Leopardstown Racecourse but instead follows Ballyogan Road Northwest then the R113 (Murphystown Way) and crosses the M50 at Junction 13 following the N31 and R113 (Leopardstown Road) then re-joining option 1-0 outside Leopardstown Racecourse.

- Route 1-2

This section utilises Sub Option 1-1 but follows the N31 (Brewery Road) northeast to meet the N11 and joins Route Option 2-0.

- Route 1-3

This section utilises Sub Option 1-1 & 1-2 but only follows the N11 for 750m, then turns east onto the R825 (Stillorgan Park Road, Upper Carysfort Avenue, Carysfort Avenue) and follows the R825 to its junction with the N31 re-joining Route 1-0.

- Route 1-4

Route Sub Option 1-4. Follows Route Option 1-0 to the Merrion Gates but does not cross the DART here, continues along the R118 (Merrion Road) to its junction with Sydney Parade Avenue and then follows Sydney Parade Avenue crossing the DART at the level crossing then turns North along Park Avenue, then East onto Gilford Road to re-join Route Option 1-0

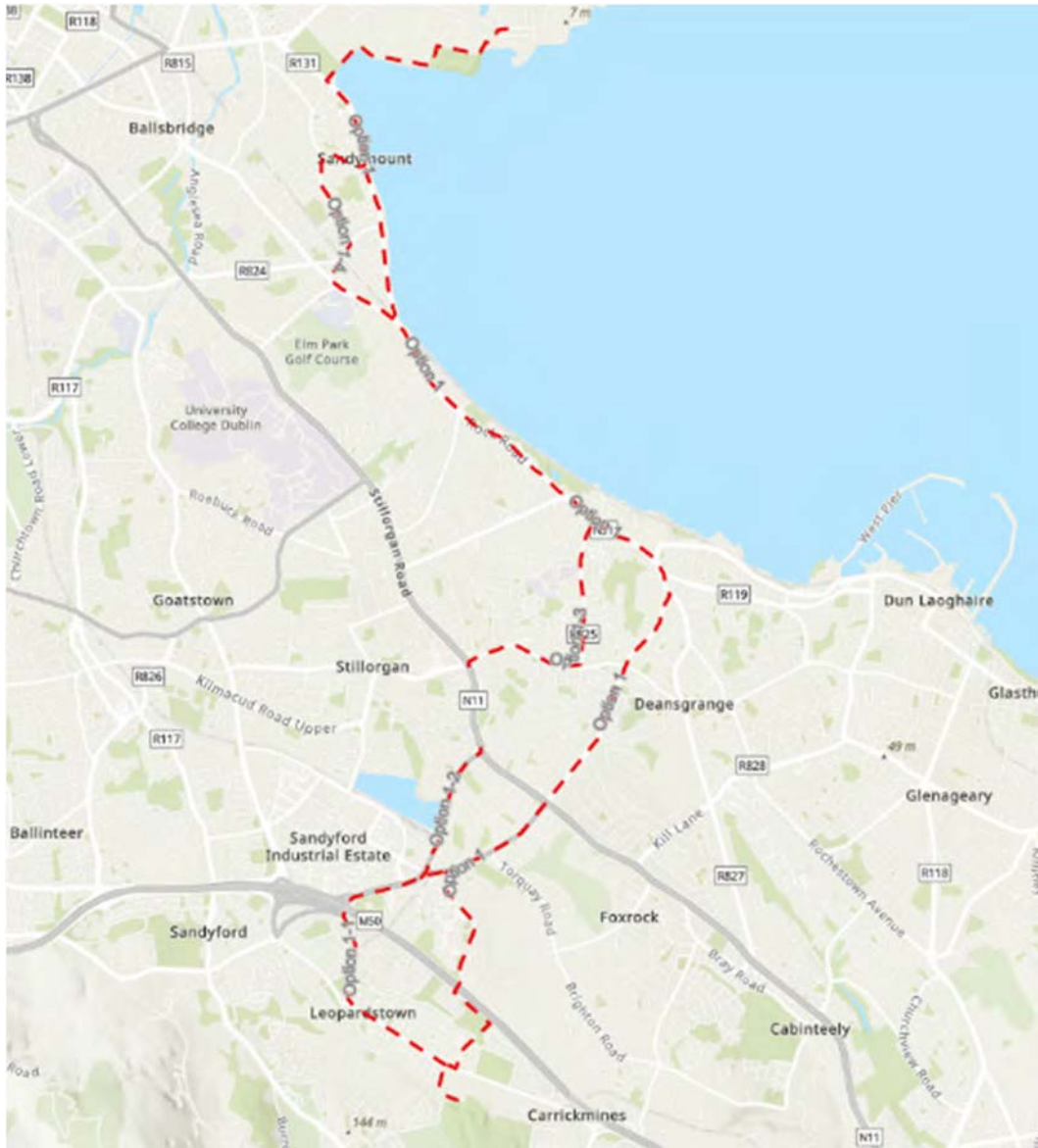


Figure 3-3: Carrickmines to Poolbeg - Route Option 1

3.2.2 Route Option 2

Route Option 2 leaves the Carrickmines Substation and travels South on Ballyogan Road. It crosses over the M50 via the Ballyogan Road bridge and travels towards the N11 on Glenamuck Road North (crossing over the Laus Green Line via a bridge on this road), Cornelscourt Hill Road and Bray Road. The route follows the N11 Northbound and continues North as the road becomes the R138. At the intersection with Ailesbury Road, the route follows Ailesbury Road East, until it reaches the Merrion Road.

The route then follows Serpentine Avenue where it crosses the DART line at a level crossing. Serpentine Avenue becomes Tritonville Road. At the intersection with Church Avenue, the route travels East into the Poolbeg Peninsula following Beach Road, Sean Moore Road and Pigeon House Road to get to the Poolbeg Substation.

The following sub-options are included in route option 2 assessment:

- Route Option 2-0

This route option avoids part of the N11, travelling instead along Saint Brigid’s Church Road, Glenalbyn Road, The Hill and Old Dublin Road before crossing the N11 to Priory Drive and Grove Avenue. This route joins option 2-1 at this point.

- Route Option 2-1

This route option travels from the N11 along the N31 to Rock Road where it joins Route Option 1.

- Route Option 2-2

This route option travels from the N11 along Booterstown Avenue to Rock Road where it joins Route Option 1.

- Route Option 2-3

This route option travels from the N11 along Woodbine Road to Rock Road where it joins Route Option 1.

- Route Option 2-4

This route option travels from the N11 along Nutley Lane to Merrion Road where it re-joins Route Option 2.

- Route Option 2-5

This route option travels from Merrion Road, along Sandymount Avenue. On Sandymount Avenue there is a level crossing with the DART line. It travels through Gilford Road, Sandymount Green, Seafort Avenue, Seafort Terrace, Dromard Terrace and Marine Drive where it joins Route Option 1.

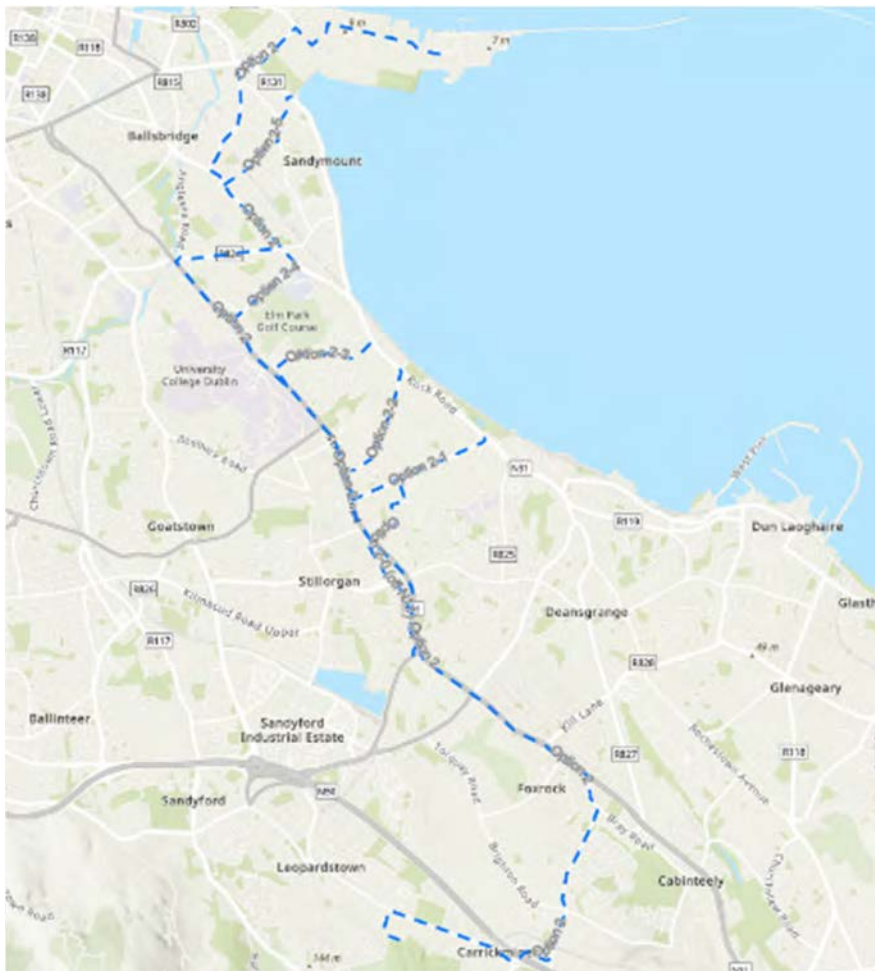


Figure 3-4 Carrickmines to Poolbeg - Route Option 2

3.2.3 Route Option 3

Route option 3 commences at the Carrickmines substation and follows the Ballyogan road onto the Kilgobin road where it crosses the M50 at Junction 14.

North of the M50 the route continues within the Drummartin Link Road (leading to the R825) until it reaches the junction with Beech Hill Road. At this junction the route runs north easterly within Beech Hill Road and Beaver Road, where the route crosses the R138 (main artery into Dublin City) and continues along the R815 (Anglesea Road).

At the junction with R815 and R118 the route turns through 90 degrees and runs along the R118 for approximately 300m. The route then proceeds down Serpentine Avenue and onto Tritonville Road. At the junction with the R111 the route turns east and is located in the R111, leading to the R131 (Sean Moore Road) and from the roundabout the route changes direction towards the Poolbeg peninsula, is located within the Pigeon House Road as far as the Poolbeg substation.

A number of alternatives have been identified which may provide opportunities to link main route options.

- Route Option 3-1. Linkage between route 1 and route 3.

This option links the N31 in Sandyford industrial Estate to the Drummartin Link Road, via Burton Hall Road, Blackthorn Avenue and Benildus Avenue. This option may be beneficial if the M50 crossing at Junction 13 (Murphystown Way bridge) or the Leopardstown Racecourse private bridge crossing is preferred over the crossing at Junction 14.

- Route 3-3 Linkage between route 2 and route 3

This option links the R825 to the R138 via R112 (Mount Anville road). The option would facilitate sections of route 2 and route 3 to be considered if there are difficulties encountered with the main routes.

- Route 3-3 Linkage between route 2 and route 3

This option links the R825 to the N11 via the R825 (Lower Kilmacud road through Stillorgan village).

The option would facilitate sections of route 2 and route 3 to be considered if there are difficulties encountered with the main routes.

- Route 3-4 Alternative route linking route 3-1 and 3-2

This option follows the R826 along St. Raphael's Road, crosses the R825 (Lower Kilmacud Road) and proceeds along the South Avenue and North Avenue to the junction with the R112 (Mount Anville Road). The option would facilitate sections of route 2 and route 3 to be considered if there are difficulties encountered with the main routes.

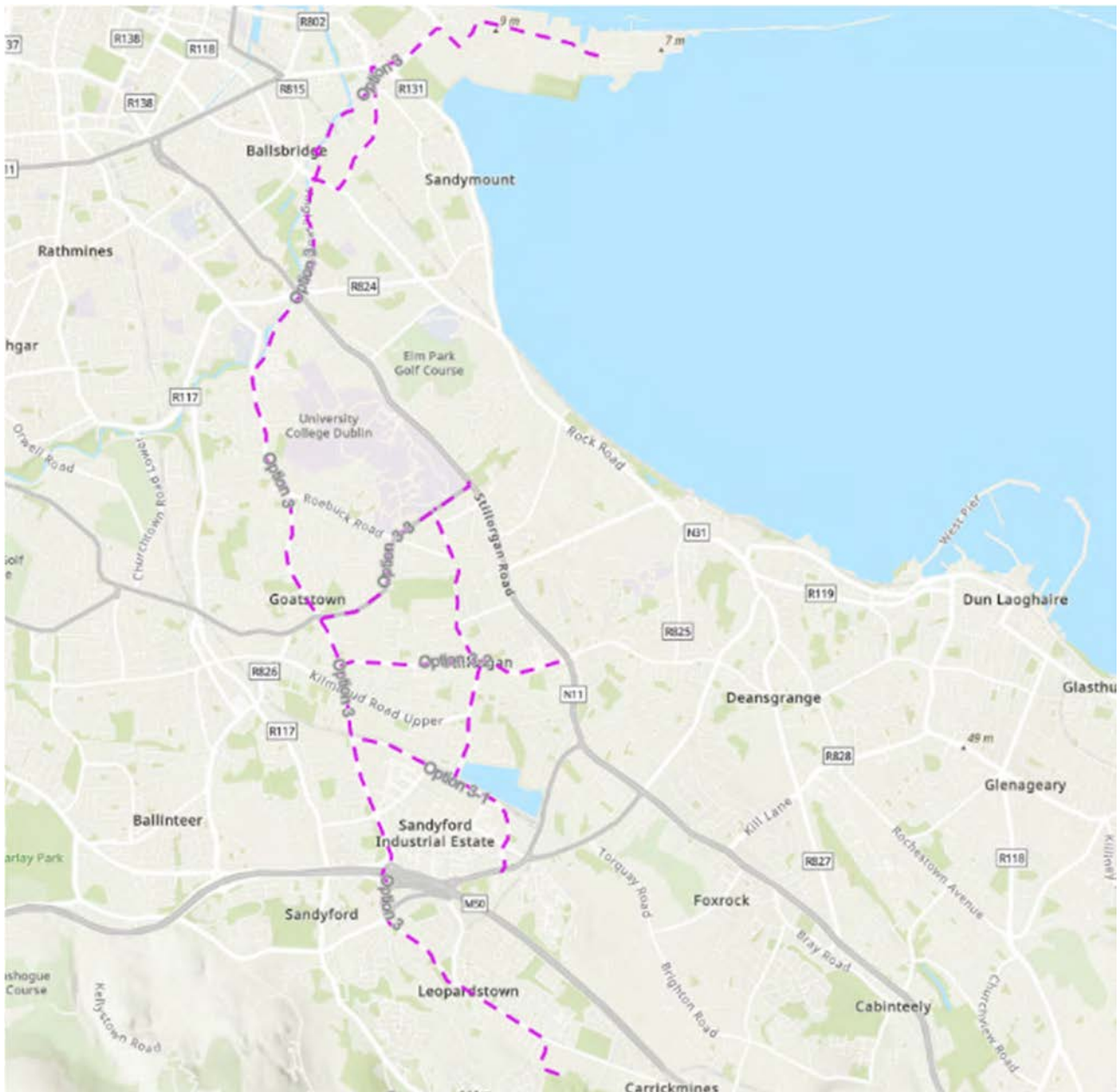


Figure 3-5 Carrickmines to Poolbeg - Route Option 3

3.2.4 Route Option 4

Route option 4 follows the same corridor as route option 2 as far as the Bray Road at Cornelscourt.

The corridor for route option 4, progresses south from the Carrickmines substation on the Ballyogan Road. It crosses over the M50 via the Ballyogan Road bridge and travels towards the N11 on Glenamuck Road North (crossing over the Luas Green Line via a bridge on this road), Cornelscourt Hill Road and Bray Road. From the Bray Road there are a number of possible routes. The first route is through Cabinteely village (across the N11), following Johnstown Road to the R828 (Pottery Avenue), R830 (Kill Avenue), R829(Mounttown Road Lower, Mounttown Road Upper, Carrickbrennan Road), Pakenham Road, Monkstown Crescent, Longford Terrace to Salthill and Monkstown Dart station. From this point the route corridor would be a submarine route with the landfall point in the vicinity of Salthill & Monkstown Dart station in the south and Poolbeg peninsula on the northern end.

There are a number of alternative route options that will bring the route corridor to the landfall point in the vicinity of Salthill & Monkstown Dart station. These include

- Route 4-1
R827 (Clonkeen Road, Grange Terrace), R113 (Temple Hill), R119(Monkstown Road), Longford Terrace
- Route 4-2
R827 (Clonkeen Road, Grange Terrace), R113 (Temple Hill), N31 (Seapoint Avenue)
- Route 4-3
Route option 1 and deviate at R113 (Temple Hill), N31 (Seapoint Avenue) [or R119(Monkstown Road), Longford Terrace

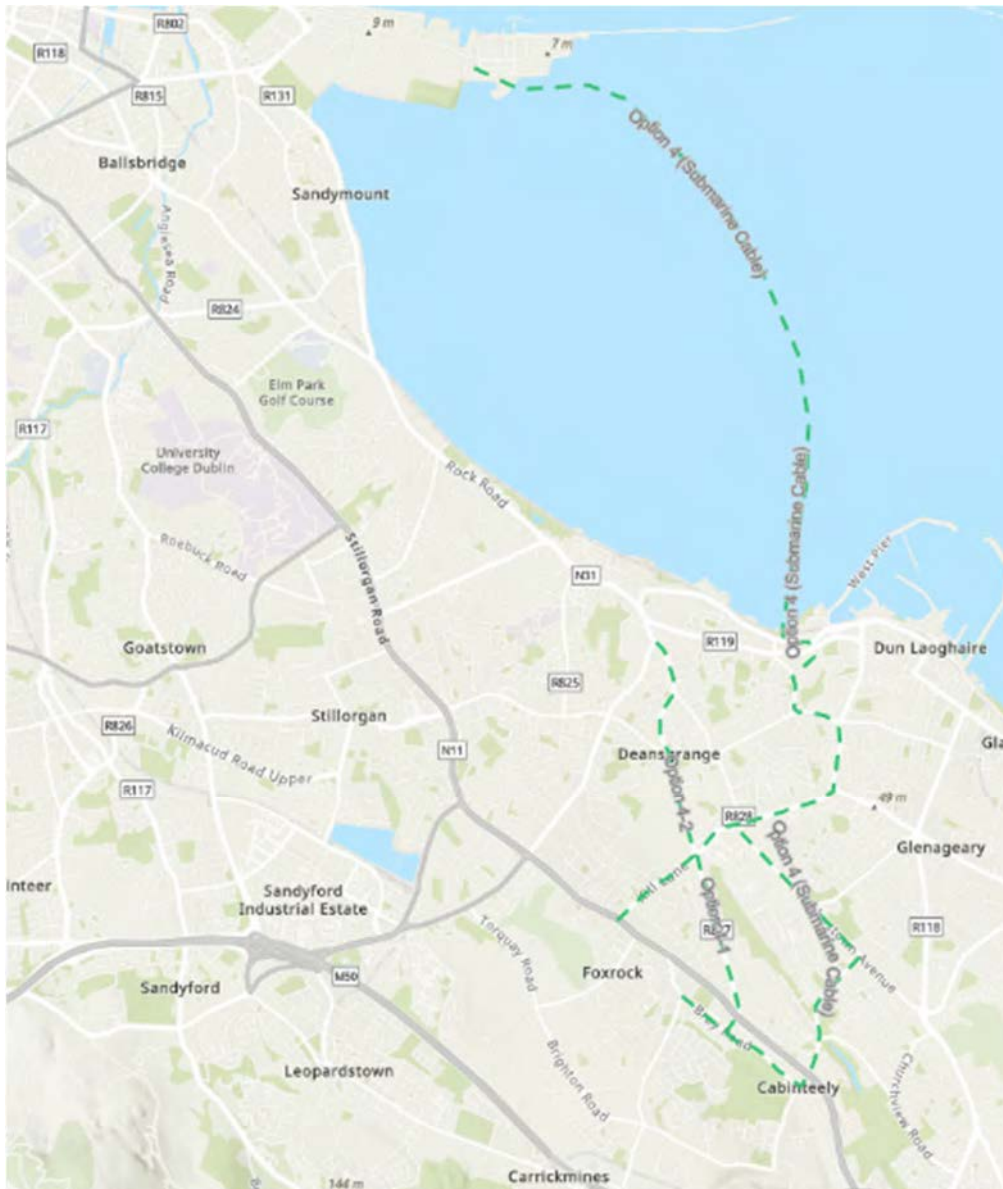


Figure 3-6 Carrickmines to Poolbeg - Route Option 4

3.2.5 Route Option CP1

Route option CP1 (the best performing route identified at the previous stage of this project) follows the same corridor as route option 3 as far as the junction at Goatstown. At this point the route corridor turns east along the R112 (Mount Anville road) and then the corridor moves onto internal roads within University College Dublin (UCD). At the main exist from UCD the route corridor crosses the Stillorgan Road in an existing overbridge

and follows the old Stillorgan Road to Nutley Park (residential road), Nutley Lane and then crosses the R118 (Merrion Road) to Ailesbury Park (residential road) on to Ailesbury Road, Sydney Parade Avenue, Park Avenue and Gifford Road. The terrestrial route option corridor terminates at the Strand Road. From this point the route corridor would be a submarine route with the landfall point in the vicinity of Strand Road in the south and Poolbeg peninsula on the northern end.

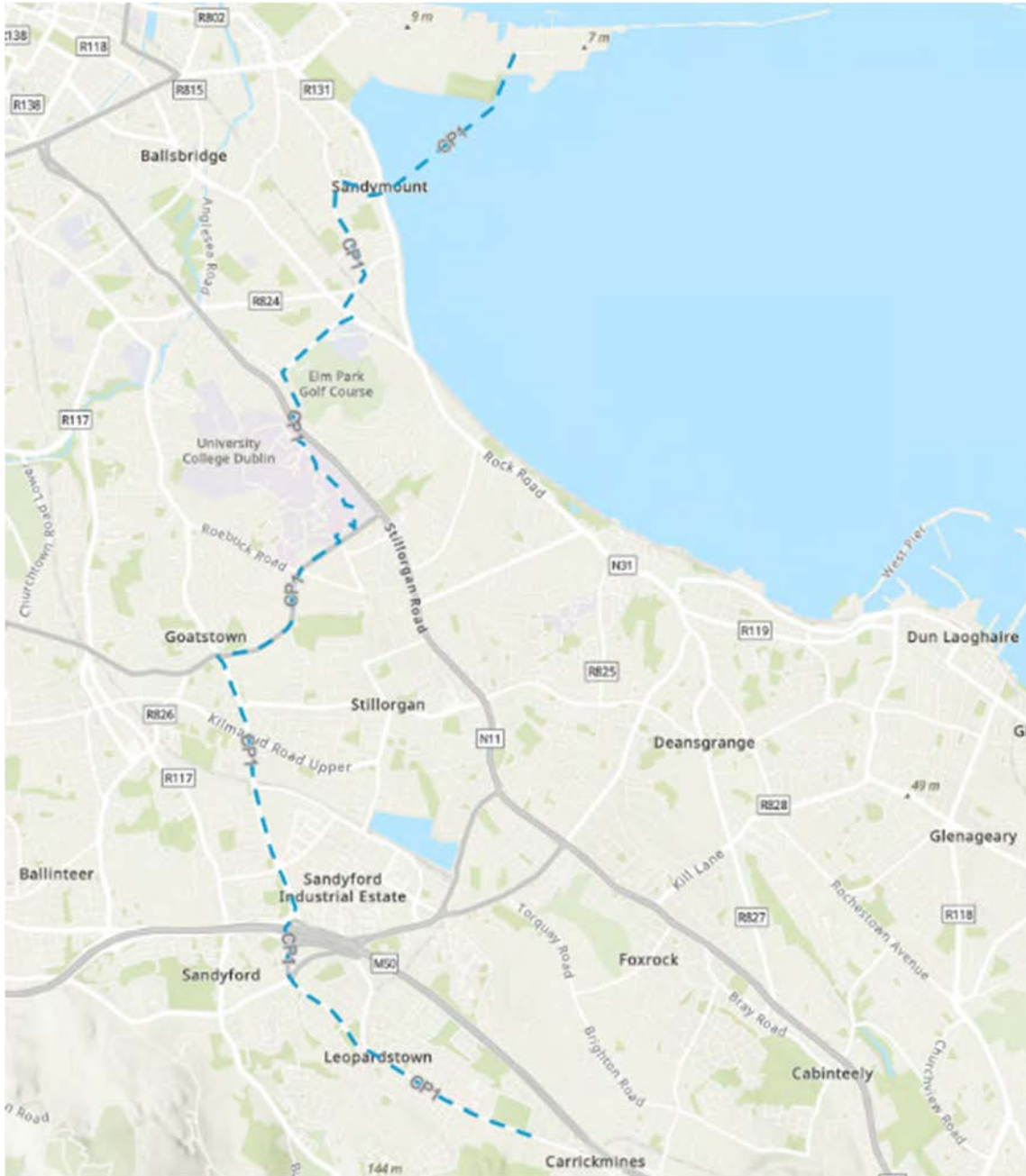


Figure 3-7 Carrickmines to Poolbeg - Route Option CP1

3.3 Identify the Sections

Nodes were placed wherever two or more route options crossed or diverted. The sections were labelled according to the nodes they run between, for example the section between Node A and Node B was called Section A-B.

A map of the identified nodes for all route options is shown in Figure 3-8.



Figure 3-8: Node Map for Carrickmines to Poolbeg route options

During the multi-criteria assessment, Section AN-AM was split into two parts to ensure the sections were small enough to analyse in enough detail for the multi-criteria assessment. The node AM1 was added to achieve this. Additionally, during the multi-criteria assessment, a new link was made between nodes B-I that did not make up any of the existing route options.

The table below lists all Sections, which route options they form part of and which roads or areas the sections run through.

Table 3-1: All Sections analysed in the Carrickmines - Poolbeg study area

DUBLIN REPLACEMENT UNDERGROUND CABLE PROGRAMME – ROUTE OPTIONS ASSESSMENT REPORT – CARRICKMINES TO POOLBEG

Section	Opt. 1	Opt. 1-1	Opt. 1-2	Opt. 1-3	Opt. 1-4	Opt. 2	Opt. 2-0	Opt. 2-1	Opt. 2-2	Opt. 2-3	Opt. 2-4	Opt. 2-5	Opt. 3	Opt. 3-1	Opt. 3-2	Opt. 3-3	Opt. 3-4	Opt. 4	Opt. 4-1	Opt. 4-2	Opt. 4-3	Opt. CP1	Section Length (km)	Road Names
A-B	x																						1.98	Off Road at Poolbeg, Irishtown Nature Reserve
B-E	x																						0.81	Strand Road
E-K	x																						1.37	Strand Road
K-O	x																						0.57	Rock Road
O-P	x																						0.44	Rock Road
P-T	x																						1.15	Rock Road
T-U	x																						0.39	Frascati Road
U-AW	x																						0.62	Frascati Road
AW-AA	x																						0.33	Stradbroom Road
AA-AI	x																						2.16	Newtownpark Avenue,
AI-AE	x																						1.12	Leopardstown Road
AE-AM	x																						2.12	Private Road at Leopardstown Racecourse, Off Road Section, Ballyogan Avenue, Drinaghmore Close
AM-AQ	x						x																0.1	Ballyogan Road
AQ-AP	x						x						x										0.42	Off Road at Carrickmines Substation
AE-AD		x																					0.22	Leopardstown Road
AD-AV		x																					0.23	Leopardstown Road
AV-AH		x																					1.43	Leopardstown Road, Murphystown Way
AH-AQ		x											x									x	0.93	Murphystown Way, Ballyogan Road
AG-AF			x																				0.1	Brewery Road
AF-AD			x																				1.18	Brewery Road
U-AU				x																			2.34	Carysfort Avenue, Carysfort Avenue Upper, Stillorgan Park Road
E-I					x																	x	1.58	Gilford Road, Park Avenue, Sydney Parade Avenue, Merrion Road
I-J					x						x											x	0.11	Merrion Road
J-K					x																		0.55	Merrion Road

DUBLIN REPLACEMENT UNDERGROUND CABLE PROGRAMME – ROUTE OPTIONS ASSESSMENT REPORT – CARRICKMINES TO POOLBEG

Section	Opt. 1	Opt. 1-1	Opt. 1-2	Opt. 1-3	Opt. 1-4	Opt. 2	Opt. 2-0	Opt. 2-1	Opt. 2-2	Opt. 2-3	Opt. 2-4	Opt. 2-5	Opt. 3	Opt. 3-1	Opt. 3-2	Opt. 3-3	Opt. 3-4	Opt. 4	Opt. 4-1	Opt. 4-2	Opt. 4-3	Opt. CP1	Section Length (km)	Road Names	
A-AS						x							x											2.13	Pigeon House Road, Sean Moore Road
AS-AT						x																		0.17	Sean Moore Road
AT-AR						x																		0.15	Beach Road
AR-C						x							x											1.35	Chruch Avenue, Tritonville Road, Serpentine Avenue
C-D						x																		0.28	Merrion Road
D-H						x																		0.87	Merrion Road
H-F						x																		1.13	Ailsbury Road
F-G						x																		0.85	Stillorgan Road
G-L						x																		0.9	Stillorgan Road
L-AY						x																		0.57	Stillorgan Road
AY-Q						x																		0.55	Stillorgan Road
Q-R						x																		0.26	Stillorgan Road
R-V						x																		0.46	Stillorgan Road
V-Z						x																		0.54	Stillorgan Road
Z-AU						x																		0.1	Stillorgan Road
AU-AG						x																		0.73	Stillorgan Road
AG-AI						x																		0.75	Stillorgan Road
AI-AJ						x																		0.97	Stillorgan Road
AJ-AN						x																		0.9	Stillorgan Road, Bray Road
AN-AM1						x																		1.19	Cornelscourt Hill, Glenamuck Road North
AM1-AM						x																		2.31	Glenamuck Road North, Ballyogan Road
S-V							x																	0.94	Grove Avenue, Priory Avenue, Priory Drive
V-Y							x																	0.55	Old Dublin Avenue
Y-AF							x																	0.75	The Hill, Glenalbyn Road, St Brigid's Chruch Road
T-S								x																1	Mount Merrion Avenue

DUBLIN REPLACEMENT UNDERGROUND CABLE PROGRAMME – ROUTE OPTIONS ASSESSMENT REPORT – CARRICKMINES TO POOLBEG

Section	Opt. 1	Opt. 1-1	Opt. 1-2	Opt. 1-3	Opt. 1-4	Opt. 2	Opt. 2-0	Opt. 2-1	Opt. 2-2	Opt. 2-3	Opt. 2-4	Opt. 2-5	Opt. 3	Opt. 3-1	Opt. 3-2	Opt. 3-3	Opt. 3-4	Opt. 4	Opt. 4-1	Opt. 4-2	Opt. 4-3	Opt. CP1	Section Length (km)	Road Names	
S-R								x																0.54	Mount Merrion Avenue
P-Q									x															1.33	Boooterstown Avenue
O-L										x														1.36	Trimleston Park, Woodbine Avenue, Stillorgan Road
H-I											x													0.19	Merrion Road
J-G											x													0.9	Merrion Road, Nutley Lane
B-D												x												1.28	Marine Drive, Dromard Terrace, Seafort Terrace, Seafort Avenue, Sandymount Avenue, Sandymount Green, Gilford Road
AS-AR													x											0.23	Sean Moore Road
C-F													x											1.36	Merrion Road, Anglesea Road
F-M													x											3.32	Beaver Row, Beech Hill Road, Clonskeagh Road, Roebuck Road, Goatstown Road, Drummartin Road
M-W													x									x		0.45	Drummartin Road, Drummartin Link Road
W-AB													x										x	0.65	Drummartin Link Road
AB-AH													x										x	2.69	Drummartin Link Road, Kilgobbin Road, Ballyogan Road
AB-AC														x										1	Benildus Avenue, Blackthorn Drive
AC-AV														x										1.13	Blackthorn Avenue, Burton Hall Road
Z-Y															x									0.2	Lower Kilmacud Road
Y-X															x									0.72	Lower Kilmacud Road
X-W															x									1.24	Lower Kilmacud Road
AY-N																x								0.37	Foster Avenue
N-M																x							x	1.61	Foster Avenue, Mount Anville Road
N-X																		x						1.48	North Avenue, South Avenue
X-AC																		x						1.14	Kilmacud Road Upper, Saint Raphaelas Road

DUBLIN REPLACEMENT UNDERGROUND CABLE PROGRAMME – ROUTE OPTIONS ASSESSMENT REPORT – CARRICKMINES TO POOLBEG

Section	Opt. 1	Opt. 1-1	Opt. 1-2	Opt. 1-3	Opt. 1-4	Opt. 2	Opt. 2-0	Opt. 2-1	Opt. 2-2	Opt. 2-3	Opt. 2-4	Opt. 2-5	Opt. 3	Opt. 3-1	Opt. 3-2	Opt. 3-3	Opt. 3-4	Opt. 4	Opt. 4-1	Opt. 4-2	Opt. 4-3	Opt. CP1	Section Length (km)	Road Names	
A-AX																		x						6.52	Off Road at Poolbeg, Submarine Cable, Offroad at Salthill & Monkstown
AX-AL																		x						2.59	Longford Terrace, Grosvenor Terrace, Packenham Road, Carrickbrennan Road, Mounttown Road Upper, Mounttown Road Lower, Kil Avenue
AL-AO																		x						3.51	Rochestown Avenue, Johnstown Avenue, Bray Road
AO-AN																		x						0.48	Bray Road
AL-AK																			x					0.5	Kil Kane
AK-AO																			x					1.55	Clonkeen Road
AA-AK																				x				1.88	Stradbrook Road, Grange Terrace
AK-AJ																				x				0.89	Kill Lane
AX-AW																						x		1.49	Seapoint Avenue
A-E																							x	1.72	Off Road at Poolbeg, Submarine Cable, Offroad at Sandymount Strand
J-BA																							x	0.78	Nutley Lane
BA-AZ																							x	0.49	Nutley Park
AZ-N																							x	1.49	Stillorgan Road, Unamed Road within, Off road in UCD walking path, North Avenue
B-I																								1.93	Marine Drive, Dromard Terrace, Seafort Terrace, Seafort Avenue, Sandymount Avenue, Sandymount Green, Gilford Road, Park Avenue, Sydney Parade Avenue, Merrion Road

4 SECTION LEVEL ASSESSMENT

4.1 Section Level Multi-Criteria Assessment

Each route section was assessed according to the methodology described in Chapter 2. A summary of this assessment can be found in Table 4-1, the main risk factors have been highlighted in this table.

Table 4-1: Summary of section assessments

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
A-B	1.98	Off Road at Poolbeg, Irishtown Nature Reserve	<p>Future expansion heavily constrained</p> <p>45% of section has high risk of coastal flooding</p>	<p>95% of section off road with restricted access. 5% of section narrow road</p> <p>70% of section parallel to multiple existing circuits converging at Poolbeg</p>	<p>There is high utility congestion along this section.</p> <p>Large sections of route brand new surface</p>	<p>This section passes one SMR buffer.</p> <p>Passes Irishtown Nature Reserve, Sean Moore Park, Sandymount Beach</p>	<p>Inland bird feeding sites DCC Brent Field Ringsend and Irishtown/Sean Moore Park, adjacent to South Dublin Bay pHNA, SPA and SAC</p> <p>Area is reclaimed land</p>
B-E	0.81	Strand Road	No technical issues on this section	<p>100% of this section is wide single carriageway</p> <p>There is high utility congestion along this section</p> <p>The existing circuit is parallel to 20% of this section</p>	<p>Sections of route have brand new surface</p>	<p>This section passes through / adjacent Sandymount Village (AA15)</p>	<p>Adjacent to South Dublin Bay pHNA, SPA and SAC</p>
E-K	1.37	Strand Road	Section may constrain future expansion crossing 1 no. rail line in this location.	<p>100% of this section is wide single carriageway</p> <p>The existing circuit is parallel to 75% of this section</p>	<p>There is moderate utility congestion along this section.</p> <p>There is one rail crossing and one major junction on this section</p>	<p>This section passes Sandymount Promenade</p>	<p>Railway Union Football Sandymount (approx. 90m away); and adjacent to South Dublin Bay pHNA, SPA and SAC</p>
K-O	0.57	Rock Road	50% of section has medium risk of coastal flooding	<p>100% of this section is dual carriageway.</p> <p>The existing circuit is parallel to 100% of this section.</p>	<p>There is low utility congestion along this section.</p> <p>There are no major junctions on this section</p>	<p>This section passes four SMR buffers.</p> <p>Section passes Booterstown Nature Reserve</p>	<p>Adjacent to South Dublin Bay pHNA, SPA and SAC</p> <p>Crosses Elm Park Stream</p>

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
O-P	0.44	Rock Road	No technical issues on this section	This section is a mix of wide and 2-lane single carriageway. The existing circuit is parallel to 100% of this section.	There is moderate utility congestion along this section. There are no major junctions on this section	Section passes St. Mary's Boys National School, Booterstown Dart Entrance, Booterstown Community Centre, Booterstown Marsh	Adjacent to South Dublin Bay pHNA, SPA and SAC and Booterstown Marsh pHNA and crosses Trimlestown Stream
P-T	1.15	Rock Road	No technical issues on this section	This section is 100% 2-lane single carriageway This section is completely offline.	There is a mix of high and low utility congestion along this section. There are no major junctions on this section	This section passes one medical centre, one Dart station and two schools.	Adjacent to the following inland bird feeding sites Williamstown Park, Blackrock College and Blackrock Park
T-U	0.39	Frascati Road	No technical issues on this section	100% of this section is dual carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes Benicasa Special School, Frascati Shopping Centre; Blackrock Village Centre	Inland bird feeding sites at Blackrock Park (approx. 80m away) Section crosses Priority Stream
U-AW	0.62	Frascati Road	No technical issues on this section	100% of this section is dual carriageway. This section is completely offline.	There is low utility congestion along this section. There are two major junctions on this section	This section passes one Garda Station, one medical centre and one sports club	Section crosses Carysfort-Moretimo Stream
AW-AA	0.33	Stradbrook Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes one sports club	No significant environmental issues on this section
AA-AI	2.16	Newtownpark Avenue,	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is a mix of high and low utility congestion along this section. There are two major junctions on this section	This section passes one medical centre, two schools, two sports clubs and one church	No significant environmental issues on this section
AI-AE	1.12	Leopardstown Road	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 50% of this section	There is high utility congestion along this section. There are no major junctions on this section	This section passes two medical centres, one business park, two sports clubs and Leopardstown Racecourse	No significant environmental issues on this section

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
AE-AM	2.12	Private Road at Leopardstown Racecourse, Off Road Section, Ballyogan Avenue, Drinaghmore Close	<p>Section passes through private land (Leopardstown Racecourse) and off-road sections</p> <p>Section may constrain future expansion crossing M50 bridge on private land and Luas Lines in this location</p>	<p>This section is a mix of wide single carriageway and a two-lane road.</p> <p>76-100% of section is on private land.</p> <p>The existing circuit is parallel to 75% of this section</p>	<p>There is low utility congestion along this section.</p> <p>There is one M50 crossing and one Luas line crossing on this section.</p>	<p>This section passes one hospital, one business park, one school, one sports clubs and Leopardstown Racecourse</p>	<p>Section is adjacent to a Native Woodlands site</p>
AM-AQ	0.1	Ballyogan Road	<p>No technical issues on this section</p>	<p>100% of this section is dual carriageway.</p> <p>76-100% of section is on private land.</p> <p>The existing circuit is parallel to 76-100%% of this section</p>	<p>There is low utility congestion along this section.</p> <p>There are no major junctions on this section</p>	<p>This section passes no identified cultural heritage sites, emergency or critical services.</p>	<p>No significant environmental issues on this section</p>
AQ-AP	0.42	Off Road at Carrickmines Substation	<p>No technical issues on this section</p>	<p>100% of this section is dual carriageway.</p> <p>76-100% of section is on private land.</p> <p>The existing circuit is parallel to 76-100%% of this section</p>	<p>There is low utility congestion along this section.</p> <p>There are no major junctions on this section</p>	<p>This section passes no identified cultural heritage sites, emergency or critical services.</p>	<p>Section adjacent to Ballyogan Stream</p>
AE-AD	0.22	Leopardstown Road	<p>Section may constrain crossing 1 no. Luas lines in this location in future</p>	<p>100% of this section is dual carriageway.</p> <p>The existing circuit is parallel to 26-50%% of this section</p>	<p>There is low utility congestion along this section.</p> <p>There is one crossing under elevated Luas line and one major junction on this section.</p>	<p>This section passes one hospital, one business park, one school, one sports clubs and Leopardstown Racecourse</p>	<p>No significant environmental issues on this section.</p>
AD-AV	0.23	Leopardstown Road	<p>No technical issues on this section</p>	<p>100% of this section is dual carriageway.</p> <p>This section is completely offline.</p>	<p>There is low utility congestion along this section.</p> <p>There are no major junctions on this section</p>	<p>This section passes no identified cultural heritage sites, emergency or critical services.</p>	<p>No significant environmental issues on this section.</p>

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
AV-AH	1.43	Leopardstown Road, Murphystown Way	Section may constrain crossing M50 in this location in future	This section is a mix of dual and wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one M50 crossing and one major junction on this section.	This section passes two SMR buffers. The section also passes St. Michael's House Day Care Centre, Grosvenor School and Clayton hotel	No significant environmental issues on this section.
AH-AQ	0.93	Murphystown Way, Ballyogan Road	Use of this route may limit ability to install a future Carrickmines to Inchicore cable	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are no major junctions on this section	This section passes Glencairn Medical Centre	No significant environmental issues on this section.
AG-AF	0.1	Brewery Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is high utility congestion along this section. There is one major junction on this section	This section passes no identified cultural heritage sites, emergency or critical services.	No significant environmental issues on this section.
AF-AD	1.18	Brewery Road	Section may constrain crossing 1 no. Luas lines in this location in future	This section is a mix of dual and wide single carriageway. The existing circuit crosses in one location.	There is high utility congestion along this section. There is one Luas line crossing and one major junction on this section	This section passes no identified cultural heritage sites, emergency or critical services.	Adjacent to Stilorgan Reservoirs
U-AU	2.34	Carysfort Avenue, Carysfort Avenue Upper, Stillorgan Park Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is a mix of high and low utility congestion along this section. There are three junctions on this section	This section passes two SMR buffers. This section also passes one school, two sports clubs and Carrysfort Park	Section crosses Carysfort-Moretimo Stream and Moretimo Stream
E-I	1.58	Gilford Road, Park Avenue, Sydney Parade Avenue, Merrion Road	80% of section has medium risk of coastal flooding, 20% of section has low risk (1:1000) of river flooding Section may constrain crossing 2 no. rail lines in this location in future	100% of this section is wide single carriageway. The existing circuit is parallel to 51%-75% of this section	There is high utility congestion along this section. There is one Irish Rail line crossing on this section	This section passes one Dart station, one school, two embassies, three sports clubs and one church.	Inland bird feeding site at Pembroke CC/Monkstown RC (approx. 60m), and Railway Union Football Sandymount (approx. 70m); and adjacent to South Dublin Bay pHNA, SPA and SAC

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
I-J	0.11	Merrion Road	No technical issues on this section	This section is 100% 2-lane single carriageway. The existing circuit crosses in one location.	There is high utility congestion along this section. There are no major junctions on this section	This section passes Merrion shopping centre	No significant environmental issues on this section
J-K	0.55	Merrion Road	No technical issues on this section	This section is 100% 2-lane single carriageway. This section is completely offline.	There is high utility congestion along this section. There is one major junction on this section	This section passes St Vincent's Hospital Emergency Department & Car Park. The section also passes Nurse Education Centre, Our Lady Queen of Peace, Merrion Gates Medical Centre	No significant environmental issues on this section.
A-AS	2.13	Pigeon House Road, Sean Moore Road	15% of section has high risk of coastal flooding	85% is a narrow road that is difficult to access for construction vehicles and 15% of this section is wide single carriageway. 51-75% of section is on private land. The existing circuit is parallel to 76-100%% of this section	There is a mix of high and low utility congestion along this section. There are two overhead utilities crossing and one major junction on this section	This section passes through one SMR buffer. This section also passes one sports club	Adjacent inland bird feeding sites at Irishtown/Sean Moore Park and approx. 130m from Irishtown Stadium Section adjacent to River Liffey
AS-AT	0.17	Sean Moore Road	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 76-100%% of this section	There is high utility congestion along this section. There is one major junction on this section	This section passes through two SMR buffers This section also passes Sean Moore Park	Adjacent inland bird feeding sites at Irishtown/Sean Moore Park
AT-AR	0.15	Beach Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is a mix of low and high utility congestion along this section. There is one major junction on this section	This section passes through two SMR buffers	No significant environmental issues on this section

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
AR-C	1.35	Chruch Avenue, Tritonville Road, Serpentine Avenue	<p>35% of section has medium risk of river flooding, 35% of section has medium risk of coastal flooding</p> <p>Section may constrain crossing 2 no.rail lines in this location in future</p>	<p>85% is a narrow road that is difficult to access for construction vehicles and 15% of this section is wide single carriageway.</p> <p>The existing circuit is parallel to 10%% of this section</p>	<p>There is a mix of high and low utility congestion along this section.</p> <p>There is one Irish Rail line crossing and one major junction on this section</p>	<p>This section passes through two SMR buffers</p> <p>This section also passes one Garda station, one sports club and one church</p>	<p>Inland bird feeding site at Sandymount YMCA Sports Ground (approx. 160m)</p>
C-D	0.28	Merrion Road	<p>50% of section has medium risk of river flooding</p>	<p>This section is 100% 2-lane single carriageway.</p> <p>This section is completely offline.</p>	<p>There is high utility congestion along this section.</p> <p>There are no major junctions on this section</p>	<p>This section passes Ballsbridge surgery, RDS carparking, and two hotels</p>	<p>No significant environmental issues on this section</p>
D-H	0.87	Merrion Road	<p>No technical issues on this section</p>	<p>This section is 100% 2-lane single carriageway.</p> <p>This section is completely offline.</p>	<p>There is a mix of high and low utility congestion along this section.</p> <p>There is one major junction on this section</p>	<p>This section passes four embassies and one sports club</p>	<p>No significant environmental issues on this section</p>
H-F	1.13	Ailsbury Road	<p>No technical issues on this section</p>	<p>100% of this section is wide single carriageway.</p> <p>This section is completely offline.</p>	<p>There is a mix of low and high utility congestion along this section.</p> <p>There are two major junctions on this section</p>	<p>This section passes three embassies and one church</p>	<p>No significant environmental issues on this section</p>
F-G	0.85	Stillorgan Road	<p>No technical issues on this section</p>	<p>100% of this section is dual carriageway.</p> <p>This section is completely offline.</p>	<p>There is low utility congestion along this section.</p> <p>There is a crossing under one pedestrian bridge in this section</p>	<p>This section passes Dublin Bus Donnybrook Depot and one church.</p>	<p>No significant environmental issues on this section</p>
G-L	0.9	Stillorgan Road	<p>No technical issues on this section</p>	<p>100% of this section is dual carriageway.</p> <p>This section is completely offline.</p>	<p>There is low utility congestion along this section.</p> <p>There is one crossing under UCD flyover in this section.</p>	<p>This section passes UCD Belfield Campus</p>	<p>Section crosses Elm Park Stream</p>

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
L-AY	0.57	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. The existing circuit crosses in one location.	There is low utility congestion along this section. There is a crossing under one pedestrian bridge and one major junction in this section	This section passes one church	No significant environmental issues on this section
AY-Q	0.55	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. This section is completely offline.	There is low utility congestion along this section. There is a crossing under one pedestrian bridge in this section	This section passes through one SMR buffer. This section also passes two schools and one church	No significant environmental issues on this section
Q-R	0.26	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. The existing circuit is parallel to 70%% of this section	There is low utility congestion along this section. There are no major junctions on this section	This section passes one church	No significant environmental issues on this section
R-V	0.46	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. The existing circuit is parallel to 100%% of this section	There is low utility congestion along this section. There are no major junctions on this section	This section passes Oatlands College and one hotel	No significant environmental issues on this section
V-Z	0.54	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. The existing circuit is parallel to 100%% of this section	There is low utility congestion along this section. There is a crossing under one pedestrian bridge in this section	This section passes through two SMR buffers	No significant environmental issues on this section
Z-AU	0.1	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. The existing circuit is parallel to 100%% of this section	There is low utility congestion along this section. There is one major junction on this section	This section passes through two SMR buffers	No significant environmental issues on this section

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
AU-AG	0.73	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. The existing circuit is parallel to 100%% of this section	There is high utility congestion along this section. There are no major junctions on this section	This section passes through six SMR buffers This section also passes St. John of Gods Hospital	No significant environmental issues on this section
AG-AI	0.75	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. This section is completely offline.	There is high utility congestion along this section. There are two major junctions on this section	This section passes Belmont Nursing Home	No significant environmental issues on this section
AI-AJ	0.97	Stillorgan Road	No technical issues on this section	100% of this section is dual carriageway. This section is completely offline.	There is low utility congestion along this section. There are two major junctions on this section	This section passes one school and one church	No significant environmental issues on this section
AJ-AN	0.9	Stillorgan Road, Bray Road	No technical issues on this section	100% of this section is dual carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes no identified cultural heritage sites, emergency or critical services.	No significant environmental issues on this section
AN-AM1	1.19	Cornelscourt Hill, Glenamuck Road North	Future expansion may be constrained at 2 no. Bridge crossings above Luas green line and M50	100% of this section is wide single carriageway. This section is completely offline.	There is high utility congestion along this section. There are two bridge crossings, above Luas lines and the M50, and 3 major junctions on this section.	This section passes one school and crosses Luas lines in two places. This section also passes 2 sports clubs	Section crosses St Bride's Stream, Carrickmines River in 2 locations
AM1-AM	2.31	Glenamuck Road North, Ballyogan Road	15% of section has medium risk of river flooding	100% of this section is wide single carriageway. This section is completely offline.	There is a mix of low and high utility congestion along this section. There are no major junctions on this section	This section passes through seven SMR buffers This section also passes 2 sports clubs	Section crosses Ballyogan Stream, Glenamuck Road Stream

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
S-V	0.94	Grove Avenue, Priory Avenue, Priory Drive	No technical issues on this section	100% is a very narrow road that is difficult to access for construction vehicles This section is completely offline.	There is low utility congestion along this section. There are no major junctions on this section	This section passes 1 sports club	Section crosses Priory Stream in 2 locations
V-Y	0.55	Old Dublin Avenue	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are no major junctions on this section	This section passes through six SMR buffers This section also passes one medical centre, two schools and Stillorgan shopping centre	No significant environmental issues on this section
Y-AF	0.75	The Hill, Glenalbyn Road, St Brigid's Church Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are no major junctions on this section	This section passes through six SMR buffers This section also passes one sports centre and one church	No significant environmental issues on this section
T-S	1	Mount Merrion Avenue	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes three schools and one church	No significant environmental issues on this section
S-R	0.54	Mount Merrion Avenue	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes no identified cultural heritage sites, emergency or critical services.	No significant environmental issues on this section
P-Q	1.33	Boosterstown Avenue	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 90%% of this section	There is low utility congestion along this section. There are no major junctions on this section	This section passes through three SMR buffers This section also passes one church	Inland bird feeding site at Blackrock College (approx. 120m) and St. Andrews Playing Pitch (approx. 190m)
O-L	1.36	Trimleston Park, Woodbine Avenue, Stillorgan Road	No technical issues on this section	00% of this section is wide single carriageway. The existing circuit is parallel to 10%% of this section	There is a mix of low and high utility congestion along this section There are no major junctions on this section	This section passes through two SMR buffers This section also passes one embassy and one medical centre	No significant environmental issues on this section

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
H-I	0.19	Merrion Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes one school	No significant environmental issues on this section
J-G	0.9	Merrion Road, Nutley Lane	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 76-100% of this section	There is a mix of high and low utility congestion along this section. There are no major junctions on this section	This section passes St. Vincent's Hospital This section also passes one sports club	No significant environmental issues on this section
B-D	1.28	Marine Drive, Dromard Terrace, Seafort Terrace, Seafort Avenue, Sandymount Avenue, Sandymount Green, Gilford Road	Section may constrain crossing 2 no.rail lines in this location in future	90% of this section is wide single carriageway. 10% of this section is narrow single carriageway. The existing circuit is parallel to 20% of this section	There is high utility congestion along this section. There is one Irish Rail crossing this section	This section passes through Sandymount Village This section also passes three schools, one Dart station, and one sports facility.	Inland bird feeding site at Sandymount YMCA Sports Ground (approx. 50m)
AS-AR	0.23	Sean Moore Road	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 20% of this section	There is low utility congestion along this section. There is one major junction on this section	This section passes through two SMR buffers	Inland bird feeding site at Irishtown/Sean Moore Park (approx. 100m) and Irishtown Stadium (approx. 150m)
C-F	1.36	Merrion Road, Anglesea Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is moderate utility congestion along this section. There are two major junctions on this section	This section passes through two SMR buffers This section also passes two sports clubs and one church	15% of section adjacent to Dodder River
F-M	3.32	Beaver Row, Beech Hill Road, Clonskeagh Road, Roebuck Road, Goatstown Road, Drummartin Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is moderate utility congestion along this section. There are two major junctions on this section	This section passes through three SMR buffers This section also passes Dublin Bus Donnybrook Depot, three schools, one sports centre and one religious' centre.	25% of section adjacent to Dodder River and crosses a stream on Roebuck Road

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
M-W	0.45	Drummartin Road, Drummartin Link Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes no identified cultural heritage sites, emergency or critical services.	No significant environmental issues on this section
W-AB	0.65	Drummartin Link Road	Crosses Luas green line Could restrict future access Bridge crossing above Luas rail line may constraint future expansion	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one Luas line crossing and two major junctions on this section	This section passes one Luas station	Adjacent to the following inland bird feeding sites Sandyford/ St.Benildus College
AB-AH	2.69	Drummartin Link Road, Kilgobbin Road, Ballyogan Road	Use of this route may limit ability to install a future Carrickmines to Inchicore cable	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one Luas line crossing and two major junctions on this section	This section passes through one SMR buffer This section also passes Beacon Private Hospital, one school and one Luas station	Adjacent to the following inland bird feeding sites Sandyford/Naomh Olaf GAA Pitches
AB-AC	1	Benildus Avenue, Blackthorn Drive	Section may constrain new circuits next to Luas Line in future	This section is a mix of dual and wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are no major junctions on this section	This section passes one Luas Station, Luas Park and Ride	Adjacent to the following inland bird feeding sites Sandyford/ St.Benildus College and Sandyford/Naomh Olaf GAA Pitches
AC-AV	1.13	Blackthorn Avenue, Burton Hall Road	Section may constrain new circuits next to Luas Line in future	This section is a mix of dual and wide single carriageway. This section is completely offline.	There is high utility congestion along this section. There are no major junctions on this section	This section passes Luas Park and Ride, and one Gym	Section passes Stillorgan reservoirs
Z-Y	0.2	Lower Kilmacud Road	No technical issues on this section	100% of this section is very wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes through three SMR buffers	No significant environmental issues on this section

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
Y-X	0.72	Lower Kilmacud Road	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 25-50% of this section	There is low utility congestion along this section. There is one major junction on this section	This section passes two schools and one Luas station. This section also passes one sports centre, one shopping centre and one church	No significant environmental issues on this section
X-W	1.24	Lower Kilmacud Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes one school	No significant environmental issues on this section
AY-N	0.37	Foster Avenue	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 100% of this section	There is low utility congestion along this section. There is one major junction on this section	This section passes UCD Belfield Campus This section also passes one church	No significant environmental issues on this section
N-M	1.61	Foster Avenue, Mount Anville Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one major junction on this section	This section passes one school and one park	No significant environmental issues on this section
N-X	1.48	North Avenue, South Avenue	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 76-100% of this section	There is low utility congestion along this section. There are no major junctions on this section	This section passes through one SMR buffer This section also passes one church and one park	No significant environmental issues on this section
X-AC	1.14	Kilmacud Road Upper, Saint Raphaelas Road	Crossing Luas line could restrict future access and constrain future expansion	100% of this section is wide single carriageway. This section is completely offline.	There is moderate utility congestion along this section. There is one Luas line crossing and one major junctions on this section	This section passes two schools and one Luas stop	No significant environmental issues on this section

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
A-AX	6.52	Off Road at Poolbeg, Submarine Cable, Offroad at Salthill & Monkstown	Submarine Route Option Crossing Dart rail line may constrain future expansion	Foreshore Licence required. Marine crossing of Dublin Bay	There is low utility congestion along this section. There is one Irish Rail crossing, 2 HDD for landfalls, Dublin Bay Marine Cable in this section	Extensive investigations likely for marine crossing	Submarine cable travels through South Dublin Bay pHNA, SPA and SAC HDD site near DCC Brent Field Ringsend
AX-AL	2.59	Longford Terrace, Grosvenor Terrace, Pakenham Road, Carrickbrennan Road, Mounttown Road Upper, Mounttown Road Lower, Kil Avenue	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are two major junctions on this section	This section passes five SMR buffers. This section passes one fire station. The section also passes one medical centre, two schools, two sports clubs and three religious centres.	No significant environmental issues on this section
AL-AO	3.51	Rochestown Avenue, Johnstown Avenue, Bray Road	River crossing may constrain future expansion	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one bridge crossing and two major junctions on this section	This section passes one Garda Station. This section also passes two medical centres, one school, two parks and one church	Section crosses Kill o'the Grange Stream
AO-AN	0.48	Bray Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are no major junctions on this section	This section passes one SMR buffer. This section also passes one sports club and one shopping centre	No significant environmental issues on this section
AL-AK	0.5	Kil Kane	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are two major junctions on this section	This section passes twelve SMR buffers The section also passes one school and one business park	No significant environmental issues on this section

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
AK-AO	1.55	Clonkeen Road	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There is one crossing of the N11 and two major junctions on this section	This section passes three SMR buffers. The section also passes one school, one shopping centre and one medical centre	No significant environmental issues on this section
AA-AK	1.88	Stradbrook Road, Grange Terrace	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are two major junctions on this section	This section passes Deans Grange Cemetery	No significant environmental issues on this section
AK-AJ	0.89	Kill Lane	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are two major junctions on this section	This section passes one library and one church	No significant environmental issues on this section
AX-AW	1.49	Seapoint Avenue	No technical issues on this section	100% of this section is wide single carriageway. This section is completely offline.	There is low utility congestion along this section. There are no major junctions on this section	This section passes four SMR buffers. The section also passes Seapoint Parking and Bathing	Adjacent to South Dublin Bay pHNA, SPA and SAC
A-E	1.72	Off Road at Poolbeg, Submarine Cable, Offroad at Sandymount Strand	Submarine Route Option	Foreshore Licence required. HDD crossing of Dublin Bay	There is low utility congestion along this section. There is a long HDD on this section across Dublin Bay	Extensive investigation likely for Marine Crossing	Submarine cable travels through South Dublin Bay pHNA, SPA and SAC HDD site near DCC Brent Field Ringsend
J-BA	0.78	Nutley Lane	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 76-100% of this section	There is high utility congestion along this section. There are no major junctions on this section	Passes St. Vincents Hospital & Emergency Department This section also passes two sports clubs	No significant environmental issues on this section

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental
BA-AZ	0.49	Nutley Park	No technical issues on this section	100% of this section is wide single carriageway. The existing circuit is parallel to 76-100% of this section	There is low utility congestion along this section. There is one major junction on this section	This section passes no identified cultural heritage sites, emergency or critical services.	No significant environmental issues on this section
AZ-N	1.49	Stillorgan Road, Unamed Road within, Off road in UCD walking path, North Avenue	No technical issues on this section	Some narrow sections on private lands likely to require temporary closure during construction. 76-100%% of section is on private land. This section is completely offline.	There is low utility congestion along this section. There are no major junctions on this section	This section passes UCD Belfield Campus	Mature trees adjacent to 15% of section in UCD
B-I	1.93	Marine Drive, Dromard Terrace, Seafort Terrace, Seafort Avenue, Sandymount Avenue, Sandymount Green, Gilford Road, Park Avenue, Sydney Parade Avenue, Merrion Road	Crossing 2 no.rail lines in this location in future may constrain future expansion	100% of this section is wide single carriageway. The existing circuit is parallel to 75% of this section	There is a mix of high and moderate utility congestion along this section. There is one Irish Rail line crossing	This section passes through Sandymount Village. This section also passes three sports clubs and one church	Inland bird feeding site at Pembroke CC/Monkstown RC (approx. 60m), and Railway Union Football Sandymount (approx. 70m); and adjacent to South Dublin Bay pHNA, SPA and SAC

4.2 Section MCA Output Summary

Using the methodology outlined in Chapter 2, the results for each section are outlined in Table 4-2.

Table 4-2: Summary results of multi-criteria assessment

Nodes	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Rating
A-B	Green	Blue	Light Blue	Light Green	Blue	Light Blue
B-E	Yellow	Light Blue	Light Green	Green	Green	Light Green
E-K	Light Green	Light Blue	Blue	Green	Light Blue	Green
K-O	Light Green	Blue	Yellow	Green	Green	Green
O-P	Yellow	Blue	Green	Light Blue	Green	Green
P-T	Yellow	Light Blue	Green	Blue	Green	Green
T-U	Yellow	Light Green	Yellow	Light Blue	Light Green	Light Green
U-AW	Yellow	Light Green	Yellow	Blue	Yellow	Light Green
AW-AA	Yellow	Green	Light Green	Light Blue	Yellow	Light Green
AA-AI	Yellow	Green	Blue	Blue	Yellow	Green
AI-AE	Yellow	Light Blue	Light Blue	Blue	Yellow	Light Green
AE-AM	Green	Blue	Blue	Light Green	Yellow	Green
AM-AQ	Yellow	Blue	Yellow	Light Green	Yellow	Yellow
AQ-AP	Yellow	Green	Yellow	Light Green	Yellow	Yellow
AE-AD	Light Green	Green	Light Green	Light Blue	Yellow	Light Green
AD-AV	Yellow	Yellow	Light Green	Light Green	Yellow	Yellow
AV-AH	Light Green	Light Green	Blue	Light Blue	Yellow	Light Green
AH-AQ	Light Green	Light Green	Light Green	Green	Yellow	Yellow
AG-AF	Yellow	Light Blue	Light Blue	Light Green	Light Green	Light Green
AF-AD	Light Green	Blue	Blue	Green	Yellow	Green
U-AU	Yellow	Light Blue	Green	Blue	Yellow	Light Green
E-I	Light Green	Light Blue	Blue	Blue	Light Green	Light Blue
I-J	Yellow	Light Blue	Light Blue	Green	Light Green	Light Green
J-K	Yellow	Green	Light Blue	Blue	Light Green	Green
A-AS	Light Green	Blue	Green	Yellow	Green	Green
AS-AT	Yellow	Light Blue	Light Blue	Light Green	Light Green	Light Green
AT-AR	Yellow	Green	Light Green	Light Green	Light Green	Yellow
AR-C	Light Green	Light Blue	Blue	Light Blue	Light Green	Light Blue
C-D	Light Green	Green	Light Blue	Light Blue	Yellow	Light Green
D-H	Yellow	Green	Green	Light Blue	Yellow	Light Green
H-F	Yellow	Light Green	Yellow	Green	Yellow	Yellow
F-G	Yellow	Light Green	Green	Green	Yellow	Light Green
G-L	Yellow	Light Green	Light Blue	Light Green	Yellow	Light Green
L-AY	Yellow	Light Blue	Light Blue	Green	Yellow	Light Green
AY-Q	Yellow	Green	Light Blue	Green	Yellow	Light Green
Q-R	Yellow	Light Blue	Green	Green	Yellow	Light Green
R-V	Yellow	Green	Light Green	Green	Yellow	Light Green
V-Z	Yellow	Green	Light Blue	Green	Yellow	Light Green
Z-AU	Yellow	Green	Yellow	Light Green	Yellow	Yellow
AU-AG	Yellow	Green	Light Blue	Green	Light Green	Light Green
AG-AI	Yellow	Green	Green	Green	Yellow	Light Green
AI-AJ	Yellow	Light Green	Yellow	Green	Yellow	Yellow
AJ-AN	Yellow	Green	Yellow	Green	Yellow	Yellow
AN-AM1	Light Green	Blue	Blue	Light Blue	Yellow	Light Blue

Nodes	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Rating
AM1-AM	Green	Green	Green	Blue	Yellow	Green
S-V	Yellow	Blue	Green	Green	Yellow	Green
V-Y	Yellow	Green	Yellow	Blue	Yellow	Green
Y-AF	Yellow	Green	Yellow	Green	Green	Yellow
T-S	Yellow	Green	Green	Blue	Yellow	Green
S-R	Yellow	Green	Green	Green	Yellow	Green
P-Q	Yellow	Blue	Green	Green	Yellow	Green
O-L	Yellow	Blue	Green	Green	Yellow	Green
H-I	Yellow	Green	Yellow	Green	Yellow	Yellow
J-G	Yellow	Blue	Yellow	Blue	Yellow	Green
B-D	Green	Blue	Blue	Blue	Green	Blue
AS-AR	Yellow	Blue	Green	Green	Yellow	Green
C-F	Yellow	Blue	Green	Blue	Yellow	Green
F-M	Yellow	Green	Green	Blue	Yellow	Green
M-W	Yellow	Green	Yellow	Green	Yellow	Yellow
W-AB	Green	Green	Blue	Green	Green	Green
AB-AH	Green	Green	Blue	Blue	Green	Green
AB-AC	Green	Green	Yellow	Green	Green	Green
AC-AV	Green	Green	Blue	Green	Yellow	Green
Z-Y	Yellow	Green	Yellow	Green	Green	Yellow
Y-X	Yellow	Blue	Yellow	Blue	Yellow	Green
X-W	Yellow	Green	Green	Blue	Yellow	Green
AY-N	Yellow	Blue	Green	Green	Yellow	Green
N-M	Yellow	Green	Green	Green	Yellow	Green
N-X	Yellow	Blue	Green	Blue	Yellow	Green
X-AC	Green	Green	Blue	Blue	Yellow	Green
A-AX	Blue	Green	Blue	Green	Blue	Blue
AX-AL	Yellow	Blue	Green	Blue	Yellow	Green
AL-AO	Green	Blue	Blue	Blue	Green	Green
AO-AN	Yellow	Green	Yellow	Blue	Yellow	Yellow
AL-AK	Yellow	Green	Yellow	Blue	Yellow	Green
AK-AO	Yellow	Blue	Green	Blue	Green	Green
AA-AK	Yellow	Green	Yellow	Blue	Yellow	Green
AK-AJ	Yellow	Blue	Yellow	Blue	Yellow	Green
AX-AW	Yellow	Green	Green	Blue	Yellow	Green
A-E	Blue	Green	Blue	Green	Blue	Blue
J-BA	Yellow	Blue	Green	Blue	Green	Green
BA-AZ	Yellow	Green	Yellow	Yellow	Yellow	Yellow
AZ-N	Yellow	Green	Green	Green	Green	Yellow
B-I	Green	Blue	Blue	Blue	Green	Blue

The results from the multi-criteria assessment were mapped showing the overall rating of each section. This map is shown below.



Legend

- Nodes

Weighted Total as % of possible score

- 0 - 33%
- 34 - 41%
- 42 - 47%
- 48 - 57%
- 58 - 100%



Client

Powering Up Dublin

Dublin Cables Project

Title

CP1146 Carrickmines to Poolbeg

Multi-Criteria Analysis Weighting

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Issue Details

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5 ROUTE BUILDING

5.1 Multi Criteria Assessment Exceptions

To create optimised route options that have the lowest overall risk factors, some sections were excluded from the route building exercise. In general, any section that was ranked light blue or dark blue overall, was excluded from further studies.

The overall summary output of the Multicriteria Assessment averages the ranking for each criterion, which are themselves averages of the sub criteria. Because of how many sub criteria and criteria there are, there might be an instance where a section may not be deemed feasible due to one factor, but if the other criteria rank well, the overall rank might be low risk. For example, the section might not be feasible from a deliverability perspective, but due to low environmental and technical risks, the overall ranking is low. In these cases, judgement is exercised, and the section will be removed from further consideration despite the low overall risk ranking, and vice versa in the case of high-ranking sections that are feasible options. The explanation for these exceptions are given below.

Table 5-1: Route sections included or excluded from route builder

Section	Overall Rating	Including/Excluding
A-B	Light Blue	Including. Viable option coming into Poolbeg Peninsula
A-E	Dark Blue	Excluding.
B-I	Light Blue	Including. Alternative to Strand Road and Merrion Gate DART crossing.
B-D	Light Blue	Excluding.
F-M	Green	Excluding. Sections of narrow road between dwellings and River Dodder.
E-I	Light Blue	Excluding.
N-X	Light Green	Excluding. Narrow road with existing circuits.
W-AB	Green	Excluding. Difficult Luas Green Line crossing.
AM-AM1	Green	Excluding. Two stream crossings, M50 crossing and Luas line crossing. Section passes Carrickmines Castle
AE-AM	Green	Excluding. Private land and M50 crossing.
AR-C	Light Blue	Excluding.
A-AX	Dark Blue	Including. Risk factors can be reduced through detailed design of submarine option.
AZ-N	Yellow	Excluding. Private land increases risk factor for delivery
AJ-AN to R-V (all sections on N11)	Yellow	Excluding.

A map of the study area excluding the sections listed above is shown below.



Legend

- Nodes

Weighted Total as % of possible score

- 0 - 33%
- 33 - 41%
- 41 - 49%
- 49 - 57%
- 57 - 100%



Client

EirGrid
Powering Up Dublin

Dublin Cables Project

Title

CP1146 Carrickmines to Poolbeg

Multi-Criteria Analysis Weighting

Progressed Sections

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5.2 Possible Route Options

From the route sections that have been progressed to this stage, four possible route options can be built. These route options are discussed in Chapter 5.3 to 5.6.

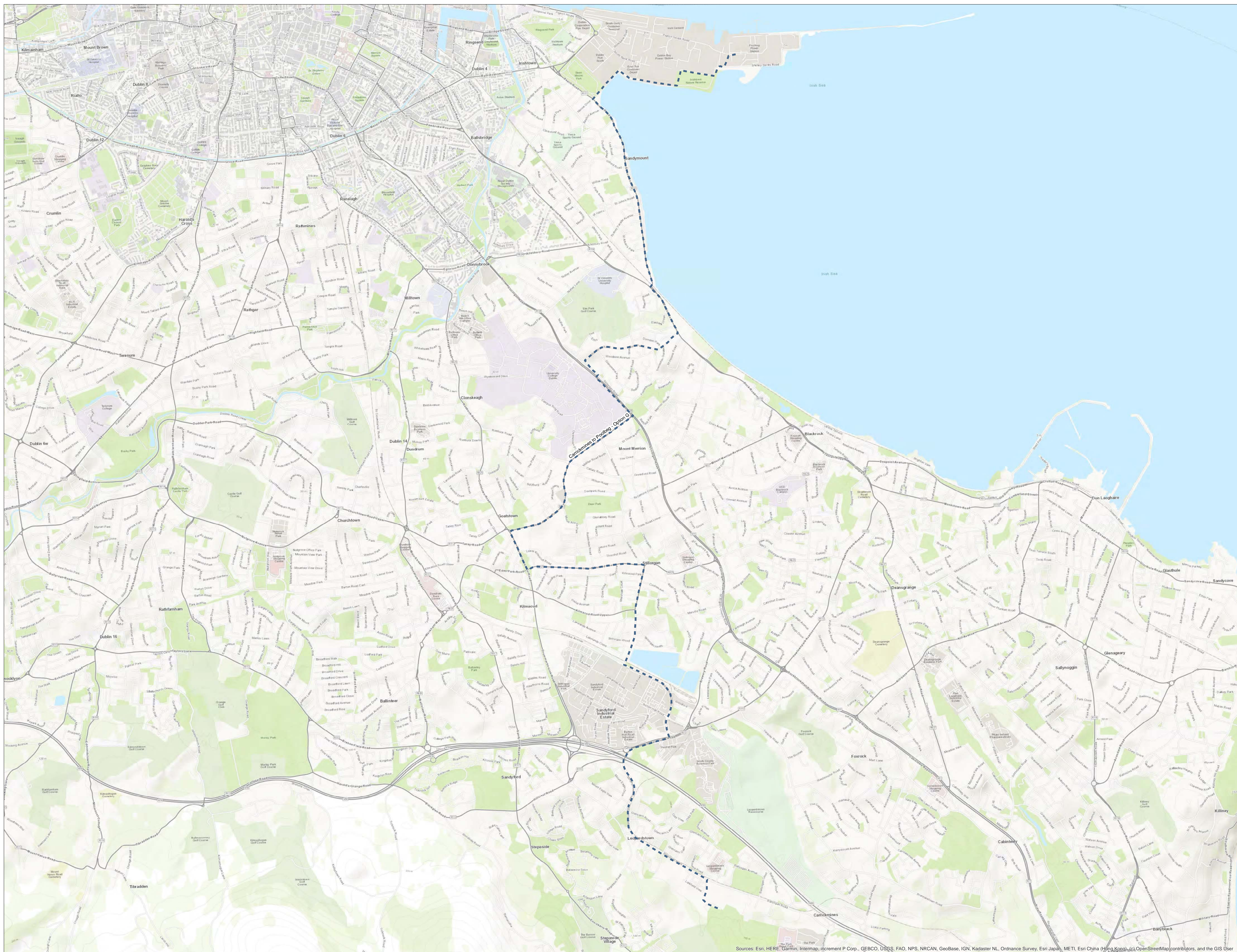
5.3 Optimised Route Option 1 (Option G)

Optimised Route Option 1 is presented below. The total length of this route is 15.4km.

Optimised Route Option 1 leaves the Carrickmines substation and follows the Ballyogan Road northwest adjacent to the Luas Green Line. It continues into Murphystown Way where it crosses the M50 at Junction 14 on to the N31.

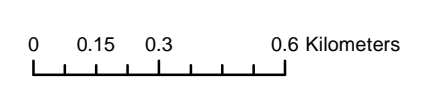
The route then turns in a northerly direction into Sandyford Industrial Estate via Blackthorn Avenue. At the junction with St Raphaela's Road, the route crosses under the Luas Green line at a level crossing. At the end of St Raphaela's Road / Kilmacud Road Upper, the route turns east along Lower Kilmacud Road to Drummartin Road. At Goatstown the route turns off Drummartin Road and follows Mount Anville Road and Foster's Avenue past University College Dublin (UCD) and onto the Stilorgan Road (N11).

The route turns east onto Woodbine Road, Trimleston Park and Trimleston Avenue before joining the Rock Road and travelling north to the DART level crossing at Merrion Gates. The route then follows Strand Road to Sean Moore Park where it turns to the East and skirts the park boundary and follows the route of the shoreline toward the Poolbeg Substation.



Legend

--- Carrickmines to Poolbeg *Option G*



Client



Dublin Cables Project

Title

Emerging Best Options
Carrickmines to Poolbeg
Option G



Issue Details

File Identifier:
 CP1146-RPS-00-XX-DR-C-DG2029

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5.3.1 Summary of Optimised Route Option 1 MCA Results

The overall risk rating of this optimised route was low-moderate risk level (light green). The breakdown showing the section level rating is shown in Table 5-2.

Table 5-2: Multi-criteria assessment results of Optimised Route Option 1

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Summary
AQ-AP	0.42	Off Road at Carrickmines Substation	Yellow	Green	Light Green	Light Green	Light Green	Yellow
AH-AQ	0.93	Murphystown Way, Ballyogan Road	Light Green	Light Green	Light Green	Green	Yellow	Yellow
AV-AH	1.43	Leopardstown Road, Murphystown Way	Light Green	Light Green	Light Green	Green	Yellow	Light Green
AC-AV	1.13	Blackthorn Avenue, Burton Hall Road	Light Green	Green	Blue	Light Green	Light Green	Light Green
X-AC	1.14	Kilmacud Road Upper, Saint Raphaelas Road	Light Green	Green	Blue	Green	Yellow	Green
X-W	1.24	Lower Kilmacud Road	Yellow	Green	Light Green	Green	Yellow	Light Green
M-W	0.45	Drummartin Road, Drummartin Link Road	Yellow	Green	Light Green	Green	Yellow	Yellow
N-M	1.61	Foster Avenue, Mount Anville Road	Yellow	Green	Light Green	Green	Yellow	Light Green
AY-N	0.37	Foster Avenue	Yellow	Green	Light Green	Green	Yellow	Light Green
L-AY	0.57	Stillorgan Road	Yellow	Green	Light Green	Green	Yellow	Light Green
O-L	1.36	Trimleston Park, Woodbine Avenue, Stillorgan Road	Yellow	Green	Light Green	Green	Yellow	Light Green
K-O	0.57	Rock Road	Light Green	Blue	Light Green	Light Green	Green	Green
E-K	1.37	Strand Road	Light Green	Green	Blue	Light Green	Green	Green
B-E	0.81	Strand Road	Yellow	Green	Light Green	Green	Green	Light Green
A-B	1.98	Off Road at Poolbeg, Irishtown Nature Reserve	Green	Blue	Green	Light Green	Blue	Blue

5.3.2 Outstanding Challenges of Optimised Route Option 1

There are several outstanding challenges on this route option that would need to be addressed with further investigation and design. They are as follows:

- M50 crossing. Space in bridge deck or space for HDD crossing
- Luas crossing. HDD crossing likely.
- DART crossing onto Strand Road at Merrion gates. This crossing has the most space required for HDD crossing.
- Crossing through Sean Moore Park and Irishtown Nature Park, inland bird feeding sites.
- High utility congestion on Poolbeg peninsula

5.3.3 Optimised Route Option 1 – Variation 1

A variation of Optimised Route Option 1 was identified with a total route length 15.1km.

At the junction of the Stillorgan Road (N11) and Woodbine Road the route continues north along the Stillorgan Road and under the UCD flyover until it reaches Nutley Lane, here it follows Nutley Lane northeast and crosses Merrion Road onto Sydney Parade Avenue where it crosses under the DART level crossing. After the DART crossing, the route follows Park Avenue north, as it becomes Gilford Road and then Sandymount Green. This route crosses through Sandymount Village into Dromard Terrace before re-joining EBO 1 at Sean Moore Park.

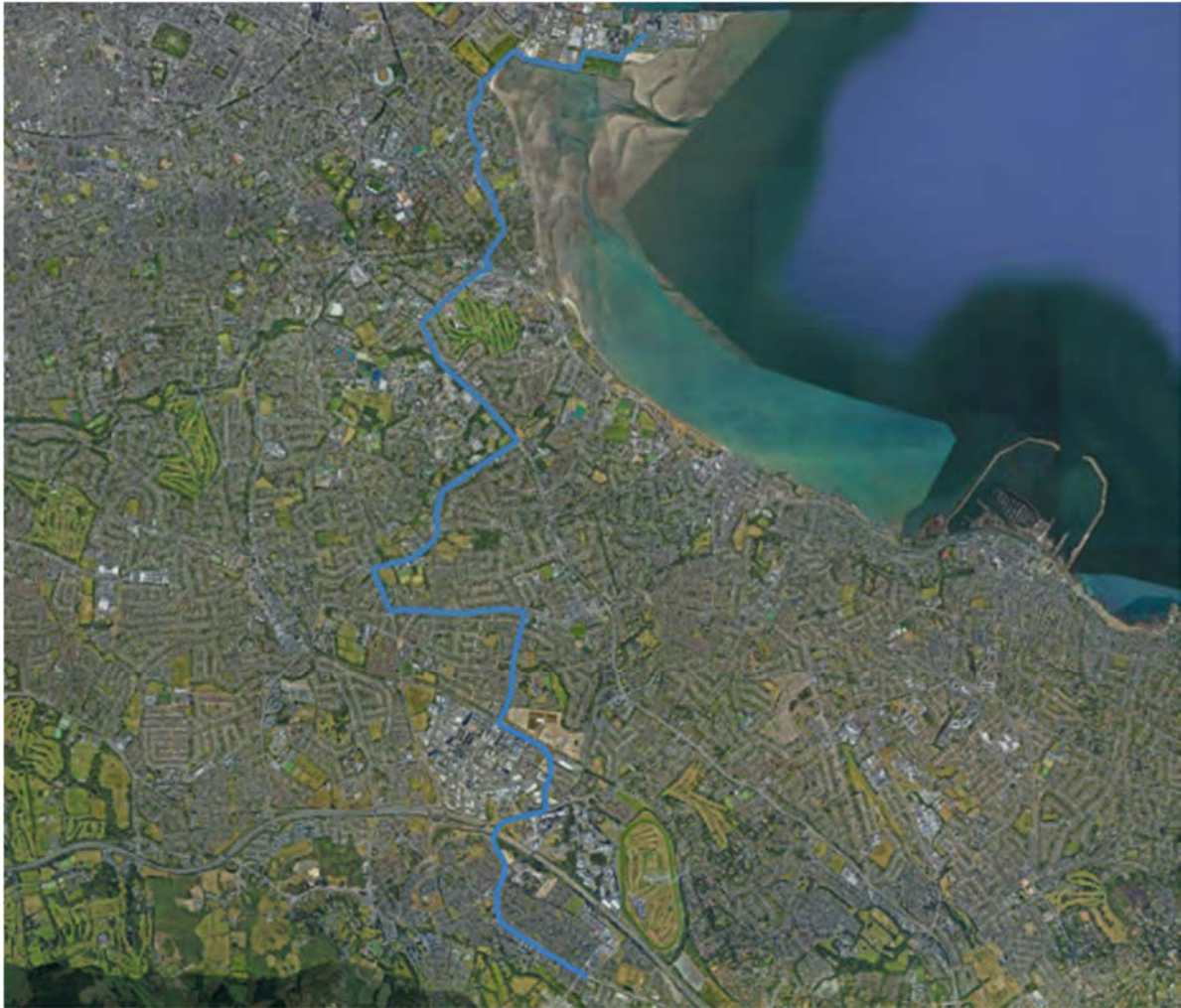


Figure 5-3: Map of Optimised Route Option 1 – Variation 1

5.3.4 Summary of Optimised Route Option 1 – Variation 1 MCA Results

The overall risk rating of this optimised route was low-moderate risk level (light green). The breakdown showing the section level rating is shown in Table 5-3.

Table 5-3: Multi-criteria assessment results of Optimised Route Option 1 – Variation 1

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Summary
AQ-AP	0.42	Off Road at Carrickmines Substation	Yellow	Green	Light Green	Light Green	Light Green	Yellow

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Summary
AH-AQ	0.93	Murphystown Way, Ballyogan Road						
AV-AH	1.43	Leopardstown Road, Murphystown Way						
AC-AV	1.13	Blackthorn Avenue, Burton Hall Road						
X-AC	1.14	Kilmacud Road Upper, Saint Raphaelas Road						
X-W	1.24	Lower Kilmacud Road						
M-W	0.45	Drummartin Road, Drummartin Link Road						
N-M	1.61	Foster Avenue, Mount Anville Road						
AY-N	0.37	Foster Avenue						
L-AY	0.57	Stillorgan Road						
O-L	1.36	Trimleston Park, Woodbine Avenue, Stillorgan Road						
K-O	0.57	Rock Road						
E-K	1.37	Strand Road						
B-E	0.81	Strand Road						
A-B	1.98	Off Road at Poolbeg, Irishtown Nature Reserve						

5.3.5 Outstanding Challenges of Optimised Route Option 1 – Variation 1

There are several outstanding challenges on this route option that would need to be addressed with further investigation and design. They are as follows:

- DART crossing on Sydney Parade. Space needed for HDD, probable short term road closures to facilitate crossing works.
- Route passes through Sandymount Village which is an Architectural Conservation Area and has a high density of population and commerce.

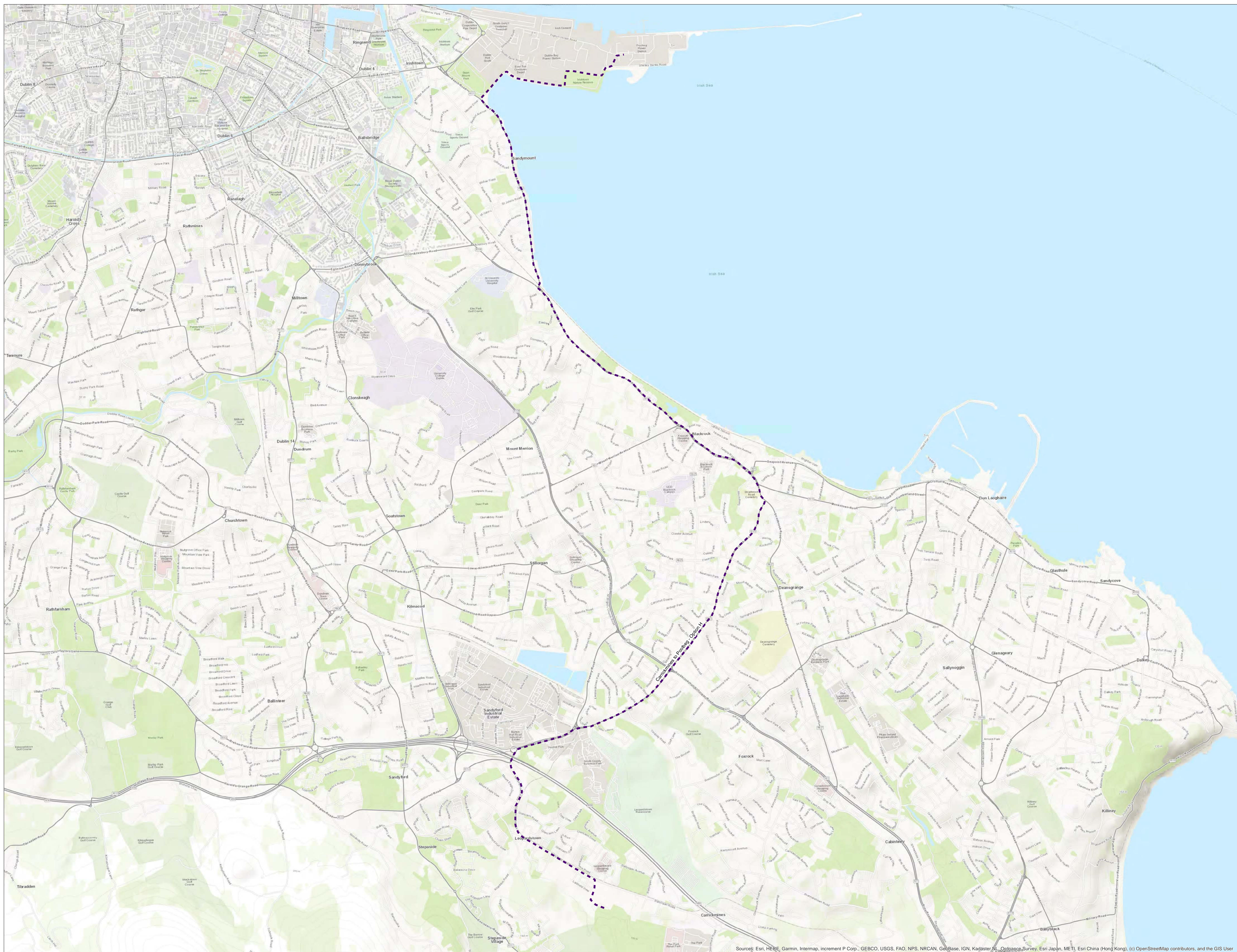
5.4 Optimised Route Option 2 (Option H)

Optimised Route Option 2 is presented below. The total length of this route is 14.17km.

Optimised Route Option 2 leaves the Carrickmines substation and follows the Ballyogan Road northwest adjacent to the Luas Green Line. It continues into Murphystown Way where it crosses the M50 at Junction 14

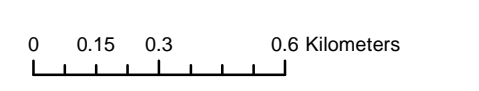
on to the N31. The route crosses under the Luas Green Line at Brewery Road junction (overhead bridge crossing), continues down the Leopardstown Road and crosses the Stillorgan Road (N11) before joining Newtownpark Avenue.

The route joins the N31 at Temple Hill and proceeds northeast along the Frascati Road (N31) and the Rock Road (R118). It continues northwest along the Rock Road to the DART level crossing at Merrion Gates. The route follows Strand Road to Sean Moore Park where it turns to the East and skirts the park boundary and follows the route of the shoreline toward the Poolbeg Substation.



Legend

--- Carrickmines to Poolbeg *Option H*



Client



Dublin Cables Project

Title

Emerging Best Options
Carrickmines to Poolbeg
Option H



Issue Details

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5.4.1 Summary of Optimised Route Option 2 MCA Results

The overall risk rating of this optimised route was low-moderate risk level (light green).

Table 5-4: Multi-criteria assessment results of Optimised Route Option 2.

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Summary
AQ-AP	0.42	Off Road at Carrickmines Substation	Yellow	Green	Light Green	Light Green	Light Green	Yellow
AH-AQ	0.93	Murphystown Way, Ballyogan Road	Light Green	Light Green	Light Green	Green	Yellow	Yellow
AV-AH	1.43	Leopardstown Road, Murphystown Way	Light Green	Light Green	Green	Green	Yellow	Light Green
AD-AV	0.23	Leopardstown Road	Yellow	Light Green	Light Green	Light Green	Yellow	Yellow
AE-AD	0.22	Leopardstown Road	Light Green	Green	Light Green	Light Green	Yellow	Light Green
AI-AE	1.12	Leopardstown Road	Yellow	Green	Green	Green	Yellow	Light Green
AA-AI	2.16	Newtownpark Avenue,	Yellow	Green	Blue	Blue	Yellow	Green
AW-AA	0.33	Stradbrook Road	Yellow	Green	Light Green	Green	Yellow	Light Green
U-AW	0.62	Frascati Road	Yellow	Green	Light Green	Light Green	Light Green	Light Green
T-U	0.39	Frascati Road	Yellow	Light Green	Light Green	Light Green	Light Green	Light Green
P-T	1.15	Rock Road	Yellow	Green	Green	Green	Green	Green
O-P	0.44	Rock Road	Yellow	Blue	Green	Green	Green	Green
K-O	0.57	Rock Road	Light Green	Blue	Light Green	Light Green	Green	Green
E-K	1.37	Strand Road	Light Green	Green	Blue	Light Green	Green	Green
B-E	0.81	Strand Road	Yellow	Green	Light Green	Green	Green	Light Green
A-B	1.98	Off Road at Poolbeg, Irishtown Nature Reserve	Green	Blue	Green	Light Green	Blue	Blue

5.4.2 Outstanding Challenges of Optimised Route Option 2

There are several outstanding challenges on this route option that would need to be addressed with further investigation and design. They are as follows:

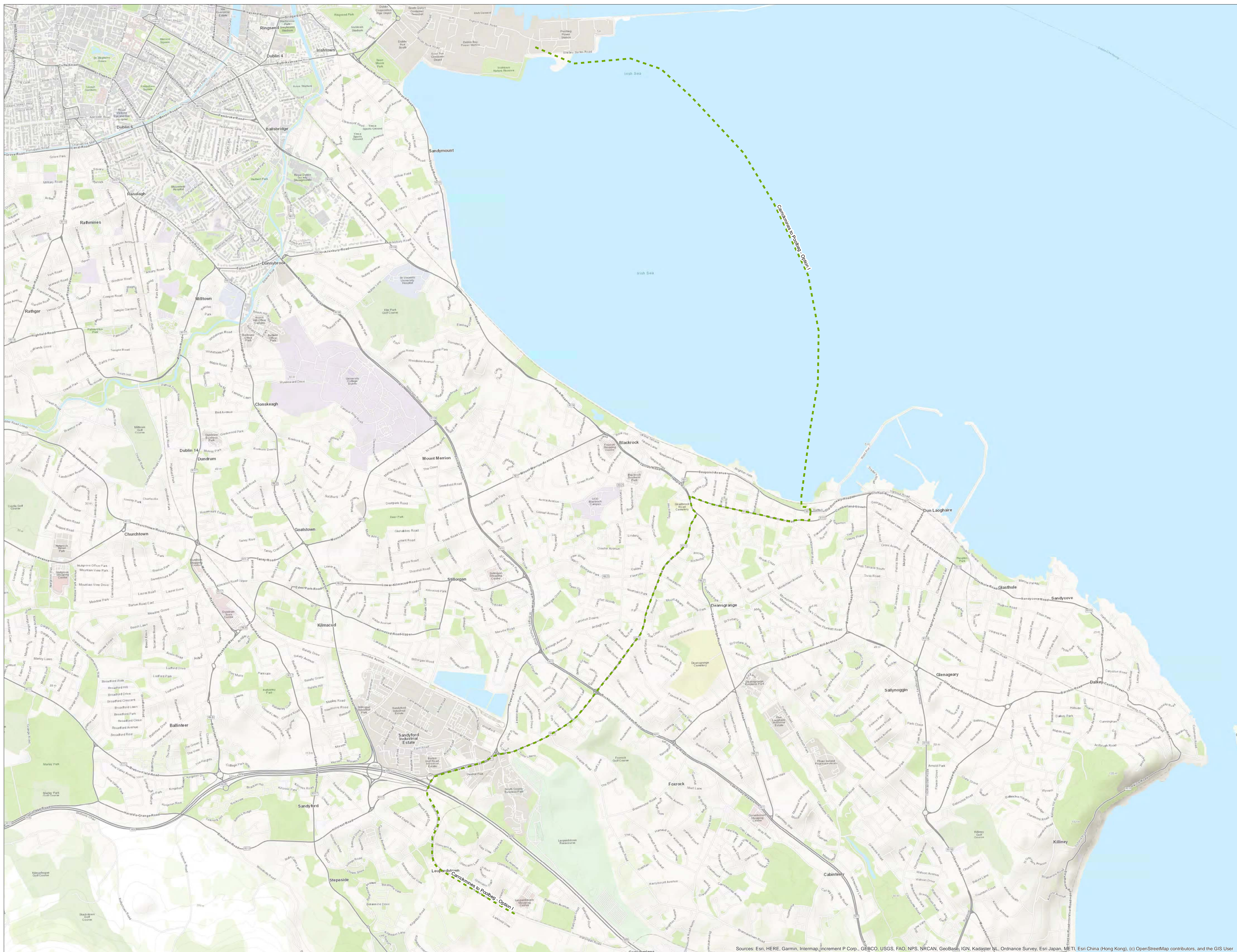
- M50 crossing. Space in bridge deck or space for HDD crossing
- DART crossing onto Strand Road at Merrion Gates. This crossing has the most space required for HDD crossing.
- Crossing through Sean Moore Park and Irishtown Nature Park, inland bird feeding sites
- High utility congestion on Poolbeg peninsula

5.5 Optimised Route Option 3 (Route Option I)

Optimised Route Option 3 is presented below. This route option is 14.9 km.

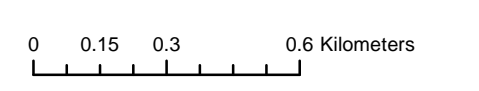
Optimised Route Option 3 leaves the Carrickmines substation and follows the Ballyogan Road northwest adjacent to the Luas Green Line. It continues into Murphystown Way where it crosses the M50 at Junction 14 on to the N31. The route crosses under the Luas Green Line at Brewery Road junction (overhead bridge crossing), continues down the Leopardstown Road and crosses the Stillorgan Road (N11) before joining Newtownpark Avenue. The route joins the N31 at Temple Hill and proceeds north for a short distance.

At the junction with Newtown Avenue, the route turns in an easterly direction and travels along Seapoint Avenue adjacent to Monkstown Village. At the junction with Link Road, the route turns north and travels into the Salthill and Monkstown DART station Car Park. From this point, the route becomes a submarine corridor from the Salthill landfall point to the Poolbeg Peninsula landfall point to the north. From the northern landfall, the route travels on to the Poolbeg substation.



Legend

--- Carrickmines to Poolbeg Option I



Dublin Cables Project

Title
Emerging Best Options
Carrickmines to Poolbeg
Option I



Issue Details

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5.5.1 Summary of Optimised Route Option 3 MCA Results

The overall risk rating of this optimised route was low moderate risk (light green). The breakdown showing the section level rating is shown in Table 5-5.

Table 5-5: Multi-criteria assessment results of Optimised Route Option 3

Section	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Summary
AQ-AP	0.42	Off Road at Carrickmines Substation	Yellow	Green	Light Green	Light Green	Light Green	Yellow
AH-AQ	0.93	Murphystown Way, Ballyogan Road	Light Green	Light Green	Light Green	Green	Yellow	Yellow
AV-AH	1.43	Leopardstown Road, Murphystown Way	Light Green	Light Green	Green	Green	Yellow	Light Green
AD-AV	0.23	Leopardstown Road	Yellow	Light Green	Light Green	Light Green	Yellow	Yellow
AE-AD	0.22	Leopardstown Road	Light Green	Green	Light Green	Green	Yellow	Light Green
AI-AE	1.12	Leopardstown Road	Yellow	Green	Light Green	Green	Yellow	Light Green
AA-AI	2.16	Newtownpark Avenue	Yellow	Green	Blue	Blue	Yellow	Green
AW-AA	0.33	Stradbrook Road	Yellow	Green	Light Green	Green	Yellow	Light Green
AX-AW	1.49	Seapoint Avenue	Yellow	Green	Light Green	Green	Light Green	Light Green
A-AX	6.52	Off Road at Poolbeg, Submarine Cable, Off road at Salthill & Monkstown	Blue	Green	Green	Light Green	Blue	Blue

5.5.2 Outstanding Challenges of Optimised Route Option 3

There are several outstanding challenges on this route option that would need to be addressed with further investigation and design. They are as follows:

- M50 crossing. Space in bridge deck or space for HDD crossing
- Space for landfall on Poolbeg Peninsula and Salthill and Monkstown
- Planning/environmental permissions for the submarine routing

5.6 Optimised Route Option 4

Optimised Route Option 4 is shown in Figure 5-5. This route option is 13.85km.

Optimised Route Option 4 leaves the Carrickmines substation and follows the Ballyogan Road northwest adjacent to the Luas Green Line. It continues into Murphystown Way where it crosses the M50 at Junction 14 on to the N31. The route crosses under the Luas Green Line at Brewery Road junction (overhead bridge crossing), continues down Brewery Road (N31) until it reaches St. Brigid’s Church Road where it diverts North.

The route follows St. Brigid’s Drive, The Hill, Old Dublin Road where it crosses the Stillorgan Road (N11), Priory Drive, Priory Avenue, Grove Avenue where it joins Mount Merrion Avenue (N31). It continues northwest along the Rock Road to the DART level crossing at Merrion Gates. The route follows Strand Road to Sean Moore Park where it turns to the East and skirts the park boundary and follows the route of the shoreline toward the Poolbeg Substation.

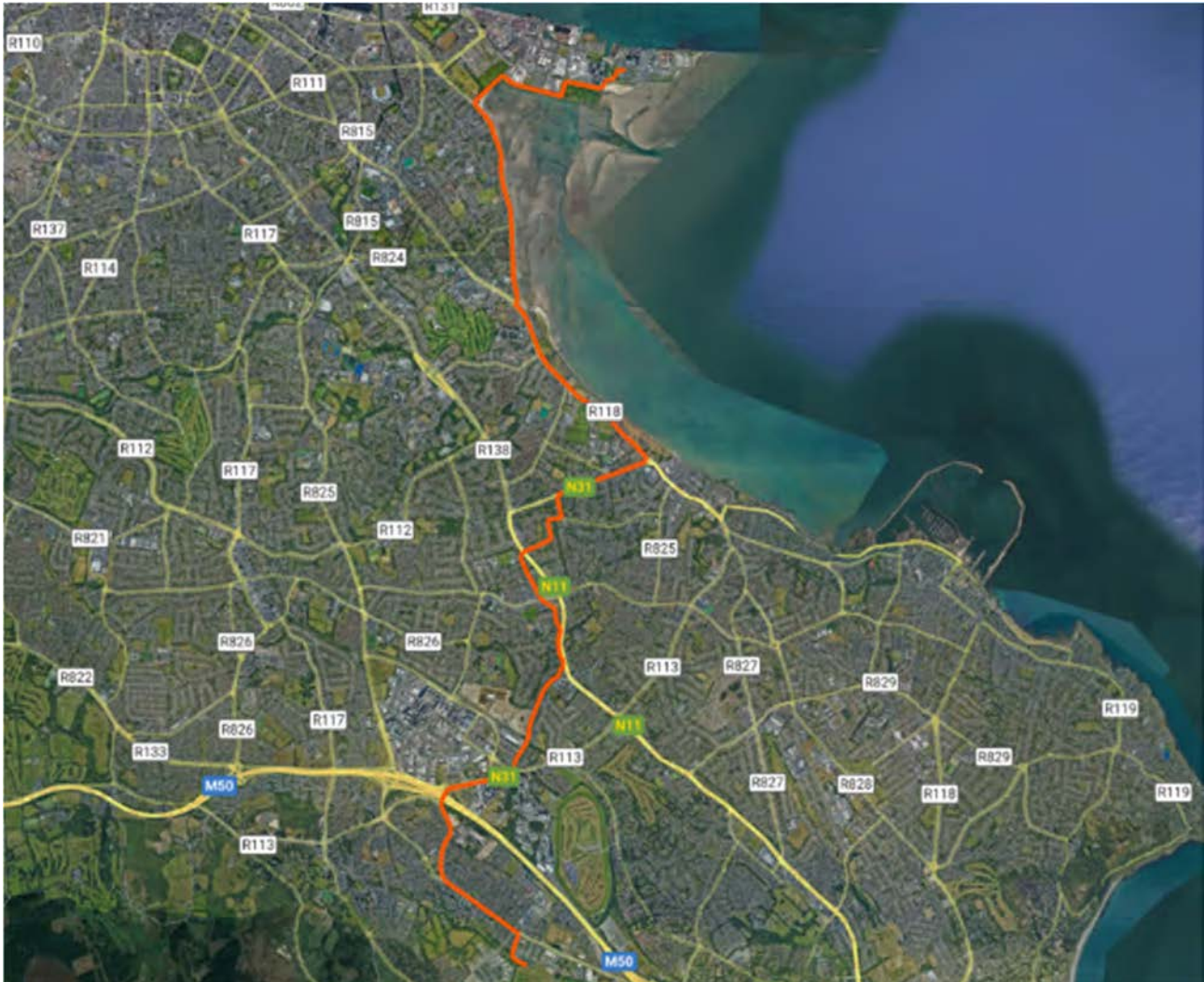


Figure 5-5: Map of Optimised Route Option 4

5.6.1 Summary of Optimised Route Option 4 MCA Results

The overall risk rating of this optimised route was low moderate risk (light green). The breakdown showing the section level rating is shown in Table 5-6.

Table 5-6: Multi-criteria assessment results of Optimised Route Option 4

Sections	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Summary
AQ-AP	0.42	Off Road at Carrickmines Substation	Yellow	Green	Light Green	Light Green	Light Green	Yellow
AH-AQ	0.93	Murphystown Way, Ballyogan Road	Light Green	Light Green	Light Green	Green	Yellow	Yellow
AV-AH	1.43	Leopardstown Road, Murphystown Way	Light Green	Light Green	Green	Green	Yellow	Light Green
AD-AV	0.23	Leopardstown Road	Yellow	Light Green	Light Green	Light Green	Yellow	Yellow
AF-AD	1.18	Brewery Road	Light Green	Blue	Blue	Light Green	Light Green	Green
AG-AF	0.1	Brewery Road	Yellow	Green	Green	Light Green	Light Green	Light Green
Y-AF	0.75	The Hill, Glenalbyn Road, St Brigid's Church Road	Yellow	Green	Light Green	Green	Light Green	Yellow
V-Y	0.55	Old Dublin Avenue	Yellow	Green	Light Green	Green	Yellow	Light Green
S-V	0.94	Grove Avenue, Priory Avenue, Priory Drive	Yellow	Green	Green	Light Green	Light Green	Light Green
T-S	1	Mount Merrion Avenue	Yellow	Green	Light Green	Green	Yellow	Light Green
P-T	1.15	Rock Road	Yellow	Green	Light Green	Green	Green	Green
O-P	0.44	Rock Road	Yellow	Blue	Light Green	Green	Green	Green
K-O	0.57	Rock Road	Light Green	Blue	Light Green	Green	Green	Green
E-K	1.37	Strand Road	Light Green	Green	Blue	Green	Green	Green
B-E	0.81	Strand Road	Yellow	Green	Light Green	Green	Green	Light Green
A-B	1.98	Off Road at Poolbeg, Irishtown Nature Reserve	Green	Blue	Green	Light Green	Blue	Blue

5.6.2 Outstanding Challenges of Optimised Route Option 4

There are several outstanding challenges on this route option that would need to be addressed with further investigation and design. They are as follows:

- M50 crossing. Space in bridge deck or space for HDD crossing
- DART crossing onto Strand Road at Merrion Gates. This crossing has the most space required for HDD crossing.
- Crossing through Sean Moore Park and Irishtown Nature Park, inland bird feeding sites
- High utility congestion on Poolbeg peninsula

5.6.3 Optimised Route Option 4 – Variation 1

Optimised Route Option 4 - Variation 1 is shown in Figure 5-7. This route option is 14.4km.

Optimised Route Option 4 - Variation 1 leaves the Carrickmines substation and follows the Ballyogan Road northwest adjacent to the Luas Green Line. It continues into Murphystown Way where it crosses the M50 at Junction 14 on to the N31. The route crosses under the Luas Green Line at Brewery Road junction (overhead bridge crossing), continues down Brewery Road (N31) until it reaches St. Brigid’s Church Road where it diverts North.

The route follows St. Brigid’s Drive and The Hill, where it diverts east along the Lower Kilmacud Road. It crosses the N11 and continues down Stillorgan Park Road until turning north along Carrysfort Avenue until joining Frascati Road. It continues northwest along the Rock Road to the DART level crossing at Merrion Gates. The route follows Strand Road to Sean Moore Park where it turns to the East and skirts the park boundary and follows the route of the shoreline toward the Poolbeg Substation.

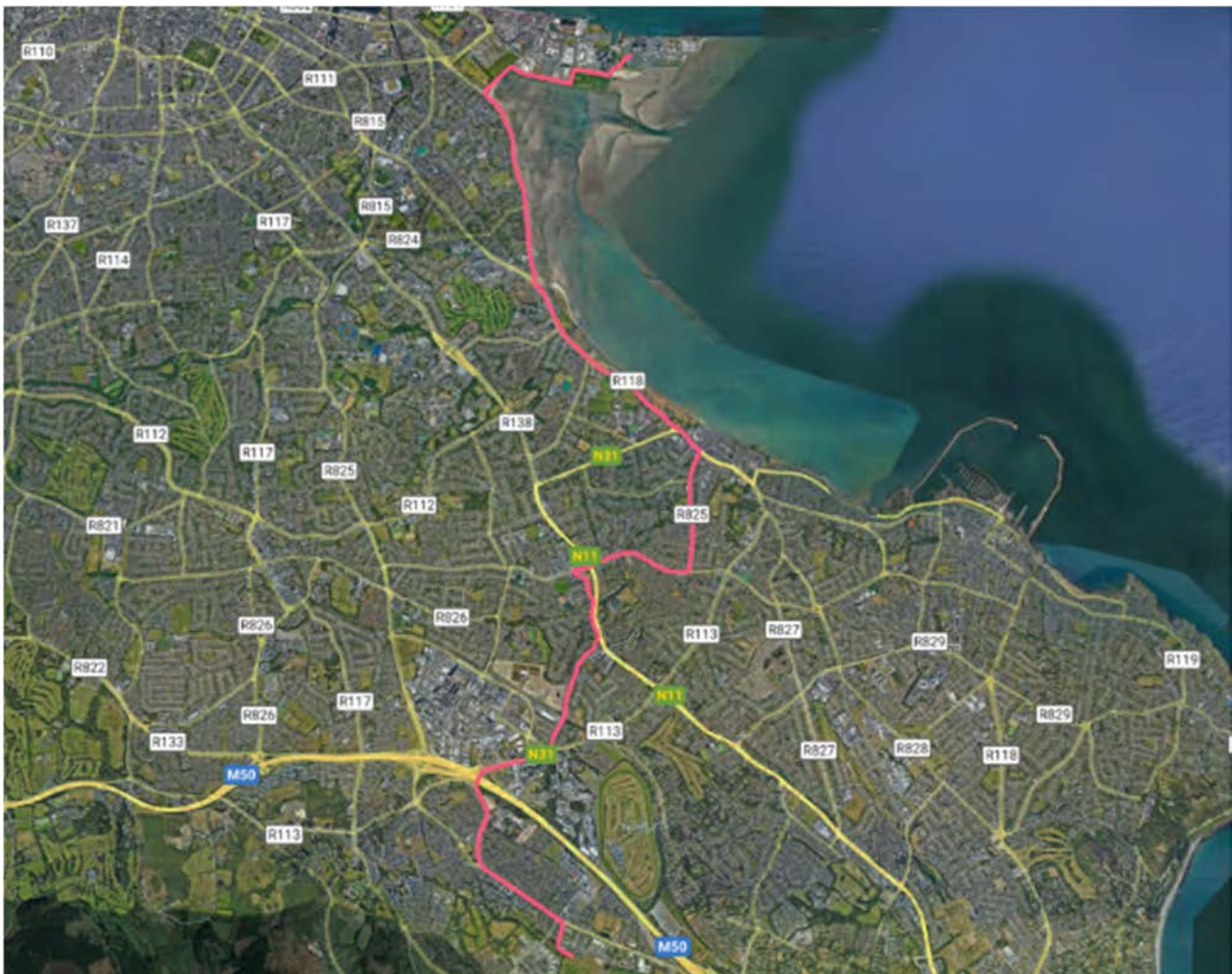


Figure 5-7: Map of Optimised Route Option 4 – Variation 1

5.6.4 Summary of Optimised Route Option 4 – Variation 1 MCA Results

The overall risk rating of this optimised route was low moderate risk (light green). The breakdown showing the section level rating is shown in Table 5-7.

Table 5-7: Multi-criteria assessment results of Optimised Route Option 4

Sections	Section Length (km)	Road Names	Technical	Deliverability	Economic	Socio-Economic	Environmental	Overall Summary
AQ-AP	0.42	Off Road at Carrickmines Substation	Yellow	Green	Light Green	Light Green	Light Green	Yellow
AH-AQ	0.93	Murphystown Way, Ballyogan Road	Light Green	Light Green	Light Green	Green	Yellow	Yellow
AV-AH	1.43	Leopardstown Road, Murphystown Way	Light Green	Light Green	Green	Green	Yellow	Light Green
AD-AV	0.23	Leopardstown Road	Yellow	Light Green	Light Green	Light Green	Yellow	Yellow
AF-AD	1.18	Brewery Road	Light Green	Blue	Blue	Green	Light Green	Green
AG-AF	0.1	Brewery Road	Yellow	Green	Green	Light Green	Light Green	Light Green
Y-AF	0.75	The Hill, Glenalbyn Road, St Brigid's Church Road	Yellow	Green	Light Green	Green	Light Green	Yellow
Z-Y	0.2	Lower Kilmacud Road	Yellow	Light Green	Light Green	Light Green	Light Green	Yellow
Z-AU	0.1	Stillorgan Road	Yellow	Green	Light Green	Light Green	Yellow	Yellow
U-AU	2.34	Carysfort Avenue, Carysfort Avenue Upper, Stillorgan Park Road	Yellow	Green	Green	Green	Light Green	Light Green
T-U	0.39	Frascati Road	Yellow	Light Green	Light Green	Green	Light Green	Light Green
P-T	1.15	Rock Road	Yellow	Green	Green	Green	Green	Green
O-P	0.44	Rock Road	Yellow	Blue	Green	Green	Green	Green
K-O	0.57	Rock Road	Light Green	Blue	Light Green	Green	Green	Green
E-K	1.37	Strand Road	Light Green	Green	Blue	Green	Green	Green
B-E	0.81	Strand Road	Yellow	Green	Light Green	Green	Green	Light Green
A-B	1.98	Off Road at Poolbeg, Irishtown Nature Reserve	Green	Blue	Green	Light Green	Blue	Blue

5.6.5 Outstanding Challenges of Optimised Route Option 4 – Variation 1

There are several outstanding challenges on this route option that would need to be addressed with further investigation and design. They are as follows:

- M50 crossing. Space in bridge deck or space for HDD crossing
- DART crossing onto Strand Road at Merrion Gates. This crossing has the most space required for HDD crossing.

- Crossing through Sean Moore Park and Irishtown Nature Park, inland bird feeding sites
- High utility congestion on Poolbeg peninsula

6 EMERGING BEST PERFORMING ROUTES

The four optimised routes created after the multi-criteria assessment, and outlined in Chapter 5, were assessed to determine the Emerging Best Performing routes to progress to the Best Performing Option Report.

Optimised Routes 1, 2 and 3 will be progressed for further consideration in the Best Performing Option Report where more detailed cable routing design and public consultation will be used to determine the Best Performing Option for Step 5.

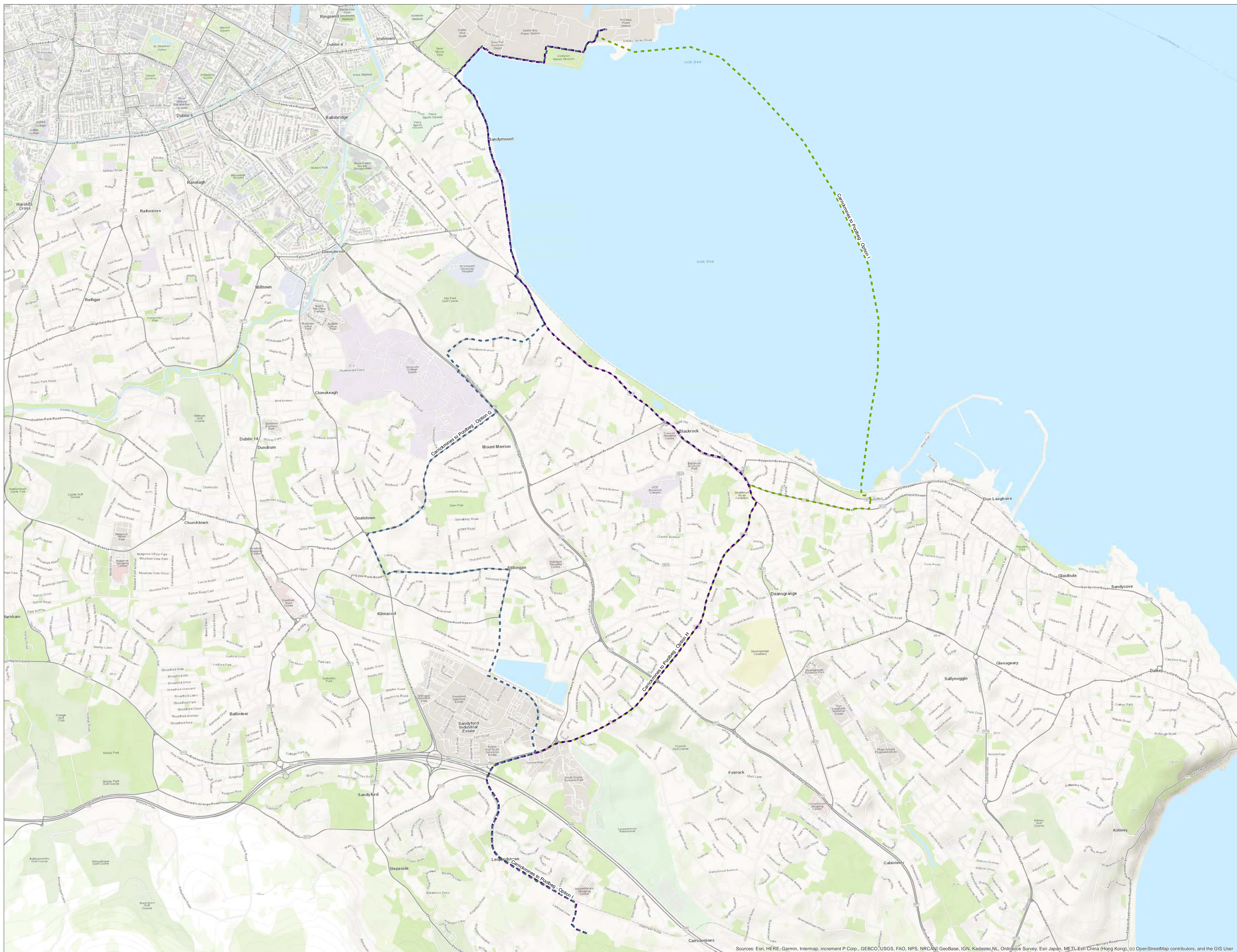
Optimised Route 1, which will from here will be labelled **Option G**, has been selected due to the overall ranking of low-moderate risk. The higher risk ranking of mid-level/moderate in the Deliverability and Socio-Economic criteria are being driven by the working time constraints, utility congestion and duration of the works. The high working time constraint is due to large sections of the route having a high TIN number and may increase the working time for construction in these areas. This route could be constructed in compliance with EirGrid specifications and would have minimal expansion/extendibility issues. Another factor driving the risk are the two HDD crossings under Luas and Dart lines which can be reduced during the detailed design phase.

Optimised Route 2 which will be relabelled **Option H**, also has an overall ranking of low-moderate risk. The criteria of Deliverability, Economic, and Socio-Economic are rated as mid-level / moderate risk. The main sub-criteria driving the higher risk rankings of this route are working time constraints, duration of works and proximity to critical services. The high working time constraint is due to a section of the route running from Leopardstown Road to the Rock Road having a TIN number of 5 which is likely to increase the working time for construction along this section. This route could also be constructed in compliance with EirGrid specifications and would have minimal expansion/extendibility issues.

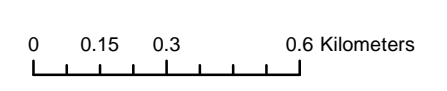
Optimised Route 3, which will be relabelled as **Option I**, is the final route that will be considered for further investigation. This route is ranked as low-moderate risk overall. The main challenge of this route is the long submarine section which travels through South Dublin Bay pHNA, SPA and SAC which will require a foreshore licence. However, with detailed design and site investigation, this risk can be managed.

Optimised Route Option 4 and Optimised Route Option 4 – Variation 1 have not been progressed for further consideration due to several constraints. Despite not having a large impact on the overall risk ratings, the narrow streets, high utility congestion and challenging route geometry between nodes AF-Y are the main drivers for not progressing these routes.

The map below shows Option G, Option H and Option 1.



- Legend**
- - - Carrickmines to Poolbeg *Option G*
 - - - Carrickmines to Poolbeg *Option H*
 - - - Carrickmines to Poolbeg *Option I*



Dublin Cables Project

Title

Emerging Best Options

Carrickmines to Poolbeg



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7 NEXT STEPS

This Route Options Assessment report will be published for public consultation. Any feedback received during the eight-week consultation will be considered in the project design moving forward.

EirGrid are also engaging through a Business Forum and Community Forum. Both forums will meet twice during the public consultation and the feedback received at each forum will also influence design where possible.

In addition to the feedback received from the consultation activity, a campaign of non-invasive investigations (such as Ground Penetrating Radar) will be performed to identify areas of high utility congestion, as well as limited invasive site investigations (such as slit trenches and H trenches) to validate the desktop designs. This approach informs and underpins the ongoing design, and in doing so reduces the risk of unexpected issues encountered during the construction phase.

Feedback and investigations are expected to iterate the design which may include sections that had previously assessed but ranked sub optimally during the Multi Criteria Assessment. These alternative sections have been subjected to the same scrutiny as all other route sections in order to provide this flexibility and are expected to enable minimal deviation from the proposed route options.

The next publication for this project is the Best Performing Option report. This report will contain the additional design and investigative work detailed above.