



DL Central Active Travel

Options Report

Dun Laoghaire Rathdown County Council

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Executive Summary

AECOM on behalf of Dun Laoghaire-Rathdown County Council (DLRCC) has been tasked with undertaking an options assessment for the emerging DL Central Active Travel Improvements scheme. The study area consists of the following:

- 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).
- 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).
- 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 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.

Scheme Objectives

- To provide continuous, high-quality and consistent cycling and walking facilities along the route;
- To provide improved public realm areas and overall visual quality;
- Promote modal shift;
- Enhance permeability and creating a place for all;
- 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.

Context

The need for the scheme was identified as part of the DLRCC Development Plan, 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.

Design Principles

A number of broad design principles contained within the National Cycle Manual and DMURS were adopted when assessing design options for the scheme, including Principles of Sustainable Safety, Quality of Service, width, integration and segregation, junctions, access and interchange, impact on other modes of transport.

Existing Conditions

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.

Options Assessment

The options assessment was undertaken using a Multi-Criteria Analysis (MCA). Multiple design options were initially identified, and brought through to a MCA for each section of the route. The assessment has identified an emerging preferred scheme for the route and a preliminary design has subsequently been developed.

Emerging Preferred Scheme and Preliminary Design

This report has identified an emerging preferred scheme for the cycling and walking infrastructure improvements along this route for which a preliminary design will be developed. The emerging preferred design proposes the following key interventions:

Bakers Corner

- The existing four arm signalised junction is proposed to be upgraded to introduce a more compact junction to reduce pedestrian and cyclist crossing distances at the junction. The existing left turn slip from Rochestown Avenue onto Kill Avenue is proposed to be removed, which will facilitate a direct single crossing for pedestrians across this arm of the junction.
- The proposed junction design is based on the CYCLOPS style arrangement which will facilitate a segregated orbital cycle path, to facilitate the safe passage of cyclists through the junction.

Kill Avenue:

- The existing footpaths on both sides of the carriageway are proposed to be widened to 2m. At one location it is necessary to reduce the footpath width to 1.8m due to the impact on existing mature trees.
- A two-way 3m wide cycle track is proposed on the southern side of the carriageway.
- Public realm improvements are proposed in the existing green space adjacent to Casement Villas including new paths, planting and associated landscaping.

Public realm improvements are proposed in the existing green space adjacent to Rose Park including new paths, planting and associated landscaping. The proposal includes a 3.0m wide footpath which runs parallel to Kill Avenue, which provides an attractive alternative route for pedestrians on Kill Avenue.

Kill Avenue / Glenageary Road Upper / Oliver Plunkett Road / Mounttown Road Lower / Highthorn Park – Signalised Junction

- The existing major five arm signalised junction is proposed to be upgraded to enhance pedestrian and cyclist safety through the junction. The proposal removes the existing left turn slips on Glenageary Road Upper, Oliver Plunkett Road and Mounttown Lower to provide a more compact junction, which will reduce crossing distances for pedestrian and cyclists.
- The junction design will be based on CYCLOPS design, which will include single direct pedestrian crossings on each arm of the junction, as opposed to the existing arrangement where pedestrians have to negotiate 3 crossings per arm on Glenageary Road Upper and Oliver Plunkett Avenue. Cyclist signals will assist to safely control the flow of segregated cyclists through the junction using an orbital cycle track around the junction.

Glenageary Road Upper

- The existing footpaths on both sides of the carriageway are proposed to be widened to 2m.
- it is proposed to introduce a one-way cycle track on the north side of the carriageway and provide a two-way, 3m wide cycle track on the southern side of the carriageway up to the Cualanor Junction.
- East of the junction with Cualanor Avenue, a two-way, 3m wide cycle track is proposed on the north side of the carriageway up to Glenageary Roundabout. The provision of this new cycle track within the existing carriageway requires the removal of the short length of existing bus lanes on Glenageary Road Upper between Laurel Hill and Glenageary Roundabout.
- Cyclist signals will assist to safely control the flow of segregated cyclists through the junction.

Glenageary Road Upper / Cualanor Avenue / Maypark Avenue – Signalised Junction

- The existing four arm signalised junction is proposed to be upgraded to enhance pedestrian and cyclist safety through the junction. The proposal removes the existing left turn slip from Maypark Avenue onto Glenageary Road Upper to provide a more compact junction.

- The proposed junction design is also based on the CYCLOPS style arrangement where single direct crossings on all arms of the junction, to reduce crossing distances for pedestrian. Also an orbital segregated cycle track will facilitate the safe flow of cyclists through the junction.

Mounttown Road Lower

- Existing footpaths are proposed to be upgraded and widened to 1.8m (min).
- A two-way, 3m wide cycle track will be provided on the east side of the carriageway.

Mounttown Road Upper

- Existing footpaths are proposed to be upgraded and widened to 1.8m (min).
- Two single lane 1.5m wide cycle tracks will be provided along the carriageway, one on the Northern Side and one on the Southern Side. There will be a shared surface between pedestrians and cyclists where these two cycle lanes merge onto the pathway near the Eastern section of the road due to insufficient space at a pinch point.
- The two proposed cycle tracks will be raised and segregated from general traffic. Additionally, car parking spaces along Mounttown Road Upper will be moved adjacent to the roadway and these cycle tracks will run on the inside, offering further segregation and protection from cyclists.
- Scheme will tie into the emerging DLRCC Connector Active Travel Scheme at the Western end of the roadway and the Tivoli Road/Mounttown Road Lower Junction at the Eastern end.

Next Steps

It is envisaged that the active travel scheme will be delivered by the submission of a Part 8 planning submission. Therefore, the next project stages will comprise of Public Engagement to facilitate feedback on the emerging scheme.

1. Introduction

Project Background

AECOM on behalf of Dun Laoghaire-Rathdown County Council (DLRCC) has been tasked with undertaking an options assessment for the DL Central Active Travel Improvements scheme. The study area encompasses Kill Avenue, Mounttown Road Lower and Glenageary Road Upper between the junctions of Oliver Plunkett Road and the junction of Sallynoggin Road.

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

Scheme Objectives

The objectives of the scheme include the improvement of facilities for people cycling and walking along the proposed route. The scheme objectives are:

1. To provide continuous, high-quality and consistent cycling and walking facilities along the route;
2. To provide improved public realm areas and overall visual quality;
3. Promote modal shift;
4. Enhance permeability and creating a place for all;
5. Improve bus priority along Kill Avenue up to the Bakers Corner Junction; and,
6. Protect and enhance sensitive landscapes.

The remainder of the report is set out as follows:

- **Design Principles** – A brief summary of design principles, including quality of service, cycle width calculator and segregation.
- **Existing Infrastructure** – A description of the existing conditions on the route based on a combination of desk-top study, site visits and observations.
- **Options Assessment** - The remaining shortlisted options are then assessed in line with the requirements of the Common Appraisal Framework (CAF) for Transport Projects and Programmes [Department of Transport Tourism and Sport (DTTAS), 2016]. A Multi-Criteria Analysis (MCA) is carried out on each option under the standard CAF assessment criteria plus an additional criterion of Quality of Service (QOS).

Need for the Scheme

The main reasons supporting the need to improve the current facilities along Kill Avenue, Mounttown Road Lower, Mounttown Road Upper and Glenageary Road Upper are:

1. Existing cycle network along Kill Avenue and Glenageary Road and Mounttown Road Upper include advisory cycle lanes, with no protected cycle infrastructure. Opportunity to enhance safety for vulnerable road users in particular at conflict points i.e. at junctions, driveways and side roads.
2. Opportunity to provide a safe and reliable cycle network along Kill Avenue, Mounttown Road Lower, Mounttown Road Upper and Glenageary Road Upper and their junctions.
3. Existing bus priority along Kill Avenue is often impacted due to general traffic queuing from Bakers Corner. Opportunity to enhance bus priority at this location. Large concrete areas which could be improved to provide better public realm spaces, like planting and landscaped areas, for users. To improve the public realm including enhancing existing public spaces and improving planting along the routes.

This next section of the report provides context on the scheme and reviews the existing conditions. The issues and network deficiencies identified help to establish the need for the scheme under study.

2. Design Principles

The proposed DL Central scheme aims to provide a high-quality, segregated cycle route, improved pedestrian facilities and enhanced public realm areas to cater for the increasing demand in the area. This chapter will outline the broad design principles that will be adopted when assessing design options for this scheme.

Quality of Service

Central to the development of a preferred option will be the Quality of Service (QOS) of the route.

'Quality of Service is a measurement of the degree to which the attributes and needs of the cyclist are met. In other words it describes the quality of the cycling environment – a high Quality of Service will better meet the 5 Needs of the Cyclist.' (National Cycle Manual, Section 1.4)

Table 2-1 QOS Criteria (Source: National Cycle Manual)

Quality of Service	Pavement condition (PCI range)	Number of adjacent cyclists	Number of conflicts per 100m of route	Journey time delay (% of total travel time)	HGV influence (% of total traffic volume)
Level A+	86 – 100	2 + 1	0 – 1	0 – 5%	0-1%
Level A	66 – 85	1 + 1	0 – 1	6– 10%	0-1%
Level B	51 – 65	1 + 1	1 – 3	11 – 25%	2 – 5%
Level C	41 – 50	1 + 0	4 – 10	26 – 50%	6 – 10%
Level D	20 – 40	1 + 0	>10	>50%	>10%

The design aims to achieve a Quality of Service (QOS) Level A, where practicable. Section 1.4 of the National Cycle Manual sets out the criteria that are to be met in order to achieve each QOS level. The criteria are reproduced in the table below. To achieve a certain QOS level at least four of the five requirements for that level must be met. For example, to meet QOS Level A, four of the following are required:

1. Pavement condition (PCI range) of 66-85
2. Journey time delay of 6-10% (of total travel time)
3. HGV influence 0-1% (of total traffic volume)
4. Number of adjacent cyclists: 1+1 (i.e. space for overtaking)
5. Number of conflicts per 100m of route: 0-1

Width

The National Cycle Manual width calculator is a tool to determine the appropriate width of a cycle lane or track. This includes three basic elements:

1. Space to the left of a cyclist;
2. Space required to support the cycling regime (two-abreast, single file, overtaking etc); and
3. Space to the right of a cyclists.

This calculator also allows for other geometric features such as sharp bends, turning pockets for cyclists and loading bays/taxi ranks. Furthermore, the manual provides tips to create additional effective width for cyclists. This includes reducing kerb heights between the cycle lane/track and footpath to 50mm or lower so that it doesn't catch the lower pedal of the bicycle and using side draining gullies in the cycle lane/track.

Junctions

The DL Central Cycle route will interact with traffic at junctions and accesses along the proposed route. In keeping with the National Cycle Manual, the recommended option will seek to minimise the frequency of vehicle conflicts, in order to optimise the Quality of Service for cyclists.

For the signalised junctions along the DL Central scheme, the safe progression of cyclists through these junctions will have to be considered carefully. It is proposed that cyclists are separated from larger traffic (particularly HGVs) when performing turning manoeuvres. This can be done by providing cyclists with physical segregation, advanced stop lines/advanced stacking locations, a dedicated signal stage or providing cyclists with an 'early start' traffic signal which will allow them to advance through the junction by approximately six seconds before other vehicles are given a green light.

Access & Interchange

The connection of the cycle route with other existing facilities and the ability to interchange with bus routes will be important in providing a robust and effective route. This will include safe accessibility for other cyclists to safely and easily access/egress the cycle route at various points. Furthermore, the provision of safe crossing facilities for other road users such as pedestrians and people needing to access/egress properties will also have to be considered.

Pedestrian and Cycle Priority

Designing for pedestrian and cycle priority at conflict points across side roads and entrances will assist to enhance safety for vulnerable road users. The scheme will promote pedestrian and cyclist priority at the conflict points as per the DMURS guidelines. Figure 2-2 below illustrates examples where similar priority has been designed for pedestrians and cyclists.

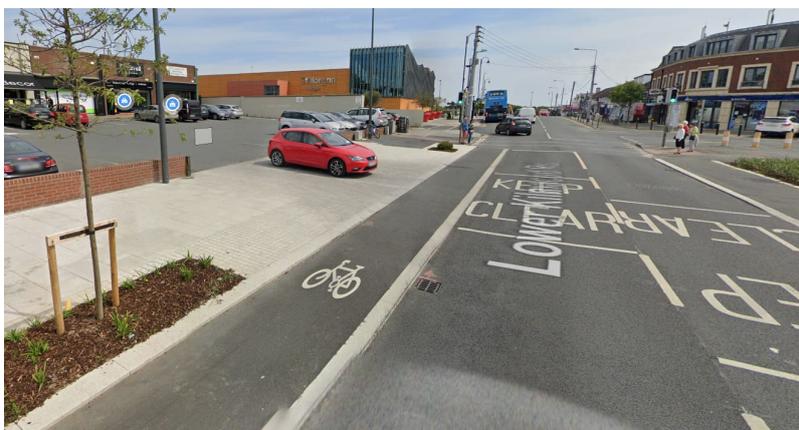


Figure 2-2 Examples of Continuous Pedestrian and Cycle Priority (Source Google Maps)

3. Existing Infrastructure

This section summarises the findings of an assessment of the existing infrastructure conditions throughout the scheme. This represents a documentation of the existing issues and problems along this scheme. It is based on an assessment of the needs of pedestrians and cyclists, general road safety issues, road and public transport infrastructure, and points of congestion/conflict.

Site Description

The study area consists of Kill Avenue, Mounttown Road Lower, Mounttown Road Upper and Glenageary Road Upper between the junction with the R830 and Glenageary Roundabout, a distance of 2.2km as shown in Figure 3.1 below. The scheme forms part of a road network linking Glenageary in the east to Deansgrange in the west. The route also serves a number of Dublin Bus and GoAhead Bus Routes.

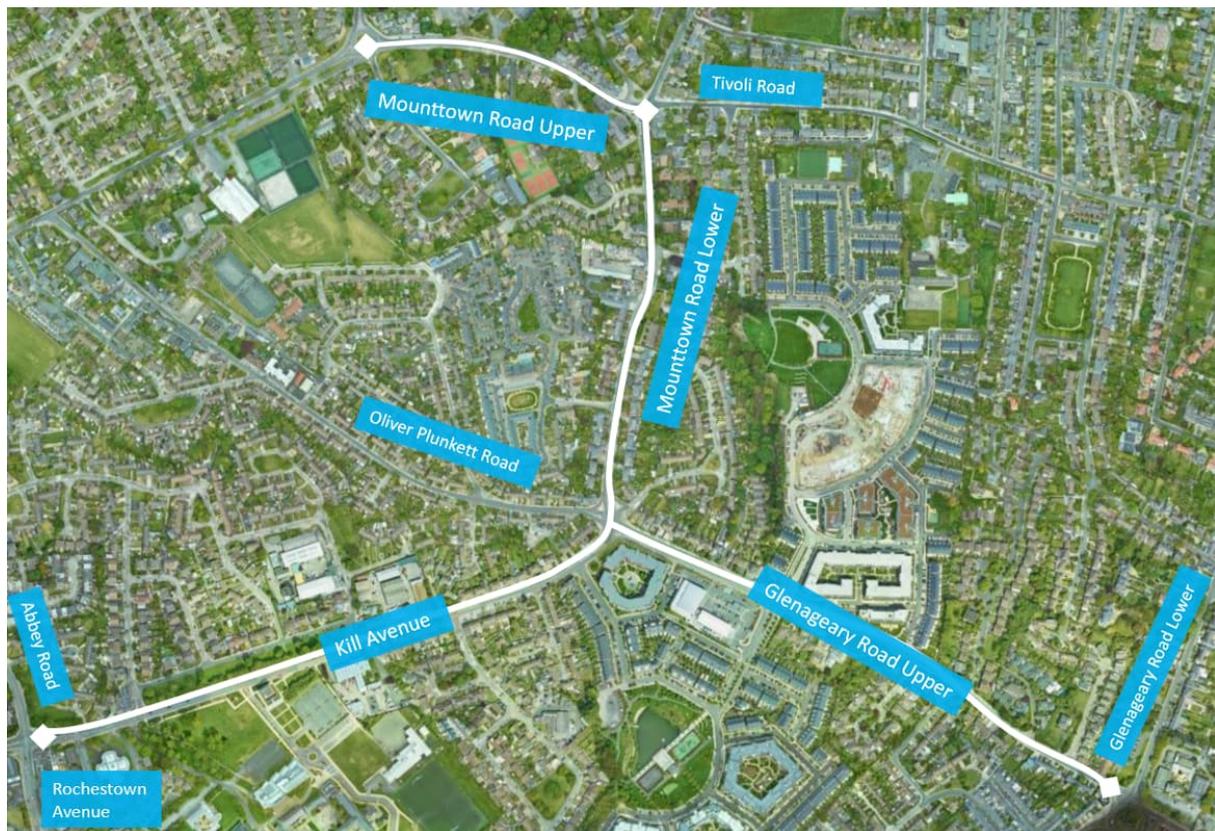


Figure 3-1 Scheme Extents

Route Sections

For the purposes of examining existing conditions and assessing design options the route has been divided into three sections as shown in Figure 3.2. A summary of the existing characteristics of each route section is given in the sections below.



Figure 3-2 Route Sections

Section 1 Kill Avenue (Bakers Corner Junction to Ashgrove)

Typical road widths on Kill Avenue on this section are 15m between the road boundaries. The carriageway is typically 10.5m wide and comprises of a traffic lane in each direction and a cycle lane on the northern side of the carriageway and a bus lane on the southern side of the carriageway, there is no cycle facility provided on the southern side of the carriageway.

The advisory cycle lane on the northern side of the road carriageway is typically 1.4m wide and has a narrower effective width due to existing gullies. The footpath widths on the north side are typically 2m; on the south side footpath width is typically 1.8m.

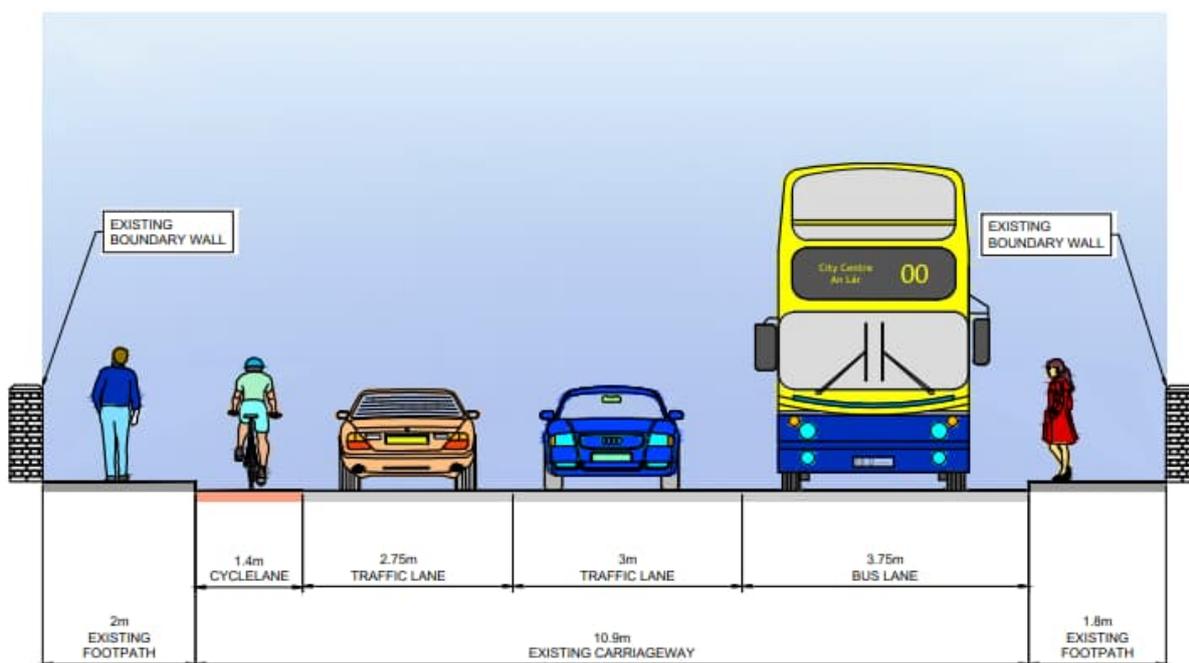


Figure 3-3 Typical Cross Section – Section 1



Figure 3-4 Typical Road Layout of Section 1

Section 2: Kill Avenue (Ashgrove to Glenageary Road Upper)

Typical road widths on Kill Avenue along this section are 14.5m between the road boundaries. The carriageway is typically 7.25m wide and comprises a traffic lane and advisory cycle lane in each direction and footpaths on both sides. The advisory, unsegregated cycle lane is typically 1.4m wide. The footpath widths on the north side are typically 1.8m; on the south side the footpath is quite wide, typically 5.5m with a strip of trees/green area.

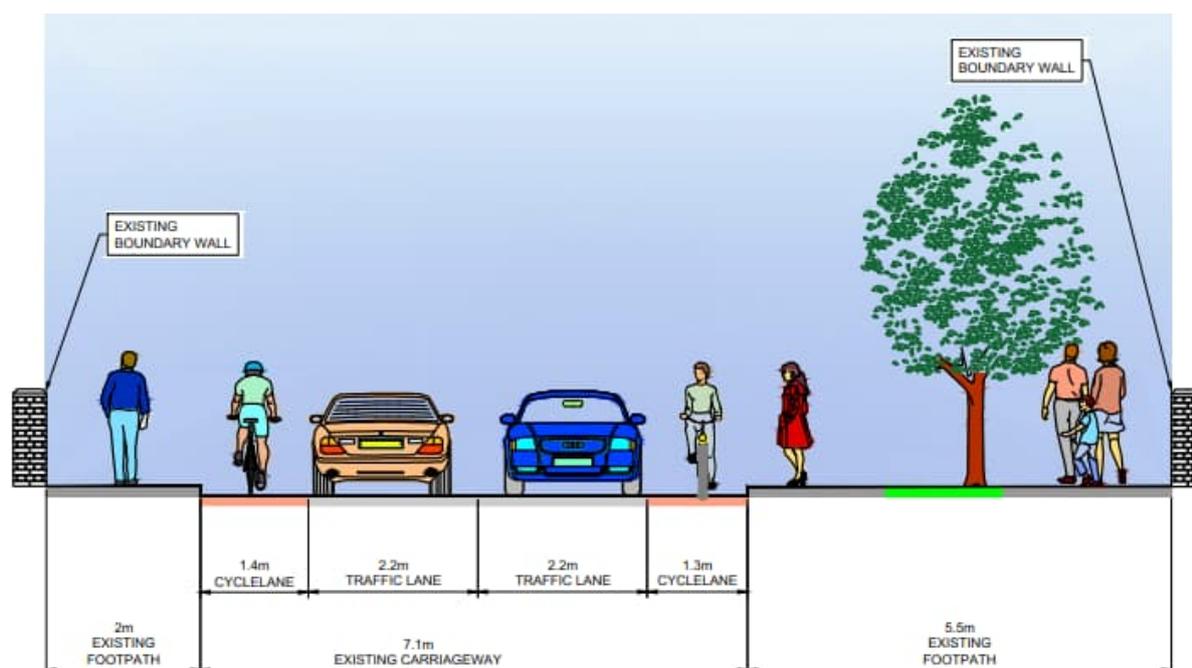


Figure 3-5 Typical Cross Section – Section 2



Figure 3-6 Typical Road Layout of Section 2

Section 3: Glenageary Road Upper (Kill Avenue to Cualanor)

Typical road widths on Glenageary Road Upper on this section are 21m between boundary walls. However, there are certain sections where this increases to 25m. The carriageway is typically 17m wide and comprises multiple traffic lanes and an advisory cycle lane in each direction and footpaths on both sides. The unsegregated cycle lane is typically 1.4m wide and has a narrower effective width due to drainage channels and gullies. The footway widths are relatively consistent and uninterrupted by trees or lighting columns.

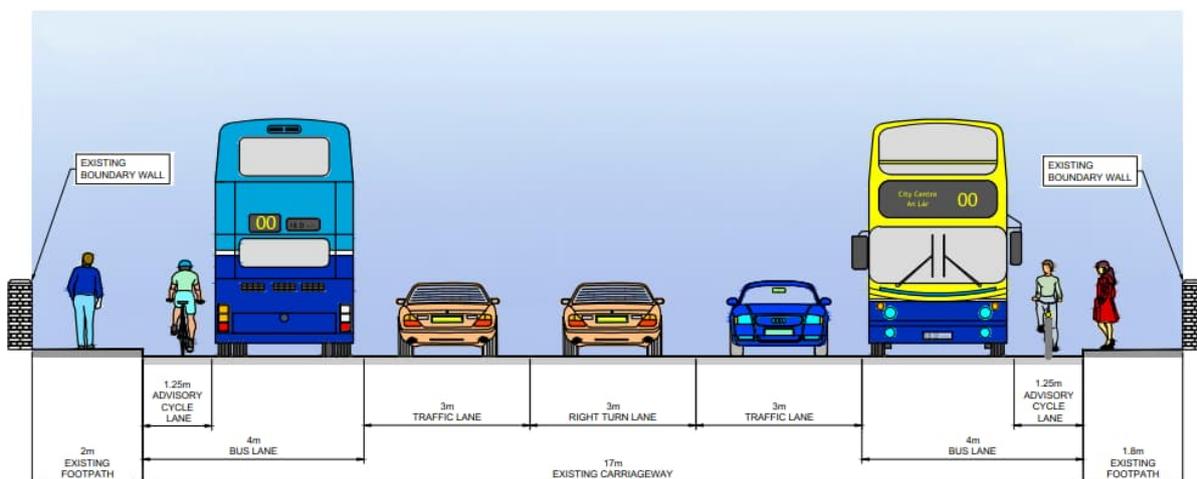


Figure 3-7 Typical Cross Section – Section 3



Figure 3-8 Typical Road Layout of Section 3

Section 4: Glenageary Road Upper (Cualanor to Glenageary Roundabout)

The typical width between boundary walls narrows from 16m at Gowrie Park to 13.5m at Glenageary Roundabout. The carriageway is typically 10.5m wide along this section and comprises a traffic lane and cycle lane in each direction and footpaths on both sides. The unsegregated cycle lane is typically 1.3m wide and has a narrower effective width due to drainage channels and gullies. There are also areas of ponding on the cycle lanes due to an uneven surface.

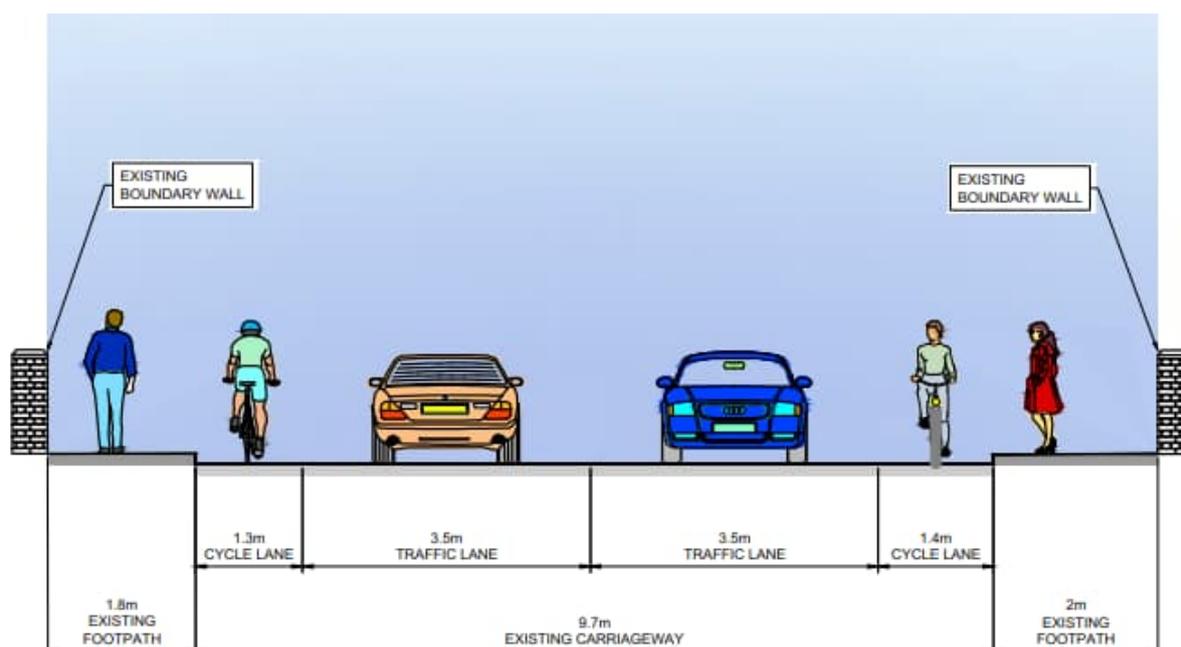


Figure 3-9 Typical Cross Section – Section 4



Figure 3-10 Typical Road Layout of Section 4

Section 5: Mounttown Lower

Typical road widths on Mounttown Lower are 15m between boundary walls. However, there is a certain section where this decreases to 12m. The carriageway is typically 10m wide and comprises a traffic lane and cycle lane in each direction and footpaths on both sides. The footpath widths vary along this section but the effective width is reduced due to lighting columns, traffic signal poles, and controller boxes.

Cars are often parked along Mounttown Lower, in particular on the western side of the carriageway near to the Woodlawn Park junction. Parking is predominately associated with motorists accessing the retail services along Mounttown Lower.

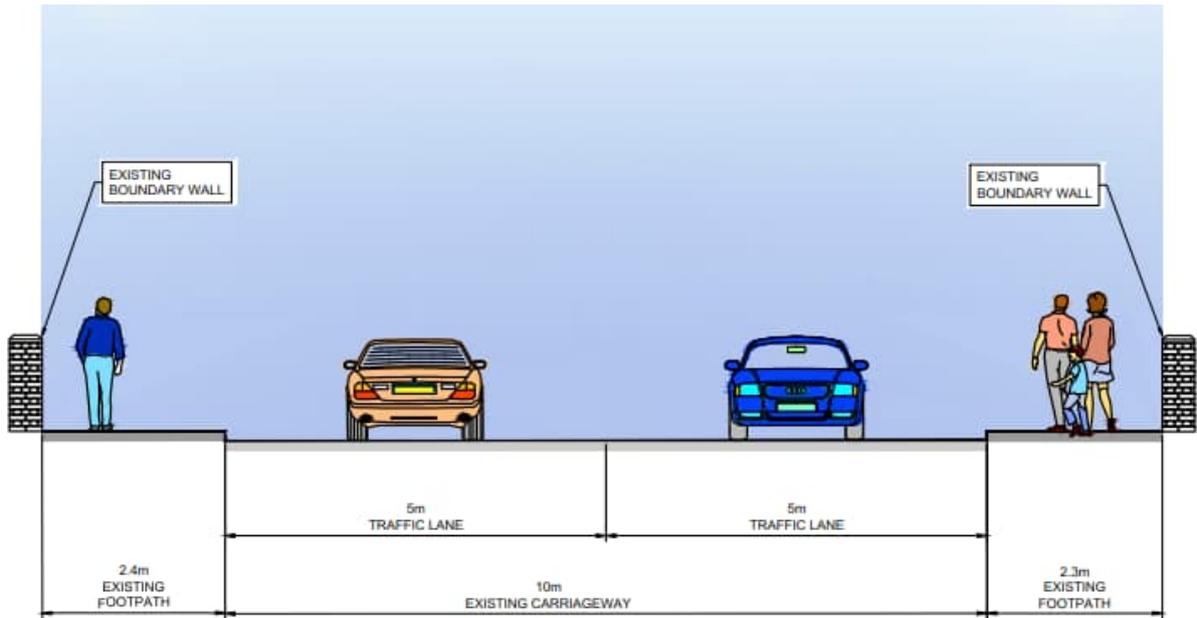


Figure 3-11 Typical Cross Section – Section 5



Figure 3-12 Typical Cross Section – Section 5

Section 6: Mounttown Road Upper

At present, Mounttown Road Upper of a lane for general traffic in either direction, an unsegregated cycle lane on either side of the corridor which run parallel to these road lanes and a footpath also each side. Typical widths along this section range drastically from 10.5m at the narrowest point to 35m wide at the central and widest segment. The current cycling tracks run along the general traffic lanes and parking spaces exist in between these cycle lanes and the pedestrian pathways for much of this section. These cycle tracks run in front of two bus stops, one on the Northern side and one on the Southern side.

Additionally, the footpaths along this section range from 1.8m wide to 5m wide. The effective width of these footpaths is particularly decreased at the Eastern section of the roadway due to lighting columns and residential waste bins which are often left on the pathways.



Figure 3-13 Typical Cross Section – Section 6

4. Options Assessment – Multi-Criteria Analysis

This stage comprises an assessment of potential scheme options identified along each section of the route, using the criteria defined in section 4.1 below.

Methodology

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.

An additional criterion of **Quality of Service** has been added to the assessment as the delivery of a Level A route is a fundamental objective of the scheme. It is assumed that all options will provide a significantly improved pavement condition (cycling surface), therefore, it has not been included as a sub-criteria for the assessment.

Table 4-1 MCA Criteria

Criterion	Assessment Sub-Criteria	Description
Economy	1.a. Capital Cost	Overall cost of the project
	1.b. Transport Reliability and Quality (Journey Time)	Impact on journey reliability and quality
Integration	2.a. Land Use Integration	Assessment of compatibility with land use strategies and regional and local plans, assessment of support for land use factors
	2.b. Residential Population and Employment Catchments	Impact upon existing residential areas
	2.c. Transport Network Integration	Impact on the operation of other transport services both during construction and in operation. Impact on the development of other transport infrastructure projects during construction.
	2.d. Cycle Network Integration	Impact on ease of interchange between modes. Impact on the development of other cycle infrastructure projects.
	2.e. Traffic Network Integration	Impact on traffic for wider traffic network

Accessibility & Social Inclusion	3.a. Vulnerable Groups	Impacts on low-income groups, non-car owners, people with a disability
	3.b. Deprived Geographic Areas	Impact of project on deprived areas.
Safety	4.a. Road User Safety	Accident reduction impacts including impacts on particular groups of road users.
Environment	5.a. Air Quality	Impacts to greenhouse gas emissions and local air quality.
	5.b. Landscape and Visual Quality	Key landscape characteristics affected; Effects on key views; Impact on intrinsic character of landscape.
	5.c. Biodiversity	Potential compliance/conflict with biodiversity objectives; Indirect impacts on protected species, designated sites; Overall effect on nature conservation resource.
	5.d. Cultural Heritage	Overall effect on cultural, archaeological and architecture heritage resource.
	5.e. Land Use	Overall impact on land take, property and geology.
Quality of Service	6.a. Number of adjacent cyclists	Capacity for cycling two abreast and/or overtaking.
	6.b. Number of conflicts	Potential interruptions to a cyclist per 100m.
	6.c. Junction time delay	Actual time delay at junctions as a percentage of the overall journey time.
	6.d. HGV Influence	The number of HGVs and buses adjacent to cyclist.
Physical Activity	7.a. Physical Activity Impacts	The health benefits derived from using different transport modes.

For each assessment criteria considered, options are compared against each other based on a five-point scale, ranging from having significant advantages to significant disadvantages over other scheme options. For illustrative purposes, this five-point scale is colour coded as presented in the table below with advantageous options graded to 'dark green' and disadvantageous options graded to 'dark red'. An expanded version of this MCA is also provided in Appendix A.

Table 4-2 Five Point Scoring Scale

Colour	Description
	Significant advantages over the other options
	Some advantages over other options
	Neutral compared to other options
	Some disadvantages compared to other options
	Significant disadvantages compared to other options

Road Sections

For ease of assessment the proposed route shall be broken up into the following:

- Section 1 – Kill Avenue (Bakers Corner to Ashgrove)
- Section 2 – Kill Avenue (Ashgrove to Glenageary Road Upper)
- Section 3 – Glenageary Road Upper (Kill Avenue to Cualanor)
- Section 4 – Glenageary Road Upper (Cualanor to Glenageary Roundabout)
- Section 5 – Mounttown Road Lower
- Section 6 - Mounttown Road Upper

Each section was assessed against four options

- **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 on the Southern Side of the road**; this option proposes to incorporate a segregated two way cycle track via reallocation of road space. The two way cycle track will be a 3m minimum.
- **Option C, Two Way (segregated) cycle track on the Northern Side of the road**; this option also proposes to incorporate a segregated two way cycle track via reallocation of road space. The two way cycle track will be a 3m minimum.
- **Option D, One-way (segregated) cycle tracks on both sides of the road**. The single lane cycle track will be 2m wide (min), therefore requiring 4m total to accommodate a single cycle track on both sides of the carriageway.

Junctions

The following major junctions within the scheme have been subject to an MCA:

- Junction 1 – Glenageary Road Upper / Cualanor Junction
- Junction 2 – Kill Avenue / Glenageary Road Upper / Mounttown Lower / Oliver Plunkett Road 5-arm junction
- Junction 3 – Kill Avenue / Claremount Avenue Junction
- Junction 4 – Kill Avenue / Rochestown Avenue / Abbey Road

Each section was assessed against four options:

- **Option A, Do Nothing**, this option proposes to maintain the existing junction layouts throughout the route. This option would offer no improvement to the existing route. 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, CYCLOPS Junction**, this option positions the pedestrian crossings on the inside of the cycle lanes across the arms of the junction. Pedestrian crossing distances are minimised as a result. Pedestrian crossings that are proposed across the cycle tracks are uncontrolled crossings. The key design features include an orbital cycle track controlled crossing points to allow pedestrians to cross to islands within a central signal-controlled area.

Left-turning cyclists can effectively bypass the junction, while giving way to pedestrians crossing as well as cyclists already on the orbital cycle track. Signal controlled pedestrian crossing distances are reduced when compared to traditional junction layouts, due to the fact that pedestrians cross the cycle track in a separate movement. Pedestrian crossings are also close to the pedestrian desire line. However, the

number of crossings for pedestrians is increased as pedestrians must cross the cycle track to access the central signal-controlled area. Figure 4-1 overleaf illustrates a typical layout of a CYCLOPS style junction.

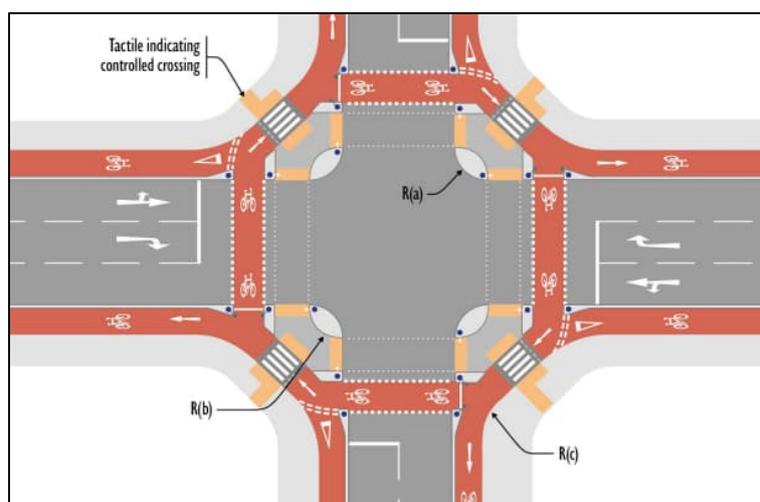


Figure 4-1 Indicative CYCLOPS layout

- **Option C, Protected Junction**, this layout of junction provides physical kerb build-outs to protect cyclists through the junction. The key design features relating to this junction type are that the traffic signal arrangement removes any uncontrolled conflict between pedestrians and cyclists. Kerbed corner islands are provided to remove the risk of vehicles cutting into the cycle route at the junction corner. These raised islands create a protected ring for cyclists navigating the junction, improving safety for right turning cyclists. Figure 4-2 illustrates a typical protected junction layout.



Figure 4-2 Indicative Protected Junction layout

- **Option D, Dutch Style Roundabout**, this option incorporates a segregated orbital cycle path, giving priority for cyclists and pedestrians on the entry and exits of the junction. Figure 4-3 illustrates a typical Dutch Style roundabout junction constructed in the UK.



Figure 4-3 Indicative Dutch Style Roundabout Junction layout

Multiple Criteria Analysis

Section 1 – Kill Ave (Bakers Corner to Ashgrove)

For this section, an MCA was undertaken to assess the four design options as set out in Section 4.2 on Kill Avenue. Details of the options assessment undertaken for Section 1 are presented in Appendix A. An options summary table below presents the relative ranking of each option under the assessment criteria.

Table 4-3 Section 1 Kill Avenue (Bakers Corner to Ashgrove) MCA

Section 1 – Kill Avenue (Bakers Corner to Ashgrove)				
Criteria/ Impacts	Option A	Option B	Option C	Option D
	Do Nothing	Two way cycle track on south side of road	Two way cycle track on north side of road	One way cycle track on both sides of road
Economy				
Safety				
Environment				
Accessibility and Social Inclusion				
Integration				
Quality of Service				
Physical Activity				
Overall Ranking	4th	1st	2nd	3rd

Option B, a 3m two-way cycle track on the south side of Kill Avenue scores higher than the other options. Below is a summary of the key benefits associated with this option:

- **Safety:** a two-way cycle track on the south side will have less conflicts than a cycle track on the northern side. The southern side benefits cyclists by having no conflicts with side roads, only entrances to an existing church, Dun Laoghaire Institute and the fire station. The northern side would conflict with side roads (Rose Park and Ashgrove) and entrances associated with Glebe Hall and no. 56 Kill Avenue.
- **Integration:** a two-way cycle track on one side of the carriageway scores better than the single track on both sides. This is because a two-way cycle track can be designed to 3m width, in comparison to a single cycle track on both sides which requires 2m either side (totalling 4m). Therefore the reduced space requirement of a 3m two way cycle track scores higher because of the reduced requirements in

comparison to 4m. In particular in this section, where the extra 1m would potentially require land take and removal of existing trees.

- **Quality of Service:** a two-way cycle track on one side of the carriageway facilitates cycling two abreast and overtaking. The southern side of Kill Avenue will have fewer conflicts in comparison to the northern side. The existing entrances on the southern side is with a church, the Dun Laoghaire Institute and a fire station. There will be peaks associated with traffic arriving and departing from the church and the Dun Laoghaire Institute, but outside of their opening times, traffic volumes is anticipated to be low, providing fewer potential conflicts between cyclists and general traffic. In comparison the northern side would result in potential conflict with traffic exiting Rose Park and Ashgrove at all times of the day.
- **Accessibility:** a two-way cycle track on the southern side of the carriageway will provide direct access for sustainable travel to Monkstown Educate Together and Dun Laoghaire Institute, which are both located on the southern side of the carriageway.

On the basis of the above, it is proposed to progress Option B, a 3m two-way cycle track on the south side of Kill Avenue between Bakers Corner and Ashgrove to the preferred design.

Section 2 – Kill Ave (Ashgrove to Glenageary Road Upper)

For this section, an MCA was undertaken to assess the four design options as set out in Section 4.2 on Kill Avenue. Details of the options assessment undertaken for Section 2 of the route are presented in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented below.

Table 4-4 Section 2 – Kill Avenue (Ashgrove to Glenageary Road Upper)

Section 2 – Kill Avenue (Ashgrove to Glenageary Road Upper)				
Criteria/ Impacts	Option A	Option B	Option C	Option D
	Do Nothing	Two way cycle track on south side of road	Two way cycle track on north side of road	One way cycle track on both sides of road
Economy				
Safety				
Environment				
Accessibility and Social Inclusion				
Integration				
Quality of Service				
Physical Activity				
Overall Ranking	4th	1st	2nd	3rd

In summary both Options B and C score comparatively. Given that Option B scored better for Section 1, for continuity benefits it is recommended that Option B, a two-way cycle track on the southern side of the carriageway is progressed in Section 2. Below is a summary of the key benefits associated with this option:

- **Safety:** an existing industrial estate is located to the northern side of Kill Avenue, which generates HGVs accessing and exiting the site. By proposing a two-way cycle track on the southern side of the carriageway this will ensure cyclists avoid the potential conflict with larger vehicles accessing the industrial units.
- **Integration:** the two-way cycle track on the southern side of the carriageway will tie directly into residential estates to the south of Kill Avenue including Ardmore Park, Carriglea Gardens and Claremont Avenue. Furthermore, Claremont Avenue provides permeability towards Honeypark playground and park, and also to a short greenway that connects onto Sallynoggin Park.

- **Quality of Service:** a two-way cycle track on one side of the carriageway facilitates cycling two abreast and also for overtaking. As the carriageway width reduces in this section in comparison to Section 1, Option D (a 2m cycle track on both sides) will be difficult to achieve due to the width constraints. Therefore two way cycle track is recommended in this section.
- **Environment:** Options B and C propose a two way cycle track will require 3m width in comparison to Option D, a single cycle track on both sides which requires 4m width. In Options B and C, the existing grassed verge can be maintained on the southern side of the road, which cannot be achieved in Option D. This grassed verge is proposed as part of landscape improvements.

On the basis of the above, it is proposed to progress Option B, a 3m two-way cycle track on the south side of Kill Avenue between Ashgrove and Glenageary Road Upper is the preferred design.

Section 3 – Glenageary Road Upper (Kill Av to Cualanor)

For this section, an MCA was undertaken to assess the four design options as set out in Section 4.2 on Glenageary Road Upper. Given the existing wide carriageway, a two way option can be facilitated on one side of the carriageway, whilst a single lane cycle track can also be facilitated on the other side.

Details of the options assessment undertaken for Section 3 of the route are presented in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented below.

Table 4-5 Section 3 Glenageary Road Upper (Kill Av to Gowrie Park) Options Summary Table

Section 3 – Glenageary Road Upper (Kill Av to Cualanor)				
Criteria/ Impacts	Option A	Option B	Option C	Option D
	Do Nothing	Two way cycle track on south side road	Two way cycle track on north side of road	One way cycle track on both sides road
Economy				
Safety				
Environment				
Accessibility and Social Inclusion				
Integration				
Quality of Service				
Physical Activity				
Overall Ranking	4th	1st	2nd	3rd

In summary Options B scores highest for Section 3, below is a summary of the key benefits associated with this option:

- **Safety:** Option B proposes a two-way cycle track on the southern, which will provide cyclists with a conflict free route between along Glenageary Road Upper between Kill Avenue and Maypark Avenue. In comparison on the northern side of the carriageway, a number of existing residential entrances would result in a higher potential of conflict between cyclists and motorists
- **Quality of Service,** Options B, two-way cycle track on the southern side provides an opportunity for a high quality of service due to the reduced number of conflict locations in comparison to Option C. A two way cycle track proposed as part of Options B and C, will give greater space for cyclists to cycle two abreast or overtaking.

Section 4 – Glenageary Road Upper (Cualanor to Glenageary Roundabout)

For this section, an MCA was undertaken to assess the four design options as set out in Section 4.2 on Glenageary Road Upper.

Details of the options assessment undertaken for Section 4 of the route are presented in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented in below.

Table 4-6 Section 4 Glenageary Road Upper (Cualanor to Glenageary Roundabout) Options Summary

Section 4 – Glenageary Road Upper (Cualanor to Glenageary Roundabout)				
Criteria/ Impacts	Option A	Option B	Option C	Option D
	Do Nothing	Two way cycle track on south side of road	Two way cycle track on north side of road	One way cycle track on both sides of road
Economy				
Safety				
Environment				
Accessibility and Social Inclusion				
Integration				
Quality of Service				
Physical Activity				
Overall Ranking	4th	=1st	=1st	3rd

In summary Options B and C score comparably, below is a summary of the key benefits associated with this option:

- **Safety:** Option C proposes a two-way cycle track on the northern side of the carriageway. The northern side of the carriageway has approximately 5no. side roads or entrances, in comparison to Option B the southern side of the carriageway which has approximately 30no. entrances or side roads. Therefore, the northern side of the carriageway will provide a safer environment for cyclists by ensuring fewer conflict locations.
- **Environment (land use),** the carriageway width reduces along Glenageary Road Upper between Greythorn Park and Glenageary Roundabout. Option D, a single 2m cycle track on both sides is difficult to achieve due to width constraints and land take would be necessary. A 3m two way cycle track as per Option B and C provides a facility for cyclists without land take.
- **Integration,** the proposed two way cycle track on the northern side of the carriageway would eventually connect to the emerging two way cycle track proposed along Glenageary Road Upper between Glenageary Roundabout and Adelaide Road.
- **Quality of Service,** Options B and C propose a two-way cycle track, which will give greater space for cyclists to cycle two abreast or overtaking.

Section 5 – Mounttown Road Lower

For this section, an MCA was undertaken to assess the four design options as set out in Section 4.2 on Glenageary Road Upper.

Details of the options assessment undertaken for Section 5 of the route are presented in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented in **Error! Reference source not found.** below.

Table 4-7 - Section 5 Mounttown Road Lower Options Summary

Section 5 – Mounttown Road Lower				
Criteria/ Impacts	Option A	Option B	Option C	Option D
	Do Nothing	Two way cycle track on east side of road	Two way cycle track on west side of road	One way cycle track on both sides of road
Economy				
Safety				
Environment				
Accessibility and Social Inclusion				
Integration				
Quality of Service				
Physical Activity				
Overall Ranking	4th	1st	2nd	3rd

In summary Options B, a two way cycle track on the eastern side of the carriageway scores highest for Section 5, a summary of the key benefits associated with this option is as follows:

- **Environment (land use)**, the carriageway width along Mounttown Road Lower is constrained in width. Option D, a single 2m cycle track on both sides is not achievable without land take. A 3m two way cycle track as per Option B and C provides a facility for cyclists without land take.
- **Quality of Service**, the western side of the carriageway serves an existing pub and a number of small retail units. These land uses will generate large vehicles such as HGVs for deliveries and servicing. A cycle track on the western side would therefore likely increase the potential risk between cyclists and HGVs in comparison to a two way facility on the eastern side of the carriageway. Options B and C propose a two-way cycle track, which will give greater space for cyclists to cycle two abreast or overtaking.
- **Quality of Service (number of conflicts)**, the western side of the carriageway has a greater number of entrances and side roads in comparison to the eastern side of the carriageway, therefore the eastern side would be more preferential for the reduced number of conflict locations.

Section 6 – Mounttown Road Upper

Details of the options assessment undertaken for Section 6 of the route are presented in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented in **Error! Reference source not found.** below.

Table 4-8 - Section 6 Mounttown Road Upper Options Summary

Section 6 – Mounttown Road Upper				
Criteria/ Impacts	Option A	Option B	Option C	Option D
	Do Nothing	Two-way cycle track on Northern side of road	Two-way cycle track on Southern side of road	One-way cycle track on both sides of road
Economy				
Safety				
Environment				
Accessibility and Social Inclusion				
Integration				
Quality of Service				
Physical Activity				
Overall Ranking	17	23	24	25

In summary Options D, a one cycle track on either side of the corridor scores highest for Section 6, a summary of the key benefits associated with this option is as follows:

- **Safety**, the current cycle tracks on either side of Mounttown Road Upper are inadequate as they provide no segregation for cyclists from general traffic. It is proposed in Option D to address this by having the cycle tracks be raised up about the road level and also, they will run behind the newly located parking spaces. Essentially, the car parking spaces and raised level will ensure that cyclists are kept away from the general traffic lanes, increasing safety and encouraging modal shift to cycling.
- **Accessibility**, the Northern side of the carriageway serves a large Junior School and a Secondary School. The proposed Option D will assure that cycling is an accessible mode of travel for all students as cycle lane segregation and connectivity would encourage students to cycle to school.
- **Quality of Service**, Option D will increase the quality of service along this section for both cycle tracks due to enhanced segregation, particularly from readjusted parking spaces and bus stop bypasses. This segregation will reduce conflict points for cyclists and enhance the quality along the route.

Junction 1 – Glenageary Road Upper / Cualanor Avenue / Maypark Avenue

For this section, an MCA was undertaken to assess the three design options as set out in Section 4.2.1 on Junction 1 (Glenageary Road Upper / Cualanor Avenue / Maypark Avenue). Details of the options assessment undertaken for Junction 1 is presented in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented in below.

Table 4-9 Junction Options Summary Table

Junction 1			
Criteria/ Impacts	Option A	Option B	Option C
	Do Nothing	CYCLOPS Junction	Protected Junction
Economy			
Safety			
Environment			
Accessibility and Social Inclusion			
Integration			
Quality of Service			
Physical Activity			
Overall Ranking	3rd	1st	2nd

In summary Options B, the CYCLOPS style junction layout scores highest and is therefore proposed to be included within the preferred design. A summary of the key benefits associated with this option is as follows:

- **Safety**, both Options B and C score highly on road safety, but Option B (CYCLOPS) scores higher because the design will enable segregated cycle crossing stage through the junction. Cyclists will also have a dedicated cycle/pedestrian stage, where there is no conflict with vehicle movements.
- **Quality of Service**, a segregated cyclist crossing is proposed in Option B, which will assist to reduce potential conflicts between cyclists and vehicles. The external orbital cycle track facilitates the incorporation of a 2-way cycle track providing additional space for queuing at cycle user stop lines. It also allows cyclists cross from the two-way cycle track on the northern side of the carriageway to the southern side of the carriageway (or vice versa) in one stage rather than two. The CYCLOPS junction also facilitates a two-way facility across the side arms, allowing for easy access into Cualanor and Maypark Avenue.
- **Environment**, both Options B and C score highly and provide an opportunity to introduce landscaping, public realm and biodiversity improvements. This can be accommodated by designing a more compact junction and removing the existing left turn slip.
- **Accessibility and Social Inclusion**, both Options B and C will propose a more compact junction, thus reducing crossing distances for pedestrians.

Junction 2 – Kill Avenue / Highthorn Park / Oliver Plunkett Road / Mounttown Road Lower

For this section, an MCA was undertaken to assess the four design options as set out in Section 4.2.1 on Junction 2 (Kill Avenue / Highthorn Park / Oliver Plunkett Road / Mounttown Road Lower). Details of the options assessment undertaken for Junction 2 of the route are presented in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented in below.

Table 4-10 – Junction 2 Kill Av / GRU 5-arm Junction Options Summary Table

Junction 2				
Criteria/ Impacts	Option A	Option B	Option C	Option D
	Do Nothing	CYCLOPS Junction	Protected Junction	Dutch Style Roundabout
Economy	Green	Orange	Orange	Orange
Safety	Orange	Green	Light Green	Yellow
Environment	Yellow	Light Green	Light Green	Yellow
Accessibility and Social Inclusion	Yellow	Light Green	Light Green	Yellow
Integration	Yellow	Yellow	Yellow	Yellow
Quality of Service	Light Green	Light Green	Yellow	Orange
Physical Activity	Orange	Light Green	Light Green	Light Green
Overall Ranking	4th	1st	2nd	3rd

In summary Options B, the CYCLOPS style junction layout scores highest and is therefore proposed to be included within the preferred design. A summary of the key benefits associated with this option is as follows:

- **Safety**, Option B (CYCLOPS) scores highest because the design will enable a dedicated cycle/pedestrian stage, where there is no conflict with vehicle movements.
- **Quality of Service**, a segregated cyclist crossing is proposed in Option B, which will assist to reduce conflicts between cyclists and vehicles in comparison to a protected junction or a Dutch style junction. The external orbital cycle track facilitates the incorporation of a 2-way cycle track providing additional space for queuing at cycle user stop lines. This additional space allows the continuation of cyclists between Glenageary Road Upper and Kill Avenue (or vice versa), without being impeded by waiting cyclists at the stop lines.
- **Environment**, a Dutch style roundabout will require a large footprint and therefore provided limited opportunities for new planting.

Junction 3 – Kill Av / Claremount Av Junction

Details of the options assessment undertaken for Junction 3, Kill Avenue and Claremount Avenue of the route are presented in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented in below.

Table 4-11 Junction 3 Kill Avenue / Claremount Av Junction Options Summary Table

Junction 3			
Criteria/ Impacts	Option A	Option B	Option C
	Do Nothing	CYCLOPS Junction	Protected Junction
Economy			
Safety			
Environment			
Accessibility and Social Inclusion			
Integration			
Quality of Service			
Physical Activity			
Overall Ranking	3rd (1st	2nd

In summary Options B, the CYCLOPS style junction layout scores highest and is therefore proposed to be included within the preferred design. A summary of the key benefits associated with this option is as follows:

- **Safety**, Option B (CYCLOPS) scores higher because the design will enable a separate cycle crossing stage during the signal cycle.
- **Quality of Service**, a segregated cyclist crossing is proposed in Option B, which will assist to reduce conflicts between cyclists and vehicles in comparison to a protected junction.
- **Environment**, both Options B and C score highly and provide an opportunity to introduce landscaping, public realm and biodiversity improvements. This can be accommodated by designing a more compact junction.

Junction 4 – Bakers Corner, Kill Avenue / Kill Lane / Rochestown Avenue

Details of the options assessment undertaken for the Bakers Corner junction is illustrated in Appendix A. An options summary table that summarises the relative ranking of each option under the assessment criteria is presented in below.

Table 4-12 Junction 4 Bakers Corner

Junction 4			
Criteria/ Impacts	Option 1	Option 2	Option 3
	Do Nothing	CYCLOPS Junction	Protected Junction
Economy			
Safety			
Environment			
Accessibility and Social Inclusion			
Integration			
Quality of Service			
Physical Activity			
Overall Ranking	18	22	18

In summary Options B, the CYCLOPS style junction layout scores highest and is therefore proposed to be included within the preferred design. A summary of the key benefits associated with this option is as follows:

- **Safety**, Option B (CYCLOPS) scores higher because the design will facilitate a separate cycle crossing stage during the signal cycle.
- **Quality of Service**, a segregated cyclist crossing is proposed in Option B, which will assist to reduce conflicts between cyclists and vehicles in comparison to a protected junction. The external orbital cycle track facilitates the incorporation of a 2-way cycle track providing additional space for queuing at cycle user stop lines. This additional space allows the continuation of cyclists between Kill Avenue and Rochestown Avenue, without being impeded by waiting cyclists at the stop lines.
- **Environment**, both Options B and C score highly and provide an opportunity to introduce landscaping, public realm and biodiversity improvements. This can be accommodated by designing a more compact junction.

5. Conclusion

Following a comprehensive Options Assessment, network option B (Two-way (segregated) cycle track) has emerged as the preferred design for the proposed cycle route improvement scheme for all sections except Mounttown Road Upper where a one way cycle track on either side configuration is preferable. It is recommended that Option B is progressed to preliminary design with a view to advancing this to planning and implementation stages for Sections 1 to 5 whereas Option D should be progressed for Section 6. These will inform the scope for widening along each side of the carriageway and the associated impacts. The multiple criteria analysis that was carried out to determine the preferred option is detailed in Appendix A.

Due to the inherently complex nature of mixed mode movements at junctions, the provision for cyclists at junctions is a critical factor in managing conflict and providing safe junctions for all road users. From the assessment junction option B (CYCLOPS junction) was determined to deal with this issue the most effectively.

Appendix A MCA

Section1 (Kill Av)

Criteria/Impacts	Option A: Do Nothing	Option B: Two way cycle track on south side of Kill Av	Option C: Two way cycle track on north side of Kill Av	Option D: one way cycle track on both sides of Kill Av	
Economy	4	3	3	3	
Safety	2	4	4	4	
Environment	2	4	4	4	
Accessibility and Social Inclusion	2	5	4	4	
Integration	3	4	4	3	
Quality of Service	2	4	4	3	
Physical Activity	2	4	4	4	
TOTAL	19	24	22	21	
Economy	Overall Economy	3.5	3	3	3
	Capital Cost	2	2	2	2
	Comments	A Do Nothing option would not have any costs associated with it apart from the ongoing maintenance costs for this section of road.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.
Safety	Transport Reliability and Quality (Journey Time)	4	4	4	4
	Comments	No change to transport reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.
	Overall Safety	1	5	4	4
Environment	Road User Safety	1	1	4	4
	Comments	No upgrade to be provided to existing facilities to improve safety.	Existing pedestrian and cyclist facilities to be upgraded providing a safer environment for these road users over existing conditions. Two way cycle track creates fewer conflict points over other options.	This option will create more conflict points over option B but will still provide an overall safer environment for road users compared with Option A.	This option will create more conflict points over option B but will still provide an overall safer environment for road users compared with Option A.
	Overall Environment	2	4	4	4
Accessibility and Social Inclusion	Air Quality	2	4	4	4
	Comments	No change in air quality.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a reduction in vehicular trips for short distances. Also more leisurely cycling.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a reduction in vehicular trips for short distances. Also more leisurely cycling.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a reduction in vehicular trips for short distances. Also more leisurely cycling.
	Landscape and Visual Quality	2	4	4	4
	Comments	existing landscape and visual quality.	Scheme proposes to enhance landscape and urban realm.	Scheme proposes to enhance landscape and urban realm.	Scheme proposes to enhance landscape and urban realm.
	Biodiversity	3	4	4	4
	Comments	existing biodiversity.	Scheme proposes to enhance biodiversity.	Scheme proposes to enhance biodiversity.	Scheme proposes to enhance biodiversity.
	Cultural Heritage	3	4	4	4
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Land Use	3	4	4	4
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Integration	Overall Accessibility and Social Inclusion	2	5	4	4
	Vulnerable Groups	2	4	4	4
	Comments	No existing cycle lane on the southern side of the carriageway providing direct access to Monkstown Educate together.	Cycle track proposed on the same side of the existing Monkstown Educate Together and Dun Laoghaire Institute, which will provide direct and segregated access to the school.	Proposal will result in a two way cycle track on the opposing side of the carriageway to the school, with crossing points to access the school.	Proposal will introduce a cycle lane on the school side of the carriageway.
Quality of Service	Deprived Geographic Areas	2	4	4	4
	Comments	No change.	Provision of better cycle facilities will promote social inclusion.	Provision of better cycle facilities will promote social inclusion.	Provision of better cycle facilities will promote social inclusion.
	Overall Integration	3	4	4	3
	Land Use Integration	2	4	4	2
	Comments	Similar for all options. No relative difference.	This option can be achieved with a 3m two way cycle track, thus reducing the impact of road reallocation in comparison to a 4m facility (Option D).	This option can be achieved with a 3m two way cycle track, thus reducing the impact of road reallocation in comparison to a 4m facility (Option D).	This option requires 4m cycle track, therefore requires additional space from road reallocation or from 3rd party lands.
	Residential Population and Employment Catchments	3	3	3	3
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Physical Activity	Transport Network Integration	2	4	4	2
	Comments	No change to transport network integration.	Upgrading and relocating of bus stops.	Upgrading and relocating of bus stops.	Upgrading and relocating of bus stops.
	Cycle Network Integration	2	4	4	4
	Comments	No change to cycle network integration.	Direct tie-in with the following section of the Glenagary Road Upper in DLBCC jurisdiction.	Direct tie-in with the following section of the Glenagary Road Upper in DLBCC jurisdiction.	Direct tie-in with the following section of the Glenagary Road Upper in DLBCC jurisdiction.
Quality of Service	Traffic Network Integration	3	3	3	3
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Overall Quality of Service	2	4	4	3
	Number of adjacent cyclists	2	4	4	2
	Comments	Existing on-road one way cycle track only allows space for cycling one-direction and overtake/catch up at selected points.	Raised adjacent 3m wide two-way cycle track allows space for cycling two-direction and overtake/catch up.	Raised adjacent 3m wide two-way cycle track allows space for cycling two-direction and overtake/catch up.	On-road 1.2m wide one-way cycle track only allows space for cycling one-direction and overtake/catch up at selected points.
	Number of conflicts	3	3	3	3
	Comments	4 junctions/driveways either side of road.	The southern side of the carriageway benefits cyclists by having no conflicts with side roads, only entrances to an existing church, Dun Laoghaire Institute and the fire station.	The northern side of the carriageway would conflict with side roads (Rose Park and Ashgrove) and residential entrances associated with Glebe Hall and no. 56 Kill Avenue. Traffic volumes associated with Rose Park and Ashgrove will be higher in comparison to the southern side.	4 junctions/driveways either side of road.
	Journey time delay	2	4	4	4
	Comments	No improvement to journey time delays.	Reduction of delays at junctions for pedestrians and cyclists due to enhanced infrastructure.	Reduction of delays at junctions for pedestrians and cyclists due to enhanced infrastructure.	Reduction of delays at junctions for pedestrians and cyclists due to enhanced infrastructure.
	HGV Influence	2	3	3	2
Comments	No improvement to the number of HGVs and buses adjacent to cyclist.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.	
Physical Activity	Physical Activity	2	4	4	4
	Comments	Existing Conditions			

Section2 (Kill Av)

Criteria/Impacts	Option A: Do Nothing	Option B: Two way cycle track on south side of Kill Av	Option C: Two way cycle track on north side of Kill Av	Option D: one way cycle track on both sides of Kill Av	
Economy	4	3	3	3	
Safety	1	4	3	4	
Environment	2	4	4	3	
Accessibility and Social Inclusion	3	4	4	4	
Integration	3	4	4	3	
Quality of Service	2	4	4	4	
Physical Activity	2	4	4	4	
TOTAL	14	22	21	20	
Economy	Overall Economy	4	3	3	3
	Capital Cost	5	2	2	2
	Comments	A Do Nothing option would not have any costs associated with it apart from the ongoing maintenance costs for the section of road	Capital cost occurring from the construction of raised adjacent cycleway and footpaths	Capital cost occurring from the construction of raised adjacent cycleway and footpaths	Capital cost occurring from the construction of raised adjacent cycleway and footpaths
Safety	Transport Reliability and Quality (Journey Time)	2	4	4	4
	Comments	No change to transport reliability and quality	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality
	Overall Safety	1	4	3	4
Environment	Road User Safety	2	4	2	4
	Comments	No upgrade to be provided to existing facilities to improve safety	There is a risk of collisions associated with this route, at the private vehicle accesses and at the side roads (Ardmore Park, Carrigloga Gardens and Claremont Avenue). However these are all residential roads, which will be low vehicle speeds. The cycle design should include cycle priority to promote vehicles to yield to oncoming cyclists	There is a risk of collisions associated with this route, at the private vehicle accesses and at the side road (Patrician Park). Whilst this option will result in less conflicts points than Option B, it is noted an existing industrial estate to the northern side of Kill Avenue, which attracts larger vehicles (HGVs) therefore greater risk of a serious collision	This option will enhance safety for vulnerable users in comparison to the existing. This option will have a higher number of potential conflict locations in comparison to options B and C
	Overall Environment	2	4	4	3
Accessibility and Social Inclusion	Air Quality	2	4	4	4
	Comments	No change in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality
	Landscape and Visual Quality	2	4	4	3
	Comments	No change in Landscape and Visual Quality	The scheme proposes landscape and visual quality improvements	The scheme proposes landscape and visual quality improvements	The scheme proposes landscape and visual quality improvements, but this will be reduced due to 4m cycle lane requirements in comparison to Options B and C which require 3m only, which facilitates more space for landscaping
	Biodiversity	3	4	4	3
	Cultural Heritage	3	2	2	3
	Land Use	3	3	3	3
Integration	Overall Accessibility and Social Inclusion	3	4	4	4
	Vulnerable Groups	3	3	3	3
	Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Quality of Service	Devised Geographic Areas	2	4	4	4
	Comments	No change	Provision of better cycle facilities will promote social inclusion	Provision of better cycle facilities will promote social inclusion	Provision of better cycle facilities will promote social inclusion
	Overall Integration	3	4	4	3
	Land Use Integration	3	4	4	3
	Comments	Similar for all options. No relative difference	This option can be achieved with a 3m two way cycle track	This option can be achieved with a 3m two way cycle track	This option requires 4m cycle track, therefore requires additional space from road reallocation or from 3rd party lands
	Residential Population and Employment Catchments	3	4	3	4
	Comments	Existing conditions	This option will tie into the large residential estate located on the southern side of the carriageway (Honeypark and Ardmore Park)	This option will not connect directly to the large residential catchment at Ardmore Park and Honeypark	Similar for all options. No relative difference
Physical Activity	Transport Network Integration	2	4	4	4
	Comments	No change to transport network integration	Boarding and reloading of bus stops	Boarding and reloading of bus stops	Boarding and reloading of bus stops
	Cycle Network Integration	2	4	4	4
	Comments	No change to cycle network integration	Direct tie-in with the following section of the Genagary Road Upper in DABOC jurisdiction	Direct tie-in with the following section of the Genagary Road Upper in DABOC jurisdiction	Direct tie-in with the following section of the Genagary Road Upper in DABOC jurisdiction
	Traffic Network Integration	3	3	3	3
	Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
	Overall Quality of Service	2	4	4	3
Physical Activity	Number of adjacent cyclists	2	4	4	2
	Comments	Existing on road one-way cycle track only allows space for cycling one-ahead and overtaking only at widest points	Raised adjacent 3m wide two-way cycle track allows space for cycling two-ahead and overtaking	Raised adjacent 3m wide two-way cycle track allows space for cycling two-ahead and overtaking	On road 1.5-2m wide one-way cycle track only allows space for cycling one-ahead and overtaking only at widest points
	Number of conflicts	2	4	4	2
	Journey time delay	2	4	4	4
	Comments	6 junctions/driveways either side of road	3 junctions/driveways either side of road	3 junctions/driveways either side of road	3 junctions/driveways either side of road
Physical Activity	Journey time delay	2	4	4	4
	Comments	Similar for all options. No relative difference	Improved journey time for cyclists due to journey time reliability	Improved journey time for cyclists due to journey time reliability	Improved journey time for cyclists due to journey time reliability
	HGV Influence	2	3	3	3
Physical Activity	Comments	No improvement to the number of HGVs and buses adjacent to cyclist	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists
	Physical Activity	2	4	4	4
Comments	Existing Conditions				

Section 3 (Glenagary Road Upper)

Criteria/Impacts	Option A: Do Nothing	Option B: Two way cycle track on south side of Glenagary Road Upper	Option C: Two way cycle track on north side of Glenagary Road Upper	Option D: one way cycle track on both sides of Glenagary Road Upper
Economy	4	3	3	3
Safety	1	5	4	4
Environment	2	4	4	4
Accessibility and Social Inclusion	3	4	4	4
Integration	3	4	3	3
Quality of Service	3	4	4	3
Physical Activity	2	4	4	4
TOTAL	15	22	22	21
Overall Economy	4	3	3	3
Capital Cost	5	2	2	2
Comments	A Do Nothing option would not have any costs associated with it apart from the ongoing maintenance costs for this section of road.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.
Transport Reliability and Quality (Journey Time)	2	4	4	4
Comments	No change to transport reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.
Overall Safety	1	5	4	4
Road User Safety	1	5	4	4
Comments	No upgrade to be provided to existing facilities to improve safety.	Existing pedestrian and cyclist facilities to be upgraded providing a safer environment for these road users over existing conditions. Two way cycle track creates fewer conflict points over other options.	This option will create more conflict points over option B but will still provide an overall safer environment for road users compared with Option A.	This option will create more conflict points over option B but will still provide an overall safer environment for road users compared with existing.
Overall Environment	2	4	4	4
Air Quality	2	4	4	4
Comments	No change in air quality.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality.
Landscape and Visual Quality	1	4	4	4
Comments	No change in Landscape and Visual Quality.	Landscaped area will be provided separating the carriageway from the footpath.	Landscaped area will be provided separating the carriageway from the footpath.	Landscaped area will be provided separating the carriageway from the footpath.
Biodiversity	3	4	4	4
Comments	Similar for all options. No relative difference.	Biodiversity improvements associated with planting.	Biodiversity improvements associated with planting.	Biodiversity improvements associated with planting.
Cultural Heritage	3	4	4	4
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Land Use	3	4	4	4
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Overall Accessibility and Social Inclusion	3	4	4	3.5
Vulnerable Groups	3	4	4	4
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Designated Geographic Areas	2	4	4	4
Comments	No change.	Provision of better cycle facilities will promote social inclusion.	Provision of better cycle facilities will promote social inclusion.	Provision of better cycle facilities will promote social inclusion.
Overall Integration	3	4	3	3
Land Use Integration	3	4	3	3
Comments	Similar for all options. No relative difference.	Slight benefit for land use integration as cycle track on south side will not result in conflicts with residential properties.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Residential Population and Employment Catchments	3	4	3	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Transport Network Integration	3	4	3	3
Comments	Similar for all options. No relative difference.	Upgrading and rescaling of bus stops.	Upgrading and rescaling of bus stops.	Similar for all options. No relative difference.
Cycle Network Integration	2	4	4	3
Comments	No change to cycle network integration.	Direct tie-in with the following section of the Glenagary Road Upper in DLBCC jurisdiction.	Direct tie-in with the following section of the Glenagary Road Upper in DLBCC jurisdiction.	Direct tie-in with the following section of the Glenagary Road Upper in DLBCC jurisdiction.
Traffic Network Integration	3	4	3	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Overall Quality of Service	3	4	4	3
Number of adjacent cyclists	2	4	4	2
Comments	Lasting narrow facilities.	Raised adjacent 3m wide two-way cycle track allows space for cycling two-abroad and overtaking.	Raised adjacent 3m wide two-way cycle track allows space for cycling two-abroad and overtaking.	On-road 1.5m wide one-way cycle track only allows space for cycling one-abroad and overtaking only at widest points.
Number of conflicts	4	3	3	3
Comments	22 conflicts.	25 conflicts.	6 junctions/driveways either side of road.	22 conflicts.
Journey time delay	3	3	4	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Possible reduction of delays at junctions due to change of road alignment.	No improvement to journey time delays.
HGV Influence	2	4	4	4
Comments	No improvement to the number of HGVs and buses adjacent to cyclist.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.
Physical Activity	2	4	4	4
Physical Activity	2	4	4	4
Comments	Existing Conditions.			

Section 4 (Glenagary Road Upper)

Criteria/Impacts	Option A: Do Nothing	Option B: Two way cycle track on south side of Glenagary Road Upper	Option C: Two way cycle track on north side of Glenagary Road Upper	Option D: one way cycle track on both sides of Glenagary Road Upper	
Economy	4	3	3	3	
Safety	1	4	5	4	
Environment	2	4	4	3	
Accessibility and Social Inclusion	3	4	4	4	
Integration	3	4	4	4	
Quality of Service	2	4	4	4	
Physical Activity	2	4	4	4	
TOTAL	15	22	23	20	
Economy	Overall Economy	3.5	3	3	3
	Capital Cost	5	2	2	2
	Comments	A Do Nothing option would not have any costs associated with it apart from the ongoing maintenance costs for this section of road	Capital cost occurring from the construction of raised adjacent cycleway and footpath.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.
Safety	Transport Reliability and Quality (Journey Time)	2	3	3	3
	Comments	No change to transport reliability and quality	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.
	Comments	No upgrade to be provided to existing facilities to improve safety	Both Options B and C will provide a high level of road user safety for pedestrians and cyclists. However the proposed cycle track on the southern side will have greater number of conflicts with existing residential dwellings in comparison to the northern side, which has significantly fewer residential units.	Both Options B and C will provide a high level of road user safety for pedestrians and cyclists. However the proposed cycle track on the northern side will result in fewer vehicular conflicts due to lower number of residential units located off the northern side of the carriageway in comparison to the southern side.	This option will create more conflict points over option B but will still provide an overall safer environment for road users compared with existing
Environment	Overall Safety	1	4	5	4
	Road User Safety	1	4	5	4
	Comments	No upgrade to be provided to existing facilities to improve safety	Both Options B and C will provide a high level of road user safety for pedestrians and cyclists. However the proposed cycle track on the southern side will have greater number of conflicts with existing residential dwellings in comparison to the northern side, which has significantly fewer residential units.	Both Options B and C will provide a high level of road user safety for pedestrians and cyclists. However the proposed cycle track on the northern side will result in fewer vehicular conflicts due to lower number of residential units located off the northern side of the carriageway in comparison to the southern side.	This option will create more conflict points over option B but will still provide an overall safer environment for road users compared with existing
	Overall Environment	2	4	4	3
	Air Quality	2	4	4	3
	Comments	No change in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality
	Comments	No change in Landscape and Visual Quality	Landscaped area will be provided separating the carriageway from the footpath between Cullane and Gowrie Park	Landscaped area will be provided separating the carriageway from the footpath between Cullane and Gowrie Park	Landscaped area will be provided separating the carriageway from the footpath between Cullane and Gowrie Park
Accessibility and Social Inclusion	Landscape and Visual Quality	2	4	4	3
	Comments	No change in Landscape and Visual Quality	Landscaped area will be provided separating the carriageway from the footpath between Cullane and Gowrie Park	Landscaped area will be provided separating the carriageway from the footpath between Cullane and Gowrie Park	Landscaped area will be provided separating the carriageway from the footpath between Cullane and Gowrie Park
	Biodiversity	3	4	4	4
	Comments	No change upon existing	Biodiversity improvements between Cullane and Gowrie Park	Biodiversity improvements between Cullane and Gowrie Park	Biodiversity improvements between Cullane and Gowrie Park
	Cultural Heritage	3	3	3	3
Integration	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Land Use	3	4	4	4
	Comments	Similar for all options. No relative difference.	Proposed 3m wide cycle track can be accommodated within the existing carriageway extents	Proposed 3m wide cycle track can be accommodated within the existing carriageway extents	A 2m cycle track on each side of the carriageway is unachievable due to constrained sections of the carriageway and therefore land take would be required with this option
	Overall Accessibility and Social Inclusion	3	4	4	4
	Vulnerable Groups	3	4	4	4
Quality of Service	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Deprived Geographic Areas	2	4	4	4
	Comments	No change	Provision of better cycle facilities will promote social inclusion	Provision of better cycle facilities will promote social inclusion	Provision of better cycle facilities will promote social inclusion
	Overall Integration	3	3	4	3
	Land Use Integration	4	3	3	1
Physical Activity	Comments	No Land take required	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Additional land take required to accommodate narrow road width and the need to provide a minimum cycle lane width
	Residential Population and Employment Catchments	3	3	3	3
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Transport Network Integration	3	3	3	3
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Upgrading and realigning of bus stops	Similar for all options. No relative difference.
Quality of Service	Cycle Network Integration	2	4	4	4
	Comments	No change to cycle network integration	The scheme would need to cross two arms of the Glenagary Roundabout to continue along the emerging Glenagary Road Upper cycle scheme.	Scheme will tie in with the Glenagary Road Upper emerging cycle track.	Direct tie in with the following section of the Glenagary Road Upper in DERC jurisdiction.
	Traffic Network Integration	2	3	3	3
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Overall Quality of Service	2	3	4	4
Quality of Service	Number of adjacent cyclists	1	4	4	2
	Comments	Existing narrow facilities	Raised adjacent 3m wide two-way cycle track allows space for cycling two abreast and overtaking	Raised adjacent 3m wide two-way cycle track allows space for cycling two abreast and overtaking	On road 1.5m wide one-way cycle track only allows space for cycling one abreast and overtaking only at widest points
	Number of conflicts	4	1	3	4
	Journey time delay	2 conflicts	41 conflicts	6 junctions/driveways either side of road	27 conflicts
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Possible reduction of delays at junctions due to change of road alignment	Similar for all options. No relative difference.
Physical Activity	HGV Influence	2	3	3	3
	Comments	No improvement to the number of HGVs and buses adjacent to cyclist	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists
Physical Activity	Physical Activity	2	4	4	4
	Comments	Existing Conditions			

Section 5 (Mounttown Lower)

Criteria/Impacts	Option A: Do Nothing	Option B: Two way cycle track on east side of Mounttown Road Lower	Option C: Two way cycle track on west side of Mounttown Road Lower	Option D: one way cycle track on both sides of Mounttown Road Lower	
Economy	4	3	3	3	
Safety	2	4	4	4	
Environment	3	3	3	3	
Accessibility and Social Inclusion	3	4	4	4	
Integration	3	4	4	4	
Quality of Service	2	4	4	4	
Physical Activity	2	4	4	4	
TOTAL	14	21	20	19	
Economy	Overall Economy	4	3	3	3
	Capital Cost	4	2	2	2
	Comments	A Do Nothing option would not have any costs associated with it apart from the ongoing maintenance costs for this section of road	Capital cost occurring from the construction of raised adjacent cycleway and footpaths	Capital cost occurring from the construction of raised adjacent cycleway and footpaths	Capital cost occurring from the construction of raised adjacent cycleway and footpaths
Safety	Transport Reliability and Quality (Journey Time)	4	4	4	4
	Comments	No change to transport reliability and quality	This scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.
	Overall Safety	2	4	4	4
Environment	Road User Safety	2	4	4	4
	Comments	No upgrade to be provided to existing facilities to improve safety. No existing cycle lanes along Mounttown lower therefore this has scored zero.	Existing pedestrian and cyclist facilities to be upgraded providing a safer environment for these road users over existing conditions.	Existing pedestrian and cyclist facilities to be upgraded providing a safer environment for these road users over existing conditions.	This option will create more conflict points over option B but will still provide an overall safer environment for road users compared with existing.
	Overall Environment	3	3	3	3
Integration	Air Quality	3	4	4	4
	Comments	No change in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality
	Landscape and Visual Quality	3	3	3	3
	Comments	No change in landscape or visual quality	No change in landscape or visual quality	Similar for all options. No relative difference	No change in landscape or visual quality
	Neighbourhood	3	3	3	3
	Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
	Cultural Heritage	3	3	3	3
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	
Accessibility and Social Inclusion	Land Use	4	3	3	3
	Comments	as per existing	This option will impact upon existing car parking	This option will impact upon existing car parking	This option would require potential land take. This option would also result in loss of parking on both sides of the carriageway
	Overall Accessibility and Social Inclusion	3	4	4	4
Quality of Service	Vulnerable Groups	2	3	3	3
	Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
	Improved Geographic Access	3	4	4	4
Physical Activity	Comments	No change	Provision of better cycle facilities will promote social inclusion	Provision of better cycle facilities will promote social inclusion	Provision of better cycle facilities will promote social inclusion
	Overall Integration	3	3	3	3
	Land Use Integration	4	4	4	4
	Comments	No additional land use required	No additional land use required	Similar for all options. No relative difference	Additional land take required to accommodate narrow road width and the need to provide a minimum cycle lane width
	Residential Population and Employment Catchments	3	3	3	3
	Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
	Transport Network Integration	3	4	4	4
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Upgrading and relocating of bus stops	Similar for all options. No relative difference	
Quality of Service	Cycle Network Integration	3	4	4	4
	Comments	No change to cycle network integration	Direct tie-in with the following section of the Glenagary Road Upper in B20C2 junction.	Direct tie-in with the following section of the Glenagary Road Upper in B20C2 junction.	Direct tie-in with the following section of the Glenagary Road Upper in B20C2 junction.
	Traffic Network Integration	3	3	3	3
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	
Quality of Service	Overall Quality of Service	2	4	4	4
	Number of adjacent cyclists	2	4	4	4
	Comments	No change to existing - no cycle facilities provided	Raised adjacent 3m wide two way cycle track allows space for cycling two abreast and overtaking	Raised adjacent 3m wide two way cycle track allows space for cycling two abreast and overtaking	On road 1.5m wide one way cycle track only allows space for cycling one abreast and overtaking only at widest points
	Number of conflicts	2	4	4	4
	Comments	05 conflicts	10 conflicts	10 conflicts	05 conflicts
Physical Activity	Journey time - daily	2	3	3	3
	Comments	poor journey time for sustainable modes	infrastructure will assist to improve journey times for sustainable modes	infrastructure will assist to improve journey times for sustainable modes	infrastructure will assist to improve journey times for sustainable modes
	ADV Influence	2	4	4	4
Comments	No improvement to the number of HGVs and buses adjacent to cyclists	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists	
Physical Activity	Physical Activity	2	4	4	4
	Comments	Existing Conditions			

Section 5 (Mounttown Road Upper)

Criteria/Impacts	Option A: Do Nothing	Option B: Two way cycle track on Northern side of Mounttown Road Upper	Option C: Two way cycle track on Southern side of Mounttown Road Upper	Option D: one way cycle track on both sides of Mounttown Road Upper
Economy	4	3	3	3
Safety	1	3	3	4
Environment	3	3	3	3
Accessibility and Social Inclusion	3	4	4	4
Integration	3	3	3	3
Quality of Service	2	2	3	3
Physical Activity	2	4	4	4
TOTAL	15	19	20	21
Economy	4	3	3	3
Capital Cost	2	2	2	2
Comments	A Do Nothing option would not have any costs associated with it apart from the existing maintenance costs for this section of road.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.	Capital cost occurring from the construction of raised adjacent cycleway and footpath.
Transport Reliability and Quality (Journey Time)	4	4	4	4
Comments	No change to transport reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.	The scheme will encourage a shift in transport modes which will have a minor impact on journey reliability and quality.
Safety	1	3	3	4
Overall Safety	1	3	3	4
Road User Safety	1	3	3	4
Comments	No upgrade to be provided to existing facilities to improve safety. No existing cycle lanes along Mounttown Lower therefore this has scored poorly.	Existing pedestrian and cyclist facilities to be upgraded providing a safer environment for these road users over existing conditions. Issue may arise during initial time in operation as cyclists come from both directions which may cause collisions between vehicles in driveways and side roads and cyclists.	Existing pedestrian and cyclist facilities to be upgraded providing a safer environment for these road users over existing conditions. Issue may arise during initial time in operation as cyclists come from both directions which may cause collisions between vehicles in driveways and side roads and cyclists.	This option will create more conflict points over option B and C but will still provide an overall safer environment for road users compared with existing. One way cycle ways would be more effective on Mounttown Road Upper due to the plethora of driveways, meaning drivers would only need to consider cyclists moving in one direction.
Environment	3	3	3	3
Overall Environment	3	3	3	3
Air Quality	3	4	4	4
Comments	No change in air quality.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality.
Landscape and Visual Quality	3	3	3	3
Comments	No change in landscape or visual quality.	No change in landscape or visual quality.	Similar for all options. No relative difference.	No change in landscape or visual quality.
Biodiversity	3	3	3	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Cultural Heritage	3	3	3	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Land Use	3	3	3	3
Comments	as per existing.	This option will impact upon existing car parking with a total loss of 5 parking spaces.	This option will impact upon existing car parking with a total loss of 5 parking spaces.	The option moves the car parking along Mounttown Road Upper adjacent to the roadway which segregates the cycleways on either side. There will similarly be a loss of 5 parking spaces.
Accessibility and Social Inclusion	3	4	4	4
Overall Accessibility and Social Inclusion	3	4	4	4
Vulnerable Groups	3	4	4	4
Comments	No improvement on existing.	Better connectivity to Monkstown Junior School for cyclists.	Better connectivity to Monkstown Lawn Tennis Club.	Better connectivity to Monkstown Junior School for cyclists.
Designated Geographic Areas	2	4	4	4
Comments	No change.	Provision of better cycle facilities will promote social inclusion.	Provision of better cycle facilities will promote social inclusion.	Provision of better cycle facilities will promote social inclusion.
Integration	3	3	3	3
Overall Integration	3	3	3	3
Land Use Integration	3	3	3	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Residential Population and Employment Catchments	3	3	3	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Transport Network Integration	3	3	3	3
Comments	Existing Conditions.	Bus stop reconfiguration to include cycle bypass.	Bus stop reconfiguration to include cycle bypass.	Bus stop reconfiguration to include cycle bypass.
Cycle Network Integration	2	3	3	3
Comments	No change to cycle network integration.	Direct fit-in with Section 5 Mounttown Lower of DLR Central Scheme. Ensures continued access to Monkstown Park Junior School on the Northern side of Mounttown Road Upper for children that cycle. In this option the Monkstown Lawn Tennis Club on the Southern side of the road is more difficult to access for cyclists.	Direct fit-in with Section 5 Mounttown Lower of DLR Central Scheme. Cycleway on the Southern Side of Mounttown Road Upper hinders connectivity to Monkstown Park Junior School for children that cycle. There is better access to the Monkstown Lawn Tennis Club in this option which will encourage cyclists to the club.	Direct fit-in with Section 5 Mounttown Lower of DLR Central Scheme. Ensures continued access to Monkstown Park Junior School on the Northern side of Mounttown Road Upper for children that cycle. There is better access to the Monkstown Lawn Tennis Club in this option which will encourage cyclists to the club.
Traffic Network Integration	3	3	3	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Quality of Service	2	2	3	3
Overall Quality of Service	2	2	3	3
Number of adjacent cyclists	2	4	4	4
Comments	No change to existing.	Raised adjacent 3m wide two-way cycle track allows space for cycling two abreast and overtaking.	Raised adjacent 3m wide two-way cycle track allows space for cycling two abreast and overtaking.	Raised 1.5m wide one-way cycle track which allows space for cycling one abreast.
Number of conflicts	2	2	3	2
Comments	28 conflicts.	20 conflicts.	8 conflicts.	28 conflicts.
Journey time delay	2	3	3	3
Comments	poor journey times for sustainable modes.	infrastructure will assist to improve journey times for sustainable modes.	infrastructure will assist to improve journey times for sustainable modes.	infrastructure will assist to improve journey times for sustainable modes.
HGV Influence	2	3	3	3
Comments	No improvement to the number of HGVs and buses adjacent to cyclist.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.	Segregated cycling facilities will significantly reduce the number of HGVs and buses adjacent to cyclists.
Physical Activity	2	4	4	4
Physical Activity	2	4	4	4
Comments	Existing Conditions.			

Assessment Ranking	Description
5	Positive
4	Slightly Positive
3	Neutral
2	Slightly Negative
1	Negative

Junction 1

Criteria/Impacts	Option A: Do Nothing	Option B: CYCLOPS Junction	Option C: Protected Junction
Economy	5	2	2
Safety	1	5	4
Environment	3	4	4
Accessibility and Social Inclusion	3	4	4
Integration	3	3	3
Quality of Service	3	4	3
Physical Activity	2	4	4
TOTAL	16	21	19

Economy	Overall Economy	5	2	1.5
	Capital Cost	5	1	1
	Comments	This option would not have any costs associated with it apart from ongoing maintenance costs.	Higher cost option due to major civil works.	Higher cost option due to major civil works.
Safety	Transport Reliability and Quality (Journey Time)	4	3	
	Comments	Impact on existing traffic regime is limited to none.	This option will remove a dedicated left turn slip lane from Oliver Plunkett Rd onto Mounttown Lower and a dedicated left turn slip lane from GRU to Kill Av. This will have a minor impact on the current traffic regime. Improvements to pedestrian and cyclist journey time.	This option will remove a dedicated left turn slip lane from Oliver Plunkett Rd onto Mounttown Lower and a dedicated left turn slip lane from GRU to Kill Av. This will have an impact on the current traffic regime. Improvements to pedestrian and cyclist journey time.
	Comments	The existing option has the greatest risk to road user safety due to the long crossing distances and the lack of dedicated cycle crossing signals.	Segregated cycle and pedestrian facilities reducing conflicts. Cyclists to be segregated from the traffic phase while also keeping them segregated by pedestrians.	Segregated cycle and pedestrian facilities reducing conflicts. The protected junction would run cyclists with left turning general traffic on flashing amber, so slightly greater risk of conflict between cyclists and motorists
Environment	Overall Environment	3	4	4
	Air Quality	2	4	4
	Comments	No change in air quality.	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality
	Landscape and Visual Quality	2	4	4
	Comments	Existing conditions	This option will facilitate opportunity to introduce landscaping and public realm improvements at the junction.	This option will facilitate opportunity to introduce landscaping and public realm improvements at the junction.
	Biodiversity	3	4	4
	Comments	Existing conditions	This option will facilitate opportunity to introduce biodiversity improvements at the junction including planting	This option will facilitate opportunity to introduce biodiversity improvements at the junction including planting
	Cultural Heritage	3	3	3
Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.	
Accessibility and Social Inclusion	Land Use	3	3	3
	Comments	Similar for all options. No relative difference.	The scheme is proposed within the existing carriageway. The tie in locations to be confirmed as to whether the side roads have been taken in charge by DRCC	The scheme is proposed within the existing carriageway. The tie in locations to be confirmed as to whether the side roads have been taken in charge by DRCC
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
Integration	Overall Accessibility and Social Inclusion	3	4	4
	Vulnerable Groups	2	4	4
	Comments	Existing conditions include long crossing distances at this junction	The proposal will result in a more compact junction, which will reduce crossing distances for vulnerable persons. Also the scheme will introduce cycle signals to improve cyclist safety through the junction	The proposal will result in a more compact junction, which will reduce crossing distances for vulnerable persons. Also the scheme will introduce cycle signals to improve cyclist safety through the junction
	Deprived Geographic Areas	3	3	3
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Overall Integration	3	3	3
	Land Use Integration	2	4	4
Quality of Service	Comments	Existing conditions	The scheme will provide a high quality walking and cycling connections into the large residential areas of Cusabor and Honeypark	The scheme will provide a high quality walking and cycling connections into the large residential areas of Cusabor and Honeypark
	Residential Population and Employment Catchments	3	3	3
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Transport Network Integration	3	3	3
	Comments	Similar for all options. No relative difference.	Similar for all options. No relative difference.	Similar for all options. No relative difference.
	Cycle Network Integration	2	4	4
Physical Activity	Comments	More difficult for cyclists to cross from cyclelane on southern side of carriageway to cyclelane on northern side of carriageway	Allows for the tie-in of cycletrack on either end of Glenagerary Road Upper	Allows for the tie-in of cycletrack on either end of Glenagerary Road Upper
	Traffic Network Integration	4	3	2
	Comments	no change to existing	this option will provide greater capacity in the junction in comparison to option C due to pedestrians and cyclists running together	proposal will reduce capacity at the junction

Junction 2				
Criteria/Impacts	Option A: Do Nothing	Option B: CYCLOPS Junction	Option C: Protected Junction	Option D: Dutch Style Roundabout
Economy	5	2	2	2
Safety	2	4	4	3
Environment	3	3	3	3
Accessibility and Social Inclusion	3	4	4	3
Integration	3	3	3	3
Quality of Service	4	4	3	4
Physical Activity	2	4	4	4
TOTAL	20	25	23	21
Overall Economy	5	2	1.5	1.5
Capital Cost	5	1	1	1
Comments	This option would not have any costs associated with it apart from ongoing maintenance costs.	Higher cost option due to major civil works.	Higher cost option due to major civil works.	Higher cost option due to major civil works.
Transport Reliability and Quality (Journey Time)	4	3	2	2
Comments	Impact on existing traffic regime is limited to none.	This option will remove a dedicated left turn slip lane from Oliver Plunkett Rd onto Mounttown Lower and a dedicated left turn slip lane from GRU to Kill Av. This will have a minor impact on the current traffic regime. Improvements to pedestrian and cyclist journey time.	This option will remove a dedicated left turn slip lane from Oliver Plunkett Rd onto Mounttown Lower and a dedicated left turn slip lane from GRU to Kill Av. This will have a minor impact on the current traffic regime. Improvements to pedestrian and cyclist journey time.	This option will reduce the entry and exit lanes to the junction down to one lane for each arm. This will have an impact on the current traffic regime. This will have a minor impact on the current traffic regime. Improvements to pedestrian and cyclist journey time.
Overall Safety	2	5	4	3
Road User Safety	2	5	4	3
Comments	Larger number of conflicts with other road users than other options	Segregated cycle and pedestrian facilities reducing conflicts. Cyclists to be segregated from the traffic phase while also keeping them segregated by pedestrians	Segregated cycle and pedestrian facilities reducing conflicts. More points of conflict between cyclists and pedestrians than Option B2	Segregated cycle and pedestrian facilities reducing conflicts.
Overall Environment	3	3	3	3
Air Quality	2	4	4	4
Comments	No change in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality	The scheme will encourage walking and cycling for both commuting and leisure purposes, which should lead to a decrease in car use leading to a reduction in traffic and a resultant improvement in air quality
Landscape and Visual Quality	2	4	4	2
Comments	Existing conditions	This option will facilitate opportunity to introduce landscaping and public realm improvements at the junction	This option will facilitate opportunity to introduce landscaping and public realm improvements at the junction	The proposed footprint of a roundabout would leave little opportunity for planting or improvements to urban realm
Biodiversity	3	3	3	3
Cultural Heritage	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Land Use	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Overall Accessibility and Social Inclusion	3	4	4	3
Vulnerable Groups	2	4	4	3
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Deprived Geographic Areas	3	3	3	3
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Overall Integration	3	3	3	3
Land Use Integration	3	3	3	3
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Residential Population and Employment Catchments	3	3	3	3
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Transport Network Integration	3	3	3	3
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Cycle Network Integration	2	4	4	4
Comments	More difficult for cyclists to cross from Mounttown Road Lower cyclelane to Kill Av cyclelane	Allows for the tie-in of cycletracks on Mounttown Road Lower and Kill Av	Allows for the tie-in of cycletracks on Mounttown Road Lower and Kill Av	Allows for the tie-in of cycletracks on Mounttown Road Lower and Kill Av
Traffic Network Integration	3	3	3	3
Comments	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference	Similar for all options. No relative difference
Overall Quality of Service	4	4	3	4
Quality of Service	2	4	3	4
Comments	Cycle and pedestrian facilities will provide a slightly lower QoS	Segregated cycle and pedestrian crossing facilities will provide a slightly higher QoS. Allows cyclists to be segregated from the traffic phase while also keeping them segregated by pedestrians	Segregated cycle and pedestrian crossing facilities will provide a slightly higher QoS. Cyclists still travelling through junction on traffic phase	Segregated cycle and pedestrian crossing facilities will provide a slightly higher QoS. Allows cyclists to be segregated from the traffic phase while also keeping them segregated by pedestrians
Construction and Buildability	3	2	2	2
Comments	Limited complexity with no major civil works needed	Increased complexity due to nature of junction	Increased complexity due to nature of junction	Increased complexity due to nature of junction
Physical Activity	2	4	4	4
Comments	Limited complexity with no major civil works needed	Increased complexity due to nature of junction	Increased complexity due to nature of junction	Increased complexity due to nature of junction

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