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Átha Cliath Theas
South Dublin County Council

Canal Loop Urban Greenway

Feasibility & Option Selection Report

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Archaeological, Architectural & Cultural Heritage	Courtney Deery Ltd
Bat Survey	Wildlife Surveys Ireland
Traffic Counts	IDASO
Tree Survey	Arborcare Ltd

EXECUTIVE SUMMARY

General

Barry Transportation were appointed by South Dublin County Council to undertake the Feasibility and Option Selection Report for the Canal Loop Urban Greenway. This new route would provide a high-quality link for pedestrians and cyclists between the proposed greenways along the Grand and Royal Canals.

This report gives the background for the scheme, details the route selection process, assesses a variety of options and recommends a preferred route for the scheme.

The section of the route that lies within the administrative boundary of Fingal County Council is not included in this version of the report, as this section will be subject to a separate consultation in the future.

Scheme Objectives

The objective of the study is to identify a preferred route that, as far as reasonably practical, delivers the infrastructure necessary to provide a high-quality pedestrian and cyclist route between the Grand and Royal Canals. This route aims to cater for cyclists and walkers of differing abilities and ages, and along with the completion of the section with Fingal County as well as the Grand and Royal Canal Greenways would create a high-quality 40 km recreational cycle loop which could be accessed easily from Dublin City Centre or any other location along the route. This high-quality cycle loop as shown in Figure 0.1 would be an excellent tourist amenity and the full loop could be cycled in around 3 hours.

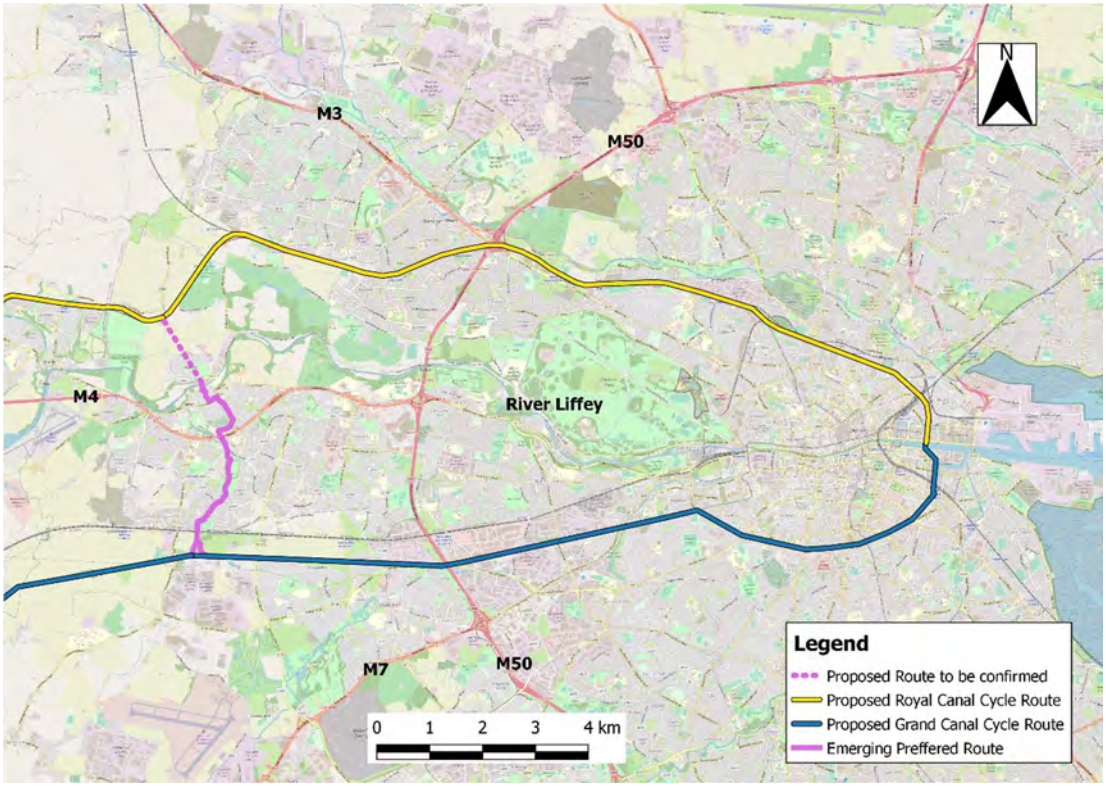

Figure 0.1 - Recreational Canal Cycle Loop

This route would also serve commuter cyclists and would include for the provision of pedestrian and cycle facilities linking to the route to encourage use by locals. It is expected that this route could be particularly useful for school children accessing the large number of schools in the Lucan Area as well as for commuters accessing the major employment centre of Grange Castle Business Park.

A major benefit of this scheme would be the increased physical activity and the associated health benefits for both recreational and commuter cyclists and walkers. Improved facilities for mobility and sensory impaired pedestrians would also be provided for the length of the scheme.

In addition, a high-quality pedestrian and cycle route would provide a safer route for both pedestrians and cyclists and would encourage a modal shift to cycling and walking. This would have the benefit of reducing the traffic congestion in Lucan Village and would result in reduced delays for motorists and public transport users, as well as an improvement in the air quality and reduction in greenhouse gases. Further aims of the scheme are to provide commercial benefits to the retail sector in the Lucan Area arising from the recreational cyclists and to use the opportunity to improve the public realm along the route.

The Study Area

The Study Area runs from The Grand Canal at the southern boundary to The Royal Canal (adjacent to Collins' Bridge) at the north. The study area is approximately 5km long north to south and was generally developed to include potential route options between the two canals, through Griffeen Valley Park and Lucan Village. There are a large number of schools in the southern half of the study area, other trip attractors include; Grange Castle Business Park, Lucan Village, St Catherine's Park, Griffeen Valley Park and Lucan Sports & Leisure Centre. The study area was then divided into smaller sections to simplify the route selection process. The study area lies within the administrative boundaries of South Dublin and Fingal County Councils.

The topography of the study area is generally flat but there are significant slopes leading down to the Liffey on both the north and the south side of the river. Existing facilities for pedestrians and cyclists within the study area are poor with limited provision of segregated cycle tracks or controlled crossings of busy roads. Footpath widths are below the required minimum as specified in DMURS in many locations and facilities for mobility and sensory impaired road users are also poor.

Route Options Assessment Process

To gain an appreciation of the specific constraints and opportunities within the study area Barry Transportation conducted a comprehensive data collection process consisting of desktop analysis supplemented with several site visits. Potential route options were then developed bearing in mind the information gathered during the data collection stage. Engineering judgement was used to determine which route options were feasible and progressed to the options assessment stage. These options were developed using best practice and design guidance from the National Cycle Manual and DMURS. More route options were developed for some study area sections than others. In the constrained areas around Lucan Village different design options for some routes were developed and assessed. These options offered differing levels of service for cyclists which could be a segregated cycle lane, a shared surface with pedestrians or having cyclists on-road mixed with low-speed traffic.

The route options were then compared against one another using Multi-Criteria Analysis (MCA) in accordance with the Department of Transport "Guidelines on a Common Appraisal Framework for Transport Projects published by the Department of Transport (DTTAS), March 2016.

The MCA considered the level of service provided, the economic impacts and the environmental impacts for each option. Each route option was comparatively assessed against sub-criteria under each of the main criteria. The options within each study area section were then ranked accordingly in order to identify the preferred option, the preferred options from each section were then combined to form the Emerging Preferred Route.

The Emerging Preferred Route

Based on the results of the analysis carried out as described in this report, an Emerging Preferred Route has been recommended, as illustrated in Figure 0.2, this is described in the following paragraphs, and in more detail in Section 9.1. Concept design drawings have been prepared and are included in Volume 3 of this report. The alignment and design of the section shown with a dotted line is within the administrative boundary of Fingal County Council and is yet to be determined. This section will be subject to a separate future consultation.

Figure 0.2 Emerging Preferred Route

Describing the route in a northbound direction, cyclists would join the route from the Grand Canal Greenway at either Hayden's Lane or via a path 300m to the east depending on if they are approaching from the west or east. From here cyclists would travel north along Hayden's Lane and would share road space with pedestrians and local access traffic, speeds and volumes of traffic on this section are within the limits set in the National Cycle Manual (see Section 1.7 of this Report) for shared surfaces. Cyclists would then use the existing cycle and pedestrian bridge to cross over the N4 and connect to Griffeen Valley Park. The existing paths and bridges through Griffeen Valley Park would be used as part of the route and cyclists would follow the existing 4m shared surface, the sections which have narrower paths would be widened and a new bridge over the Griffeen River is proposed adjacent to the existing playground. The kissing gates would be removed or replaced with more cycle friendly gates, and a new toucan crossing would be provided to allow cyclists to safely cross Old Esker Lane.

North of the N4 footbridge, cyclists would share road space with local traffic on Cherbury Park Road or use an alternative pedestrian and cycle link through the cul-de-sac and green space in Cherbury Park Avenue, they would then use the existing paths through the green area to the east to link to Beech Park, these paths would be widened and resurfaced. Cyclists would then share road space with general traffic on Beech Park and Lucan Heights. The alignment of some junctions along this section would be changed so that cyclists using the route would have priority and would need to make fewer turning movements.

The junction of Lucan Heights and Lucan Road would be signalised and toucan crossings would be provided on all arms. A new pedestrian/cycle ramp and path would be built through the green area to connect this junction to Sarsfield Park, the ramp would be built with reinforced earth and retaining wall structures, this ramp would be 200m long and would be built with a 5% incline. Cyclists would then travel north sharing road space with motorists on the low volume/low speed road of Sarsfield Park.

The existing roundabout on Lower Lucan Road and the road itself would be realigned to allow for a shared pedestrian/cyclist space on the southern and western sides of the road, this would require the removal of four trees. Zebra crossings would be provided on all arms of the roundabout to provide safe crossing for cyclists and pedestrians. This section is particularly constrained, and it is not considered practically achievable to provide a higher level of service for cyclists.

A new pedestrian/cyclist bridge crossing the Liffey would be built approximately 5m to the west of the exiting bridge this would likely require land take from the property located on an island within the Liffey. The carriageway on the existing bridge would be realigned to improve pedestrian facilities. The footpath on the western side of the road would be closed with pedestrians using the new bridge instead, and the space would be reallocated to the eastern footpath. This would provide enhanced facilities for pedestrians on both sides of the bridge and increase the connectivity between the two sides of the river.

Public lighting would be upgraded to modern LED lanterns, subject to ecological sensitivities, and CCTV installed where appropriate to reduce the likelihood of anti-social behaviour along the route. Bicycle parking and rest areas would also be provided as appropriate. Replacement tree planting would be undertaken to compensate for any trees that would need to be removed as part of the scheme and improvements to the urban realm would be done along the route where practicable. The Emerging Preferred Route is described in more detail in Section 9.1.

Scheme Benefits

The scheme detailed above would provide the infrastructure necessary for a high-quality pedestrian and cyclist route between the Grand Canal and the River Liffey and would cater for cyclists and walkers of differing abilities and ages. Along with the completion of the section within Fingal County Council as well as the Grand Canal and Royal Canal Greenways this would create a high-quality 40 km recreational cycle loop which could be accessed easily from Dublin City Centre or any other location along the route. This would benefit the Dublin Area as a whole, and Lucan Village in particular. The benefits of such routes can be seen in the other successful greenways such as the Waterford or the Great Western Greenways. The full loop would take approximately 3 hours to cycle and could easily be completed as part of a half-day trip or a full day trip with stop-offs.

This route would provide a much higher level of safety for pedestrians and cyclists when compared to the existing infrastructure. It would also encourage use of the route by greater numbers of cyclists and this increases drivers' awareness of the presence of cyclists, this would lead to a reduction in the number of accidents involving vulnerable road users.

As a commuter route, this route would also greatly improve the connectivity between north and south Lucan, particularly across the River Liffey, and would provide a higher level of service for commuter cyclists and pedestrians. This route would create accessible links between the schools and the residential areas of Lucan. This is seen as a strong advantage of this scheme and it is expected that this route would be particularly useful for school children accessing the large number of schools in the Lucan Area. It would also provide access for commuters to the major employment area of Grange Castle Business Park which is located south of the Grand Canal. A map of these trip attractors is shown in Section 9.2 of this report.

A major benefit of this scheme would be the increased physical activity and the associated health benefits for both recreational and commuter cyclists, and walkers who would use these new facilities. This would contribute to improving the well-being and productivity of the population and would reduce the health care costs for the state over time.

The construction of this scheme would encourage a modal shift for car users to cycling and walking. This would have the effect of reducing the traffic congestion in Lucan Village, which is very heavy during peak hours, this was observed on site and confirmed with traffic surveys. This would lead to reduced delays for motorists and public transport users as well as an improvement in the air quality and a reduction in greenhouse gas emissions. Cycling is also a cheaper, more efficient and more reliable mode of transport for the individual commuter. Improved facilities for mobility and sensory impaired pedestrians would also be provided for the length of the scheme.

Further benefits of the scheme would be the increased level of safety for vulnerable road users, the commercial benefits to the retail sector in the Lucan Area arising from the recreational cyclists and the opportunity to improve the public realm and provide recreational facilities along the route.

Cost Estimate

A preliminary cost estimate has been prepared based on the concept design for the scheme, which includes several assumptions regarding the scheme details. The estimated scheme infrastructure cost, which includes land acquisition and construction costs, is anticipated to be in the order of **€ 3.5 – 4.5 m** for the 4.1 km route that lies within South Dublin County. A detailed breakdown of these costs is included in Section 9.3 of this report.

The southernmost 2.5 km section of the route (Section 1), which is mostly through Griffeen Valley Park, is significantly cheaper than other sections and brings down the average cost per km of the route. The major cost items for the entire scheme are the proposed bridges over the River Liffey and the new ramp to link Lucan Heights to Sarsfield Park.

Next Steps

The next project stage (the development of a Preliminary Design) will further refine and update the initial concept design along the route. The Preliminary Design will define the final practically achievable scheme, considering more detailed studies of constraints and environmental assessment required at a local level. Prior to finalisation of the scheme design, a public consultation process will be undertaken, with inputs and feedback received incorporated where practical and appropriate to do so.

This Preliminary Design will form the basis of the planning consent process for the scheme, which will be done through the Part 8 or Part 10 process.

Table of Contents
Volume 1: Feasibility & Options Selection Report

Volume 2: Appendices

Volume 3: Concept Scheme Design Drawings

SECTION 1: INTRODUCTION

1.1 General

Barry Transportation were appointed by South Dublin County Council to undertake the Feasibility and Option Selection Report for the Canal Loop Urban Greenway. This new route would provide a high-quality link for pedestrians and cyclists between the proposed greenways along the Grand and Royal Canals.

This report gives the background for the scheme, details the route selection process, asses a variety of options and recommends a preferred route for this scheme.

The section of the route that lies within the administrative boundary of Fingal County Council is not included in this version of the report, as this section will be subject to a separate consultation event in the future.

1.2 Report Structure

This report is structured as follows:

- **Chapter 2** – This chapter outlines the general background information to the project and the policy context in which the urban greenway was developed. The scheme objectives and design principles are set out and any other transport policies relevant to the scheme are discussed.
- **Chapter 3** – In this chapter, the study area for the Canal Loop Urban Greenway is detailed and divided into distinct sections. Scheme specific constraints and opportunities are discussed.
- **Chapter 4** – The assessment methodology for identifying the Emerging Preferred Route is outlined in this chapter.
- **Chapters 5, 6, 7 & 8** – These chapters detail the Emerging Preferred Route selection process for the various sections of the study area
- **Chapter 10** – This chapter gives the overall conclusions of the scheme options assessment process and identifies and describes the Emerging Preferred Route.
- **Chapter 11** – This chapter other potential stand alone interventions that could be undertaken in the study area.

SECTION 2: TRANSPORT CONTEXT & SCHEME OBJECTIVES

2.1 Introduction

This chapter sets out the transport planning and policy framework within which the Canal Loop Urban Greenway is being developed. It also details the relevant planned developments within the core study area which have been considered as part of the feasibility and options identification stage.

2.2 Strategy for the Future Development of National and Regional Greenways

Published by the Dept. of Tourism Transport and Sport in 2018, this report lays out a strategy for the planning and delivery of rural greenway infrastructure.

2.3 Greater Dublin Area Cycle Network Plan

The National Transport Authority adopted and published the Greater Dublin Area Cycle Network Plan (GDA CNP) in 2014. The purpose of the plan was to establish the extent of the existing cycle infrastructure and facilities in the Greater Dublin Area and to set out a strategy to develop an integrated cycle network for the future. Within the GDA CNP, primary, secondary, feeder and greenway cycle routes were identified.

The proposed route would complete the Griffeen Valley Greenway and provide direct links between The Grand Canal, Liffey and Royal Canal Greenways as shown in Figure 2.1.

Figure 2.1 - Extract from GDA CNP

2.4 Development, Strategic and Local Area Plans, Guidance Documents and Strategic Development Zones

The following documents and plans were studied as part of the data collection process:

- General Plans and Guidelines
  - Adamstown Strategic Development Zone Planning Scheme (2015)
  - Design Manual for Urban Roads and Streets (2013)
  - Dublin City Development Plan 2016-2022
  - Fingal County Council Development Plan 2017-2023
  - Lucan Village Visual Design Statement (2007)
  - South Dublin County Council Development Plan 2016-2022
  - Transport Strategy for the Greater Dublin Area 2016-2035

- Cycling Plans and Guidelines
  - Grand Canal Greenway Planning Approvals
  - Greater Dublin Area Cycle Network Plan (2014)
  - National Cycle Manual (2011)
  - Royal Canal Greenway Planning Approvals
  - Rural Cycleway Design (2017)
  - Strategy for the Future Development of National and Regional Greenways (2018)

2.5 Greenway Concept

The Strategy for the Future Development of National and Regional Greenways (2018) states that a Greenway is a recreational or pedestrian corridor for non-motorised journeys, developed in an integrated manner which enhances both the environment and quality of life of the surrounding area. These routes should meet satisfactory standards of width, gradient and surface condition to ensure that they are both user-friendly and low risk for users of all abilities. As this is an urban greenway it will also serve as a route for commuter cyclists.

2.6 Objectives of Greenways

South Dublin County Council, Fingal County Council, the National Transport Authority and Waterways Ireland have identified the following objectives for this scheme:

- The route should form part of a recreational loop between the two canal greenways.
- The route should as far as is practicable be suitable for cyclists of all ages and abilities.
- The route should also provide for commuter cyclists.
- It is desirable for the route to pass through Lucan Village in order to provide increased business.
- The route should where feasible join in with the Greater Dublin Area Cycle Network Plan.
- All options should be cognisant of the existing environmental constraints.

2.7 Design Principles

This pedestrian and cycleway will be designed to provide the highest level of service possible for pedestrians and cyclists and will use industry best-practice along with guidance from The National Cycle Manual (2011), the Design Manual for Urban Roads and Streets (2013) and TII's document Rural Cycleway Design (Offline) (2017) .

Two figures from the National Cycle Manual are particularly important in this part of the design process. The first is the "Mixed or Separate" calculator for determining what types of cycle facilities are appropriate for a given road or street. As shown in Figure 2.2 below cyclists may only share road space with vehicular traffic when the speeds and volumes of traffic are below certain thresholds. Fully segregated cycle facilities are the most preferable and have been selected wherever possible.

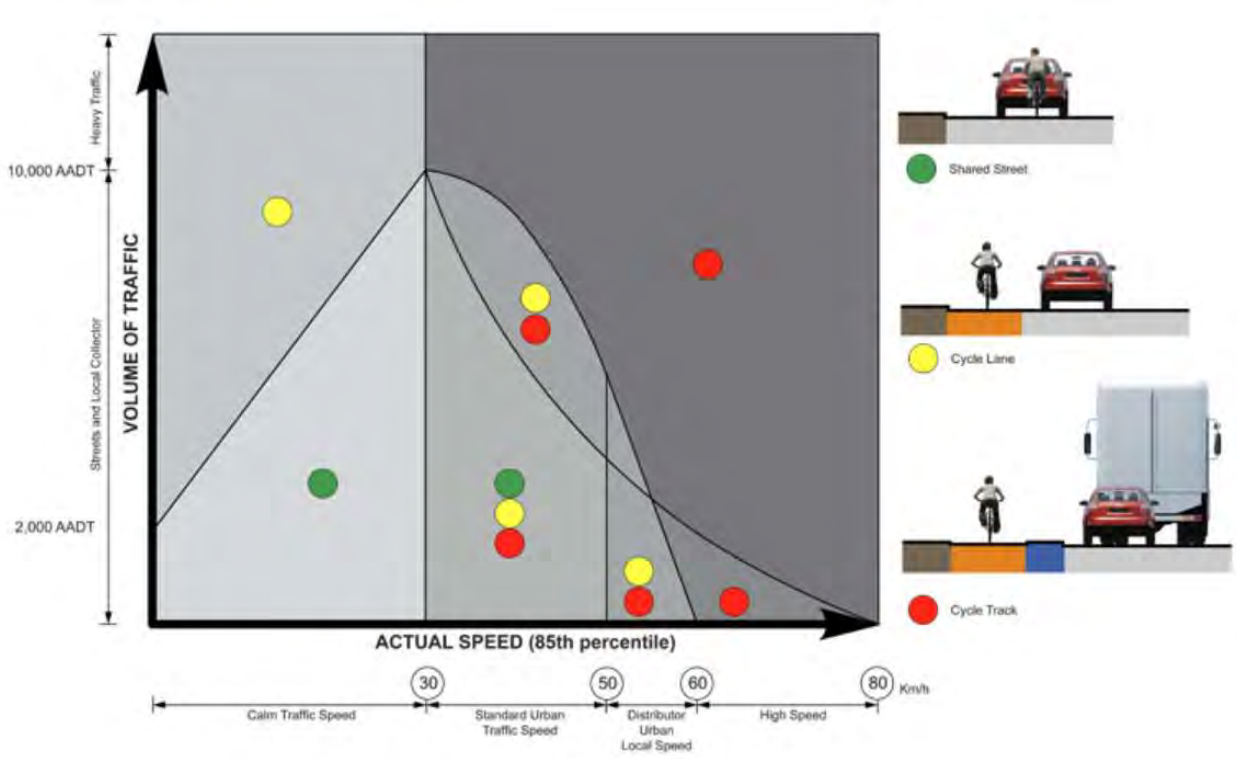

Figure 2.2 - NCM "Mixed or Separate" Calculator

The second is the Width Calculator, as shown in Figure 2.3 below. This figure is used to calculate the minimum width required for a segregated cycle lane. Wherever space allows, cycle lanes/tracks have been designed to exceed this minimum width. This figure is used for urban sections where cyclists are adjacent to motorised traffic.

A Inside Edge		B Cycling Regime		C Outside Edge		D Additional Features	
Kerb	0.25m	Single File	0.75m	30kph, 3.0m wide lane	0.50m	Uphill	0.25m
						Sharp bends	0.25m
Channel Gully	0.25m	Single File + Overtaking, Partially using next lane	1.25m	50kph, 3.0m wide lane	0.75m	Cyclist stacking, Stopping and starting	0.50m
Wall, Fence or Crash Barrier	0.65m	Basic Two-Way	1.75m	Raised kerb, dropped Kerb or physical barrier	0.50m	Around primary schools, Interchanges, or for larger tourist bikes	0.25m
Poles or Bollards	0.50m	Single File + Overtaking, Partially using next lane	2.00m	Kerb to vegetation etc. (ie. cycleway)	0.25m	Taxi ranks, loading, line of parked cars	1.00m (min 0.8m)
		2 Abreast + overtaking (tracks and cycleways)	2.50m			Turning pocket cyclists	0.50m

Example:
To determine required cycle width, select the appropriate Inside Edge, Cycling Regime, Outside Edge and any Additional Features

Channel Gully	0.25m	Single File + Overtaking, Partially using next lane	1.25m	50kph, 3.0m wide lane	0.75m	Around primary schools, Interchanges, or for larger tourist bikes	0.25m

0.25m
+ 1.25m
+ 0.75m
+ 0.25m

Required width = 2.50m

Figure 2.3 - NCM "Width Calculator"

For more rural sections where cyclists are separated from traffic the below figure from TII's Rural Cycleway Design (Offline) guidance document is more relevant. On consultation with the NTA a desirable cross section of 4m has been used for the greenway sections of this route. This assumption should be reviewed at the next design stage

		Desirable Min (m)	One Step Below Desirable Min (m)	Two Steps Below Desirable Min (m)
Cycleways	Low Volume	3.0	2.0	1.75
	High Volume	5.0	3.0	2.5

Figure 2.4 – TII's RCD Required Cross Sectional Widths

Wayfinding

Wayfinding is an important part of recreational cycle routes as many users will be unfamiliar with the area. So frequent, legible and consistent usage of signage, road markings and surfacing types are important to deliver a successful recreational cycle route. This would be particularly the case as cyclists pass through Lucan Village as there are multiple possible turn offs and the route may not be obvious. Examples of signage and road markings that are currently provided through Griffeen Valley Park are shown below.

Figure 2.5 - Example Signage from Griffeen Valley Park

Figure 2.6 - Sample Markings from Griffeen Valley Park (left) and Toronto's Lower Don Greenway (right)

Compatibility with Other Road Users

Consideration of other road users is a key component of the scheme. Along with providing a high-quality cycle route, the facilities for pedestrians will be improved throughout the scheme and the greenway will also act as a high-quality walking route. In addition, pedestrian and cyclist connectivity and permeability to trip generating locations shall be considered in the assessment of route options.

Traffic flow and access routes will be maintained along the route where practical. However, for some route options there will be a negative impact on traffic capacity along the route, this is as a result of reallocation of sections of road to cycle lanes, improved pedestrian and cycle infrastructure at junctions and/or the implementation of turning restrictions. The final scheme will be selected bearing in mind the hierarchy of road users specified in DMURS.

Figure 2.7 - Hierarchy of Road Users (DMURS)

Rest Facilities

A successful recreational cycle route often has rest areas or places where cyclists can stop to appreciate the scenery, these are also beneficial to the local economy. There are a number of obvious locations along the route where this could be included on this scheme including on the banks of the River Liffey, as well as in Griffeen Valley and St Catherine's Park. The provision of picnic benches and cycle parking at these locations can make them more attractive to recreational cyclists.

Figure 2.8 - Potential Rest Area with View of the River Liffey, Historic Weir and Masonry Arch Bridge

Cycle Parking

Another key part of a successful cycle scheme is the provision of adequate cycle parking in the locations where it is needed. There are many trip attractors along this route including schools, business parks and leisure centres where there would be a high demand for bicycle parking following the completion of this scheme. It is recommended that a cycle parking survey be undertaken to determine exactly where and how much cycle parking would be needed along this route.

Figure 2.9 - Cycle Parking

Public Lighting/CCTV

Public lighting improves the safety, comfort and security of all road users, including cyclists. It is an essential requirement for urban commuting during winter months. Unlike motorised vehicles, bicycle headlamps will not illuminate the route. Their design purpose is primarily to alert other road users to the presence of the cyclist. Cyclists are dependent on ambient or public lighting to see where they are going. Subject to ecological sensitivities, public lighting will be provided on unlit sections of the route as well as those alongside existing streets. Modern LED powered streetlights are more efficient than older style lamps and they are also designed to reduce light pollution and so are less impactful on the environment.

Public lighting can be supplemented with CCTV masts in areas where anti-social behaviour is a problem. Such masts have already been installed through Griffeen Valley Park, as shown in Figure 2.10, and it is likely similar masts would need to be provided on other isolated parts of the route. These masts are equipped with speakers so that those monitoring the cameras can issue audible warnings to those nearby.

Figure 2.10 - Example of public lighting and CCTV currently provided in Griffeen Valley Park

Cycle Friendly Gates

While there are existing good quality cycle facilities through most of Griffeeen Valley Park one of the major downsides are the kissing gates, as shown in Figure 2.11 below. These gates are inconvenient for cyclists and they are required to dismount and awkwardly manoeuvre their bikes through them. As part of this scheme these gates would be removed and replaced with more cycle friendly gates.

Figure 2.11 - Example of existing kissing gates in Griffeen Valley Park

SECTION 3: STUDY AREA

3.1 Introduction

The Canal Loop Urban Greenway Study Area runs from The Grand Canal at the southern boundary to The Royal Canal at the north. The study area was generally developed to include potential route options between the two canals and through Griffeen Valley Park and Lucan Village as illustrated below. The study area lies within the administrative boundaries of South Dublin and Fingal County Councils.

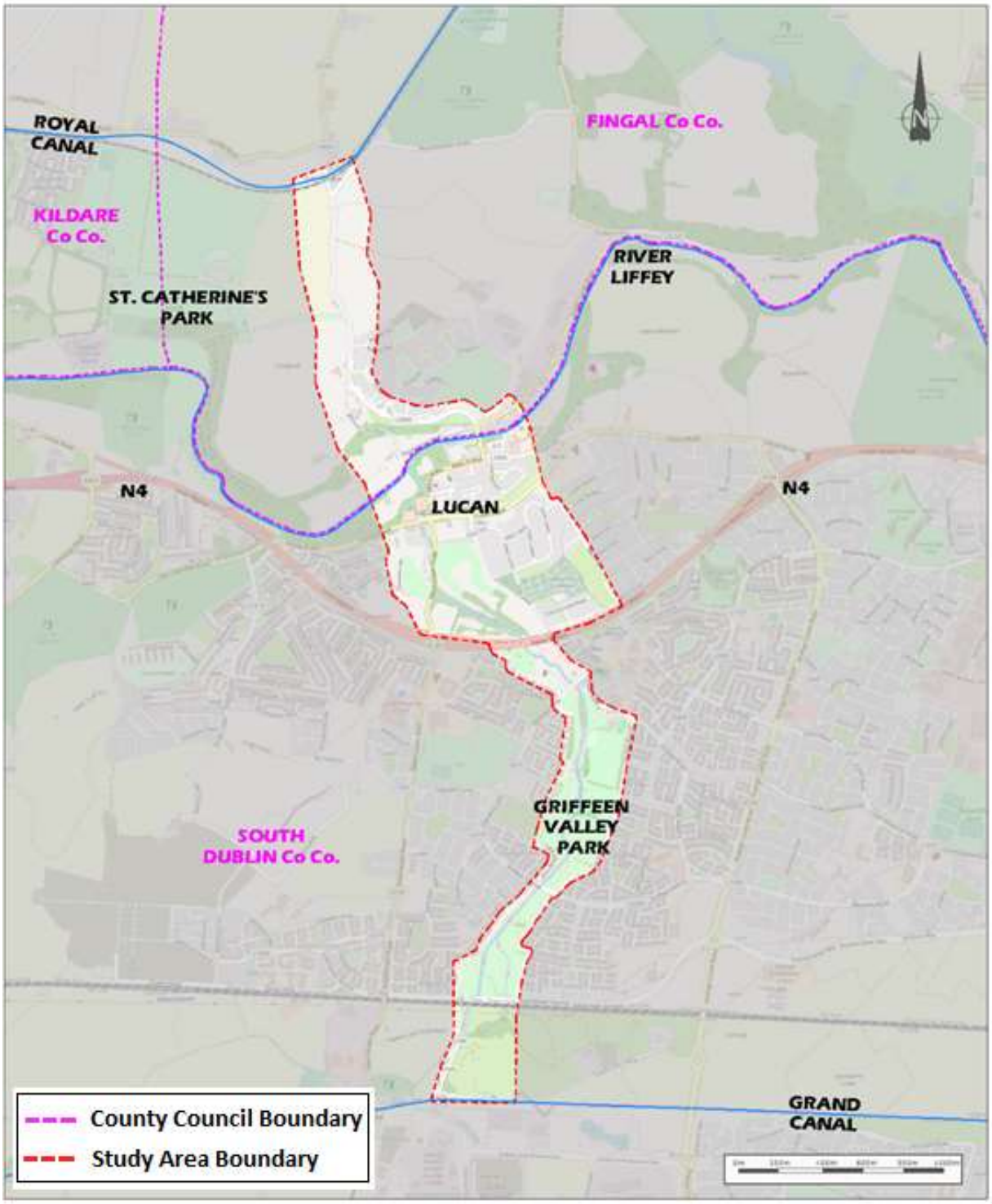

Figure 3.1 - Study Area

The Study Area was split into three smaller sections, as shown by the figure below. Due to the constrained nature of the road network and the high number of potential route options Section 2 has been further subdivided into sub-sections. The sections are described below.

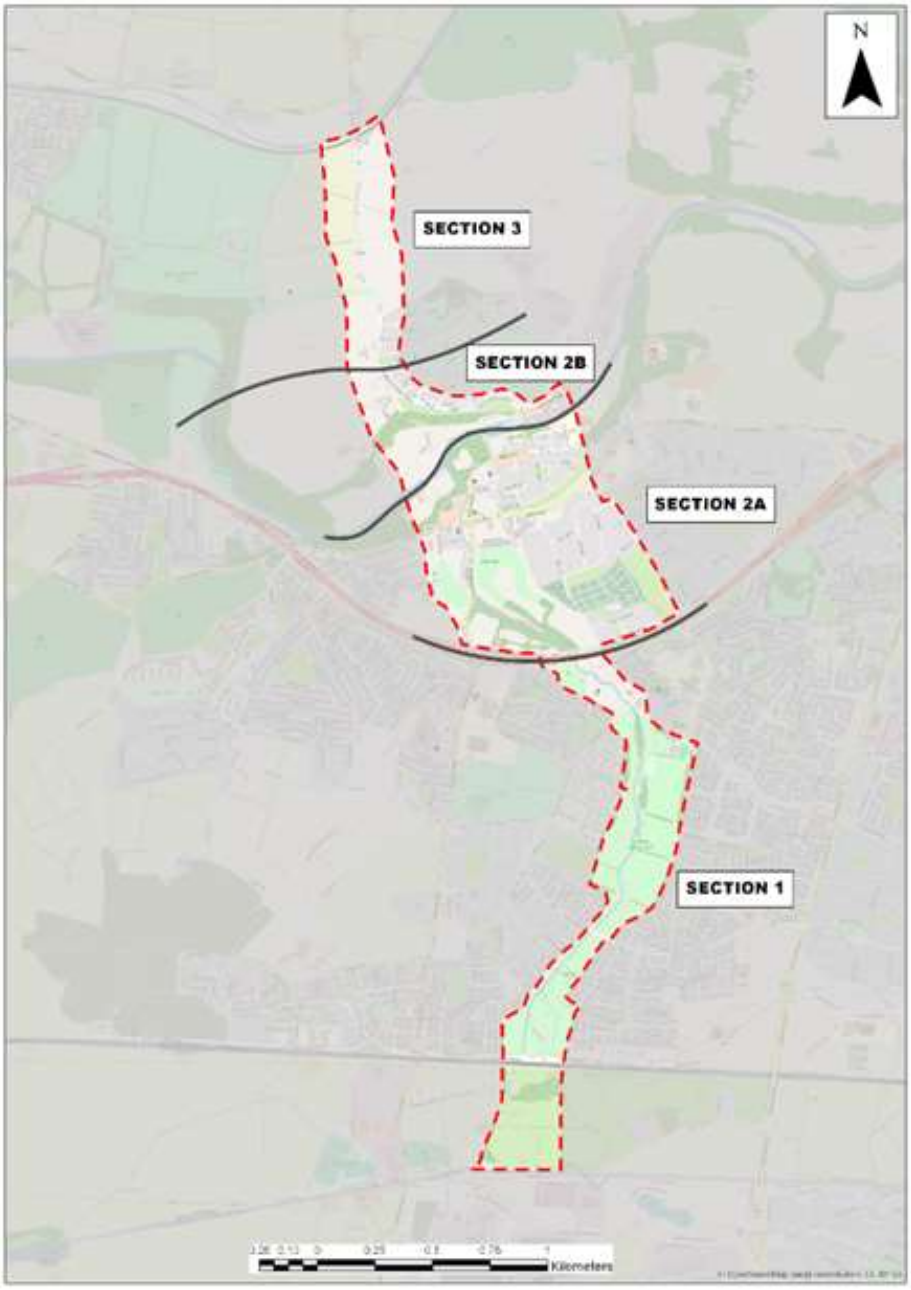

Figure 3.2 - Study Area Sections

Section 1 consists of the area within Griffeen Valley Park. There are existing pedestrian and cycle paths through the park, and these will be upgraded to form part of the proposed greenway. The park consists mostly of open green areas and so the design and construction of this section will be relatively straight forward when compared to other sections.

Section 2 is the area Lucan Village area. This is the most complex section of the study area with many constraints, including the network of narrow urban streets, large volumes of traffic, protected structures, limited places to cross the Liffey, areas of archaeological interest, steep gradients and ecological constraints. Several route options have been developed for this section.

Section 3 of the route is within the administrative boundary of Fingal County Council and is yet to be fully determined. This section will be subject to a separate future consultation.

3.2 Physical Constraints & Opportunities

There are a number of features in the natural and built environment within the study area which constrain scheme options or provide opportunities for enhanced integration. These are considered within the scheme assessment process and include the following:

- River Liffey, River Griffeen, The Royal Canal, Grand Canal and the N4 (limited options for crossing restricts design options).
- Trees, hedges and other natural and ecological features including rivers and streams.
- Architectural, archaeological and heritage sites and features.
- Protected structures adjacent to the route.
- Topography – There are steep slopes leading down to the Liffey on both sides of the river.
- Existing urban and rural street networks, the area around Lucan Village is particularly constrained.
- Limited availability of land in urban and suburban areas.
- Railway Line.
- Planned and committed developments.

3.3 Collision Database

Barry Transportation have studied the Road Safety Authority's Collision Database as part of the data collection stage. As can be seen from the below map there is a concentration of incidents around the main junctions in Lucan Village. Many of these involve pedestrians, including one fatality. This scheme will seek to address these concerns by providing enhanced pedestrian facilities and reducing vehicle speeds in accordance with DMURS.

Figure 3.3 - Reported Collision Map (RSA.ie)

SECTION 4: METHODOLOGY

The following chapter details the methodology used for the route selection process

4.1 Data Collection

The following information has been collated and studied for the route selection process:

- Background Mapping OS Tiles to determine road dimensions and topography, verified with onsite measurements where required
- Central Statistics Office (CSO) Data
- Deprived Geographic Index Mapping (Source: https://www.pobal.ie.)
- Traffic Count Data to measure traffic speeds and volumes
- Locations of Special Conservation Areas (SACs), Proposed National Heritage Areas (pNHAs) and Special Protection Areas (SPAs)
- Locations of Trees, Hedges and Other Ecological Features
- Planning Applications
- Collision Database
- Land Use Zoning from Development Plans
- Land Registry Information
- Specific Local Objectives from Development Plans
- Greater Dublin Area Cycle Network Plan Routes
- Watercourses and Flood Extent Mapping
- Zones of Archaeological Interest
- Record of Protect Structures, Monuments and Places

4.2 Route Option Development

The first step of the route selection process is to develop route options. Using the information collected during the data collection process, site visits and engineering judgement, feasible route options were developed for each study area section to bring forward to the Multi-Criteria Analysis Stage. In some locations multiple design options were developed for the same route option. All route options are described in Chapters 4-8.

4.3 Multi Criteria Analysis

All route options are compared against one another using a detailed Multi-Criteria Analysis in accordance with the Department of Transport Document "Common Appraisal Framework for Transport Projects and Programmes" for projects valued between €5 and €20 million.

The criteria below have been developed by Barry Transportation to satisfy the requirements of this document and to assess route options, this is further detailed in Section 4.4. Each option is comparatively assessed against these criteria using the methods of measurement identified below. The scheme options are then ranked using engineering judgement to identify the Emerging Preferred Route Option.

The assessment criteria are detailed below in the table following:

Assessment Criteria		Sub-Criteria
1	**Capital Cost**	1.a Infrastructure Cost
		1.b Land Acquisition Cost
2	**Quality of Service**	2.a Road Safety
		2.b Coherence
		2.c Directness
		2.d Attractiveness
		2.e Comfort
3	**Environment**	3.a Archaeological, Architectural and Cultural Heritage
		3.b Biodiversity
		3.c Water Resources
		3.d Landscape and Visual
		3.e Noise, Vibration and Air
		3.f Land Use and the Built Environment
		3.g Impact on Other Road Users and Lucan Village
4	**Planning**	4. Viability from a Planning Consent Perspective

1. Capital Cost

The capital cost of a scheme is comprised of;

(1.a) Indicative Infrastructure Cost Estimate

The infrastructure cost estimate determines the likely capital infrastructure cost of a particular scheme, taking into account the extent of works required in order to construct that scheme and achieve the route objectives. The infrastructure costs include the following:

- Pedestrian and Cycle route infrastructure
- Road re-alignment / new road construction
- Junction upgrades
- Drainage
- Services and utilities protection and relocation work
- Lighting
- CCTV
- Signs & Lines
- Modification to existing structures or any new structures required
- Construction traffic management

Linear rates of €/km were developed for individual sections of the route options depending on the extent of the construction required for each, nine such rates were developed based on the types of construction required. The structures, ramps and junctions were individually priced and then added to the sum of the linear rates to come up with a total estimated infrastructure cost for each route option.

(1.b) Land Acquisition Cost

The land acquisition costs consist of the cost of acquiring lands necessary for the scheme and also the costs of boundary / accommodation works associated with each scheme. It considers the likely number of properties required (commercial, public, residential and industrial) and also the extent of land required.

In this assessment, land is defined as either public or private. Public land is considered to be the space between road boundaries and any also any public open space. For this analysis, it is assumed that there is no cost associated with the acquisition of public land. The identification of land acquisition is based on available Ordnance Survey mapping only and as such is approximate.

For the purposes of this preliminary cost assessment, private land is assumed to have a standardised cost of €1,500 per square metre, however for a more detailed analysis, a more site-specific approach would be required. Land zoned for agricultural use has been assigned a lower rate of €20,000 per acre.

2. Quality of Service

The quality of service will be measured using the 5 Needs of a Cyclist as set out in The National Cycle Manual. How each of these will be assessed is described following:

(2.a) Road Safety

This criterion will look at the level of safety for cyclists using the route. It will consider the following issues

- Width and gradient of cycle facilities provided.
- Are the facilities segregated from traffic and/or pedestrians?
- Volume and 85th percentile speed of traffic on the route.
- Analysis of how cyclists would pass through junctions and potential conflict points.

(2.b) Coherence

To assess the coherence of each route option the number of turning movements that a cyclist will be counted, and the assessment will be made on how easy the route would be to follow for a recreational cyclist who is unfamiliar with the route.

(2.c) Directness

The route length and an estimate of average journey time for each route option will be used to assess the Directness criterion.

(2.d) Attractiveness

This criterion will be a subjective assessment of the attractiveness of each route option. Route options which pass through or adjacent to open green areas or have scenic views e.g. of areas of natural beauty, rivers, or heritage structures will score highly.

(2.e) Comfort

This criterion will measure the comfort levels of cyclists on each route option. Routes with steep gradients or sharp turning movements will score lower on this criterion while routes with wide, flat surfaces will score higher.

3. Environment

(3.a) Archaeological, Architectural and Cultural Heritage

Effects on cultural heritage can be considered in terms of impacts on below ground archaeological remains, historic buildings (individual and areas), and historic landscapes and parks. The construction, presence and operation of transport infrastructure can impact directly on such cultural heritage resources through physical impacts resulting from direct loss or damage, or indirectly through changes in setting, noise and vibration levels, air quality, and water levels.

Provision of a cycle route has the potential for impacts on archaeological, architectural and cultural heritage. Potential impacts of each scheme on Recorded Monuments and Protected Structures (RMPs) within 50m of the corridor are assessed and compared. Potential impacts on Sites of Archaeological or Cultural Heritage and on buildings listed on the National Inventory of Architectural Heritage are also assessed and compared under this criterion.

(3.b.) Biodiversity

The provision of the cycle route may have negative impacts on flora and fauna, for example, through construction of new infrastructure through green field sites. These impacts are compared for each scheme under this criterion and have been informed by desktop analysis and field visits.

(3.c.) Water Resources

The provision of cycle route infrastructure may include aspects (for example structures) with the potential to impact on hydrology. Any such structures and impacts are considered for each scheme under this criterion.

(3.d.) Landscape and Visual

Provision of cycle route infrastructure has the potential to negatively impact on the landscape and visual aspects of the area, for example, by the removal of front gardens or green spaces or the altering of streetscapes, character and features. Different schemes are compared, and any negative effects considered under this criterion.

The landscape (and visual) assessment of the route corridor options has had regard to:

- Land use zonings (amenity, open space, recreation, sport, etc)
- Protected views and prospects
- Recreation Access Routes / Designated Walk Ways
- Tree Preservation Orders (TPO) and tree preservation/protection objectives
- Location of Protected Structures
- Location of sites on the Record of Monuments and Places (including Areas of Archaeological Potential)
- Designation of Architectural and candidate Architectural Conservation Areas (ACA)

(3.e.) Noise, Vibration and Air

Provision of cycle route infrastructure has the potential to negatively impact on noise, vibration and air quality along a scheme. For example, through construction works. These effects are compared for each scheme option under this criterion. It is noted however that impact is quantified on whether the road is moving closer to a sensitive receptor, for example road widening or new realignment.

(3.f.) Land Use and the Built Environment

This criterion assesses the impact of each scheme option on land use character, and measures impacts which prevent land from achieving its intended use, for example through land acquisition, removal of parking spaces or severance of land.

(3.h.) Impact on Other Road Users and Lucan Village

This criterion assesses the anticipated impact of each scheme option on other road users. Changes to the level of service for motorists and pedestrians are assessed as well as any potential impacts to Lucan Village caused by traffic restrictions or removal of parking spaces.

4. Planning

(4.) Viability from a Planning Consent Perspective

This criterion is a qualitative assessment of the likelihood of each route option attaining planning permission. This considers the anticipated levels of community buy-in as well as potential opposition in terms of impacts on vehicular access, trees, parking, land take, safety and security.

4.4 Compliance with DTTAS Common Appraisal Framework

The Department of Transport, Tourism and Sport's "Guidelines on a Common Appraisal Framework for Transport Projects" specifies that multi-criteria analysis should consider the following criteria.

Economy	The impacts of a transport investment on economic growth and competitiveness are assessed under the economic impact and economic efficiency criteria.
Safety	Safety is concerned with the impact of the investment on the number of transport related accidents.
Physical Activity	This relates to the health benefits derived from using different transport modes.
Environment	Environment embraces a range of impacts, such as emissions to air, noise, and ecological and architectural impacts.
Accessibility and Social Inclusion	Accessibility and social inclusion embraces the notion that some priority should be given to benefits that accrue to those suffering from social deprivation, geographic isolation and mobility and sensory deprivation.
Integration	Integration considers the extent to which the project being evaluated promotes integration of transport networks and is compatible with a range of Government policies, including national spatial and planning policy.

How this assessment methodology, which has been developed by Barry Transportation, assesses each of these criteria is discussed below.

Economy

The economic effects of this greenway can be split into two separate categories, the financial cost of constructing the greenway will be assessed in Criterion 1- Capital Cost and the positive impacts of this investment will be measured in Criterion 2 - Quality of Service. The higher the quality of service provided by the route the greater the economic benefit as described in Section 10.3 of this report.

Safety

This will be measured by in one of the sub-criteria of Criterion 2 - Quality of Service.

Physical Activity

The higher the quality of the cycle route provided the more it would encourage physical activity, and this will be measured by Criterion 2 - Quality of Service.

Environment

This will be measured by Criterion 3 - Environment and the various sub-criteria.

Accessibility & Social Inclusion

An improved cycle route would benefit all communities within the study area even if a route does not pass directly through their particular area. The impact of each route option on Accessibility and Social Inclusion will be measured by Criterion 2 - Quality of Service. Additionally, the impact on mobility and sensory impaired pedestrians will also be assessed under one of the sub-criteria for Criterion 3 – Environment.

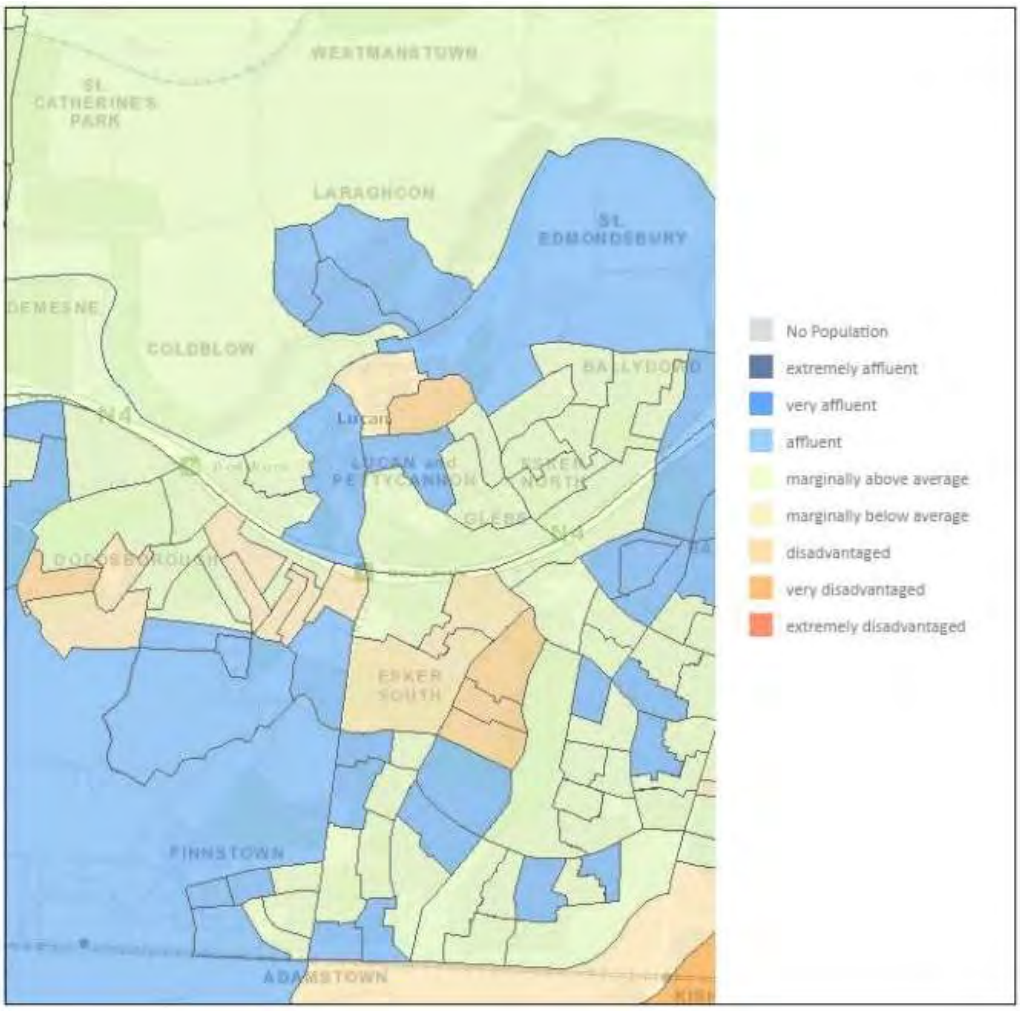

Figure 4.1 - Geographic Deprivation Index (www.Pobal.ie)

Integration

The relevant policy aim for this project is to provide a high-quality cycle route which links the Grand Canal to the Royal Canal while also serving Lucan Village. This will be measured by Criterion 2 - Quality of Service.

4.5 Scheme Options Summary Table

A qualitative ranking system has been developed to compare routes under each sub-criteria, this is shown below.

Table 4.1 - Qualitative Ranking System

Extreme Positive	Severe Negative
Major Positive	Major Negative
Moderate Positive	Moderate Negative
Minor Positive	Minor Negative
Neutral	

The above ranking system was used to determine, compare and contrast the relative advantages and disadvantages of each route option in relation to the others, as opposed to against a set of universal or general criteria. Where no relative advantage or disadvantage has been identified between route options for a particular criterion, each have been given a neutral rating. This ranking system is in accordance with the NTA Project Management Guidelines (2011) and industry best practice.

For each of the criteria, a qualitative approach was adopted to assign the relative rankings of each. Therefore, judgement was applied in arriving at the rankings assigned.

SECTION 5: STUDY AREA SECTION 1

This chapter outlines the options assessment process for Section 1 of the Study Area (Griffeen Valley Park). Two route options have been developed one on the western side and one on the eastern side of the Griffeen River.

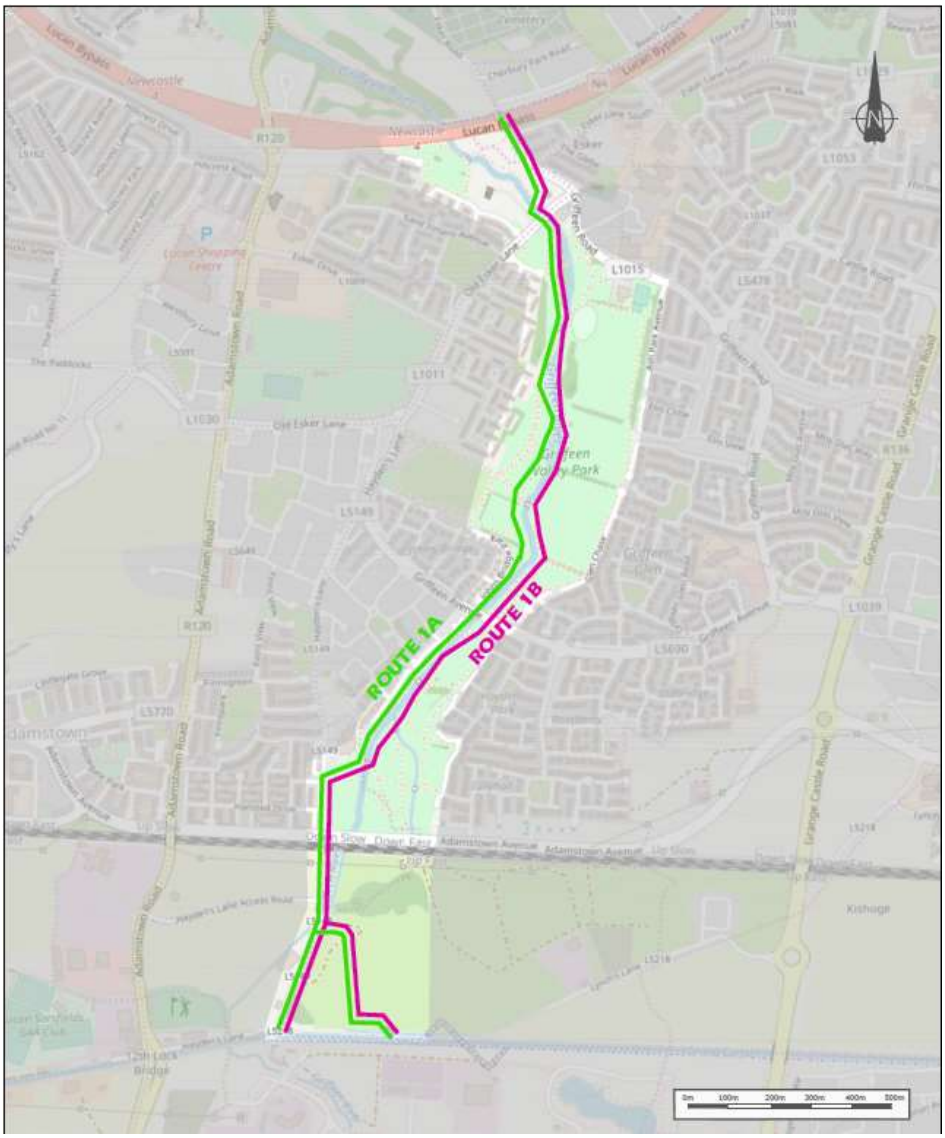

Figure 5.1 - Route Options for Section 1

5.1 Route 1A

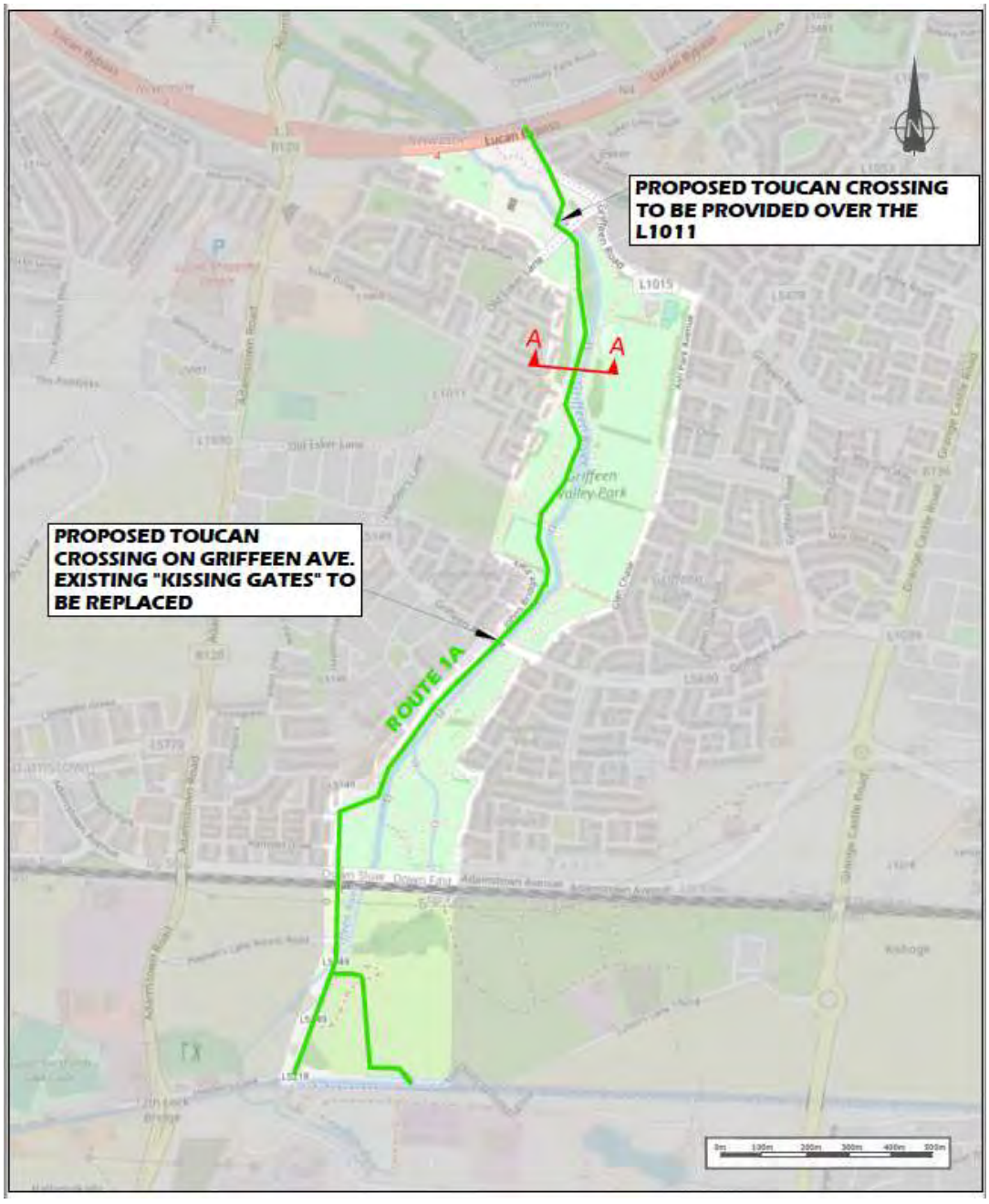

Figure 5.2 - Route 1A

Describing the route in a northbound direction, cyclists would join the route from the Grand Canal Greenway at either Hayden's Lane or via a path 300m to the east depending on if they are approaching from the west or east. From here cyclists would travel north along Hayden's Lane and would share road space with pedestrians and local access traffic. Cyclists would then use the existing footbridge to cross over the N4 and connect to Griffeen Valley Park.

This route follows the existing paths within Griffeen Valley Park to the west of the river, the paths would be resurfaced and widened. New public lighting and CCTV masts would be provided for the full length of the route. This route extends as far north as the existing footbridge over the N4.

The toucan crossing on Griffeen Avenue would be moved to allow for a more direct crossing for cyclists and a new one would be provided on Old Esker Lane. The existing kissing gates for the park would be replaced

with more cycle friendly gates. A new pedestrian/cyclist bridge would also be constructed crossing the Griffeen River just north of Old Esker Road, this would be required as the existing bridge on Old Esker Road is not wide enough to provide segregated cycle facilities, it would also provide a more direct route.

Figure 5.3 - Route 1A, Cross Section A-A Existing[1]

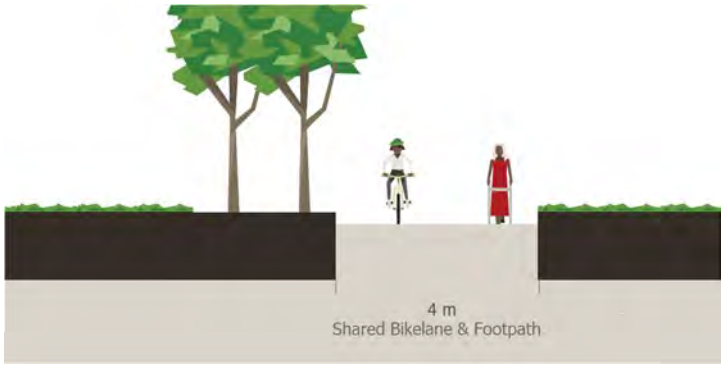

Figure 5.4 - Route 1A, Cross Section A-A Proposed

[1]*Credit for this and all subsequent cross section images to www.streetmix.net*

5.2 Route 1B

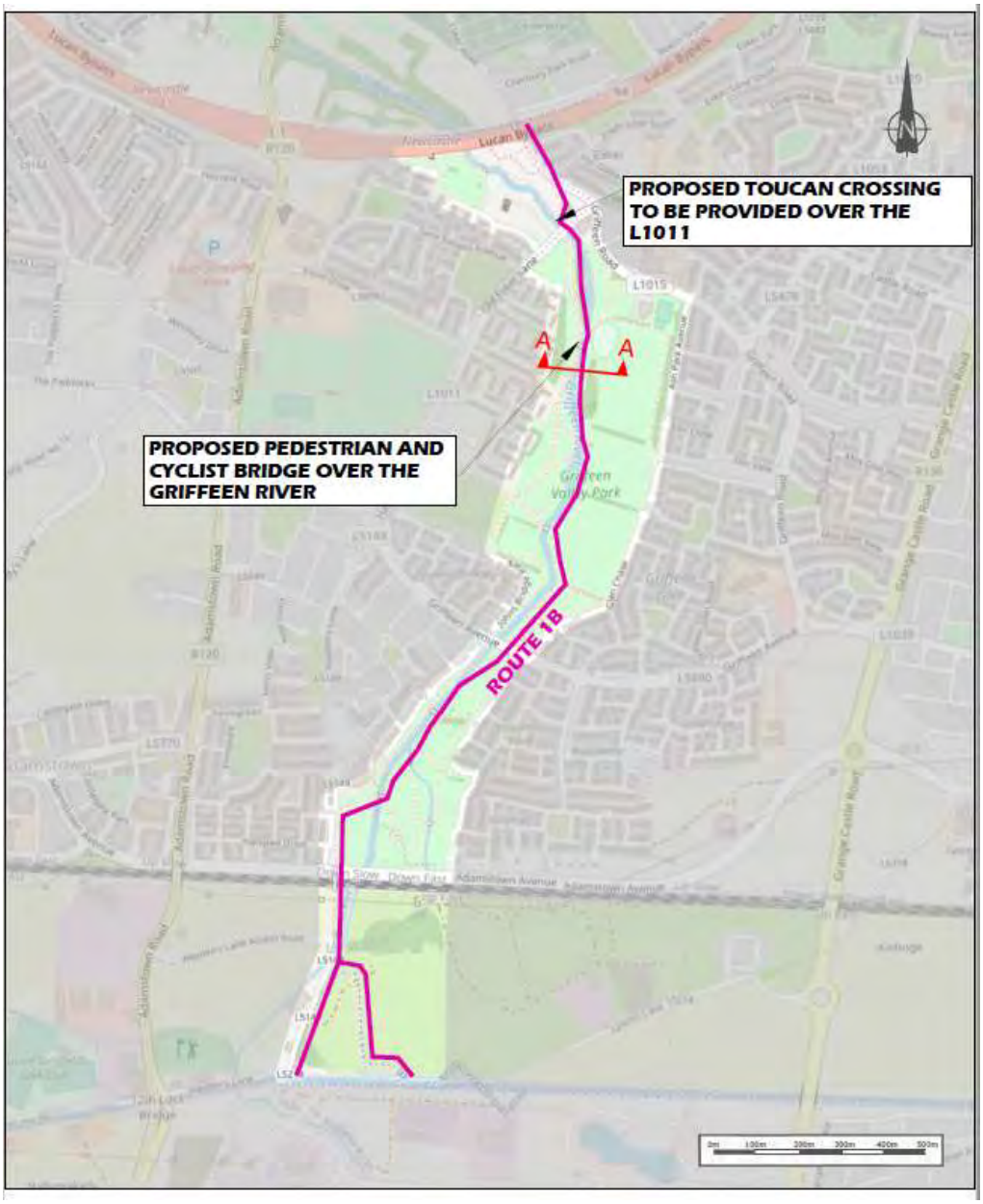

Figure 5.5 - Route 1B

For this option the existing paths and bridges through Griffeen Valley Park would be used as part of the route and cyclists would follow the existing path on the eastern side of the river. The southern section of the park has existing 4m wide paths, public lighting and CCTV masts and so minimal works would be required here. A photo of this section is shown below in Figure 5.6, this photo is taken facing north.

For the section north of Griffeen Avenue paths would be widened and resurfaced and public lighting provided. A new 4m wide pedestrian and cyclist bridge would be constructed over the Griffeen River as shown in Figure 5.5 and this would provide connectivity to the Lucan Sports and Leisure Centre.

Figure 5.6 - Image showing existing 4m wide shared surface and public lighting on eastern side of the river

The existing kissing gates in the park would be replaced with more cycle friendly gates and a new toucan crossing would be provided to allow cyclists to safely cross Old Esker Lane.

Figure 5.7 - Route 1B, Cross Section A-A Existing

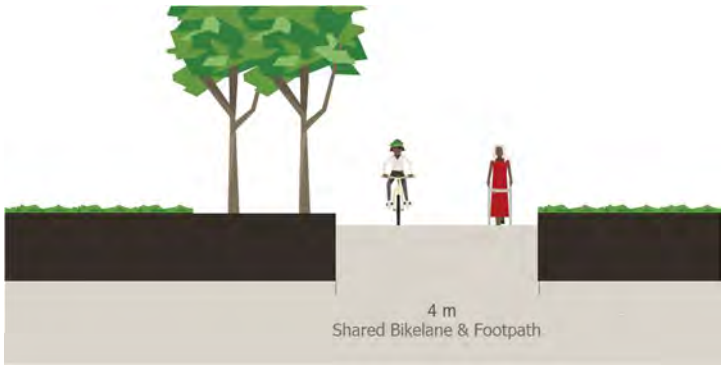

Figure 5.8 - Route 1B, Cross Section A-A Proposed

5.3 Options Assessment

A summary of the ranking of options for Section 1 against the scheme sub-criteria is presented in Table 5.1 below, the colour coded scoring system is shown below. Further details of the route options assessment are presented in Appendix A.

Table 5.1 - Section 1 MCA Summary Table

Section 1			
Assessment Criteria	**Sub-Criteria**	**1A**	**1B**
Capital Cost			
Quality of Service	Road Safety		
	Coherence		
	Directness		
	Attractiveness		
	Comfort		
Environment	Archaeological, Architectural and Cultural Heritage		
	Biodiversity		
	Water Resources		
	Landscape and visual		
	Noise, Vibration and Air Quality		
	Land Use and the Built Environment		
Planning	Viability from a Planning Perspective		

Table 5.2 - Qualitative Ranking System

Extreme Positive
Major Positive
Moderate Positive
Minor Positive
Neutral
Minor Negative
Moderate Negative
Major Negative
Severe Negative

In terms of Capital Cost, Route 1B utilises a 500m section which has an existing wide shared surface path, public lighting and CCTV masts and so would be cheaper to construct than 1A.

In terms of Level of Service, Route 1A is marginally more direct than 1B. Route 1B is judged to be more attractive as there are better views from the existing bridges and paths on the eastern side of the river that Route 1B uses, while Route 1A has some views of housing estates to the west.

Figure 5.9 below, taken facing south, shows a section of the two pathways, 1A on the right and 1B on the left.

Figure 5.9 - Existing Facilities in Griffeen Valley Park (Facing South)

In terms of Biodiversity, Route 1B would involve the installation of fewer public lighting columns and so would be slightly less impactful on the behaviour of animals. This issue also means that Route 1B is slightly preferable in terms of Planning as well. Route 1A could require the construction of a new bridge over the Griffeen River and so is slightly less preferable in terms of Water Resources.

Conclusion

Based on the assessments above it has been determined that Route 1B offers the preferred route option. This route achieves the scheme objectives of providing high quality cycle infrastructure to link the Grand and Royal Canals and has the following benefits when compared to other route options:

- It is cheaper and simpler to construct as it uses sections of the park where cycle infrastructure has already been constructed.
- It provides a more attractive route as the views are judged to be better than those on Route 1A.

- It would have a lesser impact on the environment and would be more likely to attain planning as the extent of the construction works and public lighting would be lower.

SECTION 6: STUDY AREA SECTION 2A

In order to simplify the route selection process Section 2 of the study area has been further subdivided into two sub-sections. This chapter outlines the options assessment process for Section 2A of the Study Area which is the area south of the River Liffey. Crossings over the Liffey and the area north of this are looked at in subsequent chapters.

This section consists of a network of narrow urban streets with limited scope for provision of segregated cycle facilities. 7 route options have been identified for this section as shown in the figure below. There are two variants of route 4, these differ on how they cross the Lucan Road. All route options are shown in the figure below.

North of the Lucan Road there is limited road space available which limits the possibility of providing segregated cycle facilities, only one design per route option is proposed here. South of the Lucan Road there is more space available and several design options have been prepared with varying levels of segregation provided for cyclists. In total 18 options have been developed, these are discussed individually in the sections following.

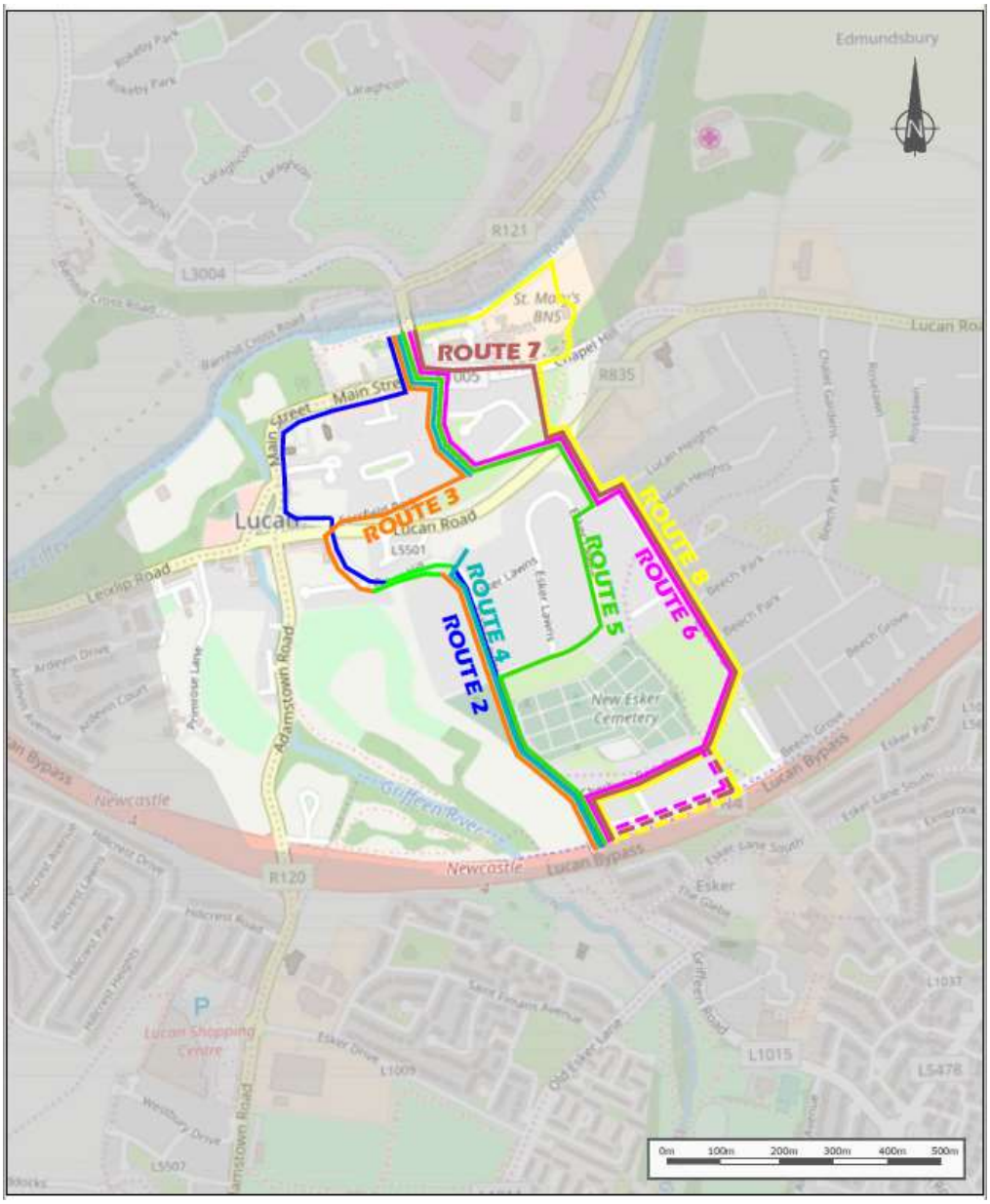

Figure 6.1 - Section 2A Route Options

6.1 Route 2

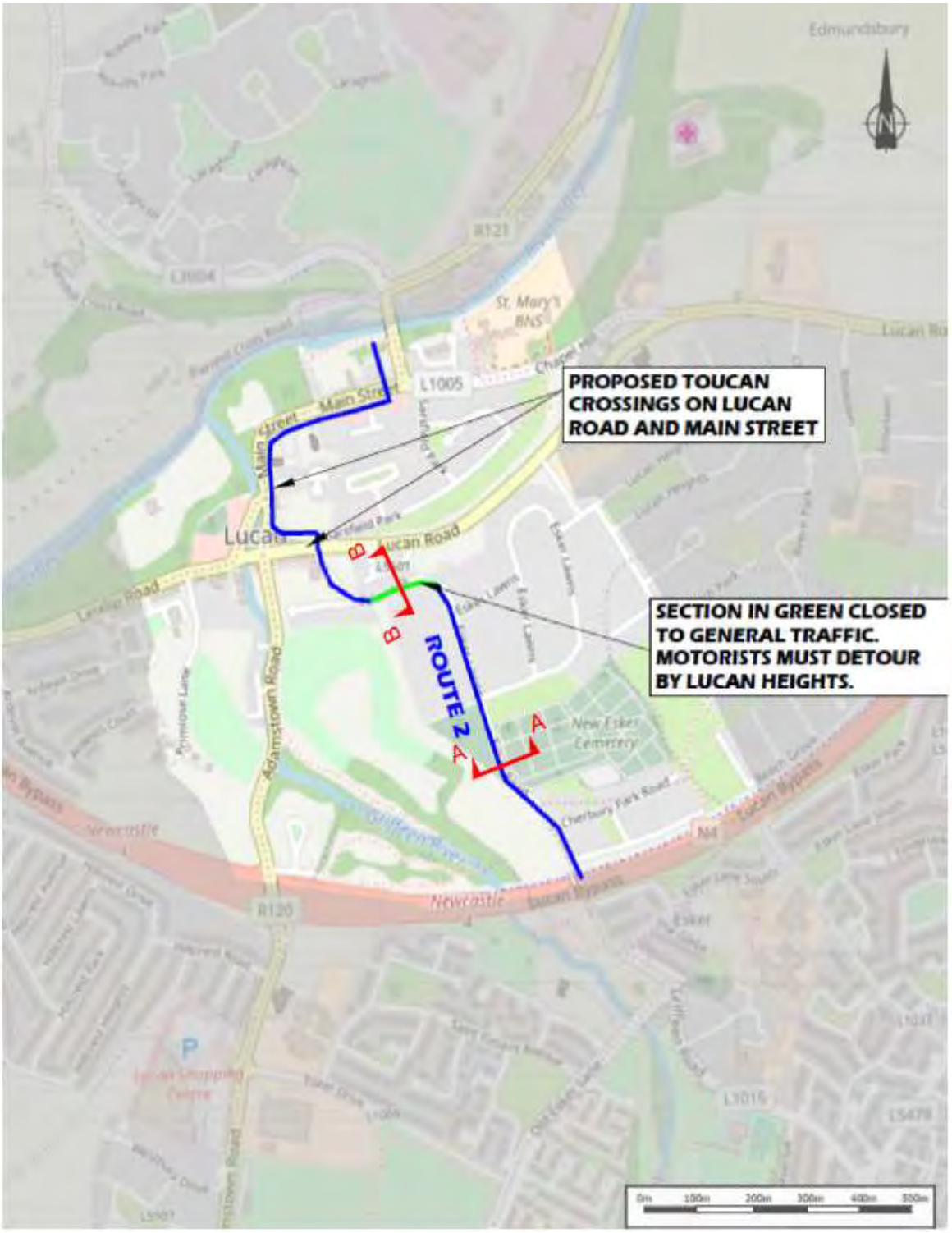

Figure 6.2 - Route 2A

The southern end of Route 2A starts the existing footbridge over the N4, from here cyclists would travel north along the existing path which would be resurfaced and widened. Cyclists would then travel along the existing roads Esker Park and Esker Lawns, these roads are low speed, low volume residential streets and cyclists would share road space with general traffic. The lane widths here will be reduced to 2.5m each with the remaining space used to provide wider footpaths. This would further reduce vehicle speeds in accordance with DMURS.

Esker Hill has a very constrained cross section and it does not sufficient have width to safely provide for two-way traffic movements and one footpath, in addition the steep gradient (approx. 8%) and horizontal curve would make it unsafe for cyclists to mix with general traffic. For this section it is proposed to close Esker Hill to general traffic from the junction with Mount Gandon to the pedestrian entrance to Esker Hill Park, this section would then become a shared space for pedestrians and cyclists, and motorists would be required to detour via Lucan Heights. Land take from either side of the road was not considered feasible at this section due to the large level differences and mature trees that are on both sides of the road.

A new northbound contra-flow cycle track would be constructed on the 50m one-way section of Main Street, this would require the relocation of the existing taxi rank. Cyclists would then share road space with motorists for the reminder of the route, it is not considered feasible to remove the on-street parking to provide fully segregated facilities due to the negative impact on businesses in Lucan. A parking study was undertaken which showed a high occupancy and turnover of parking spaces along this section.

A new toucan crossing would be provided on the Lucan Road and a new cyclist/pedestrian ramp constructed in place of the steps to link to Sarsfield Park. A toucan crossing would also be provided on Main Street at the junction with Sarsfield Road.

Figure 6.3 - Route 2, Cross Section A-A Existing

Figure 6.4 - Route 2, Cross Section A-A Proposed

Figure 6.5 - Existing Layout on Esker Hill

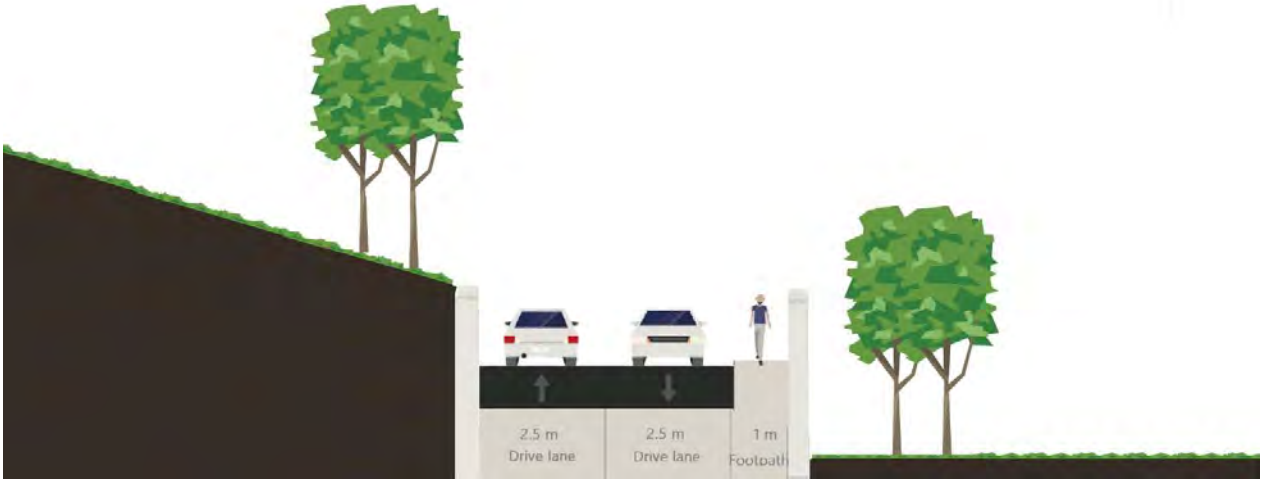

Figure 6.6 - Route 2, Cross Section B-B Existing

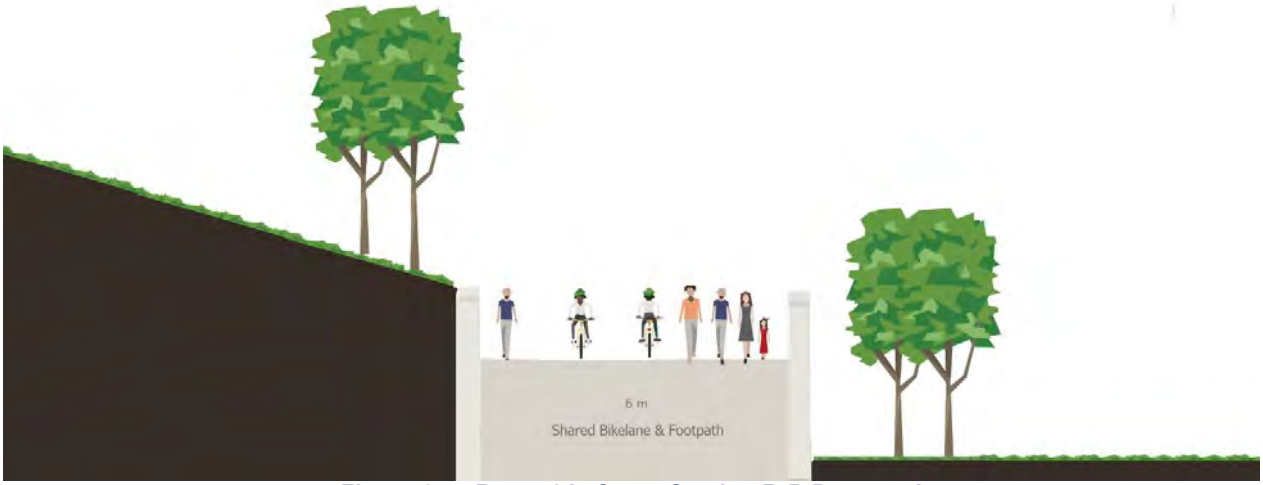

Figure 6.7 - Route 2A, Cross Section B-B Proposed

Route 2B

Route 2B differs from 2A in that cyclists are segregated from general traffic on Esker Road and Esker Lawns. Cyclists in both directions would share space with pedestrians on the eastern side of the road. This would require some realignment of the road and would involve removing the existing verge and street trees along this section.

Figure 6.8 - Cross Section A-A Existing

Figure 6.9 - Route 2B, Cross Section A-A Proposed

6.2 Route 3

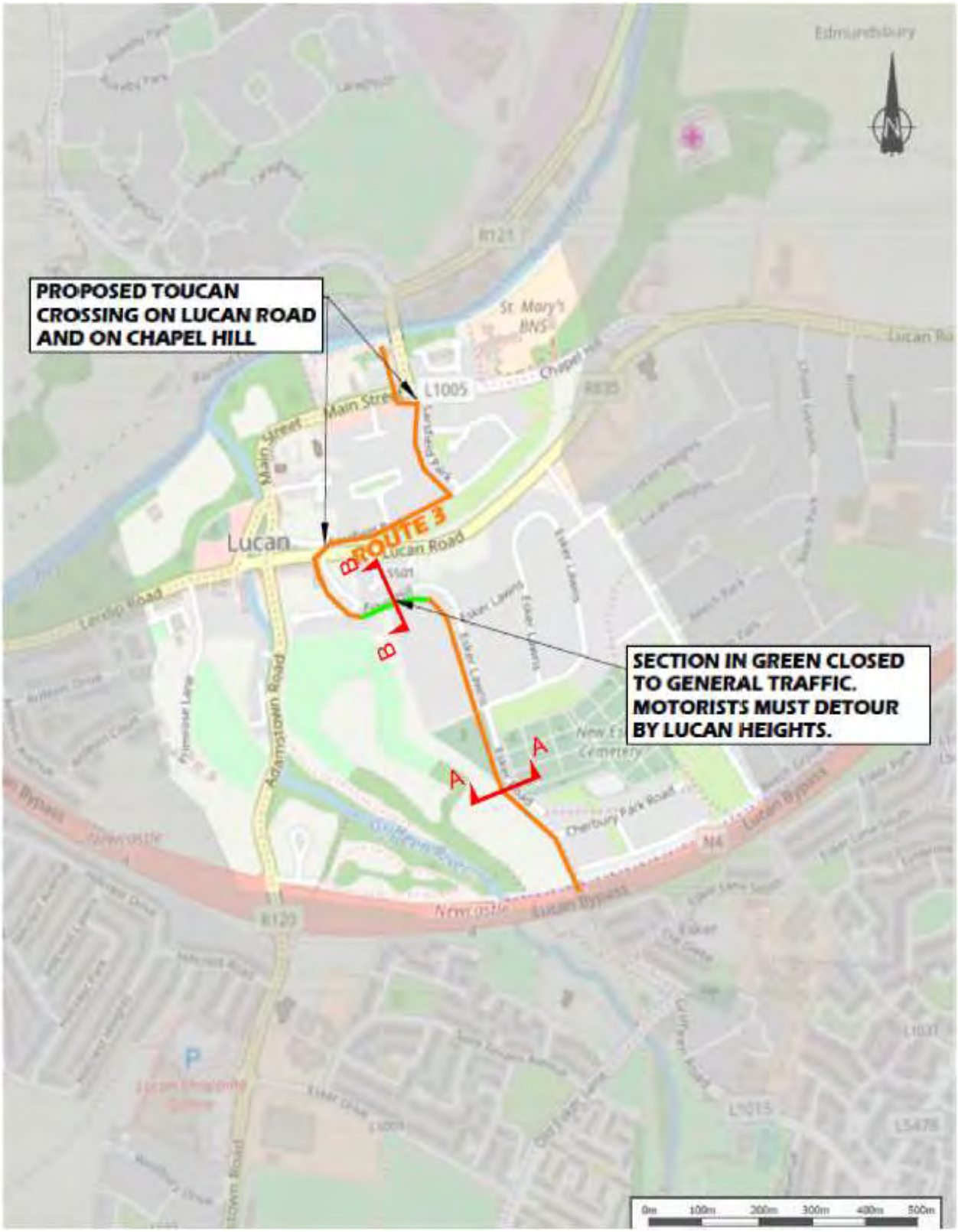

Figure 6.10 - Route 3

Route 3A

The southern end of Route 3 starts the existing footbridge over the N4, from here cyclists would travel north along the existing path which would be resurfaced and widened. Cyclists would then travel along the existing roads Esker Park and Esker Lawns, these roads are low speed, low volume residential streets and cyclists would share road space with vehicular traffic. The lane widths here will be reduced to 2.5m each with the remaining space used to provide wider footpaths in accordance with DMURS. Additional traffic calming measures would be added to ensure the volumes and speeds of traffic are below the limits set in the National Cycle Manual (see Section 1.7 of this report).

Esker Hill has a very constrained cross section and there is does not have sufficient width to safely provide for two-way traffic movements and one footpath, in addition the steep gradient and horizontal curvature would make it unsafe for cyclists to mix with general traffic. For this section it is proposed to close Esker Hill to general traffic from the junction with Mount Gandon to the pedestrian entrance to Esker Hill Park, this section would then become a shared space for pedestrians and cyclists, and motorists would be required to detour via Lucan Heights.

A new toucan crossing would be provided on the Lucan Road and a new cyclist/pedestrian ramp constructed in place of the steps to link to Sarsfield Park. Cyclists would then share road space with general traffic on the low speed/low volume roads of Sarsfield Park. Speeds and volumes of traffic on this road are below the limits set for shared surfaces in the National Cycle Manual.

Figure 6.11 - Route 3, Cross Section A-A Existing

Figure 6.12 - Route 3A, Cross Section A-A Proposed

Figure 6.13 - Existing Layout on Esker Hill

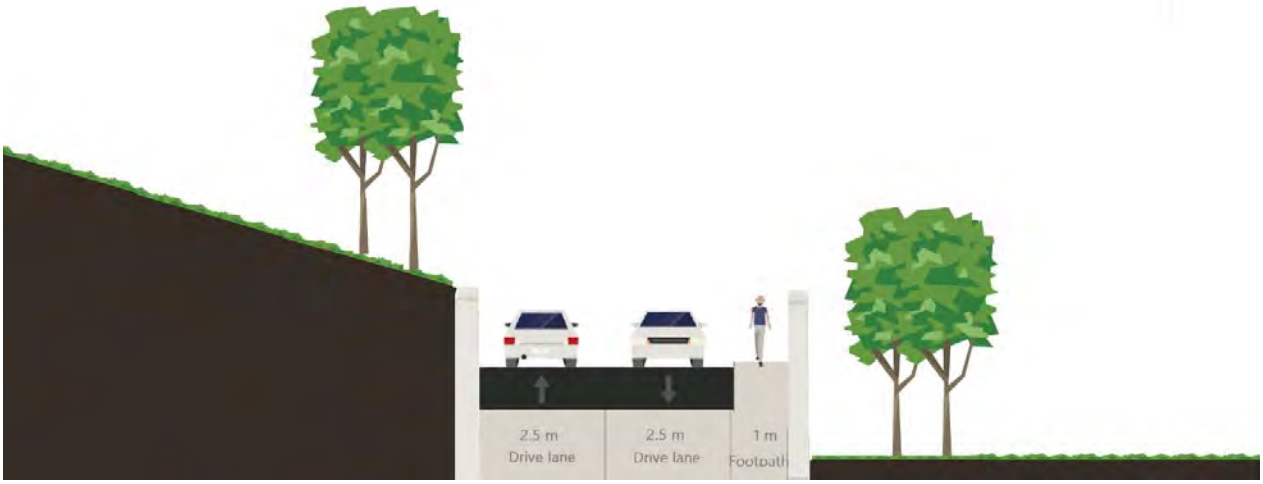

Figure 6.14 - Route 3, Cross Section B-B Existing

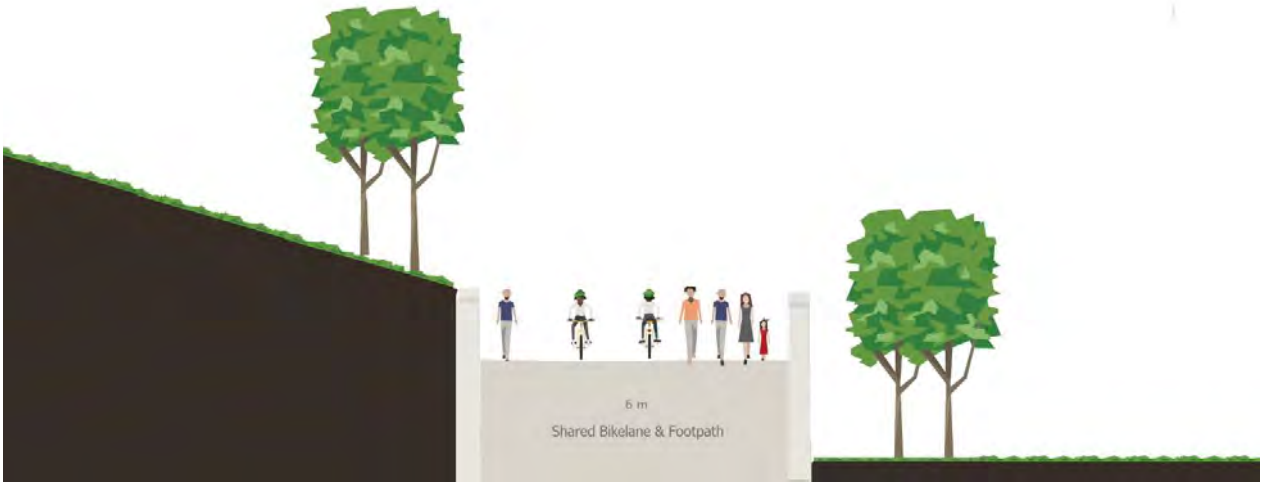

Figure 6.15 - Route 3A, Cross Section B-B Proposed

Route 3B

Route 3B differs from 3A in that cyclists are segregated from general traffic on Esker Road and Esker Lawns. Cyclists in both directions would share space with pedestrians on the eastern side of the road. This would require some realignment of the road and would involve removing the existing verge and trees along this section.

Figure 6.16 - Route 3, Cross Section A-A Existing

Figure 6.17 - Route 3B, Cross Section A-A Proposed

6.3 Route 4

There are two variants of Route 4 depending on the method of crossing the Lucan Road, one crosses at grade using a toucan crossing while the other requires construction of a pedestrian/cyclist bridge passing over the Lucan Road. These options are then divided further depending on if cyclists are sharing road space with general traffic on Esker Lawns and Esker Road or if a shared space for pedestrians and cyclists is provided on the eastern side of the road. This results in 4 variants of Route 4.

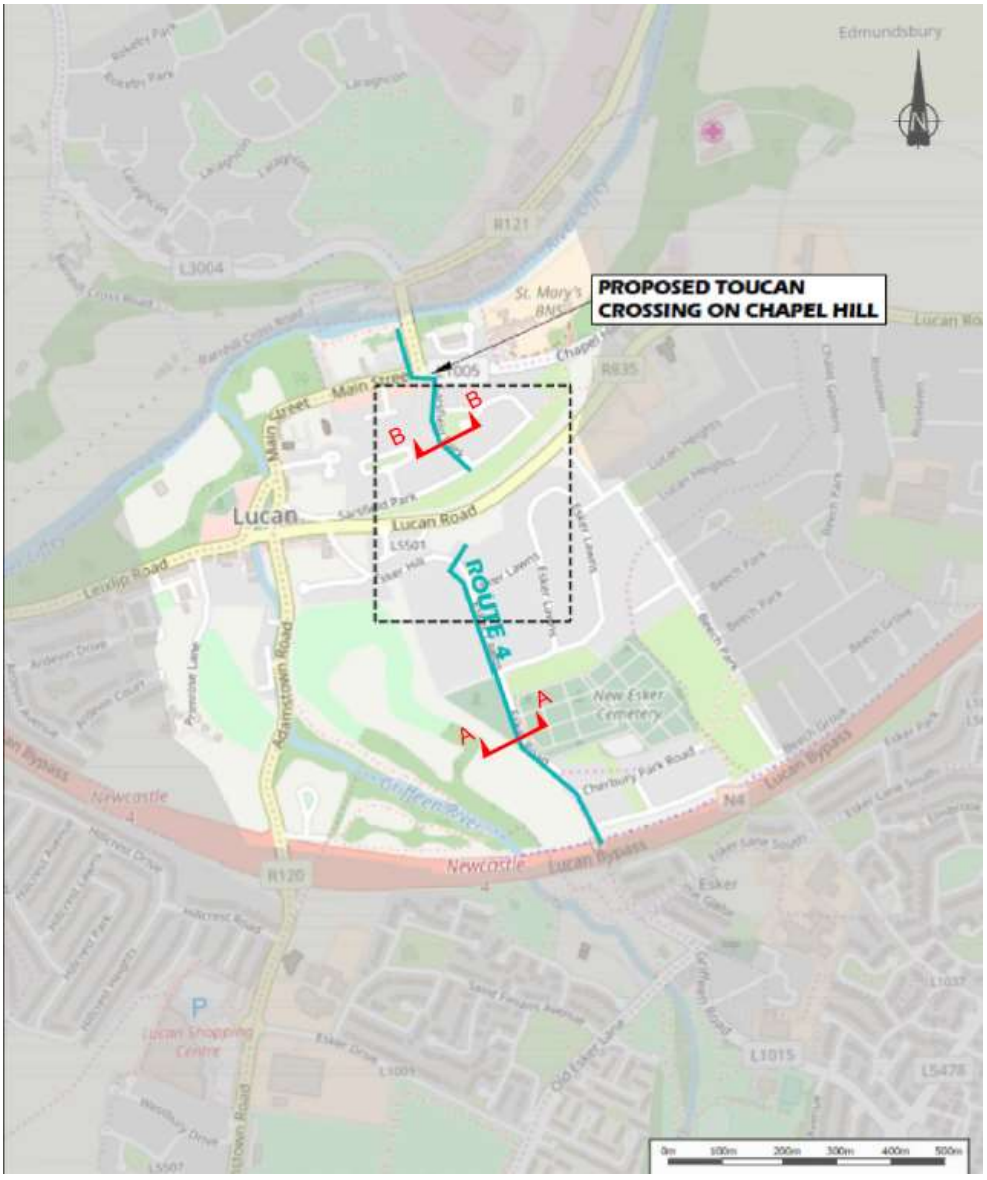

Figure 6.18 - Routes 4-1 & 4-2

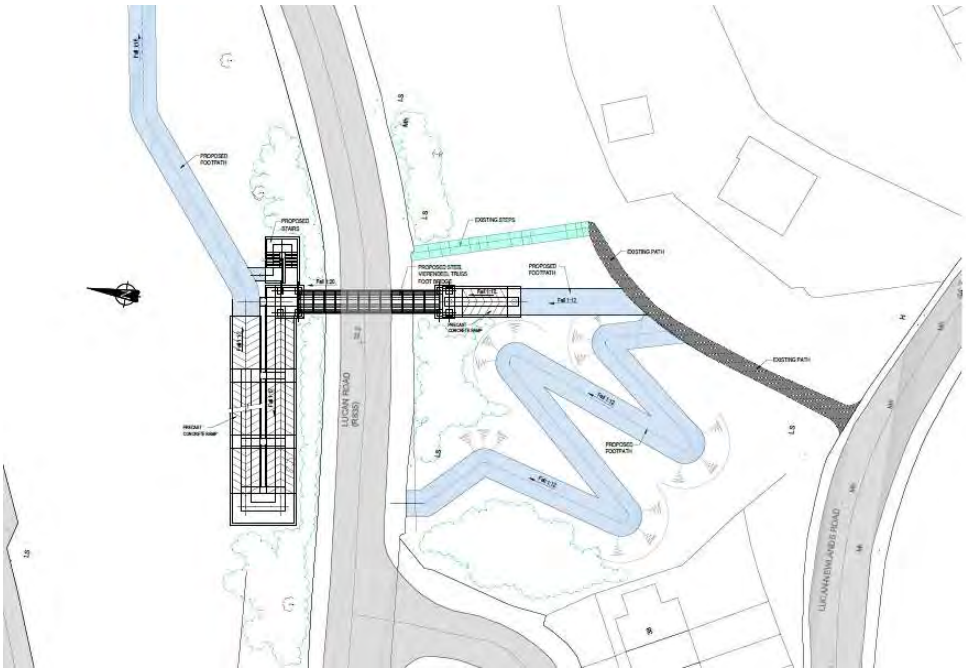

Figure 6.19 - Concept Design for Lucan Road Crossing for Routes 4-1 and 4-2

The figure above shows a concept design drawing for both options for crossing the Lucan Road. The zig-zagged ramp down to road level (shown on the bottom right of the above image) would be used by Option 4-1, while the overbridge option is used on Route 4-2. An elevation drawing of the bridge used by option 4-2 is shown below in Figure 6.20.

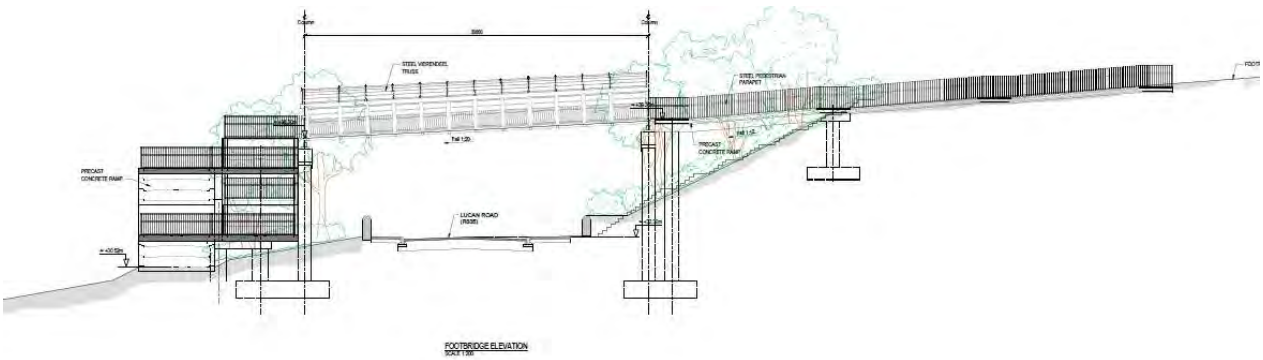

Figure 6.20 - Elevation of Bridge Crossing for Route 4-2

Route 4-1

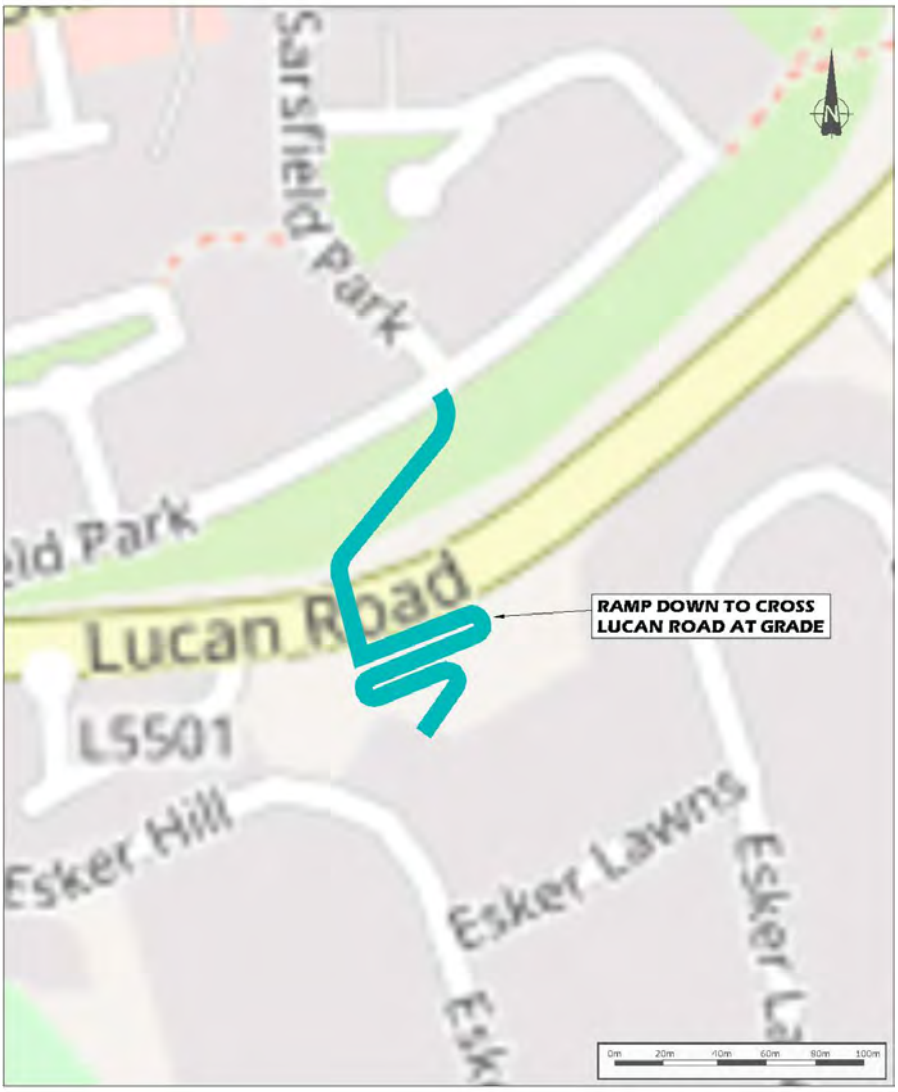

Figure 6.21 - Route 4-1

Route 4-1A

The southern end of Route 4-1A starts at the existing footbridge over the N4, from here cyclists would travel north along the existing path which would be resurfaced and widened. Cyclists would then travel along the existing roads Esker Park and Esker Lawns, these roads are low speed, low volume residential streets and cyclists would share road space with general traffic. The lane widths here will be reduced to 3m each with the remaining space used to provide wider footpaths.

A new toucan crossing would be provided on Esker Hill to link to a new pedestrian /cyclist ramp which would be constructed to link Esker Hill to the Lucan Road, this ramp would be constructed using reinforced earth. Several retaining walls and significant clearance of trees would be required to construct this ramp which would zig-zag from the top of Esker Hill Park to meet the Lucan Road at grade.

A new toucan crossing would be provided on Lucan Road and a pedestrian/cycle path would be built through the green area to link to Sarsfield Park. Cyclists would then share road space with general traffic on the low volume/low speed roads (within the tolerances set in the National Cycle Manual) of Sarsfield Park.

Figure 6.22 - Route 4, Cross Section A-A Existing

Figure 6.23 - Route 4-1A & 4-2A Cross Section A-A Proposed

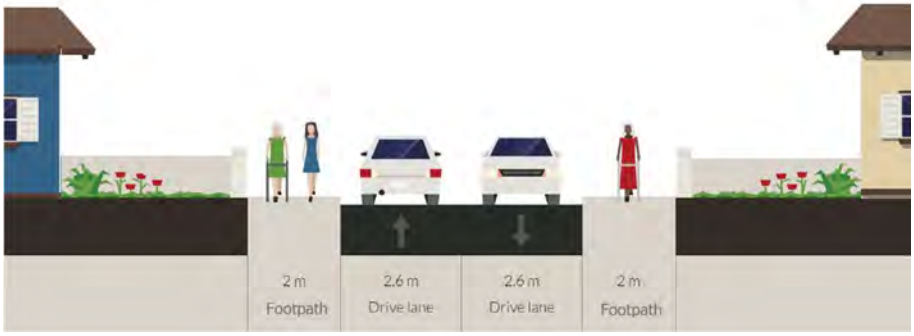

Figure 6.24 - Route 4, Cross Section B-B Existing

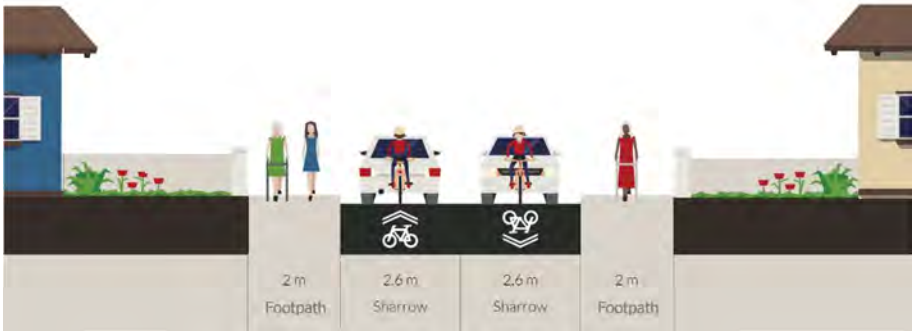

Figure 6.25 - Route 4-1A, 4-1B, 4-2A & 4-2B Cross Section B-B Proposed

Route 4-1B

Route 4-1B differs from 4-1A in that cyclists are segregated from general traffic on Esker Road and Esker Lawns. Cyclists and pedestrians in both directions would share space on the eastern side of the road. This would require some realignment of the road and would involve removing the existing verge and street trees along this section. This route would require some land take from gardens adjacent to Esker Hill Park and would not require a toucan crossing on Esker Hill.

Figure 6.26 - Route 4, Cross Section A-A Existing

Figure 6.27 - Route 4-1B & 4-2B Cross Section A-A Proposed

Route 4-2 – New bridge over the Lucan Road

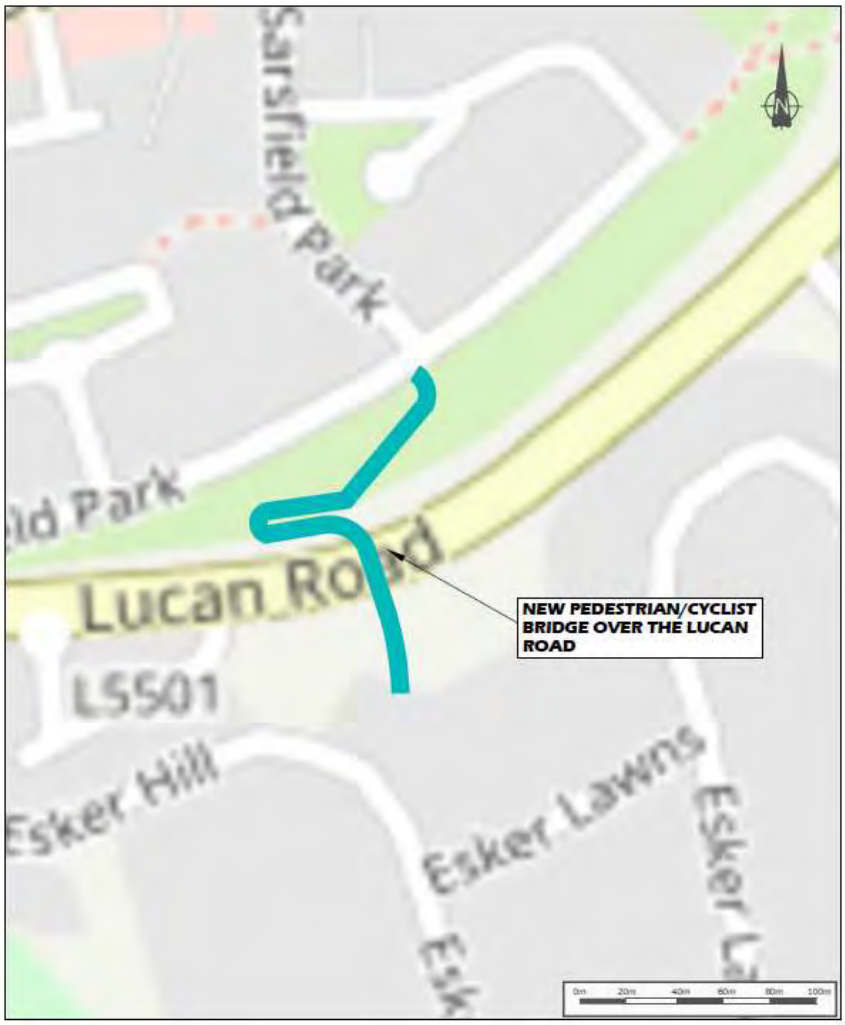

Figure 6.28 - Route 4-2

Route 4-2A

Route 4-2A is similar to 4-1A except that instead of crossing the Lucan Road at grade, a new pedestrian/cyclist bridge would be constructed which would pass over the Lucan Road to link Esker Hill to Sarsfield Park, as shown in Figure 6.20 previously.

Route 4-2B

Route 4-2B is the same as 4-1B, except that like 4-2A above, it would cross over the Lucan Road using an overbridge.

6.4 Route 5

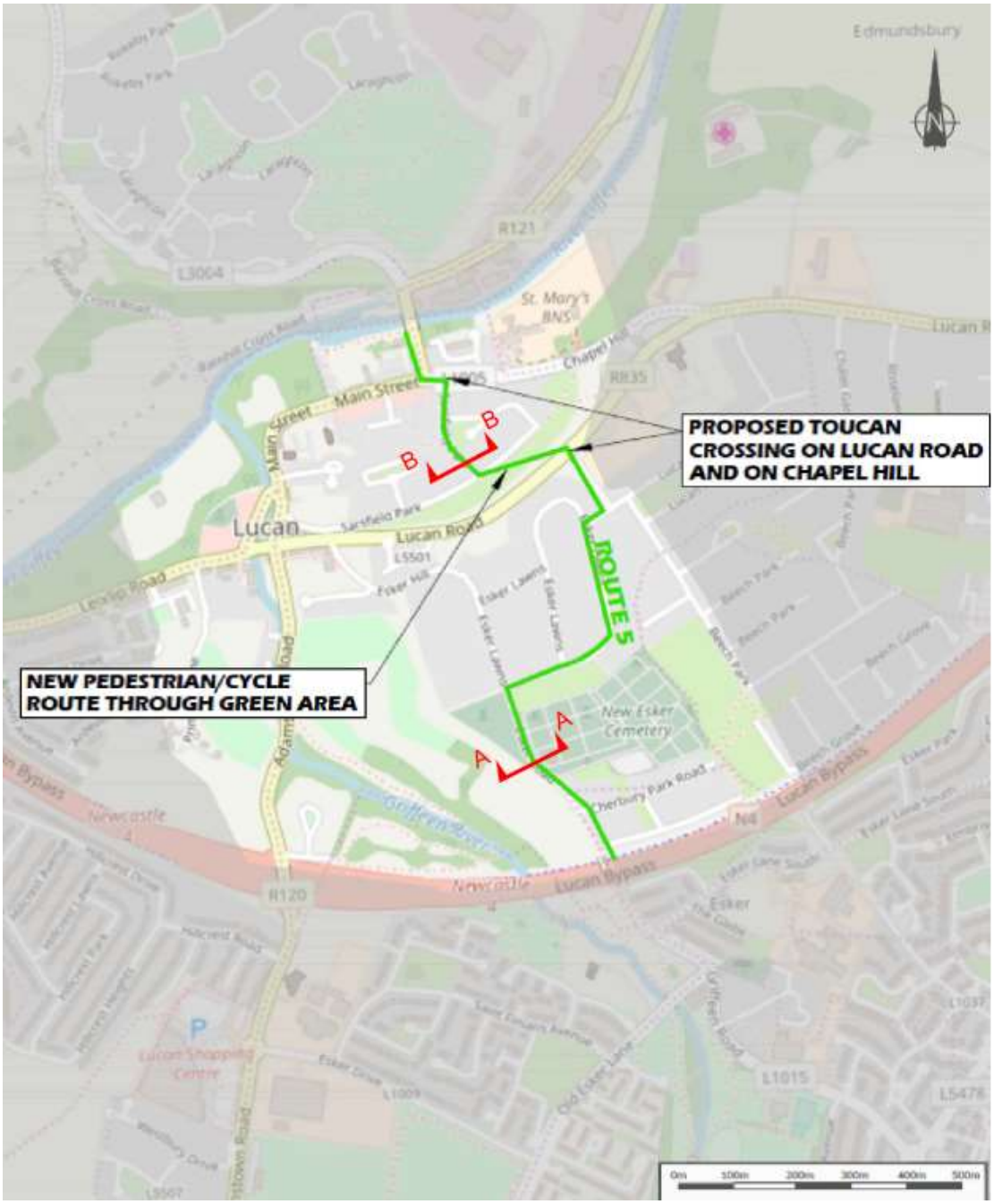

Figure 6.29 - Route 5

Route 5A

The southern end of Route 5A starts at the existing footbridge over the N4, from here cyclists would travel north along the existing path which would be resurfaced and widened. Cyclists would then travel along the existing roads Esker Road, Esker Lawns and Lucan Heights, these roads are low speed, low volume residential streets and cyclists would share road space with vehicular traffic, traffic calming measures would be added to ensure speeds and volumes of traffic are within the limits set in the National Cycle Manual. The lane widths here would be reduced to 3m each with the remaining space used to provide wider footpaths.

The junction of Lucan Heights and Lucan Road would be signalised and a toucan crossing would be provided here. A new pedestrian/cycle ramp and path would be built through the green area to link this junction to Sarsfield Park. This ramp would be built with reinforced earth and a retaining wall would be constructed. Cyclists would share road space with motorists on the low volume/low speed roads of Sarsfield Park, speed surveys were conducted on this road and speeds and volumes are within the limits set in the National Cycle Manual.

Figure 6.30 - Route 5, Cross Section A-A Existing

Figure 6.31 - Route 5A Cross Section A-A Proposed

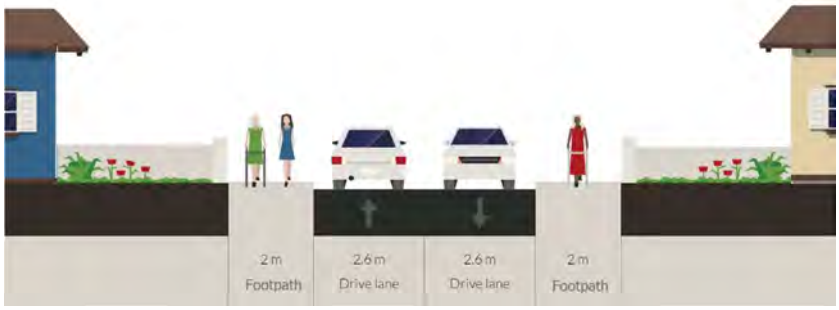

Figure 6.32 - Route 5, Cross Section B-B Existing

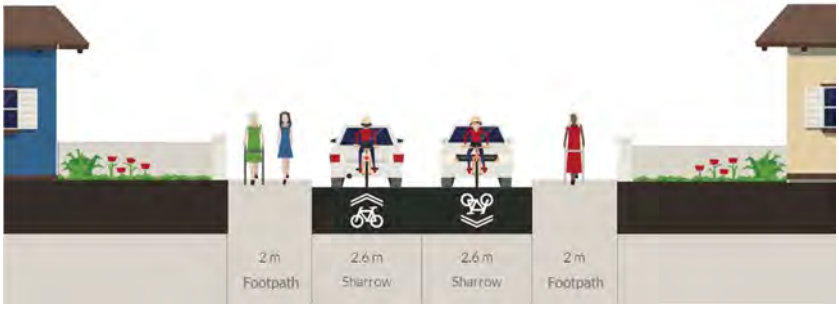

Figure 6.33 - Route 5A, 5B, & 5C Cross Section B-B Proposed

Route 5B

Route 5B differs from 5A in that cyclists are segregated from general traffic on Esker Road, Esker Lawns and Lucan Heights. Cyclists in both directions would share space with pedestrians on the eastern side of the road. This would require some realignment of the road and would involve removing the existing verge and street trees along this section.

Figure 6.34 - Route 5, Cross Section A-A Existing

Figure 6.35 - Route 5B Cross Section A-A Proposed

Route 5C

Route 5B differs from 5C in that cycle lanes would be provided on either side of the road on Esker Lawns and Lucan Heights rather than having both directions on the same side of the road. The impacts on verges, trees and parking would be the same as 5B.

Figure 6.36 - Route 5, Cross Section A-A Existing

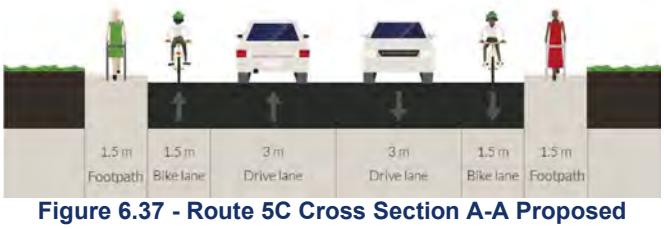

Figure 6.37 - Route 5C Cross Section A-A Proposed

6.5 Route 6

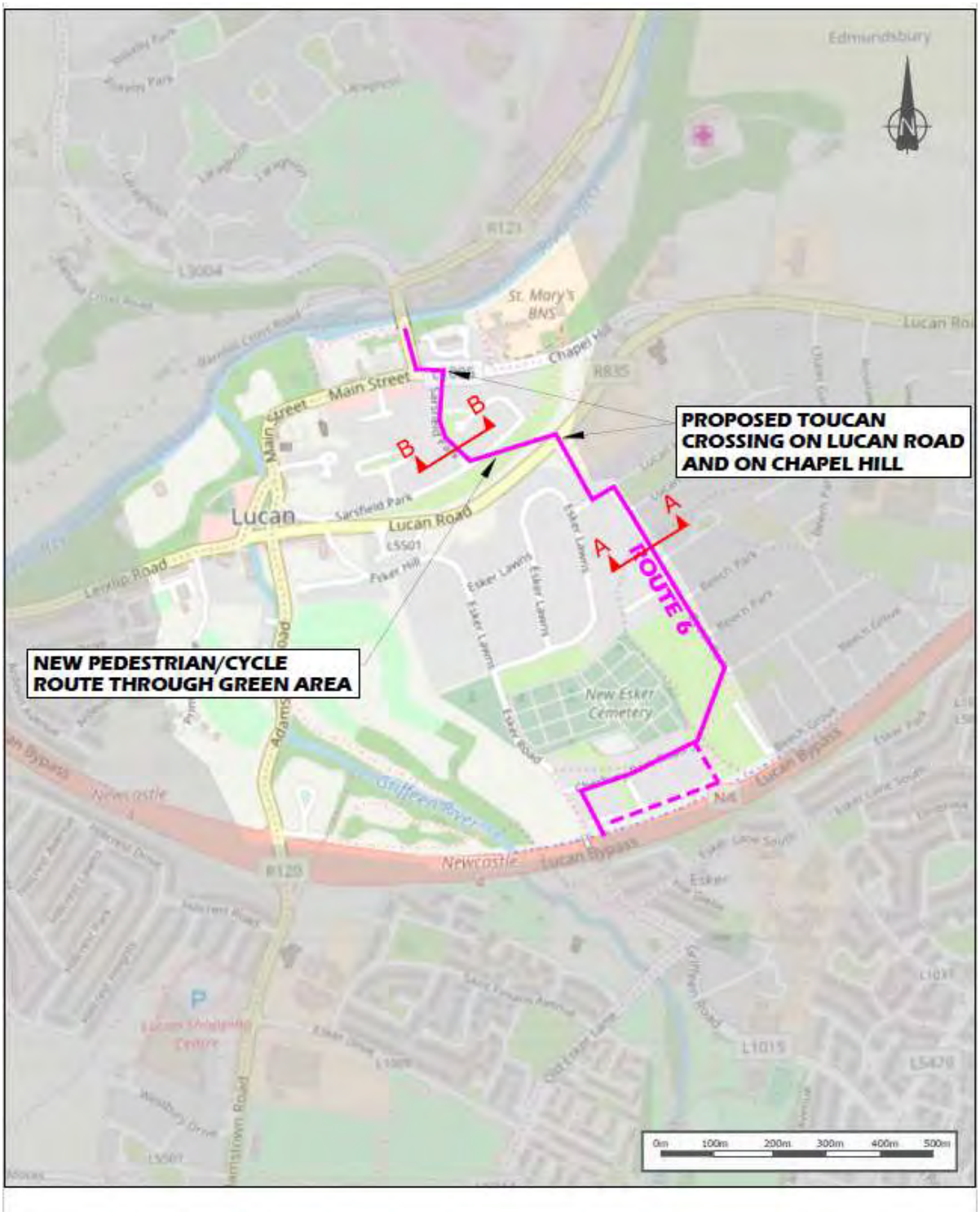

Figure 6.38 - Route 6

Route 6A

The southern end of Route 6A starts at the existing footbridge over the N4, from here cyclists would travel north along the existing path which would be resurfaced and widened. Cyclists would then travel along Cherbury Park Road, sharing road space with local traffic. They would then use the existing paths through the green area to reach Beech Park. On Beech Park and Lucan Heights cyclists would again share road space with local traffic. These roads are low speed, low volume residential streets and would be traffic calmed to further reduce speeds. The alignment of some junctions on Beech Park/Lucan Heights would be changed so that cyclists would have to make fewer turning movements and would have greater priority.

The junction of Lucan Heights and Lucan Road would be signalised and a toucan crossing would be provided here. A new pedestrian/cycle ramp and path would be built through the green area to link this junction to Sarsfield Park. This ramp would be built with reinforced earth and a retaining wall would be constructed. A conceptual design for this ramp is shown below in Figure 6.39. The construction of this ramp would require the removal of several trees from the existing corpse, replacement tree planting would be done in the adjacent green space. Cyclists would then share road space with motorists on the low volume/low speed road of Sarsfield Park.

Figure 6.39 - Pedestrian/Cyclist Ramp from Lucan Heights to Sarsfield Park

Figure 6.40 - Route 6, Cross Section A-A Existing

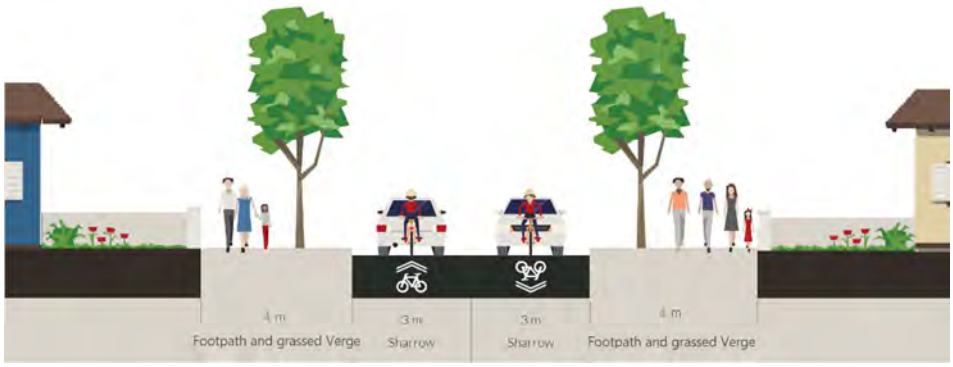

Figure 6.41 - Route 6A, Cross Section A-A Proposed

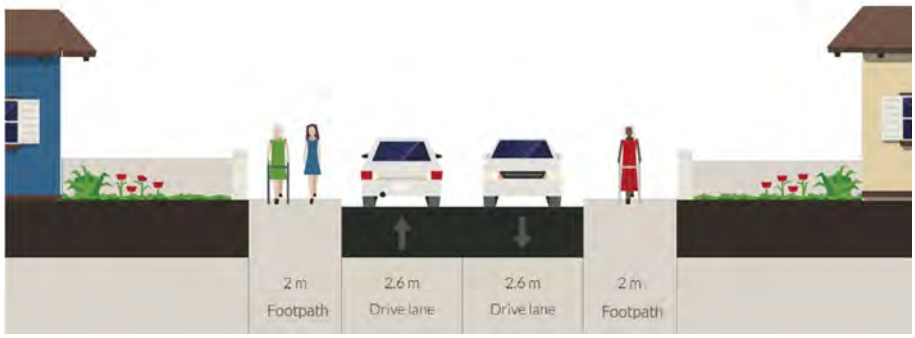

Figure 6.42 - Route 6, Cross Section B-B Existing

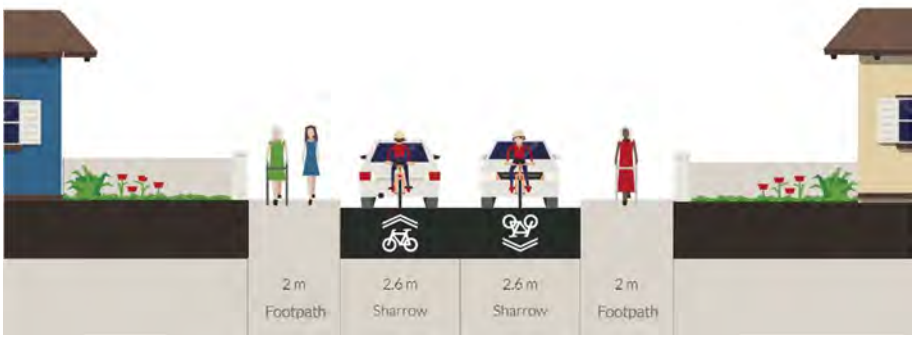

Figure 6.43 - Route 6A, 6B & 6C Cross Section B-B Proposed

Route 6B

Route 6B differs from 6A in that cyclists would travel down Cherbury Park Avenue rather than Cherbury Park Road, this would require the creation of a new permeability link. On this option cyclists would be segregated from general traffic on Cherbury Park Avenue, Beech Park and Lucan Heights. A two-way cycle track would be provided on the southern side on Cherbury Park Avenue, on the western side of Beech Park and the eastern side of Lucan Heights. Zebra crossings would be provided to allow them to safely cross the road. This option would require some realignment of the road and would involve removing some on-street parking and street trees along this section.

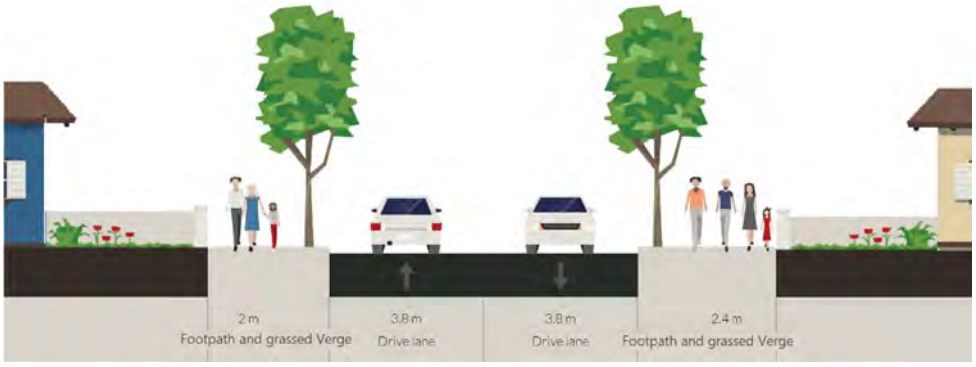

Figure 6.44 - Route 6, Cross Section A-A Existing

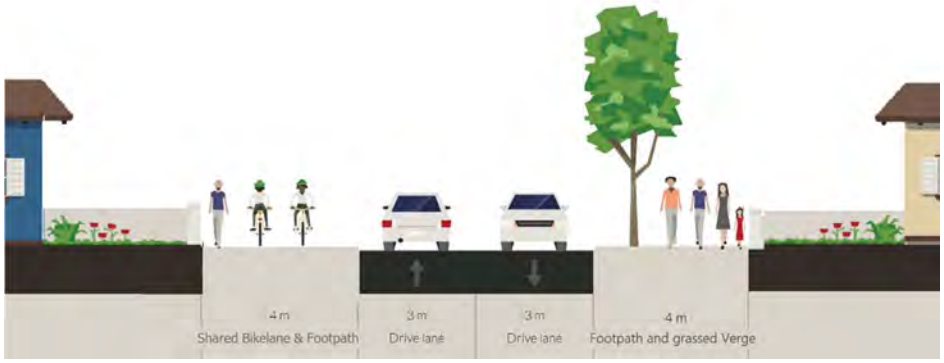

Figure 6.45 - Route 6B, Cross Section A-A Proposed

Route 6C

Route 6B differs from 6C in that cycle lanes would be provided on either side of the road on Beech Hill and Lucan Heights rather than having both directions on the same side of the road. The impacts on verges, trees and parking would be the same as 6B.

Figure 6.46 - Route 6, Cross Section A-A Existing

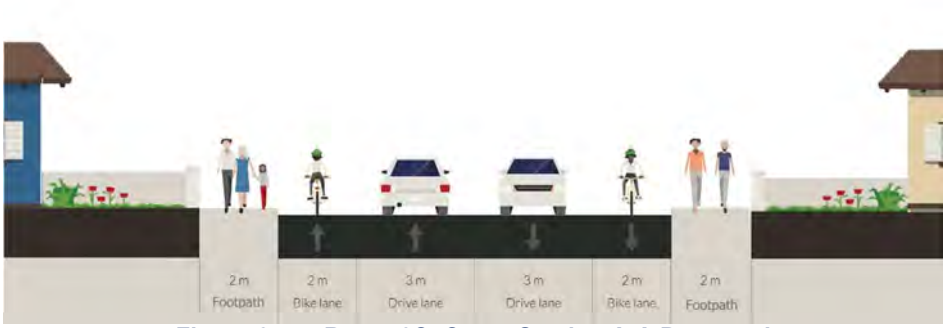

Figure 6.47 - Route 6C, Cross Section A-A Proposed

6.6 Route 7

Figure 6.48 - Route 7

Route 7A

The southern end of Route 6A starts at the existing footbridge over the N4, from here cyclists would travel north along the existing path which would be resurfaced and widened. Cyclists would then travel along Cherbury Park Road, sharing road space with local traffic. They would then use the existing paths through the green area to reach Beech Park. On Beech Park and Lucan Heights cyclists would again share road space with local traffic. These roads are low speed, low volume residential streets and would be traffic calmed to further reduce speeds. The alignment of some junctions on Beech Park/Lucan Heights would be changed so that cyclists would have to make fewer turning movements and would have greater priority.

The junction of Lucan Heights and Lucan Road would be signalised and a toucan crossing would be provided here. A new pedestrian/cycle ramp and path would be built through the green area to link this junction to Chapel Hill. This ramp would be built with reinforced earth and a retaining wall would be constructed. Cyclists in both directions would then use a shared space with pedestrians on the southern side of Chapel Hill, this would require the removal of on-street parking from this section of the road.

Figure 6.49 - Route 7, Cross Section A-A Existing

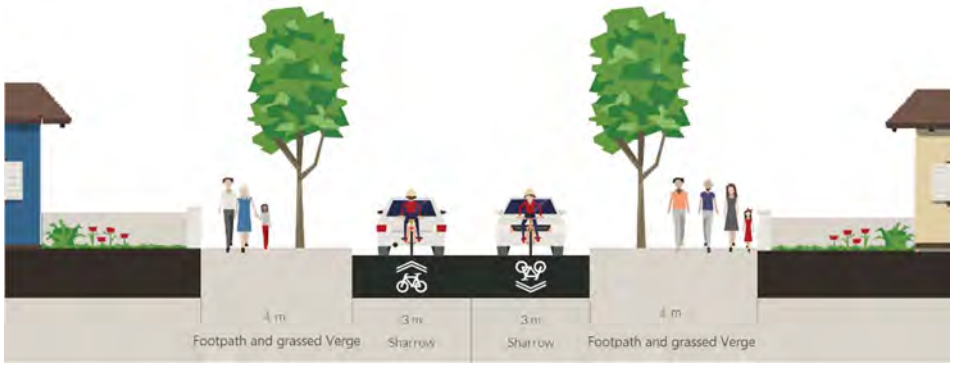

Figure 6.50 - Route 7A, Cross Section A-A Proposed

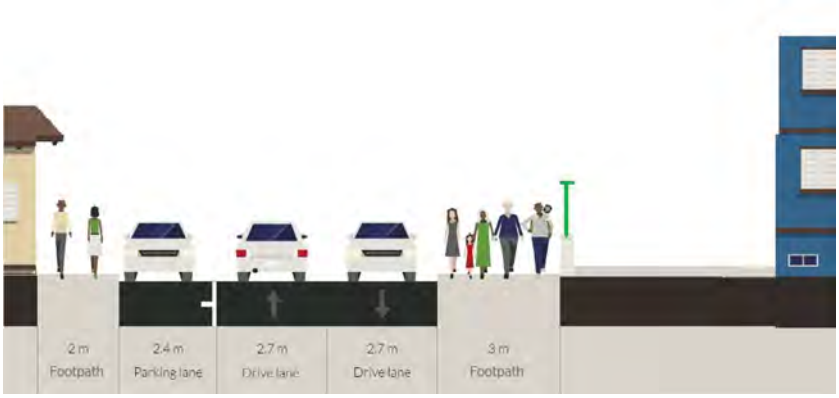

Figure 6.51 - Route 7, Cross Section B-B Existing

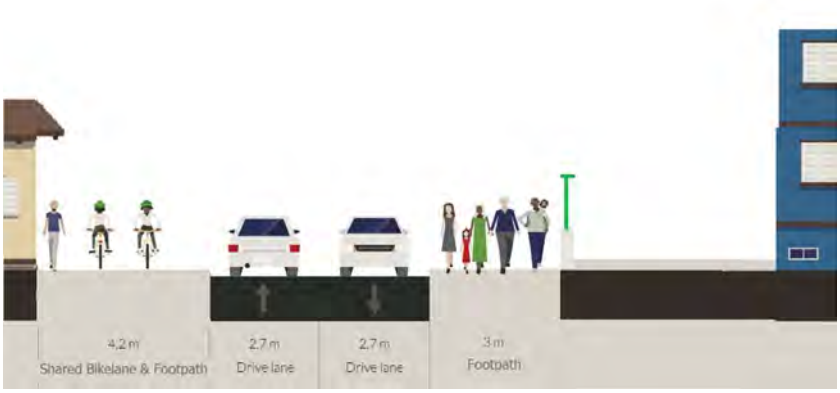

Figure 6.52 - Route 7A, 7B & 7C, Cross Section B-B Proposed

Route 7B

Route 6B differs from 6A in that cyclists would travel down Cherbury Park Avenue rather than Cherbury Park Road, this would require the creation of a new permeability link. On this option cyclists would be segregated from general traffic on Cherbury Park Avenue, Beech Park and Lucan Heights. A two-way cycle track would be provided on the southern side on Cherbury Park Avenue, on the western side of Beech Park and the eastern side of Lucan Heights. Zebra crossings would be provided to allow them to safely cross the road. This option would require some realignment of the road and would involve removing some on-street parking and street trees along this section.

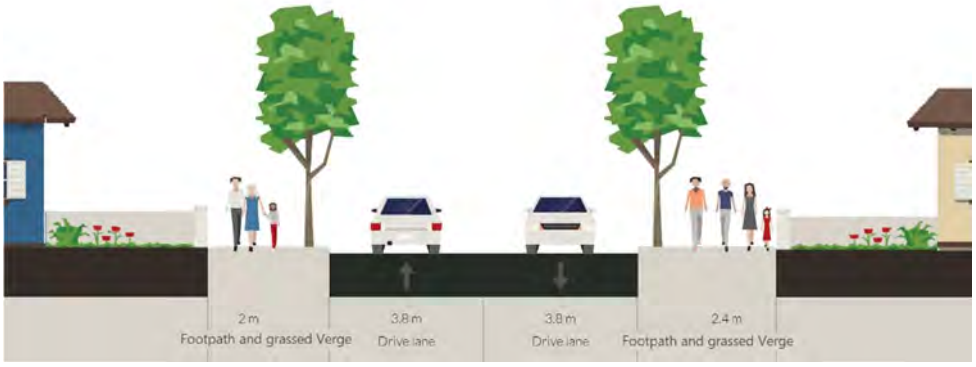

Figure 6.53 - Route 7, Cross Section A-A Existing

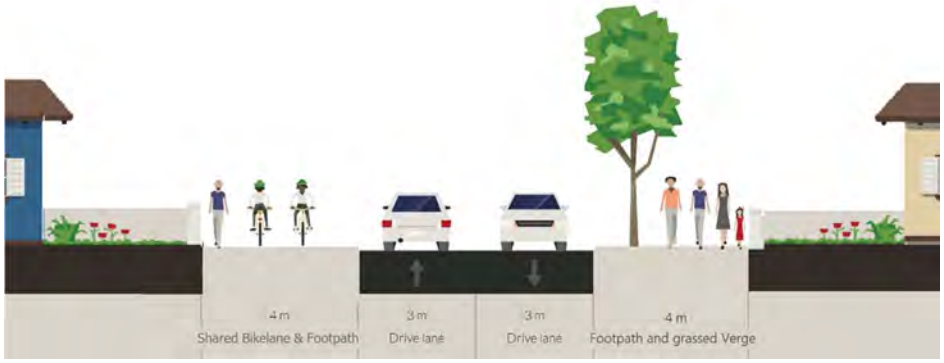

Figure 6.54 - Route 7B, Cross Section A-A Proposed

Route 7C

Route 7B differs from 7C in that cycle lanes would be provided on either side of the road on Beech Hill and Lucan Heights rather than having both directions on the same side of the road. The impacts on verges, trees and parking would be the same as 7B.

Figure 6.55 - Route 7, Cross Section A-A Existing

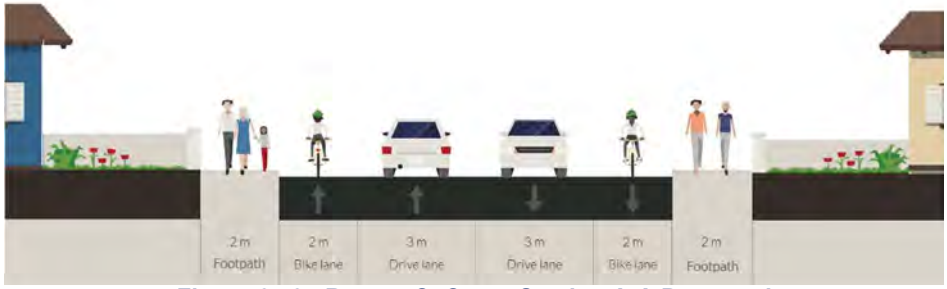

Figure 6.56 - Route 7C, Cross Section A-A Proposed

6.7 Route 8

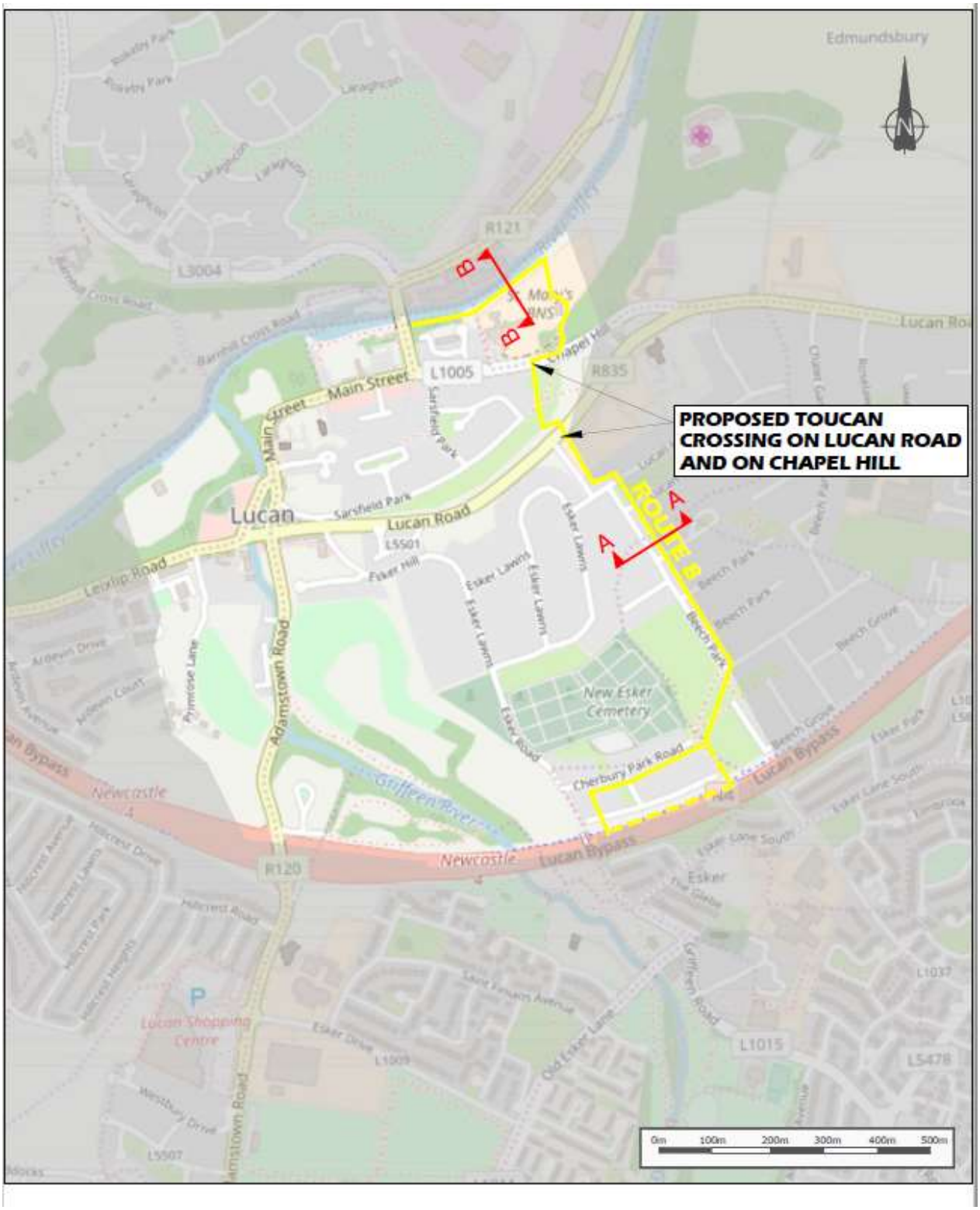

Figure 6.57 - Route 8

Route 8A

The southern end of Route 8A starts at the existing footbridge over the N4, from here cyclists would travel north along the existing path which would be resurfaced and widened. Cyclists would then travel along Cherbury Park Road, sharing road space with local traffic. They would then use the existing paths through the green area to reach Beech Park. On Beech Park and Lucan Heights cyclists would again share road space with local traffic. These roads are low speed, low volume residential streets and would be traffic calmed to further reduce speeds. The alignment of some junctions on Beech Park/Lucan Heights would be changed so that cyclists would have to make fewer turning movements and would have greater priority. A new toucan crossing would be provided on Lucan Road and a new pedestrian/cycle ramp and path would be built through the green area to link to Chapel Hill, where a new toucan crossing would be provided.

A second ramp would be built to bring cyclists down from Chapel Hill to ground level on the public land to the east of St Mary's Boys National School. A new cycle path would be built along the banks of the River Liffey, this would require the clearing of vegetation, but mature trees would be left in place. Some land take would likely be required from the communal area of The Old Rectory housing estate. The cycle track would then pass through the existing stone abutment of the bridge, this would require the construction of a new box culvert.

Figure 6.58 - Route 8, Cross Section A-A Existing

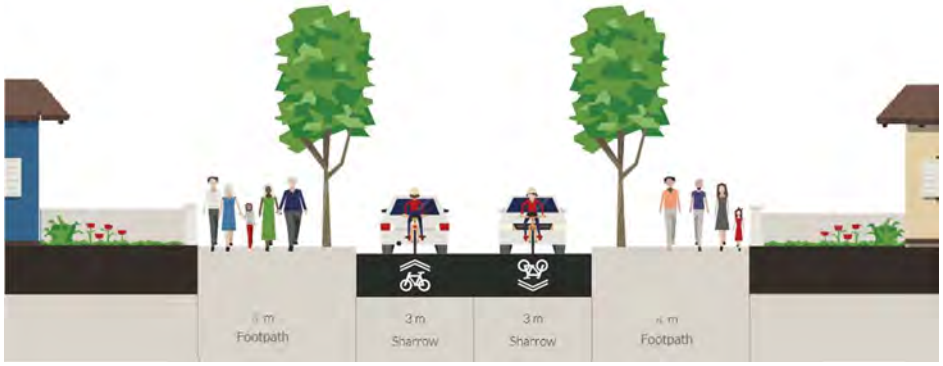

Figure 6.59 - Route 8A, Cross Section A-A Proposed

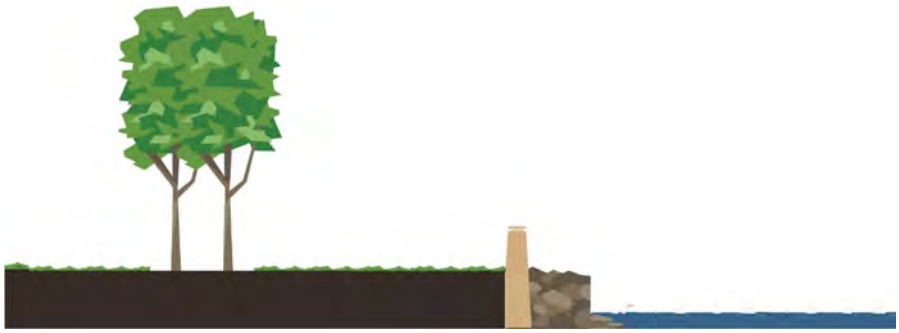

Figure 6.60 - Route 8, Cross Section B-B Existing

Figure 6.61 - Route 8A, 8B & 8C, Cross Section B-B Proposed

Route 8B

Route 8B differs from 8A in that cyclists are segregated from general traffic on Cherbury Park Avenue, Beech Park and Lucan Heights. A two-way cycle track would be provided on the southern side on Cherbury Park Avenue, on the western side of Beech Park and the eastern side of Lucan Heights and zebra crossings would be provided to allow them to safely cross the road. This option would require some realignment of the road and would involve removing the existing verge and street trees along this section.

Figure 6.62 - Route 8, Cross Section A-A Existing

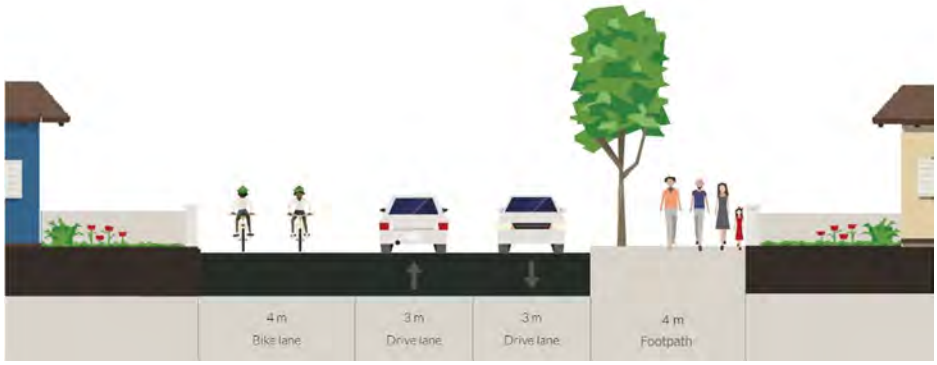

Figure 6.63 - Route 8B, Cross Section A-A Proposed

Route 8C

Route 8B differs from 8C in that cycle lanes would be provided on either side of the road on Beech Hill and Lucan Heights rather than having both directions on the same side of the road. The impacts on verges, trees and parking would be the same as 8B.

Figure 6.64 - Route 8, Cross Section A-A Existing

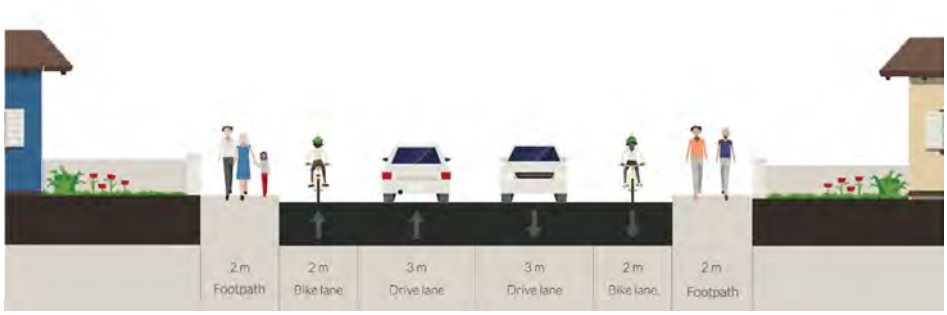

Figure 6.65 - Route 8C, Cross Section A-A Proposed

6.8 Options Assessment

A summary of the ranking of options for section 2A against the scheme sub-criteria is presented in Table 5.2 below, the colour coded scoring system is shown below.

Table 6.1 - Qualitative Ranking System

Extreme Positive
Major Positive
Moderate Positive
Minor Positive
Neutral
Minor Negative
Moderate Negative
Major Negative
Severe Negative

Table 6.2 - Section 2A MCA Summary

Section 2A																				
Assessment Criteria	**Sub-Criteria**	**2A**	**2B**	**3A**	**3B**	**4-1A**	**4-1B**	**4-2A**	**4-2B**	**5A**	**5B**	**5C**	**6A**	**6B**	**6C**	**7A**	**7B**	**7C**	**8A**	**8B**	**8C**
Capital Cost																					
Quality of Service	Road Safety																				
	Coherence																				
	Directness																				
	Attractiveness																		Major Positive	Major Positive	Major Positive
	Comfort																				
Environment	Archaeological, Architectural and Cultural Heritage																				
	Biodiversity																				
	Water Resources																				
	Landscape and visual																				
	Noise, Vibration and Air Quality																				
	Land Use and the Built Environment																				
	Impact on Other Roads Users and Lucan Village																				
Planning	Viability from a Planning Perspective																				

The following paragraphs provide a summary of the options assessment for this section of the study area. Further details of the assessment are presented in Appendix A.

In terms of Road Safety, the main differentiator is the level of segregation provided by each option, routes where cyclists are separated from vehicular traffic score higher. Routes 6, 7 & 8 have the highest level of segregation and so score higher. Route 2 would involve cyclists mixing with general traffic on Lucan Main St and so scores worst. Options A, B & C differ in the type of cycle facilities provided in the housing estates south of the Lucan Road. Options C have segregated cycle tracks on either side of the road and are the preferred option of the three. Options B would have a pedestrian/cyclist shared space on one side of the road. There are several entrances to properties along this section and it was considered that cyclists on Options B would be at a high risk of being struck by cars exiting these properties, as cyclists would approach from a direction that may not be easily anticipated, as a result these options score worst. Options A would involve cyclists sharing road space with traffic on the low volume, low speed residential roads and score in between the two others.

In terms of Coherence, Route 5 would require slightly more turning movements than other routes and so scores a “Minor Negative”. On Route 2 there would be a somewhat complicated route from Esker Hill to Main St and this route may be confusing for cyclists, and so this also scores a “Minor Negative”. All other routes are considered to be slightly preferable.

For the Directness, Route 4 is preferable as it has the shortest route length and scores a “Moderate Positive”. Routes 3, 5 and 6 are next preferable and score a “Minor Negative”. On Route 2 cyclists may be delayed by queueing traffic on Main St while Route 7 has quite a long route, both of these score a “Minor Negative”. Route 8 has the longest route length and scores a “Moderate Negative”.

In terms of Attractiveness, the routes which are fully segregated from traffic and pass through green areas are considered preferable. Routes 6, 7 & 8 are considered slightly preferable as they are fully segregated on the southern end of the route. Route 8 scores a “Major Positive” as it also passes along the scenic banks of the River Liffey. Route 4-2 scores a “Minor Positive” as there would be likely be scenic views from the cycle bridge passing over the N4. All other routes score a “Minor Negative”.

In terms of Comfort, routes which have steep slopes, zig-zagged inclined cycle ramps or are required to share road space on busy roads or footpaths are considered less favourable. Route 2 would require cyclists to share road space with cars on Lucan Main St and so scores a “Minor Negative” Both versions of Route 4 involve steep zig-zagged inclined ramps and score a “Moderate Negative”. Route 7 involves a zig-zagged ramp and sharing a footpath with pedestrians on Chapel Hill, while Route 8 involves two separate zig-zagged ramps, and so these both also score a “Moderate Negative”. Routes 3, 5 & 6 are considered slightly preferable and score a “Minor Positive”.

In terms of Architectural, Archaeological and Cultural Heritage, Routes 2 & 3 would be built entirely over exiting roads and so are the most preferable. Routes 4, 5, 6 & 7 would disturb some greenfield land between Lucan Road and Chapel Hill and so score a “Minor Negative”. Route 8 would disturb some ground along the River Liffey and within the Zone of Archaeological Potential for Lucan Village and so scores a “Moderate Negative”.

In terms of Biodiversity, Routes 4-8 involve would involve the clearing of some sections of urban woodland to construct ramps/bridges and so a “Minor Negative”. Route 8 also involves construction within the ecologically sensitive Liffey Valley pNHA and may involve the removal of some habitat for protected species and so scores a “Major Negative”.

In terms of Water Resources Route 8 would involve construction within the flood plain of the Liffey and so scores a “Minor Negative”. All other options would have a negligible impact.

In terms of Landscape & Visual, the main factor is the removal of existing street trees. Options A are preferred over B & C as street trees would be retained on the residential roads of Esker Hill, Esker Lawns, Beech Park and Lucan Heights. Options 2 & 3 would involve removing the fewest number of trees and a

section of linear park would be created on Esker Hill, which would improve the urban realm, and so these score highest. Routes 5, 6, 7 & 8 would all require the removal of more trees than Routes 1 & 2 and score similarly. Replacement planting would be undertaken to mitigate the removal of trees, but this may not necessarily be close to where the original trees were removed from.

In Terms of Noise, Vibration & Air Quality all routes are considered to have negligible impact.

In terms of Impact on Other Road Users and Lucan Village, Routes 5, 6, 7 & 8 would involve signalising the junction at Lucan Heights/Lucan Road, the improvement of pedestrian facilities and would rationalise of the layout at the entrance to St. Mary's Primary School. As a result, these routes are considered slightly preferable under this criterion. Route 7 would involve the removal of parking and cyclists sharing with pedestrians on Chapel Hill and so scores a "Moderate Negative".

In terms of Planning, Route 8 is considered the least preferable due to the impacts on the Liffey Valley pNHA and scores a "Moderate Negative". Routes 2 & 3 would involve closing Esker Hill to through traffic and score a "Minor Negative". Routes 5B, 5C, 6B, 6C, 7B, & 7C would all require a new permeability link from Cherbury Park Avenue to the N4 footbridge, it is possible this would lead to objections from residents and so these routes score a "Minor Negative". Routes 4, 5A, 6A and 7A would have the least impact on vehicular access, on-street parking and trees and score a "Minor Positive" under this criterion.

Conclusion

Based on the assessments above it has been determined that Route 6A offers the preferred route option. This route achieves the scheme objectives of providing high quality cycle infrastructure to link the Grand and Royal Canals and has the following benefits when compared to other route options:

- It provides a high level of overall quality of service for cyclists.
- It would be cheaper and have less of an environmental impact than other routes which offer a similar level of service.
- It would not require the removal of trees or on-street parking on residential roads.
- It would not require the creation of new permeability links or restrictions in vehicular movements.
- It would improve the pedestrian facilities at the junction of Lucan Heights and Lucan Road which has large pedestrian movements due to the nearby schools.

SECTION 7: LIFFEY CROSSING

This chapter outlines the options development process for the section that requires a crossing of the River Liffey in Lucan Village. Seven possible options have been considered and engineering judgement has been used to determine which bridge options are feasible and should be brought forward for inclusion in route options for this section of the study area.

7.1 Potential Bridge Crossings

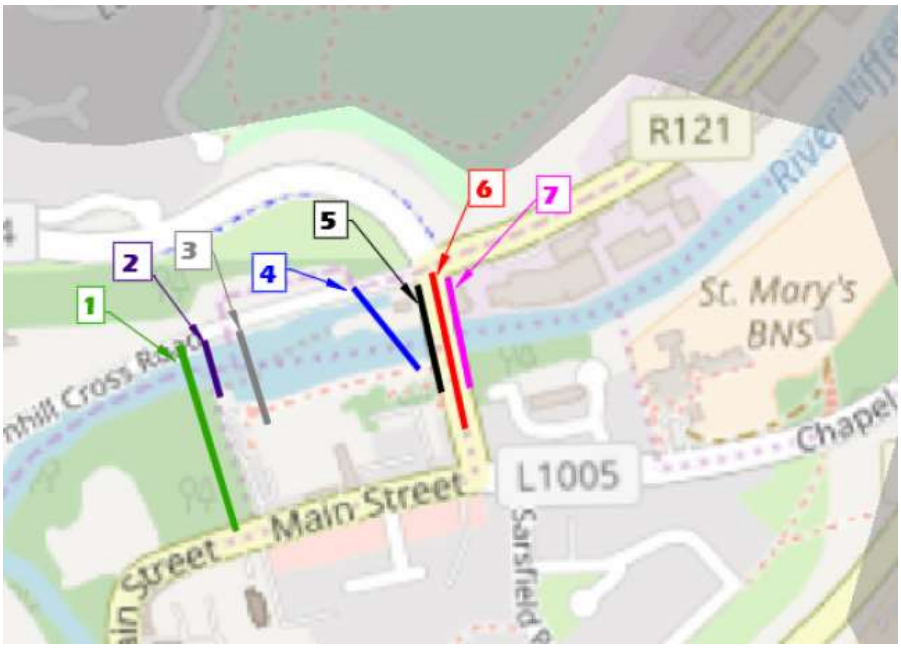

Figure 7.1 - Potential Liffey Crossings

Bridge Option 1

This option would involve constructing a new bridge over the River Liffey approx. 300m to the west of the existing bridge. The span of this bridge would be approx. 50m with no significant level differences between the two banks of the Liffey.

Construction of this bridge would be feasible from a technical point of view, but this option is not brought forward to the next assessment stage as it would require land take from the Italian Embassy.

Bridge Option 2

This option would use the existing bridge abutment on the southern side of the river which remains from a previous bridge that was washed away in a flood. This bridge abutment is privately owned and in use a car park for an apartment block. While this bridge would have the shortest span (~40m) and would have a lesser visual impact and a lesser impact on architectural heritage than other potential bridges it is not considered feasible due to the anticipated problems in removing parking spaces from private residences.

Bridge Option 3

This option would involve constructing a new bridge over the River Liffey 160m to the west of the existing bridge at the same location where a previous bridge once existed, it has since been washed away by a flood. The span of this bridge would be approximately 60m.

This bridge option is considered feasible and is brought forward to the next assessment stage.

Bridge Option 4

This option would involve constructing a new bridge over the River Liffey connecting Lucan Road Lower to Barnhill Cross Road to the west of the protected structure. The span of this bridge would be approx. 70m with the option of placing a bridge pier on the island reducing the main span to 50m.

Construction of this bridge would be feasible from a technical point of view, but it is not brought forward to the next assessment stage as it compares unfavourably to bridge option 4 on a number of issues:

- It would have a longer span and therefore be more expensive.
- It would not serve the residential population of Laraghcon as well.
- It would be less likely to be used by pedestrians crossing Lucan Bridge.
- It would have a greater visual impact, potentially obscuring views of the Weir from Lucan Bridge.

Bridge Option 5

This option would involve constructing a new bridge over the River Liffey immediately to the west of the existing bridge. The span of this bridge would be approx. 60m with the option of placing a bridge pier on the island reducing the main span to 45m.

This bridge option is considered feasible and is brought forward to the next assessment stage.

Bridge Option 6

This option would not involve constructing a new bridge and cyclists would use the existing bridge. There are two possible options for this, the first is a “do-nothing” scenario where cyclists would share road space with traffic, the 2nd is to operate a one-way shuttle system for traffic, controlled by a new set of signals and to provide a two-way segregated cycle lane. Both of these options are considered feasible and are brought forward to the assessment stage.

Bridge Option 7

This option would involve constructing a new bridge over the River Liffey immediately to the east of the existing bridge. There is a protected structure adjacent to the bridge on the north-eastern side and this building would prevent the construction of the bridge. This option is not considered feasible.

7.2 Summary

Bridge Options 3, 5 and both options for 6 are brought forward to the next assessment stage. These options will be developed further to form part of routes in the next section of the report.

SECTION 8: STUDY AREA SECTION 2B

This chapter outlines the options assessment process for Section 2B of the Study Area.

The section of route beyond the junction of Barnhill Cross Road and Lucan Bridge is within the jurisdiction of Fingal County Council and will be subject to a separate consultation.

This section is constrained with limited route options available. The existing Liffey Bridge is heavily trafficked (AADT of 18,200) and long queues form during peak times on all approaches to the bridge. This bridge is also a protected heritage structure and is Ireland's longest spanning masonry arch bridge.

Figure 8.1 - Existing Masonry Arch Bridge in Lucan

The feasible bridge options discussed in the previous section of this report have been combined with options on Lower Lucan Road to the south of the Liffey, and with Laraghcon Distributor Road and Barnhill Cross Road to the north of the Liffey to form eight route options.

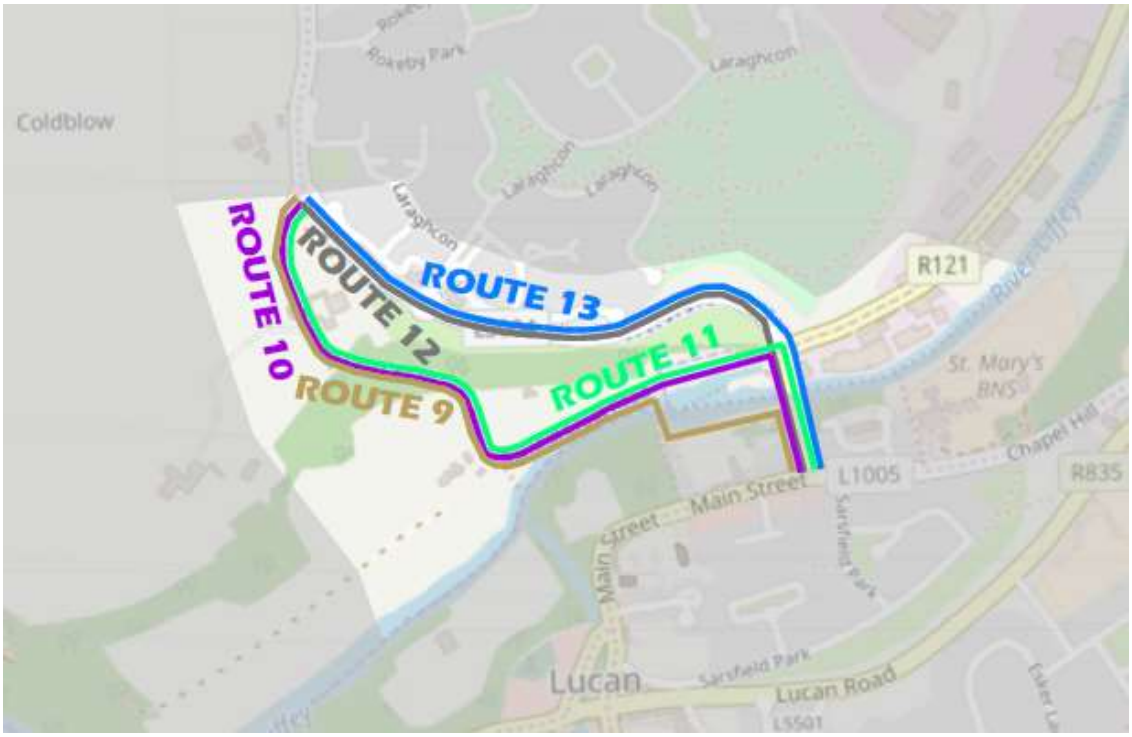

Figure 8.2 - Section 2B Route Options

8.1 Route 9

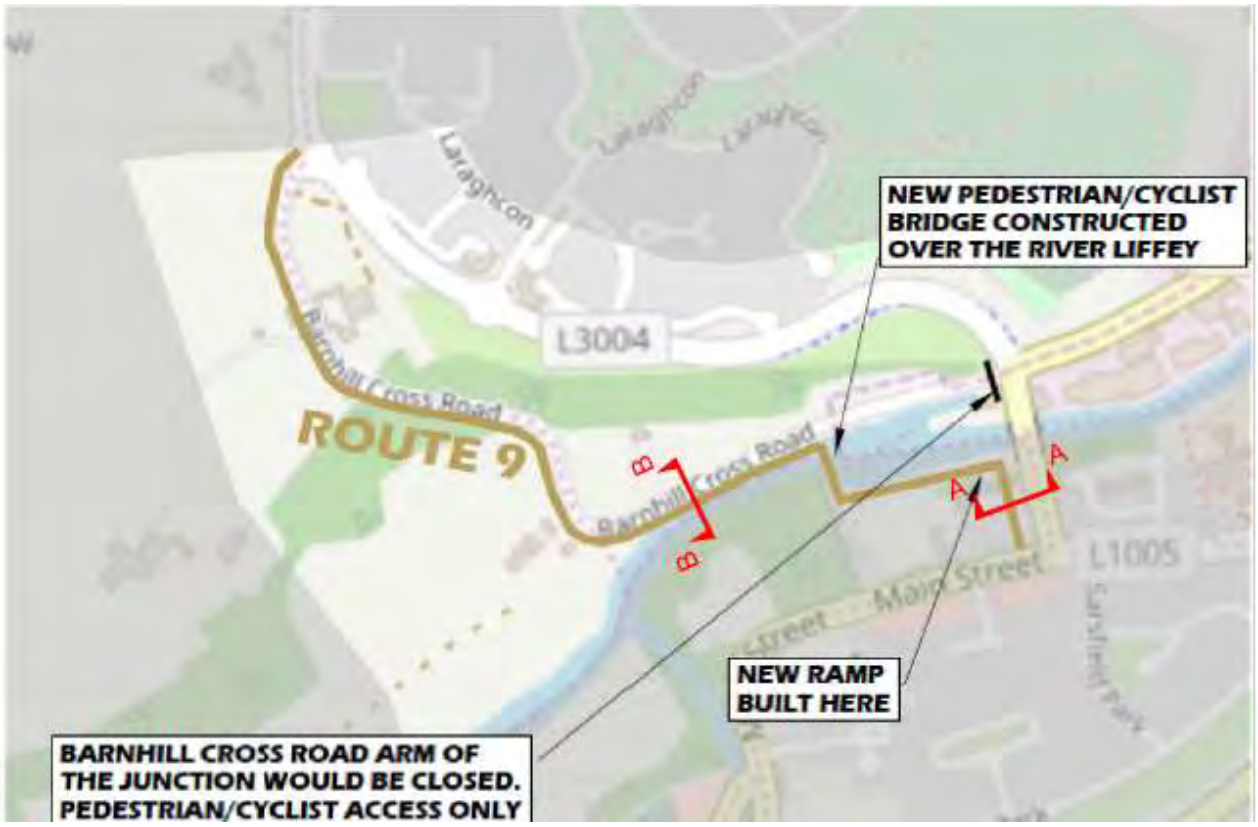

Figure 8.3 - Route 9

Route 9 runs from the roundabout south of the existing Liffey bridge to the roundabout at the junction with the L3005.

Lower Lucan Road would be realigned to allow for a shared pedestrian/cyclist space on the western side of the road, this would require the removal of a number of trees. New steps would be constructed to link to the existing riverwalk to the west of the bridge and a new bridge crossing the Liffey would be built approximately 160m to the west of the exiting bridge to connect to Barnhill Cross Road. This is close to the site of an old stone arch bridge which was washed away in a previous flood. An elevation drawing of a conceptual design of a prestressed concrete arch is included below in for information.

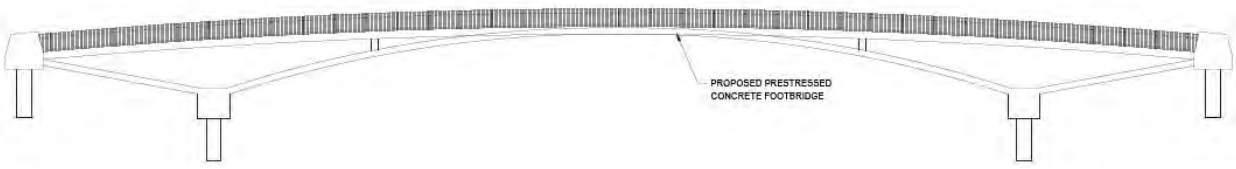

Figure 8.4 - Prestressed Concrete Arch Bridge

Barnhill Cross Road is narrow with no footpaths and has stonewalls and high trees on either side. It is a quiet rural access road with occasional use by vehicular through traffic in the AM peak. This was observed on a site visit and confirmed by a traffic survey. On this proposal the road would be closed to through traffic at the section shown above, with only pedestrians and cyclists permitted to pass. This would lower the speed

and volume of traffic using the road and allow cyclists to share road space with local traffic. The road would be resurfaced, traffic calmed, and new public lighting provided.

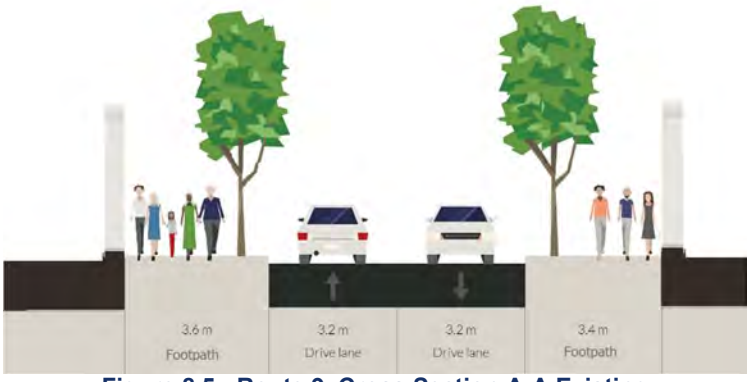

Figure 8.5 - Route 9, Cross Section A-A Existing

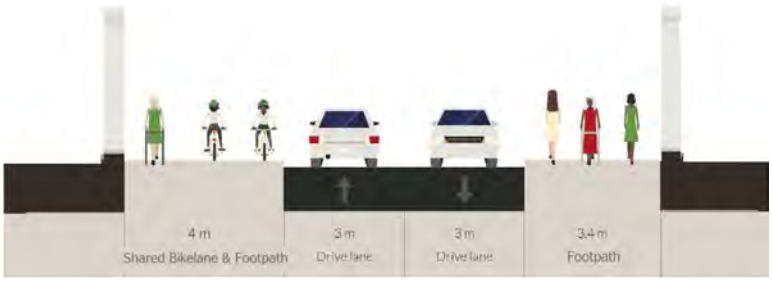

Figure 8.6 - Route 9, Cross Section A-A Proposed

8.2 Route 10

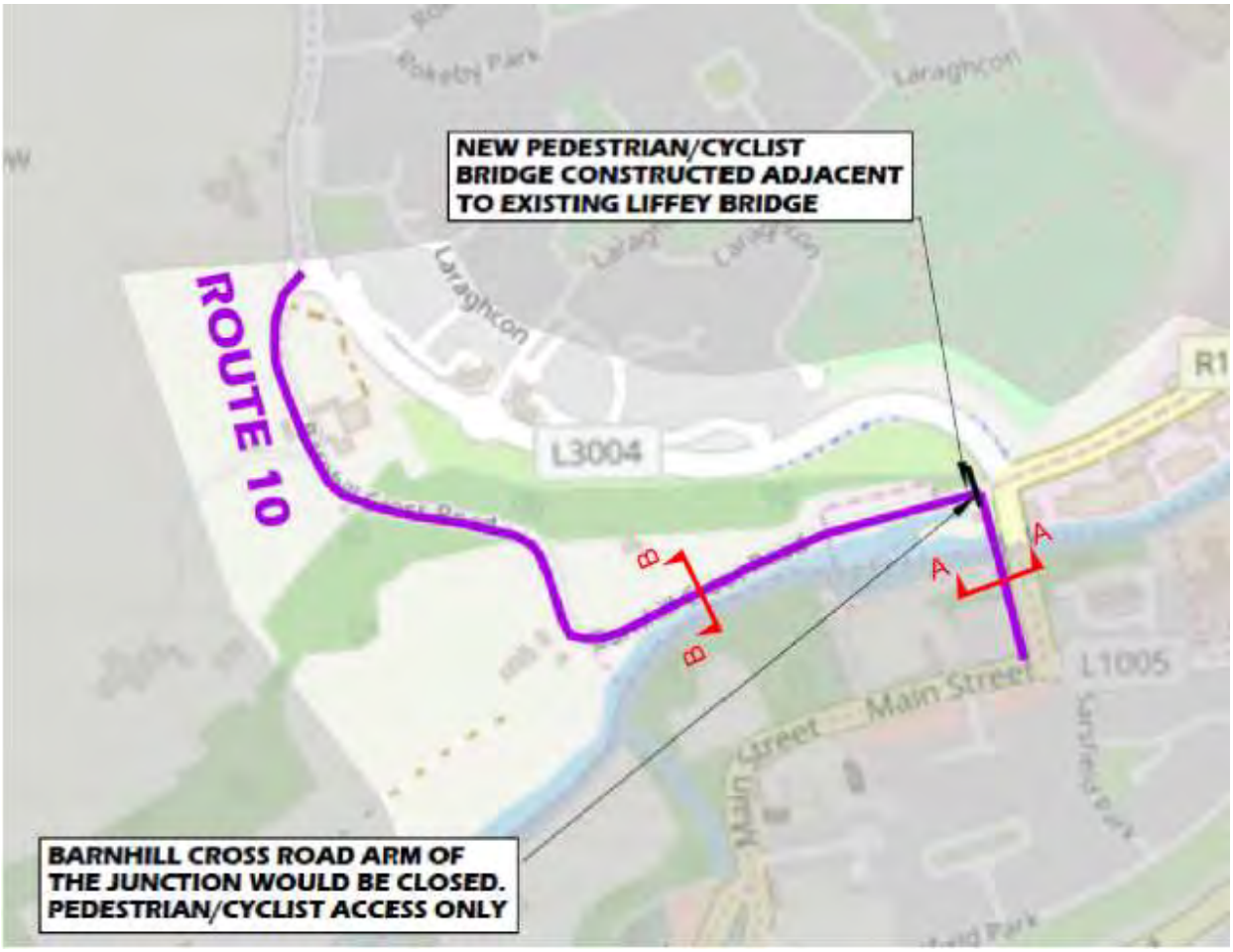

Figure 8.7 - Route 10

Route 10 runs from the roundabout south of the existing Liffey bridge to the roundabout at the junction with the L3005.

Lower Lucan Road would be realigned to allow for a shared pedestrian/cyclist space on the western side of the road, this would require the removal of a number of trees. A new pedestrian/cyclist bridge crossing the Liffey would be built approximately 5m to the west of the exiting bridge to connect to Barnhill Cross Road. An elevation drawing of a conceptual design of a prestressed concrete arch is included below in for information.

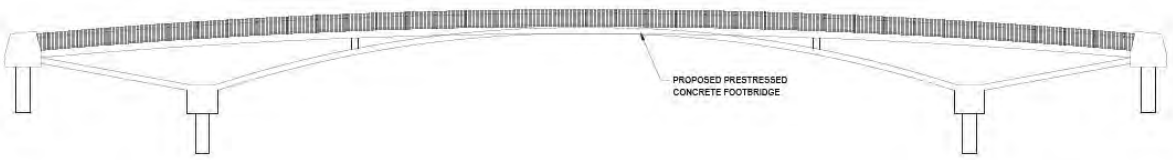

Figure 8.8 - Pre-stressed Concrete Arch Bridge

Cyclists would then travel along Barnhill Cross Road, this road is narrow with no footpaths and has stonewalls and high trees on either side. It is a quiet rural access road with occasional use by vehicular

through traffic in the AM peak. This was observed on a site visit and confirmed by a traffic survey. On this proposal the road would be closed to through traffic at the section shown above, with only pedestrians and cyclists permitted to pass. This would lower the speed and volume of traffic using the road and allow cyclists to share road space with local traffic. The road would be resurfaced, traffic calmed, and new public lighting provided.

Figure 8.9 - Route 10, Cross Section A-A Existing

Figure 8.10 - Route 10, Cross Section A-A Proposed

8.3 Route 11

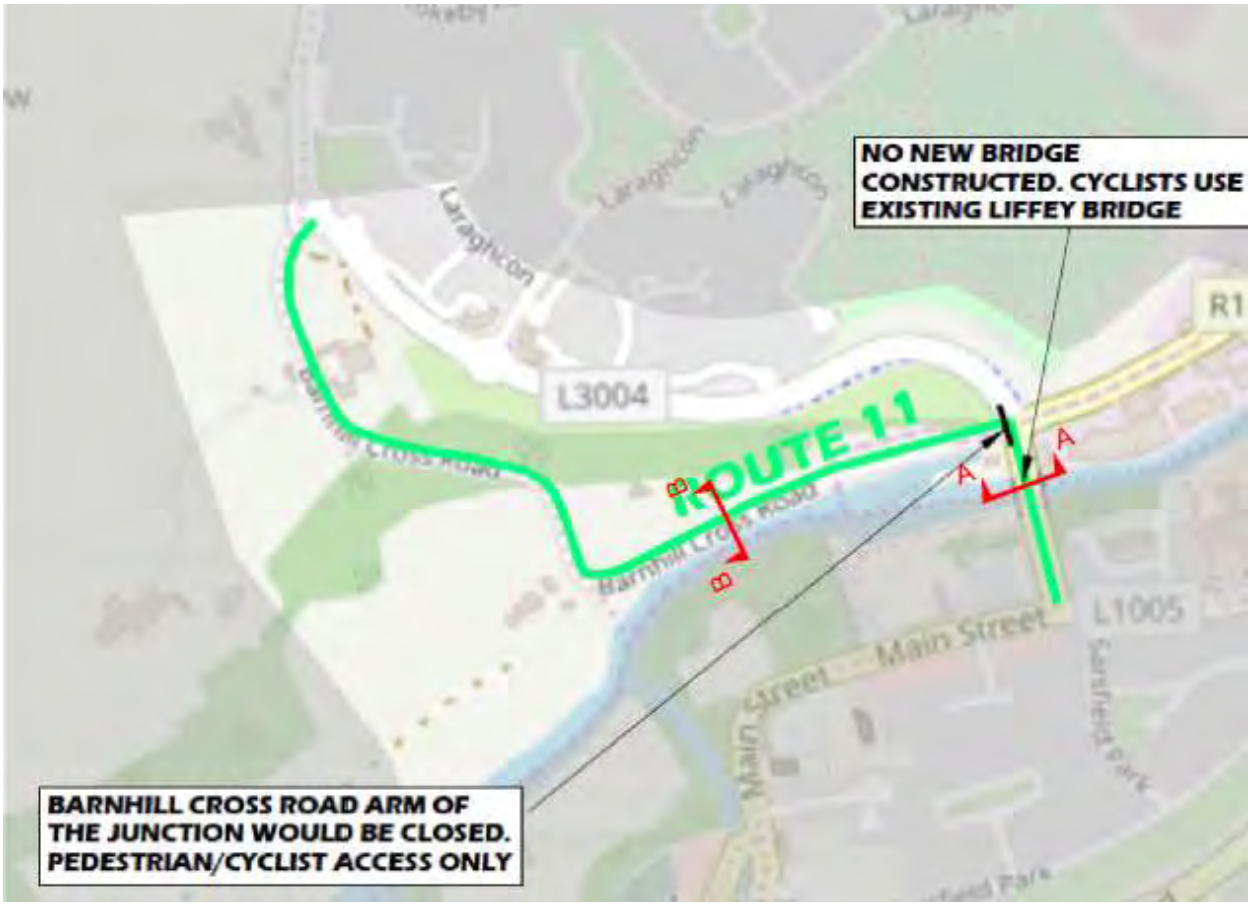

Figure 8.11 - Route 11

Route 11A

Route 11A runs from the roundabout south of the existing Liffey bridge to the roundabout at the junction with the L3005.

No changes would be made to the existing Liffey Bridge or to Lower Lucan Road for this scheme and cyclists would share road space with traffic here. Toucan crossings would be provided on all arms of the crossroads on the northern side of the Liffey to allow cyclists to connect to Barnhill Cross Road.

Barnhill Cross Road is narrow with no footpaths and has stonewalls and high trees on either side. It is a quiet rural access road with occasional use by vehicular through traffic in the AM peak. This was observed on a site visit and confirmed by a traffic survey. On this proposal the road would be closed to through traffic at the section shown above, with only pedestrians and cyclists permitted to pass. This would lower the speed and volume of traffic using the road and allow cyclists to share road space with local traffic. The road would be resurfaced, traffic calmed, and new public lighting provided.

Figure 8.12 - Route 11, Cross Section A-A Existing

Figure 8.13 - Route 11 A, Cross Section A-A Proposed

Route 11B

This route is similar to Route 11A except that one lane of traffic on the existing bridge would be closed and the road space would be allocated to pedestrians and cyclists. This would require a one-way shuttle system for traffic over the bridge which would be controlled by a new set of traffic signals. This would reduce the capacity of the existing bridge for vehicular traffic. Lower Lucan Road would be realigned to allow for a shared pedestrian/cyclist space on the western side of the road, this would require the removal of a number of trees.

Figure 8.14 - Route 11, Cross Section A-A Existing

Figure 8.15 - Route 11 B, Cross Section A-A Proposed

8.4 Route 12

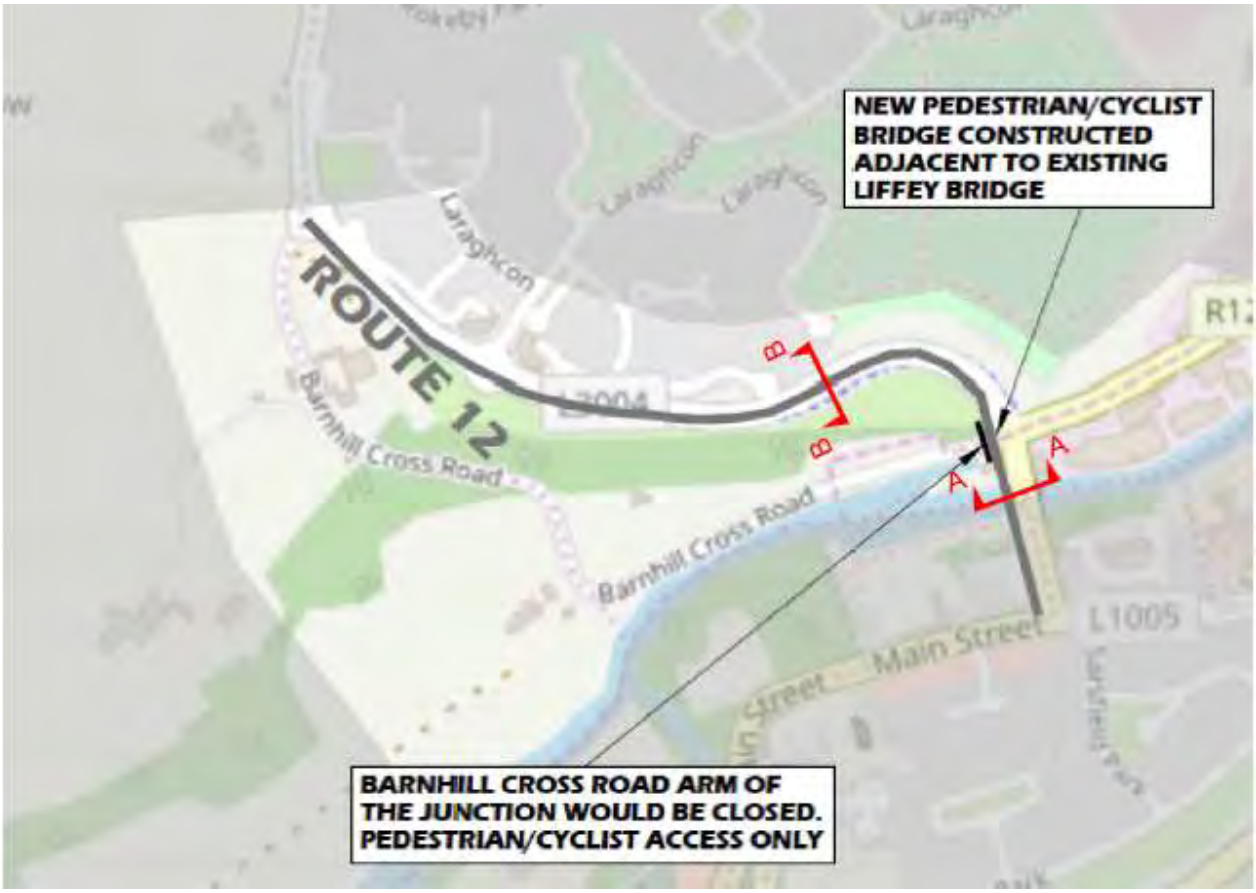

Figure 8.16 - Route 12

Route 12 runs from the roundabout south of the existing Liffey bridge to the roundabout at the junction with the L3005.

Lower Lucan Road would be realigned to allow for a shared pedestrian/cyclist space on the western side of the road, this would require the removal of a number of streets trees. A new pedestrian/cyclist bridge crossing the Liffey would be built approximately 5m to the west of the exiting bridge to connect to Laraghcon. An elevation drawing of a conceptual design of a prestressed concrete arch prepared for this location is included below in for information, the bridge could be designed to be lightweight in appearance and the arch could be designed to match the existing masonry arch.

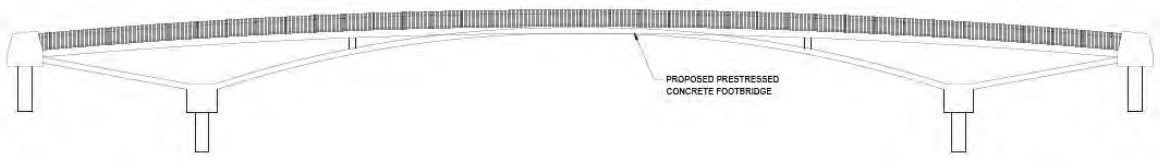

Figure 8.17 - Pre-Stressed Concrete Arch Bridge

At the junction to the north of the Liffey bridge the access to Barnhill crossroad would be closed to traffic and they would be required to detour via the junction to the north. This would provide continuous priority for pedestrians and cyclists accessing the new bridge from the northern side of the Liffey. This would also prevent the use of this road by through traffic and would slightly improve the efficiency and reduce the overall

queueing on the approaches to this junction, particularly in the AM peak. Vehicular through traffic was observed on site visits and has been confirmed by a traffic survey.

A two-way cycle track would be built on the western side of Laraghcon by widening the existing pedestrian/cyclist paths.

Figure 8.18 - Route 12, Cross Section A-A Existing

Figure 8.19 - Route 12, Cross Section A-A Proposed

8.5 Route 13

Route 13 runs from the roundabout south of the existing Liffey bridge to the roundabout at the junction with the L3005.

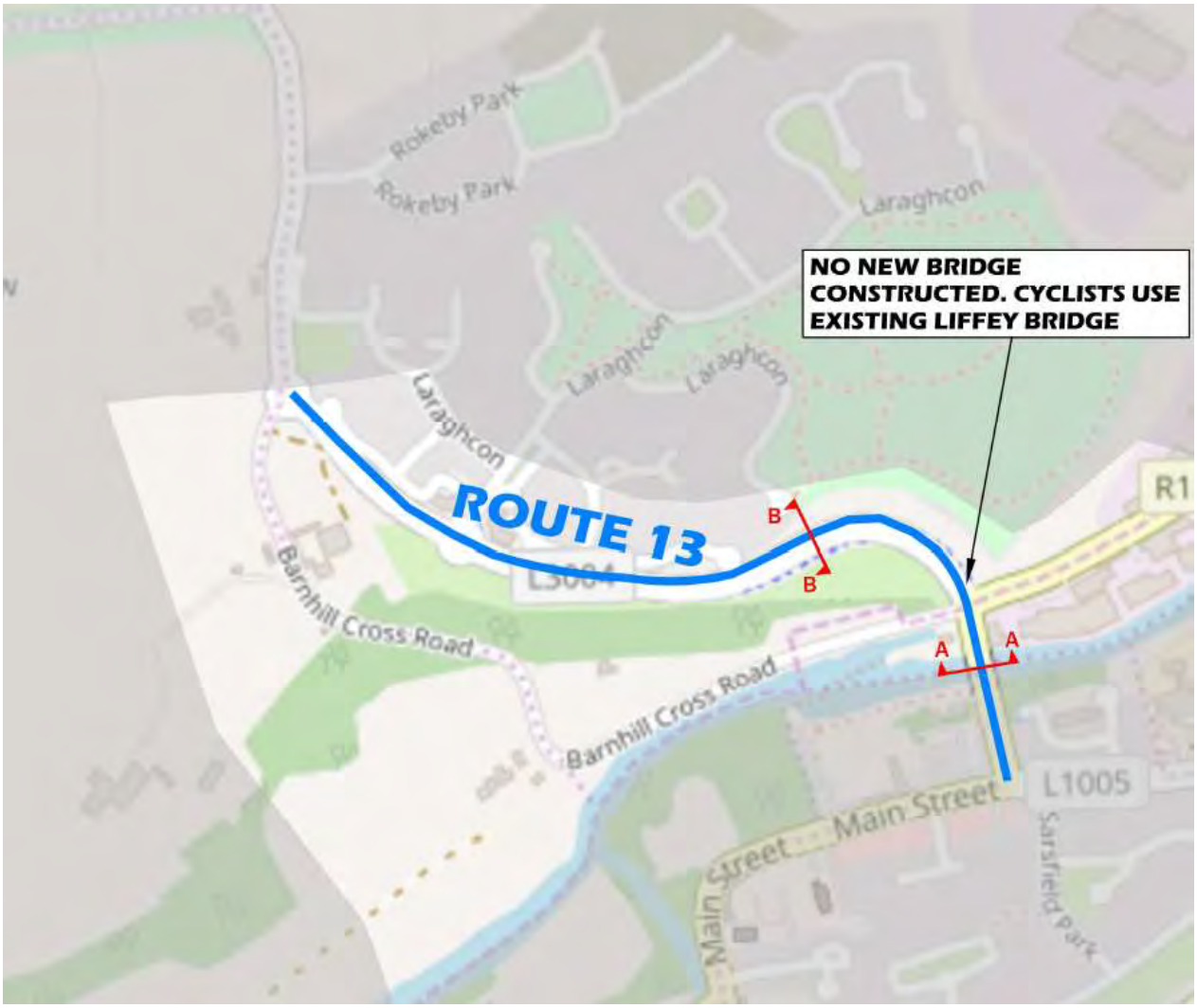

Figure 8.20 - Route 13

Route 13A

No changes would be made to Lower Lucan Road or the Liffey Bridge for this option and cyclists would share road space with traffic. Toucan crossings would be provided on all arms of the crossroads on the northern side of the Liffey.

For this option the existing cycle tracks on either side of Laraghcon distributor road would be used to take cyclists as far as the northernmost roundabout. A new toucan crossing would be provided here to link to the two-way cycle path further north in Section 3 of the study area.

Figure 8.21 - Route 13, Cross Section A-A Existing

Figure 8.22 - Route 13 A & 13 B, Cross Section A-A Proposed

Route 13B

Route 13B is similar to 13A except a two-way cycle track would be built on the western side of Laraghcon Distributor Road by widening the existing pedestrian/cyclist paths.

Route 13C

This route is similar to Route 13B except that one lane of traffic on the existing bridge would be closed and the road space would be allocated to pedestrians and cyclists. This would require the operation of a one-way shuttle system for traffic over the bridge, which would be controlled by a new set of traffic signals. This would reduce the capacity of the existing bridge for vehicular traffic and likely lead to an increase in queues approaching the bridge at all times. Lower Lucan Road would be realigned to allow for a shared pedestrian/cyclist space on the western side of the road, this would require the removal of four trees.

Figure 8.23 - Route 13, Cross Section A-A Existing

Figure 8.24 - Route 13 C, Cross Section A-A Proposed

8.6 Options Assessment

A summary of the ranking of options for Section 2B against the scheme sub-criteria is presented in Table 8.1 below, the colour coded scoring system is shown below.

Table 8.1 - Section 2B MCA Summary Table

Section 2B									
Assessment Criteria	**Sub-Criteria**	**9**	**10**	**11A**	**11B**	**12**	**13A**	**13B**	**13C**
Capital Cost									
Quality of Service	Road Safety								
	Coherence								
	Directness								
	Attractiveness								
	Comfort								
Environment	Archaeological, Architectural and Cultural Heritage								
	Biodiversity								
	Water Resources								
	Landscape and visual								
	Noise, Vibration and Air Quality								
	Land Use and the Built Environment								
	Impact on Lucan Village and Other Road Users								
Planning	Viability from a Planning Perspective								

Table 8.2 - Qualitative Ranking System

Extreme Positive
Major Positive
Moderate Positive
Minor Positive
Neutral
Minor Negative
Moderate Negative
Major Negative
Severe Negative

The following paragraphs provide a summary of the options assessment for this section of the study area. Further details of the assessment are presented in Appendix A.

In terms of Road Safety, 12 and 13C are entirely segregated from traffic and so score the highest. 9, 10 & 11B are segregated from traffic apart from the section that would involve sharing road space with cars on Barnhill Cross Road. This road would be cul-de-saced and the volumes and speeds of traffic would be well within the limits set in the National Cycle Manual, and so these routes also score highly. 11A, 13A & 13B would require cyclists to share road space with traffic on Lucan Road Lower and on the existing bridge. The volumes of traffic on these exceed the limits set out in The National Cycle Manual (The AADT is 18,200) and so these routes score a “Major Negative” on this criterion.

In terms of Coherence, 11A, 13A & 13B involve cycling on the road mixed with general traffic, the lack of dedicated cycle facilities would make these routes more difficult to follow. The cycling routes approaching and through junctions would also be less obvious than other options. Route 9 involves more turning movements than other options and so is also considered slightly less preferable. All other routes are slightly preferable.

For the Directness criterion, the route options are compared based on their route length and their estimated journey time for cyclists. Options which use Laraghcon are preferred over options that use Barnhill Cross Road due to their shorter route lengths. Cyclists would be delayed by queuing traffic on Lower Lucan Road on Routes 11A, 13A & 13B as they involve sharing road space here and this road is heavily congested at peak times.

In terms of Attractiveness, the routes which involve new bridges would have enhanced views of the River Liffey, the Weir and the existing arch bridge and are preferred over routes which travel over the existing bridge. Route 9 travels along the Liffey Promenade as well as a new bridge and so scores highest on this criterion.

In terms of Comfort, Routes 11A, 13A & 13B score a “Moderate Negative” as the designated cycle route would be frequently blocked by queueing traffic on Lower Lucan Road, this would lead some cyclists to cycle on the narrow footpaths, reducing the level of service for both cyclists and pedestrians. The gradients on Barnhill Cross Road are steeper than those on Laraghcon Distributor Road and so these routes are slightly less preferable. Route 9 drops down 6m to the Liffey Promenade before rising back up again to continue up Barnhill Cross Road and so scores a “Moderate Negative”. Routes 9, 10 & 12 involve cyclists in both directions sharing a 3m wide surface with pedestrians on Lower Lucan Road and Chapel Hill and this could become crowded at times. While the layout of Routes 10 & 12 provide a low level of comfort it is considered preferable to sharing road space with general traffic and these routes score a “Minor Positive”.

In terms of Architectural, Archaeological and Cultural Heritage, Routes 10 and 12 involve construction of a new pedestrian/cyclist bridge adjacent to the existing heritage bridge and as a result score a “Major Negative” on this criterion. This bridge could potentially be designed to mitigate the impacts by matching the arch of the existing bridge with a lightweight modern bridge and by choosing suitable cladding/building materials. Route 9 also involves constructing a new bridge. this is removed from the existing bridge but would involve construction near the Weir which is a protected structure built in the 13th/14th century and so also scores poorly under this criterion.

In terms of Biodiversity and Water Resources all options which would involve the construction of a new bridge score a “Minor Negative” as construction works would be required within the River Liffey pNHA.

In terms of Landscape & Visual, Options 9, 10, 11B, 12 & 13C would involve the removal of mature trees on Lucan Road Lower, while the construction of the new pedestrian bridges for Options 10 & 12 could partially obscure the view of the protected bridge from the west.

In Terms of Noise, Vibration & Air Quality, the two routes which would involve implementing a shuttle system over the bridge would result in increased queueing and a reduction in the air quality on the surrounding streets. As a result, Routes 11B & 13C score a “Moderate Negative” under this criterion.

In terms of Impact on Lucan Village and Other Road Users, Routes 10 and 12 would involve construction of a new bridge adjacent to the existing one. This new bridge would provide enhanced facilitates for

pedestrians on the western side of the bridge and would also facilitate the realignment of the road on the existing bridge to allow for a wider footpath on the eastern side of the bridge. These improved pedestrian facilitates would be of a significant benefit to Lucan Village and so these schemes score a “Moderate Positive”. Route 9 would provide an additional crossing for pedestrians but would not address the issues at the existing bridge and so scores a “Minor Positive”. Routes 11B & 13C would involve closing one lane of traffic over the existing bridge and the implementation of a shuttle system. This would significantly reduce the traffic capacity of the bridge and would lead to increased queueing in this already congested section of Lucan. As a result, they score a “Major Negative”.

In terms of Planning, Options 11B & 13C would involve introducing a one-way shuttle system over the existing bridge and would likely lead to increased congestion in Lucan, these score a “Moderate Negative”. Options 11A, 13A & 13B would involve minimal changes to the existing bridge and so score a “Minor Positive”. All other options would require the construction of a new bridge and score a “Minor Negative”

Conclusion

Based on the assessments above it has been determined that Route 12 offers the preferred route option. This route achieves the scheme objectives of providing high quality cycle infrastructure and has the following benefits when compared to other route options:

- The new pedestrian and cyclist bridge combined with the most direct route means this route provides the highest level of service for cyclists and would lead to a continuous high-quality cycle route across the scheme.
- It also significantly improves the facilities for pedestrians across Lucan Bridge.
- It would improve the efficiency of the junction to the north of the River Liffey.
- The negative scoring under the environmental criteria could be mitigated at the next design stage.

SECTION 9: SECTION 3

This chapter, relating to the section of urban greenway within the administrative boundary of Fingal County Council, is yet to be fully determined and will be subject to a separate future consultation.

SECTION 10: PROPOSED SCHEME

10.1 Concept Scheme Design

The emerging preferred route is shown below in Figure 10.1. A concept design has been prepared for this and this section of the report should be read in conjunction with the concept design drawings provided in Volume 3. The alignment and design of the section shown with a dotted line is within the administrative boundary of Fingal County Council and is yet to be determined. This section will be subject to a separate future consultation.

Figure 10.1 - Emerging Preferred Route

Describing the route in a northbound direction, cyclists would join the route from the Grand Canal Greenway at either Hayden's Lane or via a path 300m to the east depending on if they are approaching from the west or east. From here cyclists would travel north along Hayden's Lane and would share road space with pedestrians and local access traffic. Cyclists would then use the existing footbridge to cross over Adamstown Avenue and the railway line and connect to Griffeen Valley Park. The existing paths and bridges through Griffeen Valley Park would be used as part of the route, paths would be widened in the locations where they are below 4m in width.

Figure 10.2 - Existing Paths Through Griffeen Valley Park

The existing kissing gates in Griffeen Valley Park would be removed or replaced with more cycle friendly gates and a new toucan crossing would be provided to allow cyclists to safely cross Old Esker Lane. A new pedestrian/cyclist bridge would be constructed crossing the Griffeen River near the existing playground. Cyclists would then use the existing pedestrian and cyclist bridge to cross over the N4.

Figure 10.3 - Existing Footbridge over the N4

North of the N4 footbridge, cyclists would share road space with local traffic on Cherbury Park Road or use an alternative pedestrian and cycle link through the cul-de-sac and green space in Cherbury Park Avenue, they would then use the existing paths through the green area to the east to link to Beech Park, these paths would be widened and resurfaced. Cyclists would then share road space with general traffic on Beech Park and Lucan Heights. The alignment of some junctions along this section would be changed so that cyclists using the route would have priority and would need to make fewer turning movements.

Figure 10.4 - Existing Path Linking Cherbury Park Avenue to Beech Park

The junction of Lucan Heights and Lucan Road would be signalised and toucan crossings would be provided on all arms. A new pedestrian/cycle ramp and path would be built through the green area to connect this junction to Sarsfield Park, the ramp would be built with reinforced earth and retaining wall structures. Cyclists would then share road space with motorists on the low volume/low speed roads of Sarsfield Park.

Figure 10.5 - Concept Design of Junction Layout and Ramp from Lucan Road to Sarsfield Park

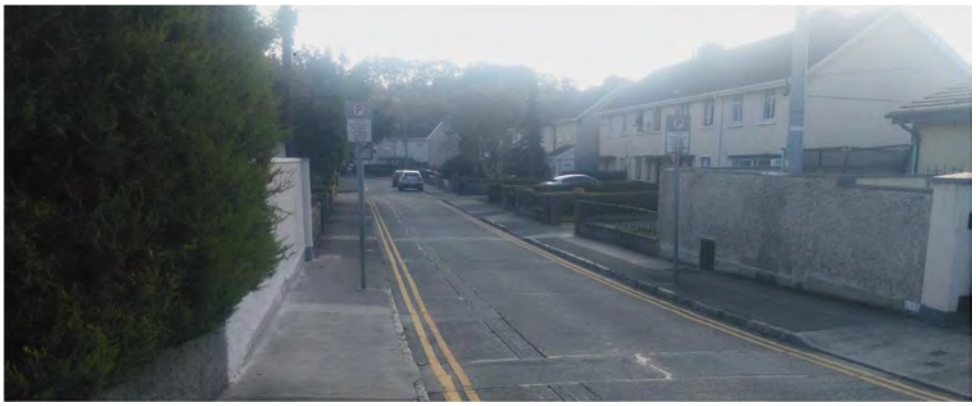

Figure 10.6 - Existing Layout on Sarsfield Park

The existing roundabout on Lower Lucan Road and the road itself would be realigned to allow for a shared pedestrian/cyclist space on the southern and western sides of the road, this would require the removal of four trees. Zebra crossings would be provided on all arms of the roundabout to provide safe crossing for cyclists and pedestrians. This section is particularly constrained, and it is not considered practically achievable to provide a higher level of service for cyclists.

Figure 10.7 - Lucan Bridge

A new pedestrian/cyclist bridge crossing the Liffey would be built approximately 5m to the west of the exiting bridge. This would likely require land take from the property located on an island within the Liffey. The carriageway on the existing bridge would be realigned to improve pedestrian facilities by moving it further to the west, the footpath on the western side of the road would be closed and pedestrians would use the new bridge instead. The extra space freed up on the existing bridge would be reallocated to providing a wider footpath on the eastern side. This would provide enhanced facilities for pedestrians on both sides of the bridge and increase the connectivity between the two sides of the river. An extract from the concept design drawings for this section is shown in Figure 10.8.

A design has been prepared and approved by SDCC for access steps from Lucan Road Lower down to the Liffey Promenade. At the next design stage, the design of the steps and the new bridge should be done together to ensure they are compatible with one another.

Figure 10.8 - Proposed Layout at the Liffey Bridge

Figure 10.9 - View of River Liffey from Lucan Bridge

Public lighting, where appropriate and subject to ecological sensitivities, would be upgraded to modern LED lanterns. Bicycle parking and rest areas would also be provided as appropriate.

Figure 10.10 - Existing Public Lighting and CCTV Masts within Griffeen Valley Park

Wayfinding signs, road markings and distinctive surfacing materials should be used to allow cyclists and walkers to easily follow the Canal Loop Urban Greenway route.

All efforts have been made to avoid the removal of mature trees as part of this scheme and replacement tree planting would be undertaken to compensate for any trees that would need to be removed. Improvements to the urban realm would also be made along the route where practicable.

10.2 Scheme Benefits

The scheme detailed above would provide the infrastructure necessary for a high-quality pedestrian and cyclist route between the Grand Canal and the River Liffey and would cater for cyclists and walkers of differing abilities and ages. Along with the completion of the section within Fingal County Council as well as the Grand Canal and Royal Canal Greenways this would create a high-quality 40 km recreational cycle loop which could be accessed easily from Dublin City Centre or any other location along the route. This would benefit the Dublin Area as a whole, and Lucan Village in particular. The benefits of such routes can be seen in the other successful greenways such as the Waterford or the Great Western Greenways. The full loop would take approximately 3 hours to cycle and could easily be completed as part of a half-day trip or a full day trip with stop-offs.

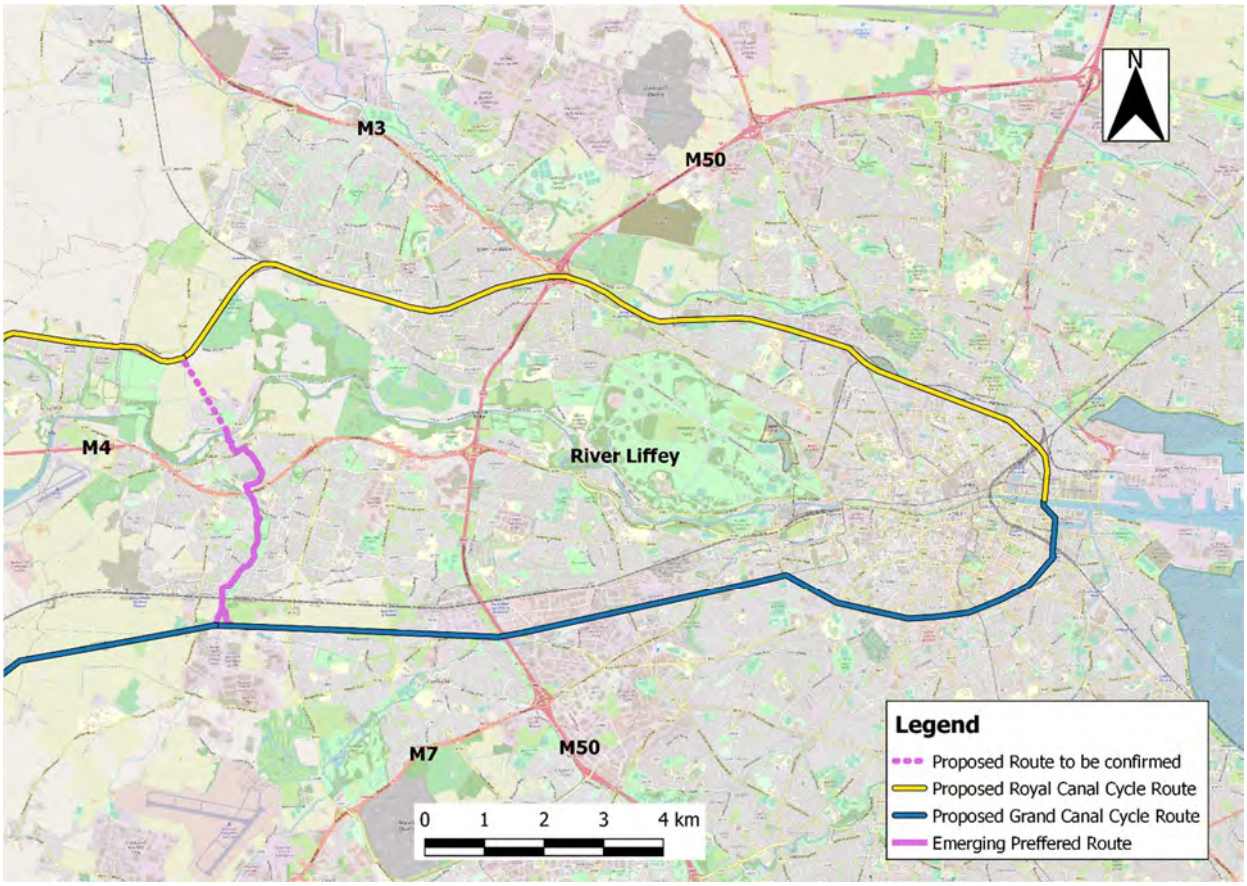

Figure 10.11 - Proposed Recreational Canal Loop Cycle Route

This route would provide a much higher level of safety for pedestrians and cyclists when compared to the existing infrastructure. It would also encourage use of the route by greater numbers of cyclists and this increases drivers' awareness of the presence of cyclists, this would lead to a reduction in the number of accidents involving vulnerable road users. As a commuter route, this route would also greatly improve the connectivity between north and south Lucan, particularly across the River Liffey, and would provide a higher level of service for commuter cyclists and pedestrians. This route would create accessible links between the schools and the residential areas of Lucan. This is seen as a strong advantage of this scheme and it is expected that this route would be particularly useful for school children accessing the large number of schools in the Lucan Area. It would also provide access for commuters to the major employment area of

Grange Castle Business Park which is located south of the Grand Canal. A map of these trip attractors is shown in

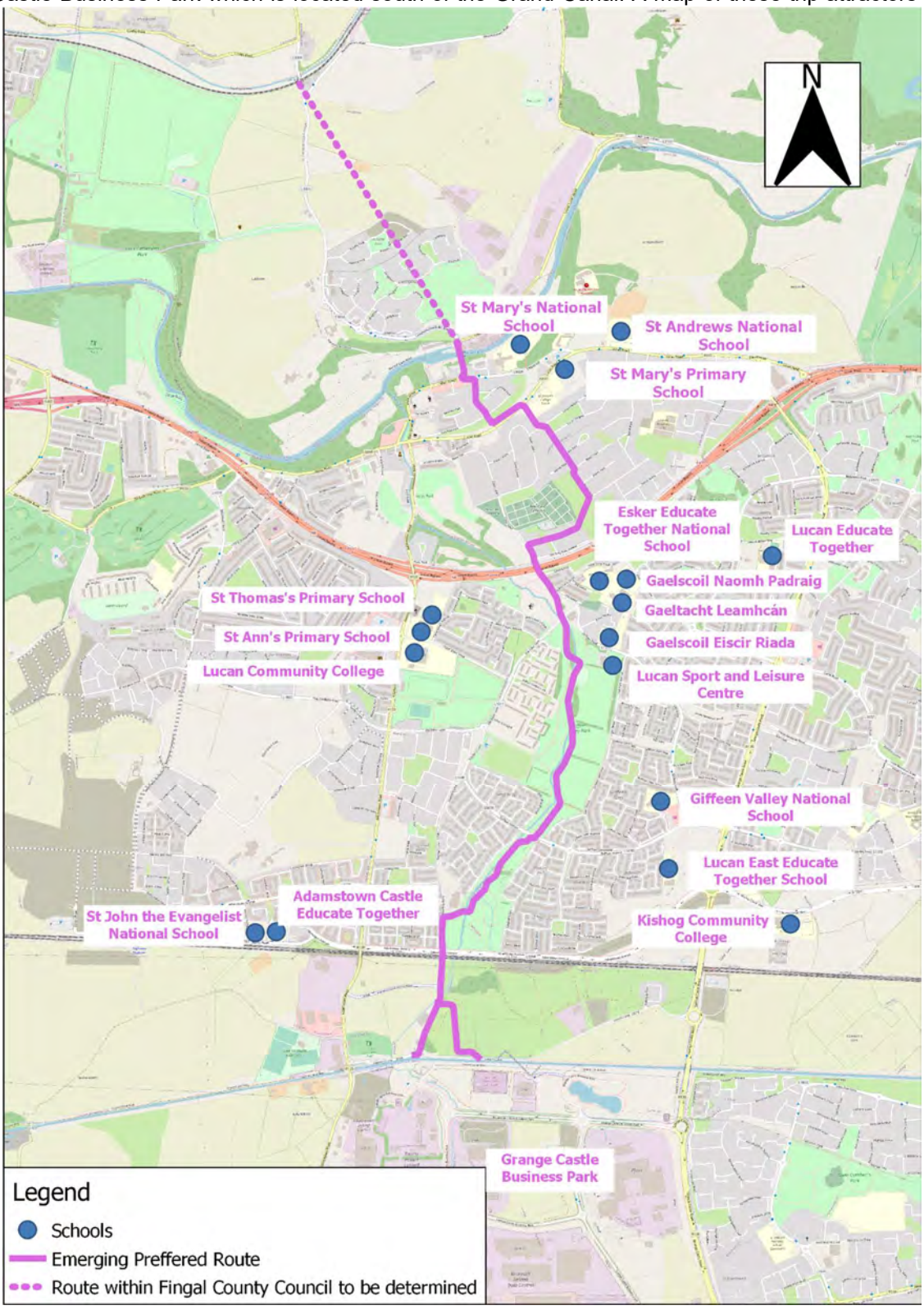

Figure 10.12.

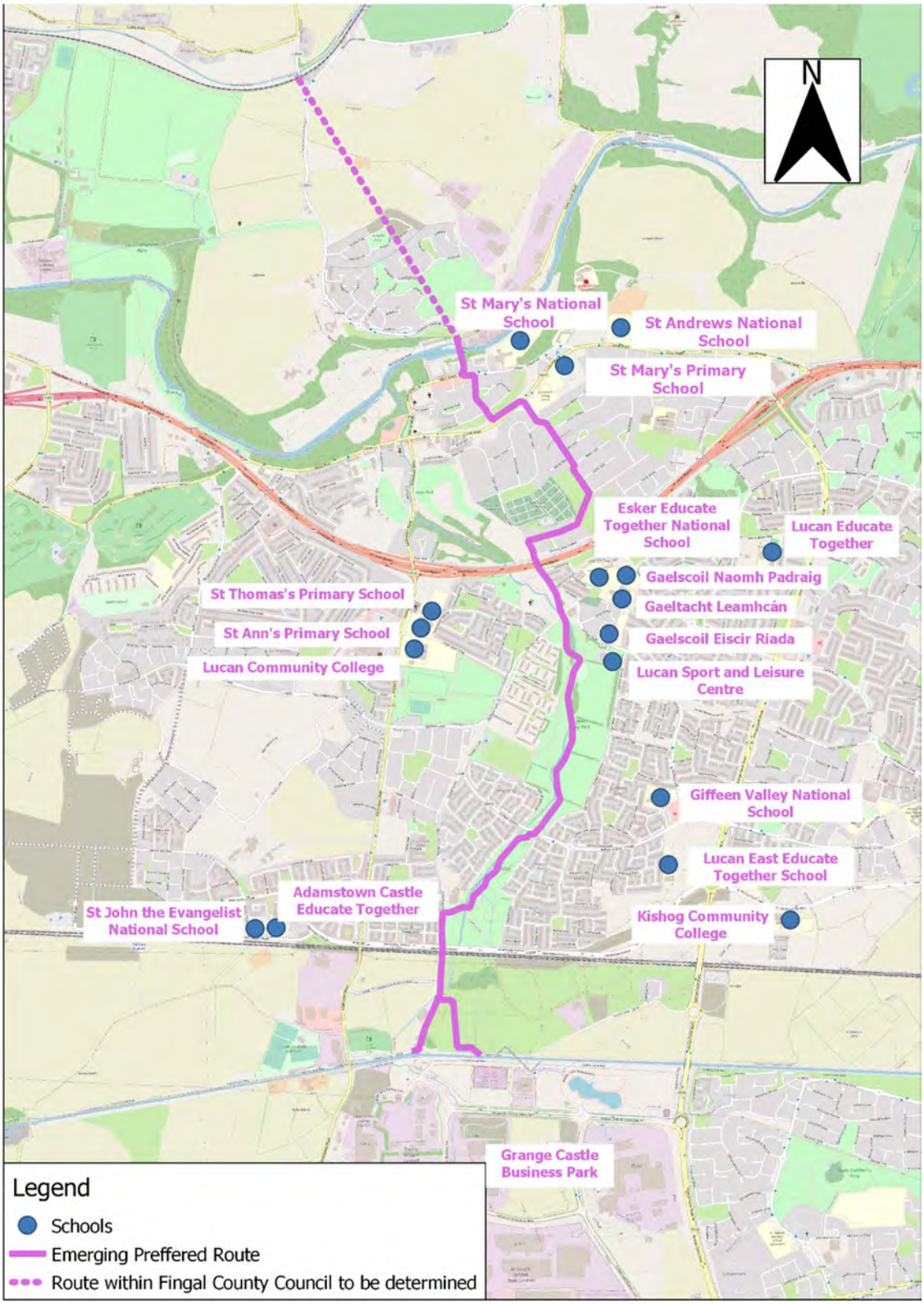

Figure 10.12 - Schools, Employment Centres and Recreational Facilities

A major benefit of this scheme would be the increased physical activity and the associated health benefits for both recreational and commuter cyclists, and walkers who would use these new facilities. This would contribute to improving the well-being and productivity of the population and would reduce the health care costs for the state over time.

The construction of this scheme would encourage a modal shift for car users to cycling and walking. This would have the effect of reducing the traffic congestion in Lucan Village, which is very heavy during peak

hours. This would lead to reduced delays for motorists and public transport users as well as an improvement in the air quality and a reduction in greenhouse gas emissions. Cycling is also a cheaper, more efficient and more reliable mode of transport for the individual commuter. Improved facilities for mobility and sensory impaired pedestrians would also be provided for the length of the scheme.

Further benefits of the scheme would be the increased level of safety for vulnerable road users, the commercial benefits to the retail sector in the Lucan Area arising from the recreational cyclists and the opportunity to improve the public realm and provide recreational facilities along the route.

10.3 Cost Estimate

A preliminary cost estimate has been prepared based on the concept design for the scheme, which includes a number of assumptions regarding the scheme details. A breakdown of these costs by study area section is shown below

Section 1

Route Length	2.6 km
Estimated Cost	€ 0.6 million
Cost per km	€ 0.2 million / km

Section 2

Route Length	1.6 km
Estimated Cost	€ 3 million
Cost per km	€ 1.9 million / km

The estimated scheme infrastructure cost, which includes land acquisition and construction costs, is anticipated to be in the order of **€ 3.5 – 4.5 m** for the 4.2 km route. An additional contingency has been added and a price range given as the design is not detailed enough at this stage for a more accurate cost estimate.

The major cost item within this scheme is the proposed bridge over the River Liffey (approx. €700k).

10.4 Next Steps

This report has identified an emerging preferred route for the urban greenway and a concept design has been developed.

The next project stage (the development of a Preliminary Design) will further refine and update the initial concept design along the route. The Preliminary Design will define the final practically achievable scheme, considering more detailed studies of constraints and environmental assessment required at a local level. Prior to finalisation of the scheme design, a public consultation process will be undertaken, with inputs and feedback received incorporated where practical and appropriate to do so.

This Preliminary Design will form the basis of the planning consent process for the scheme, which will be done through the Part 8 or Part 10 process.

SECTION 11: POTENTIAL STAND-ALONE INTERVENTIONS

While conducting the research for this project the design team noticed two other issues within the study area that could potentially be dealt with as standalone urban improvement schemes or traffic studies. These are discussed in the following sections.

11.1 Pedestrian Crossings on Chapel Hill

There are currently no pedestrian crossings on Chapel Hill. There are a high number of pedestrians in this urban village environment as well as a number of schools. The level of priority given to traffic over pedestrians is inconsistent with the guidance provided in DMURS. This intervention has been brought forward and is included in the emerging preferred route design.

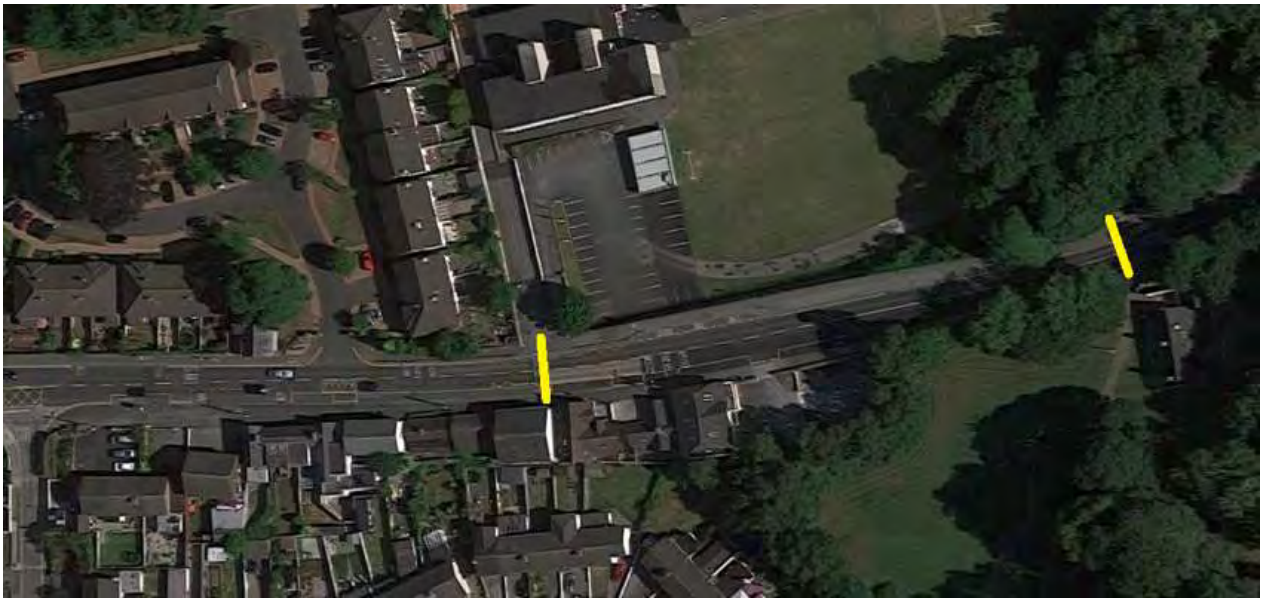

Figure 11.1 - Location of Potential Pedestrian Crossing on Chapel Hill (Credit Google Maps)

11.2 Improve Pedestrian Facilities on Esker Hill

It was observed that pedestrian facilities are dangerously poor on Esker Hill, with footpath widths as narrow as 1m, fast moving traffic, narrow traffic lanes and sharp horizontal and vertical curvatures. The improvement of pedestrian facilities here would require the reallocation of road space from traffic lanes. This would require motorists in one or both directions to be diverted via Lucan Heights.

Figure 11.2 - Narrow Cross Section on Esker Hill

South Dublin County Council

Canal Loop Urban Greenway Feasibility & Option Selection Report

Addendum – Section 2A Review: Post Non-Statutory Public Consultation

Issue 3 | 2 August 2022

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Contents

Executive Summary

Arup were appointed by South Dublin County Council to undertake the preliminary design, detailed design, construction procurement, construction supervision and project handover for the delivery of the Canal Loop Urban Greenway. Barry Transportation were previously appointed by SDCC to develop the Feasibility and Option Selection Report for the Canal Loop Urban Greenway.

Following the publication of the Barry Transportation Feasibility and Option Selection Report, a non-statutory public consultation was held over a period of six weeks beginning in March 2021. The Virtual Consultation Room received 3,918 views (5,231 total with repeat views).

The purpose of the consultation was to:

- Inform the public of the emerging preferred concept route
- Gauge opinion and get high level feedback on the concept route
- Having engaged the public, help inform the next preliminary design stage of the Project

During consultation, local residents indicated their preference for the route to utilise Esker Road and Esker Lawns as an alternative to Cherbury Park and to connect into Lucan village via the public space adjacent to the Brookvale estate.

This report is therefore an addendum to the Feasibility and Option Selection Report for the Canal Loop Urban Greenway (FOSR) to detail the work Arup have done in assessing the feasibility of this alternative route and to detail the new draft Preferred Route Option (PRO) following the non-statutory public consultation.

Where substantial revisions have been made to the design since the publication of the Emerging Preferred Route (EPR) Option in February 2021, options have been assessed using a Multi-Criteria Assessment (MCA) to determine the revised PRO. The methodology used is consistent with that carried out during the initial route optioneering work which informed the EPR Option. This additional assessment does not supersede work done during earlier stages but rather complements it and is a direct response to issues raised by the public during the public consultation process. This assessment has also been carried out in the context of more detailed information now available.

The revised PRO is detailed in Figure 1 below.

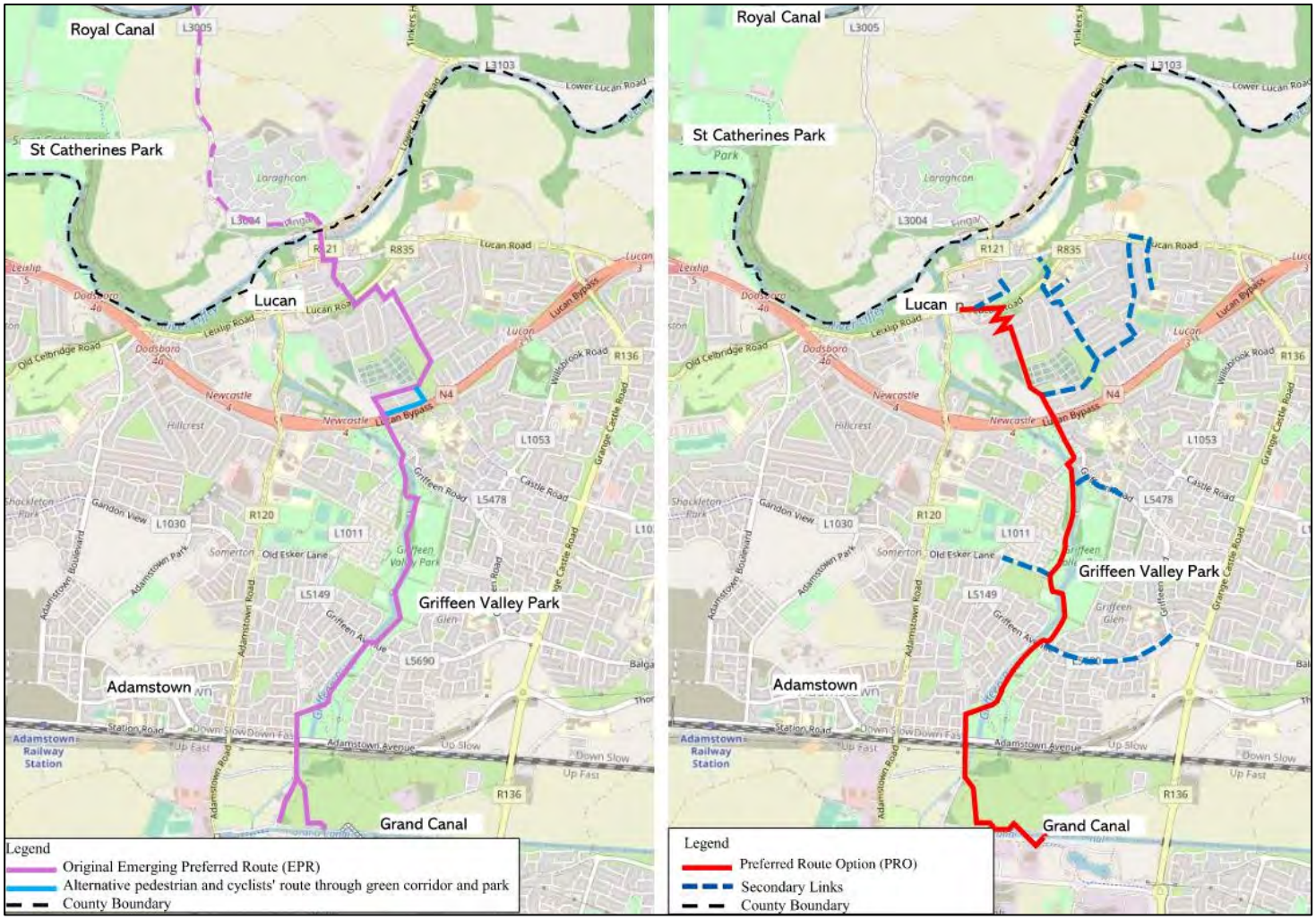


Figure 1: Revised Preferred Route Option

1 Introduction

1.1 General

Barry Transportation were previously appointed by SDCC to develop the 'Feasibility and Option Selection Report for the Canal Loop Urban Greenway'(FOSR). This report detailed the background of the scheme, the route selection process, assessed a variety of options and recommended an Emerging Preferred Route (EPR) for the scheme. Following the publication of this report, a non-statutory public consultation was held over a period of six weeks beginning in March 2021. The Virtual Consultation Room received 3,918 views (5,231 total with repeat views). The key findings of this consultation are summarised in 1.3.3.

Arup were appointed by South Dublin County Council in October 2021 to undertake the preliminary design, detailed design, construction procurement, construction supervision and project handover for the delivery of the Canal Loop Cycle Scheme.

This report is an addendum to the FOSR to detail the work Arup have done in assessing the feasibility of an alternative route and to detail the new Preferred Route Option (PRO) following the non-statutory public consultation.

1.2 Report Structure

This report - 'Addendum – Section 2A Review: Post Non-Statutory Public Consultation' has been prepared for the Canal Loop Urban Greenway, which will build on the previously published FOSR.

The Study Area Analysis and Multi Criteria Analysis for the previously proposed feasible route options are considered to still be valid unless otherwise detailed and updated in this report. Any additional design work or optioneering has been assessed against the previously identified Emerging Preferred Route (EPR) Option in order to determine the revised Preferred Route Option (PRO). Additional design development and the updated PRO referenced in this report have been based on;

- Output from engagement and consultation activities on the EPR Option and draft Preferred Route Option Proposals;
- Updated topographical survey information;
- Further design development and options assessment; and
- Change in the extent of the scheme

This report is structured as follows:

- Chapter 2 – In this chapter, the study area for the Canal Loop Urban Greenway is detailed and divided into distinct sections. Scheme specific constraints and opportunities are discussed.
- Chapter 3 – The assessment methodology for identifying the Emerging Preferred Route is outlined in this chapter.
- Chapters 4 – This chapter details the Emerging Preferred Route selection process for the Section 2A of the study area
- Chapter 5 – This chapter gives the overall conclusions of the scheme options assessment process and identifies and describes the Preferred Route Option.

1.3 Context & Scheme Objectives

1.3.1 The need for the scheme

The Canal Loop Cycle Scheme forms parts of the National Transport Authority Greater Dublin Area Cycle Network Route and is route 01 in the Cycle South Dublin Programme. Arup have been commissioned by SDCC to develop the Scheme as a safe, coherent and attractive route with a high Quality of Service that will form part of the wider strategic cycle network in the South Dublin Area. The scheme objectives are as follows:

- Encourage modal shift to cycle as a safe and convenient means of making local trips (work, school/college, recreational trips, etc) and to create a network of high-quality cycling facilities;
- Develop secondary links in the vicinity of the main scheme that will look to increase the usability of the main route through increasing access and destination options;
- Ensure the delivery of a high-quality cycle route that provides high quality linkage between residential areas and key trip attractors (e.g. schools/colleges, sports clubs, shopping centres) as well as other planned and existing cycle and walking routes;
- Upgrade junctions where facilities for pedestrians and cyclists are limited or non-existent;
- Significantly improve safety for pedestrians and cyclists to minimum Level of Service IV in accordance with the NTA Cycle Manual.

1.3.2 Planning/Strategic Context

The planning and strategic context for the Canal Loop Urban Greenway is as detailed in Section 2 of the ‘Feasibility and Option Selection Report for the Canal Loop Urban Greenway’ and remains unchanged.

1.3.3 FOSR Preferred Route

The FOSR detailed assessment determined that Route 12 offers the preferred route option. It was deemed the preferred route as it was determined that it would achieve the scheme objectives of providing high quality cycle infrastructure and has the following benefits when compared to other route options:

- The new pedestrian and cyclist bridge combined with the most direct route means this route provides the highest level of service for cyclists and would lead to a continuous high-quality cycle route across the scheme.
- It also significantly improves the facilities for pedestrians across Lucan Bridge.
- It would improve the efficiency of the junction to the north of the River Liffey.
- The negative scoring under the environmental criteria could be mitigated at the next design stage.

1.3.4 Public consultations

Following the publication of the FOSR, South Dublin County Council undertook an online public consultation programme on a 4.2-kilometre section on the emerging preferred route.

The purpose of the consultation, which took place over a period of six weeks, beginning in March 2021 was to:

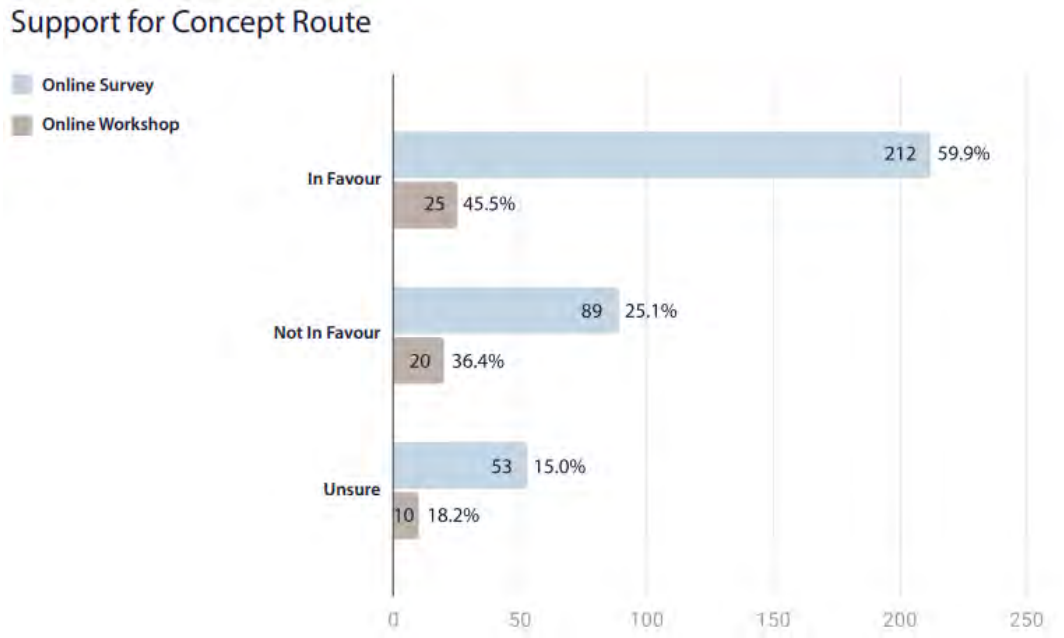
- Inform the public of the emerging preferred concept route
- Gauge opinion and get high level feedback on the concept route
- Having engaged the public, help inform the next preliminary design stage of the Project.

The multifaceted methods utilised to engage with the public during this consultation included, among others:

- Informing local Councillors of the proposed method of engagement and timeframe for same
- an online survey
- a youth conservation kit
- a series of live online consultation events involving presentations, questions and answers, live polling and workshops
- a recorded online presentation
- the online display of material including maps, technical documents, photomontages and a video within a fully interactive Virtual Consultation Room

Within the context of Covid 19 restrictions, social media platforms and e-leaflets were utilised extensively to encourage participation across different age groups. Various groups, schools and individuals were also notified directly via the Council's Public Participation Network. The Virtual Consultation Room received 3,918 views (5,231 total with repeat views).

The consultation gathered a variety of important insights and opinions from the public on the Greenway's concept route. As illustrated in the following chart, there was a divergence in the proportion of people in favour of the concept route when comparing results of the online survey with polling that was conducted during the online consultation workshops:



When collated, the total number of people in favour of the concept route was 237 (58%) and the total of people who were not in favour of the concept route was 109 (27%) with 64 (15%) unsure.

The results of the youth conversation kit were even more positive than the survey and workshop results with 80% of youths (60 of 75 respondents to this question) indicating that they were either Very Happy or Extremely Happy with the concept route.

Six major themes could be identified from the breakout room discussions that took place during the workshops.

Three of the identified themes related largely to the route's impact on residential areas, including potential impacts on:

1. The safety of cyclists, pedestrians and the elderly
2. Security and privacy
3. Crime and anti-social behaviour

The other three themes related to Lucan Village as follows:

4. The visual and aesthetic impact on Lucan Bridge
5. The need for stronger link to the centre of Lucan Village
6. The need to address traffic congestion

Those in favour of the route also suggested the need to separate pedestrians and cyclists along the route.

Additional non-statutory public consultation has taken place since March 2021. SDCC met with the following residents to update and discuss current scheme proposals:

- Sarsfield Park (November 2021)
- Cherbury Park (November 2021)

Arup along with SDCC have also engaged with local schools along with local amenities such as Lucan Sarsfield GAA club.

The above key findings and additional consultation have been used to inform the preliminary design development of the preferred route option and the formation of secondary links.

1.3.5 Outcome of Public Consultation

The findings of the non-statutory public consultation have heavily the preliminary design and the need to revisit the route options set out in the FOSR in order to determine the new PRO that ensures the scheme has a stronger link to the centre of Lucan Village, has stronger links to schools and the visual and aesthetic impact on Lucan Bridge is minimised .

2 Study Area

The Canal Loop Urban Greenway Study Area is as described in Section 3 of the 'Feasibility and Option Selection Report for the Canal Loop Urban Greenway'. The Study Area runs from The Grand Canal at the southern boundary to The Royal Canal at the north. The study area was generally developed to include potential route options between the two canals. The study area lies within the administrative boundaries of South Dublin and Fingal County Councils.

The Study Area Analysis for the previously proposed feasible route options are considered to still be valid. Any additional design work or optioneering has been carried out within the boundaries of the previous Study Area shown in Figure 2.1 below.

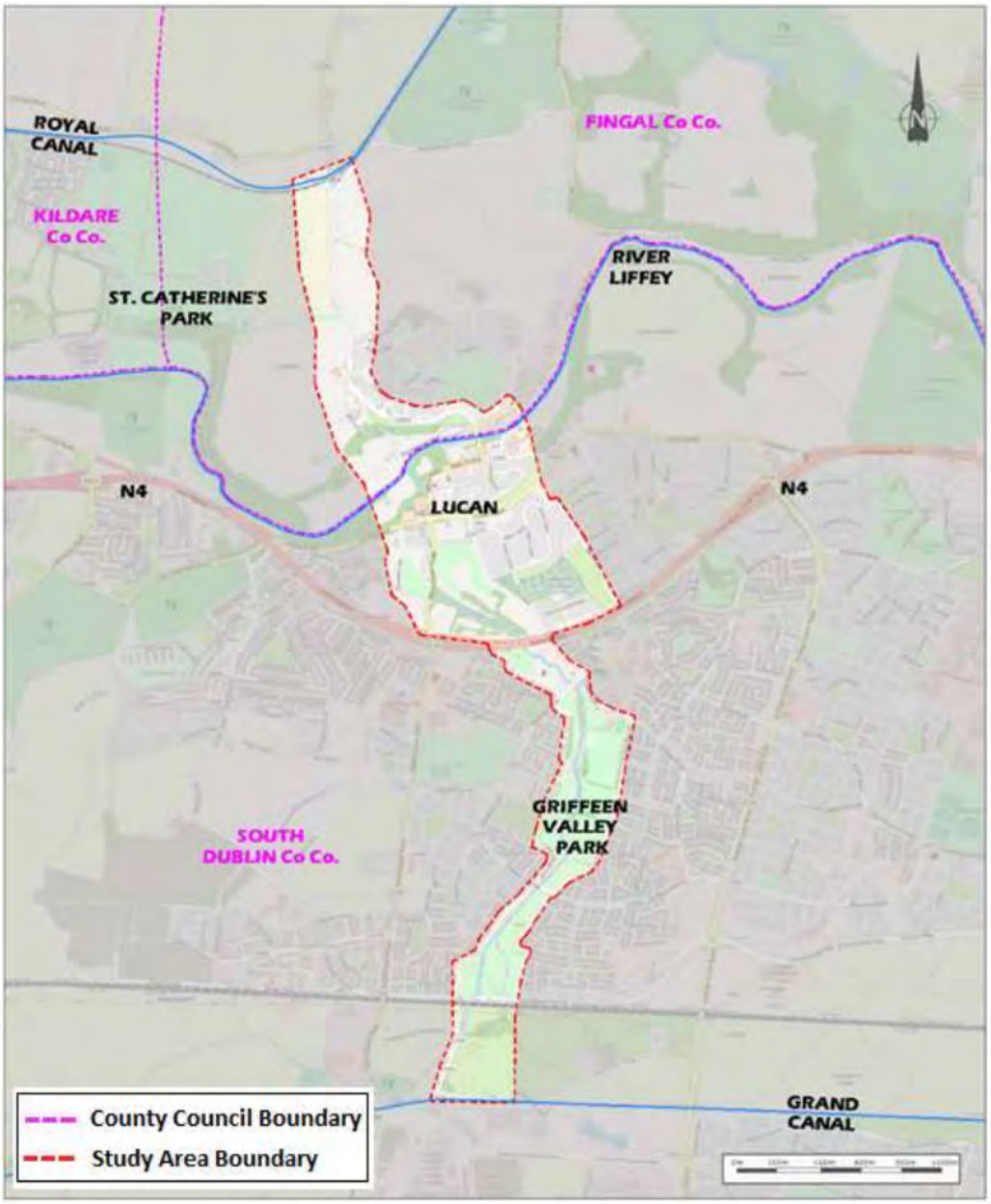


Figure 2.1 Study Area

The Study Area was split into three smaller sections, as shown by the Figure 2.2 below. Due to the constrained nature of the road network and the high number of potential route options Section 2 has been further subdivided into sub-sections. The sections are described in Figure 2.2.

For the purpose of this report Arup's scope covers Section 1 and Section 2A. The EPR for Section 1 remains unchanged while Section 2A has been developed further to ensure the scheme has a stronger link to the centre of Lucan Village and has stronger links to schools. The connection over the Lucan Bridge is to be progressed at a later date. Sections 2B which includes the location of the Liffey crossing has been omitted from this scheme and will be progressed as part of a later scheme as a result of feedback provided during the non-statutory public consultation held in March 2021. Section 3 and part of Section 2B of the route is within the administrative boundary of Fingal County Council and is yet to be fully determined. This section will be subject to a separate future consultation and later scheme to be completed by Fingal County Council.

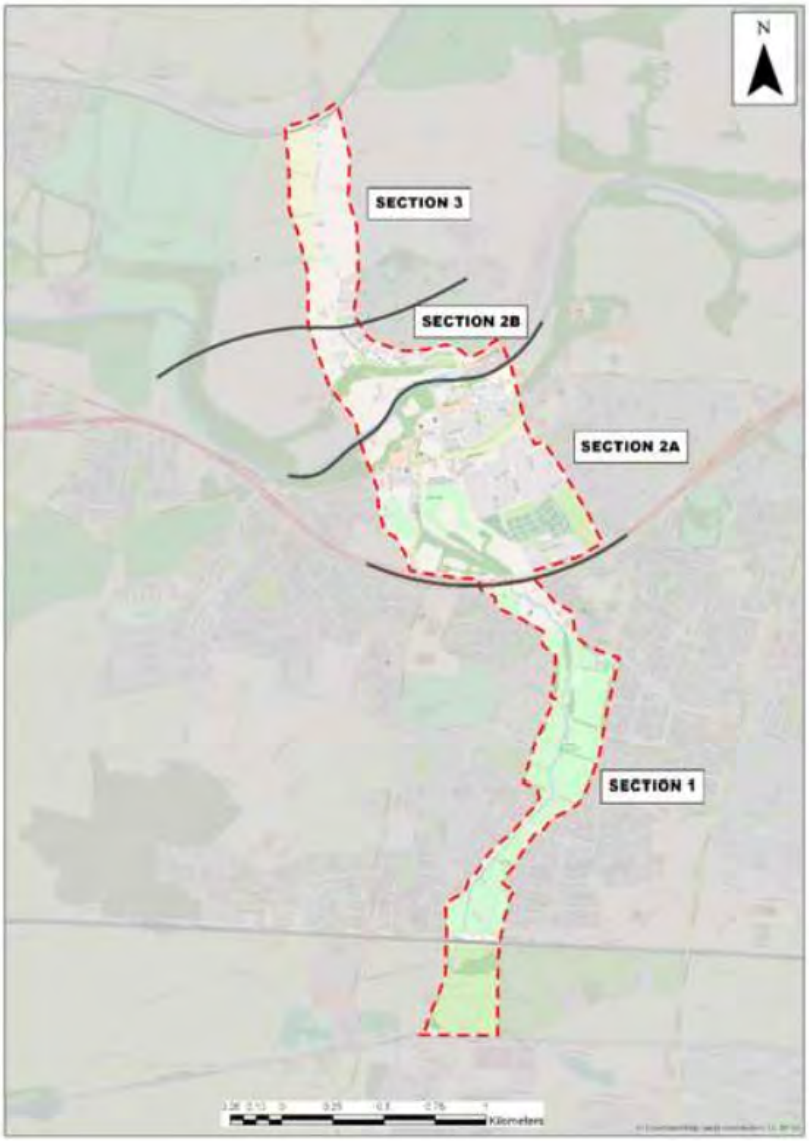


Figure 2.2: Study Area Sections

2.1 Physical Constraints & Opportunities

There are a number of features in the natural and built environment within the Section 2A of the study area which constrain scheme options or provide opportunities for enhanced integration. These are considered within the scheme assessment process and include the following:

- Trees, hedges and other natural and ecological features including rivers and streams.
- Architectural, archaeological and heritage sites and features.
- Protected structures adjacent to the route.
- Topography – Lucan Village is situated within in a valley so there are steep gradients on existing streets and steep slopes in the vicinity of Vesey Park and Brookvale open space to overcome.
- Existing urban and rural street networks, the area around Lucan Village is particularly constrained.
- Limited availability of land in urban and suburban areas.
- Planned and committed developments.

2.1.1 Brookvale Ownership

The lands known as Brookvale open space (referred to as Esker Hill Park in the FOSR), detailed in Figure 2.3, are not currently under SDCC control and could become within the control of SDCC through a taken-in-charge process. Previously, the Brookvale housing estate's planning application included public open space which was to be taken-in-charge. During the taken-in-charge process, the roads were taken in charge and the open space portion was not concluded, due to the land not being up to SDCC Parks standard and the process was halted. On this basis, SDCC has contacted the owners, William Neville & Sons, who are willing to re-engage with the taken-in-charge process and have no objection to the Canal Loop Greenway's Part VIII. After which, the taken-in-charge process will be progressed in advance of starting works.

Figure 2.3: Brookvale Open Space (Referred to as Esker Hill Park in the FOSR)

3 Methodology

The methodology used for the further development of Section 2A is as detailed in Section 4 – Methodology of the FOSR and remains unchanged.

3.1 Section 2A Route Option Development

The first step of the route selection process is to develop route options. Using the information collected during the data collection process, site visits and engineering judgement, feasible route options were developed for each study area section to bring forward to the Multi-Criteria Analysis Stage.

In order to simplify the route selection process Section 2 of the study area was further subdivided into two sub-sections. This chapter outlines the options assessment process for Section 2A of the Study Area which is the area south of the River Liffey.

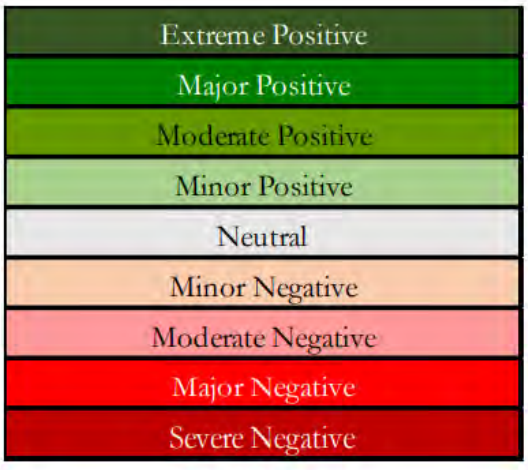
This section consists of a network of narrow urban streets with limited scope for provision of segregated cycle facilities. 7 route options were identified as part of the FOSR for Section 2A as shown in the figure below. There were variants of route 4, which differed on how they cross the Lucan Road. All route options are shown in the figure below.

During design development Route 4 has been developed further and a new sub-route, Route 4-3 has been identified.

As a result of the non-statutory public consultation, the Liffey crossing has been omitted from this scheme and will be progressed as part of a later scheme. Section 2A will now terminate at Lucan Village via Sarsfield Park Road. North of Lucan Road will be delivered as part of a later scheme.

3.2 Project Appraisal Matrix/Multi Criteria Analysis

The qualitative ranking system that was used to assess the new route compared to the previously identified route options uses sub-criteria as detailed in the FOSR, this is shown below.



The above ranking system was used to determine, compare and contrast the relative advantages and disadvantages of each route option in relation to the others, as opposed to against a set of universal or general criteria. Where no relative advantage or disadvantage has been identified between route options for a particular criterion, each have been given a neutral rating. This ranking system is in accordance with the NTA Project Management Guidelines and industry best practice and is also consistent with the 9 point ranking system applied in the FOSR.

For each of the criteria, a qualitative approach was adopted to assign the relative rankings of each. Therefore, judgement was applied in arriving at the rankings assigned.

4 Section 2A

In order to simplify the route selection process Section 2 of the study area was further subdivided into two sub-sections. This chapter outlines the options assessment process for Section 2A of the Study Area which is the area south of the River Liffey.

This section consists of a network of narrow urban streets with limited scope for provision of segregated cycle facilities. 7 route options were identified as part of the FOSR for Section 2A as shown in the figure below. There were four variants of Route 4 of which Route 4-1 was identified as the preferred option in the FOSR. All route options are shown in the figure below.

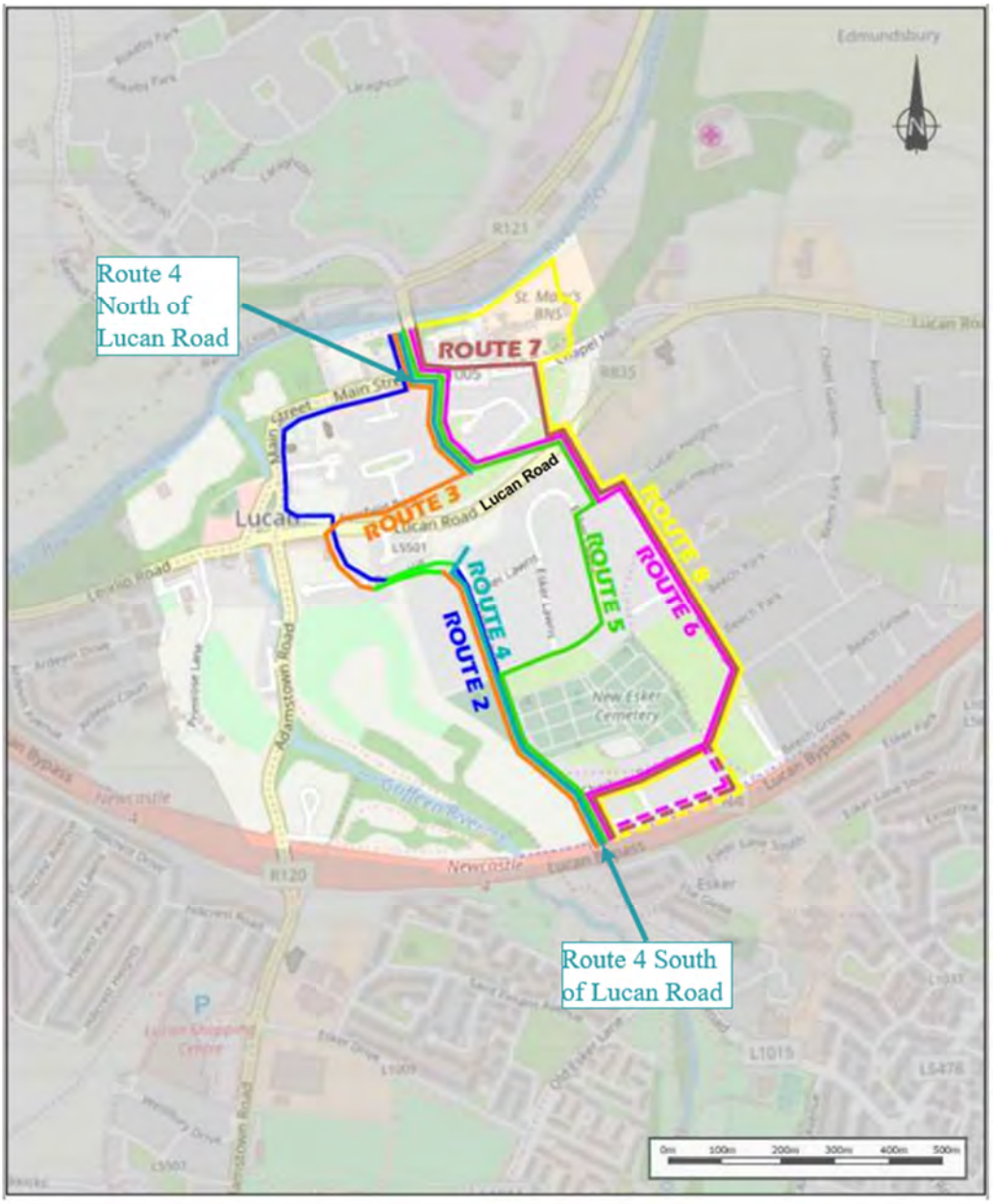


Figure 4.1: Route Options for Section 2A

During preliminary design development Route 4 was developed further and a new sub-route, Route 4-3A has been identified. As noted in the Methodology section of this report, North of Lucan Road will be delivered as part of a later scheme. Section 2A will now terminate at Lucan Village via Sarsfield Park Road.

South of the Lucan Road there is more space available and several design options were prepared with varying levels of segregation provided for cyclists. In total 18 options were developed; these are discussed individually in the FOSR and remain unchanged. Option 4-3A has been considered alongside these options using the same MCA qualitative ranking system and an updated MCA table has been prepared to consider this new option alongside those previously developed.

A summary of the ranking of options for section 2A against the scheme sub-criteria is presented in Section 3.2.

4.1 Route 4

In the FOSR there were two variants of Route 4 depending on the method of crossing the Lucan Road, one crosses at grade using a toucan crossing while the other requires construction of a pedestrian/cyclist bridge passing over the Lucan Road. These options are then divided further depending on if cyclists are sharing road space with general traffic on Esker Lawns and Esker Road or if a shared space for pedestrians and cyclists is provided on the eastern side of the road. This resulted in 4 variants of Route 4.

During preliminary design development a new variation of Route 4 was developed, Route 4-3A. Route 4-3A is detailed in Figure 4.2 below. All 5 variants of Route 4 are detailed in the following sections and compared against all options in an updated MCA table detailed in Section 4.7 of this report.

4.1.1 Route 4 Traffic Count Data

Traffic counts were previously carried for the FOSR and are detailed in Volume 2 Appendix E – Traffic Count Report of the FOSR.

Further traffic counts were carried out over a period of 24 hours for seven days from Monday 7th to Sunday 13th February 2022 in the vicinity of Esker Lawns, Esker Road and Cherbury Park Road at the locations illustrated in Figure 2.3. For the purpose of preliminary design and further assessing Route 4 we considered this latest traffic count data.

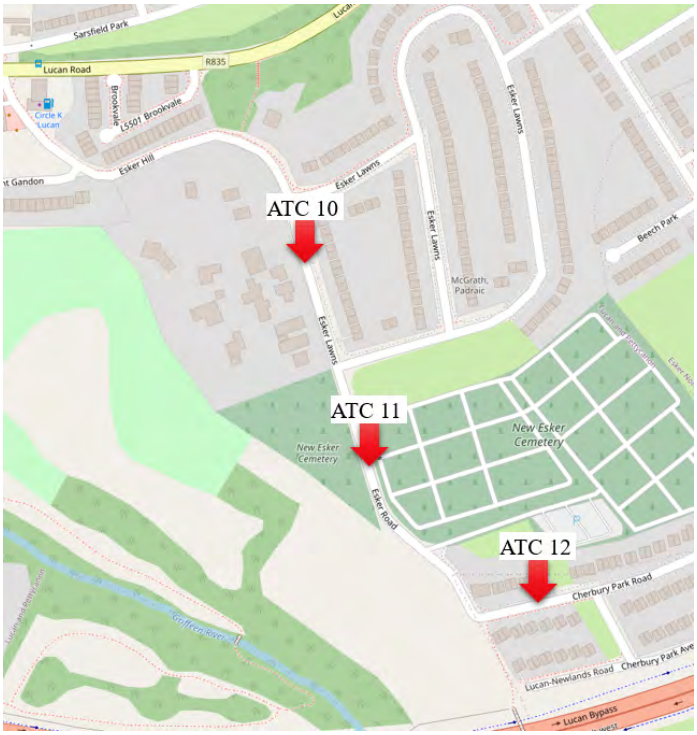


Figure 2.3: ATC Traffic Count Locations

The key take aways from these counts are detailed in Table 2.1.

	ATC 10	**ATC 11**	**ATC 12**
ADDT	957	1027	559
Combined Northbound and Southbound Peak Hourly Volumes for the 7 day average	87	101	47
Combined Northbound and Southbound 7-Day 85th %ile Speed	49.8 kmph	52 kmph	34 kmph
% HGVs	0.6%	0.7%	0.6%

Table 2.1 Traffic Count Data

Reviewing this data against the Guidance Graph from the National Cycle Manual indicates that the AADT for Esker Lawns, Esker Road and Cherbury Park is under the threshold of 2,000 ADDT required for a Shared Street. The peak hourly 7 day average volumes are currently less than one vehicle passing per minute in each direction. There is a low percentage of HGV movements but this should be reduced even further when the construction of the new Esker Cemetery is complete. The 85th percentile data shows however a reduction in speed is required

to create a safe environment for cyclists. This could be achieved by introducing a range traffic calming measures such as:

- Reducing the speed limit from 50 kmph to 30kmph
- Reducing carriageway widths to 3m
- Tightening junction radii
- Constructing raised tables across T-Junctions to create pedestrian priority zones
- Constructing chicanes at strategic locations

A combination of the above would satisfy the requirements of a shared street environment.

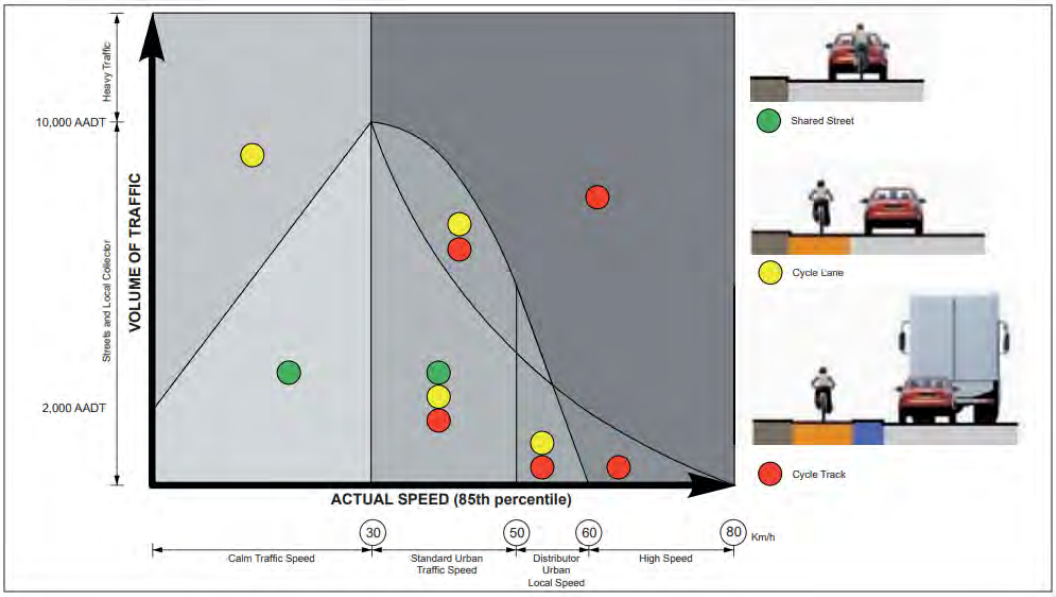


Figure 2.3: Guidance Graph from the National Cycle Manual

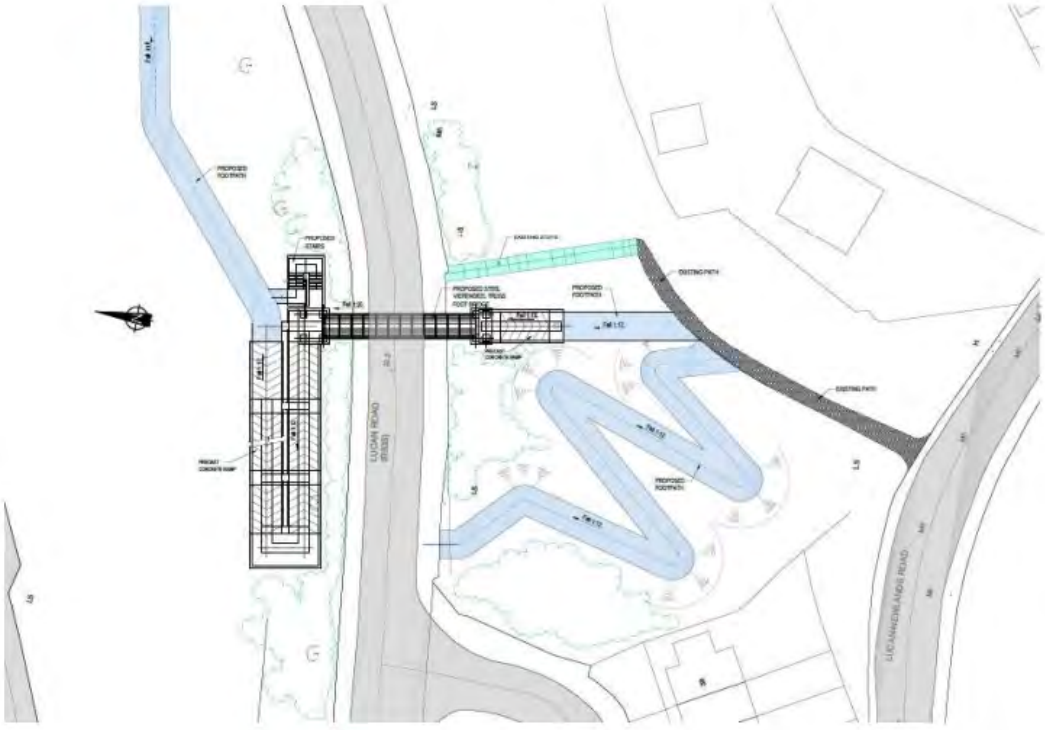


Figure 4.2: Concept Design for Lucan Road Crossing for Routes 4-1 and 4-2

The figure above shows the concept design drawing for Route 4-1 and Route 4-2 for crossing the Lucan Road. The zig-zagged ramp down to road level (shown on the bottom right of the above image) would be used by Route 4-1, while the overbridge option is used on Route 4-2.

4.1.2 Route 4-1A

The southern end of Route 4-1A starts at the existing footbridge over the N4, from here cyclists would travel north along the existing path which would be resurfaced and widened. Cyclists would then travel along the existing Lucan-Newlands Road, these roads are low speed, low volume residential streets and cyclists would share road space with general traffic. The lane widths here will be reduced to 3m each with the remaining space used to provide wider footpaths.

A new toucan crossing would be provided at the top of Brookvale on Lucan-Newlands Road to link to a new pedestrian /cyclist ramp which would be constructed to link Lucan-Newlands to the Lucan Road, this ramp would be constructed using reinforced earth. Several retaining walls and significant clearance of trees would be required to construct this ramp which would zig-zag from the top of Brookvale open space to meet the Lucan Road at grade. It should be noted that this ramp would have a gradient of 1:12 which is not in accordance with the guidance detailed in Table 4.2.

A new toucan crossing would be provided on Lucan Road and a pedestrian/cycle path would be built through the green area to link to Sarsfield Park. Cyclists would then share road space with general traffic on the low volume/low speed roads (within the tolerances set in the National Cycle Manual) of Sarsfield Park.

4.1.3 Route 4-1B

Route 4-1B differs from 4-1A in that cyclists are segregated from general traffic on Esker Road and Esker Lawns. Cyclists and pedestrians in both directions would share space on the eastern side of the road. This would require some realignment of the road and would involve removing the existing verge and street trees along this section. This route would require some land take from gardens adjacent to Esker Hill Park and would not require a toucan crossing on Esker Hill.

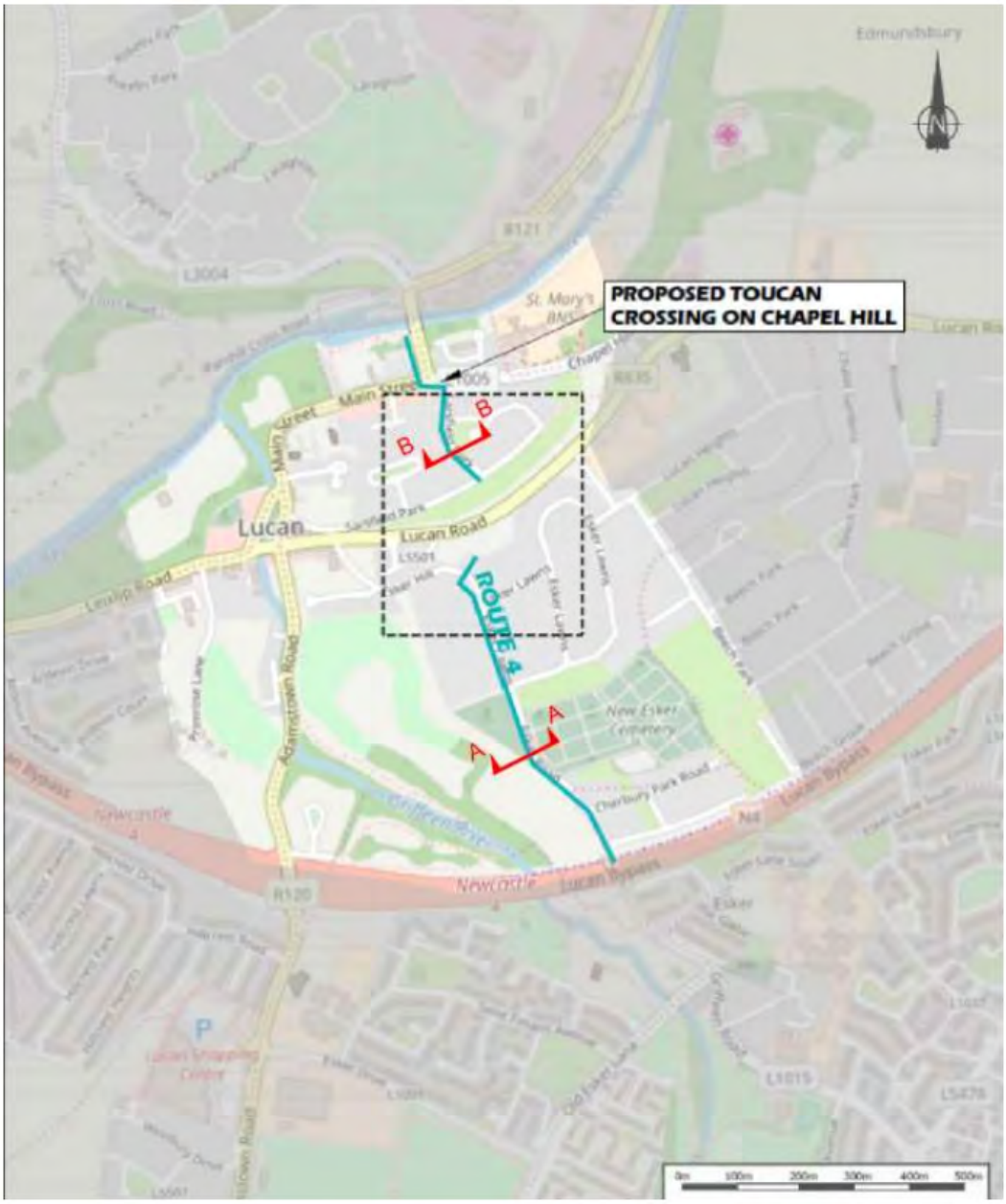


Figure 4.3: Routes 4-1 and 4-2 in the FOSR

4.1.4 Route 4-2A

Route 4-2A is similar to 4-1A except that instead of crossing the Lucan Road at grade, a new pedestrian/cyclist bridge would be constructed which would pass

over the Lucan Road to link Esker Hill to Sarsfield Park, as shown in Figure 4.2 previously.

4.1.5 Route 4-2B

Route 4-2B is the same as 4-1B, except that like 4-2A above, it would cross over the Lucan Road using an overbridge.

4.1.6 Route 4-3A

Route 4-3A is similar to Route 4-1A in that the southern end of Route 4-3A starts at the existing footbridge over the N4, from here cyclists would travel north along the existing path alignment. Cyclists would then travel along the existing Esker Road and Esker Lawns. These roads are low speed, low volume residential streets, per Section 4.2.1. Five treatments were considered for this alignment, and after analysis and discussion with the NTA, a shared street with traffic calming treatments was considered the most appropriate per the available space and character of the area. The proposed traffic calming measures are a combination of raised tables at junctions, reduced corner radii at bell mouths, reduced carriageway widths of 5.5 to 6m where cyclists would share road space with general traffic. Chicanes are also prosed as additional measure in the design of Route 4-3A.

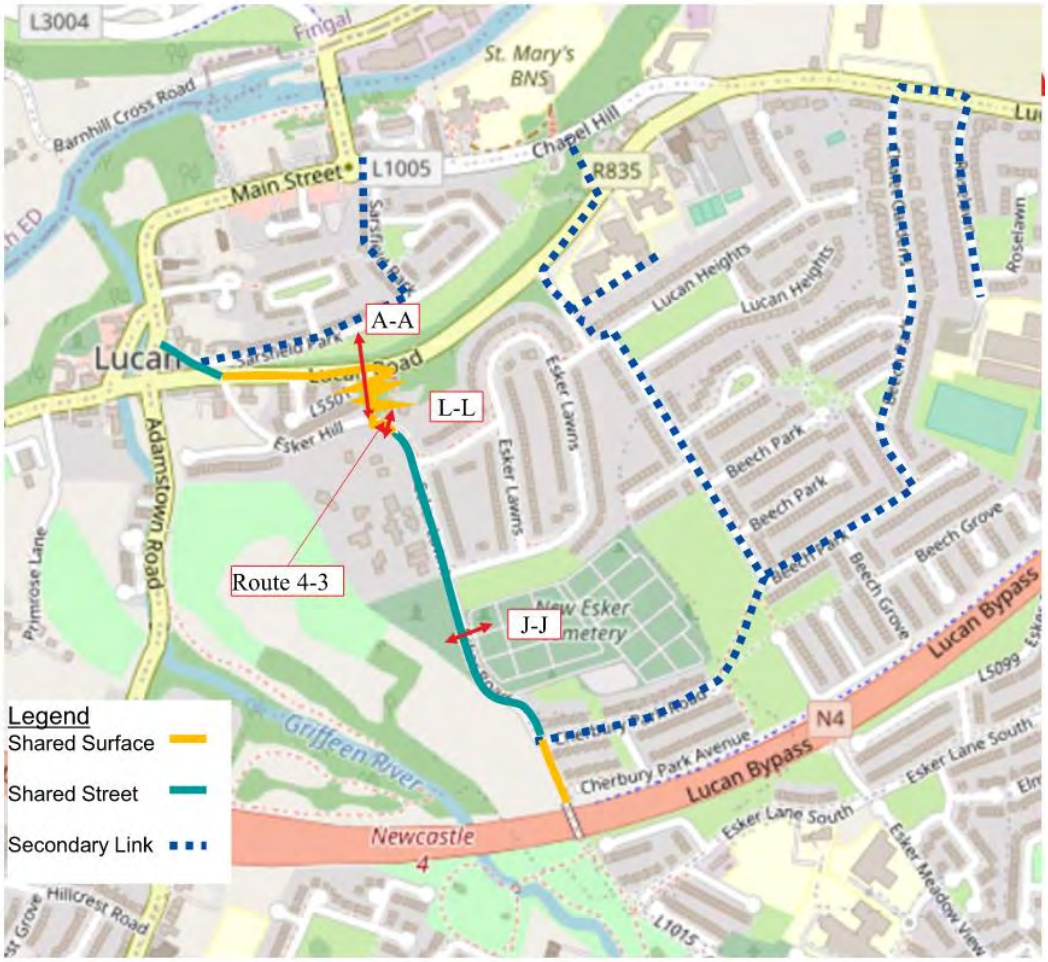


Figure 4.4: Route 4-3A Outline

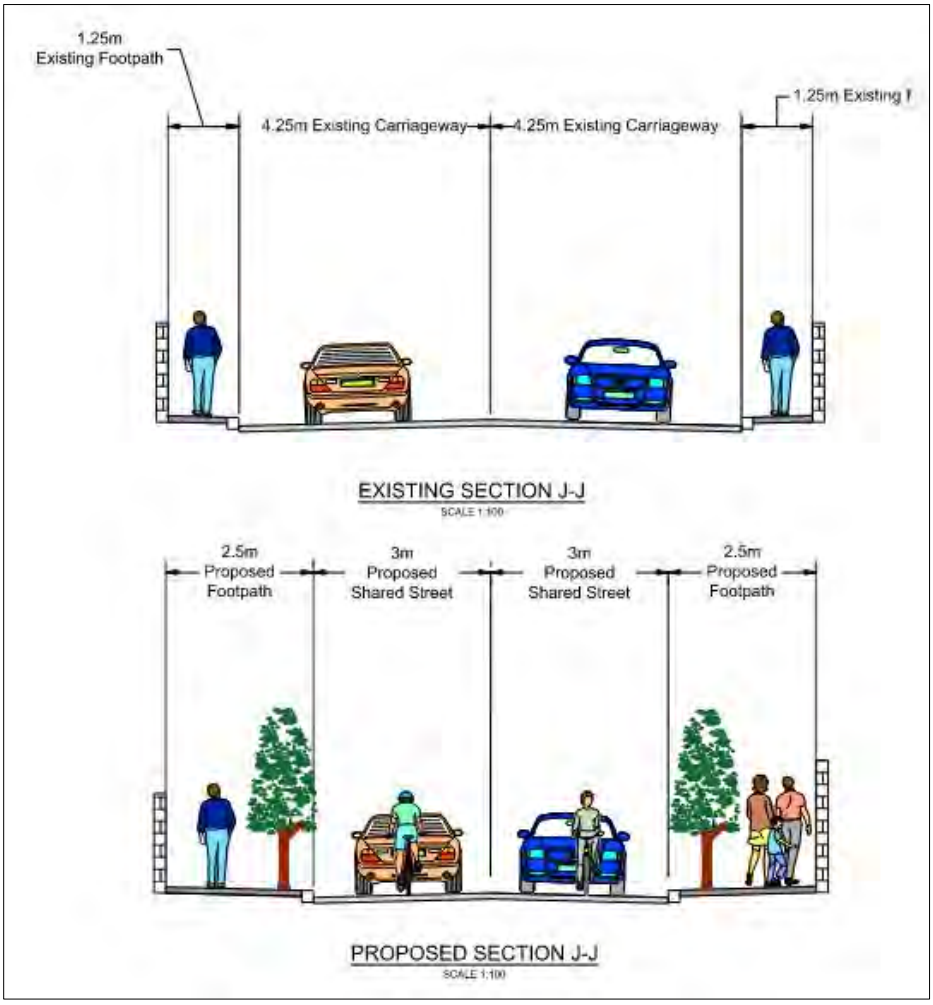


Figure 4.5: Section J-J

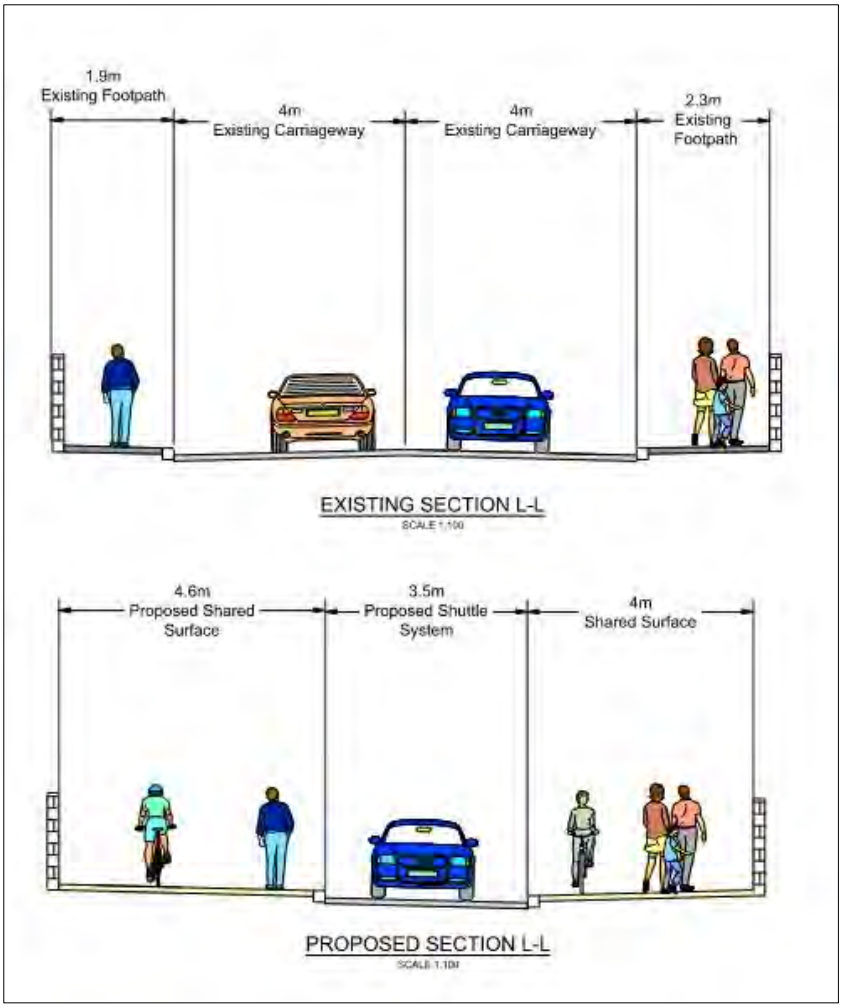


Figure 4.6: Section L-L

The cross section at Esker Hill narrows to a pinch point of 9.5m wide. Refer to Section L-L in Figure 4.6. Route 4-3A differs to 4-1A as following consultation with the NTA it was agreed that the due to the constraints and poor visibility for road users as they approach the entrance to Brookvale open space a new proposal was required. It was agreed that a signalised shuttle system, reducing the carriageway to one 3.5m wide lane with a toucan crossing would be the best solution. This would provide a safe crossing point on Esker Hill to link to a 3m wide shared surface accessible zig-zag route through Brookvale open space linking Esker Hill to Lucan Road at grade.

A new toucan crossing would be provided on Lucan Road and a shared pedestrian/cycle path in the form of a boardwalk would be built through the green area adjacent to Lucan Road to link to the western end of Sarsfield Park. Cyclists would then share road space with general traffic on the low volume/low speed roads (within the tolerances set in the National Cycle Manual) of Sarsfield Park and link into Lucan Village.

During the design development of, Arup carried out a levels study to examine the optimal route to overcome the level difference in Brookvale open space to achieve universal access for all. Route 4-1 of the FOSR details a steep zig-zagged ramp

with a gradient of 1:12. This would not achieve universal access. The following guidance was used in designing the revised shared surface accessible zig-zag route of Route 4-3A.

Table 4.2: Part M and Access for Everyone Universal Access Guidance

Gradient	National Cycle Manual	Part M	Access for Everyone
4% (1:25) or less			Access routes with a gradient of 1 in 25 should have level landings at maximum 19m intervals and routes with a gradient of 1 in 33 should have landings at no more than 25m intervals. The interval of landings for access routes with gradients between 1 in 25 and 1 in 33 can be established by linear interpolation. Access routes with gradients above 1 in 25 should be designed as external ramps. On long routes, level resting places should be provided off the path of travel at intervals of no more than 30 meters.
5% (1:20)	Ramp	Where a gently sloped access route is provided:	External ramp.
	Ramp to have maximum slope of 5%	where the gradient or part of the the gradient is steeper than 1:50 and less steep than 1:20, level landings should be provided at each rise of 500 mm. (Every 10m)	External ramps should have a gradient not exceeding 1 in 20, with a maximum rise of 450mm between landings and a corresponding maximum ramp length of 9000mm.

The gently sloped route through Brookvale open space takes the form of a 3m shared space with gradients of less than 5% or 1:20 and landings every 10m or 500mm rise and level resting places at each turn. A stairs is provided through the centre of route to link up the level landings and provide an alternative route for pedestrians.

Once this optimal route was determined our Landscape Architecture team came up with a new park design that integrates this section of the route into the surrounding area and sets out to achieve the following.

A new local park to serve local people which will provide;

- An entrance to the Canal Loop Greenway.
- An accessible route for cyclists and other wheels.
- Low maintenance and beautiful perennial beds
- A viewing point at the top of the hill (see Figure 4.7 for existing view)
- Boundaries that are protected by a thick native hedgerow and trees
- Stepped access with rest places.

A conceptual design of this park design proposal is illustrated in Figure 4.8.

Figure 4.7: Existing View at the top of Esker Hill/Brookvale Open Space

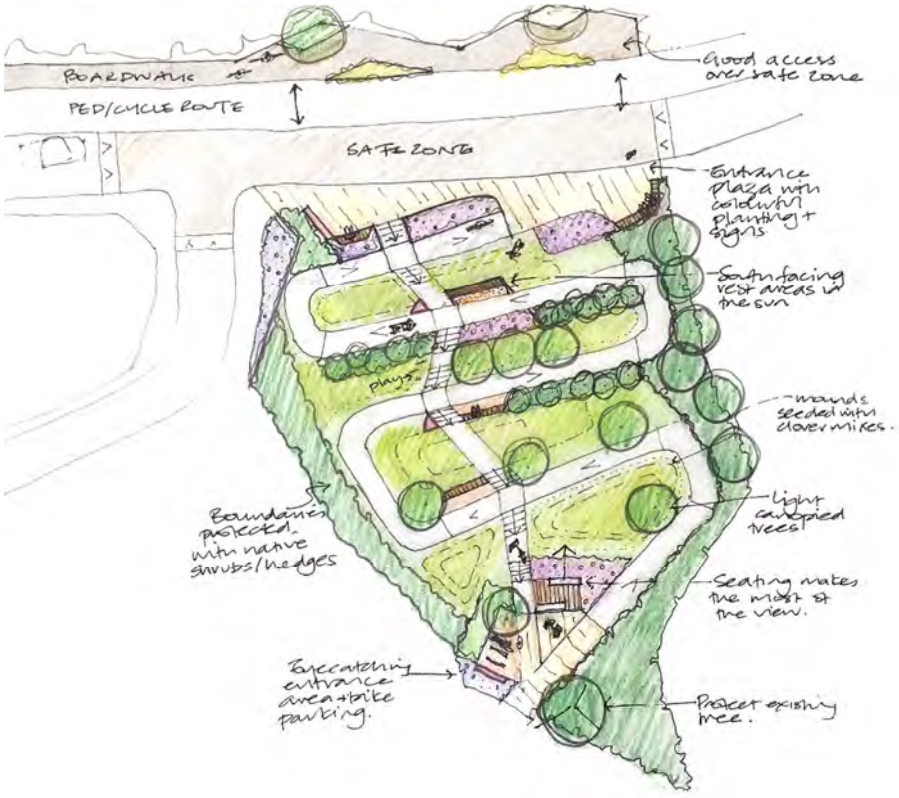


Figure 4.8: Brookvale Open Space Conceptual Design

A raised table and signalised toucan crossing would be provided on Lucan Road to provide a link from the end of the Brookvale gently sloped access to the boardwalk adjacent to Lucan Road, connecting to Sarsfield Park Lane and Lucan Village. A conceptual design for the boardwalk is shown below in Figure 4.8.

Figure 4.8: Route 4-3A Section 3 Brookvale and Boardwalk Conceptual Design

Section A-A, shown in Figure 4.9, details a cross section through the Brookvale and Boardwalk conceptual design.

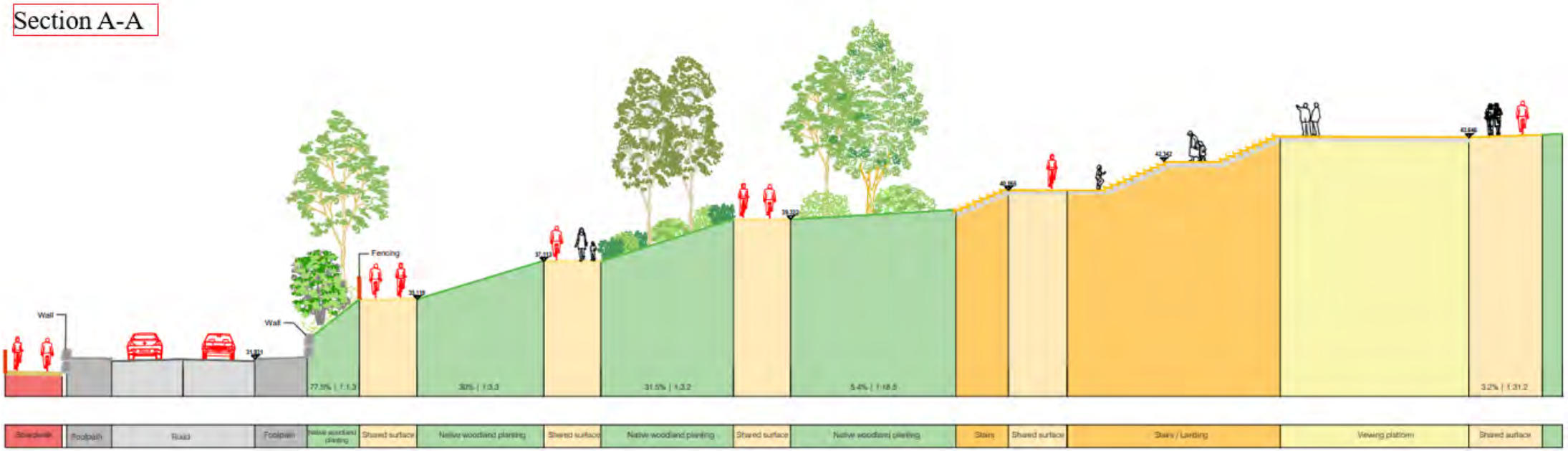
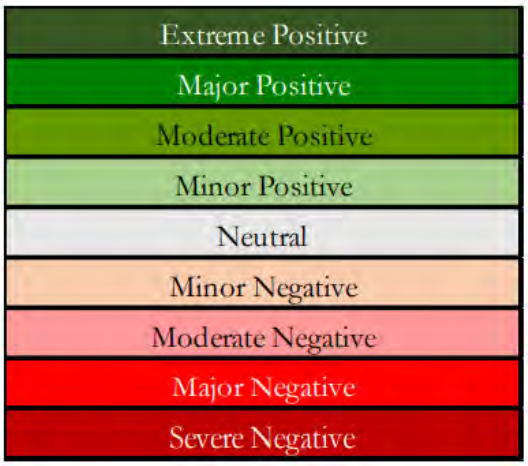


Figure 4.6: Section A-A through Brookvale and Boardwalk Conceptual Design

The secondary links detailed in Figure 4.4 take the form of the preferred Route 6-A from the FOSR. In addition to the primary route, cyclists would travel along Cherbury Park Road, sharing road space with local traffic. They would then use the existing paths through the green area to reach Beech Park. On Beech Park and Lucan Heights cyclists would again share road space with local traffic. These roads are low speed, low volume residential streets and would be traffic calmed to further reduce speeds. The alignment of some junctions on Beech Park/Lucan Heights would be changed so that cyclists would have to make fewer turning movements and would have greater priority. The secondary link through Sarsfield Park provides an alternative link connecting the proposed primary route to Chapel Hill and Main Street.

4.2 Revised MCA

The qualitative ranking system that was used to assess Route 4-3A compared to the previously identified 18 route options for Section 2A uses the same sub-criteria as detailed in the FOSR, this is shown below in Figure 4.7.



The above ranking system was used to determine, compare and contrast the relative advantages and disadvantages of each route option in relation to the others, as opposed to against a set of universal or general criteria. Where no relative advantage or disadvantage has been identified between route options for a particular criterion, each have been given a neutral rating. This ranking system is in accordance with the NTA Project Management Guidelines and industry best practice.

For each of the criteria, a qualitative approach was adopted to assign the relative rankings of each. Therefore, judgement was applied in arriving at the rankings assigned.

A summary of the ranking of options for section 2A against the scheme sub-criteria is presented in Figure 4.7 below.

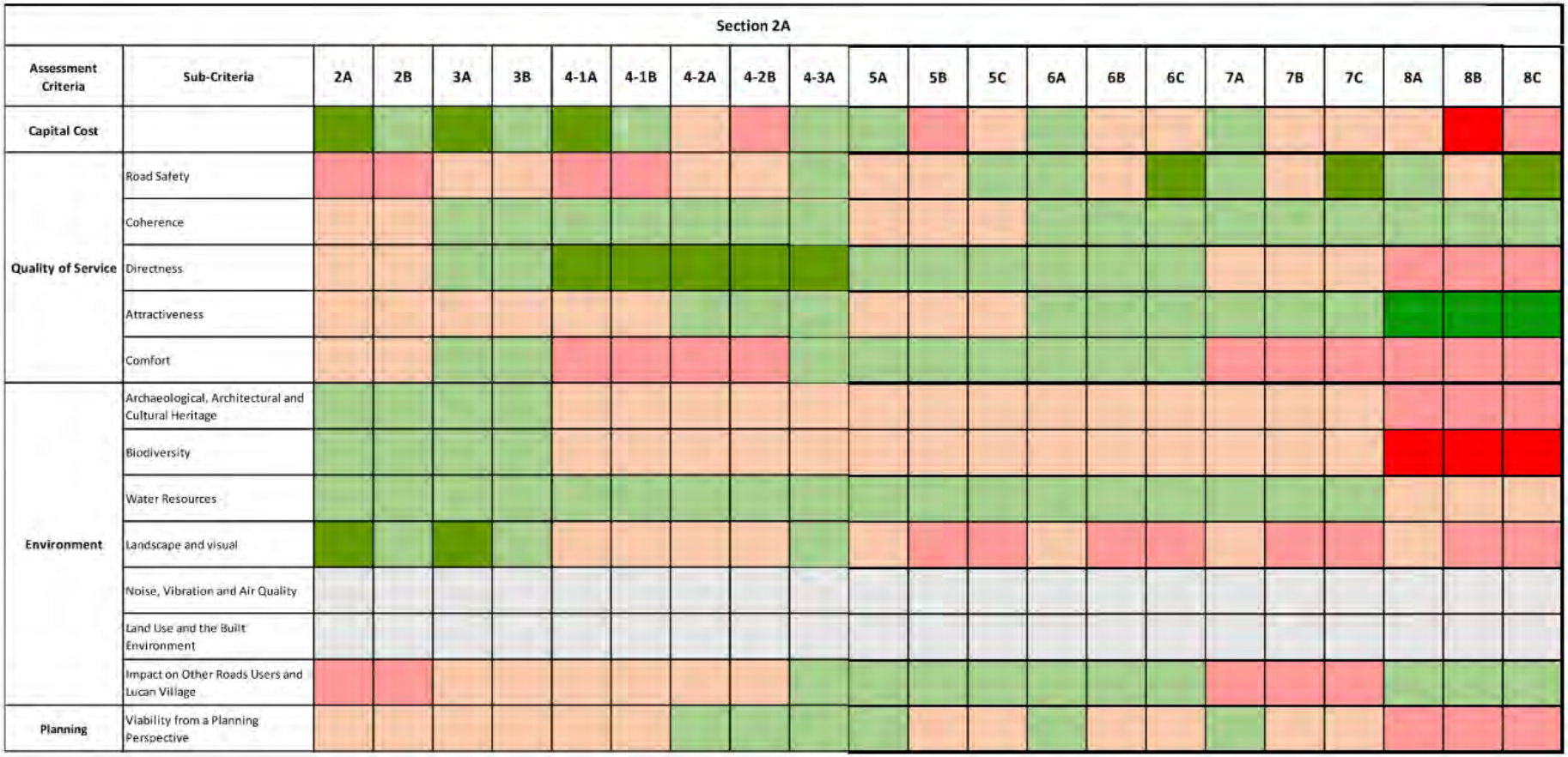


Figure 4.7: Revised MCA

The following paragraphs provide a summary of the options assessment for this section of the study area.

In terms of Road Safety, the main differentiator is the level of segregation provided by each option, routes where cyclists are separated from vehicular traffic score higher. Routes 6, 7 & 8 have the highest level of segregation and so score higher. Route 2 would involve cyclists mixing with general traffic on Lucan Main St and so scores worst. Options A, B & C differ in the type of cycle facilities provided in the housing estates south of the Lucan Road. Options C have segregated cycle tracks on either side of the road and are the preferred option of the three. Options B would have a pedestrian/cyclist shared space on one side of the road. There are several entrances to properties along this section and it was considered that cyclists on Options B would be at a high risk of being struck by cars exiting these properties, as cyclists would approach from a direction that may not be easily anticipated, as a result these options score worst. Options A, would involve cyclists sharing road space with traffic on the low volume, low speed residential roads and score in between the two others.

In terms of Coherence, Route 5 would require slightly more turning movements than other routes and so scores a “Minor Negative”. On Route 2 there would be a somewhat complicated route from Esker Hill to Main St and this route may be confusing for cyclists, and so this also scores a “Minor Negative”. All other routes are considered to be slightly preferable.

For the Directness, Route 4 is preferable as it has the shortest route length and scores a “Moderate Positive”. Routes 3, 5 and 6 are next preferable and score a “Minor Negative”. On Route 2 cyclists may be delayed by queueing traffic on Main St while Route 7 has quite a long route, both of these score a “Minor Negative”. Route 8 has the longest route length and scores a “Moderate Negative”.

In terms of Attractiveness, the routes which are fully segregated from traffic and pass through green areas are considered preferable. Routes 6, 7 & 8 are considered slightly preferable as they are fully segregated on the southern end of the route. Route 8 scores a “Major Positive” as it also passes along the scenic banks of the River Liffey. Route 4-2 scores a “Minor Positive” as there would be likely be scenic views from the cycle bridge passing over the N4. Route 4-3A scored a “Minor Positive” as the proposed link through Brookvale Open Space would create a viewing point at the top and a new amenity space for the local residents. All other routes score a “Minor Negative”.

In terms of Comfort, routes which have steep slopes, zig-zagged inclined cycle ramps or are required to share road space on busy roads or footpaths are considered less favourable. Route 2 would require cyclists to share road space with cars on Lucan Main St and so scores a “Minor Negative” Both versions of Route 4 involve steep zig-zagged inclined ramps and score a “Moderate Negative”. Route 7 involves a zig-zagged ramp and sharing a footpath with pedestrians on Chapel Hill, while Route 8 involves two separate zig-zagged ramps, and so these both also score a “Moderate Negative”. Routes 3, 5 & 6 are considered slightly preferable and score a “Minor Positive”. Route 4-3A scored a

"Minor Positive" as while there is a zig-zag route it has be designed with gentle gradients of less than 1:20 and provides universal access for all.

In terms of Architectural, Archaeological and Cultural Heritage, Routes 2 & 3 would be built entirely over exiting roads and so are the most preferable. Routes 4, 5, 6 & 7 would disturb some greenfield land between Lucan Road and Chapel Hill and so score a "Minor Negative". Route 8 would disturb some ground along the River Liffey and within the Zone of Archaeological Potential for Lucan Village and so scores a "Moderate Negative".

In terms of Biodiversity, Routes 4-8 involve would involve the clearing of some sections of urban woodland to construct ramps/bridges and so a "Minor Negative". Route 8 also involves construction within the ecologically sensitive Liffey Valley pNHA and may involve the removal of some habitat for protected species and so scores a "Major Negative".

In terms of Water Resources Route 8 would involve construction within the flood plain of the Liffey and so scores a "Minor Negative". All other options would have a negligible impact.

In terms of Landscape & Visual, the main factor is the removal of existing street trees. Options A are preferred over B & C as street trees would be retained on the residential roads of Esker Hill, Esker Lawns, Beech Park and Lucan Heights. Options 2 & 3 would involve removing the fewest number of trees and a South Dublin County Council Canal Loop Urban Greenway – Phase 1 Feasibility & Options Selection Report 69 section of linear park would be created on Esker Hill, which would improve the urban realm, and so these score highest. Routes 5, 6, 7 & 8 would all require the removal of more trees than Routes 1 & 2 and score similarly. Replacement planting would be undertaken to mitigate the removal of trees, but this may not necessarily be close to where the original trees were removed from.

In Terms of Noise, Vibration & Air Quality all routes are considered to have negligible impact.

In terms of Impact on Other Road Users and Lucan Village, Routes 4-3A, 5, 6, 7 & 8 would involve signalising the junction at Lucan Heights/Lucan Road, the improvement of pedestrian facilities and would rationalise of the layout at the entrance to St. Mary's Primary School. As a result, these routes are considered slightly preferable under this criterion. Route 7 would involve the removal of parking and cyclists sharing with pedestrians on Chapel Hill and so scores a "Moderate Negative".

In terms of Planning, Route 8 is considered the least preferable due to the impacts on the Liffey Valley pNHA and scores a "Moderate Negative". Routes 2 & 3 would involve closing Esker Hill to through traffic and score a "Minor Negative". Routes 5B, 5C, 6B, 6C, 7B, & 7C would all require a new permeability link from Cherbury Park Avenue to the N4 footbridge, it is possible this would lead to objections from residents and so these routes score a "Minor Negative". Routes 4, 5A, 6A and 7A would have the least impact on vehicular access, on-street parking and trees and score a "Minor Positive" under this criterion.

4.2.1 Conclusion

Based on the assessments above it has been determined that Route 4-3A offers the preferred route option. While Route 4-3A is similar to Route 4-1A it scored higher in the following areas:

- Road Safety – Signalised Shuttle System and additional traffic calming measures introduced
- Coherence – Majority of the route proposed as shared surface
- Attractiveness – more direct link to Lucan Village provided
- Comfort – universal access for all provided
- Landscape and Visual – design of boardwalk revised to be sensitively designed within the existing vegetation and to minimise visibility to Sarsfield Park Residents. Design of link from Esker Hill to Lucan Road incorporates the design of a new local park to serve local people.
- Planning – no land acquisition required

Route 4-3A achieves the scheme objectives of providing high quality cycle infrastructure and has the following benefits when compared to other route options:

- It provides a high level of overall quality of service for both cyclists and pedestrians with universal access throughout.
- It provides a more direct route to Lucan Village while still maintaining a secondary link and upgrades to the junction of Lucan Heights and Lucan Road which has large pedestrian movements due to the nearby schools, and without predetermining the Liffey River/Fingal County Council Connection.
- It would not require the removal of on-street parking on residential roads.
- It would not require restrictions in vehicular movements.
- It would improve the pedestrian facilities and provide universal access for all to Lucan Village via Brookvale Open Space while also providing a public amenity and gateway into the village and the Canal Loop Greenway.

5 Proposed Scheme Update

5.1 Preferred Route Option

The Emerging Preferred Route (EPR) that was published as part of the FOSR remains largely unchanged. The key changes made to the EPR are the incorporation of Route 4-3A in Section 2A of the study area, as described in the previous chapters. Figure 5.1 details a map overlaying the previous EPR and the current Preferred Route Option (PRO).

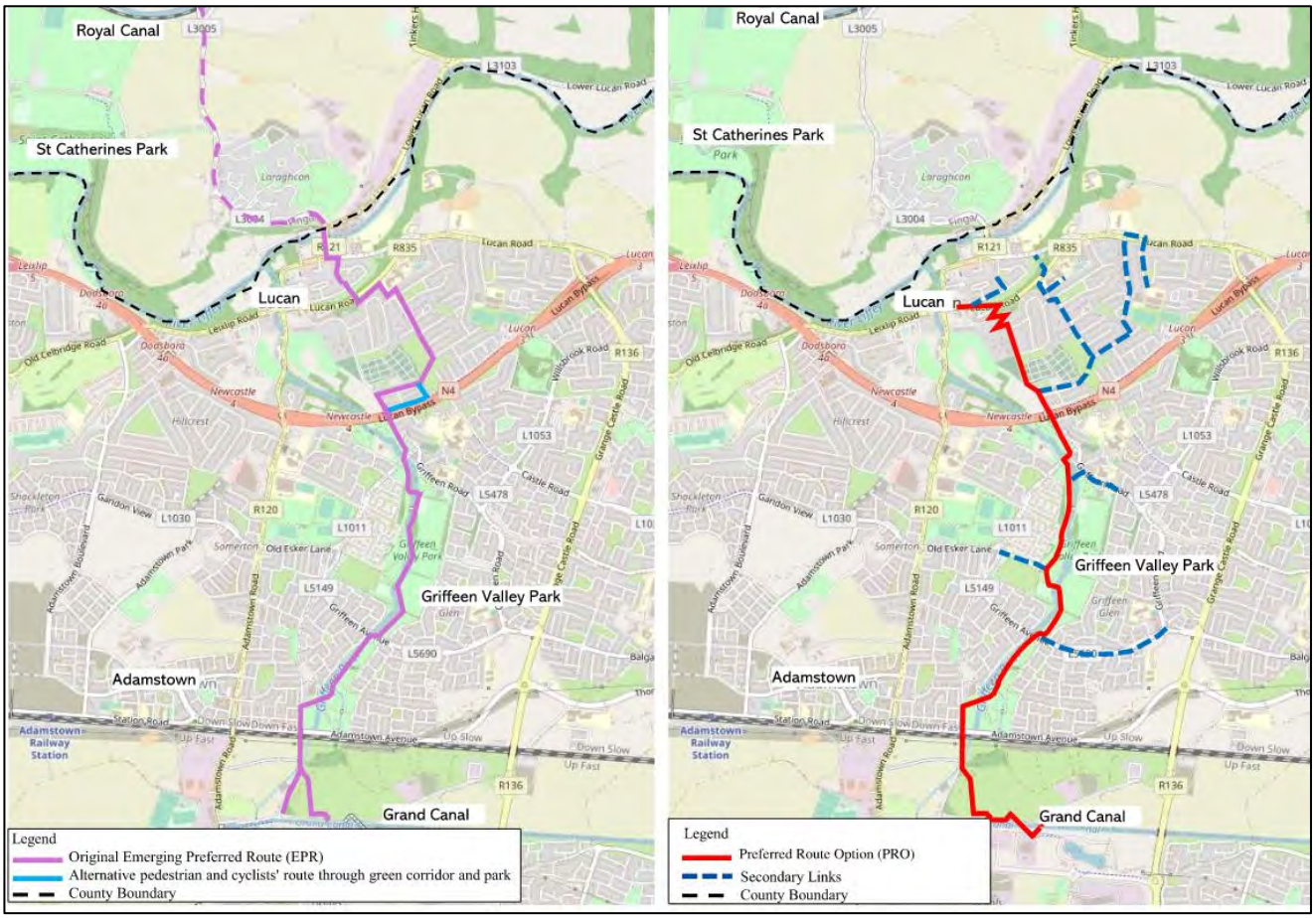


Figure 5.1: Revised Preferred Route Option

5.2 Secondary Links

As part of design development a number of secondary links have been identified to better connect the preferred route option into the surrounding areas. Some of the secondary links will comprise of small interventions such as the removal of kissing gates, installation of way finding signage, junction tightening, road markings and safe school treatments to improve permeability and access onto the primary route.

These secondary links will increase the usability of the main route and regional connectivity through increasing access and destination options while also providing

high quality linkage between residential areas and key trip attractors with a particular focus on connecting schools/colleges as well as other planned and existing cycle and walking routes.

The preferred alignment and inclusions of these routes have been considered in consultation with the destinations (schools or amenity). The preferred alignments are shown in Figure 5.2 below.

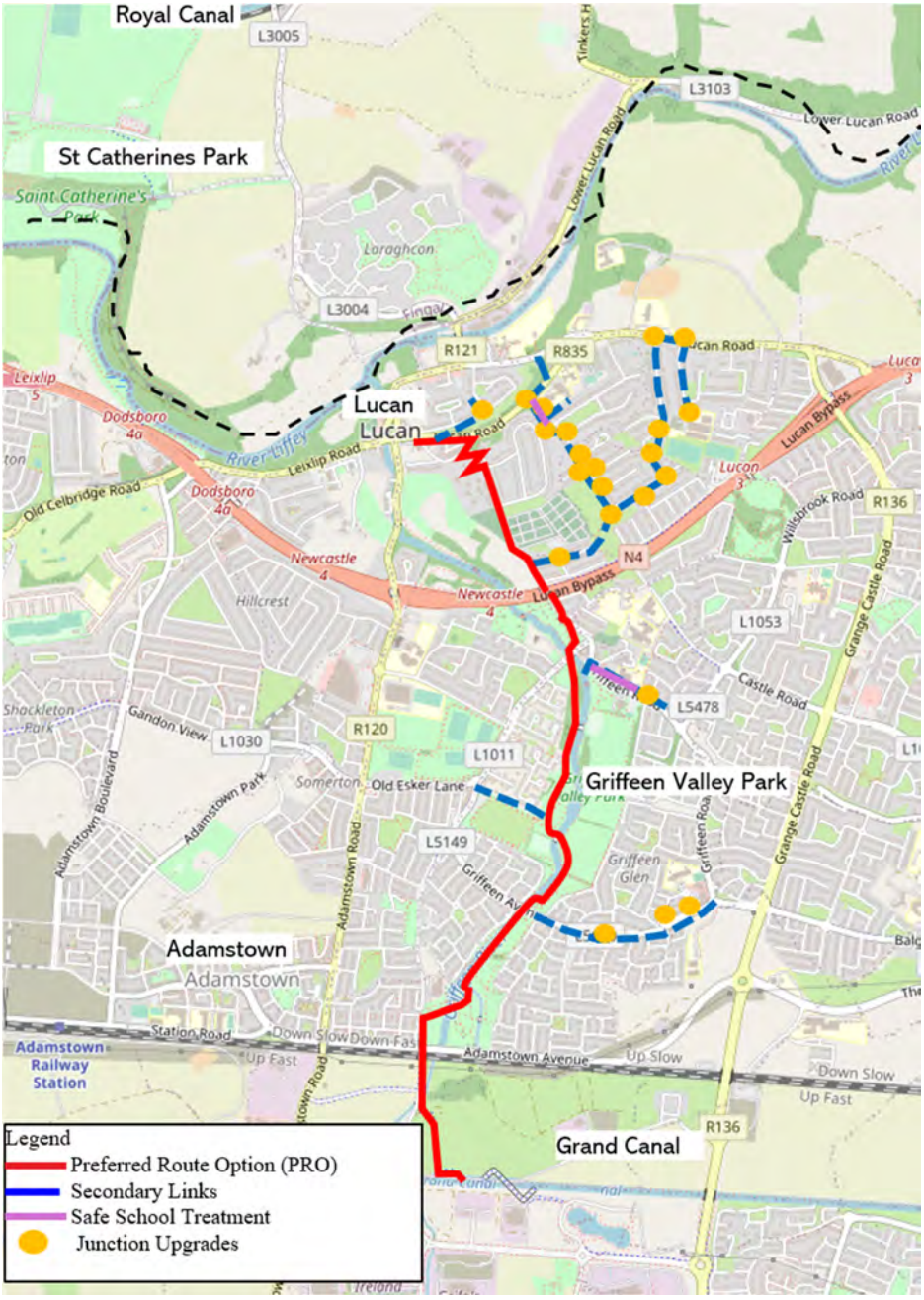


Figure 5.2: Secondary Links

5.3 Cost Estimate

A preliminary cost estimate was previously prepared for the EPR. The estimated scheme infrastructure cost, which includes land acquisition and construction costs, was anticipated to be in the order of € 3.5 – 4.5 m for the 4.2 km route.

Following the preliminary design development and the emergence of Route 4-3 as the new PRO, the cost estimate has been revised.

The estimated scheme infrastructure cost is anticipated to be in the order of €9.5 to 11.3M. It is noted that this revised estimate includes 4.2km primary route, 3.9km secondary links including 29 junction upgrades (including secondary links), 4 bridge replacements, a 690m boardwalk and additional landscape interventions along the route. It also includes 10% for prelims, 5% for Traffic Management, 7.5% for inflation, 20% contingency and 13.5% VAT on construction. The total construction cost before this percentages are included is €6.7M. The rest of the cost increase is part of the previous preferred alignment and should be considered in that context. A detailed cost estimate is included in Appendix A of this report and will also be included in the preliminary design report.

5.4 Next Steps

This report has detailed the design development that has taken place to develop the previously published emerging preferred route for the Canal Loop Greenway. The next project stage (the development of a Preliminary Design) will further refine and update the preferred route. The Preliminary Design will define the final practically achievable scheme, considering more detailed studies of constraints and environmental assessment required at a local level.

Prior to finalisation of the scheme design, additional non-statutory public consultations will be undertaken with stakeholders, with inputs and feedback received incorporated where practical and appropriate to do so.

This Preliminary Design will form the basis of the planning consent process for the scheme, which will be done through the Part 8 process.