DL Central
Active Travel Scheme

Final Business Case

November 2024

Delivering a better world

Executive Summary

Introduction

AECOM, on behalf of Dún Laoghaire-Rathdown County Council (DLRCC) have prepared a Final Business Case for the Dún Laoghaire Central Active Travel Improvement Scheme.

The Final Business Case is a follow-on document from the Detailed Business Case for the scheme, which was prepared by AECOM in 2024. The core study area consists of the following streets:

- Mounttown Road Upper (R829)
- Kill Avenue (R830)
- Mounttown Road Lower (R829)
- Glenageary Road Upper (R829)

The scheme aims to improve the current facilities along this busy cycling and walking route to provide an enhanced environment to cater for the increasing cycling and walking demand; and provide improved connections to other key cycling routes.

Investment Rationale

The need for the scheme was identified as part of the DLRCC Development Plan 2022 - 2028, which aims to promote and provide for the development of cycling and walking as healthy sustainable attractive transport modes in the County for commuting, short utility trips, recreation trips and trips to schools/colleges.

A review of the existing infrastructure conditions throughout the scheme was carried out. The review identified existing constraints and opportunities of relevance to pedestrians and cyclists specific to this scheme.

Scheme Objectives

The following scheme objectives formed the development of the Dún Laoghaire Central Active Travel Scheme:

- To provide continuous, high-quality and consistent cycling and walking facilities along the route.
- To provided improved public realm areas and overall visual quality.
- To promote a modal shift.
- To enhance permeability and create a place for all.
- To improve bus priority along Kill Avenue up to the Bakers Corner Junction.
- To protect and enhance sensitive landscapes.
- To enhance safety for all road users including vulnerable persons.

Concept Development and Options Selection (NTA PAG Phase 2)

A long list of options was developed to consider all design options which could feasibly meet the objectives of the project.

To ensure that all options were considered equally, they were assessed through a consistent Multi Criteria Analysis (MCA) framework. Based on the results of the MCA, a shortlist of options were recommended for progressing to the Concept Development and Option Selection Phase.

The options assessed varying levels of interventions/upgrades to the junctions and link sections along the route, including:

- **Option A:** Do Nothing.
- **Option B:** Two Way (segregated) Cycle Track with Cyclops-style junctions.
- **Option C:** One Way (segregated) Cycle Tracks on both sides of the road with Protected Junctions.
- **Option D:** Quick Build Footpath, maintaining all other existing facilities.

Following the MCA exercise, Option B scored highest; and was brought forward as the preferred option through to the preliminary design phase (NTA PAG Phase 3).

Preliminary Design (NTA PAG Phase 3) & Statutory Processes (NTA PAG Phase 4)

Preliminary Design for the scheme was completed in 2022, and the scheme was submitted for Part 8 planning approval (NTA PAG Phase 4) in 2022.

Approval was granted in autumn 2022 and the scheme moved to NTA PAG Phase 5 (Detailed Design and Procurement).

Detailed Design and Procurement (NTA PAG Phase 5)

The Detailed Design of the DL Central Active Travel scheme was undertaken in 2023, with a tender package issued to the NTA for review in December 2023. As a result of the publication of the Cycle Design Manual at the end of 2023, design changes to the scheme were instructed by the NTA, including the following:

- Revised tactile paving arrangements for pedestrian crossings over cycle track and across carriageway as per CDM TL502 for CYCLOPS junctions;
- Amendment to surfacing of pedestrian crossings of cycle track to pedestrian islands and incorporation of white zebra markings
- New pole and cycle push button units set back 1.5m as per CDM TL502.
- Increased cycle storage areas.
- Side Road cycle and pedestrian crossings over Ardmore Park side road to comply with CDM Full Set Back (TL407)
- Side Road Cycle and Pedestrian crossings throughout the scheme to be upgraded to comply with CDM Partial Set Back (TL408) detail where feasible.
- Amendment to the proposed buffer between cycle track and road where feasible, to be increased from 250mm to 300mm.

A post-tender cost estimate was undertaken for the scheme. An overall total post-tender cost (inclusive of Inflation, Risk, Contingency) of **€18,366,725.63** (excluding VAT) was identified. The Cost Estimate has been provided in Appendix A of this document.

Stage 1 Tender

In order to progress with the timely procurement of the scheme while also updating the detailed design and tender documents, AECOM proposed to progress with a 2-stage Tendering Process. The contract under which the scheme shall be tendered (and subsequently constructed) is PW-CF3 *Public Works Contract For Civil Engineering Works Designed By The Employer*.

The Stage 1, SAQ response process, was published in April 2024, with tender responses received in May 2024. 5 no. responses were received during the tender period from the following five candidates:

1. Clonmel Enterprises Ltd
2. Coffey Construction Ltd
3. John Sisk & Sons (Holdings) Ltd
4. John Craddock Ltd
5. Murphy Ireland.

A tender assessment was undertaken by AECOM, which assessed the five candidates based on the criteria set out in the SAQ documents. The candidates were all deemed to have provided satisfactory information and were invited to the Stage 2 Tender.

Stage 2 Tender

AECOM undertook a tender assessment and invited each of the 5 tenderers to progress to the Stage 2 of the tender process. The Stage 2 tender process, with the 5no. tenderers invited to progress from Stage 1, was published in July 2024. Tender submissions were received on 24th September 2024 from the following three candidates:

- Clonmel Enterprises Ltd
- Coffey Construction Ltd
- Murphy Internation limited.

A tender assessment was undertaken by AECOM, please refer to the DL Central Stage 2 Tender Assessment Report. The assessment identified that the tender received by Clonmel Enterprises Ltd should be accepted as it is the Most Economically Advantageous Tender which has achieved the highest overall marks, and which also met the specified minimum criteria in the Suitability Assessment Criteria.

The submitted tender sum for Clonmel Enterprises Ltd comprised of **€12,438,438.45** (excluding VAT).

Demand Analysis

In order to determine the need for new schemes, existing travel characteristics in the area should be taken into consideration. With this in mind, the 2022 Census Data for Area Based Modal Splits in the immediate vicinity of the proposed scheme is shown below. The data for the 23 Small Areas directly adjacent to the scheme was extracted from the 2022 Census SAPMAP tool.

Cost

A post-tender cost estimate was undertaken for the scheme. An overall total, inclusive of Inflation, Risk, Contingency and VAT, of €**20,897,939.42** was identified. The Cost Estimate has been provided in Appendix A of this document.

Scheme Impacts

The proposed scheme will lead to:

- **An Increase in Cycle Patronage** – representing an additional 366 cyclist journeys per day by 2030, equivalent to an 10% increase in cyclist numbers in the high scenario
- **An Increase in Pedestrian Patronage** - the proposed scheme will result in an 834 (10%) uplift in pedestrians along the corridor in the central scenario

- **Journey Time Savings** - due to improvements in the level of service provided by the improved cycle facilities and separation from the pedestrians. This will result in an average time saving of approximately 1.5 minutes for pedestrians travelling along the route
- **A Modal Shift towards Sustainable Travel**, which will reduce reliance on private car and will encourage new journeys on foot, bicycle and public transport.

Financial Appraisal

The FNPV / financial PVC has been calculated to be **€14,821,962.00** over the scheme lifecycle, including both capital and current costs. As the scheme is publicly funded, the main exchequer outflow will ultimately be the cost of developing and maintaining the route. The FNPV from the previous section – which represents the sum of discounted cash flows – has been classed as a net exchequer outflow in this analysis.

- The **Present Value of Benefits** is **€18,300,277.00.**
- The **Net Present Value** is **€3,478,314.00.**

Scheme Appraisal Balance Sheet

The scheme appraisal balance sheet (PABS) is based on the CBA outcomes and anticipated scheme impacts. Firstly, it is important to establish the relevant criteria to be used during appraisal. There are seven main criteria listed by TAF:

- Transport User Benefits and Other Economic Impacts
- Accessibility Impacts
- Social Impacts
- Land Use Impacts
- Safety Impacts
- Climate Change Impacts
- Local Environment Impacts.

Risk Management

All schemes face risks, and as a complex scheme in a busy urban environment, the DL Central scheme faces many potential internal and external risks that must be addressed.

This section of the business case sets out the potential risks and highlights how these may impact on its delivery or success.

AECOM and DLRCC have put a risk register in place and have developed strategies for avoiding or managing these risks as the scheme progresses.

Prepared for:

National Transport Authority

Prepared by:

AECOM Ireland Limited
4th Floor
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
Co. Dublin A96 T927
Ireland

T: +353 1 238 3100
aecom.com

Table of Contents

Figures

Tables

1 Introduction

1.1 Scheme Overview

The scheme, which aims to upgrade existing pedestrian and cycle infrastructure across approximately 2.8km, will include works to the following roads:

- **Kill Avenue (R830)** from its junction with Rochestown Avenue / Kill Lane / Abbey Road extending approximately 850m to its junction with Glenageary Road Upper / Oliver Plunkett Road / Highthorn Park / Mounttown Road Upper;
- **Mounttown Road Lower (R829)** from its junction with Glenageary Road Upper / Oliver Plunkett Road / Highthorn Park / Kill Avenue, extending approximately 757m to its junction with Tivoli Road / York Road / Mounttown Road Upper;
- **Mounttown Road Upper (R829)** from its junction with Mounttown Road Lower / Tivoli Road / York Road, extending approximately 400m to a point approximately 20m east of the existing roundabout junction (Castlepark / Monkstown Avenue / Carrickbrennan Road); and
- **Glenageary Road Upper (R829)** from its junction with Kill Avenue / Oliver Plunkett Road / Highthorn Park extending approximately 780m up to the Glenageary Roundabout.

The scheme passes through predominantly residential areas, although there are also several key local centres with significant commercial activity along the route, such as the Park Pointe Shopping Centre and Dún Laoghaire Institute of Art and Design (IADT).

The overall route and location of key junctions is illustrated in **Figure 1.1** below.

Figure 1.1: Scheme Extents

1.2 Project Brief

Given the progression of the scheme and the readiness to deliver, the following key points are noted in terms of key project outputs. These have been identified through the design phases of the scheme:

- 3km scheme length
- Upgrade of 5no. existing signalised main junctions
- Upgrade of 6no. existing signalised pedestrian / toucan crossings
- Public realm and landscaping enhancements
- Introduction of Sustainable Urban Drainage Systems (SuDS)
- Introduction of high-quality pedestrian and cycle infrastructure; including segregated cycle infrastructure.

1.3 Purpose

This report sets out the business case for the Dún Laoghaire (DL) Central Active Travel scheme. This business case has been developed to:

- Outline existing issues in the locality and outline the case for change
- Define the aims and objectives of the scheme
- Appraise the options for change
- Set out an evidence-based representation of expected return on public investment.
- Ensure the scheme meets the objectives set and is good use of public funds

The report has been prepared in accordance with the Department of Public Expenditure & Reform (DPER) Public Spending Code (PSC) 2019, the Department of Transport (DoT) Transport Appraisal Framework (TAF) 2023 (updated July 2024) and the National Transport Authority (NTA) Project Appraisal Guidelines (PAG).

The economic appraisal element of the business case supports decision-making and accounts for the scheme's potential benefits and costs in monetary terms, or where a monetary equivalent can be estimated. In the transport sector, the economic appraisal usually takes the form of Cost-Benefit Analysis (CBA) and serves several functions at both individual scheme level and for state-wide comparisons on public investment.

- **Scheme level** – CBA defines the economic viability of the scheme in terms of transport benefits, provides a comparison of alternative options and takes account of relevant sensitivity testing.
- **National level** – economic appraisal compares schemes across sectors that would provide a positive return on investment.

CBA will usually only incorporate the monetised transport benefits; however, it is important to acknowledge that such benefits only represent a proportion of the total suite of benefits associated with a scheme. These wider non-monetised benefits also need to be considered as part of the broader case for change.

The TII TEAM tool has been used to inform this Business Case.

1.4 Approach to Scheme Appraisal

According to the Transport Appraisal Framework, a quantitative and qualitative appraisal should be undertaken for all active mode projects.

Firstly, it is important to establish the relevant criteria to be used during appraisal. There are seven main criteria listed by TAF:

- Transport User Benefits and Other Economic Impacts
- Accessibility Impacts
- Social Impacts
- Land Use Impacts
- Safety Impacts
- Climate Change Impacts
- Local Environment Impacts.

All of these should be considered, the additional sub-criteria will be dependent on relevance to the scheme.

During the qualitative analysis, both quantitative and monetary indicators may be used to assist with scoring. Indicators are useful to make the process more objective.

1.5 Structure of the Report

Following this introductory chapter, the rest of the report is structured as follows:

- Chapter 2 – Rationale for Investment
- Chapter 3 – Objectives
- Chapter 4 – Alternatives and Options to Address the Problem
- Chapter 5 – Proposed Design
- Chapter 6 – Demand Analysis
- Chapter 7 - Costs
- Chapter 8 – Scheme Impacts
- Chapter 9 – Financial Appraisal
- Chapter 10 – Economic Appraisal
- Chapter 11 – Scheme Appraisal Balance Sheet
- Chapter 12 – Governance Plan
- Chapter 13 – Risk Management
- Chapter 14 – Procurement and Implementation
- Chapter 15 – Monitoring and Evaluation Approach
- Chapter 16 – Conclusion

2 Rationale for Investment

2.1 Introduction

This chapter sets out the overarching rationale for investment, demonstrating the need for the scheme. The section covers the policy context and adherence and sets out the drivers for change and problem identification.

2.2 Public Policy Context

This section sets out the broader public policy context underpinning the scheme. As illustrated in the table below there is a strong international, national, and local policy basis for this scheme. If implemented, the scheme would directly and indirectly achieve a range of policy objectives, including investment in low-carbon and sustainable transport, development of a network of national and local greenways, encouraging increased levels of physical activity across the population, attracting tourism and investment, and improving safety for vulnerable road users.

Table 2.1 Relevant Policy

Policy level	Policy
European	• European Green Deal • RISM Directive
National	• Project Ireland 2040: National Planning Framework • National Development Plan 2021-2030 • Climate Action Plan 2024 • National Investment Framework for Transport in Ireland (NIFTI) • National Physical Activity Plan • Government Road Safety Strategy 2021-2030
Regional	• Regional Spatial and Economic Strategy for the Eastern and Midland Region, 2019-2031 • Draft Transport Strategy for the Greater Dublin Area 2022-2042 • GDA Cycle Network Plan
Local	• Dun Laoghaire Rathdown County Council Development Plan 2022-2028

2.3 European Policy

2.3.1 European Green Deal

The European Green Deal was adopted in 2020 and contains a set of policy initiatives aimed at making the European Union climate neutral by 2050.

Overall, the Green Deal aims to reduce emissions by at least 50% by 2030 and achieve net-zero emissions by 2050 by introducing new strategies, funding and legislation for the circular economy, transport, buildings, and biodiversity. Two of these strategies are described in further detail.

Figure 2.1- European Green Deal focus areas

2.3.1.1 EU Sustainable and Smart Mobility Strategy

Forming part of the Green Deal, the EU's ***Sustainable and Smart Mobility Strategy*** aims to reduce transport emissions across the Union through funding, regulations and policy supports for clean and sustainable mobility. While naturally EU policy mainly focuses on pan-European measures and cross-border mobility, the Strategy does reiterate strong support for investment in urban walking and cycling infrastructure by member states.

The Strategy places a particular emphasis on urban mobility and increasing the sustainable mode shares for trips to work, school and other key destinations. The Street Scheme will make progress towards the strategy.

Table 2.2 Alignment to the EU Sustainable and Smart Mobility Strategy

No.	Action
35	As set out in the 2030 climate target plan, increasing the modal shares of collective transport, walking and cycling, as well as automated, connected and multimodal mobility will significantly lower pollution and congestion from transport, especially in cities and improve the health and well-being of people. Cities are and should therefore remain at the forefront of the transition towards greater sustainability. The Commission will further engage with cities and Member States to ensure that all large and medium-sized cities that are urban nodes on the TEN-T network put in place their own sustainable urban mobility plans by 2030. The plans should include new goals, for example on having zero emissions and zero road fatalities. Active transport modes, such as cycling, have seen growth with cities announcing over 2300 km of extra cycling infrastructure. This should be doubled in the next decade towards 5000 km in safe bike lanes. The Commission is also considering developing a mission in the area of Climate-neutral and Smart Cities28 as a strategic priority for joint action to accomplish decarbonisation within a large number of European cities by 2030.
37	The EU and Member States must deliver on our citizens' expectations of cleaner air, less noise and congestion, and eliminating fatalities on our city streets. By revising the Urban Mobility Package to promote and support these sustainable and healthy transport modes, the Commission will contribute to the improvement of the current European framework for urban mobility. Clearer guidance is needed on mobility management at local and regional level, including on better urban planning, and on connectivity with rural and suburban areas, so that commuters are given sustainable mobility options. European policies and financial support should also reflect the importance of urban mobility for the overall functioning of the TEN-T, with provisions for first/last mile solutions that include multimodal mobility hubs, park-and-ride facilities, and safe infrastructure for walking and cycling.

In line with the EU Sustainable and Smart Mobility Strategy, approximately 3km of new protected cycle facilities are to be provided as part of the DL Central Active Travel Scheme.

2.3.1.2 Biodiversity Strategy for 2030

The ***Biodiversity Strategy*** is also part of the European Green Deal, and it *"aims to put Europe's biodiversity on the path to recovery by 2030 for the benefit of people, climate and the planet"*.

Noting that *"the biodiversity crisis and the climate crisis are intrinsically linked""*, the strategy notes the dual benefits of green infrastructure or nature-based solutions, such as cooling in urban areas, reducing pollution and flooding, mitigating the impact of natural disasters, and protecting wildlife and biodiversity. It also recognises the value of green and open spaces to physical and mental wellbeing, particularly in urban areas where space is limited.

The Biodiversity Strategies recommends several actions aimed at greening urban areas, including:

- The "systemic integration" of healthy ecosystems, green infrastructure and nature-based solutions into urban planning, including in public spaces, infrastructure and the design of buildings and their surroundings;
- The development of 'Urban Greening Plans' in all European cities of at least 20,000 inhabitants which would focus on creating biodiverse and accessible urban parks, green spaces and tree-lined streets; as well as improve connections between existing green spaces.

The scheme provides a prime opportunity to integrate green infrastructure into the design of new walking and cycling facilities, and to enhance the urban realm throughout the scheme extents. SUDS will be provided along the extent of the scheme, and new landscaping areas will be included in the design.

2.3.2 Road Infrastructure Safety Management (RISM) Directive

The European Union has set a 'Vision Zero' target, which aims to halve fatalities on European roads by 2030, and reduce this to 'almost zero' by 2050. Influenced by a 'Safe Systems' approach, which is a road safety concept that deaths and serious injuries are largely preventable by good design and maintenance of road infrastructure, the 'Vision Zero' target is accompanied by a suite of European and national policies and programmes aimed at achieving this strategic ambition.

Accordingly, the Directive on Road Infrastructure Safety Management (RISM) defines procedures for EU member states to improve safety on European road networks. Under RISM, each member state is required to carry out actions to monitor and improve road safety on the network, including network-wide 'Safety Ranking', regular Road Safety Inspections, Road Safety Audits during planning and design of infrastructure, training, certification and knowledge exchange with local authorities and European partners. While RISM was originally intended to cover just the TEN-T network, the 2019 revision to the RISM Directive notes that it is: *"desirable for those RISM principles to be applied to other parts of the European road network*".

RISM was updated in 2019 to require Member States to take into account the needs of 'vulnerable road users' in network planning, design and operation, which are defined as *"non-motorised road users, including, in particular, pedestrians and cyclists".* In planning and designing road infrastructure, the updated RISM Directive places much greater emphasis on separating protecting vulnerable road users from the risks of high-speed and high-volume traffic, and requires authorities to consider things such as:

- *"Provisions for cyclists, including the existence of alternative routes or separations from high-speed motor traffic;*
- *Density and location of crossings for pedestrians and cyclists;*
- *Provision for pedestrians and cyclists on affected roads in the area; and*
- *Separation of pedestrians and cyclists from high speed motor traffic or the existence of direct alternative routes on lower class roads".*

Similarly, the rationale for the DL Central Active Travel Scheme recognises that traffic volumes are high along Kill Avenue, Mounttown Road Lower, Mounttown Road Upper and Glenageary Road Upper, and

would not be conducive to have cyclists mixed with general traffic along these routes. The DL Central Active Travel Scheme proposes protected cycle tracks and junctions; with a view to providing continuous, segregated and high-quality cycling routes.

2.4 National Policy

2.4.1 'Project Ireland 2040' – National Planning Framework

Project Ireland 2040 is Ireland's National Planning Framework (NPF); and provides a high-level strategic plan to shape planning policy, future growth and development in Ireland in the period to 2040. The NPF aims to avoid the "mistakes" made in previous planning policy – mistakes that have led to urban sprawl, unbalanced regional development, and increased car dependency - by ensuring that investment is closely aligned to these overarching principles.

The NPF is based on ten 'National Strategic Outcomes' (NSO), which are an expression of the shared national goals or benefits the NPF aims to achieve.

Figure 2.2 - Project Ireland 2040 National Strategic Outcomes

All public projects are required to demonstrate how they align to the NPF, and how they would contribute to the achievement of the NSO. The alignment of the proposed scheme to the NSO is summarised in the table below.

Table 2.3 - Alignment with NPF National Strategic Outcomes

NSO	Relevance to the Proposed Scheme
1. Compact Growth	Responding to past levels of urban sprawl and car dependency, the NPF aims to concentrate growth in existing villages, towns and cities; and to ensure that residents have easy access to jobs, amenities and services. The scheme will encourage compact growth by encouraging a shift to sustainable modes of transport, and making Dun Laoghaire a healthier and more liveable town.
4. Sustainable Mobility & 10. Transition to a low Carbon and Climate Resilient Society	The scheme aims to support sustainable mobility and encourage a shift from private cars to reduce transport emissions.
7. Enhanced Amenity & Heritage	The scheme proposes to open up the existing greens at Rose Park and Casement Villas, to deliver enhanced amenities and public realm for local residents and visitors to walk, cycle, jog, or to simply enjoy spending time in a high-quality public realm.
9. Sustainable management of water, waste and other environmental resources	The scheme aims to improve environmental quality by integrating green infrastructure (i.e., vegetation, SUDs etc) into the planning and design, where possible.

As well as the NSO, the NPF also includes 'National Policy Objectives' to provide a more specific statement of the types of actions or investment that should be prioritised. Several of these are of particular relevance to the scheme and are displayed in the below.

As well as transport and climate objectives, this highlights the potential of the project to make a positive contribution to other policy areas, particularly in terms of improving the environment and quality of life within the study area.

Table 2.4 - Alignment with NPF National Policy Objectives

No.	National Policy Objective
6	**Making Stronger Urban Places:** Regenerate and rejuvenate cities, towns and villages of all types and scale as environmental assets, that can accommodate changing roles and functions, increased residential population and employment activity and enhanced levels of amenity and design quality, in order to sustainably influence and support their surrounding area.
26	**People, Homes and Communities:** Support the objectives of public health policy including Health Ireland and the National Physical Activity Plan, through integrating such policies, where appropriate and at the applicable scale, with planning policy.
27	**People, Homes and Communities:** Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages.
54	**Realising our Sustainable Future:** Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaption objectives, as well as targets for greenhouse gas emissions reductions.
57	**Realising our Sustainable Future:** Integrating sustainable water management solutions, such as Sustainable Urban Drainage (SUDS), non-porous surfacing and green roofs, to create safe places.
62	**Realising our Sustainable Future:** Identify and strengthen the value of greenbelts and green spaces at a regional and city scale, to enable enhanced connectivity to wider strategic networks, prevent coalescence of settlements and to allow for the long-term strategic expansion of urban areas.
64	**Realising our Sustainable Future:** Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions.

2.4.2 Climate Action Plan

Climate action is a key objective of the scheme and is rooted in a robust national climate policy framework. In 2021, the 'Climate Action and Low Carbon Development (Amendment) Act' became law. The Act established a legally binding target to reduce emissions by 50% (relative to a 2018 baseline) by 2030, and to move towards net-Zero emissions by 2050.

The Act provides for a system of carbon budgets to enforce these targets, which would set a maximum level of emissions for each sector of the economy to stay within, and gradually decrease in the period to 2030 and 2050. In October 2021, the Climate Change Advisory Council (CCAC) published proposed carbon budgets for the 2021-2030 period, which outlined pathways to achieving the overall emissions reductions target of 50% by 2030. The carbon budgets were based on an average reduction of 4.8% per annum in 2021-2025, rising to 8.3% in 2026-2030.

In 2024, the Department of Environment, Climate and Communications published a new Climate Action Plan, which sets out targets and actions required to give effect to the carbon budgets up to 2030. Overall, the Plan aims for a 51% reduction in transport emissions by 2030, with a particular focus on demand management, sustainable mobility and shifting trips from fossil fuel-powered cars to walking, cycling and public transport. Among the targets and measures contained in the Plan:

- Increase in daily public transport and active mode trips by 500,000 (+14%) through planned sustainable mobility programmes (i.e. BusConnects, DART+, Connecting Ireland), investment in active travel and other measures)
- Reduction in internal combustion engine vehicle kilometres by 10%.

According to the Plan, achieving these targets requires *"continued and enhanced investment in walking, cycling and public transport infrastructure and services across the country"*, and a focus on "reliable" and "realistic" sustainable mobility options to enable this shift. It commits to allocating 20% of the transport capital budget towards active travel, as well as the completion of the GDA Cycle Network. The Climate Action Plan also supports the reallocation of public space to be less "vehicle centred" and more "people centred".

The DL Central Active Travel scheme aligns with the objectives of the Climate Action Plan and the legally-binding targets for emissions reductions. It will support the implementation of the GDA Cycle Network Plan and a major shift towards sustainable modes of transport, while discouraging use of private cars in Dun Laoghaire. It will also help to make Dun Laoghaire more resilient to climate change through the provision of green infrastructure; by promoting a nature-based approach to managing challenges from flooding and pollution.

2.4.3 National Investment Framework for Transport in Ireland (NIFTI)

The Department of Transport recently published a framework for guide future investment in the land transport network and to prioritise investment that supports the delivery of the National Strategic Outcomes. The investment objectives of NIFTI are:

- *'Delivering clean, low-carbon and environmentally sustainable mobility;*
- *Supporting successful places and vibrant communities;*
- *Facilitating safe, accessible, reliable and efficient travel on the network; and*
- *Promoting and strong and balanced economy.'*

NIFTI includes two 'hierarchies' specifying the order in which transport investment should be prioritised: an 'Intervention Hierarchy' and a 'Modal Hierarchy'; both of which are shown in the figure below.

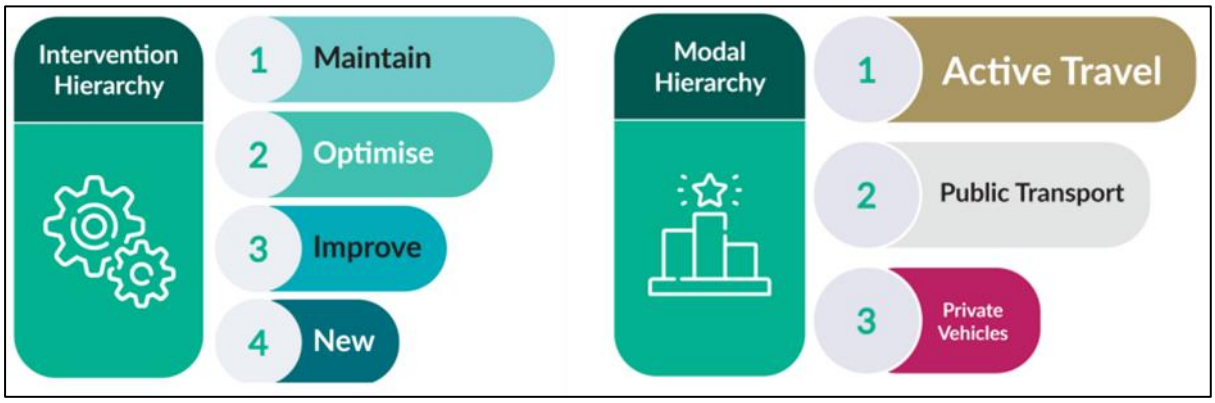

Figure 2.3 - NIFTI Intervention and Modal Hierarchies

The Intervention Hierarchy differentiates between the level of intervention proposed, and states that investment should firstly seek to 'maintain' existing infrastructure; then to 'optimise' or 'improve' existing infrastructure; and finally – if it is not possible to achieve an objective through previous steps – to invest in providing 'new' infrastructure. The aim of the Investment Hierarchy is to maximise the lifespan and value for money of past investments, and to ensure that more affordable and efficient options for achieving an objective are considered before investing in large-scale transport projects or programmes.

The DL Central Active Travel scheme is mostly aligned with Level 3 ('improve') on the Intervention Hierarchy. While requiring new infrastructure in parts, the primary focus of the project is improving and re-designing existing public space in Dún Laoghaire to be more efficient, sustainable and equitable. This includes targeted upgrades to cycling, pedestrian, and public transport infrastructure, while reducing the prominence given to private cars.

The Modal Hierarchy differentiates between the modes of transport, and states that Active Travel (walking and cycling) should be prioritised, followed by public transport, and lastly by private vehicles. As outlined throughout, the scheme has been guided by a user hierarchy which seeks to prioritise active travel and bus users over private cars, which squarely aligns with NIFTI's Modal Hierarchy.

2.4.4 National Physical Activity Action Plan

The aim of the Department of Health's ***National Physical Activity Plan*** is to increase physical activity levels across the whole population, and the Plan sets separate targets for adults, children and older people to reach the recommended levels of physical activity. Recognising that there are many reasons that people are unable to meet recommended levels of physical activity, the Plan contains some guiding principles to promote greater levels of physical activity, namely by: *"creating increased opportunities for people to be active in ways which fit into everyday lives; which is suitable for individual needs, circumstances and interests; and which removes the barriers people face to being active and encouraging people to recognise how to overcome those barriers".*

The Plan highlights walking and cycling as a way to easily incorporate physical activity in everyday life, and includes several actions aimed at promoting active travel and recreation, including to:

- *'Develop and promote walking and cycling strategies in each Local Authority Area;*
- *Ensure that the planning, development and design of towns, cities and schools promotes cycling and walking with the aim of delivering a network of cycle routes and footpaths;*
- *Ensure that the planning, development and design of towns and cities promotes the development of local and regional parks and recreational that encourage physical activity;*
- *Prioritise the planning and development of walking and cycling and general recreational / physical activity infrastructure; and*
- *Explore opportunities to maximise physical activity and recreational amenities in the natural environment'.*

As well as providing dedicated facilities for walking and cycling, the DL Central Active Travel scheme aims to create opportunities for physical activity and exercise for residents, locals and visitors alike. In

line with national policy, this infrastructure will be attractive and accessible to users of all ages and abilities.

2.4.5 Government Road Safety Strategy 2021-2030

The Government's ***Road Safety Strategy (RSS)*** 2021-2030 is Ireland's fifth RSS; and provides an integrated strategy for managing safety on the road network up to 2030. Building on progress over previous decades, the RSS aims to reduce road deaths on Irish roads by at least 50% (144 to <72), with serious injuries decreasing by the same percentage (1259 to <630). One of the key intervention areas is promoting safe and healthy modes of travel (i.e. walking and cycling).

The RSS emphasises the many benefits provided by active travel; and recognises the unique vulnerability of pedestrians and cyclists in collisions. It proposes several actions aimed at improving safety and encouraging increased uptake, including:

- Continue to implement an active travel infrastructure scheme where Local Authorities can apply for funding to develop improved active travel infrastructure;
- Encourage modal shift to support environmental, safety and health objectives by promoting the use of sustainable and active modes of travel; and
- During 2021-2025, construct 1,000 km of segregated walking and cycling facilities to provide safe cycling and walking arrangements for users of all ages.

In line with the RSS, the DL Central Active Travel Scheme aims to promote safety for vulnerable road users, with improved link and junction designs, to ultimately reduce collisions and encourage increased levels of walking and cycling due to a safer and more pleasant environment.

2.5 Regional Policy

2.5.1 Regional Spatial and Economic Strategy (RSES) 2019-2031

The ***Regional Spatial and Economic Strategy*** **(RSES)** for the Eastern & Midland Regional Assembly provides a high-level development framework for the region and supports the implementation of the NPF and relevant economic policies and objectives of the Government at a regional level. Local authorities are required to give effect to the policies of RSES when developing county and local area plans. For the Dublin Metropolitan Area, the RSES notes several key guiding principles, including the development of strategic and sustainable transport networks, urban and social regeneration, and enhancing amenities and Green Infrastructure.

Several Regional Policy Objectives (RPO) are also relevant to the scheme, especially the strong emphasis placed on developing strategic Green Infrastructure that links key environmental assets in the Dublin region.

Table 2.5 - Alignment with Regional Spatial and Economic Strategy (RSES) 2019-2031 actions

RPO	Action
5.2	**Sustainable transport:** Support the delivery of key sustainable transport projects including Metrolink, DART and Luas expansion programmes, BusConnects and the GDA Metropolitan Cycle Network and ensure that future development maximises the efficiency and protects the strategic capacity of the metropolitan area transport network, existing and planned.
5.3	**Sustainable transport:** Future development in the Dublin Metropolitan Area shall be planned and designed in a manner that facilitates sustainable travel patterns with a particular focus on increasing the share of active modes (walking and cycling) and public transport use and creating a safe and attractive street environment for pedestrians and cyclists
5.7	**Green Infrastructure:** Coordinate across local authority boundaries to identify, manage, develop and protect regional Green Infrastructure, to enhance strategic connections and develop a Green Infrastructure policy in the Dublin Metropolitan Area

RPO	Action
5.8	**Green Infrastructure:** Support the promotion and development of greenway infrastructure and facilities in the Dublin metropolitan area, and support the expansion and connections between key strategic cycle routes and greenways as set out in the NTA GDA Cycle Network Plan

2.5.2 Transport Strategy for the Greater Dublin Area

The overall aim of the Strategy is: *"To provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the need of urban and rural communities, and supports economic growth"*.

As with NIFTI, the Strategy is guided by a road user hierarchy, which aims to prioritise investment and space allocation towards pedestrians at the top, followed by cyclists, public transport, goods, and lastly, private motor vehicles.

The objectives of the DL Central Active Travel Scheme scheme align squarely with the high-level objectives of the GDA Transport Strategy outlined above. They also align with numerous specific actions, particularly those relating to completion of the GDA Cycle Network, improving quality and accessibility of public space for pedestrians, and integrating high quality design and place-making with transport investments.

Table 2.6 - Alignment with GDA Transport Strategy actions

No.	Action
PLAN 12	**Urban Design in Major Infrastructure Projects:** The NTA will incorporate a high standard of urban design and placemaking into the planning and design of all major public transport infrastructure schemes, and will consider how greater biodiversity could be fostered.
PLAN 13	**Urban Design in Walking and Cycling Projects:** In the design, planning and prioritisation of walking and cycling schemes, the NTA and the local authorities will ensure the incorporation of urban design and placemaking considerations.
PLAN 14	**Reallocation of Road Space:** The NTA, in conjunction with the local authorities, will seek the reallocation of road space across the GDA to prioritise walking, cycling and public transport use and prioritise the placemaking functions of the urban street network.
PLAN 16	**The Road User Hierarchy:** The NTA, in the decision-making process around the design, planning and funding of transport schemes in the GDA, will be guided by the priority afforded to each mode in the Road User Hierarchy as set out in the Transport Strategy.
WALK 2	**Improved Footpaths:** The NTA, in conjunction with local authorities, will implement footpath improvement schemes across the GDA where required throughout the period of the Transport Strategy in order to ensure that they are of sufficient width, adequately lit, serve both sides of the road in urban areas (in most cases) are of good quality surfacing and are free of unnecessary clutter.
WALK 3	**Improved Junctions:** *The NTA, in conjunction with local authorities, will implement junction improvements across the GDA as follows: • To enhance safety at junctions, a programme of "narrowing" junctions by reducing kerb-line radii will be undertaken as a means of managing vehicular speeds; and • To enhance movement by pedestrians and cyclists, a programme of removal of slip lanes will be undertaken at appropriate locations, together with consideration of junction signalling changes to better balance the use of the junction between motorised and vulnerable modes.*
WALK 8	**Persons with Disabilities:** Local authorities in the GDA and the NTA will take full account of people with disabilities and pedestrians with mobility impairments when delivering transport schemes which affect the pedestrian environment; and will implement improvements to existing facilities where appropriate and encourage the enforcement of the Road Traffic Laws in this regard.
CYC 1	**GDA Cycle Network**: It is the intention of the NTA and the local authorities to deliver a safe, comprehensive, attractive and legible cycle network in accordance with the updated Greater Dublin Area Cycle Network.

No.	Action
CYC 2	**Cycle Infrastructure Design:** It is the intention of the NTA to ensure that cycle infrastructure in the GDA provides an appropriate quality of service to all users, through the implementation of the design guidance contained in the latest version of the National Cycle Manual.
TM 2	**Management of Urban Centres in the GDA:** The NTA and DLRCC will deliver the public transport, cycling and walking networks, and public realm that are required to serve an expanding urban centre in Dún Laoghaire Rathdown, and to facilitate a post-Covid recovery based on sustainable transport. The NTA and DLRCC will also ensure that the delivery of goods to businesses and the operation of taxis are managed to the benefit of all users.
FREIGHT 8	**Environmental Measures for Freight:** It is the intention of the NTA, in collaboration with other authorities to: • Seek the reduction of the amount of 'last mile trips' being made by motorised vehicles; and • Facilitate the transition to zero-emission delivery vehicles such as cargo bikes and electric vehicles

2.5.3 GDA Cycle Network Plan

The GDA Cycle Network Plan accompanies the GDA Transport Strategy and sets out the vision and planned network of cycling facilities in Dublin City and the surrounding GDA. The overall vision of the Network is:

> *"The Greater Dublin Area Cycle Network seeks to be an inclusive cycling environment that is safe for all cycling abilities and ages with strong function and recreational connectivity between homes and key destinations"*.

The goals of the GDA Cycle Network are to:

- **Increase Participation –** The plan proposes an optimised cycle network accessible by cyclists of all abilities, regardless of users' level of confidence and skill. Specific attention is given to increasing cycling for school, education and recreational trips
- **Improve Safety and Accessibility –** Safety and accessibility will be improved on the GDA Cycle Network, such that actual and perceived safety concerns are reduced. Users should be able to quickly access the network from home, work and/or education settings.
- **Improve Connectivity –** Barriers will be removed or mitigated where they obstruct direct and continuous cycling. Initiative and infrastructure will be designed, developed and delivered to enhance permeability and enable the connection to key destinations.
- **Create a Navigable and Coherent Network –** The GDA Cycle Network will be enhanced to improve connections between cycle routes with suitable infrastructure, supporting facilities and wayfinding signage.

The GDA Cycle Network Plan places a greater emphasis on the safety, quality, and accessibility of cycling infrastructure than previously, making it clear that in order to attract cyclists of all abilities, the scheme must be designed to high specifications, with a high level of segregation and continuity. It also places more emphasis on recreational cycling, which supports measures to improve the comfort and attractiveness of any cycling facilities.

Within the DL Central Active Travel Scheme, Mounttown Road Upper is identified as a Primary Route – meaning that it is a main cycling arterial with high levels of utility cycling. The remaining roads of the scheme (Mounttown Road Lower, Glenageary Road Upper and Kill Avenue) are identified as Secondary Routes, meaning that they serve as links from the primary cycle routes to local zones.

In summary, the proposed DL Central Active Travel Scheme has the potential to accommodate higher levels of cycling among local residents, visitors and commuters.

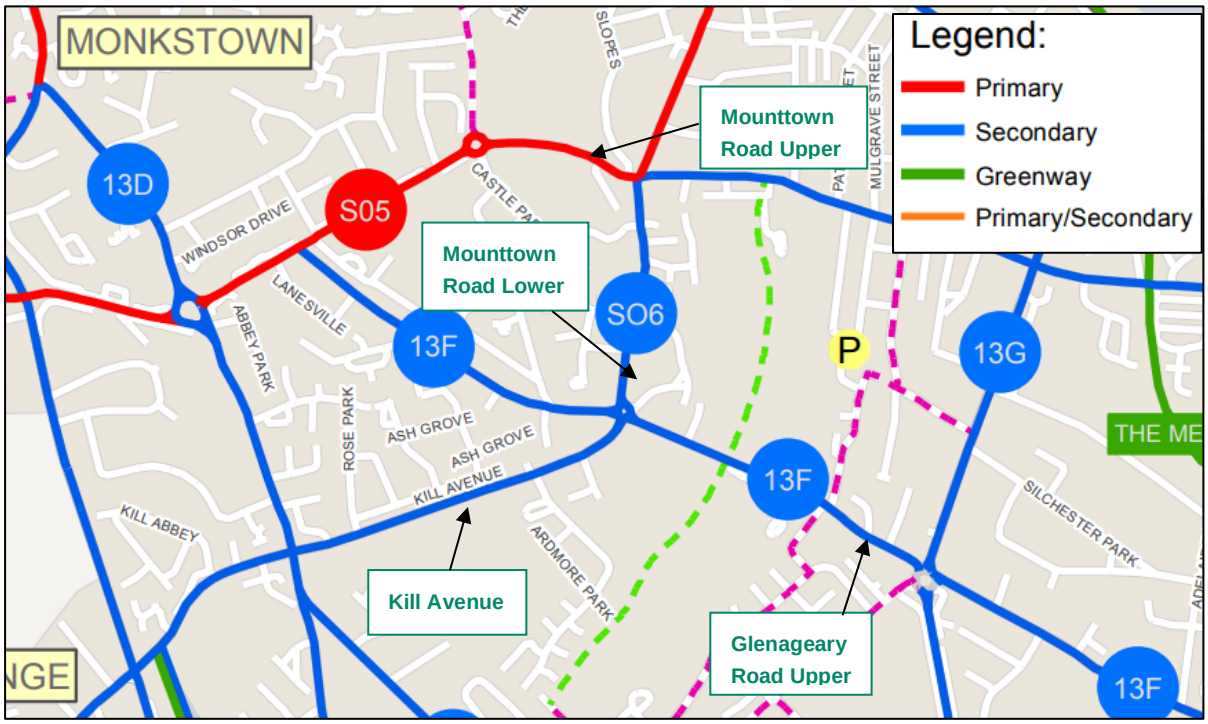

Figure 2.4 DL Central Active Travel Scheme within the GDA Cycle Network Plan

2.6 Local Policy

2.6.1 DLRCC Development Plan 2022 - 2028

The proposed DL Central Active Travel scheme complies with the DLRCC Development Plan 2022-2028, which was adopted in March 2022.

The Development Plan sets out a vision for the towns and villages within the county to guide future climate resilience and economically vibrant growth over the Plan period. The Plan identifies the overall policy approach for Transport and Mobility as being:

- The adopt the 'Avoid – Shift – Improve Approach'
- To integrate land use and transport policies
- To support the demand management approach which focuses on moving people from private car to sustainable modes
- To improve permeability for the pedestrian and cyclists
- To provide attractive high-quality walking and cycling networks with direct routes to local destinations and transport hubs
- To adopt a balanced approach to road and street design in accordance with the four core principles of DMURS – connected networks, multifunctional streets, pedestrian focus and a multi-disciplinary approach.

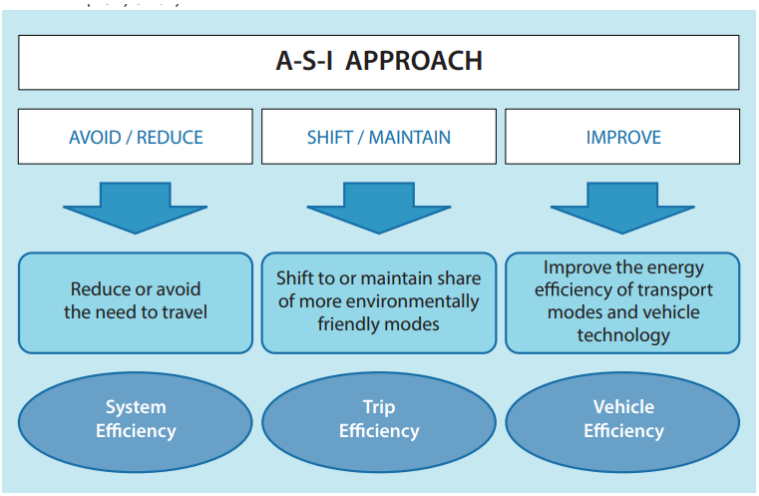

Figure 2.5 Avoid – Shift – Improve Model (Source: DLRCC Development Plan 2022 – 2028)

3 Scheme Objectives

3.1 Need for Scheme

The Greater Dublin area continues to grow, with the realisation of development and the bringing forward of housing and development sites, leading to increasing numbers being reliant for residential and work purposes. Furthermore, the Dún Laoghaire area is a strong attractor for leisure and tourism, further increasing the number of users and contributing to more complex trip patterns.

It is acknowledged that whilst Covid-19 has impacted demand for travel over the recent years, the indication over the past years has been for a return to strong growth. Whilst economically advantageous, the impact of growth on the transport network must be addressed and sustainable solutions brought forward. The proposed scheme is a key demonstrator of this, providing high quality infrastructure for active mode users; attracting existing users to a more pleasant route, and providing a safe space, more likely to encourage new users due to the level of segregation offered.

Considering mode share, there remains a reliance on motorised transport for work purposes, and whilst walking is the dominant mode for education trips, the use of motor vehicles remains high. There is propensity to achieve mode change through the introduction of new infrastructure and the encouragement of active mode update. Success has been demonstrated elsewhere in the Dublin and Dún Laoghaire-Rathdown area. Establishing travel behaviour towards active modes at a younger age has strong links to increased use in adulthood.

The DL Central Active Travel Scheme provides further continuity of an off-road route which will be attractive for both work and education trips, and notably safer due to the levels of segregation provided.

3.2 Objective Setting Process

In general, all schemes should have a clear statement of objectives, which describes what the sponsoring agency hopes to achieve from the proposed intervention. When setting objectives for schemes, the Public Spending Code requires that objectives are **SMART**. This means objectives need to be **'Specific'**, **'Measurable'**, **'Attributable'**, **'Realistic'** and **'Time-Bound'**.

In defining objectives for the scheme and ensuring they are SMART, a four-stage process was used, as summarised in the graphic below.

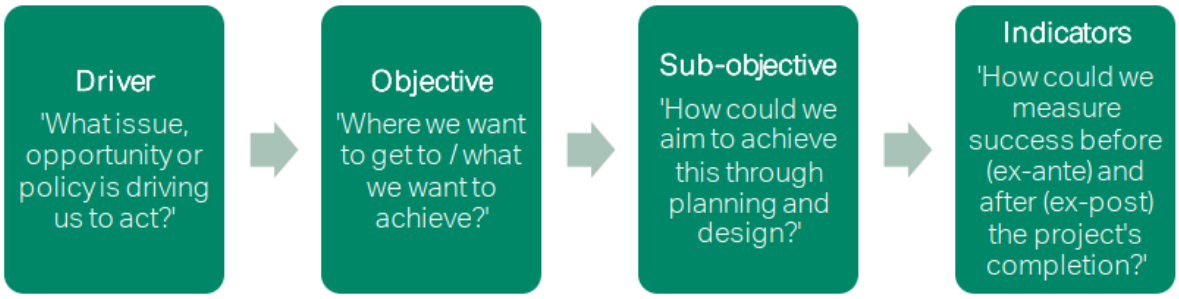

Figure 3.1: Scheme Objective Setting Process

In light of an issue or opportunity, Objectives describe the outcome that the sponsoring agency aims to achieve through the intervention.

Sub-Objectives represent more specific design or planning objectives necessary to achieve the high-level objective, while indicators present metrics that could be used to assess the performance of option(s).

Indicators are split into Ex-Ante Objectives, which will be used during the appraisal stages to assess the likely impacts of the scheme; and Ex-Post Indicators, which will be used during the evaluation stage to measure the success of the intervention.

3.3 Scheme Objectives

The proposed scheme objectives are summarised as follows:

- To provide Continuous, High-Quality and Consistent cycling and walking facilities;
- To provide Improved Public Realm areas and enhance the overall Visual Quality;
- Promote modal shift from Private Vehicle to more sustainable modes including walking, cycling and public transport;
- Enhance permeability and creating a place for all ages and abilities;
- Improve Bus Priority along Kill Avenue up to the Bakers Corner Junction;
- Protect and Enhance sensitive Landscapes;
- Enhance Safety for all road users including vulnerable persons.

4 Scheme Options Selection Process

4.1 Options

The aim of the long list of options process for the DL Central Active Travel Scheme was to consider all options which could feasibly meet the objectives of the project.

To ensure all options were considered equally, they were assessed through a consistent Multi Criteria Analysis (MCA) framework. Based on the results of the MCA, a shortlist of options were recommended for progressing to the Concept Development and Option Selection Phase (NTA PAG Phase 2).

The options assessed in the following sections considered varying levels of interventions/upgrades to the junctions and link sections along the route:

- **Option A: Do Nothing**
    - This option would retain the existing conditions for pedestrians and cyclists along the route.
    - This option would offer no improvement to the existing conditions and thus not achieve the sustainability targets and strategies for the implementation of an active travel network.
    - This would not cater for future cycling and walking demand and would not enhance safety for all road users along the route.
    - Therefore, the Do-Nothing option would not meet the objectives of the scheme.
- **Option B: Two Way (Segregated) Cycle Track with Cyclops Junction**
    - This option would propose to incorporate a segregated two-way cycle track via reallocation of road space.
    - The two-way cycle track would have 3m minimum width.
    - The Cyclops junction would position the pedestrian crossings on the inside of the cycle lanes across the arms of the junction. Pedestrian crossing distances would be minimised as a result. Pedestrian crossings that are proposed across the cycle tracks are uncontrolled crossings.

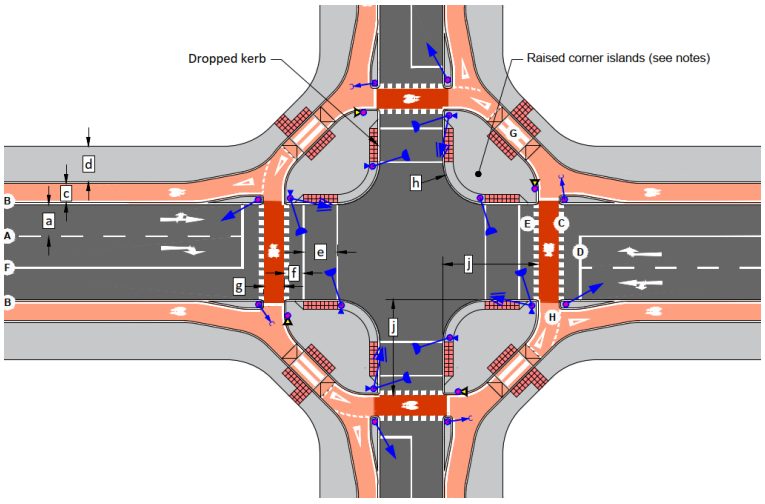

Figure 4.1: Indicative Projected Junction – CYCLOPS layout (CDM Reference TL502)

- **Option C: One-Way (Segregated) Cycle Tracks on Both Sides of the Road with Protected Junction**
    - The single lane cycle track would be 2m wide (min), therefore requiring 4m total to accommodate a single cycle track on both sides of the carriageway.

- The protected junction would provide physical kerb build-outs to protect cyclists through the junction, and the traffic signal arrangement would remove any uncontrolled conflict between pedestrians and cyclists.
- Kerbed corner islands would be provided to remove the risk of vehicles cutting into the cycle route at the junction corner. These raised islands would create a protected ring for cyclists navigating the junction, improving safety for right turning cyclists.

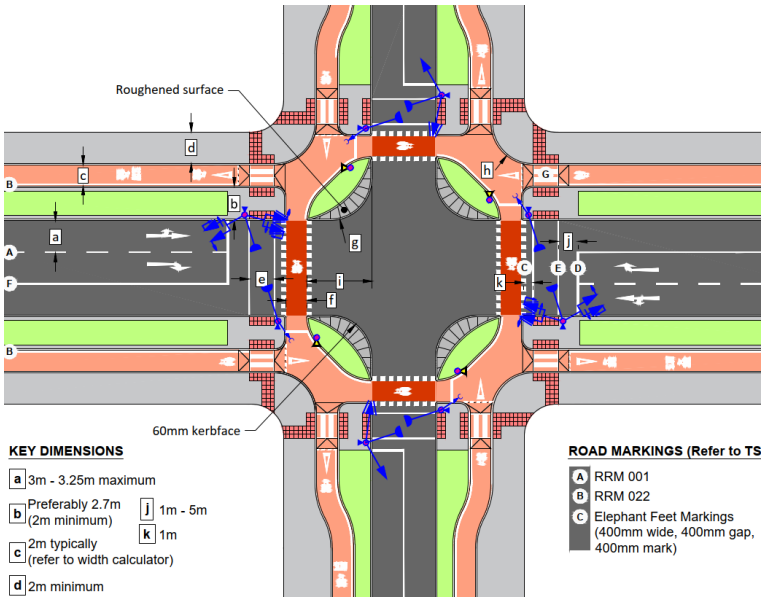

Figure 4.2: Indicative Protected Junction layout (CDM Reference TL501)

- **Option D: Quick Build Footpath, maintaining all other Existing Facilities**
  - This option would involve installing a quick-build footpath to improve the standard of the pedestrian facilities along the scheme.
  - Junctions and cycle lanes would be maintained in their existing condition.

4.2 MCA Process

A Multi-Criteria Analysis (MCA) can be applied under common headings to determine the range of positive effects and negative effects in a single framework to allow easy comparison of alternative options in decision-making.

The 'Common Appraisal Framework for Transport Projects and Programmes' published by the Department of Transport, Tourism and Sport (DTTAS), was used as a basis for providing the criteria that were used when assessing the various options for this scheme and is detailed below.

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

At the end of the options assessment, an overall Multi Criterion Appraisal (MCA) table is provided, bringing together each of the individual criterion assessments. All criteria were considered in undertaking the assessment and a lower ranking on one criterion, for example, did not necessarily mean that the option was not suitable. The outcome from the multi-criteria assessment was considered in a holistic manner to derive a preferred option.

As previously noted, there were four potential options considered for the study area. These options are discussed in the following paragraphs.

4.2.1 Option A: Do Nothing

For this report the 'Do Nothing' option was considered to be retention of the existing footpaths, cycle lanes, and junction arrangements between Glenageary, Dún Laoghaire and Kill of the Grange, with no works proposed.

Given that the current footpath is narrow along some sections and the limited existing facilities for cyclists comprise on road marked cycle lanes, the 'Do-Nothing' option would inhibit the development of the transport goals detailed in the Transport Strategy for the Greater Dublin Area 2016-2035 and the Transport Strategy for the Greater Dublin Area 2022-2042. The 'Do-Nothing' option would not support safe cycling through junctions along the route. The current junction arrangements would remain unchanged with no upgrades to the existing pedestrian and cycle facilities. The existing facilities are unlikely to support any future aspirations for increasing sustainable mode shares in the locality. The 'Do Nothing' option would make no contribution to meeting the aims of the GDA Cycle Network Plan proposals for the area.

In summary:

- The 'Do Nothing' scenario would be likely to reinforce a reliance on private vehicles as the primary mode of transport for existing / future residents of the surrounding lands, thereby contravening the objectives of the project.

4.2.2 Option B: Two Way (Segregated) Cycle Track with Cyclops Junction

Option B would comprise of interventions including a 3m wide two-way cycle track and a Cyclops junction at each of the main intersections.

The following links were considered in the proposed scheme:

- Kill Avenue, including the Kill Avenue / Claremount Avenue junction and the Kill Avenue / Rochestown Avenue / Abbey Road junction
- Glenageary Road Upper, including the Glenageary Road Upper / Cualanor Junction and the Kill Avenue / Glenageary Road Upper / Mounttown Lower / Oliver Plunkett Road 5-arm junction
- Mounttown Road Upper & Mounttown Road Lower.

Under Option B, a two-way cycle lane would be implemented along each of the sections of road listed above. The cycle lanes would be a minimum of 3m wide, and the side of the road on which they would be implemented would have to undergo further optioneering to determine a design with the least amount of conflict between cyclists and motorised vehicles. The cycle lane would be raised above the road level, and in some locations would be segregated from the traffic by relocated parking spaces. This will increase cyclist safety and encourage a modal shift.

In general, the assessment deemed that there is sufficient road space to allow for this reallocation of road space, except for at a pinch point on Mounttown Road Upper. Alternative layouts would need to be considered at this location, including the provision of a one-way cycle track on each side of the road.

Within this option, the Kill Avenue/Claremont Avenue junction, Kill Avenue / Rochestown Avenue / Abbey Road junction, Glenageary Road Upper / Cualanor Junction and Kill Avenue / Glenageary Road Upper / Mounttown Lower / Oliver Plunkett Road 5-arm junction would all be upgraded to Cyclops junctions.

In summary:

- Option B would provide an improved pedestrian and cyclist environment compared to the existing arrangements.
- This option would provide improved active travel access to various schools, employment centres and local amenities.

- Therefore, Option B would contribute significantly towards meeting the objectives of the GDA Cycle Network Plan by providing a coherent and continuous network in the Dún Laoghaire/Glenageary area.

4.2.3 Option C: One-Way (Segregated) Cycle Tracks on Both Sides of the Road with Protected Junction

Option C would comprise interventions including a 2m wide one-way cycle track on both sides of the road and a protected junction at each of the main intersections. The same links and junctions were considered for Option C as were considered under Option B.

Under Option C, a one-way cycle lane would be implemented along either side of Kill Avenue, Glenageary Road Upper and Mounttown Road. This would require at least 4m of road cross-section, with each individual cycle lane being at least 2m wide. Along some stretches of these roads, 4m of cycle lane would not be implementable without land take.

In this option, the Kill Avenue/Claremont Avenue junction, Kill Avenue / Rochestown Avenue / Abbey Road junction, Glenageary Road Upper / Cualanor Junction and Kill Avenue / Glenageary Road Upper / Mounttown Lower / Oliver Plunkett Road 5-arm junction would all be upgraded to protected junctions. This would improve the safety of cyclists and pedestrians crossing the junction by removing conflict with motor vehicles.

In summary:

- Option C would provide an improvement to pedestrian and cyclist infrastructure compared to the existing arrangements, but in places it would not be possible to implement a high quality 2m cycle lane on either side of the road due to space limitations.
- A protected junction arrangement would significantly increase the safety and quality of pedestrian and cyclist crossing facilities.
- There are advantages and disadvantages to both protected and cyclops junctions, but it was decided that CYCLOPS junctions would be more suitable for this scheme.

4.2.4 Option D: Quick Build Footpath, maintaining all other Existing Facilities

Option D would be a quick-win approach, improving the standard of the pedestrian facilities along the scheme.

The existing carriageway and cycle facilities would be maintained, as would the existing junction layouts.

In summary:

- While improving pedestrian safety, this option would allow for no upgrades to the existing poor quality cycle lanes that are currently in place.

4.3 Route Options MCA

Following the MCA exercise, Option B emerged as the preferred option, scoring well on all the assessment criteria. Its lowest score was on economy, as this option would cost more to build than Options A, C or D. However, it would deliver on all project objectives and would align with government policy to provide high levels of service for Active Travel modes.

Option C emerged as the second most desirable option, with good performance on safety, accessibility and physical activity. However, it fell down on its environmental impact, integration and QOS, due to the insufficient road width to implement 2m cycle tracks on either side of the road and lack of space for landscaping and SuDS.

Options A and D would not provide sufficient safety improvements or quality of service for pedestrians and cyclists.

The options assessment table for each of the options with relative ranking of the options against each of the assessment criteria are summarised in Table 4.1 below.

Table 4.1: DL Central MCA Summary

Criteria	Option A	Option B	Option C	Option D
Impacts	**Do Nothing**	**Two Way (Segregated) Cycle Track with Cyclops Junction**	**One-Way (Segregated) Cycle Tracks on Both Sides of the Road with Protected Junction**	**Quick Build Footpath, maintaining all other Existing Facilities**
Economy				
Safety				
Environment				
Accessibility and Social Inclusion				
Integration				
Quality of Service				
Physical Activity				

5 Proposed Design

5.1 Overview

An accompanying Detailed Design Report has been prepared by AECOM for the DL Central scheme. In summary, Detailed Design drawings have been prepared to convey the scheme design principles. The following provides a description of the drawings and relevant design content displayed in the drawings:

- 100 – Site Extents
- 120 – General Arrangement
- 130 – Long Sections
- 140 – Cross Sections
- 150 – Standard Details
- 200 – Site Clearance
- 300 – Fencing
- 500 – Drainage
- 600 – Earthworks
- 700 – Pavement
- 1100 – Kerb, Footways and Paved Areas
- 1200 - Traffic Signs & Road Markings
- 1250 – Traffic Signals
- 1300 – Public Lighting
- 2400 – Walls
- 3000 – Landscape

5.2 Key Design Features

5.2.1 Junction Upgrades

The DL Central scheme proposes to upgrade three main signalised junctions:

- **Bakers Corner Junction** – Signalised 4-way junction of Kill Lane / Abbey Road / Kill Avenue / Rochestown Avenue.
- **Kill Avenue / Glenageary Road Upper / Highthorn Woods / Mounttown Road Lower / Oliver Plunkett Road Junction** – Signalised 5-way junction.
- **Cualanor Junction** – Signalised 4-way junction at entrance to Cualanor & Honepark Developments. Intersection of Glenageary Road Upper / Maypark Avenue / Cualanor Avenue.

Each of the above junctions will be fully upgraded to be in accordance with the Cycle Design Manual published detail, *TL502 Protected Junction – CYCLOPS Layout*. However, in a departure from the layout the junctions on the DL Central Scheme provide a two-way cycle track crossing orbitally around some of the arms of the junctions.

- The cycle track crossings on road, traversing the junction, are at road carriageway level and will be surfaced with a high-friction red surfacing material. These track crossings are signal controlled, and can be triggered by a cyclist waiting to cross by a push button unit on a half-height pole on each arm

- The orbital cycle tracks, when coming off road carriageway, ramp up by ~60mm to leave an upstand of 60mm beneath the footpath / pedestrian island extents on either side of the cycle tracks. The reduced upstand of 60mm between the footpath / pedestrian island and the cycle track will reduce the risk of bicycle pedals clipping off the upstand kerb. In addition, it should reduce the trip risk along the extents. The buildup and surfacing of the orbital cycle track shall be constructed in accordance with the NTA *"Specification of Red Surface Course for Use on Off-Road Urban Cycleways – Interim Technical Advice"*.

- The orbital cycle tracks, on approach to the pedestrian crossing points of the cycle track (zebra crossing), ramp up to flush with the footway / pedestrian island extents along the extents of the crossing point. The crossing extents are demarcated to users through the provision of tactiles, the white zebra crossing markings, and the flush kerb upstand,. The tactile provision shall be red, in accordance with the new Cycle Design Manual & revision to the Traffic Signs Manual and updated regulations. Cyclists on approach to the pedestrian crossing are expected to yield to pedestrians waiting to cross at the pedestrian crossing point.

- Each pedestrian island will contain 2 signalised crossing points to cross each arm of the signalised junction. The crossing extents are demarcated to users through the provision of red tactiles, a flush kerb upstand and a push button unit will also be provided to users. Where achievable, the upstand of the pedestrian island on to the road will rise between the two signalised crossing points to provide further clarity as to the correct extents of the signalised crossings.

5.2.2 Link Design

Kill Avenue

A two-way cycle track will be provided along the full length the south-eastern side of Kill Avenue. The two-way cycle track will be raised above the carriageway level (upstand variable depending on existing constraints – levels / utilities / etc).

Glenageary Road Upper

A two-way cycle track will be provided along the southern side of **Glenageary Road Upper** between the signalised Kill Avenue / Glenageary Road Upper / Highthorn Woods / Mounttown Road Lower / Oliver Plunkett Road junction (Chainage 2015) and the Cualanor junction (Chainage 2240). In addition, a one-way cycle track will be provided along the northern side of Glenageary Road Upper along these extents.

Between the Cualanor junction (Chainage 2260) and Abbot Drive side road entrance (Chainage 2440), the two-way cycle track will be segregated horizontally from the road carriageway through a rain garden area. An upstand of 125mm between the carriageway and rain garden will be provided. No upstand will be provided between the cycle track and the rain garden.

The one-way cycle track will be segregated horizontally from the road carriageway through rain garden areas across the full extents discussed here. An upstand of 125mm between the carriageway and rain garden will be provided. No upstand will be provided between the cycle track and the rain garden.

A two-way cycle track will be provided along the northern side of Glenageary Road Upper between the proposed toucan crossing (Chainage 2500) and the scheme tie in with the Glenageary Road Upper scheme (Chainage 2760).

Mounttown Road Lower

Along the extent of Mounttown Road Lower, a two-way cycle track will be provided. The cycle track will be segregated horizontally from the carriageway through an extruded concrete kerb (250mm in width). Breaks in the kerb will be provided to allow for driveways, side roads, and areas of higher pedestrian desire lines.

Mounttown Road Upper

Along Mounttown Road Upper, between Chainage 4000 – 4100, due to cross sectional width constraints between the existing boundaries to Mounttown Road Upper, and no land take proposed as part of the DL Central Active Travel scheme, a shared pedestrian & cyclist area will be provided on both sides of the road.

Along Mounttown Road Upper, between Chainage 4100 – 4345 two one-way cycle tracks have been provided. On both extents, the cycle tracks act as raised adjacent tracks and have an upstand of 75mm from the road carriageway.

5.2.3 Side Road Entrance Treatment

In accordance with the requirements set out in the Cycle Design Manual, the following side road entrance treatments have been provided across the DL Central Active Travel scheme:

- Two Way Cycle Track Crossing Side Road with Priority – Full Set Back (CDM TL407)
- Two Way Cycle Track Crossing Side Road with Priority – Partial Set Back (CDM TL408)
- Pedestrian Priority Crossing

5.2.4 Bus Stops

A stated objective of the DL Central Active Travel scheme is to improve the bus stop infrastructure across the scheme. 9 no. bus stops will be upgraded as part of the DL Central Active Travel scheme. The upgrades to the bus stops will be in accordance with details TL201 and TL 202 of the Cycle Design Manual.

In general, where available space allowed the bus stops were upgraded in accordance with detail TL 201: Island Bus Stop. However due to space constraints available within existing publicly owned areas (as no land take include as part of this scheme), the majority of the bus stops provided aligned more closely with detail TL 202: Shared Bus Stop Landing Zone. The design of the landing area has been increased in width from 1.0m to 1.5m following feedback from DLRCC.

5.2.5 SuDS Infrastructure

A total of 33 raingarden areas are to be installed across the DL Central Active Travel scheme.

Surface run-off will be taken into the raingardens generally from the road and cycle track surrounding them, through a “hit & miss” kerb arrangement. The raingardens will be lined with an impermeable geo-membrane and a permeable pipe at the base of each raingarden will ultimately carry the surface water into the mains stormwater drainage network. Each raingarden will be planted with a locally sourced wildflower mix to increase visual amenity. In addition, some raingardens will include for streets trees in tree pits.

6 Demand Analysis

In order to determine the need for new schemes, existing travel characteristics in the area should be taken into consideration.

6.1 Census Data for Area Based Modal Splits

With this in mind, the 2022 Census Data for Area Based Modal Splits in the immediate vicinity of the proposed scheme is shown below. The data for the 30 Small Areas directly adjacent to the scheme was extracted from the 2022 Census SAPMAP tool. The indicative boundaries of these small areas are shown in Figure 6.1 below.

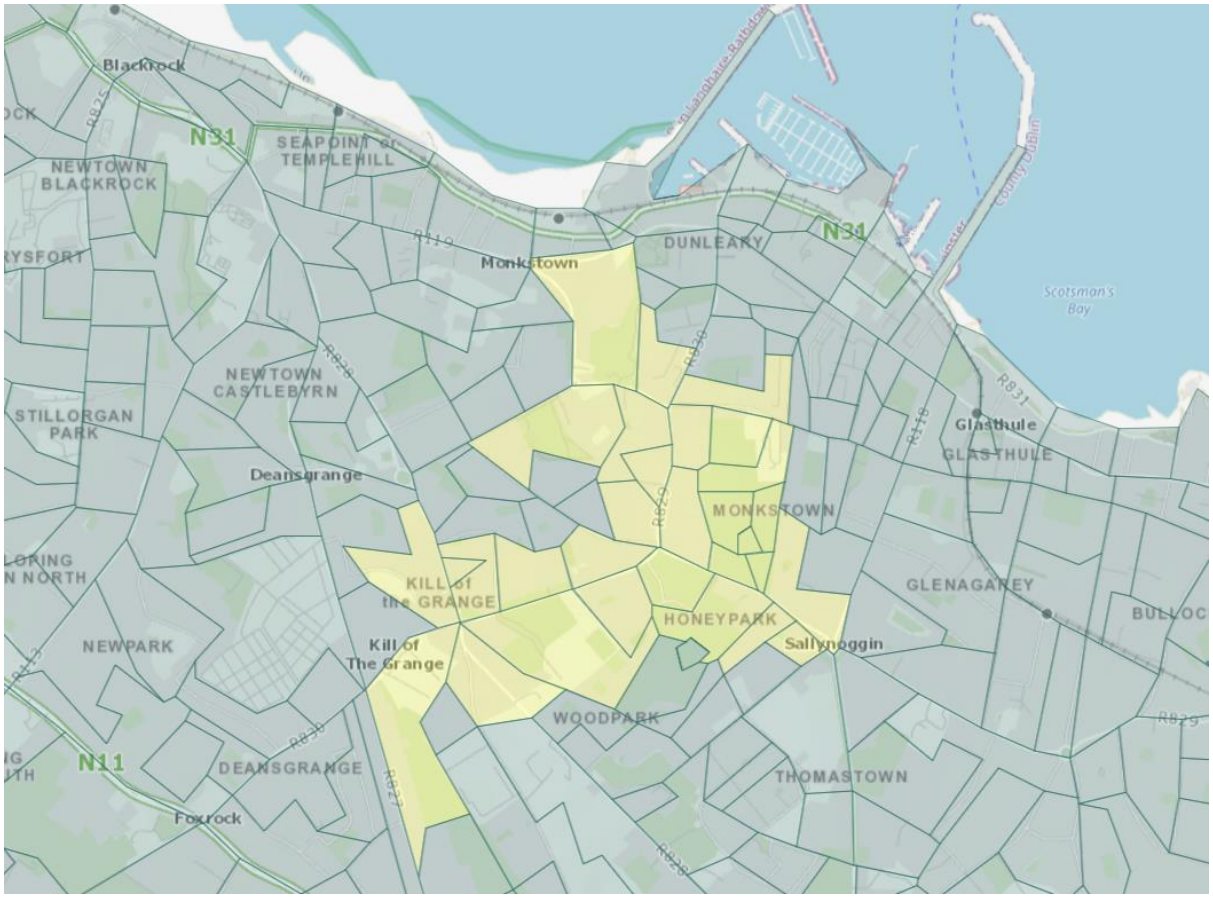

Figure 6.1: Small areas Surrounding Scheme Extents

The Census data for Mode of Travel to School, College and Work provides an overview of the transport patterns in this area.

A total of 9,585 people live in the selected Small Areas, and their modes of travel are shown below in Figure 6.2, compared against the data for the overall Dún Laoghaire-Rathdown County Council area.

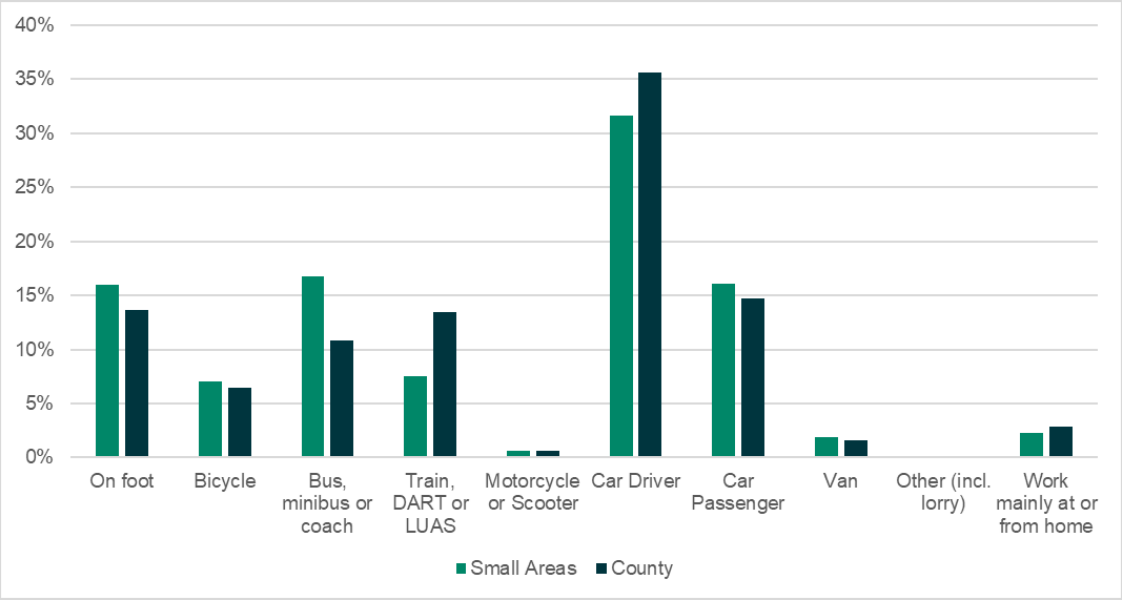

Figure 6.2: Modes of Travel in Small Areas Adjacent to Scheme and DLRCC

The results indicate the selected Small Areas have a slightly higher walking mode share of 16% compared to 14% for the overall DLRCC average. The cycle mode share of 7% for the selected Small Areas is in line with 6% for the overall DLRCC average. It should also be noted that these results are prior to the recent Covid-19 mobility interventions which have been implemented recently throughout Dún Laoghaire-Rathdown County with evidence showing this has resulted in a greater uptake in walking and cycling in the area.

The Bus/Minibus/Coach modal share for the selected Small Areas adjacent to the scheme is notably higher than that for DLRCC in general, with 17% compared to 11% using these modes to get to work or education. However, the share for Train, DART or LUAS is lower for the selected areas than for DLRCC (7% vs 13%). This is likely explained by the fact that the nearest DART station to this scheme is a 15-minute walk from the scheme, and the nearest LUAS station at the Sandyford Depot is almost an hour's walk. This is less convenient than for other parts of the DLRCC area.

The modal share for car drivers is lower in the selected Small Areas than in DLRCC overall (32% vs 36%) but for car passengers is in line with DLRCC (16% vs 15%).

These results indicate that there is an existing demand in the Study Area for high quality pedestrian and cycle facilities, but with half of people living in the area using cars or vans to get to work or school, there is scope for improvement in the active travel infrastructure to encourage a modal shift away from high car ownership and usage.

6.2 Future Demand Analysis

In order to determine a high-level estimate of future travel demand and potential usage of the DL Central Active Travel Scheme, consideration has been given to the existing travel characteristics of the immediate area noted previously.

As the scheme is constructed, it is anticipated that there will be a step change in the demand for high-quality active travel infrastructure along the route. Table 6.1 sets out the potential increased future demand following the completion of the DL Central scheme. This considers three potential scenarios:

- **Low Scenario:** This is based on the results of traffic surveys undertaken in 2021, which recorded existing pedestrian and cycling volumes along the study area.
- **Medium Scenario:** The medium scenario considers the potential uplift in demand particularly due to the provision high quality infrastructure for sustainable modes.
- **High Scenario:** This is based on the anticipated demand following delivery of upgrades and bus services.

The above future demand scenarios are in accordance with the trends and patterns for increased interest in active travel as a result of better infrastructure, an enhanced public transport network, work from home practices.

Table 6.1 – Potential Future Increased Demand

Mode	Low	Medium	High
On foot	8,428	8,849	9,271
Bicycle	3,662	3,845	4,028

7 Cost

The current range of potential costs associated with meeting the identified objectives and solving the problem are outlined below. All are based off the current phase of the project (NTA PAG Phase 5, Detailed Design and Procurement), and are subject to review and monitoring as the scheme progresses through the construction phase.

7.1 Factors Influencing Construction Costs

A range of factors were identified, which will have a significant influence on the construction costs for the DL Central Active Travel Scheme. These include:

- The extents of the widening/upgrades to junctions and link sections;
- Phasing of the construction of the works and the interaction with adjacent planned construction projects (Rochestown Avenue Active Travel Scheme, Abbey Road and Stradbrook Road Rapid Deployment, DLR Connector, any other potential active travel schemes in the immediate vicinity, i.e. Kill Lane and Tivoli Road);
- Traffic Management particularly around busy junctions such as the Tivoli Road / Mounttown Road Lower junction, Honeypark junction, 5-Arm Glenageary Road junction, Glenageary Roundabout and Baker's Corner;
- Increased cost due to market forces and/or inflation;
- Existing ground conditions;
- Public realm, SuDs and landscaping enhancements to be delivered as part of the scheme (e.g. type of planting/trees, street furniture, lighting etc);
- Supply chain delays;
- Coordination with underground services providers in the surrounding area, especially with regard to potential utility diversions.

7.2 Indicative Project Costs

7.2.1 Overall Costs

An AECOM Post Tender cost estimate has identified approximate overall scheme cost of **€18,366,725.63** (Exc. VAT) or €**20,897,939.42** (Inc. VAT). The breakdown of the costs is summarised in the following subsections. The Post Tender Cost Estimate has been provided in Appendix A of this document.

7.2.2 Construction Costs

The submitted tender sum for Clonmel Enterprises Ltd comprised of **€12,438,438.45** (excluding VAT).

7.2.3 Land Acquisition Costs

The proposed upgrades along the DL Central Active Travel Scheme route are within the existing road extents and public green spaces, in DLRCC ownership, for the entirety of the scheme. Therefore, there are no anticipated additional land acquisition costs as part of the scheme.

Whilst no land acquisition will be required as part of the scheme, minor tie in works will be required on roads running into lands which are not owned in their entirety by DLRCC. The land will temporarily be made available to the Contractor for the tie in works but it is not anticipated that there will be costs associated with this.

7.2.4 Preparation and Administration Costs

The preparation and administration costs have been outlined in the following table.

Preparation & Administration Costs	
Scope & Purpose	€5,980.00
Concept, Development & Option Selection	€10,000.00
Preliminary Design	€42,835.00
Statutory Processes	€113,014.00
Detailed Design & Procurement	€335,864.00
Construction & Implementation	€600,000.00
Close Out & Review	€5,000.00
Total Preparation & Administration Costs	**€1,112,693.00**

7.2.5 Traffic Management Costs

Traffic management costs from the contractors tender totaled **€1,362,963.00**.

7.2.6 Cost Contingency, Project Specific Risk and Inflation

Based on the NTA Contingency Calculator, a contingency of **10.6%** of the construction cost was included in the Pre-Tender Cost Estimate.

A Project Specific Risk value of **€2,291,685.00**, based on the NTA Project Specific Risk Calculator, was also included in the Pre-Tender Cost Estimate.

Inflation in the order of **1.3%** of the construction cost and add-on costs has been included to cover the anticipated 26 month construction period of the scheme, beyond the measures included in the contract documents.

7.2.7 Overall Project Cost Estimate

Taking into account each of the above costs in the Post-Tender cost estimate, the total post-tender cost estimate is **€18,366,725.63** (excluding VAT). Inclusive of VAT, the total post-tender cost estimate is **€20,897,939.42**.

8 Scheme Impacts

This chapter focuses on the benefits that the scheme will provide outlining the benefits to pedestrians, cyclists, public transport users, businesses, visitors, the environment and other road users.

8.1.1 Impact on Users

Safety, health, socio-economic and journey time benefits were identified and quantified using data and findings gained from the previous demand forecasting stages. These factors were applied to a bespoke spreadsheet model, called the TEAM tool, with parameters based on DoT TAF and the TII PAG (Unit 13: Walking and Cycling Facilities). The following benefits are included in the appraisal:

- **Safety Improvements** due to the separation of cyclists from the pedestrians and general traffic lanes.
- **Health Benefits** due to the increasing number of users along the corridor, leading to the reductions of the overall health- related risks. In addition, the reduction in congestion will reduce users' exposure to harmful greenhouse gases and particulates.
- **Socio-Economic Benefits** presented as improved journey quality, ambience and recreation, decreasing absenteeism due to improved active mode trip quality as a result of the proposed infrastructure.
- **Travel Time Reductions** due to improvements in the level of service of the facility type.
- **Mode Shift Benefits** from people shifting to cycling due to the active mode facility.

In terms of appraising the impacts, all general parameters such as values of time, value of time growth rates, discount rates, shadow pricing factors etc, were applied from TII PAG (Unit 6.11 – National Parameters Value Sheet).

8.1.2 Health Impacts

Physical activity has a significant impact on health benefits, thus regular cycling or walking could help to reduce the risk of various illnesses, such as diabetes, cardiovascular diseases, and depression. Daily cycling was found to reduce the risk of premature death by 41% (Netherlands Institute for Transport Policy Analysis, 2018). Conversely, physical inactivity contributes to numerous chronic diseases and high obesity levels.

The significant contribution of walking and cycling to health improvements could attract new users to shift to active modes. This benefit is attributable to new cyclists only.

8.1.3 Socio Economic Impacts

8.1.3.1 Journey Quality

Journey quality (or ambience) is a measure of the real and perceived physical and social environment experienced while travelling. The benefits are as a result of the users' perception of reduced danger (a reduced fear of potential collisions/incidents) and improved quality of journey.

The proposed scheme aims to improve the current infrastructure and the quality of the walking and cycling, making it more appealing in attracting new users. A significant intervention for enhancing the travel experience and ambience for the user would be achieved through the separation of cyclists and pedestrians' movements along the corridor, making cycling a more attractive travel option.

However, each user will experience danger and environmental quality in a different level, making the ambience benefit challenging to measure. It is considered that the benefits would be significant, especially for cyclists because surveys suggest that existing and potential cyclist users attach great importance to the perceived safety and quality benefits of improved facilities in particular facilities segregated from motorised traffic.

Assessing the journey quality benefit is challenging, as different users will have different sensitivities to danger and environmental quality. However, the benefit is potentially large, especially for cyclists, because surveys suggest that existing and potential cyclist users attach great importance to the perceived safety and quality benefits of improved facilities.

8.1.3.2 Work Absenteeism

As explained in the health benefit section, introducing cycling and walking to the everyday behaviour of people will result into improving users' health, thus reducing the short-term absence from work. (Transport Infrastructure Ireland, 2016). The number of working people affected by the proposed scheme is calculated from the number of new users who are expected to use the facility, so the absenteeism is only attributable to new commuting users.

8.1.3.3 Recreation

Similarly, to journey quality, the recreation benefit is a result of the cyclists' perception on a high-quality active travel infrastructure. The proposed scheme aims to provide a high-quality infrastructure for pedestrians and cyclists in order to attract more users and therefore enhance the active travel.

Not all users' have the same perception on a provided active travel infrastructure in regards of its quality. However, research has shown that the majority of existing and new active travel users consider the perceived quality benefits as an important factor for improved facilities.

8.1.4 Journey Time Savings

Journey time savings are highly dependent on the type of infrastructure provided and the speed of the users. The average cyclists' speed varies based on the type of cycle facility too. The current infrastructure provides either on road advisory cycle lanes or no cycle infrastructure (Mounttown Road Lower) therefore delaying the users' time to cross the study area.

The proposed scheme aims to separate their movements through high quality cycle tracks and dedicated cyclist crossings at junctions; therefore, reducing the interaction between cyclists and pedestrians and reducing the journey time for all the users.

8.1.5 Mode Shift Benefits

Mode Shift Benefits are referring to benefits for individuals and society from the reduction in car use.

The five benefits analysed under the mode shift are the following.

- Vehicle operating & ownership costs
- Carbon
- Air quality
- Noise
- Congestion

The above benefits measure the reduction on the cost for users to own and operate a car and the traffic levels, due to people shifting to active modes. The reduction on different types of emissions and noise are also considered in the benefit.

The proposed scheme aims to attract more cyclists and pedestrians, moving people into active modes for their daily commute, thus enhancing the reduction of the above benefits.

8.1.6 Impact on Demand for Walking and Cycling

As set out in Chapter 6, the proposed scheme will lead to:

- **An Increase in Cycle Patronage –** representing an additional 366 cyclist journeys per day by 2030, equivalent to an 10% increase in cyclist numbers in the high scenario

- **An Increase in Pedestrian Patronage -** the proposed scheme will result in an 834 (10%) uplift in pedestrians along the corridor in the central scenario
- **Journey Time Savings -** due to improvements in the level of service provided by the improved cycle facilities and separation from the pedestrians. This will result in an average time saving of approximately 1.5 minutes for pedestrians travelling along the route
- **A Modal Shift towards Sustainable Travel,** which will reduce reliance on private car and will encourage new journeys on foot, bicycle and public transport.

9 Financial Appraisal

9.1 Introduction

The financial appraisal considers only the financial costs and benefits of a scheme to an organisation, whereas economic costs and benefits are considered in the economic appraisal. While these broader objectives are important in determining a scheme's value for money, the financial appraisal is necessary for determining whether the scheme is affordable for Dun Laoghaire Rathdown County Council.

In line with the Public Spending Code, a number of financial metrics are presented in this section. These focus on affordability and financial impact of the proposed scheme. These metrics include:

- **General Financial Analysis** – identifying the financial impact to the Sponsoring Agency
- **Exchequer Cash Flow Analysis** – identifying the financial impact to the Government / Exchequers
- **Sources of Funding Analysis** – identifying the nominal costs and sources of funding for a scheme.

It is important to note that as this scheme will earn no revenue, many of these metrics will be negative.

9.2 Assumptions

The table below illustrates the core assumptions that underpin the financial and economic appraisals. Additional assumptions are outlined where applicable.

Table 9.1 Financial and Economic Appraisal Assumptions

Assumption	Description	Value
Appraisal Period	The period over which financial and economic appraisal is carried out.	30 years + 10-year residual
Base Year	The year in which values for costs and benefits are expressed.	2022
Financial Discount Rate	Rate to account for the time value of money, as per the Public Spending Code. This differs from the Economic Discount Rate and is set by the National Development Finance Agency each quarter.	1.75%
Shadow Price of Labour	Applied to labour spending to account for the additional benefit to the exchequer as a result of reduced unemployment. Given that Dublin is close to full employment, this has been set at 1 (i.e. no additional benefit from labour expenditure).	100%
Tender Date	The year in which the tender for construction works will be awarded	2024
Construction Period	The estimated length of the construction period.	26 months
Average effective income tax rate	The average effective rate of income tax on gross income, as estimated by the Revenue Commissioners' annual income tax returns. Applied to the labour component of spending to estimate the income tax generated as a result of the scheme.	15.5%

The financial appraisal is based on cashflow outputs, as described in the costs in Section 7. A discounted cash flow shows outflows over and above those set out in the do minimum investment counterfactual. An assessment of affordability or sources of funding for the investment is included.

9.3 Analysis

9.3.1 General Financial Analysis

A General Financial Analysis is mandatory for all business cases. The purpose of General Financial Analysis is to estimate the present value of cash flows over the course of the construction and operational phases (i.e. in real terms) for the Sponsoring Agency, and to return a 'Financial Net Present Value' (FNPV). FNPV is a measurement of net financial flows calculated by subtracting the present values of financial outflows from the present values of financial inflows over the appraisal period. As the proposed scheme is not revenue-generating scheme, the FNPV is effectively the net present financial cost of the final option.

Both financial outflows are presented in present values, which were calculated by adjusting future costs or benefits by a discount rate. Discount rates are intended to reflect the time value of money, meaning that people are generally more responsive to costs/benefits the closer in time they occur. The National Development Finance Agency (NDFA) discount rate of 1.75% was used for the financial appraisal, as per the supplementary Department of Public Expenditure Reform's guidance on the Public Spending Code. Present values also exclude inflation over the appraisal period, meaning that the FNPV is expressed in base 2022 values.

Table 9.2 presents the results of the general financial analysis, showing both the financial and economic Present Value of Costs (PVC). Overall, this shows the Present Value of Costs to be **€14,821,962.00** over the scheme lifecycle, including both capital and current costs.

Table 9.2 Results of the General Financial Analysis

	Financial
Present Value of Costs	€14,821,962.00
Present Value of Benefits	€18,300,277.00

It should be noted that this differs from the PVC used in the economic appraisal. To convert the financial PVC to economic PVC:

- VAT and other transfer payments are removed, as these payments are not a net economic cost and ultimately return to the Government.
- All costs are converted to 2011 prices using the Consumer Price Index (CPI), and only excess inflation is included. Excess inflation refers to inflation that occurs at a faster rate than the general CPI.
- Costs are adjusted using shadow prices. In public appraisal, two main types of shadow prices are specified: the Shadow Price of Labour (SPL) and Shadow Price of Public Funds (SPPF). The SPL accounts for any unemployment displaced by construction of the scheme but is generally only applied in areas/sectors where unemployment is high. As the scheme is in Dublin, this is not applied. The SPPF accounts for the economic cost of raising funds through taxation and is applied to the publicly-funded proportion of any public expenditure. As the scheme is fully funded by the Exchequer, the full shadow price (130%) is applied to the economic PVC.

9.3.2 Exchequer Cash Flow Analysis

The exchequer cash flow analysis is specified in the Public Spending Code for the appraisal of publicly-funded schemes. It identifies and quantifies the financial flows that impact the Exchequer as a result of a proposed scheme.

As the scheme is publicly funded, the main exchequer outflow will ultimately be the cost of developing and maintaining the route. The FNPV from the previous section – which represents the sum of discounted cash flows – has been classed as a net exchequer outflow in this analysis.

Table 9.3 Results of the Exchequer Cash Flow Analysis

	Financial
Net Exchequer Cash Flow	€3,478,314.00

9.3.3 Affordability and Funding

The purpose of 'Sources of Funding' or 'Affordability' Analysis is to identify the sources of funding for a scheme and to quantify how much funding is required. This analysis takes into account both capital and current costs over the appraisal period.

It is assumed that NTA will fund the capital cost of this scheme, while DLRCC will the ongoing operation and maintenance costs.

10 Economic Appraisal

10.1 Introduction

The key purpose of appraisal is to ensure public funds are allocated in an economically advantageous manner for the State and its residents, by establishing the merits of a proposal using a consistent and comprehensive framework – the CAF.

The Economic Appraisal of the proposed scheme is explained in detail in this section, forming a key element of the business case.

Economic Appraisal is a decision-making analysis for a scheme, and it considers a wide range of costs and benefits, provided in monetary terms or where a monetary equivalent can be estimated. In the transport sector, economic appraisal is expressed in the form of a Cost Benefit Analysis (CBA) and serves several functions at the individual scheme level and for comparing across a variety of schemes and State-wide locations:

- On a scheme level, the CBA defines the economic viability of the scheme and can provide a comparison of alternative options, as well as to taking account of sensitivity testing.
- At a national level, the economic appraisal compares and identifies the schemes that would provide positive return on investment.

In general terms, where a scheme has a Benefit to Cost Ratio (BCR) of over 1, the scheme provides a positive return to the economy. The net present value (NPV) and BCR are key indicators of worth but do not provide information on benefits and costs that are not monetizable, e.g. wider economic benefits (WEB). Therefore, although an important input, the economic analysis should not be used as the sole basis for decision making.

This is particularly true for this scheme: while CBA tries to measure the incremental benefits of a proposal, this section will ultimately form part of a wider cycle network strategy for Dún Laoghaire, and many of the benefits will only be realised on completion of the route as a whole.

A summary of the appraisal undertaken for the proposed scheme is presented in the below sections. The appraisal has been undertaken in compliance with CAF.

10.2 Appraisal Framework and Assumptions

The assumptions that support this assessment are based on are the following:

- The appraisal period for cyclists and pedestrians is 30-years (plus a 10 year residual period), reflecting their lifecycle.
- The estimate of the new users, who will begin cycling and walking as a result of the proposed scheme will be calculated based on outputs from applicable research and literature review undertaken.
- The proposed cycle and walking facilities are predominately segregated with little to no interaction with the road network except at junctions, which will result in a reduction in incidents along the length of the proposed scheme.
- All parameter values for the calculation of economic benefits are referenced from TII PAG Unit 6.11: National Parameter Values Sheet and TII PAG Unit 13: Pedestrian and Cyclist Facilities.
- Benefits will be calculated for an average day representing the full year.

10.3 Results

This section outlines the monetary benefits associated with the delivery of the proposed scheme. As previously presented, the costs for the journey quality and the collision reduction benefits were

calculated for both the existing and new users, since both groups will benefit from the new scheme, while the costs for the remaining benefits will consider only the new users.

The breakdown of the benefits for the cyclists and pedestrians is presented in the following figure. The results are referring to a 30-year appraisal period (plus a 10-year residual value) for the central scenario, with a cyclist growth rate of 5% as a result of the implementation of the scheme and pedestrian growth rate of 5%.

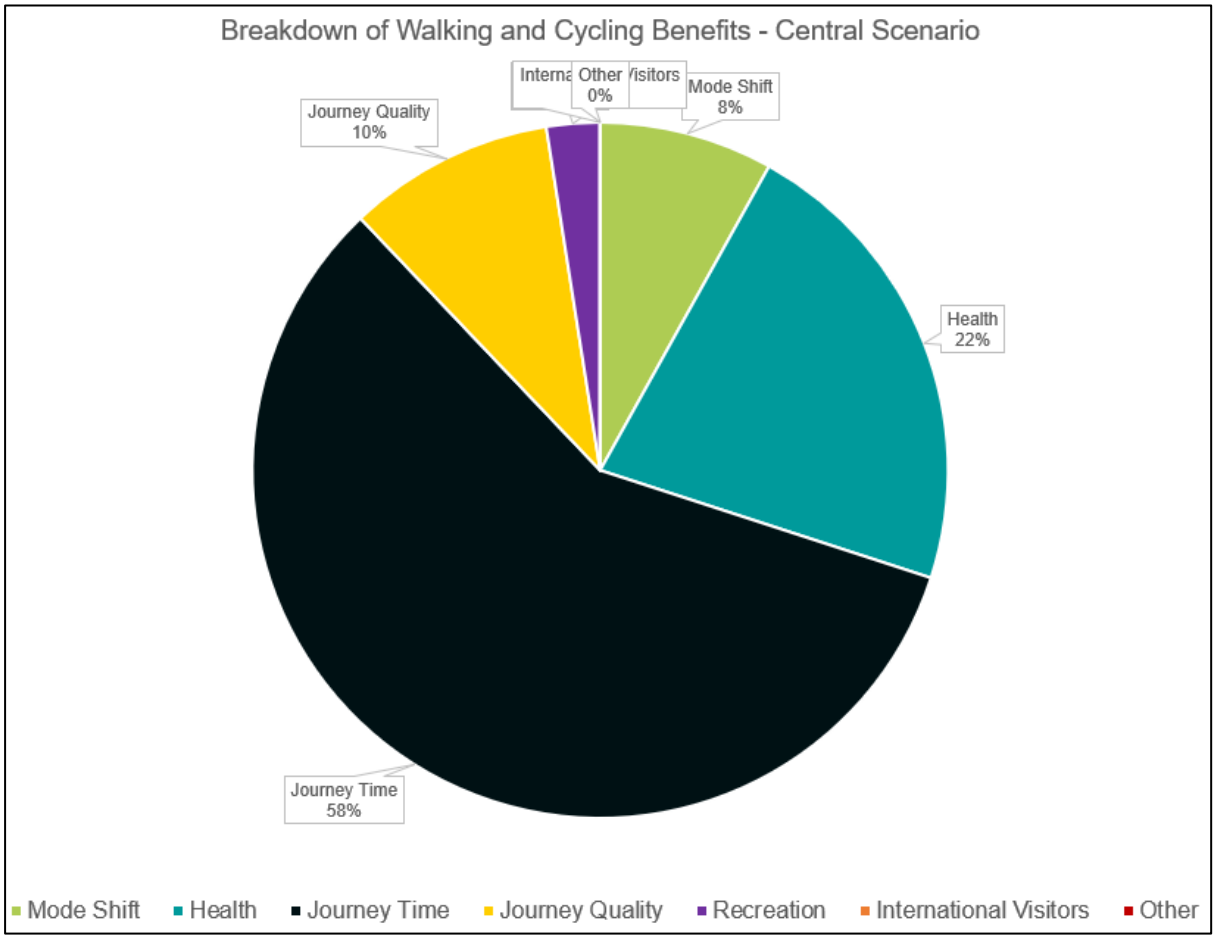

Figure 10.1 Breakdown of Walking and Cycling Benefits – Central Scenario

A series of sensitivity tests in relation to modelling assumptions, economic variables and costs have been undertaken and are set out below:

- Demand sensitivity, with allow and a high growth rate scenario for the number of new cyclists and pedestrians due to the development of the proposed scheme.
- Benefits Sensitivity with changes between -20% to 20%.
- Cost sensitivity with changes on the cost between -20% to 20%.
- Removal of some benefits such as journey quality

The results of these sensitivity tests are presented in the following sections.

10.3.1 Detailed Analysis of Appraisal Results

The following table provides a summary of the overall economic appraisal, in the form of:

- Present Value of Benefits (PVB)
- Present Value of Costs (PVC)
- Benefit- Cost Ratio (BCR)

The PVC is a combination of investment costs, maintenance costs, changes in operator revenues and allows for shadow pricing of funds and labour.

The PVB refers to the overall benefits from travel time impacts across all modes and impacts on cyclists in the form of health, collision reduction, journey quality/ambience and absenteeism benefits.

Table 10.1 CBA Summary – Central Scenario (including 10 year residual value)

Type of Benefit	Benefit Values (€) – Central Scenario
Mode Shift	€1,477,576
Health	€4,013,695
Journey Time	€10,593,696
Journey Quality	€1,760,900
Recreation	€454,409
Present Value of Benefits (PVB)	**€18,300,277**
Present Value of Costs (PVC)	**€14,821,962**
Benefit to Cost Ratio (BCR)	**1.23**

10.3.2 Demand Sensitivity

The demand related to new cyclists and pedestrians was calculated in the previous section. The sections presented the lower and higher growth rates that were set for the new users, allowing for a sensitivity analysis to be carried out for estimating the impact that the growth rates would have on the economic assessment.

A summary of the CBAs under the two growth rate sensitivities are provided in the following table.

Table 10.2 CBA summary – Low & High Growth Rate Scenarios

CBA Breakdown	Benefit Values (€)		
Type of Benefit	**Low Scenario**	**Central Scenario**	**High Scenario**
Present Value of Benefits (PVB)	**€12,408,442**	**€18,300,277**	**€24,199,243**
Present Value of Costs (PVC)	**€11,857,570**	**€14,821,962**	**€17,786,355**
Benefit-Cost Ratio (BCR)	**0.84**	**1.23**	**1.63**

10.3.3 Sensitivity

The benefit and cost sensitivity analysis presents the changes on the values for the central scenario. The results of this cost sensitivity analysis are presented in the following table.

Table 10.3 CBA Summary – Present Value of Benefits (PVB) changes

CBA Breakdown	Benefit Values (€)				
Type of Benefit	-20%	-10%	Central Scenario	+10%	+20%
Present Value of Benefits (PVB)	€14,640,221	€16,470,249	€18,300,277	€20,130,304	€21,960,332
Present Value of Costs (PVC)	€11,857,570	€13,339,766	€14,821,962	€16,304,158	€17,786,355
Benefit-Cost Ratio (BCR)	0.99	1.11	1.23	1.36	1.48

11 Scheme Appraisal Balance Sheet

The scheme appraisal balance sheet (PABS) is based on the CBA outcomes and anticipated scheme impacts. Firstly, it is important to establish the relevant criteria to be used during appraisal. There are seven main criteria listed by TAF:

- Transport User Benefits and Other Economic Impacts
- Accessibility Impacts
- Social Impacts
- Land Use Impacts
- Safety Impacts
- Climate Change Impacts
- Local Environment Impacts.

The criteria were qualitatively evaluated and present some of the anticipated benefits of the proposed scheme.

Table 11.1 Scheme Appraisal Balance Sheet

Scheme Appraisal Balance Sheet			
Criteria		**Scoring**	**Qualitative Assessment**
Economy	**Transport Efficiency & Effectiveness**	Highly Positive	The scheme will have a significant impact on the transport efficiency and effectiveness. The introduction of high quality infrastructure for walking and cycling is projected to result in an increase of new cyclists and pedestrians along the route, providing a more efficient use of road space, that could potentially increase the public transport usage. The scheme will attract more car user to shift into cycling, walking and public transport, leading to more efficient use of them. Cycling is a very effective means of transport.
	Benefit - Cost Ratio (BCR)	Highly Positive	The economic appraisal of the proposed scheme results in a positive return on investment and presents a strong economic case for the scheme.
	Wider Impacts	Moderate Positive	The scheme will trigger numerous wider impacts, especially for residential and commercial areas in close proximity of the study area, related to utility, infrastructure and economy.
Environment	**Air Quality & Climate**	Highly Positive	The modal shift towards cycling and walking will positively affect air quality and climate due to the reduction in congestion and associated vehicle emissions. The planting, SuDS and public realm proposals will assist to promote highly positive air quality and climate interventions to the environment.
	Noise & vibration	Moderate Positive	The scheme will result in an increase in walking and cycling and a reduction in car use, that would reduce traffic and relatively reduce noise and vibration.
Safety	**Collision Reduction**	Highly Positive	The proposed scheme aims to significantly improve the cycling and walking facilities, providing a safer route for people to use for their daily commute or for leisure. The improved infrastructure will reduce collisions by keeping the cyclists and pedestrians protected. This impact has been quantified and monetised as part of this business case. The scheme will lead to a modal shift from private cars to active modes and public transport. This will decrease road traffic, thus reducing the number and severity of injury incidents overall.
	Security	Moderate Positive	The scheme will positively affect the security of cyclists and pedestrians by the installation of adequate lighting along the route, providing a safely accessible environment for the users.
Physical Activity	**Journey Quality / Ambience**	Highly Positive	The proposed infrastructure for pedestrians and cyclists will provide a safer and more enjoyable cycling environment, leading to a modal shift into active modes due to the provide high quality facilities. Journey quality (ambience) is a measure of the real and perceived physical and social environment experienced while travelling. The proposed scheme will improve the existing offline cycle and pedestrian facilities by providing a high-quality route that will separate the cycling and walking movements. Therefore, the users' perception of danger related to potential collisions will be reduced and their journey quality will be improved. Track segregation is an essential factor contributing to achieving high journey quality for cyclists and pedestrians, because of the conflict reduction between cyclists or pedestrians and other types of road users. The travel experience is then significantly improved, making cycling and walking as two attractive travel options.
	Absenteeism	Highly Positive	The scheme will encourage people to cycle and walk along the scheme without the cyclists interrupting the pedestrian movements and vice versa. So, the scheme will have a positive effect on citizens' health and physical activity and by choosing cycling and walking for their everyday commute, absenteeism will be reduced.
	Reduced Health Risk	Highly Positive	As previously mentioned, the proposed infrastructure will attract more people to cycle and walk. Cycling and walking will significantly increase the users' physical activity, thus affecting positively their health and wellbeing and finally reducing multiple health risks.
Accessibility	**Vulnerable Groups**	Highly Positive	It is essential to provide a safe and resilient transport network, segregated from the motorised network to socially deprived people, who do not own a car or afford to use public transport. The dedicated network for active modes will enhance their accessibility to employment, social networks, education and healthcare centres.
Integration	**Transport Integration**	Highly Positive	The scheme will be complementary to the wider pedestrian and cycle network in the County and other schemes outlined in the Project Ireland 2040: National Planning Framework and the GDA Cycle Network. The proposed scheme will contribute on the enhancement of active and public transport at local, regional and national levels by improving cycle facilities and bus journey times and reliability throughout the city. The proposed scheme will achieve the objectives of the many policies Project Ireland 2040: National Planning Framework, the GDA Transport Strategy 2022 – 2042 and the Dun Laoghaire Central Development Plan to generally improve quality of life and improve accessibility to work, education and other activities. The design has been future-proofed to allow for increases in the use of Cargo Bikes, eBikes and eCars, etc.
	Other	Moderate Positive	

12 Governance Plan

12.1 Scheme Governance Structure

12.1.1 Sponsoring Agency

Dún Laoghaire Rathdown County Council (DLRCC) is the Sponsoring Agency for the scheme. DLRCC has overall responsibility for planning, appraisal and delivery of the scheme, as well as its future operation and maintenance.

The Sponsoring Agency's functions include:

- Nominating and appointing a Scheme Manager
- Managing the overall planning and delivery of the scheme
- Completing the required appraisal deliverables according to the PSC, TAF, and NTA PAG and securing approval from the Approving Authority at each gateway
- Appointing a Scheme Supervisor Design Process (PSDP) and Scheme Supervisor Construction Stage (PSCS) as required under Health and Safety legislation
- Obtaining approval from the Approving Authority for the Scheme proposals and for any changes to Scope
- Acting as the Contracting Authority to procure the planning, design and construction/implementation of the Scheme
- Assuming the role of Contracting Authority for Public Works Contracts and PPP Schemes

12.1.2 Approving Authority

The NTA is the Approving Authority for this scheme. Its role includes:

- Evaluating the appraisal deliverables and scheme proposals against strategic objectives
- Determining the requirement for a Scheme Steering Group, if required, clearly defining and communicating its role, composition, level of delegated authority, responsibilities and structure. Note there is a Steering Group in place for this scheme
- Considering requests for changes in the Scope from the Sponsoring Agency
- Monitoring the progress of scheme with emphasis on cost, programme, quality and impacts
- Assessing Scheme reviews
- Making and informing of decisions in relation to scheme reviews in a timely manner

12.1.3 Scheme Manager

The Scheme Manager oversees the day-to-day delivery of the scheme. Their responsibilities include:

- Day-to-day management and delivery of the scheme programme with respect to safety, time, cost, quality, scope, risks and outputs.
- Develop and submit relevant appraisal, planning and regular progress reports to the Scheme Steering Committee, Corporate Scheme Support Office, or Corporate Scheme Governance Board as necessary.

- Managing the procurement and appointment of technical advisors, service providers and contractors as required.

12.2 Scheme Phases and Approval Points

The scheme is being delivered in accordance with the NTA Project Approval Guidelines (PAG).

13 Risk Management

All schemes face risks, and as a complex scheme in a busy urban environment, the DL Central Active Travel scheme faces many potential internal and external risks that must be addressed. This section of the business case sets out the potential risks and highlights how these may impact on its delivery or success.

AECOM and DLRCC have put a risk register in place and have developed strategies for avoiding or managing these risks as the scheme progresses.

13.1 Identification of Risks

The table below summarises potential political, economic, social, technical, legal and environmental risks to the scheme, along with their potential impacts. These form the basis of the risk register, which is maintained and updated by DLRCC as the scheme progresses.

Category	Risk	Description of Potential Impacts on the Scheme
Political	Change in Government could result in the scheme not being funded.	Risk that a general election is called and a change of government occurs. Risk that a new government will not support the funding of this project.
	Misinformation during the construction phase and risk of communication from elected members to the project team.	Misinformation during construction phase could exacerbate any potential opposition, and increase the risk of political opposition or legal challenges. Low risk given status of scheme.
Economic	Reduction in exchequer funding due to budgetary constraints	This could delay or halt approval of the scheme, and cause the scheme to be downgraded in scope or quality. This would negatively impact the achievement of objectives.
	High levels of construction inflation due to material/labour cost increases	Significant cost escalations could lead to rejection of the scheme, delays, or the need to reduce its scope or quality. Inflation has been captured in the cost estimate.
	Insufficient resources due to competing infrastructure schemes from the contractor	This could lead to delays to the scheme. Risk mitigation is that the tender assessment included a quality submission on programme and managing the proposed deadline.
	Disruption to traffic, deliveries or public transport during construction or operation.	This could negatively impact transport and the economy of the Dun Laoghaire Central area, and increase the risk of opposition and delays.
Social	Long-term change in travel patterns due to COVID-19 and remote working	Long-term reductions in commuting demand could reduce the effectiveness of the scheme in terms of meeting climate and transport objectives.
	Anti-social behaviour and security concerns on new infrastructure / public realm space	Security concerns along new infrastructure or boardwalks could discourage their use, and reduce the scheme's effectiveness in achieving its objectives.
Technical	Unforeseen structural conditions	Works to the boundary at Rose Park green could require additional reinforcements, and result in cost escalations or delays.
	Presence of sewerage, surface water and electricity infrastructure, EIR	This could require redesigns, delays and cost escalations. The level of investment required could also impact the viability of the scheme.
	Presence of watermains or replacement required	This could require redesigns, delays and cost escalations. The level of investment required could also impact the viability of the scheme.
Legal	Legal challenges / judicial review of proposed option(s)	This would add to the timeline, and introduce uncertainty. If challenges are successful, it would require a redesign.

Category	Risk	Description of Potential Impacts on the Scheme
Environment	Impact on ecology	As well as having a negative environmental impact, this could result in planning refusal or redesigns; impacting the cost and programme. AA Screening has been undertaken and a CTMP will be prepared if required.
	Carbon impacts of construction	This would reduce the scheme's effectiveness in achieving its climate objectives.
Internal & Governance	Conflicting inter-departmental or inter-agency objectives	This could delay or reduce the resources available to the scheme. It could also result in opposition to the proposed design/route, and require redesign.
	Delay in achieving milestone sign-off to proceed to next stage	This would delay the programme and create uncertainty.

The formulation of a risk register and resultant QRA value is a demonstration of the risk approach to the project. The risk register has been updated as part of this submission and includes project risks, alongside proposed mitigation to reduce the level of risk. The items within the risk register with the highest risk rating are:

- **Statutory Undertakers** works not being undertaken in accordance with the programme. The currently proposed mitigation is through early engagement and commitment to specified dates.
- **Scope Creep/Additions** during the construction phase. This will be mitigated through early and continued stakeholder liaison.
- **Unprecedented Inflation**. Whilst inflation at this point is largely a contractor risk, there is a residual risk regarding emergency relief or ex-gratia payments.

Enhanced site supervision, with suitably qualified personnel will reduce the instance of risks materialising on site and ensure risks which do arise are dealt with safely and in a timely manner.

14 Procurement and Implementation

14.1 Procurement Strategy

It is envisaged that a Contractor shall be appointed in line with the Capital Works Management Framework. The contract under which the scheme shall be tendered (and subsequently constructed) is PW-CF3 *Public Works Contract For Civil Engineering Works Designed By The Employer*.

The procurement of the DL Central Active Travel scheme has been undertaken in two-stages.

The Stage 1, SAQ response process, was on published in April 2024, with tender responses received in May 2024. 5 no. responses were received during the tender period. AECOM undertook a tender assessment and invited each of the 5 tenderers to progress to the Stage 2 of the tender process.

The Stage 2 tender process, with the 5no. tenderers invited to progress from Stage 1, was published in July 2024. Tender submissions were received on 24th September 2024 from the following three candidates:

- Clonmel Enterprises Ltd
- Coffey Construction Ltd
- Murphy Internation limited.

A tender assessment was undertaken by AECOM, please refer to the DL Central Stage 2 Tender Assessment Report. The assessment identified that the tender received by Clonmel Enterprises Ltd should be accepted as it is the Most Economically Advantageous Tender which has achieved the highest overall marks, and which also met the specified minimum criteria in the Suitability Assessment Criteria.

The submitted tender sum, for Clonmel Enterprises Ltd comprised of **€12,438,438.45** (excluding VAT).

It is the intention of AECOM / DLRCC that the contract will be awarded before the end of 2024.

14.2 Implementation Proposals

The anticipated construction duration of the DL Central Active Travel Scheme is 26 months.

The completed Scheme will be maintained by Dún Laoghaire Rathdown County Council (DLRCC) as part of their standard maintenance of the public road network.

15 Monitoring and Evaluation

15.1 Monitoring and Evaluation Requirements

DLRCC and NTA continuously monitor cyclist demand through fixed cyclist counters and multi-modal surveys.

Post-construction surveys / counts will also be undertaken to assess the impact of the scheme on cycling levels. These surveys will place particular emphasis on identifying whether the scheme has been successful in encouraging under-represented groups to take up cycling, such as women, children and the elderly.

An Ex-Post Evaluation will be undertaken for the DL Central Active Travel scheme 2 years after completion of the scheme. The Evaluation Plan undertaken will include the information included in Appendix B of this document.

15.2 Logic Path Model

A Logic Path Model is a tool to demonstrate the coherency of a proposal in achieving certain outcomes or objectives. The Model shows the relationship between an issue or objective that DLRCC seeks to address, the actions it carries out, and the results of these actions.

The following table displays the Logic Path Model for this scheme. Beginning with an issue or constraint that DLRCC aims to address, it shows the inputs DLRCC will put into the scheme; the activities it will carry out; the outputs these activities will produce; the direct outcome of these outputs; and the wider impacts for the economy, society or the environment.

It also provides examples of indicators that can be used to measure and track the success / failure of the scheme towards these objectives.

Table 15.1 Potential Key Performance Indicators (KPIs) for the Proposed Scheme.

Objective	Example of Indicators	Relevance
To increase the contribution to the local economy from tourism	Number of tourists using active modes Number of visitors using the scheme	Increasing active travel amongst visitors can result in increased spending in local businesses such as cafés, shops and restaurants. This can be verified post-construction through surveys of users and local businesses.
To improve safety and security for vulnerable users	Number of road crossing points on the route Length of fully segregated cycle facilities Number of new pedestrians and cyclists Reduction in / low collision rate for cyclists along corridor	Indicators such as route segregation and the number of crossing points or conflicts can provide an early indication of the relative risk involved in the route. Post-construction, user surveys assess how many new users were attracted due to improved safety. A post construction Road Safety Audit (Stage 3) will also be undertaken to assess any potential post construction safety concerns.
To enhance connectivity in Dun Laoghaire including to key services such as residential areas, schools, employment and adjoining cycle network	Demonstration of improved connectivity through scheme outputs	Integration of the route with the wider local infrastructure can encourage use of the route to reach a wider range of destinations.

Objective	Example of Indicators	Relevance
		This can be verified post-construction through surveys.
To establish mode shift away from private car use	Number of private cars in the vicinity Level of emissions in the vicinity Reduction in car use within the urban area Reduction in transport related carbon emissions	To encourage a shift away from car-orientated travel it is important that the infrastructure in place can accommodate this. This can be verified post-construction through user surveys
To increase participation in leisure / physical activity along the corridor among users of all ages and abilities	Amount of physical activity undertaken amongst the population (walking or cycling) Physical Activity	A high-quality segregated route can result in increased participation in leisure and physical activity along the route. This can be verified post-construction through user surveys.

15.3 Benefit Realisation Plan

The Logic Path Model has been used to derive an outline Benefit Realisation Plan as shown in the following table. The benefit realisation plan uses the scheme objectives as a foundation, setting out how each indicator can be measured in relation to data source, type and collection frequency.

Importantly, the Benefit Realisation Plan outlines the relevant measures of success, using metrics from the proposed scheme design and resultant appraisal to set a series of proposed scheme benefits.

Table 15.2: Benefit Realisation Plan

Objective/Benefit	Example of indicators	Data Source	Type	Collection Frequency	Benefit Metric
Increased contribution to the local economy from tourism	Number of tourists using active modes	User surveys	Quantitative	Post Opening	
	Number of visitors using the scheme	User surveys	Quantitative	Post Opening	
Improved safety and security for vulnerable users	Number of road crossing points on the route	Achieved through the design process and a key project output	Design / construction drawings	Scheme Completion	5 medium sized junctions to be upgraded including controlled pedestrian and cycle crossings.
	Length of fully segregated cycle facilities	Achieved through the design process and a key project output	Design / construction drawings	Scheme Completion	Scheme length 2.8km
	Number of new pedestrians and cyclists	Number of users determined though permanent counters and additional surveys as necessary	Quantitative	Pre and post opening	Increase in cyclist numbers increase in pedestrians
Enhanced connectivity along the study area and to onward destinations, including key housing sites	Demonstration of improved connectivity through scheme outputs	Achieved through the design process and a key project output	Design / construction drawings	Scheme Completion	Delivered scheme
Mode shift away from private car use	Number of private cars in the vicinity	Parking capacity	Quantitative	Pre and post opening	
	Level of emissions in the vicinity	AQ monitoring data/proxy calculations	Quantitative	Pre and post opening	
	Reduction in car use within the urban area	ATC data	Quantitative	Pre and post opening	

Objective/Benefit	Example of indicators	Data Source	Type	Collection Frequency	Benefit Metric
	Reduction in transport related carbon emissions	Carbon monitoring/proxy calculations	Quantitative	Pre and post opening	
An attractive route to facilitate all trip purposes	Use of the scheme amongst all trip purposes	User surveys	Quantitative	Post opening	50% leisure users/50% commuters (TBC)
	Demonstration of connectivity to key locations through scheme outputs	Achieved through the design process and a key project output	Design / construction drawings	Scheme opening	Delivered scheme
Increased participation in leisure / physical activity along the corridor	Amount of physical activity undertaken amongst the population (walking or cycling)	User surveys	Quantitative	Pre and post opening	

16 Conclusion

The Business Case for the DL Central Active Travel scheme included analysis aiming to assess the reasonable impacts expected of the scheme.

The scheme proposes the delivery of Active Travel Improvements including enhancing walking and cycling accessibility; and promotes the use of Active Travel. The scheme will meet all the objectives set and lead to a significant increase in pedestrian and cycling demand in the area. This will result in:

- An Increase in **Cycle Patronage**
- An Increase in **Pedestrian Patronage**
- **Cycle Journey Time** Savings - due to improvements in the level of service provided by the improved cycle facilities and separation from the pedestrians.
- A **Modal Shift** towards Sustainable Travel, which will reduce reliance on private car
- **Journey Time** Savings of circa €10,593,696 over the appraisal period
- **Health Benefits** Savings of circa €4,013,695
- **Mode Shift** Savings of circa €1,477,576
- **Journey Quality** Improvements of circa €1,760,900;
- **Recreation Benefits** of circa €454,409

The Central Assessment results were expressed in BCR over a 30-year appraisal period (plus a residual period of 10 years). The Economic Appraisal forecasts a BCR of **1.23** for the central scenario, with a PVB of **€18,300,277.** Thus, the Economic Appraisal presents a strong case for investment in the DL Central Active Travel Scheme, enhancing provision for Active Modes.

A number of Sensitivity Analyses were also developed for assessing the impact of the following scenarios:

- Demand Sensitivity, with allow and a high growth rate scenario for the number of new cyclists and pedestrians due to the development of the proposed scheme;
- Benefits Sensitivity with changes between -20% to 20%; and
- Cost Sensitivity with changes on the cost between -20% to 20%.

The scheme is an essential enabler for Project Ireland's goals of future **Enhanced Regional Accessibility, Sustainable Mobility, High-Quality International Connectivity and Transition to a Low Carbon Economy**.

This Business Case has shown that the scheme will meet the aims and objectives set for the project and that it will provide a strong return on investment. The benefits of the scheme for society, the economy and the environment greatly exceed the cost.

Investment in the scheme represents a good use of public funds.

Appendix A Post-Tender Cost Estimate

Pre-Tender Cost Estimate Template

NOTE: For Band 2 & 3 Projects the activity cost heads presented are the minimum expected for a linear road project and are to be proposed, discussed and agreed in writing with NTA prior to production of the cost estimate.

Project Title:	DL Central Active Travel Scheme		
Project / Contract Code:	60661468	Prepared By (Individual/Organisation)	AECOM
Approving Authority:	Dún Laoghaire-Rathdown County Council	Date Estimate Prepared:	08/11/2024
Sponsoring Agency:	National Transport Authority	Base Date of Estimate:	Q4 2024

Project Information

Mainline Cross-Section Type:	Single Carriageway	Average Link / Side Road Width (m):	6
Location:	Dún Laoghaire, County Dublin	Cyclepath Included (Y/N):	Y
Total Mainline Length (m):	3000	Footway Included (Y/N):	Y
Total Mainline Width (m):	14 - 18 (variable - TBC)	Hardstrip Included (Y/N):	N
Total Link / Side Road Length (m):	TBC	Central Reserve Included (Y/N):	N
Potential Construction Works Start Date:	Q4 2024	Anticipated Construction Works Duration (Months):	26
Other Relevant Project Information:			

1 Construction Costs

Ref	Description	Incurred Costs	Forecast Costs to Complete	Total Cost (€)
Enabling Works Costs *(Please provide supplementary information giving detail of costs)*				
1.1	Heritage Contracts			€ -
1.2	Utilities Contracts	€ 137,696.30	€ 129,054.95	€ 266,751.25
1.3	Archaeological Contracts			€ -
1.4	Site Investigation Contracts	€ 125,000.00		€ 125,000.00
Main Contract(s) Costs *(Please provide supplementary information giving detail of costs)*				
1.5	Site Clearance		€ 402,714.60	€ 402,714.60
1.6	Fencing		€ -	€ -
1.7	Road Restraint Systems		€ -	€ -
1.8	Earthworks		€ 1,601,302.05	€ 1,601,302.05
1.9	Drainage		€ 1,392,256.00	€ 1,392,256.00
1.10	Pavements		€ 1,277,752.60	€ 1,277,752.60
1.11	Kerbing & Footways		€ 3,049,041.45	€ 3,049,041.45
1.12	Traffic Signs and Road Marking		€ 246,740.20	€ 246,740.20
1.13	Road Lighting		€ 27,287.00	€ 27,287.00
1.14	Structural Concrete (Including Structures Generally)		€ 76,170.90	€ 76,170.90
1.15	Accommodation Works		€ -	€ -
1.16	Works for Statutory Undertakers		€ -	€ -
1.17	Landscaping & Ecology		€ 253,162.60	€ 253,162.60
1.16	Other Project Costs		€ 400,000.00	€ 400,000.00
1.17	Preliminaries including Site Compounds (excluding traffic management)		€ 2,847,491.10	€ 2,847,491.10
	Sub-Total A - Project Base Costs	€ 262,696.30	€ 11,702,973.45	€ 11,965,669.75

2 Preparation and Administration

2.1	Preparation and Administration Costs			€ 1,112,693.00
2.1.1	Scope & Purpose	€ 5,980.00	€ -	€ 5,980.00
2.1.2	Concept, Development & Option Selection	€ 10,000.00	€ -	€ 10,000.00
2.1.3	Preliminary Design	€ 42,835.00	€ -	€ 42,835.00
2.1.4	Statutory Processes	€ 113,014.00	€ -	€ 113,014.00
2.1.5	Detailed Design & Procurement	€ 335,864.00	€ -	€ 335,864.00
2.1.6	Construction & Implementation	€ -	€ 600,000.00	€ 600,000.00
2.1.7	Close Out & Review	€ -	€ 5,000.00	€ 5,000.00
	Sub-Total B - Preparation and Administration Costs	€ 507,693.00	€ 605,000.00	€ 1,112,693.00

3 Traffic Management Related Costs

3.1	Traffic Management Related Costs		€ 1,135,465.00	€ 1,135,465.00
	Sub-Total C - Traffic Management Related Costs	€ -	€ 1,135,465.00	€ 1,135,465.00

4 Land and Property Costs

Ref	Description	Quantity	Unit	Rate	Incurred Costs	Forecast Costs to Complete	Total (€)
4.1	Properties		Nr	€ -		€ -	€ -
4.2	Garden Ground		Ha	€ -		€ -	€ -
4.3	Industrial Development Land		m2	€ -		€ -	€ -
4.4	Amenity Land / Open Space		Ha	€ -		€ -	€ -
4.5	Residential Development Land / Urban		Ha	€ -		€ -	€ -
4.6	Agricultural Ground		Ha	€ -		€ -	€ -
	Sub-Total D - Tland & Property Costs				€ -	€ -	€ -

5 Adjustments

Add Inflation	1%	%	€ 13,443,438.45		€ 174,764.70
Add Project Specific Risk *(Output From QRA - 013_B23_QRA_CMG)*	1	Item	€ 2,291,685.03		€ 2,291,685.03
Add Contingency *(001_B123_CC_CMG)*	11%	%	€ 15,909,888.18		€ 1,686,448.15
Per Cent for Art Scheme https://publicart.ie/main/commissioning/funding/per-cent-for-art-scheme/		%	€ 15,909,888.18		€ -
				Sub-Total E - Adjustments	€ 4,152,897.88

Total Pre-Tender Cost Estimate Exclusive of VAT				€ 18,366,725.63
VAT *on Construction Costs TM and Associated Adjustment Costs*	13.5%	%	€ 16,854,032.63	€ 2,275,294.40
VAT *on Preparation and Administration Costs*	23%	%	€ 1,112,693.00	€ 255,919.39
VAT *on Land and Property* https://www.revenue.ie/en/vat/vat-on-property-and-construction/vat-and-the-supply-of-property/index.aspx	1	Item		€ -
Total Pre-Tender Cost Estimate Inclusive of VAT				€ 20,897,939.42

Mainline Length	3	Km	**Rate Per Km (Excluding VAT)** € 6,122,241.88
			Rate Per Km (Including VAT) € 6,965,979.81

Source of Cost Data *(Please provide a brief narrative on the source of cost data in the box below)*

Revision	Title	Prepared By	Checked By	Issue Date

NOTE:
Costs are considered to include all allowances for overheads and profit.
Costs are reflective of costs at the base date stated above.
VAT is not applicable to all land and property therefore it is not appropriate to apply a uniform percentage. The value associated with VAT on land and property is to be determined on an individual basis and included as a lump sum.

Project Risk Register

Project Title:	DL Active Travel Scheme
Project / Contract Code:	60661468
Current Project Phase:	Phase 5 - Detailed Design and Procurement
Capital Cost Estimate (Construction, Preparation & Administration and	€ 14,463,827.75
Date:	08/11/2024

SA to list probability rank (1-5: 5 been the highest)

Note, Costs will default across once probability & risk exposure is confirmed

RISK RANK	RISK ID	DATE IDENTIFIED	RISK OWNER	CATEGORY	RISK / OPPORTUNITY	TECHNICAL DISCIPLINE	RISK DESCRIPTION *(Describe Cost, Programme & Quality Impacts)* Note: ***Qualitative** Costs associated with review contain within Initial Risk Exposure and Residual Risk Exposure*	RESPONSE *(Mitigation [M] and/or Contingency [C])*	RISK EXPOSURE									CONSTRUCTION RISK VALUE			Status	Register Review Date	REVIEW COMMENTS
									PROBABILITY			COST IMPACT (£)					RISK RATING	€ 1,380,355.40	€ 2,291,685.03	€ 3,203,014.66			
									RANK		%	CAT		Min	Most Likely	Max	(P x CI)	Min	Most Likely	Max			
	D. 01	18/01/2023	DLRCC / NTA	Design / Scope Change	Risk	Project Management	Changes in design instructed by DLRCC or NTA during construction phase. Late design changes would have an impact on programme and cost of scheme during the construction stage.	• Continuing liaison with the DLRCC regarding progress. • Regular feedback from client. • Monthly meetings with client	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	This process has been managed continually during Phase 5 through regular communications with DLRCC. Outstanding risk remains through NTA review process and into construction phase.
	D. 02	18/01/2023	DLRCC / NTA	Design / Scope Change	Risk	Project Management	Design Complexity - the proposed scheme includes for innovative design elements which have not been designed at detailed level before - i.e. protected junctions, raised crossings, SuDS elements element of associated programme risk	• Regular liaison with DLRCC on certain bespoke design elements • Engagement with specialist AECOM teams outside of local team • Engagement of CIVIC Engineers, to undertake drainage & SuDS designs	0	#N/A	#N/A	0	#N/A	#N/A	#N/A	#N/A	€ -	€ -	€ -	€ -	Closed	05/11/2024	This process was managed continually during Phase 5 through regular communications with DLRCC. No longer applicable at this stage.
	D. 03	18/01/2023	DLRCC	Planning	Risk	Project Management	Community Satisfaction with Proposed Scheme	• Public Consultations were held during Part 8 planning application process. • Stakeholder consultations took place during detailed design process. • Contractor will be required to engage with members of the public regularly during construction phase.	1	VL	3%	1	VL	€ 14,463.83	€ 43,391.48	€ 72,319.14	€ 1.00	€ 361.60	€ 1,084.79	€ 1,807.98	Residual	05/11/2024	This process has been managed continually during Phase 5 through regular communications with DLRCC.
	D. 04	18/01/2023	DLRCC	Environmental	Risk	Environmental	Environmental Impact of proposed design	• Continuous liaison with DLRCC throughout all design phases. • Preparation of environmental assessment documents for Part 8 stage. • Coordination with internal AECOM Environmental Team throughout the Part 8 planning stage.	1	VL	3%	2	L	€ 72,319.14	€ 108,478.71	€ 144,638.28	€ 2.00	€ 1,807.98	€ 2,711.97	€ 3,615.96	Residual	05/11/2024	This process has been managed continually during Phase 5 through regular communications with DLRCC.
	D. 05	18/01/2023	DLRCC / NTA	Client	Risk	Project Management	Significant number of Stakeholders with an interest in DL Central Active Travel Scheme	• Liaison undertaken with key stakeholders from early design stage. • Proposals were agreed within Project Steering Group before going to stakeholder and public awareness. • Consultation formalised with key stakeholders	1	VL	3%	2	L	€ 72,319.14	€ 108,478.71	€ 144,638.28	€ 2.00	€ 1,807.98	€ 2,711.97	€ 3,615.96	Residual	05/11/2024	This process has been managed continually during Phases 3-5 .
	D. 06	18/01/2023	AECOM / DLRCC	Design / Scope Change	Risk	Project Management	Inaccurate or insufficient survey data causing re-design. The Detailed design was primarily based off the Topographical & GPR surveys which were undertaken for the whole site at preliminary design phase.	• Minor additional surveys were commissioned during preliminary design to ensure full site coverage. • Survey data checking process took place, run by a senior member of the AECOM team.	2	L	13%	2	L	€ 72,319.14	€ 108,478.71	€ 144,638.28	€ 4.00	€ 9,401.49	€ 14,102.23	€ 18,802.98	Residual	05/11/2024	This process has been managed continually during Phase 5 .
	D. 07	18/01/2023	AECOM / DLRCC	Design / Scope Change	Risk	Utilities	Potential significant impacts to services in terms of diversion or projection requirements, based off locations noted in topographical & GPR surveys; and record information from utility providers. Causing re-design of infrastructure	• Early engagement with affected utility providers by scheme took place, based off utility record information and TOPO / GPR survey results. • Engagement was also undertaken with relevant departments in DLRCC with responsibility for various utilities. • Reviews of design proposals were undertaken by relevant utility providers and approach agreed.	2	L	13%	2	L	€ 72,319.14	€ 108,478.71	€ 144,638.28	€ 4.00	€ 9,401.49	€ 14,102.23	€ 18,802.98	Residual	05/11/2024	This process has been managed continually during Phase 5 .
	D. 08	18/01/2023	DLRCC	Environmental	Risk	Environmental	Impact of the scheme on local landscape character and the visual setting	• DLRCC have been engaged at an early stage with respect to landscape mitigation measures, particularly in the areas around Rose Park and Emmet Park. • AECOM landscape team have been commissioned to develop a comprehensive detailed design landsacping design. • Landscaping designs have been approved by DLRCC at completion of detailed design phase.	1	VL	3%	1	VL	€ 14,463.83	€ 43,391.48	€ 72,319.14	€ 1.00	€ 361.60	€ 1,084.79	€ 1,807.98	Closed	05/11/2024	This process has been managed continually during Phase 5 .
	D. 09	18/01/2023	AECOM / DLRCC	Programme	Risk	Project Management	Delay in procurement of the works	• Continuing liaison with DLRCC regarding progress have taken place. • Regular reporting to the NTA by DLRCC.	0	#N/A	2%	0	#N/A	#N/A	#N/A	#N/A	€ -	€ -	€ -	€ -	Closed	05/11/2024	Risk no longer applicable at this stage as it was specific to tender procurement process.
	D. 10	18/01/2023	DLRCC	Construction	Risk	Contractor	Impact of construction works on traffic	• AECOM prepared detailed specifications and Preliminary Traffic Management Plans for inclusion in the tender pack. • AECOM have engaged with DLRCC Roads and Traffic Departments during detailed design phase to capture TM requirements. • Requirements were included in the tender pack to ensure that the Contractor produces detailed traffic management plans for construction works. • Contractor requirements at construction phase - detailed consultation with DLRCC Roads and Traffic Department to agree extent and phasing of works will be required.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Residual	05/11/2024	This process has been managed continually during Phase 5 .
	D. 11	18/01/2023	AECOM / DLRCC	Construction	Risk	Land Services	Engagement and agreement with Landowners of Accommodation Works	• No formal accommodation works anticipated to be required as part of the scheme. • Some minor temporary land acquisition at tie ins of side roads will be required. The Contractor will be required to liaise with the landowner / management company prior to work being undertaken - this has been noted in the tender documents.	1	VL	3%	2	L	€ 72,319.14	€ 108,478.71	€ 144,638.28	€ 2.00	€ 1,807.98	€ 2,711.97	€ 3,615.96	Residual	05/11/2024	This process has been managed continually during Phase 5 .
	D. 12	18/01/2023	AECOM / DLRCC	Client	Risk	Project Management	Risk of errors / discrepancies in the Tender Docs / Pricing Documents submitted to Contractor, which may lead to programme delays / price discrepancies.	• Regular liaisons and design submissions to DLRCC during the detailed design phase have taken place. • Design & Tender Document reviews have been undertaken by AECOM internal team (and documented through the AECOM internal quality management process). • NTA Gateway 5A review took place. • Peer Review took place.	2	L	13%	4	H	€ 433,914.83	€ 578,553.11	€ 723,191.39	€ 8.00	€ 56,408.93	€ 75,211.90	€ 94,014.88	Residual	05/11/2024	This process has been managed continually during Phase 5 .
	D. 13	09/03/2023	AECOM / DLRCC	Programme	Risk	Project Management	Tight Project Detailed Design Delivery Programme.	• Project Team was established to manage the project. • Project Execution Plan to be approved by DRCC • Regular project meetings between AECOM & DLRCC took place during the detailed design phase, and design issues / proposals workshopped as necessary to avoid project delays arising as a result. • Project programme has produced and was frequently checked/revised as part of the detailed design process.	0	#N/A	#N/A	0	#N/A	#N/A	#N/A	#N/A	€ -	€ -	€ -	€ -	Closed	05/11/2024	Risk no longer applicable at this stage as it was specific to detailed design / tender process.
	D. 14	09/03/2023	AECOM / DLRCC	Environmental	Risk	Environmental	Identification of protected species - particular risk in the Rose Park areas and Emmett Park areas. Impact on cost and programme at construction stage.	• Part 8 environmental assessments identified no protected species within the scheme extents to be considered during design. • A Pre-construction walkover will be undertaken.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	This process has been managed continually through the design phase & will remain managed during construction.
	D. 15	09/03/2023	AECOM / DLRCC	Design	Risk	Traffic	Unknown developments on route are made known to the design team late in the design process, requiring a design change to the scheme. Cost and programme impact.	• Regular communication with DLRCC was undertaken during the detailed design process, allowing AECOM to catch any potential issues early on. • Monitoring of planning applications were undertaken by AECOM during detailed design process.	0	#N/A	#N/A	0	#N/A	#N/A	#N/A	#N/A	€ -	€ -	€ -	€ -	Closed	05/11/2024	Risk no longer applicable at this stage as it was specific to detailed design process.
	D. 16	09/03/2023	DLRCC / NTA	Approvals (Statutory / Overseeing Organisation)	Risk	Client	Delay or failure in full scheme gaining approval for Detailed Design to move to construction (NTA Gateway 5A / 5B).	• Continuous liaison with the DLRCC regarding progress through detailed design phase. • Engagement with stakeholders/public awareness.	3	M	36%	1	VL	€ 14,463.83	€ 43,391.48	€ 72,319.14	€ 3.00	€ 5,134.66	€ 15,403.98	€ 25,673.29	Pending	05/11/2024	Risk ongoing through Gateway 5B approval process.
	D. 17	09/03/2023	DLRCC / NTA	Political / Funding	Risk	Client	Funding not made available for full scheme to move to Construction phase.	• Continuous liaison with DRCC and NTA.	3	M	36%	1	VL	€ 14,463.83	€ 43,391.48	€ 72,319.14	€ 3.00	€ 5,134.66	€ 15,403.98	€ 25,673.29	Pending	05/11/2024	Risk ongoing through Gateway 5B approval process.
	D. 18	09/03/2023	DLRCC	Construction	Risk	Contractor	Complaints from community groups and commercial businesses against disruption caused by the scheme construction (noise, dust, construction traffic, road closures/diversions)	• Contractor required to develop construction methodologies to minimise disruption. • Traffic surveys, site visits, observations of local travel patterns and traffic modeling/junctions analyses.	2	L	13%	2	L	€ 72,319.14	€ 108,478.71	€ 144,638.28	€ 4.00	€ 9,401.49	€ 14,102.23	€ 18,802.98	Pending	05/11/2024	Risk ongoing.
	D. 19	09/03/2023	AECOM / DLRCC	Construction	Risk	Contractor	Archeological remains uncovered during construction	• Contractor to include for some provision of archaeological assessment prior to any excavation works.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 20	09/03/2023	AECOM / DLRCC	Design	Risk	Utilities	Clashes between proposed kerb line and existing manholes and chambers due to discrepancies between information available at design phase and location of infratructure at construction phase, requiring re-design at construction phase.	• Realignment of proposed kerbs. • Possible realignment of utilities. • Possible realignment of kerbs/footways/cycleways.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Clash detection has been undertaken to inform kerb lines
	D. 21	09/03/2023	AECOM	Design	Risk	Traffic	Level difference between footpath and cycle track and between cycle track and carriageway	• Footways and cycle tracks to be flush with top of kerb where levels allow it. 3d model was undertaken through detailed design phase.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 22	09/03/2023	AECOM / DLRCC	Construction	Risk	Contractor	Demolition of Walls throughout scheme and maintenance in good condition to allow for careful reconstruction. Risk that walls are not maintained sufficiently and new stone will need to be procured.	• Contractor to prepare detailed construction methodology in advance of works. All demolition works to be carried out to avoid structural instability of boudary walls and cantilevers.	2	L	13%	2	L	€ 72,319.14	€ 108,478.71	€ 144,638.28	€ 4.00	€ 9,401.49	€ 14,102.23	€ 18,802.98	Pending	05/11/2024	Risk ongoing.

RISK RANK	RISK ID	DATE IDENTIFIED	RISK OWNER	CATEGORY	RISK / OPPORTUNITY	TECHNICAL DISCIPLINE	RISK DESCRIPTION *(Describe Cost, Programme & Quality Impacts)* Note: **Qualitative** *Costs associated with review contain within Initial Risk Exposure and Residual Risk Exposure*	RESPONSE *(Mitigation [M] and/or Contingency [C])*	RISK EXPOSURE									CONSTRUCTION RISK VALUE			Status	Register Review Date	REVIEW COMMENTS
									PROBABILITY			COST IMPACT (£)					RISK RATING	€ 1,380,355.40	€ 2,291,685.03	€ 3,203,014.66			
									RANK		%	CAT		Min	Most Likely	Max	(P x CI)	Min	Most Likely	Max			
	D. 23	09/03/2023	Contractor	Construction	Risk	Utilities	Shallow utility services under existing / proposed infrastructure that will be affected by works and was not detected by Topographical / GPR survey.	• Contractor to CAT Scan every location prior to excavation and all necessary H&S procedures follows. • Contractor to ensure that all utility companies are notified prior to work being undertaken in proximity to known services, and utility company supervision is organised as required. • Contractor to ensure works are done safely where excavations need to be done near shallow ducts.	2	L	13%	4	H	€ 433,914.83	€ 578,553.11	€ 723,191.39	€ 8.00	€ 56,408.93	€ 75,211.90	€ 94,014.88	Pending	05/11/2024	Risk ongoing.
	D. 24	09/03/2023	Contractor	Construction	Risk	Utilities	General - Unidentified utilities in the ground that have not been identfied at design phase (detected by Topographical / GPR survey).	• All existing utilities identified at design phase have been identified from utility company record information, TOPO & GPR information. • Continuous liaison with utility companies and DLRCC to minimise risk of uncertainties when working in a certain area of the scheme.	3	M	36%	4	H	€ 433,914.83	€ 578,553.11	€ 723,191.39	€ 12.00	€ 154,039.77	€ 205,386.35	€ 256,732.94	Pending	05/11/2024	Risk ongoing.
	D. 25	09/03/2023	AECOM / DLRCC	Construction	Risk	Environmental	Ecological restrictions of works, particularly in Rose Park and Emmett Park areas (i.e. nesting, etc)	• Project programme will be produced by Contractor and will be frequently checked/revised. • TTM Plan produced and checked.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 26	09/03/2023	AECOM / DLRCC	Construction	Risk	Utilities	Utilities clash with bus shelter foundation	• Clash check was undertaken as part of Detailed Design. • Engagement with JC Decaux regarding alternative foundation to avoid utilities will be undertaken as required during construction phase.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 27	05/01/2024	AECOM / DLRCC / NTA	Construction	Risk	Contractor	Innovative elements to be implemented as part of scheme, risk of construction issues associated with constructability of innovative elements.	• Engagement was undertaken with other similar schemes with regards to these innovative design / construction elements. • Implementation instructions included in tender documents. • Tender process required works proposal submissions from tenderers as part of tender submission	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 28	05/01/2024	AECOM / DLRCC / NTA	Procurement	Risk	Project Management	Costing Risk with bespoke elements to be constructed - issues with quantifying	• Engagement was undertaken with other similar schemes with regards to these innovative design / construction elements. • Tender documents were amended to include item coverages for key bespoke elements.	2	L	13%	4	H	€ 433,914.83	€ 578,553.11	€ 723,191.39	€ 8.00	€ 56,408.93	€ 75,211.90	€ 94,014.88	Pending	05/11/2024	Risk ongoing.
	D. 29	05/01/2024	AECOM / DLRCC	Construction	Risk	Environmental	Environmental Impacts at Construction Phase	• Requirement for contractor to enforce environmental elements.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 30	05/01/2024	AECOM / DLRCC	Construction	Risk	Utilities	Risk that Traffic Fibre Infrastructure isn't in anticipated location. Lack of accurate information was provided by DCC Traffic Department to the detailed design team, however the expectation of DCC is that the existing fibre is to be retained and protected in place. Risk that existing fibre will not be located in the approximate locations identified by DCC, which will require re-design elements while on site.	• Engagement with utility company and as many records as possible obtained. • Liaison with DCC Traffic Department & submission of proposed Detailed Designs for acceptance.	3	M	36%	4	H	€ 433,914.83	€ 578,553.11	€ 723,191.39	€ 12.00	€ 154,039.77	€ 205,386.35	€ 256,732.94	Pending	05/11/2024	Engagement with DCC traffic department and DLRCC ITS department through detailed design phase which included review of their record information, design workshops and sight walkovers. Design swere submitted to DCC traffic department throughout design phase.
	D. 31	05/01/2024	AECOM / DLRCC	Construction	Risk	Utilities	Risk that Public Lighting infrastructure isn't in anticipated location. The record information was provided by DLRCC PL department however it was not detailed (and the department was unable to provide any additional clarity).	• Engagement with utility company and as many records as possible obtained. • Liaison with DCC PL Department & submission of proposed Detailed Designs for acceptance.	3	M	36%	4	H	€ 433,914.83	€ 578,553.11	€ 723,191.39	€ 12.00	€ 154,039.77	€ 205,386.35	€ 256,732.94	Pending	05/11/2024	Engagement with DLRCC public lighting department through detailed design phase which included design workshops and site walkover. Designs were submitted to DLRCC public lighting department and approved.
	D. 32	05/01/2024	Contractor	Construction	Risk	Contractor	General risk of damaging trees when working in proximity to them across the scheme.	• Arborist was retained during preliminary & detailed design phase and arboricultural impact report & mitigation strategies were developed. This information was provided to the tenderers at tender phase. • Arborist supervision at construction phase required.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 33	05/01/2024	Contractor	Construction	Risk	Contractor	Risk of auger boring in Rose Park areas.	• Arborist was retained during preliminary & detailed design phase and arboricultural impact report & mitigation strategies were developed. This information was provided to the tenderers at tender phase. • Arborist supervision at construction phase required.	3	M	36%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 9.00	€ 51,346.59	€ 102,693.18	€ 154,039.77	Pending	05/11/2024	Risk ongoing.
	D. 34	05/01/2024	Contractor	Construction	Risk	Contractor	H&S Risks associated with thrust boring in Rose Park areas.	• Construction stage method statements will be required by Contractor.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 35	05/01/2024	Contractor	Construction	Risk	Contractor	Risk of wall removal along Rose Park to install new footpath along Kill Avenue - retention of level of soil areas behind behind the wall	• Construction stage method statements will be required by Contractor.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 36	05/01/2024	AECOM / DLRCC	Construction	Risk	Contractor	Risk of utilities in proposed raingarden areas. Potential re-location / protection of utilities required.	• The locations of the raingardens have been developed by sub-consultants in tandem with a clash check off the Topographical & GPR surveys.	3	M	36%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 9.00	€ 51,346.59	€ 102,693.18	€ 154,039.77	Pending	05/11/2024	Risk ongoing.
	D. 37	05/01/2024	Contractor	Construction	Risk	Contractor	Risk of damage to existing trees when installing infrastructure (DUPLICATION)	• Arborist supervision at construction phase required. • Arborist engagement at design phase, in addition to arboricultural impact report & mitigation strategies, required.	0	#N/A	#N/A	0	#N/A	#N/A	#N/A	#N/A	€ -	€ -	€ -	€ -	Closed	05/11/2024	
	D. 38	15/01/2024	AECOM	Design / Scope Change	Risk	Client	Risk of slips, trips and falls during & post-construction, which would require an amendment to the constructed scheme to address any issues.	• Design has been undertaken in accordance with that shown in Cycle Design Manual • Scheme has been Road Safety Audited (both Stage 1 RSA and Stage 2 RSA) & accepted by Auditors • Risk Assessment process undertaken between AECOM / DLRCC.	3	M	36%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 9.00	€ 51,346.59	€ 102,693.18	€ 154,039.77	Pending	05/11/2024	Risk ongoing.
	D. 39	15/01/2024	AECOM	Design / Scope Change	Risk	Client	Risk of new safety issues being identified following Stage 3 & Stage 4 Road Safety Audit - undertaken post completion of scheme. There is a risk that this audit identfies the need for changes to the scheme.	• Design has been undertaken in accordance with that shown in Cycle Design Manual • Scheme has been Road Safety Audited (both Stage 1 RSA and Stage 2 RSA) & accepted by Auditors	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 40	15/01/2024	AECOM	Client	Risk	Traffic	Risk that large vehicles are unable to manoeuvre through the new compact junction layouts. There is a risk that larger HGV vehicles struggle with the new tighter turning requirements at the junctions, and frequently cause delays / damage kerbing etc, causing complaints to be raised by the local community.	• AECOM have undertaken swept path analyses of a refuse lorry through the proposed junctions, to inform the design of the junctions.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 41	15/01/2024	AECOM	Client	Risk	Utilities	Risk that location of the new public lighting poles set back off Kill Avenue will be located closer to the existing trees off Rose Park - regular maintenance of exising trees will be required to minimise reduction in lighting levels due to overgrown trees. There is a risk of inadequate lighting levels on the footpath on Kill Avenue should the trees not be maintained.	AECOM have undertaken a review of the proposed public lighting with DLRCC lighting department. Proposed lighting has been agreed, and internal management by DLRCC required in terms of maintenance, to minimise risk	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 42	15/01/2024	AECOM	Client	Risk	Drainage & Flooding	Risk of capacity pressures to existing drainage network during storm events on Mounttown Road Upper.	Extensive drainage modelling and civil 3d analysis has been undertaken to mitigate risk while scheme drainage design was undertaken.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 43	15/01/2024	AECOM	Environmental	Risk	Environmental	Risk that sufficient quantities of local wildflower seeds are not available to use on DLR Central scheme, despite prior commitment of same by DLRCC Ecologist. Contractor will then need to source, leading to potential delays, costs, and risk that sourced seeds are not the same as required local seeds.	DLRCC and AECOM to liaise with DLRCC Ecologist to ensure this is programmed in.	2	L	13%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 6.00	€ 18,802.98	€ 37,605.95	€ 56,408.93	Pending	05/11/2024	Risk ongoing.
	D. 44	05/11/2024	AECOM / DLRCC	Client	Risk	Traffic	Risk that cost assumed for DCC ITS is not in alignment with that assumed in Cost Estimate (based on previous schemes undertaken - no cost yet provided by DCC ITS to DLRCC for DL Central Active Travel Scheme)	Allowance included in Post-Tender Cost Estimate.	3	M	36%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 9.00	€ 51,346.59	€ 102,693.18	€ 154,039.77	Pending	05/11/2024	Risk ongoing.
	D. 45	05/11/2024	AECOM / DLRCC	Design / Scope Change	Risk	Traffic	Risk that ITS / Traffic Signal Design requirements change beyond that which was agreed at Detailed Design phase, requiring re-design &/or re-construction of key scheme elements.	Detailed designs were submitted and approved by DCC Traffic & DLR ITS Department representatives. Regular liaision to be undertaken with these departments once construction commences.	4	H	66%	3	M	€ 144,638.28	€ 289,276.56	€ 433,914.83	€ 12.00	€ 94,738.07	€ 189,476.14	€ 284,214.22	Pending	05/11/2024	Risk ongoing.
	D. 46	05/11/2024	AECOM / DLRCC	Client	Risk	Project Management	Risk that inflation throughout construction phase exceeds that set out in NTA Inflation Bulletin, due to changing global circumstances.	Inflation indices to be monitored during construction phase.	2	L	13%	4	H	€ 433,914.83	€ 578,553.11	€ 723,191.39	€ 8.00	€ 56,408.93	€ 75,211.90	€ 94,014.88	Pending	05/11/2024	Risk ongoing.

SA to list risk exposure rank (1-5; 5 been the highest)

Cumulative Risk Value:	€ 1,380,355.40	€ 2,291,685.03	€ 3,203,014.66
Average Cumulative Risk:		€ 2,291,685.03	

Contingency Calculator

Project Title:	DL Central Active Travel Scheme
Project / Contract Code:	60661468

NTA Project Phase:	**Phase 5 - Detailed Design and Procurement**	**Work Classification:**	**'Standard' project**

Contingency Factors:	**'Non-standard' project**		**'Standard' project**		**Quantitative Risk Assessment (QRA)**			
NTA Project Phase	**Upper bound Contingency (%)**	**Lower bound Contingency (%)**	**Upper bound Contingency (%)**	**Lower bound Contingency (%)**	**QRA Required**	**Band 1**	**Band 2**	**Band 3**
Phase 1 - Scope and Purpose	66	50	44	30	No	N/A	N/A	N/A
Phase 2 - Concept Development and Option Selection	66	50	44	30	No	N/A	N/A	N/A
Phase 3 - Preliminary Design	50	30	35	20	Yes	004_B1_QRA_CMG	013_B23_QRA_CMG	013_B23_QRA_CMG
Phase 4 - Statutory Processes	50	30	30	20	Yes	004_B1_QRA_CMG	013_B23_QRA_CMG	013_B23_QRA_CMG
Phase 5 - Detailed Design and Procurement	30	10	20	10	Yes	004_B1_QRA_CMG	013_B23_QRA_CMG	013_B23_QRA_CMG

Contributory Factors	**Mitigation Action**	**% Weighting**	**% Completed**	**% Mitigation**
Land / Planning	Proposed works confined to land within NTA ownership / control	5.0%	100.0%	5.0%
	Additional land values confirmed / land acquired	2.5%	100.0%	2.5%
	Liaison with Planning Authority / Planning commenced or awarded	2.5%	100.0%	2.5%
Design development / complexity	Design developed beyond stated NTA Project Phase	5.0%	100.0%	5.0%
	Design comprises standard construction elements	2.5%	90.0%	2.3%
	NTA / Contractor has a proven track record of delivering similar solutions	2.5%	100.0%	2.5%
Risk management	Key Project risks identified and mitigation measures defined	2.5%	100.0%	2.5%
	Key Project risks allocated appropriate cost and time allowances / QRA produced	20.0%	85.0%	17.0%
Estimates / costs independently verified	Cost build-up independently checked and verified	5.0%	100.0%	5.0%
	Alignment of costs with NTA benchmarks	7.5%	85.0%	6.4%
Scope of Proposal	Scope of works is well defined and robust	5.0%	100.0%	5.0%
Project intelligence / surveys and investigations	Surveys and investigations undertaken to inform the design	5.0%	100.0%	5.0%
Stakeholders	Affected stakeholders identified, consulted and key requirements documented	15.0%	95.0%	14.3%
Environmental impact	Proposed solution has minimal environmental impact	2.5%	100.0%	2.5%
	Base price and delivery programme includes appropriate allowance for environmental / ecological mitigation	5.0%	100.0%	5.0%
Health & Safety	Methodology mitigates serious incident occurrence	5.0%	100.0%	5.0%
Procurement	Procurement strategy concluded / tried and tested solution recommended	2.5%	100.0%	2.5%
	Procurement successfully completed	5.0%	80.0%	4.0%
		100.0%		**93.9%**

Mitigated Contingency Calculation

Upper Bound =	20.0%
Lower Bound =	10.0%
Difference =	10.0%
Mitigation % =	93.9%
Mitigation Value =	9.4%
Applicable Contingency Percentage	**10.6%**

Example of Applying Percentage Completion of Mitigating Action

Contingency Calculator Categories
Contributory Factor: Estimates / costs independently verified
Mitigation Action: Cost build-up independently checked and verified

Example of Using the Calculator:
% Completed: 100%
Why: A peer review was undertaken on all projects costs (not just construction related costs). Comments from the peer review were incorporated where deemed appropriate.

Cost build-up independently checked and verified	5.0%	100.0%	5.0%

Appendix B Ex-Post Evaluation Plan Template

Metrics/Evaluation Tools suggested:	Dun Laoghaire Central
Active travel scenario/Project Description	The proposed DL Active Travel scheme proposes the upgrade of existing footpaths and new cycle infrastructure, extending to approximately 2.8km in length
North Star Vision (& Indicators)	
1. Independent travel to school (enabling future capability & active travel norms, as well as supporting younger generation health & wellbeing from now into the future)	
2. Vision zero (Prevent crashes, Reduce injuries, Save lives)	
3. Modal share woman and teenage girls cycling	
Governance/Policy Assessment (Audit)	
Policy Audit and Governance insights: qualitative Assessment of Policies and Processes	
Policy & Active Travel Score Card	
Street/Network Assessment (Audit)	
DMURS Quality Audit for Pedestrians: Do footpath widths meet recommendations? What % of the network does not? What are priority areas for improvement?	
Cycling Network Assessment: Is there a safe, comfortable cycling network, proximal to where people live and connected to where local people want to go? Is it inclusive? Where are the connectivity gaps?	
Network/Junction Vulnerable User Risk Assessment: • Pedestrian risk hotspots • Cycle risk hotspots	
Sustainable & Safe Deliveries Assessment: Is there a practical delivery policy and network that enables local business functionality, supports sustainability goals and minimises risk to vulnerable users.	
Healthy Streets Check* (street segment e.g. Main Street or other people orientated streets such as with sig. numbers of pedestrians or high levels of retail/hospitality)	
Project Process & Outputs	
Record plan & process details Being able to identify the magic that really works is sometimes lost by not recording the details e.g. from the processes used around communications/engagement or the width or surface treatment of a pavement	
PROCESS COMPLETE/FINAL OUTPUTS measured against plan or baseline e.g. % completed compared to plan and/or % change such as in Public Space Quantity {sqm quantity of road space (re) allocation to (1) Public Space & (2) Active Travel}. Change in Quality & Utilisation of Public Realm	
_Level of Community Engagement (process complete/output): % of local community/business & other relevant groups engaged; % completion comparted to plan of e.g. Public Realm Quantity/Active Travel provision etc	

Metrics/Evaluation Tools suggested:	Dun Laoghaire Central
Baseline & Outcome (Before & After) Metrics	
People & Perception	
Community & Business Insights (CIS) survey: Project Awareness and Satisfaction (Outcome)	
Community/Business/Visitor/Tourist (as relevant) Representative Insights	
Network/trips Cyclability - User perception	
User Group Observation Study (Estimated Age & Gender)	
PRIORITY INDICATORS (Nature of traffic on Streets/networks) These can have a direct bearing on multiple policy objectives e.g. safety, air quality, noise, health and wellbeing, congestion, accessibility Vehicle speed, vol & mix found in place & movement (as also relevant to networks); footfall in place only	
Traffic Speed and flow	
Traffic Volume	
Traffic Mix e.g. large vehicles (number, speed & proximity) pose a particular threat to children and cyclists	
Modal Share/Demand (disaggregated, if school children & carer)	
PLACE (& Healthy Streets Check indicators)	
Ease of Crossing (HSC qualitative assessment)	
Accessibility and Navigation of crossings for people with Vis Impairments (HSC qualitative assessment)	
Quality of the footway/path (HSC qualitative assessment)	
Space for walking/Width of pavement (HSC qualitative assessment)	
Cycle safety at Junctions (HSC qualitative assessment)	
Quality of the carriageway surface for cycling (HSC qualitative assessment)	
Space for cycling (HSC qualitative assessment)	
Public seating (HSC qualitative assessment)	
Trees (and shelter) (HSC qualitative assessment)	
Green Infrastructure (SUDS) (HSC qualitative assessment)	
Lighting & Surveillance (HSC qualitative assessment)	
Convenience of driving short journeys/through traffic (HSC qualitative & Quant assessment)	
Bus stops: Access, comfort, shelter (HSC qualitative assessment)	
Sense of Place (Relating to heritage and local interest) (HSC qualitative assessment)	
Pedestrian Crossing Time at Signalised Junctions (Green & Amber Man) (Non HSC quantitative assessment)	
Pedestrian Waiting Times at Signalised Crossing (Non HSC quantitative assessment)	
% total road/street space allocation to different uses (Non HSC quantitative assessment)	
MOVEMENT & Network Indicators	
Extent of Network Kms (does not measure connectivity, proximity, comfort)	
Connectivity & Directness: Distance to everyday services along (i) a safety walking network and (ii) safe cycling network	
Proximity and Accessibility - easy, safe and inclusive access to active travel networks	
Network safety (Real & Perceived)	
Comfort, Continuity, Convenience	
Intermodality	
Vehicle routing data (may include local & network levels)	
Public transport travel time; or avr. Travel speed (before & after) (Note: these indicators primarily relate to Active Travel)	

Metrics/Evaluation Tools suggested:	Dun Laoghaire Central
Impact (Wider Effects) Metrics	
An Active Travel/Public Realm intervention can impact on a range of wider policy priorities such as safety, air quality, local businesses and community health & wellbeing	
Active Travel Safety	
Environment (air quality, noise, climate)	
Community health & wellbeing	

aecom.com