



**Lucan to
City Centre Core
Bus Corridor Scheme**
August 2022

**Preferred
Route
Option
Report**

**BUS
CONNECTS**

SUSTAINABLE TRANSPORT FOR A BETTER CITY.

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Glossary of Technical Terms

Bus Gate – A Bus Gate is a sign-posted short length of stand-alone bus lane. This short length of road is restricted exclusively to buses, taxis and cyclists plus emergency vehicles. It facilitates bus priority by removing general through traffic along the overall road where the bus gate is located. General traffic will be directed by signage to divert away to other roads before they arrive at the Bus Gate.

Carbon - The term Carbon is used to refer to carbon emissions or Green House Gas Emissions interchangeably.

Cycle Lane – A cycle lane is a lane on the carriageway that is reserved either exclusively or primarily for cycling and is separated from general traffic or bus lanes by road markings.

Cycle Track – A cycle track is a separate section of the road dedicated for cycling only. This space will generally be isolated from other vehicular traffic by a physical kerb.

Greenway – A greenway is a recreational 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.

Protected Junctions - Refers to junctions, which provide physical kerb buildouts to protect cyclists through the junction. Due to the inherently complex nature of mixed mode movements at junctions, the provision for cyclists at junctions is a critical factor in managing conflict and providing safe junctions for all road users. As such, this is the preferred layout, where practicable, for signalised junctions as part of the CBC Infrastructure Works.

Quiet Street Treatment – Where Core Bus Corridor (CBC) roadway widths cannot facilitate cyclists without significant impact on bus priority, alternative cycle routes are explored for short distances away from the CBC bus route. Such offline options may include directing cyclists along streets with minimal general traffic other than car users who live on the street. They are called Quiet Streets due to the low amount of general traffic and are deemed suitable for cyclists sharing the roadway with the general traffic without the need to construct segregated cycle tracks or painted cycle lanes. The Quiet Street Treatment would involve appropriate advisory signage for both the general road users and cyclists.

Signal Controlled Priority - Signal Control Priority uses traffic signals to enable buses to get priority ahead of other traffic on single lane road sections, but it is only effective for short distances. This typically arises where the bus lane cannot continue due to obstructions on the roadway. An example might be where a road has pinch-points where it narrows due to existing buildings or structures that cannot be demolished to widen the road to make space for a bus lane. It works through the use of traffic signal controls (typically at junctions) where the bus lane and general traffic lane must merge ahead and share the road space for a short distance until the bus lane recommences downstream. The general traffic will be stopped at the signal to allow the bus pass through the narrow section first and when the bus has passed, the general traffic will then be allowed through the lights.

Executive Summary

Introduction

The purpose of this report is to present an overview of the Preferred Route Option (PRO) for the 'Lucan to City Centre Core Bus Corridor' (CBC) as well as describing the options assessed, and changes made to the scheme since the first Non-Statutory Public Consultation in November 2018.

The aim of delivering the Lucan to City Centre CBC is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor.

The objectives are to:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements;
- Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable;
- Support the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets;
- Enable compact growth, regeneration opportunities and more effective use of land in Dublin, for present and future generations, through the provision of safe and efficient sustainable transport networks;
- Improve accessibility to jobs, education and other social and economic opportunities through the provision of improved sustainable connectivity and integration with other public transport services; and
- Ensure that the public realm is carefully considered in the design and development of the transport infrastructure and seek to enhance key urban focal points where appropriate and feasible.

Scheme Overview & Assessment Process

The Lucan to City Centre CBC commences at Junction 3 on the N4. The CBC is routed via the N4 as far as Junction 7 (M50), and via the R148 along the Palmerstown bypass, Chapelizod bypass, Con Colbert Road and St John's Road West as far as Frank Sherwin Bridge, where it will join the prevailing traffic management regime on the South Quays.

Priority for buses is provided along the entire route, consisting of continuous dedicated bus lanes in both directions. At junctions priority is given to buses over general traffic.

Where key changes have been made to the design since the publication of the Emerging Preferred Route (EPR) Option in November 2018, options have been assessed using a Multi-Criteria Assessment (MCA) to determine the Preferred Route Option (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 and further design development. This assessment has also been carried out in the context of more detailed information now available, including topographical survey.

The following list highlights the main scheme changes between the published EPR Option and the PRO:

- A significant improvement in cyclist facilities from the start of the Proposed Scheme on the R136 Ballyowen Road at N4 Junction 3 to the start of the R148 Chapelizod bypass on the east side of Palmerstown village, comprising;

- Provision of a two-way segregated cycle track on the east side of the R136 Ballyowen Road between Hermitage Road and the R835 Lucan Road, including a new shared pedestrian and cyclist bridge on the east side of the R136 Ballyowen Road;
 - Fully flexible carriageway
 - Provision of a two-way segregated cycle track on the northside of the R835 / N4 Lucan Road between Junctions 3 and 2 of the N4, requiring land acquisition from the adjacent landholdings, including the Hermitage Golf Club, Sureweld and Hermitage Medical Clinic;
 - Provision of a two-way segregated cycle track on the southside of the Old Lucan Road between the N4 Junction 2 and the existing pedestrian and cyclist bridge over the M50;
 - Provision of a two-way segregated cycle track on the northside of the Old Lucan Road in Palmerstown from the existing pedestrian and cyclist bridge over the M50 to the start of the Chapelizod bypass.
- Relocation of the existing bus stops at Liffey Valley Shopping Centre some 200m further west and a new pedestrian bridge over the N4 that links with the proposed bus interchange within Liffey Valley Shopping Centre;
 - Introduction of a westbound, bus only, right turn lane at The Oval junction to facilitate buses turning into Palmerstown village;
 - The new bus stops on the R148 Chapelizod bypass at Chapelizod Hill Road are provided with laybys and are accessed by steps and ramps both in-bound and out-bound. The steps and ramps to the new in-bound bus stop on the Chapelizod bypass have been moved to the south side of Chapelizod Hill Road;
 - At the junction of the R148 Con Colbert Road with Memorial Road, while the junction has been designed to tie-in to the existing one-way layout of Memorial Road, consideration has been given to the tie-in with the proposals contained in the Liffey Valley to City Centre CBC, which proposes making Memorial Road two-way. To facilitate this a new eastbound right-turning lane on the R148 Con Colbert Road could be accommodated within the proposed junction layout.
 - The introduction of a northbound right turn lane at the R111 South Circular Road junction to allow vehicles to turn right from the R111 South Circular Road to R148 St John's Road West;
 - Removal and replacement of additional trees along St John's Road West so that facilities for both taxis and bicycles can be provided on the approach to the train station;
 - The provisions of a new outbound bus layby on St John's Road West opposite Heuston Station, requiring land acquisition from the lawned area in front of Dr Steevens' Hospital;
 - The layout of all bus stops along the route have been enhanced to the latest design guidance;
 - Some bus stop locations have been optimised to allow better connectivity for bus passengers; and
 - Pedestrian and cycle facilities at all junctions have been updated to reflect the latest design guidance with a view to providing improved cycle provision and safety.

The Preferred Route drawings are presented in Appendix A of this report.

The Public Consultation Submission documents are presented in Appendix B and Appendix C of this report.

1. Introduction and Background

1.1 Introduction

This report presents the Preferred Route Option (PRO) for the Lucan to City Centre Core Bus Corridor (CBC) Scheme (hereinafter called the Proposed Scheme).

The Proposed Scheme has an overall length of approximately 9.6km and commences at Junction 3 on the N4. It is routed via the N4 as far as Junction 7 (M50), and via the R148 along the Palmerstown bypass, Chapelizod bypass, Con Colbert Road and St John's Road West as far as Frank Sherwin Bridge, where it will join the prevailing traffic management regime on the South Quays.

The Proposed Scheme will significantly enhance travel by public transport by providing continuous bus priority as well as improved pedestrian and cycling infrastructure on the N4 and R148 to / from the City Centre. Currently this key access corridor is characterised by traffic congestion and discontinuous inadequate bus and cycling infrastructure, meaning that for most of the journey, buses and cyclists are competing for space with the general traffic, impacting on the attractiveness of these sustainable modes. The objectives of the Proposed Scheme include provision of necessary bus, cycle, and walking infrastructure enhancements that will facilitate modal shift from car dependency contributing to an efficient, low carbon and climate resilient City. Refer to Figure 1-1.

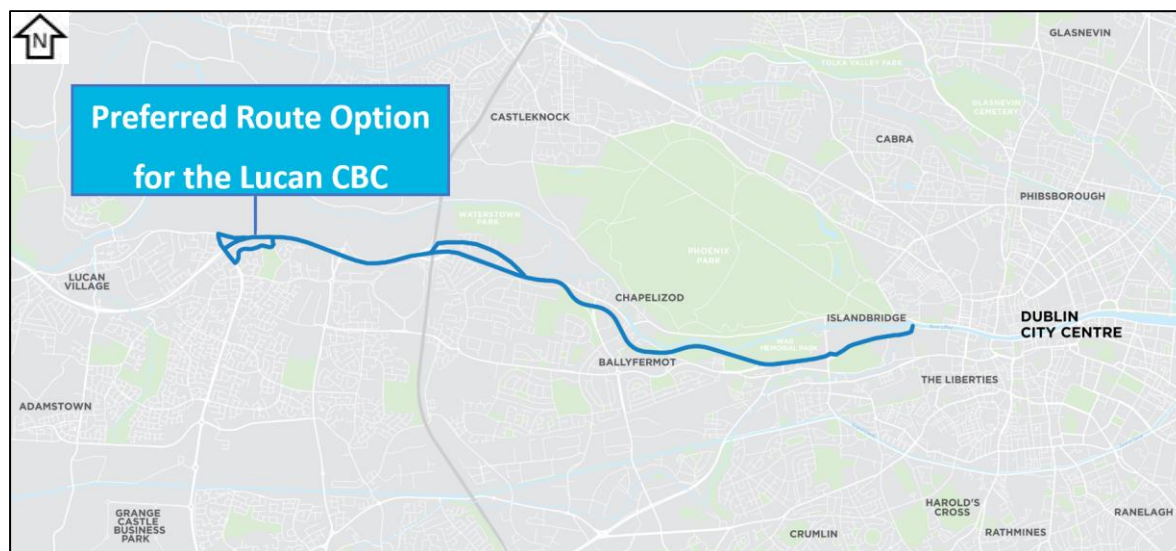


Figure 1-1 Lucan to City Centre Core Bus Corridor Scheme

1.2 The Core Bus Corridor Infrastructure Works

The Proposed Scheme is one of twelve stand-alone core bus corridor schemes to be delivered under the BusConnects Dublin - Core Bus Corridors Infrastructure Works (hereinafter called the CBC Infrastructure Works). The CBC Infrastructure Works, once completed, will deliver the radial core corridors identified in the Transport Strategy for the Greater Dublin Area 2016-2035 (hereinafter called the GDA Transport Strategy) Core Bus Network which is discussed below.

The BusConnects Dublin Programme is the National Transport Authority's (NTA) programme to greatly improve bus services in the Greater Dublin Area (GDA) and the CBC Infrastructure Works is one element of that Programme, itself containing twelve stand-alone CBC schemes. It is a key part of the Government's policies to improve public transport and address climate change in Dublin and other cities.

The NTA established a dedicated BusConnects Infrastructure team to advance the planning and construction of the CBC Infrastructure Works. It comprises an inhouse team including technical and communications resources and external service providers procured from time-to-time to assist the internal team in the planning and design of the 12 Proposed Schemes.

The CBC Infrastructure Works will deliver a major component of the overall Core Bus Network as identified in the GDA Transport Strategy, encompassing the delivery of approximately 230km of dedicated bus lanes and 200kms of cycle tracks along 12 stand-alone Core Bus Corridors Schemes.

The 12 stand-alone Core Bus Corridor Schemes to be delivered under the CBC Infrastructure Works are (see Figure 1-2):

- The Clongriffin to City Centre Core Bus Corridor Scheme;
- The Swords to City Centre Core Bus Corridor Scheme;
- The Ballymun / Finglas to City Centre Core Bus Corridor Scheme;
- The Blanchardstown to City Centre Core Bus Corridor Scheme;
- **The Lucan to City Centre Core Bus Corridor Scheme;**
- The Liffey Valley to City Centre Core Bus Corridor Scheme;
- The Tallaght / Clondalkin to City Centre Core Bus Corridor Scheme;
- The Kimmage to City Centre Core Bus Corridor Scheme;
- The Templeogue / Rathfarnham to City Centre Core Bus Corridor Scheme;
- The Bray to City Centre Core Bus Corridor Scheme;
- The Belfield / Blackrock to City Centre Core Bus Corridor Scheme; and
- The Ringsend to City Centre Core Bus Corridor Scheme.

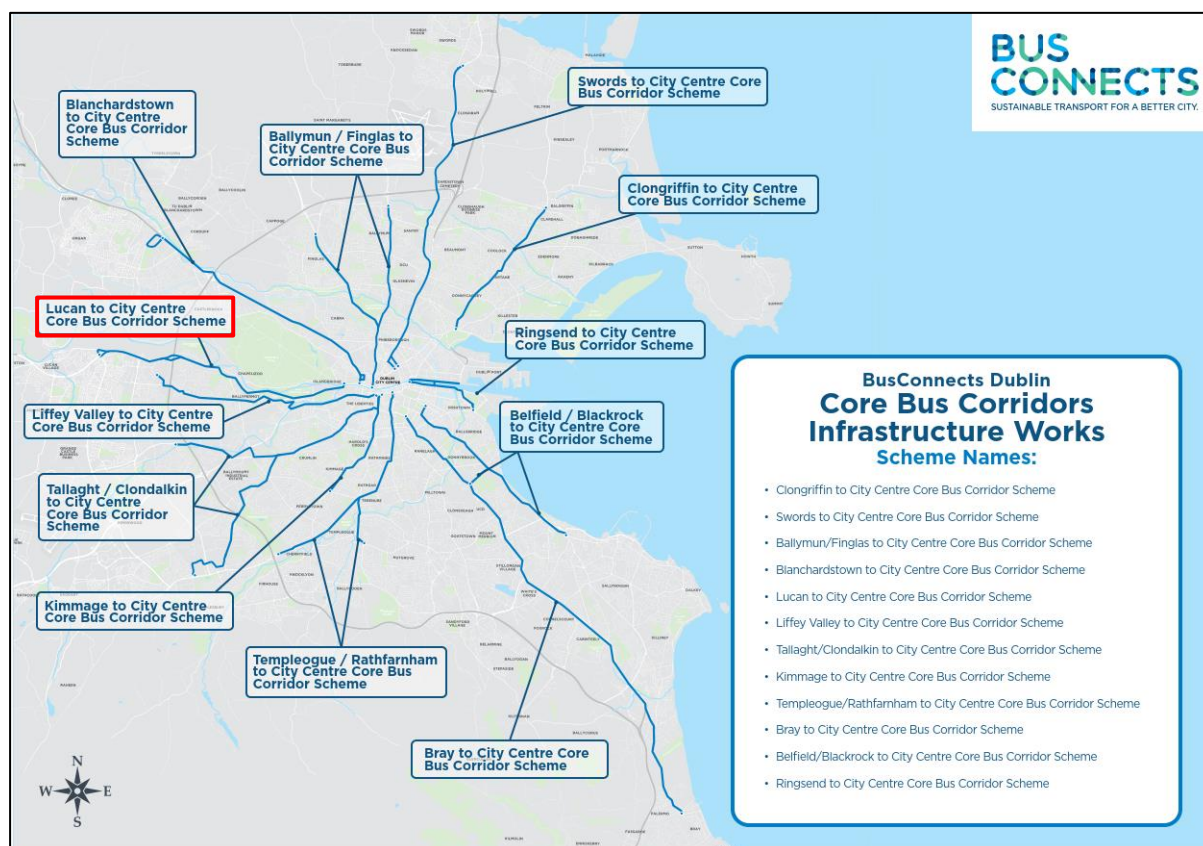


Figure 1-2 Core Bus Corridor Infrastructure Works

1.3 Approach for this Report

In June 2018, the NTA published the 'Core Bus Corridors Project Report'. The report was a discussion document outlining proposals for the delivery of a CBC network across Dublin. The 'Lucan to City Centre CBC' is identified in this document as forming part of the radial Core Bus Network.

As part of this process, the 'Lucan to City Centre Core Bus Corridor Options Study Feasibility Report' was published, which identified feasible options along the corridor, assessed these options and arrived at an Emerging Preferred Route (EPR) Option for the CBC. Submissions were invited from the public to provide comment on the EPR Option proposals and to inform subsequent design stages.

This 'Preferred Route Option Report' has been prepared for the Proposed Scheme, which will build on the assessment carried out in the 'Lucan to City Centre Core Bus Corridor Options Study Feasibility Report'. This Feasibility Report referenced above, along with their associated appendices as published, are included in Appendix F of this report.

The Study Area Analysis and Multi-Criteria Analysis (MCA) for the previously proposed feasible route options is considered still to be valid unless otherwise detailed and updated in this PRO Report. Any additional design work or optioneering has been assessed against the previously identified EPR Option and draft PRO in order to determine the PRO. Additional design development has been detailed in this report, and the resulting PRO referenced in this report has been based on:

- Updated topographical survey information;
- Output from public engagement and consultation activities on the EPR Option and Draft PRO proposals;
- Clarifications to the previous assessment in the 'Lucan to City Centre Core Bus Corridor Options Study Feasibility Report';
- Further design development and options assessment; and
- Change in the extent of the scheme.

1.4 Report Structure

This report is structured as follows:

- [Chapter 2: Planning and Policy Context](#) – This chapter outlines the general background information to the CBC Infrastructure Works. It also outlines the policy context in which the CBC was developed and presents the concept of the CBC network as outlined in the GDA Transport Strategy and the CBC Infrastructure Works.
- [Chapter 3: Background and Public Consultation](#) – This chapter outlines the summary of the Non-Statutory Public Consultation process.
- [Chapter 4: Study Area](#) – In this chapter, the study area for the CBC is detailed. The integration of the Proposed Scheme with existing and planned transport networks is considered, along with considerations of the Proposed Scheme for other road users.
- [Chapter 5: Review of Lucan to City Centre Core Bus Corridor Options Study - Feasibility Report](#) - This chapter is a summary of the options assessment that was previously carried out in each section of the 'Lucan to City Centre Core Bus Corridor Options Study Feasibility Report'. An assessment has been made on the validity of the previous options assessment in the context of additional information collected, including through more detailed survey work undertaken and feedback from the public consultation process. Issues arising and key changes resulting from the design development are detailed.
- [Chapter 6: Options Assessment](#) – This chapter subsequently updates the previous options assessment work undertaken in light of the additional considerations set out in Chapter 5.
- [Chapter 7: Preferred Route Option](#) – This chapter gives the overall conclusions of the options assessment process and describes the PRO proposal.

2. Planning and Policy Context

2.1 Transport Strategy for the Greater Dublin Area, 2016-2035

2.1.1 Introduction

The 'GDA Transport Strategy', which was published by the NTA in 2016, provides a statutory planning basis and framework for the planning and delivery of transport infrastructure and services in the Greater Dublin Area (GDA).

The GDA Transport Strategy has been prepared in accordance with Section 12 of the Dublin Transport Authority Act, 2008 (as amended) and was approved in 2016 by the then Minister for Transport, Tourism and Sport (now the Department of Transport). The GDA Transport Strategy, along with supporting Government investment programmes, is an essential component for the orderly development of the GDA over the next 20 years. The purpose of the GDA Transport Strategy is stated as being "to contribute to the economic, social and cultural progress of the Greater Dublin Area by providing for the efficient, effective and sustainable movement of people and goods".

2.1.2 The Core Bus Network as identified in the GDA Transport Strategy

The delivery of an efficient reliable bus service is an essential component of the GDA Transport Strategy as it will provide a viable and readily accessible alternative to private general traffic that is causing congestion problems in the GDA. As Dublin is a low-density city there are few areas with the size and concentration of population for rail based public transport. This means that for most corridors in Dublin, bus travel represents the optimum form of public transport. Dublin City Bus Services carried 153 million passengers in 2019. In percentage terms, the bus system accounts for over 65% of public transport passenger journeys in the GDA; the Luas carries 20%, and DART and commuter rail services deliver the remaining 15%.

In terms of geographical reach and coverage, bus operations extend across every corridor in the Dublin region. Luas operates two fixed lines - Red and Green and heavy rail operates four railway services – Kildare, Maynooth, Northern and South-eastern lines. While the GDA Transport Strategy identified key rail-based enhancements it is underpinned by the bus-based city-wide public transport system. The GDA Transport Strategy identified a "Core Bus Network", representing the most important bus routes within the GDA, generally characterised by high passenger volumes, frequent services and significant trip attractors along the routes. The Core Bus Network forms part of an overall integrated transport system planned for the GDA. In developing the GDA Transport Strategy, alternatives were considered by the NTA at both a corridor and overall network level.

The identified core bus network comprised radial bus corridors, orbital bus corridors and regional bus corridors. These corridors are generally characterised by discontinuity, whereby the corridors currently have dedicated bus lanes along only less than one third of their lengths which means that for most of the journey, buses and cyclists are competing for space with general traffic and are negatively affected by the increasing levels of congestion. This results in delayed buses and unreliable journey times for passengers.

The GDA Transport Strategy states that it is intended to provide continuous bus priority, as far as is practicable, along the core bus routes, with the objective of supporting a more efficient and reliable bus service with lower journey times, increasing the attractiveness of public transport in these areas and facilitating a shift to more sustainable modes of transport.

In Section 5.5.4 of the GDA Transport Strategy it states that "A number of the Core Radial Bus Corridors are proposed to be developed as Bus Rapid Transit routes, where the passenger numbers forecast on the routes are approaching the limits of conventional bus route capacity."

As design and planning work was progressed by the BusConnects Infrastructure team, it became clear that the level of differentiation between the Bus Rapid Transit corridors and the CBCs would, ultimately, be limited, and that all of the radial CBCs should be developed to provide a similarly high level of priority service provision, (i.e. to provide consistency in terms of bus priority and infrastructure to support the bus services).

2.2 Greater Dublin Area Cycle Network Plan

The 'Greater Dublin Area Cycle Network Plan' (hereinafter called the 'GDA Cycle Network Plan') was adopted by the NTA in early 2014 following a period of consultation with the public and various stakeholders. This plan forms the strategy for the implementation of a high quality, integrated cycle network for the GDA.

There are two primary (Routes 6, S05) and three secondary (Routes S04, S06, NO5) cycle routes identified along the Proposed Scheme. The route also interchanges with the Liffey Greenway and the River Camac Greenway. During the course of the analysis carried out to identify the preferred route option, the provision of these cycle routes was considered at all stages.

Therefore, as part of the options assessment process, any upgrading of infrastructure to provide bus priority also needs to consider and provide for the required cycling infrastructure, where practicable, to the appropriate level and quality of service (as defined by the NTA National Cycle Manual) required for primary and secondary cycle routes.

2.3 Development Plans, Local Area Plans and Strategic Development Zones

2.3.1 South Dublin County Council Development Plan (2016-2022)

The South Dublin County Council (SDCC) Development Plan includes transport and mobility policies and objectives to promote the sustainable development of the County by supporting and guiding national agencies in delivering major improvements to the public transport network and to ensure existing and planned public transport services provide an attractive and convenient alternative to the car.

The Development Plan recognises that one of the major challenges facing the County during the life of this Plan is the need to promote and provide for sustainable transport options, whilst maintaining the effectiveness of the County's road network.

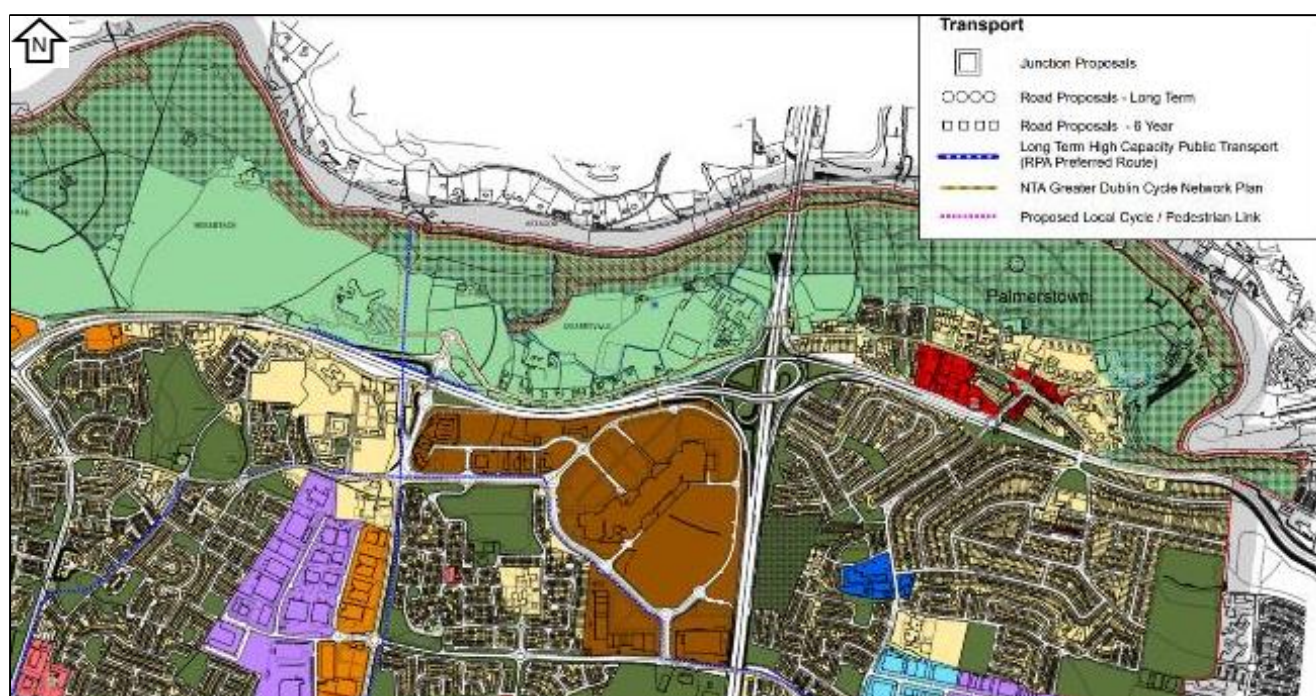
In terms of transport infrastructure, the Policies and Objectives shown in Table 2-1 and Table 2-2 are extracts from the County Development Plan which support the Proposed Scheme. Figure 2-1 shows an extract of Map 2 of the Plan.

Table 2-1 SDCC Development Plan Overarching Objectives aligned with the Proposed Scheme

Transport and Mobility Policy 1 Overarching	
TM1 Objective 1:	<i>To support and guide national agencies in delivering major improvements to the transport network.</i>
TM1 Objective 2:	<i>To spatially arrange activities around, and improve access to, existing and planned public transport infrastructure and services.</i>
TM1 Objective 3:	<i>To focus on improvements to the local road and street network that will better utilise existing road space and encourage a transition towards more sustainable modes of transport, while also ensuring sufficient road capacity exists for the residual proportion of the trips which will continue to be taken by private vehicle.</i>
TM1 Objective 5:	<i>To balance the needs of road users and the local community with the need to support the development of a sustainable transportation network.</i>
TM1 Objective 6:	<i>To support the delivery of sufficient public transport and road capacity to facilitate sustainable new development in the County.</i>

Table 2-2 SDCC Development Plan Objectives for Public Transport aligned with the Proposed Scheme

<i>Transport and Mobility Policy 2 Public Transport</i>	
TM2 Objective 1:	<i>To secure the implementation of major public transport projects as identified within the relevant public transport strategies and plans for the Greater Dublin Area.</i>
TM2 Objective 2:	<i>To establish future public transport routes that will support the County's medium to long term development, in particular orbital routes</i>
TM2 Objective 3:	<i>To generate additional demand for public transport services through integrated land use planning and maximising access to existing and planned public transport services throughout the network</i>
TM2 Objective 4:	<i>To create an interlinked network that maximises the efficiency of existing services, reduces overall journey times and facilitates easy exchanges between modes and/or routes</i>

**Figure 2-1 SDCC Development Plan – Extract of Map 2**

These objectives result in SDCC identifying a number of actions and the two most relevant to the Proposed Scheme are outlined below:

- *Work with the NTA to secure the extension and expansion of the Core Bus Network and other bus services to serve new areas of employment, housing and tourism potential, whilst also improving the efficiency and frequency of services within more established areas.*
- *Identify opportunities for multi-modal interchange and transport hubs at key locations (such as Centres, cross cutting infrastructure) to increase the efficiency and flow of public transport services.*

The Development Plan also outlines the policy of SDCC to encourage walking and cycling. It recognises that there are opportunities to make walking and cycling more attractive and in order to encourage these active modes for travel it identifies that it is necessary to focus on the delivery of:

- *A permeable pedestrian and cycling network that allows for multiple direct connections between key destinations; and*
- *An attractive pedestrian and cycling environment where high quality facilities are provided.*

Table 2-3 below identifies the relevant Plan Objectives.

Table 2-3 SDCC Development Plan Objectives for walking and cycling aligned with the Proposed Scheme

<i>Transport and Mobility Policy 3 Walking and Cycling</i>	
<i>TM3 Objective 1:</i>	<i>To create a comprehensive and legible County-wide network of cycling and walking routes that link communities to key destinations, amenities and leisure activities with reference to the policies and objectives contained in Chapter 9 (Heritage, Conservation and Landscape) particularly those that relate to Public Rights of Way and Permissive Access Routes</i>
<i>TM3 Objective 2:</i>	<i>To ensure that connectivity for pedestrians and cyclists is maximised in new communities and improved within existing areas in order to maximise access to local shops, schools, public transport services and other amenities, while seeking to minimise opportunities for anti-social behaviour and respecting the wishes of local communities.</i>
<i>TM3 Objective 3:</i>	<i>To ensure that all streets and street networks are designed to prioritise the movement of pedestrians and cyclists within a safe and comfortable environment for a wide range of ages, abilities and journey types.</i>

These objectives result in SDCC identifying a number of actions and the three most relevant to the Proposed Scheme are outlined below:

- *Work with the NTA to assist and secure funding for the ongoing implementation of the County Strategic Cycle Network;*
- *Reduce walking and cycling distances to areas of employment, community services, schools, shops, public transport and other community facilities through the delivery of Local Permeability Improvements within existing communities; and*
- *Ensure facilities for pedestrians and cyclists are designed in accordance with the principles, approaches and standards contained within the Design Manual for Urban Roads and Streets and the National Cycle Manual.*

As shown in Figure 2-2, the western portion of the Lucan to City Centre CBC interacts with the following items of note:

- The planned public transport and cycle network improvements;
- West of the M50 the route runs adjacent to the River Liffey / Woodville / Hermitage / Quarryvale areas, are all zoned HA, to protect and enhance the outstanding natural character and amenity of the Liffey Valley area;
- East of the M50 the route runs adjacent to Palmerstown village, zoned VC, to protect, improve and provide for the future development of village centres; and
- Towards the boundary with Dublin City Council the route runs adjacent to the proposed Natural Heritage Area (pNHA) of the River Liffey.

2.3.2 Dublin City Council Development Plan (2016-2022)

The Dublin City Council (DCC) Development Plan recognises the challenge that transport has in making an important contribution to make towards achieving a sustainable city. These key challenges for the City are outlined as follows:

- *Effective integration of land-use and transportation, and the management of access and mobility;*
- *Pro-active engagement and collaboration with communities to bring about further modal shift and effective mobility management;*
- *The expansion of the strategic cycle network along all major water bodies including the River Liffey and the canals;*
- *Improving the city centre environment for pedestrians through public realm enhancements and through improvement of the strategic pedestrian network;*
- *Ensuring maximum benefits are achieved from public transport improvements including Luas cross-city and the anticipated Bus Rapid Transit network;*

- *Managing city centre road-space to best address the competing needs of public transport, pedestrians, cyclists, and the private car; and*
- *Increasing significantly the existing mode share for active modes, i.e. walking and cycling, and supporting the forthcoming National Policy Framework for Alternative Fuels Infrastructure.*

Therefore, sustainable forms of transport such as public transport, walking, and cycling are strongly promoted in this plan, which takes a pro-active approach to influencing travel behaviour and effective traffic management.

The following tables are an extract of the development plan objectives for Modal Change and Active Travel, see Table 2-4, and Public Transport, see Table 2-5, which are aligned with the Proposed Scheme.

Table 2-4 DCC Development Plan Objectives for Modal Change and Active Travel aligned with the Proposed Scheme

<i>Movement and Transport: Promoting Modal Change and Active Travel</i>	
MT2:	<i>Whilst having regard to the necessity for private car usage and the economic benefit to the city centre retail core as well as the city and national economy, to continue to promote modal shift from private car use towards increased use of more sustainable forms of transport such as cycling, walking and public transport, and to co-operate with the NTA, Transport Infrastructure Ireland (TII) and other transport agencies in progressing an integrated set of transport objectives. Initiatives contained in the government's 'Smarter Travel' document and in the NTA's draft transport strategy are key elements of this approach.</i>

Table 2-5 DCC Development Plan Objectives for Public Transport aligned with the Proposed Scheme

<i>Movement and Transport: Public Transport</i>	
MT3:	<i>To support and facilitate the development of an integrated public transport network with efficient interchange between transport modes, serving the existing and future needs of the city in association with relevant transport providers, agencies and stakeholders.</i>
MT4:	<i>To promote and facilitate the provision of Metro, all heavy elements of the DART Expansion Programme including DART Underground (rail interconnector), the electrification of existing lines, the expansion of Luas, and improvements to the bus network in order to achieve strategic transport objectives.</i>
MT5:	<i>To work with the relevant transport providers, agencies and stakeholders to facilitate the integration of active travel (walking, cycling etc.) with public transport, thereby making it easier for people to access and use the public transport system.</i>
MT6: (i)	<i>To work with Iarnród Eireann, the NTA, Transport Infrastructure Ireland (TII) and other operators to progress a coordinated approach to improving the rail network, integrated with other public transport modes to ensure maximum public benefit and promoting sustainable transport and improved connectivity.</i>

Volume 3 of the Dublin City Development Plan (2016-2022) provides maps of the Dublin Metropolitan area indicating the proposed zoning. The eastern section of the Lucan to City Centre CBC, falls across Maps D and E, as shown in Figure 2-2 below.

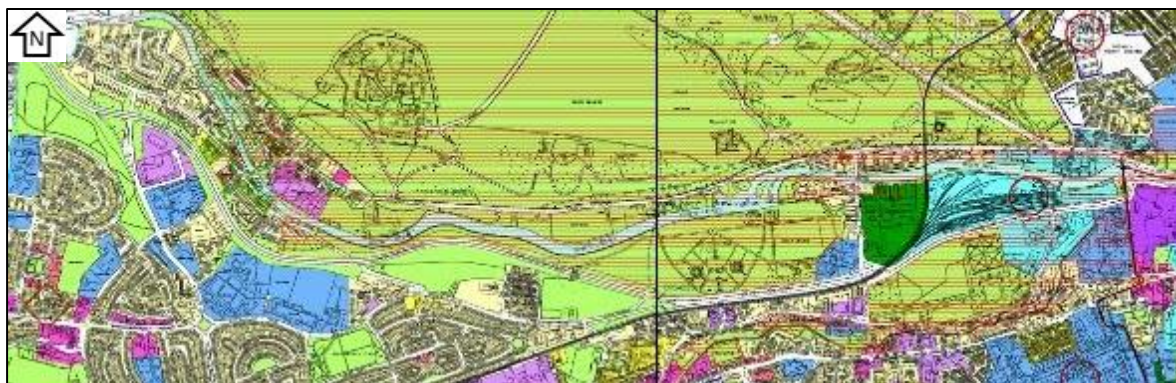


Figure 2-2 DCC Development Plan – Extract of Maps D and E

From these maps it has been identified that the proposed route interacts with the following items of note:

- Map D – the route runs adjacent to the River Liffey Conservation Area;
- Map E – the route runs adjacent to the Conservation Areas associated with the Memorial Gardens and Royal Kilmainham Hospital.

The Dublin City Development Plan recognises the challenge that Transport has in making an important contribution to make towards achieving a sustainable city. These key challenges for the City are outlined as follows:

- *Effective integration of land-use and transportation, and the management of access and mobility;*
- *Pro-active engagement and collaboration with communities to bring about further modal shift and effective mobility management;*
- *The expansion of the strategic cycle network along all major water bodies including the River Liffey and the canals;*
- *Improving the city centre environment for pedestrians through public realm enhancements and through improvement of the strategic pedestrian network;*
- *Ensuring maximum benefits are achieved from public transport improvements including Luas cross-city and the anticipated Bus Rapid Transit network;*
- *Managing city centre road-space to best address the competing needs of public transport, pedestrians, cyclists, and the private car; and*
- *Increasing significantly the existing mode share for active modes, i.e. walking and cycling, and supporting the forthcoming National Policy Framework for Alternative Fuels Infrastructure.*

2.3.3 Liffey Valley Local Area Plan (extended 2013)

This Local Area Plan was adopted by the elected members of South Dublin County Council on 10th March 2008 and subsequently extended in 2013 for a further five years.

The Local Area Plan was supported by a detailed traffic and transport assessment incorporating a major traffic modelling exercise. Some of the key findings of this assessment were:

- *A combination of roads, public transport, cycle/pedestrian improvements and demand management measures are required to accommodate the increase in forecast traffic. Public Transport improvements will include improvements to existing Bus services and the provision of new 'shuttle' services;.*
- *The model found that 80% of trips to the Liffey Valley site are by private car. Public transport trips including (cycle/pedestrian users) currently account for approximately 18% of the transport market to the Liffey Valley Centre; and*
- *A Mobility Management Plan – and effective monitoring of the Mobility Management Plan – is crucial to the delivery of the transport and development proposals.*

The Local Area Plan sets out a number of objectives that support the proposed development:

- *To ensure that transport infrastructure within the Town Centre is upgraded in tandem with new development;*
- *To facilitate expansion of the public transport network through enhanced bus services within and accessing the Town Centre; and*
- *To ensure that the design and layout of the new town centre optimises opportunity for access to the Town Centre by 'alternative modes of transport' such as public transport, walking or cycling.*

2.3.4 Heuston and Environs Strategic Development and Regeneration Plan

An urban design land-use framework plan for the regeneration of the Heuston area was produced in 2003. This plan provided a regeneration framework for key development sites addressing issues of spatial layout, urban grain, massing, height and land-use, and the need to interface such sites successfully with the Phoenix Park, the River Liffey and cultural institutions.

Two of the key guiding principles of the plan were:

- *To develop a new urban gateway character area focused on the transport node of Heuston Station with world class public transport interchange facilities, vibrant economic activities, a high-quality destination to live, work and socialise in, a public realm and architectural designs of exceptional high standard and a gateway to major historic, cultural and recreational attractions of Dublin City, and*
- *To improve pedestrian and cycle linkages throughout the area and through key sites, with a particular focus on seeking the following new linkages/improvements: along St John's Road West; from St John's Road to the Royal Hospital Kilmainham via Heuston South Quarter; from Dr Steevens' Hospital to Irish Museum of Modern Art, with consideration given to a new path along the banks of the river Camac.*

2.4 The Aim and Objectives of delivering the Lucan to City Centre Core Bus Corridor Scheme

The aim of CBC Infrastructure Works is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor.

The objectives are to:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements;
- Enhance the potential for cycling by providing safe infrastructure for cycling, segregated from general traffic wherever practicable;
- Support the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets;
- Enable compact growth, regeneration opportunities and more effective use of land in Dublin, for present and future generations, through the provision of safe and efficient sustainable transport networks;
- Improve accessibility to jobs, education and other social and economic opportunities through the provision of improved sustainable connectivity and integration with other public transport services; and
- Ensure that the public realm is carefully considered in the design and development of the transport infrastructure and seek to enhance key urban focal points where appropriate and feasible.

3. Background and Public Consultation

3.1 Lucan to City Centre Core Bus Corridor Options Study Feasibility Report and Emerging Preferred Route Option

In early 2016, the NTA initiated plans to develop the network of CBCs identified in the GDA Transport Strategy. As part of this body of work, the Lucan to City Centre Core Bus Corridor Options Study Feasibility Report (December 2016) was prepared which identified feasible options along the corridor, assessed these options and arrived at an EPR Option. These proposals formed the basis for the first Non-Statutory Public Consultation on this CBC.

The Feasibility Report study area was divided into four sections:

- Section 1 N4 Junction 5 (Celbridge / Leixlip) to N4 Junction 3 (Ballyowen / Lucan);
- Section 2: N4 Junction 3 (Ballyowen / Lucan) to Kennelsfort Road;
- Section 3: Kennelsfort Road to Con Colbert Road; and
- Section 4: Con Colbert Road to City Centre.

The “Dublin Area Bus Network Redesign” project was launched by the NTA in 2017 and looked at the existing bus network and the radial Core Bus Network identified in the GDA Transport Strategy. The output from the Bus Network Review was published in August 2018, and prior to the first Non-Statutory Public Consultation, the decision was taken to omit Section 1 of the route between N4 Junction 5 and N4 Junction 3. The rationale for this decision is described in paragraph 4.1 below.

3.2 First Non-Statutory Public Consultation – Emerging Preferred Route Option

The first Non-Statutory Public Consultation on the BusConnects CBCs took place on a phased basis. The first phase of consultation occurred from 14th November 2018 to 29th March 2019. The second phase ran from 23rd January 2019 to the 30th April 2019, and the final phase ran from 26th February 2019 until the 31st May 2019. The Lucan to City Centre CBC EPR Option formed part of the first phase of the consultation, which closed on 29th March 2019. The Information Brochure published as part of this consultation is included in Appendix G of this report.

There were 44 submissions received relating to the Lucan to City Centre CBC. The submissions received ranged from personal submissions by residents, commuters and local representatives, to detailed proposals from public bodies, specialists, various associations and private sector businesses.

A brief summary of the feedback received on the Proposed Scheme during the first Non-Statutory Public Consultation is presented in this section of the report. The 44 submissions contained 135 comments which covered a variety of topics, the key issues emerging from the consultation were as follows:

- Starting point of the Lucan to City Centre CBC;
- N4 Junction 3 safety and design issues;
- Physical issues that negatively impact cyclists;
- Issues raised regarding increased congestion;
- Environmental queries;
- Heuston Station design issues;
- Bus Stop locations;
- Chapelizod bypass – rerouting of services;
- Loss (property value, revenue, loss of function / parking, future planning gain etc.);
- Left turn slip lanes;
- Old Lucan Road to Palmerstown traffic issues; and

- New ideas and suggestions.

Further detail on these issues can be found in the 'Emerging Preferred Route Public Consultation Report' contained in Appendix B of this report.

3.3 Development of Draft Preferred Route Option

Following the first Non-Statutory Public Consultation, a review was undertaken of the scheme proposals along the route based on the following new information which was available for consideration:

- Detailed topographical survey along the route corridor;
- Submissions received during the first Non-Statutory Public Consultation; and
- Issues raised during meetings with community forum, resident groups and one-on-one meetings with directly impacted landowners.

As part of this review, a number of new design options were developed for consideration in specific areas where issues were identified. These new design options were subject to further options assessment as detailed in Section 6 of this report.

3.4 Second Non-Statutory Public Consultation – Draft Preferred Route Option

In March 2020 the Draft PRO was published with the Non-Statutory Public Consultation running from 4th March 2020 through to the 17th of April 2020. The Information Brochure published as part of this consultation is included in Appendix H of this report.

While the Non-Statutory Public Consultation was completed, due to COVID-19 restrictions being imposed by Government in mid-March the planned Public Information Events were impacted. Consequently, there were 16 submissions received relating to the Proposed Scheme. The submissions received ranged from personal submissions from residents and commuters to detailed proposals from public bodies, specialists, various associations and private sector businesses. Refer to Appendix C of this report for the 'Second and Third Public Consultations Submissions Summary Report'.

A brief summary of the feedback received on the Lucan to City Centre CBC during this second round of Non-Statutory Public Consultation is presented in this section of the report. While a variety of matters were raised in the submissions, which included 55 comments, the key issues emerging from the consultation were as follows:

- The starting point for the CBC at N4 Junction 3;
- Cyclists not being prioritised in Palmerstown or Chapelizod;
- Cyclist safety – raised tables & continuity;
- Pedestrian safety at crossings;
- Old Lucan Road - 2-way cycle track & speed limit;
- Kennelsfort Road junction – staggered pedestrian crossing;
- Concerns about increased congestion;
- Disability access – junctions generally, tactile paving and bus stops;
- Pedestrian priority zone – width of provision; and
- Suggestions and new ideas.

The issues raised during the second public consultation were considered in the further development of the draft PRO. Subsequently, it was determined by the NTA that a third non-statutory public consultation would be conducted prior to finalising the PRO. The issues raised during the second public consultation were considered in the further development of the draft PRO.

Subsequently, it was determined by the NTA that a third non-statutory public consultation would be conducted prior to finalising the PRO.

3.5 Development of Updated Draft Preferred Route Option

Following the second Non-Statutory Public Consultation, a review was undertaken of the scheme proposals along the route based on the following new information which was available for consideration:

- Updated topographical survey along the route corridor;
- Submissions received during the second Non-Statutory Public Consultation; and
- Issues raised during meetings with resident groups and one-on-one meetings with directly impacted landowners.

No key changes have resulted from the second round of Non-Statutory Public Consultation. The selected updated draft PRO identified formed the basis for the third Non-Statutory Public Consultation in November / December 2020.

3.6 Third Non-Statutory Public Consultation – Updated Draft Preferred Route Option

The third round of Non-Statutory Public Consultation for the CBC Infrastructure Works took place from 4th November 2020 until 16th December 2020 on the updated Draft PRO. The Information Brochure published as part of this consultation is included as Appendix I of this report.

With the continuing effect of the Covid-19 pandemic and associated Government restrictions, the third Non-Statutory Public Consultation was held virtually. Virtual consultation rooms for each CBC were developed and the Information Brochure was published.

Along with offering a call back facility, the virtual consultation rooms provided a description of each Preferred Route from start to finish with supporting maps and included information of all revisions made, if any, since the previous rounds of Non-Statutory Public Consultation as well as other supporting documents.

The consultation period remained open until 16th December 2020 and submissions could be made by email, through the virtual consultation room or by post. All relevant information including the updated Information Brochures and the EPR Non-Statutory Public Consultation reports were made available on the BusConnects website (<https://busconnects.ie>) to view and download as part of the third Non-Statutory Public Consultation. In addition, landowner meetings were held over the phone and / or online, and minutes were recorded as part of the consultation process.

There were 200 submissions received as part of the Lucan to City Centre CBC third Non-Statutory Public Consultation. These submissions ranged from individual submissions by residents, commuters and local representatives, to detailed proposals from various associations and private sector businesses.

The 200 submissions included a total of 437 comments covering a variety of topics. The key issues emerging from the consultation were as follows:

- Congestion on the Ballyowen Road at the N4 junction 3;
- Cyclist safety and facilities, particularly at Ballyowen Road and South Circular Road junctions;
- Pedestrian safety and facilities, particularly at South Circular Road junction;
- Loss of parking in Palmerstown village;
- Bus stops and bus services; and
- Other – Positive feedback, noise impact and tree loss.

Further detail on these issues can be found in the ‘Second and Third Public Non-Statutory Consultations Submissions Summary Report’ contained in Appendix C of this report.

The issues raised during the Third Non-Statutory Public Consultation have been considered in the further development of the PRO.

4. Study Area

4.1 Introduction

In the 'Lucan to City Centre Core Bus Corridor Options Study Feasibility Report' completed in 2016, the defined study area was divided into the following four sections:

- Section 1: N4 Junction 5 (Celbridge / Leixlip) to N4 Junction 3 (Ballyowen / Lucan);
- Section 2: N4 Junction 3 (Ballyowen / Lucan) to Kennelsfort Road;
- Section 3: Kennelsfort Road to Con Colbert Road; and
- Section 4: Con Colbert Road to City Centre.

These sections are shown in Figure 4-1.

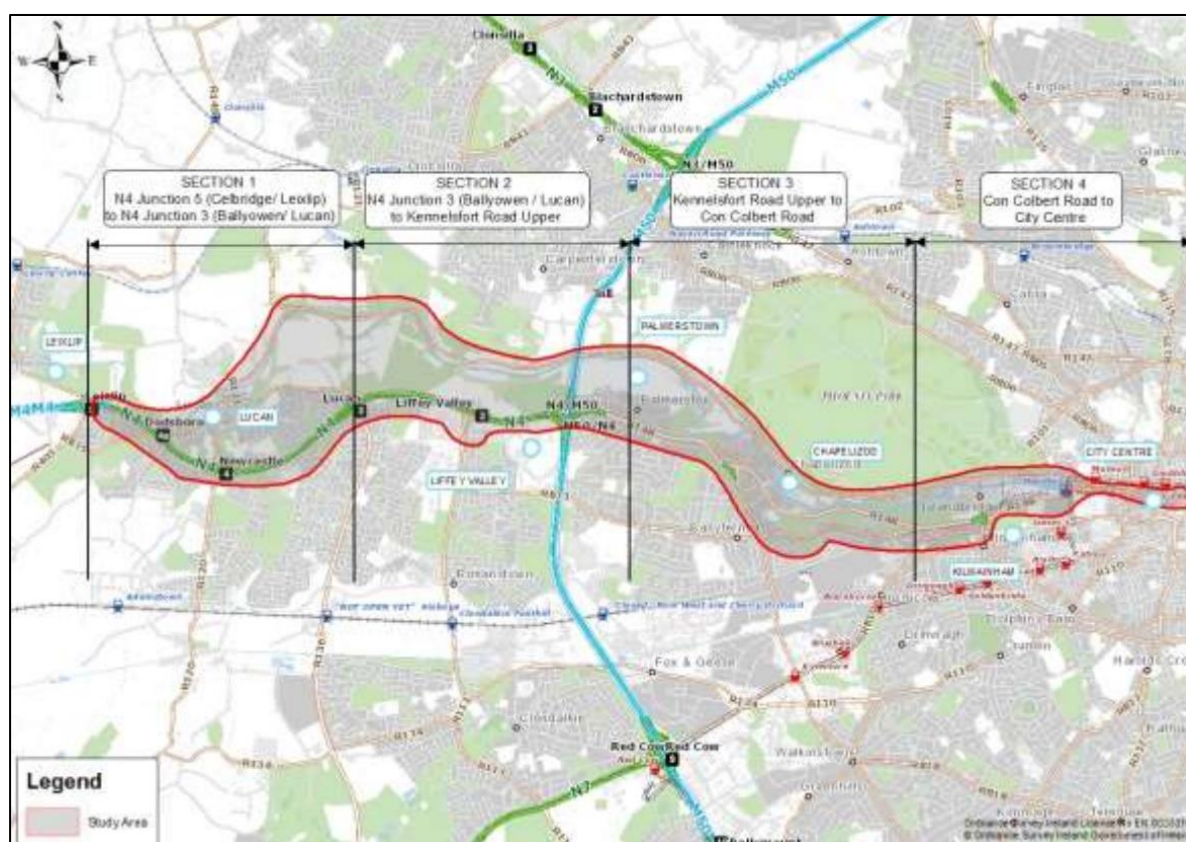


Figure 4-1 Lucan to City Centre CBC Options Study Feasibility Report - Study Area

In 2017, the NTA began work on reviewing the Dublin Area Bus Network, in collaboration with Bus Operators and other stakeholders (including local authorities). Jarrett Walker and Associates, a transport planning practice with specific expertise in bus network redesign, was appointed to provide advice and technical support.

The "Dublin Area Bus Network Redesign" project was launched by the NTA in 2017 and looked at the existing bus network and the radial Core Bus Network identified in the GDA Transport Strategy. The output from the Bus Network Review was published and available for public comment in August 2018 and again in October 2019.

Figure 4-2 below indicates the final output from the Bus Network Review in the vicinity of the western end of the Lucan to City Centre CBC. This illustrates that the C-Spine route from the City Centre along the R148 and the N4 terminates at N4 Junction 3 (Ballyowen / Lucan). West of this point, there is a three-way split of future services, with some branch routes (C1 and C2) running along Ballyowen Road, other branch routes (C3 and C4) running through Lucan village and various peak time routes continuing along the N4.



Figure 4-2 Revised Bus Network – Start of C-Spine, Lucan

As such, the decision was taken to exclude the section of the route between the N4 Junction 5 and Junction 3 in the Emerging Preferred Route Option for the Lucan to City Centre CBC and commence the Proposed Scheme at N4 Junction 3 (Ballyowen / Lucan) to serve the C-Spine route.

The revised study area is divided into the three remaining sections:

- Section 1: N4 Junction 3 (Ballyowen / Lucan) to Kennelsfort Road;
- Section 2: Kennelsfort Road to Con Colbert Road; and
- Section 3: Con Colbert Road to City Centre.

Following the first Non-Statutory Public Consultation it was determined that the width of the study area for the Proposed Scheme did not need to be amended and therefore remained as extending from N4 Junction 3 to the City Centre.

4.2 Physical Constraints and Opportunities

The study area for the three remaining sections has not altered from the previously published 'Lucan to City Centre Core Bus Corridor Options Study Feasibility Report'. Therefore the potential physical constraints and opportunities for these three sections identified in the Options Study Feasibility Report are considered to remain valid. These are considered within the scheme assessment process and include the following:

- The proposed Natural Heritage Area (pNHA) of the River Liffey acts as a constraint to the northern extents of the study area;
- The Kildare Rail line provides a constraint to the southern extents of the study area towards the eastern end of the route;
- Availability of space between existing building lines in some locations;
- Existing and committed future development along the route, which act as a constraint but could also give rise to a potential opportunity;
- Various rail and motorway bridges (M50 Junction 7, Kildare Rail Line at South Circular Road);
- Public parks (Hermitage Park, Liffey Gaels Park);
- Free flow junction between N4 and M50;
- Need to maintain traffic flow in key areas, such as traffic exiting from the City Centre onto the R148; and
- Luas Red Line at Heuston Station.

Significant opportunities for this corridor include the following:

- existing high-quality bus lanes are present along much of the route, which provides a potential opportunity to provide a very high degree of bus priority if the remaining pinch points can be removed;
- The corridor also passes close to one of the largest shopping centres in Dublin at Liffey Valley, which will generate passenger numbers outside of peak hours making this corridor much more effective;
- The proposed transport interchanges at Liffey Valley Shopping Centre and Heuston Station, the latter providing the opportunity for the Lucan to City Centre CBC to facilitate interchange with both light and heavy rail;
- Enhanced connectivity by sustainable transport modes between the educational, commercial and residential centres along the corridor, particularly at interfaces with the cycle routes included in the GDA Cycle Network Plan; and
- Provision of urban realm upgrades at key locations along the corridor.

4.3 Integration with Existing and Proposed Public Transport Network

4.3.1 Introduction

One of the key objectives of the Proposed Scheme is to enhance interchange between the various modes of public transport operating in the city and wider metropolitan area, both now and in the future. The EPR Option was developed to provide improved existing or new interchange opportunities with other transport services, including:

- Liffey Valley to City Centre CBC at three locations;
- The Luas Red Line at Heuston Station;
- Existing Dublin Bus services at numerous locations along the route; and
- Interface with orbital and local services included in the proposed BusConnects Network Redesign.

Figure 4-3 and Figure 4-4 below show Dublin Bus existing services and an extract from BusConnects Network Redesign maps which shows the different interfaces along the corridor between Lucan and Heuston station which is primarily along the proposed C Spine.

4.3.2 Bus Services

Up until the November 2021, the Lucan Corridor was used by Dublin Bus Route 25 (Dodsborough via Lucan village to Sandymount / UCD), Route 66 (Maynooth / Leixlip to Ringsend Road) and Route 67 (Maynooth / Celbridge to Ringsend Road). The corridor was also used by several regional bus services.

Figure 4-3 indicates the route for the Dublin Bus 25B service along the Chapelizod bypass, although it is noted that several other services served Chapelizod village.

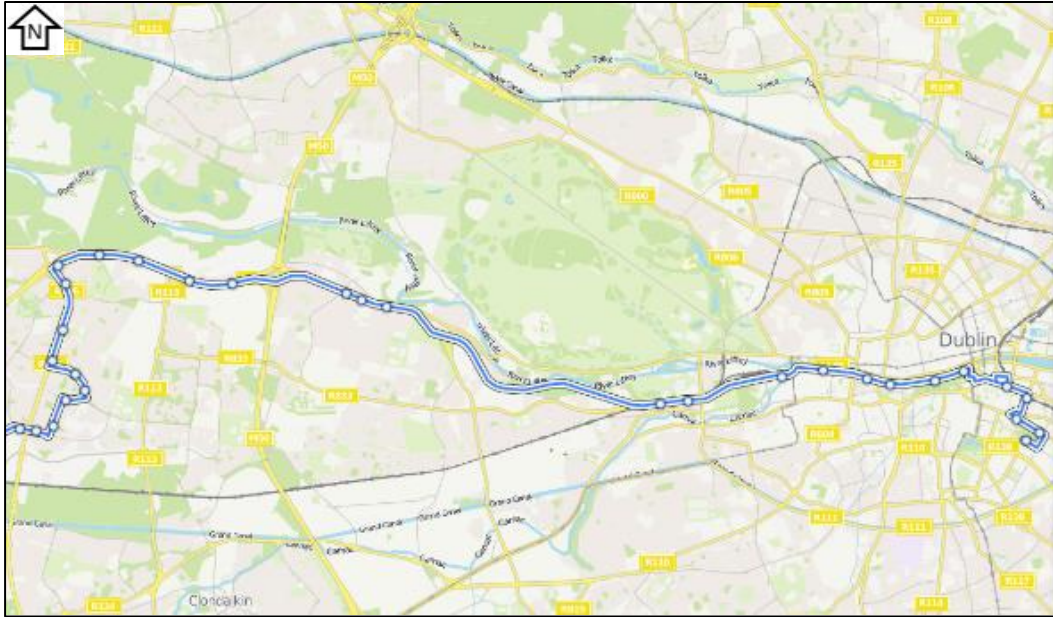


Figure 4-3 Dublin Bus Route 25B (Source: Moveitapp.com)

4.3.3 Dublin Area Revised Bus Network

On 28th November 2021, BusConnects Dublin introduced a redesigned, higher capacity bus network which is more coherently planned and more understandable, delivering a better overall bus system for Dublin and the surrounding areas. Figure 4-4 indicates the final output from the Bus Network Redesign and illustrates that the C-Spine (C1, C2, C3, C4) runs from the City Centre to the West, serving areas along the Lucan to City Centre Corridor.

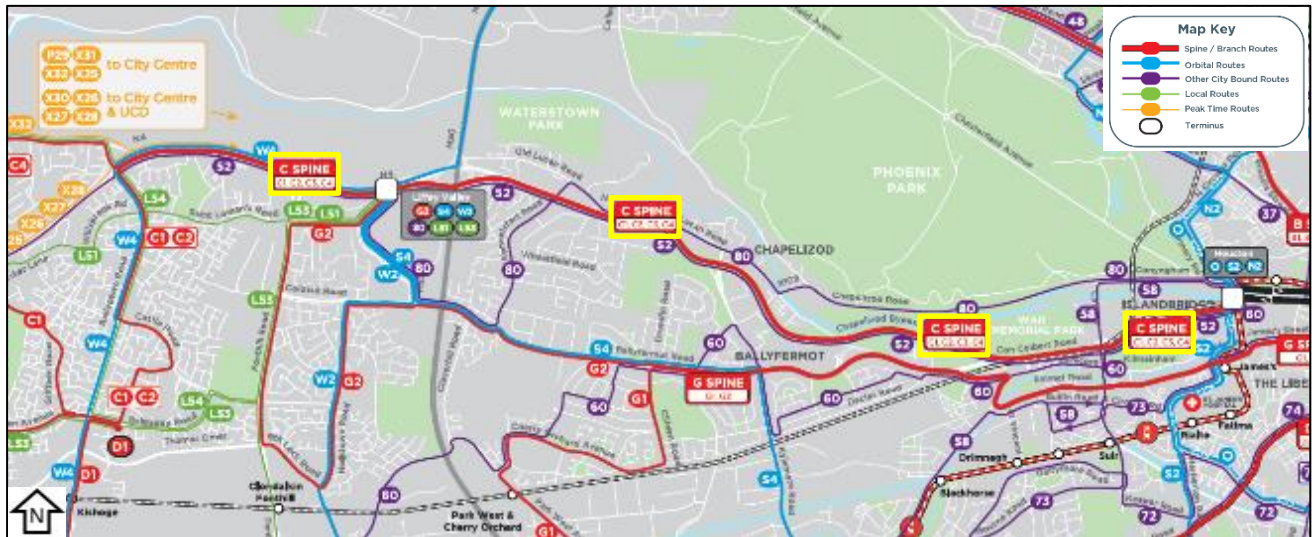


Figure 4-4 Extract from Dublin Area Revised Bus Network for the Study Area

The following is a list of the different Spines & Branches, Orbital Routes, Radial Routes and Peak Time Routes that interact with the Proposed Scheme:

- Spines & Branches
 - C-SPINE Lucan - City Centre;
 - C1 Adamstown – City Centre-Sandymount;
 - C2 Adamstown – City Centre-Sandymount;
 - C3 Maynooth – Leixlip – Lucan - City Centre – Ringsend Road; and
 - C4 Maynooth – Celbridge - City Centre – Ringsend Road.

- Orbital Routes
 - W4 Tallaght - Blanchardstown;
 - O Inner city loop
 - S2 Heuston – Ringsend; and
 - N2 Heuston to Clontarf Road.
- Radial Routes
 - 52 Leixlip – City Centre - Ringsend;
 - 58 Clondalkin – Heuston - City Centre – Dublin Port;
 - 60 Red Cow - Cherry Orchard - Decies Rd. - Spencer Dock; and
 - 80 Liffey Valley – Palmerstown - Chapelizod - City Centre – Rathmines - Ballinteer.
- Peak Time Routes
 - X25 Maynooth – City Centre;
 - X26 Maynooth City Centre - UCD;
 - X27, X28 Celbridge – City Centre - UCD;
 - P29 Adamstown - City Centre;
 - X30 Adamstown - City Centre – UCD; and
 - X31, X32 Leixlip – Lucan – City Centre.

4.4 Compatibility with Other Road Users

A key objective of the Proposed Scheme is to improve pedestrian and cyclist facilities along the route. In general, segregated facilities, where practicable, should be proposed for these modes.

During the course of the analysis carried out to identify the Proposed Scheme, the provision of these cycle routes was considered at all stages. Where it is considered impractical to construct pedestrian or cycle facilities along a particular section of the Proposed Scheme, such facilities will need to be provided along a suitable alternative route.

General traffic flow and local access will generally be maintained along the Proposed Scheme although it is inevitable that there will be impacts on traffic capacity along the route associated with the reallocation of road space to provide bus priority and cycle tracks, along with the introduction of turning movement restrictions.

Figure 4-5 below is an extract from GDA Cycle Network Plan and shows the different interfaces along the corridor between Lucan and the City Centre. Stub cycle tracks have been provided at all interfaces that adjoin the Proposed Scheme.

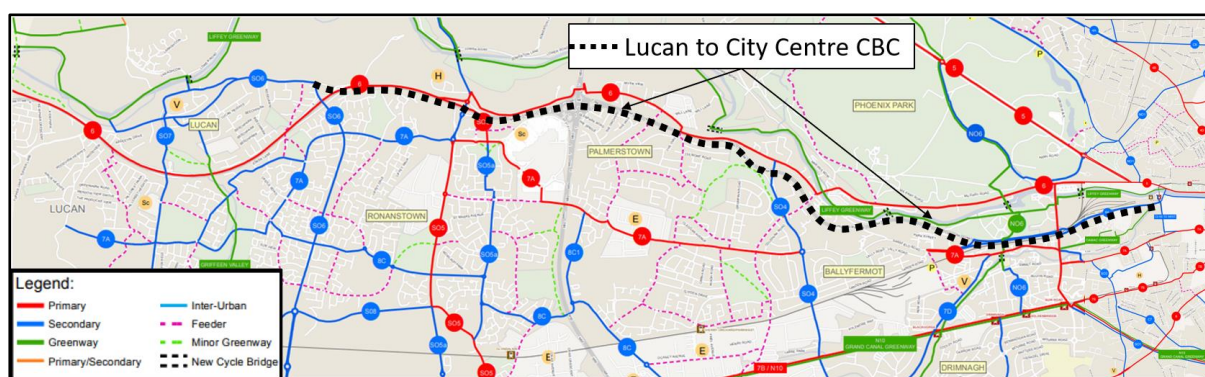


Figure 4-5 Extract for the GDA Cycle Network Plan for the Study Area

As can be seen from Figure 4-5, Primary Cycle Route 6 follows the same route as the Proposed Scheme from Lucan to the western end of the Chapelizod bypass, from where it deviates from the route of the CBC and passes through Chapelizod village. Secondary Cycle Route 6A follows the same route as the Proposed Scheme from Con Colbert Road to Heuston Station.

Other cycle routes in the GDA Cycle Network Plan that interface with the Proposed Scheme are:

- Primary Routes;
 - S05 intersects with the Proposed Scheme at Liffey Valley.
- Secondary Routes;
 - S06 intersects with the Proposed Scheme at Ballyowen Road;
 - NO5 intersects with the Proposed Scheme at Liffey Valley;
 - 6A intersects with the Proposed Scheme at Con Colbert Road and then runs along the full length of St John's Road West;
 - C3 intersects with the Proposed Scheme at Dr Steeven's Lane.
- Feeder Routes;
 - The Feeder route along Kennelsfort Road crosses the Proposed Scheme at Palmerstown;
 - The Feeder route along Woodfarm Avenue meets the Proposed Scheme at The Oval junction in Palmerstown;
- Greenways
 - the Liffey Greenway is connected to the Proposed Scheme via Secondary Route NO5 at Liffey Valley;
 - NO6 intersects with the Proposed Scheme at Memorial Road and provides another connection to the Liffey Greenway; and
 - the River Camac Greenway intersects with the Proposed Scheme at Military Road.

5. Review of the ‘Lucan to City Centre Core Bus Corridor Options Study Feasibility Report’

5.1 Introduction

Following a comprehensive review of the potential route options within the study area a two-stage assessment process was used to narrow down the number of routes available to one optimal route for each of the sections of the study area. These routes then converged to form the overall Emerging Preferred Route (EPR) Option which was presented at the first Non-Statutory Public Consultation for information and feedback.

As part of this EPR Non-Statutory Public Consultation process, the preparation of the ‘Lucan to City Centre Core Bus Corridor Options Study Feasibility Report’ served to give the public a greater insight into how the process took place in addition to providing a transparency into the process of elimination used to determine the optimal route, given the information available and best engineering judgement.

From a review of submissions received as part of the EPR Non-Statutory Public Consultation process, as well as a review of the topographical survey carried out since the publication of the EPR Option, a number of issues have been identified which may be overcome through the implementation of alternative design solutions. These issues are described in the following sections.

5.2 Assessment Methodology

5.2.1 Introduction

The first step in the assessment process was to review the Lucan to City Centre Core Bus Corridor Options Study Feasibility Report. The development of the EPR Option during the Route Selection stage comprised a two stage assessment process. The first stage was a high-level route options assessment or ‘sifting’ process which appraised the potentially viable route options identified in terms of their ability to achieve the project objectives. The second stage of the option assessment is a comparison of each viable scheme option for each of the study area sections using a Multi Criteria Analysis (MCA) to determine the EPR Option.

This additional assessment does not supersede work undertaken during earlier stages but complements it, and responds to issues raised by the public during the public consultation process or issues identified by additional information available to the Design Team.

5.2.2 Stage 1 – Route Options Assessment – Sifting Stage

A ‘spider’s web’ of route options was produced that would accommodate the objectives of the Proposed Scheme for the study area as shown in Figure 5-1 below.

As part of the sifting stage each of the route options were assessed using a high level qualitative method, based on professional judgement and general appreciation for existing constraints and conditions within the study area that could be ascertained from available surveys and site visits.

This exercise screened and assessed technically feasible route options, based on distinct, project specific objectives. In addition to being assessed on their individual merits, routes were also screened relative to each other allowing some routes to be ruled out if more suitable alternatives existed.

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



Figure 5-1 Spiders Web of Route Options

5.2.3 Stage 2 – Route Options Assessment – Multi-Criteria Analysis

Following completion of Stage 1, the remaining potentially viable options were progressed to Stage 2 of the assessment process. This process involved a more detailed qualitative and quantitative assessment using criteria established to compare the route options.

The indicative scheme for each route option was then progressed to a MCA. The ‘Common Appraisal Framework for Transport Projects and Programmes’ published by the Department of Transport, Tourism and Sport (DTTAS), March 2016, requires schemes to undergo a MCA under the following criteria:

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

Physical Activity was scoped out of the MCA at this stage, as all route options carried forward promote physical activity equally, and physical activity was not considered to be a key differentiator between route options.

Table 5-1 presents a summary of the Proposed Scheme assessment criteria and sub criteria used as part of the Stage 2 detailed route options assessment process, with options compared and ranked against each other as per Table 5-2. Options were compared based on a five-point scale, ranging from having significant advantages to having significant disadvantages over other route options. Table 5-2 shows the colour coding of the five-point scale, with advantageous routes graded “dark green” and disadvantageous routes graded “red”.

Table 5-1 Assessment Criteria

Assessment Criteria	Assessment Sub-Criteria
1. Economy	1.a. Capital Cost
	1.b. Transport Reliability and Quality of Service
2. Integration	2.a. Land Use Integration
	2.b. Residential, Employment and Educational Catchments
	2.c. Transport Network Integration
	2.d. Cycle Integration
3. Accessibility & Social Inclusion	3.a. Key Trip Attractors
	3.b. Deprived Geographic Areas
4. Safety	4.a. Road User Safety
	4.b. Pedestrian Safety
5. Environment	5.a. Archaeology, Architectural and Cultural Heritage
	5.b. Flora & Fauna
	5.c. Soils and Geology
	5.d. Hydrology
	5.e. Landscape and Visual
	5.f. Air Quality
	5.g. Noise & Vibration
	5.h. Land Use Character

Table 5-2: Assessment Ranking

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

Following the application of the MCA the EPR Option was carried forward to the first round of Non-Statutory Public Consultation.

5.3 Emerging Preferred Route Option Summary

5.3.1 Emerging Preferred Route Option

The Feasibility Report concluded that the Emerging Preferred Option (EPR) Option should follow the N4 / R148 corridor from Junction 5 of the N4 to Heuston Station.

As described in paragraph 4.1, the Dublin Area Bus Network Redesign indicates that the C-Spine route from the City Centre along the R148 and the N4 is proposed to terminate at N4 Junction 3 (Ballyowen / Lucan). West of this point, a three-way split of future services is proposed, with some branch routes

(C1 and C2) running along Ballyowen Road, other branch routes (C3 and C4) running through Lucan village, and various peak time routes continuing along the N4.

In view of this, and prior to the first Non-Statutory Public Consultation, the decision was taken to omit the section of the route between N4 Junction 5 and N4 Junction 3. Following the first Non-Statutory Public Consultation, this decision was reviewed in light of submissions received from members of the public and the review confirmed that the western extents of the EPR Option should remain as commencing at N4 Junction 3. The extents of the study area were also reviewed, and it was concluded that this remained valid.

The assessment process and details outlined in the Options Study Feasibility Report were also reviewed. It was confirmed that the assessment of the various route options remained valid and that the EPR identified in the Feasibility Report along the N4 / R148 corridor remained the optimum routing for the Proposed Scheme.

The EPR Option was then reviewed for the three sections listed below and shown in Figure 5-2:

- Section 1: N4 Junction 3 (Ballyowen / Lucan) to Kennelsfort Road;
- Section 2: R148, Kennelsfort Road to Con Colbert Road; and
- Section 3: R148, Con Colbert Road to City Centre.

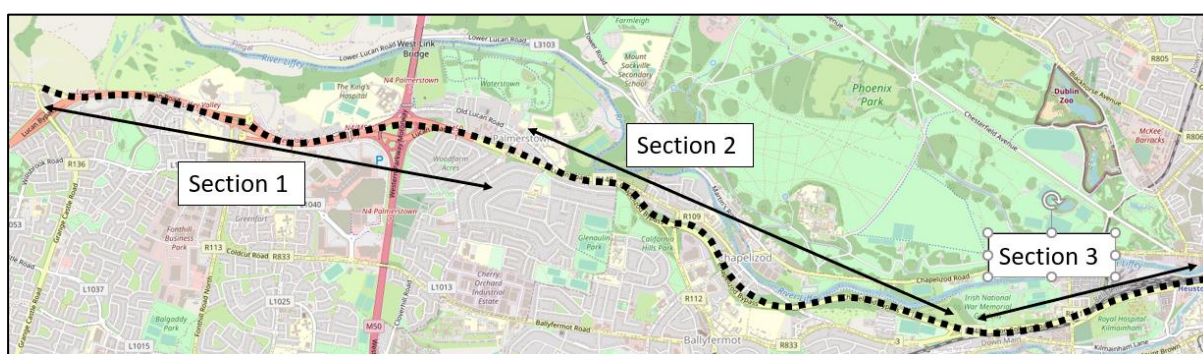


Figure 5-2 Sections of the EPR Option

The EPR Option for each section is described in the following sections, and areas identified for re-examination are highlighted.

5.3.2 Section 1 - N4 Junction 3 (Ballyowen / Lucan) to Kennelsfort Road

5.3.2.1 EPR Option

Following assessments undertaken as part of the Options Study Feasibility Report it was determined that the optimum route from the N4 Junction 3 to Kennelsfort Road was as follows:

- The EPR Option commences at Junction 3 on the N4 Lucan Road and follows this route as far as the M50 interchange. Here the designation of the route changes to the R148 Regional Road and continues to the Kennelsfort Road junction;
- The EPR Option retains the existing bus lane layout on the overbridge and extends the existing bus lane on Ballyowen Road as far as the junction with Lucan Road, which is modified to accommodate this bus lane and improved cycle facilities. On the Lucan Road the EPR Option extends the existing bus lane as far as the existing roundabout junction with a new cycle track also provided. To accommodate this change, there is some limited land take from the adjacent green space;
- On the westbound off-slip ramp, the EPR Option includes a continuous bus lane from the N4 to the junction with Ballyowen Road, with the off-ramp widened on both sides to provide for this bus lane and a new cycle track, with some land take required to the south of the off-ramp, and a shared footway / cycle track provided to reduce the requirement of land take in this area;
- On the N4 between Junction 3 and Junction 2 the EPR Option maintains the existing eastbound bus lane and a new segregated cycle track is included on the north side of the existing road requiring some land take. For westbound traffic the existing segregated general traffic lane is

retained, and a bus lane introduced to the east of the Ballyowen Lane junction connecting to the existing bus lane to the east of the existing footbridge adjacent to Mount Andrew Court. The EPR Option requires some limited land take from adjacent properties;

- At the N4 Junction 2, the EPR Option retains the existing bus lane and bus stop facilities on the eastbound off ramp and links the new cycle track to the existing cycle network. A new toucan crossing is proposed at this section of the junction. The existing bus lanes in each direction on the overbridge are retained and from the N4 junction 2, cyclists are directed onto the Old Lucan Road running parallel to and on the north side of the N4;
- At the M50 junction, the EPR Option provides a continuous bus lane while maintaining two general traffic lanes in both directions through the junction. Cyclists are directed to the existing foot / cycle bridge over M50 on to the Old Lucan Road; and
- Between the M50 Junction and Kennelsfort Road Junction the EPR Option maintains the existing arrangements of a single bus lane and two general traffic lanes on the eastbound R148, and one general traffic lane for through traffic & a bus lane on the westbound route.

The proposed section of the route from N4 Junction 3 to Kennelsfort Road meets the scheme objectives and is the PRO for this corridor.

5.3.2.2 Areas Identified for Re-examination

Following the first Non-Statutory Public Consultation feedback and design updates, two areas were identified for re-examination as part of this report:

- The standard of facilities for cyclists along this section of the route; and
- The location of bus stops serving Liffey Valley Shopping Centre.

These are discussed in the following paragraphs.

5.3.2.3 Standard of Cycle Facilities

Following on from the first Non-Statutory Public Consultation a number of comments were made questioning the adequacy of the cycle facilities included in the Emerging Preferred Route Option, and expressing the view that the standard of cycle facilities proposed had not been fully considered. Specifically, the following issues were raised:

- Concerns were raised regarding the cyclist's safety coming off the N4 Junction 3 westbound slip road, as cyclists were to be positioned between traffic lanes;
- A significant number of comments made note of the stop-start nature of the cyclist's journey in the EPR Option between N4 Junction 3 and Junction 2, with comments stating that there was a lack of continuity for cyclists at minor junctions / accesses to private properties;
- Some submissions raised the extents of shared surfaces along the route and the hazards this could pose; it was expressed that shared surfaces offered a low level of service for all users and put vulnerable and disabled users at risk when mixed with higher speed cyclists;
- Concerns were raised about the lack of specific facilities for cyclists along the Old Lucan Road between the N4 Junction 2 and the M50, and along the Old Lucan Road between the M50 and Kennelsfort Road;
- Some submissions highlighted the lack of specific facilities for cyclists along the Old Lucan Road in Palmerstown village. In particular, concern was raised about the speed of traffic and amount of uncontrolled parking along this section of carriageway; and
- It was noted that there was poor cyclist connectivity for the residents to the south of the R148 to access Palmerstown village, which presented an opportunity to provide improved facilities.

It was noted that the EPR Option focussed on the incorporation of the CBC into existing bus routes / facilities to ensure the accessibility and inclusion of the Proposed Scheme into local communities, with limited consideration given to providing enhanced cycle facilities. Therefore, it was considered appropriate to investigate if alternative proposals for cycle facilities could be developed.

As described in Sections 2.2 and 4.4, it was noted that Primary Cycle Route 06 of the GDA Cycle Network Plan is proposed to run between N4 Junction 3 and the city centre, as shown in Figure 5-3.

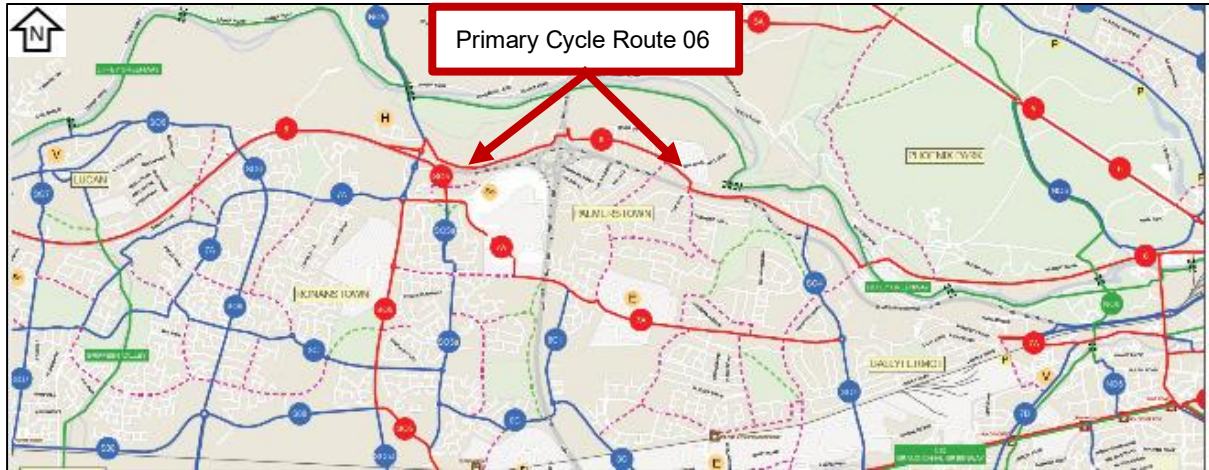


Figure 5-3 Extract of GDA Cycle Network Plan

The section of Primary Cycle Route 06 from N4 Junction 3 to the start of the Chapelizod bypass follows the route of the Lucan to City Centre CBC. This presented an opportunity to incorporate the design of this cycle route into this length of the Lucan to City Centre CBC, which had the potential to provide significantly enhanced cyclist facilities along the full length of this section of the route when compared to those included in the EPR Option proposals.

In addition, the standard of provision for cyclists on the R136 Ballyowen Road and at the junction with the R835 Lucan Road was identified to be re-examined with a view to providing enhanced facilities for Secondary Cycle Route SO6.

5.3.2.4 Location of Bus Stops at Liffey Valley Shopping Centre

As part of the overall BusConnects programme, Liffey Valley Shopping Centre is identified as one of the key public transport interchange locations on the Dublin Area Revised Bus Network. See Figure 5-4 below.



Figure 5-4 Extract from Dublin Area Revised Bus Network

Proposals for the Liffey Valley to City Centre CBC, which starts at Liffey Valley Shopping Centre, included a public transport interchange at this location. This is to facilitate passenger transfers between a variety of radial services (C-Spine and G-Spine), orbital services (W4, S4) and local services. The

interchange would also allow transfer of passengers between these and the various, express and regional services operating along the N4.

It was evident that the location of the existing pedestrian / cyclist bridge connecting the bus stops on the N4 with Liffey Valley Shopping Centre did not provide a direct link to the future public transport interchange (SD19A/0320 / ABP-306251-19). In addition, the existing bus stops were not of an adequate size and standard to serve future anticipated demand.

Therefore, it was considered appropriate to review the location and standard of bus stop provision, with a view to developing an enhanced connection to the proposed interchange within the shopping centre site and provide the necessary standard of passenger and pedestrian facilities.

Furthermore, feedback from stakeholders indicated that the existing bus stops serving Liffey Valley Shopping Centre presented traffic operational issues with regards to speed differential between buses and N4 traffic. The possibility of providing increased lengths for the buses to accelerate and weave with eastbound traffic approaching the M50 interchange, as well as providing increased weaving length for all westbound traffic exiting the M50 interchange, was also considered.

5.3.3 Section 2 – R148 Kennelsfort Road to Con Colbert Road

5.3.3.1 EPR Option

Following assessments undertaken as part of the Options Study Feasibility Report it was determined that the optimum route from the Kennelsfort Road to Con Colbert Road was as follows:

- The EPR Option includes the modification of the Kennelsfort Road junction to provide at-grade pedestrian crossing facilities of the R148 dual carriageway, and to provide new cycling facilities along Kennelsfort Road Lower. Cyclist are directed along the Old Lucan Road and are linked to an existing shared footway / cycle track located on the north of the R148 at the start of the Chapelizod bypass.
- Between the Kennelsfort Road junction and the Con Colbert Road junction the EPR Option follows the existing R148 Palmerstown bypass and R148 Chapelizod bypass. Along this section the existing arrangement of a single bus lane and two general traffic lanes in both directions is maintained. The EPR Option includes new bus stops on the R148 Chapelizod bypass serving Chapelizod Hill Road. Some limited land take is required to facilitate these works.

5.3.3.2 Areas identified for Re-examination

Following the first Non-Statutory Public Consultation feedback and design updates, some submissions highlighted the lack of specific facilities for cyclists along the Old Lucan Road between the Kennelsfort Road and the start of the Chapelizod bypass. In particular, concern was raised about the speed of traffic along this section of carriageway.

Therefore, the standard of cycle track facilities along the section from Kennelsfort Road to start of the Chapelizod bypass was identified for re-examination, to be included as part of the re-examination identified in section 5.3.2.3.

5.3.4 Section 3 – R148 Con Colbert Road to City Centre

5.3.4.1 EPR Option

Following assessments undertaken as part of the Options Study Feasibility Report it was determined that the optimum route from Con Colbert Road to the City Centre (Frank Sherwin bridge) was as follows:

- From the Con Colbert Road junction, the EPR Option maintains continuous bus lanes, two general traffic lanes and cycle tracks in their current configuration, with cycle lanes on Memorial Road.
- The existing South Circular Road Junction is modified to accommodate additional bus lane and cycle track provision.

- Along St John's Road West, between the South Circular Road Junction and the junction into the Heuston South Quarter Development, the EPR Option maintains continuous bus lanes and general traffic lanes in their current configuration.
- Between the Heuston South Quarter junction and Victoria Quay the EPR Option includes one bus lane and one single general traffic lane on both inbound and outbound directions on St John's Road West, with new cycle tracks in both directions. This new arrangement requires the road to be widened into the existing central median.
- The existing taxi queuing lane at Heuston Station is retained with a cycle track located between the footway and the taxi queuing lane.
- The EPR Option ends at the junction with Victoria Quay at Frank Sherwin bridge.

5.3.4.2 Areas identified for Re-examination

Following the first Non-Statutory Public Consultation feedback and design updates, no areas were identified for re-examination in this section.

5.4 Summary of Review of Emerging Preferred Route Option

Following the review of the EPR Option, it is considered that all three sections are following the optimum routing, and that this should be taken forward as the Preferred Route Option (PRO).

As described above, there are two potential design amendments to elements of the EPR Option. Consideration has been given to the need for a further assessment to ascertain if they should be included in PRO.

These potential amendments are:

- i. Improvement in cyclist facilities from the Lucan Road at N4 Junction 3 to the start of the Chapelizod bypass. (Beyond this point the route of Primary Cycle Route 06 deviates from the route of the Proposed Scheme.) These facilities would be of an appropriate segregated standard (Level of Service (LOS) A) to serve as the Primary Cycle Route 06 included in the GDA Cycle Network Plan and SDCC County Development Plan;
- ii. Relocation of the existing bus stops at Liffey Valley Shopping Centre further west, with improved segregation from the existing carriageway and a new bridge over the N4 that links with the proposed bus interchange within Liffey Valley Shopping Centre to provide higher quality pedestrian facilities, and also provide an increased length for the buses to accelerate to negotiate the M50 interchange more safely;

While neither of these two potential proposals alter the route option, both involve significant additional infrastructure and investment. It is therefore considered that detailed assessments are warranted for these two items. The assessment of these two key potential changes are discussed in the following chapter.

5.5 Carbon Considerations for the Preferred Route Option

In the case of the Proposed Scheme, carbon arises from the three potential sources namely User Carbon, Capital Carbon and Operational Carbon.

- User Carbon is produced by cars, light and heavy goods vehicles and buses. The majority of the current bus fleet is combustion engine based but a programme to transition the fleet to electric vehicles is in place. The Climate Action Plan 2021 outlines a range of targets for the electrification of private and public service vehicles in the medium term;
- Capital Carbon is produced by road construction and is a necessary investment to reconfigure the roadway infrastructure to facilitate a shift to sustainable modes for the safe, efficient and reliable movement of people. The Proposed Scheme is designed to put the infrastructure in place to facilitate a long-term User Carbon footprint reduction; and
- The Operational Carbon arises from the operations along the route such as junction signals, street lighting and routine maintenance.

The Proposed Scheme will start with an increase in carbon (Capital Carbon) from the construction activities: a necessary investment to achieve the long-term decarbonisation outcomes by facilitating the following Scheme objectives:

- Enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements; and
- Support the delivery of an efficient, low carbon and climate resilient public transport service, which supports the achievement of Ireland's emission reduction targets.

The impacts of construction Capital Carbon were initially considered as part of the route options assessment process. Ultimately the Capital Carbon elements for the Proposed Scheme will be less than that of the User Carbon footprint and as such it was not considered to be a reasonable differentiator for the purposes of route options assessment. Although carbon was not directly assessed for the route options, each route option was assessed using a range of environmental factors including Noise and Air Quality which reflect similar contributory elements (i.e. construction and operational stage impacts) to that for carbon emissions.

Furthermore, the development of the preferred route option supports enhanced bus capacity and public transport potential in line with the objectives, which would contribute to reductions in user carbon and contribute towards the 500,000 additional trips by public transport by 2030 outlined as a target in the Climate Action Plan 2021.

In developing the PRO, consideration was given to the carbon generated by the Scheme during construction and operation. Many of the changes made to the scheme design since the EPR proposal have resulted in minor changes in the Construction Capital Carbon generated by the Proposed Scheme such as reducing lane widths to 3m, the altering of junction layouts, cycle tracks and footways. Additionally, significant design iterations were undertaken to mitigate against traffic re-distribution impacts and consequent impacts on greenhouse gas (GHG) emissions.

The preferred route proposals will improve bus journey times and reliability, which will contribute to achieving reductions in User Carbon through an efficient public transport service. This would in turn make the existing bus services more attractive to existing road users, and thereby encourage mode change from private car-based transport to more sustainable public transport commuting. Construction Capital Carbon has been considered and assessed as part of the evolving scheme design, and the preparation of the supporting Environmental Impact Assessment Report (EIAR) documentation.

6. Options Assessment

6.1 Introduction

As described in Section 5.4, following on from feedback to the first Non-Statutory Public Consultation, there are two areas to be re-examined during the development of the Preferred Route Option:

- Standard of cyclist facilities from the Lucan Road at N4 Junction 3 to the start of the Chapelizod bypass; and
- Relocation of the existing bus stops at Liffey Valley Shopping Centre further west.

As these two potential design amendments involve significant additional infrastructure and investment, it is considered that detailed assessments are warranted for these two items, and these are discussed below.

6.2 Standard of Cyclist Facilities: N4 Junction 3 (Ballyowen / Lucan) to start of Chapelizod bypass

6.2.1 Review of EPR Option

The section of the route over which the standard of cycle facilities are to be re-examined are shown in Figure 6-1 below.

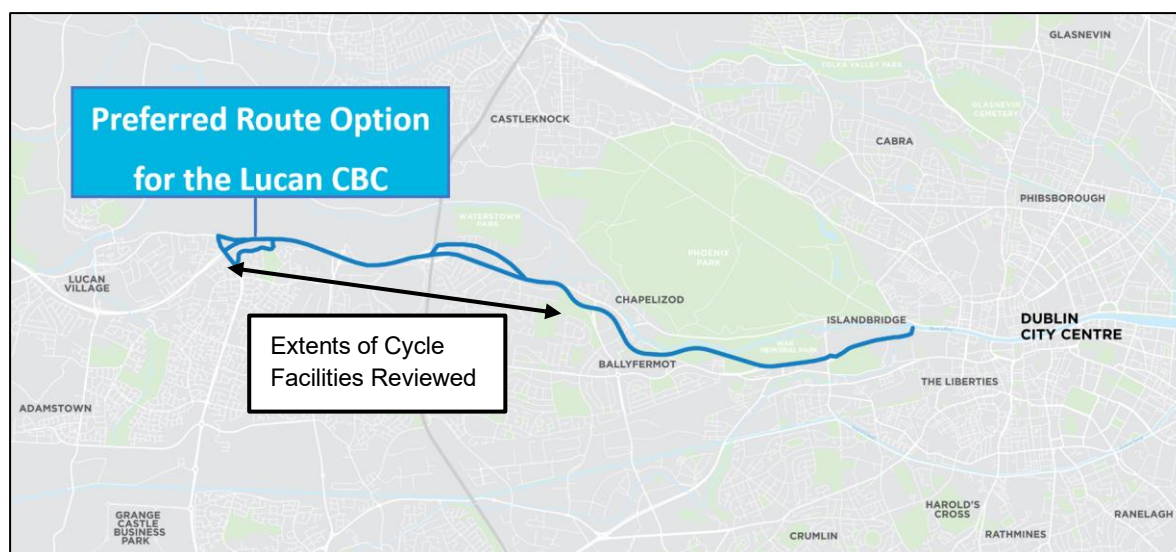


Figure 6-1 Section of Route for which Standard of Cycle Facilities to be Reviewed

As part of the re-examination, alternative proposals for the cycle facilities were developed that reflected the appropriate standard required for the Primary Cycle Route 06 and considered the concerns raised in response to the public consultation. The cycle facilities contained within the EPR Option and the cycle facilities included in the Alternative Option developed are described below.

6.2.2 EPR Option

Eastbound a one-way cycle track runs down the northern side of the R835 Lucan Road parallel to the bus lane and then follows the N4 Junction 3 entry slip running parallel to the bus lane on the existing shared footway / single cycle track. The cycle track then continues along the northern side of the N4 replacing the existing shared footway / single cycle track as far as the exit slip road at Junction 2.

The cycle track then follows the exit slip road running parallel to the bus lane on the existing shared footway / single cycle track, crossing over the R113 Fonthill Road and running down Old Lucan Road as a proposed Quiet Street. In the vicinity of the bus stop serving the Liffey Valley Shopping Centre there is an existing pedestrian / cyclist shared bridge over the N4. At this point there is also an existing

shared footway / cycle track link between the Old Lucan Road and the existing two-way segregated cycle track that then crosses the M50 via a shared pedestrian / cyclist over-bridge.

East of the M50 the cycle route continues along the Old Lucan Road as a proposed Quiet Street and runs through Palmerstown village to the start of the R148 Chapelizod bypass. Here it connects to the existing shared area running parallel to the R148, separated from the carriageway by a verge. At this point Primary Cycle Route 6 deviates from the CBC, continuing down the R112 Lucan Road towards Chapelizod village and the cycle facilities included in the EPR Option end.

Westbound, from the start of the Chapelizod bypass the route runs along the Old Lucan Road as a proposed Quiet Street through Palmerstown village to the shared pedestrian / cyclist bridge over the M50. From there the route follows the existing two-way segregated cycle track as far as the existing pedestrian / cyclist shared bridge over the N4. It then runs along Old Lucan Road as a proposed Quiet Street as far as the N4 Junction 2.

At the N4 Junction 2 the route makes use of the existing shared areas around the dumb-bell roundabouts to cross underneath the N4 and turn east up the shared area on the westbound off-slip, before doubling back to join the cycle track that runs along the N4 next to the bus lane on the main carriageway. Alternatively, from N4 Junction 2 cyclists can head further south on the R113 Fonthill towards the roundabout with St Loman's Road and then double back up the N4 westbound on-slip with general traffic to join the cycle track along the N4 running next to the bus lane on the main carriageway.

Once on the N4 east of Junction 2 cyclists would then make use of a single way cycle track along the N4, and land acquisition will be required from two residential properties over this section. Either side of Ballyowen Lane a 270m length of shared area is proposed for cyclists and pedestrians and then the cycle route makes use of an existing cycle lane on the westbound off-slip road on the approach to the N4 Junction 3.

At the signalised junction with the R136 Ballyowen Road at the western end of the slip road, the cycle lane is located between the left-hand turn and straight-ahead lane. The westbound off-slip road will require widening to allow the planned works to take place which includes land acquisition from thirteen private residences and one commercial property. In addition to the land acquisition there would also be a requirement to remove a number of mature trees to facilitate the widening.

6.2.3 Alternative Option Considered

In developing an alternative option, reference was made to the NTA's National Cycle Manual, which sets out the requirements for the design of cycle facilities in Ireland. It offers guidance on five basic requirements:

- i. Road Safety - Designers of transport infrastructure must seek to maximise road safety for all road users, including cyclists. All networks should include measures that are proven to be safe and that the cyclist believes to be safe. Any perception of a lack of safety could be a deterrent to cycling;
- ii. Coherence - The cycling network should link all main origin and destination zones / centres for cyclists. A well-targeted cycle network should carry the majority of cycle traffic (in cycle-km terms). Cycling routes within the network should be logical and continuous. Delays, detours, gaps or interruptions should be avoided. Markings and signage should be clear and consistent;
- iii. Directness - Cycling infrastructure should be as direct as possible, minimising any delays or detours. A well-designed urban cycle network should confer an advantage in terms of average distance or journey time when compared with other transport networks;
- iv. Attractiveness - The cycling environment along a route should be pleasant and interesting. This is particularly important for beginners, tourists and recreational cyclists. Monotony and exposure to the elements are unattractive to cyclists, as are litter, uncontrolled animals and poorly maintained environments; and
- v. Comfort - Cycling infrastructure should be designed, built and maintained for ease of use and for comfort. This is particularly important for beginners, tourists and recreational cyclists. Anything that causes discomfort or delay, or requires a disproportionate amount of effort, is likely to result in the cycling facility not being used. Improved cycling comfort can be achieved through providing effective width for cycling links; well-drained high-quality surfacing; improving shelter; minimising stopping, delays, detours etc.

Reference was also made to the Preliminary Design Guidance Booklet (PGBD) for BusConnects Core Bus Corridors, which sets out the desirable minimum width for a two-way cycle track is 3.25m. In addition to this, a desirable minimum buffer of 0.5m, with an absolute minimum of 0.3m, should be provided between the two-way cycle track and the carriageway. The PDGB also notes that a reduction of these desirable minimum widths can be considered on a case-by-case basis by reference to the National Cycle Manual Width Calculator which provides a simplified means of determining the width required for cycle lanes and tracks, as shown in Figure 6-2.

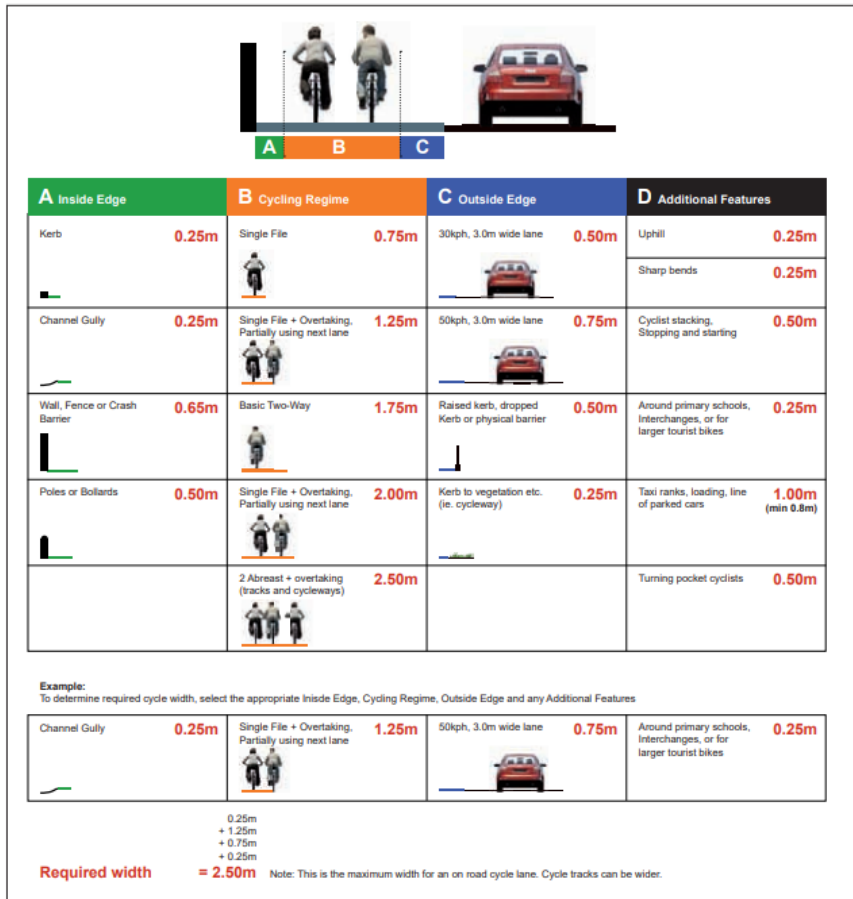


Figure 6-2 National Cycle Manual Width Calculator

The above requirements were considered in tandem with the GDA Cycle Network Plan, as described in Sections 2.2 and 4.4 above. It was concluded that there was a need for significantly improved cyclist facilities over this section of the route compared to those included in the Emerging Preferred Route Option identified in the Lucan to City Centre Core Bus Corridor Options Study Feasibility Report.

It was noted that east of N4 Junction 2 the Primary Cycle Route 06 is located on the northern side of the N4 / R148 and follows the Old Lucan Road either side of the M50 to the start of the Chapelizod bypass east of Palmerstown village, where it would connect to the existing shared facility. Over this length there was potential for the route to be provided by a segregated two-way cycle track by re-allocating road space within the existing width of the Old Lucan Road.

With the route fixed on the northern side of the N4 / R148 over this section, the potential for a continuation of a similar standard of cycle provision between N4 Junction 3 and Junction 2 on the northern side of the N4 was considered. This facility would be located on the north side of the Lucan Road and the N4 as far as Junction 2, requiring land acquisition from the adjacent green space, Hermitage Golf Club and Hermitage Medical Clinic.

Consideration was also given to the provision of a segregated two-way cycle track on the south side of the N4 for the full length between Junctions 3 and Junction 2. This was discounted as the layout of the N4 Junction 2 did not allow for a direct and attractive connection and significant land acquisition would be required in excess of that required for the Emerging Preferred Route, including direct impacts on over 20 residential properties and two commercial properties. However, with access provided to the south side of the N4 via the existing shared pedestrian and cyclist bridge just west of the access to St

Loman's Hospital, a Quiet Street along Hermitage Road was identified as a potential option to enhance the connectivity to the adjacent residential areas.

As a result, a concept alternative option was developed for a two-way cycle track, as shown in Figure 6-3.

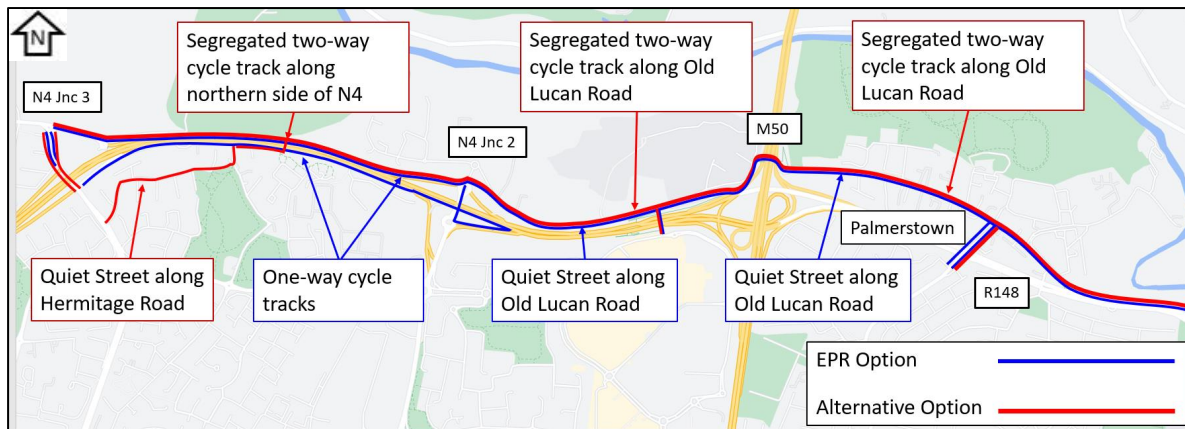


Figure 6-3 Alternative Option for Cycle Facilities

Starting at the commencement of the Proposed Scheme, at Junction 3 of the N4, new cycle facilities are provided in each direction along R136 Ballyowen Road, from the R835 Lucan Road junction and across the N4 bridge, this road being part of Secondary Cycle Route SO6.

In an easterly direction a two-way cycle track runs along the northern side of the R835 Lucan Road as far as the roundabout accessing the Lucan Retail Park. This requires land acquisition from the adjacent green space.

From the roundabout the cycle route then runs along the public access road towards the entrance to the Hermitage Golf Club. From there a two-way cycle track is provided adjacent to the existing N4 dual carriageway along the southern edge of the golf club and the Hermitage Medical Clinic lands. This requires the acquisition of a strip of land from the Hermitage Golf Club and the Hermitage Medical Clinic.

The two-way cycle track then continues along the edge of the eastbound off-slip at Junction 2 of the N4 and crosses the road via a new signalised crossing, connecting to the existing shared areas around the dumb-bell roundabouts to allow cyclist to cross underneath the N4 and join the R113 Fonthill Road.

East of the N4 Junction 2 the option continues as a segregated two-way cycle facility along the south side of Old Lucan Road. No land acquisition would be required over this section with existing road space re-allocated. The two-way cycle track links to the existing pedestrian / cyclist bridge crossing of the N4 that connects to the Liffey Valley Shopping Centre and then follows the existing two-way cycle track before making use of the existing pedestrian / cyclist bridge crossing of the M50.

East of the M50 the alternative option continues as a segregated two-way cycle facility along the northern side of Old Lucan Road, running through Palmerstown village before connecting to the existing shared pedestrian priority zone at the start of the Chapelizod bypass. No land acquisition is required over this section with existing road space re-allocated.

Within Palmerstown village a two-way segregated cycle track runs along the eastern side of Kennelsfort Road Lower, with a signalised crossing of the R148 Palmerstown bypass, and the two-way cycle track continues along Kennelsfort Road Upper before connecting with existing cycle lanes via another signalised crossing.

At the start of the Chapelizod bypass Primary Cycle Route 06 deviates from the route of the CBC and continues down the R112 towards Chapelizod village. As with the EPR Option, the remaining section of the route to the city centre would be developed separately and is not part of the Proposed Scheme.

For cyclists heading in a westerly direction, the two-way cycle-track described above provides a direct route from the R112 Lucan Road in Chapelizod to the R835 Lucan Road / R136 Ballyowen Road junction at Junction 3 of the N4. In addition, cyclists are able to avail of the following connections to the cycle network and residential areas on the south side of the R148 and N4 dual carriageways:

- Two-way segregated cycle track along Kennelsfort Road, Lower and Upper;

- Existing pedestrian / cyclist bridge over the N4 at Liffey Valley Shopping Centre;
- Existing shared areas at N4 Junction 2 along R113 Fonthill Road;
- Existing pedestrian / cyclist bridge over the N4 at Mount Andrew / Ballyowen Lane; and
- Existing and proposed cycle tracks along R136 Ballyowen Road between the R835 Lucan Road at N4 junction 3 and Hermitage Road.

In addition, the existing shared areas on the south side of the N4 / parallel service road are maintained between the access to St Loman's Hospital and Ballyowen Lane, which includes connections to the existing pedestrian / cyclist bridge over the N4 at Mount Andrew. A Quiet Street is proposed to provide a link between Ballyowen Lane and the R136 Ballyowen Road via a short connection through Hermitage Park and Hermitage Road. In addition, the existing westbound cycle lane would be maintained on the service road between Ballyowen Lane and the Foxhunter public house.

6.2.4 Additional Sub-options Considered

In response to the third round of public consultation on the draft Preferred Route Option, concerns were raised by the Hermitage Golf Club in respect of the impact of the two-way cycle track on their existing boundary with the N4, in particular the number of trees that would be lost. A suggestion was made that the two-way cycle track should be located on the south side of the N4 between Junction 3 (R136 Ballyowen Road) and the existing pedestrian / cyclist bridge crossing the N4 immediately east of the golf club lands and west of the access to St Loman's Hospital.

Although consideration had been given to locating the two-way cycle track on the southern side of the N4 between Junctions 3 and 2 when the proposals for the alternative option were developed, this suggested further sub-option was not considered at that time.

The sub-option, with the two-way cycle track on the south side of the westbound off-slip of the N4 at Junction 3 and connecting to the draft Preferred Route Option proposals on the north side of the N4 east of the golf club is shown in blue in Figure 6-4 below.

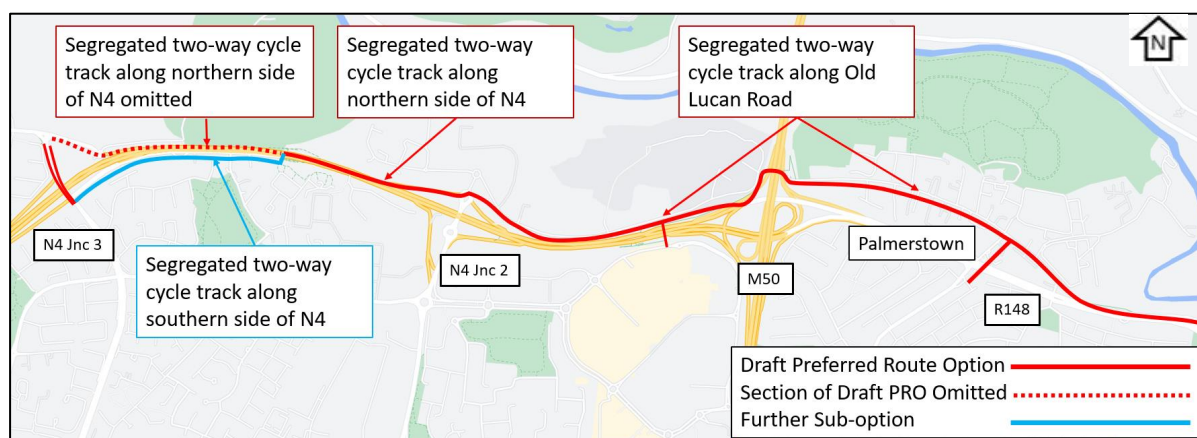


Figure 6-4 Further Sub-option for Cycle Facilities

Consideration was also given to a further sub-option suggested where the existing bus lane, or one of the general traffic lanes, is removed to accommodate the two-way cycle track within the existing road reservation. Removal of the bus lane would be directly contrary to the scheme objectives and was discounted. As regards the possible removal of a general traffic lane, the existing N4 has three general traffic lanes in each direction between Junction 5 at Leixlip and the M50. Future year traffic forecasts with the Preferred Route Option in place indicate that three lanes for general traffic will be required to provide the appropriate capacity along the route. Any reduction to two lanes, either locally or over a greater length, would result in a bottleneck which would lead to road safety issues associated with slow and queuing traffic. Therefore, the removal of one of the general traffic lanes was also discounted on the grounds of road traffic demand and safety.

6.2.5 Options Assessment

6.2.5.1 Operational Assessment of Alternative Option and Sub-option

When compared to the EPR option, the alternative option provides a significant improvement against each of the five key requirements described in the National Cycle Manual. The alternative provides a continuous fully segregated two-way facility that offers a significant improvement in terms of road safety, by taking cyclists offline, as well as improving safety for pedestrians by reducing shared spaces. Locating the two-way cycle track on the northside of the N4 reduces the number of intersections with junctions and accesses to private properties. This increases the safety of the cyclists using facilities along the route. The Emerging Preferred Route Option intersected with twelve private accesses and junctions between N4 junction 2 and Junction 3, compared to just two in the alternative option.

The alternative option provides all the necessary components of the GDA Cycling Strategy in this area, as well as introducing a new link between Ballyowen Lane and R136 Ballyowen Road, providing a coherent network that links all main origin and destination zones / centres for cyclists, with minimal detours and interruptions minimised. This is a significant improvement on the EPR proposals which contains detours and gaps in the westbound direction.

The alternative option provides a significantly more direct route for westbound cyclists than the EPR proposals and also provides for several links from areas south of the N4 and R148 facilitating a more direct route for eastbound cyclists from those areas. The proposals will reduce journey times for cyclists using the route by reducing the stop-start nature of that the EPR proposals, which was raised as an issue at the first Non-Statutory Public Consultation. The introduction of a segregated two-way cycle track will eliminate the need for cyclists to use the shared area at Junction 2 of the N4 in the westbound direction.

Overall, it is considered that the alternative proposals would provide a more attractive and comfortable route to the EPR proposals as cyclists using the route will no longer be cycling directly next to traffic lanes of the N4 dual carriageway west of the M50, and will not have to negotiate parked cars and traffic along Old Lucan Road east of the M50.

When the sub-option is compared to the EPR option it also provides a significant improvement as the majority of its length is unchanged from the alternative option. However, when the sub-option is compared to the alternative option the alignment of Primary Cycle Route 6 would be less direct and attractive to users from Lucan and the N4 further west, with the added need to traverse the existing pedestrian / cyclist bridge over the N4 to the west of the access to St Loman's Hospital. Furthermore, this bridge is not of sufficient width to provide segregated facilities and would require a new parallel cyclist bridge for the two-way cycle track.

6.2.5.2 Multi-Criteria Assessment

A multi-criteria assessment in accordance with the 'Common Appraisal Framework (CAF) for Transport Projects and Programmes' published by the Department of Transport, Tourism and Sport (DTTAS) has been undertaken, and the CAF assessment criteria and sub-criteria are shown in Table 6-1.

Table 6-1 Assessment Criteria

Assessment Criteria	Assessment Sub-Criteria
1. Economy	1.a. Capital Cost
	1.b. Transport Reliability and Quality of Service
2. Integration	2.a. Land Use Integration
	2.b. Residential, Employment and Educational Catchments
	2.c. Transport Network Integration
	2.d. Cycle Integration
	3.a. Key Trip Attractors

Assessment Criteria	Assessment Sub-Criteria
3. Accessibility & Social Inclusion	3.b. Deprived Geographic Areas
4. Safety	4.a. Road User Safety
	4.b. Pedestrian Safety
5. Environment	5.a. Archaeology, Architectural and Cultural Heritage
	5.b. Flora & Fauna
	5.c. Soils and Geology
	5.d. Hydrology
	5.e. Landscape and Visual
	5.f. Air Quality
	5.g. Noise & Vibration
	5.h. Land Use Character

A summary of the assessment against each of the 5 criteria is provided below.

Economy

In economic terms, although the alternative option requires significantly more land take than the EPR Option, it reduces the number of commercial and residential properties impacted. This was a key concern highlighted at the first Non-Statutory Public Consultation as several submissions expressed the view that it would impact their property values. None the less the alternative proposals would have a significantly higher capital cost than the EPR proposals. However, the economic benefits of the improved transport reliability and quality provided by the alternative proposals would be significantly greater than the EPR proposals.

The sub-option requires the existing westbound service road and N4 Junction 3 off-slip to be widened on the southern side over its full length to accommodate the two-way cycle track. This requires the removal of a significant line of mature trees that will impact the rear gardens of 21 residential properties adjacent to the N4 westbound off-slip, including land acquisition from 16 of these properties. In addition, land take is required from a further seven residential properties and two commercial properties adjacent to the westbound service road either side of Ballyowen Lane.

Integration

From an integration perspective, there is no significant difference between the three options in terms of land use integration and overall catchments areas. However, compared to the EPR proposals, the alternative option and sub-option provide some advantages in integrating with the transport network by providing fully segregated cyclist facilities. The alternative option also offers significant advantages over the EPR proposals in terms of integration with the cycle network in terms of meeting the five key requirements of the NCM, as described above. The sub-option also offers advantages over the EPR proposals but is less favourable than the alternative option.

Accessibility and Social Inclusion

The alternative option provides some advantages over the EPR proposals in relation to accessibility and social inclusion associated with key trip attractors. The sub-option also offers advantages over the EPR proposals but is less favourable than the alternative option.

Safety

As described above, the alternative option provides significant advantages over the EPR proposals in term of road safety. The alternative option provides a far safer environment for cyclists travelling along the N4 and there would be significantly less interactions with junctions and accesses. The sub-option also offers advantages over the EPR proposals but is less favourable than the alternative option.

Environment

In relation to the environment, there is no appreciable difference between the options in terms of archaeology, cultural heritage, architectural heritage, soils / geology, hydrology, air, noise and land use character.

However, the alternative option will have a significant impact on trees and hedgerows along the northern boundary of the N4 between Junction 3 and Junction 2, including the need to remove a large number of trees along the southern edge of the Hermitage Golf Club, whereas the EPR Option has no such comparable impact.

The EPR proposals would however have some impact on the trees along the southern boundary of the N4 westbound off-slip at Junction 3 to the rear of residential properties on Hermitage Garden, and to the boundaries of two residential properties east of Ballyowen Lane.

The sub-option requires the removal of a significant line of mature trees that will impact the rear gardens of 21 residential properties adjacent to the N4 westbound off-slip, including land acquisition from 16 of these properties. In addition, land take and associated tree loss is required from a further seven residential properties and two commercial properties adjacent to the westbound service road either side of Ballyowen Lane.

The alternative option would have some disadvantages over the EPR proposals from the perspective of landscape and visual impact given the significant road widening resulting in the replacement of existing boundaries and planting along the northern side of the N4 between Junctions 3 and 2. The sub-option also has some disadvantages over the EPR proposals and is comparable to the alternative option in respect of environmental impact.

Assessment Ranking

The rankings for each of the criteria are shown in Table 6-2 below. Details of the assessment are presented in Appendix D and summarised in Table 6-3 below.

Table 6-2: Assessment Ranking

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

Table 6-3: Assessment Summary

Assessment Criteria	EPR Option	Alternative Option	Alternative Sub-option
Economy			
Integration			
Accessibility & Social Inclusion			
Safety			
Environment			
Overall			

Summary of Assessment

Although the alternative option has a higher capital cost and greater adverse impact on existing trees and hedgerows (which would be replanted) than the EPR Option, there would be significant advantages in transport reliability and quality, as well as improved integration, accessibility and, in particular, significantly improved safety in comparison to the EPR Option.

When compared to the sub-option, the alternative option has significantly less adverse impact on property and comparable amount of tree loss associated. It also provides better integration, accessibility and safety.

Overall, the alternative option will provide a significantly improved cycle facility for the Primary Cycle Route 06, along with better connectivity to the wider cycle network. The provision of this segregated two-way cycle track in the draft Preferred Route Option represents a key change to the Emerging PRO. It has been determined that the alternative option offers the optimum proposal for the cycle facilities.

6.2.6 Conclusion and Preferred Route Option

In conclusion, the Preferred Route Option for the cyclist facilities will be the alternative option described in Section 6.2.3. As stated, it will provide a significantly improved cycle facility for the Primary Cycle Route 06, along with better connectivity to the wider cycle network.

The provision of this segregated two-way cycle track in the Preferred Route Option represents a key change to the Emerging PRO.

6.3 N4 Junction 2 to M50: Bus Stops at Liffey Valley Shopping Centre

6.3.1 Review of EPR Option

The EPR Option proposals maintained the existing arrangement and provision at this location with no changes proposed.

In the eastbound direction a single length bus layby is provided, with a ramped access to the shared pedestrian / cyclist bridge over the N4 dual carriageway connecting to the Liffey Valley Shopping Centre site. For buses leaving the stop and heading towards the R148 and the city centre there is a very short length for them to accelerate and negotiate with N4 traffic that is heading towards the M50 northbound, with a significant speed differential between the two movements.

In the westbound direction there is a similar provision of a single length bus layby, with a ramped pedestrian access to the shared pedestrian / cyclist bridge over the N4 dual carriageway. For buses entering this stop there is a very short length for them to accelerate and negotiate with N4 traffic that has come from the M50 northbound.

Figure 6-5 shows the EPR Option.

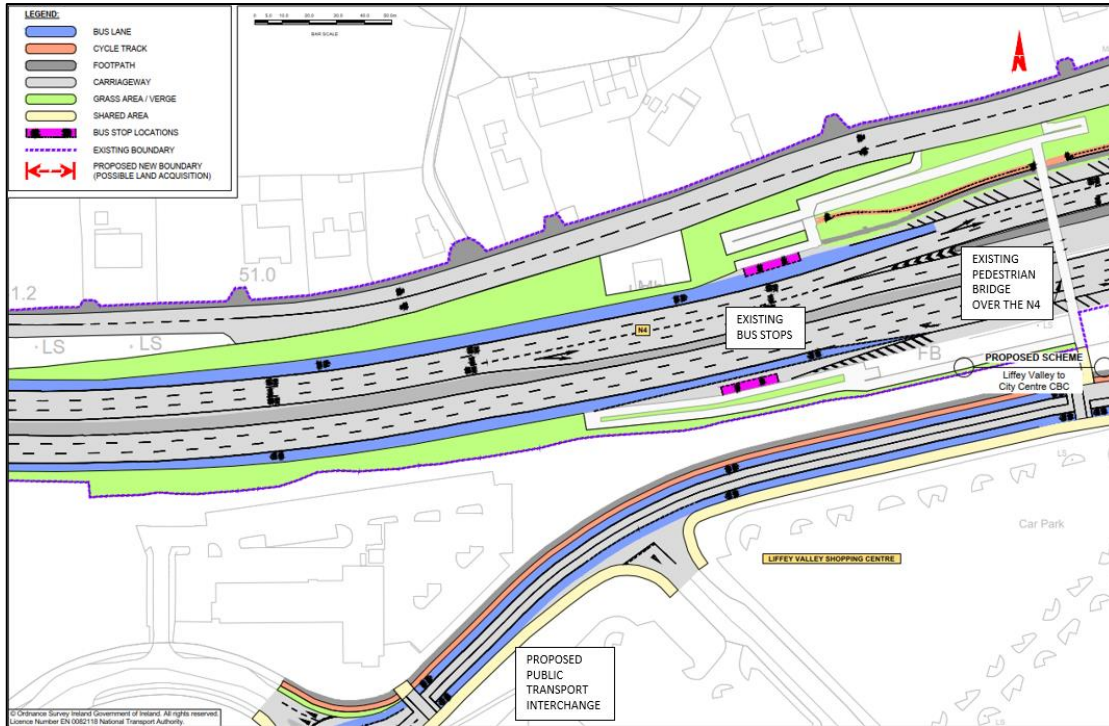


Figure 6-5 EPR Option - Liffey Valley Bus Stops

6.3.3 Alternative Option

The alternative proposals developed are shown in Figure 6-6.

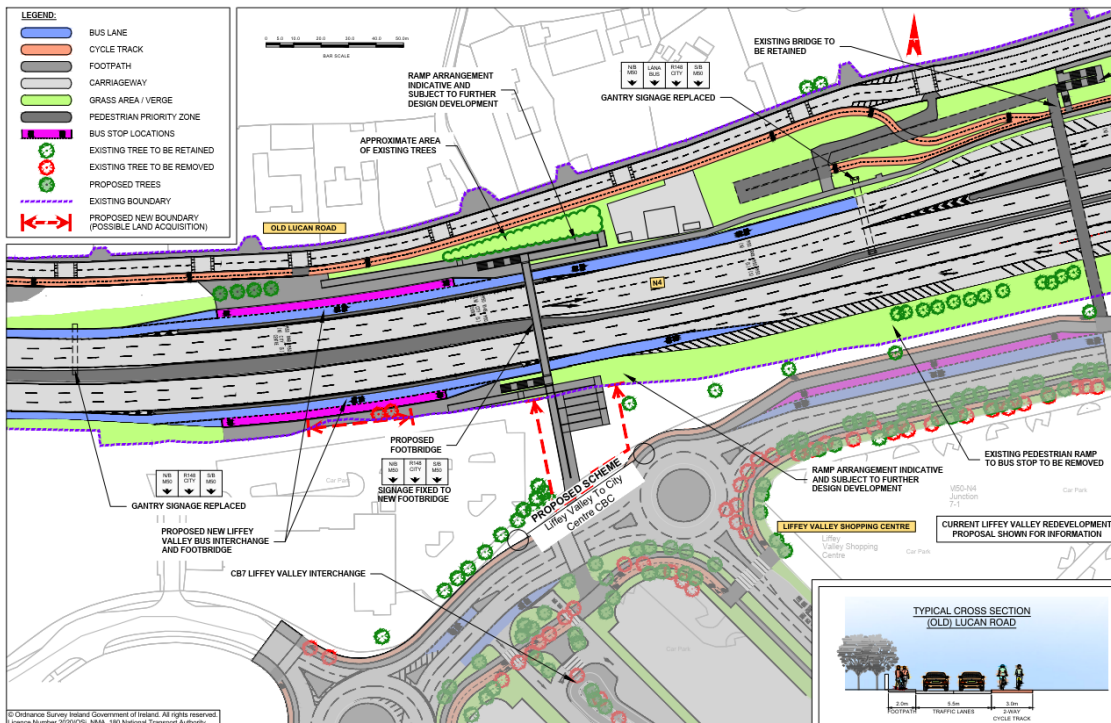


Figure 6-6 Alternative Option - Liffey Valley Shopping Centre Bus Stops

These alternative proposals relocate the existing bus stops some 200m further west, with segregation from the existing carriageway. In addition, a significant increase in length was provided to allow multiple buses to use the bus stop at the same time, in recognition of the future use of the stops by longer distance regional and national bus services as well as local Dublin bus services. In order to provide an enhanced connection to the proposed public transport interchange within the shopping centre site, a new pedestrian bridge is proposed over the N4, with associated ramps and steps.

These alternative proposals provide a significantly improved level of pedestrian facilities compared to the EPR Option. Furthermore, the alternative arrangements provide increased lengths for buses to accelerate and weave with eastbound traffic approaching the M50 interchange, and also an increased weaving length for all westbound traffic exiting the M50 interchange.

6.3.4 Options Assessment

A multi-criteria assessment in accordance with the 'Common Appraisal Framework (CAF) for Transport Projects and Programmes' published by the Department of Transport, Tourism and Sport (DTTAS) has been undertaken, and the CAF assessment criteria and sub-criteria are shown in Table 6-4.

Table 6-4 Assessment Criteria

Assessment Criteria	Assessment Sub-Criteria
1. Economy	1.a. Capital Cost
	1.b. Transport Reliability and Quality of Service
2. Integration	2.a. Land Use Integration
	2.b. Residential, Employment and Educational Catchments
	2.c. Transport Network Integration
	2.d. Cycle Integration
3. Accessibility & Social Inclusion	3.a. Key Trip Attractors
	3.b. Deprived Geographic Areas
4. Safety	4.a. Road User Safety
	4.b. Pedestrian Safety
5. Environment	5.a. Archaeology, Architectural and Cultural Heritage
	5.b. Flora & Fauna
	5.c. Soils and Geology
	5.d. Hydrology
	5.e. Landscape and Visual
	5.f. Air Quality
	5.g. Noise & Vibration
	5.h. Land Use Character

A summary of the assessment against each of the 5 criteria is provided below.

Overall, the alternative proposals have a number of advantages over the EPR Option. Primarily, these centre around the improved integration with policy and the wider BusConnects proposals, associated with the connection to the Liffey Valley transport interchange. In essence, the EPR Option will not achieve the necessary standard required at this important transport node. The additional capital investment associated with the alternative proposals is offset by a greater reliability and quality of transport provision.

The alternative option also provides improved operational benefits associated with the enhanced bus stop layouts and an increased length for buses to accelerate and weave with eastbound traffic approaching the M50 interchange. It also provides an increased weaving length for all westbound traffic exiting the M50 interchange. The alternative proposals provide significant advantages over the EPR option in this respect.

The alternative proposal would result in a small number of trees being lost by the construction of the new ramps and bus stop on the northern side of the N4, adjacent to Old Lucan Road. However, this is

not considered significant in the overall environmental assessment, with opportunities for replanting / new landscaping proposals at this location.

Assessment Ranking

The rankings for each of the criteria are shown in Table 6-5 below. Details of the assessment are presented in Appendix E and summarised in Table 6-6 below.

Table 6-5: Assessment Ranking

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

Table 6-6: Assessment Summary

Assessment Criteria	EPR Option	Alternative Option
Economy		
Integration		
Accessibility & Social Inclusion		
Safety		
Environment		
Overall		

6.3.5 Conclusion and Preferred Route Option

In conclusion the Preferred Route Option for the bus stops serving the Liffey Valley Shopping Centre and public transport interchange will be the alternative option, as despite the higher capital cost, there would be significant advantages in transport reliability and quality, as well as it being more advantageous through improved integration, accessibility and, in particular, significantly improved safety in comparison to the Emerging Preferred Route Option.

The provision of these revised bus stop arrangements in the Preferred Route Option represents a material change to the Emerging Preferred Route Option.

7. Preferred Route Option

7.1 Introduction

This chapter of the report presents and describes the PRO identified and the PRO scheme design for the Proposed Scheme. The updated concept scheme design drawings are included in Appendix A of this report.

7.2 Preferred Route Option Scheme Design Description

7.2.1 Scheme Design Description Overview

The Proposed Scheme between Lucan and the city centre is 9.6km as shown below in Figure 7-1. The Proposed Scheme commences at Junction 3 on the N4 and is routed via the N4 as far as Junction 7 (M50), and via the R148 along the Palmerstown bypass, Chapelizod bypass, Con Colbert Road and St John's Road West as far as Frank Sherwin Bridge, where it will join the prevailing traffic management regime on the South Quays.



Figure 7-1 Lucan to City Centre Core Bus Corridor Scheme

The following sections outline a more detailed description of the Preferred Route Option design, which has three distinct sections as follows:

- 1) Section 1 - N4 Junction 3 to M50 Junction 7 – N4 Lucan Road;
- 2) Section 2 - M50 Junction 7 to R148 Con Colbert Road – Palmerstown bypass and Chapelizod bypass; and
- 3) Section 3 - R148 Con Colbert Road to City Centre (Frank Sherwin bridge) – Con Colbert Road and St John's Road West

7.2.2 Section 1: N4 Junction 3 to M50 Junction 7 – N4 Lucan Road

The Preferred Route Option commences at Junction 3 on the N4 Lucan Road / Lucan Bypass where the C-Spine route terminates before splitting to branch routes, and includes modifications to the various component parts of this junction. The Proposed Scheme includes a two-way segregated cycle track on the east side of the R136 Ballyowen Road between R835 Lucan Road and Hermitage Road, including a new pedestrian and cycle bridge across the N4. This represents a change from the EPR Option published in November 2018, where the existing lane arrangement on the R136 Ballyowen Road bridge over the N4 was maintained, and a change from the draft Preferred Route Option published in November 2020, which proposed to include cycle lanes in each direction in lieu of the right turning lane for the N4 westbound on-slip.

At the R136 Ballyowen Road junction with the R835 Lucan Road, the layout has been modified from that shown in the EPR Option to remove the left-turn slip lanes. As a result, there is no longer a requirement for the land acquisition from the Woodville Lawn estate that was identified in the EPR Option.

Also at the R136 Ballyowen Road junction with the R835 Lucan Road, the location of the existing eastbound bus stop on the R835 Lucan Road will be moved closer to the junction and will also be increased in length. A continuous bus lane is proposed along the R835 Lucan Road to the roundabout serving the Lucan Retail Park and also on the N4 Lucan Road eastbound on-slip. A segregated two-way cycle track is proposed on the northern side of the R835 Lucan Road which will require land acquisition from the adjacent green space, as was the case with the EPR Option.

Over the full length of the N4 Lucan Road over this section of the Proposed Scheme the existing continuous eastbound and westbound bus lanes will be maintained, with no change to the number of existing general traffic lanes. In addition, the bus lane on the westbound service road Junction 3 will be extended to ensure bus priority is provided on the approach to the junction with R136 Ballyowen Road at the top of the slip road. A small area of land acquisition will be required from the site of the former Foxhunter public house to facilitate this extended bus lane.

The Proposed Scheme will provide a significant improvement to the bus stop provision in the vicinity of the Liffey Valley Shopping Centre (LVSC). The bus stops themselves will be moved some 150m further west, increased in length and bus laybys are proposed, segregated from the adjacent N4 Lucan Road carriageway. A small strip of land acquisition will be required on the southern side of the N4 adjacent to the car park of the Liffey Valley Office Campus to facilitate the new outbound bus stop arrangement. This represents a significant change from the EPR Option,

To better serve the increased bus stop capacity a new pedestrian only bridge is proposed adjacent to the new bus stop locations, some 200m further west from the existing foot / cycle bridge, which will be retained. The position of this new bridge will align with the proposed public transport interchange within the shopping centre site. A small piece of land acquisition will be required from the green area adjacent to the shopping centre for the provision of the ramps leading to the new footbridge.

On the M50 junction it is proposed to provide two general traffic lanes and a continuous bus lane in both directions through the junction which is unchanged from the EPR Option. On the N4 Lucan Road eastbound approach a change to the lane designation is proposed to separate earlier the general traffic heading towards the M50 northbound and the R148 Palmerstown bypass. The relocation of the bus stops for LVSC will allow for an increased length to accelerate and negotiate with traffic for all eastbound traffic approaching the M50 interchange, and also for all westbound traffic exiting the M50 interchange.

To provide a continuous facility for the Primary Cycle Route 6 as identified in the GDA Cycle Network Plan, from the roundabout serving the Lucan Retail Park, facilities for cyclists will initially comprise a Quiet Street along the public road providing access to the Hermitage Golf Club.

On the northern side of the N4 between the entrance to the Hermitage Golf Club and Junction 2 of the N4 a segregated two-way cycle track is included in the Proposed Scheme. Land acquisition will be required from the Hermitage Golf Club to provide this cycle track which will connect with the existing foot / cycle bridge over the N4 adjacent to the Mount Andrew estate / St Loman's Hospital access. 15m high temporary sports netting is proposed adjacent to the relocated boundary for 130m stretch opposite Ballyowen Lane, to allow establishment of infill planting to the roadside boundary and southern edge of the fairway. Eastwards of this location the two-way cycle track continues on the north side of the N4 and will require land acquisition from the Hermitage Medical Clinic. The two-way cycle track will then

run along the north side of the eastbound off-slip at Junction 2. This represents a change from the EPR Option which primarily retained the existing one-way cycle lanes in each direction.

From Junction 2 of the N4 the segregated two-way cycle track will be located along the south side of the Old Lucan Road before connecting to the foot / cycle bridge that crosses the M50. This represents a change from the EPR Option which provided a Quiet Street along the Old Lucan Road. In the Proposed Scheme, the cycle track will be accommodated within the existing road space and a 30km/hr speed limit will be placed on the Old Lucan Road, which will be narrowed, and traffic calmed to reflect the existing 30km/hr speed limit.

On the south side of the N4 a pedestrian priority zone is provided between Ballyowen Lane and the existing foot / cycle bridge over the N4 adjacent to the Mount Andrew estate. From Ballyowen Lane a Quiet Street is proposed along Hermitage Road to the R136 Ballyowen Road. The provision of the two-way segregated cycle track along the northern side of the N4 and the Quiet Street along Hermitage Road avoids the need for a segregated one-way cycle track on the southern side of the N4, as well as along the westbound off-slip at Junction 3. As a result, there is no longer a requirement for land acquisition that was included in the EPR Option along the vast majority of the southern boundary of the N4 between Junctions 3 and 2.

7.2.3 Section 2: M50 Junction 7 to R148 Con Colbert Road – R148 Palmerstown bypass and Chapelizod bypass

Between the M50 junction and Kennelsfort Road junction, it is proposed to maintain a bus lane and two general traffic lanes in the eastbound direction, which is unchanged from the EPR Option. In the westbound direction, a bus lane and two general traffic lanes are proposed, with the lane designation to be amended to separate earlier the general traffic heading towards the M50 and the N4 Lucan Road westbound. This arrangement will allow for a continuous westbound bus lane from the Kennelsfort Road junction and through the M50 interchange.

On the R148 Palmerstown bypass modifications are proposed to both the Kennelsfort Road and the Old Lucan Road / The Oval junctions to remove the existing left turn slip lanes. In addition, the left turn movement from Kennelsfort Road Lower to the R148 Palmerstown bypass eastbound is to be prohibited to facilitate new signalised crossings on the east side of the Kennelsfort Road junction to serve pedestrian demand and cater for the proposed two-way cycle track that crosses the R148 Palmerstown bypass at this location.

In addition, at the signalised junction of the R148 with the Old Lucan Road / The Oval a new westbound, bus only, right turn lane is proposed on the R148 Palmerstown bypass to facilitate new bus services through Palmerstown village. A small area of land acquisition will be required from the western edge of the petrol filling station at this location to accommodate this new bus movement. These junction modifications represent changes to the EPR Option.

The existing bus stops on the R148 Palmerstown bypass at Kennelsfort Road and The Oval are proposed to be lengthened and relocated to allow the provision of a bus layby in all cases. In addition, it is proposed to rationalise the bus stops within Palmerstown village with new bus stops provided on the Old Lucan Road immediately west of the junction with Mill Lane.

Between the junction with The Oval and the R833 Con Colbert Road junction, it is proposed to maintain a continuous bus lane and two general traffic lanes in each direction, as per the existing arrangement. The existing bus lane and public transport signals on the westbound on-slip from the R112 Kylemore Road will be retained. The Proposed Scheme includes laybys for these new bus stops, and they will be connected to Chapelizod Hill Road via a combination of steps and ramps. This represents a change from the EPR Option which included a new at-grade signalised crossing of the R148 Chapelizod bypass at this location. Additionally, the speed limit for the bus lanes along the full length of the R148 Chapelizod bypass will be reduced from 80km/hr to 60km/hr.

A segregated two-way cycle track is proposed to run along the north side of the Old Lucan Road from the foot / cycle bridge crossing the M50, all the way through Palmerstown village connecting to the existing pedestrian priority zone at the start of the R148 Chapelizod bypass. This represents a change

to the EPR Option which provided a Quiet Street along the full length of the Old Lucan Road. A new Toucan crossing is also proposed on the R112 Lucan Road on the approach to Chapelizod village.

The Proposed Scheme includes a new segregated two-way cycle track along the east side of Kennelsfort Road Lower before crossing the R148 Palmerstown bypass via a new signalised crossing on the east side of the junction described above. This two-way cycle track will connect to a new Toucan Crossing on Kennelsfort Road Upper. This is a change from the EPR Option which provided one-way cycle tracks in each direction along Kennelsfort Road. The Proposed Scheme will require a small area of land acquisition from the frontage of the Palmerstown Lodge hotel, similar to that required for the EPR Option.

7.2.4 Section 3: R148 Con Colbert Road to City Centre (Frank Sherwin bridge) – Con Colbert Road and St John’s Road West

At the R833 Con Colbert Road junction with the R148 Chapelizod bypass the existing left turn slip lane from R833 Con Colbert Road will be removed and a segregated cycle track is proposed in each direction. Between the Con Colbert Road junction and the R111 South Circular Road junction the existing continuous bus lanes and two general traffic lanes are maintained and narrowed slightly to facilitate the introduction of a segregated cycle track in each direction, which is unchanged from the EPR Option.

In the Proposed Scheme, at the junction between the Con Colbert Road and Memorial Road the pedestrian crossing has been moved to the east side of the junction to be on the same side as the bus stops. This represents a change from the EPR Option where the existing layout was maintained. In addition, while the junction has been designed to tie-in to the existing one-way layout of Memorial Road in the Proposed Scheme, consideration has been given to the tie-in with the proposals contained in the Liffey Valley to City Centre CBC, which proposes making Memorial Road two-way. To facilitate this a new eastbound right-turning lane on the R148 Con Colbert Road could be accommodated within the proposed junction layout.

At the R111 South Circular Road junction, there are a number of changes proposed to the existing traffic lanes when compared to the EPR Option. On the eastbound and westbound approaches to the junction the existing left turn slip lanes will be removed.

On the R111 South Circular Road northbound a short right turn lane will be provided to facilitate future bus movements and compensate for restricted turns included in the Liffey Valley to City Centre CBC. In order to improve the standard of pedestrian and cyclist facilities at this junction, the number of general traffic lanes through the junction will be reduced in the eastbound, northbound and southbound directions and the R111 South Circular Road will be widened along the western edge through the junction to facilitate the inclusion of segregated cycle tracks in each direction.

On the R148 St John’s Road West between the R111 South Circular Road junction and Heuston Station the existing eastbound lane configuration of one bus lane and one single general traffic lane is proposed to be maintained, which is unchanged from the EPR Option.

In the westbound direction of R148 St John’s Road West a continuous bus lane is to be provided instead of one of the two existing general traffic lanes. A segregated cycle track is proposed in each direction along this section, and this will require a small area of land acquisition from the frontage of the Eir building. The existing taxi queuing lane on the eastbound direction will be maintained between the Heuston South Quarter junction and Heuston Station, along with the existing taxi rank at the station.

Along the section of the R148 St John’s Road West between the Heuston South Quarter junction and Heuston Station some trees will need to be removed and replaced so that the facilities for both taxis and cycles described above can be provided. An urban realm landscaping improvement is therefore proposed along this section of the road. This includes the removal of the pedestrian guard railing and new planting, which will result in a net increase in the number of trees along the road.

In the immediate vicinity of Heuston Station continuous bus lanes and segregated cycle tracks will be provided in both directions as far as Frank Sherwin Bridge. It is proposed to upgrade the bus stop provision on R148 St John’s Road West outside the southern façade of the station, with lengthened bus stops and bus laybys provided. On the southern side of the road this will require some land acquisition

from the Health Service Executive's Dr Steevens' Hospital. A detailed urban realm and landscaping proposal has been developed at this location.

7.3 Main Scheme Changes

The following list highlights the main scheme changes between the published EPR Option and the PRO as a result of feedback from the public consultations, environmental assessment and design development:

- The Proposed Scheme includes a significant improvement in cyclist facilities from the R136 Ballyowen Road at N4 Junction 3 to the start of the R148 Chapelizod bypass on the east side of Palmerstown village, comprising:
 - Provision of a two-way segregated cycle track on the east side of the R136 Ballyowen Road between Hermitage Road and the R835 Lucan Road, including a new shared pedestrian and cyclist bridge on the east side of the R136 Ballyowen Road;
 - Provision of a two-way segregated cycle track on the northside of the R835 / N4 Lucan Road between Junctions 3 and 2 of the N4, requiring land acquisition from the adjacent landholdings, including the Hermitage Golf Club, Sureweld and Hermitage Medical Clinic;
 - Provision of a two-way segregated cycle track on the southside of the Old Lucan Road between the N4 Junction 2 and the existing pedestrian and cyclist bridge over the M50;
 - Provision of a two-way segregated cycle track on the northside of the Old Lucan Road in Palmerstown from the existing pedestrian and cyclist bridge over the M50 to the start of the Chapelizod bypass;
- At Liffey Valley Shopping Centre the existing bus stops will be relocated some 200m further west, with improved segregation from the existing carriageway and a new bridge over the N4 that links with the proposed bus interchange within Liffey Valley Shopping Centre;
- The new bus stops on the R148 Chapelizod bypass at Chapelizod Hill Road are provided with laybys and are accessed by steps and ramps both in-bound and out-bound. The steps and ramps to the new in-bound bus stop on the Chapelizod bypass have been moved to the south side of Chapelizod Hill Road, which results in a reduction in height and length of the ramps, as well as reducing the overall area of the new facility;
- The introduction of a northbound right turn lane at the R111 South Circular Road junction to allow vehicles to turn right from the R111 South Circular Road to R148 St John's Road West;
- Removal and replacement of additional trees along St John's Road West so that facilities for both taxis and bicycles can be provided on the approach to the train station;
- The provisions of a new outbound bus layby on St John's Road West opposite Heuston Station, requiring land acquisition from the lawned area in front of Dr Steevens' Hospital. A detailed urban realm and landscaping proposal has been developed at this location;
- The layout of all bus stops along the route have been enhanced to the latest design guidance;
- Some bus stop locations have been optimised to allow better connectivity for bus passengers; and
- Pedestrian and cycle facilities at all junctions have been updated to reflect the latest design guidance with a view to providing improved cycle provision and safety.

7.4 Scheme Benefits

7.4.1 Bus Journey Times

Through the provision of increased bus priority infrastructure, the Proposed Scheme will improve both the overall journey times for buses along the route and their journey time reliability. This will help to realise the aims and objectives of the Proposed Scheme as set out in Section 2.4 of this report.

The facilitation of bus priority along the Proposed Scheme, through the delivery of dedicated bus lanes, is forecast to reduce bus journey times along the Proposed Scheme. In addition to this, journey reliability is forecast to be improved, by largely removing interaction between bus traffic and general traffic.

7.4.2 Walking and Cycling

In addition to the improvements to bus journey time and journey time reliability, the Proposed Scheme will provide benefits for cyclists and pedestrians.

The provision of dedicated cycling infrastructure along the Proposed Scheme, as well as on parallel routes in some cases, will improve the level of service provided for cyclists along the route, making cycling trips safer and more attractive.

The Proposed Scheme will deliver substantial elements of the GDA Cycle Network Plan as outlined in Section 4.4, in particular Primary Cycle route 6, as well as linking with other proposed cycling schemes, including the Liffey Greenway, River Camac Greenway, and cycle routes S05, S06, NO5, C3 and NO6, contributing towards the development of a comprehensive cycling network for Dublin.

A number of public realm upgrades, for example at the R148 Con Colbert Road / R111 South Circular Road junction, which will include widened footpaths, high quality hard and soft landscaping and street furniture being provided, where practicable, in areas of high activity to contribute towards a safer, more attractive environment of pedestrians. The Proposed Scheme would also provide improved pedestrian crossing facilities along the route.

7.5 Summary of Infrastructure Provision

The Proposed Scheme is approximately 9.7km long from end to end. The Preferred Route Option scheme design drawings, see Appendix A, show the extent of the infrastructure proposed to deliver this Proposed Scheme and the length of the primary interventions are summarised in the Table 7-1 and Table 7-2 below.

Table 7-1 Bus Priority Comparison

Bus Priority	Existing (km)	Proposed (km)
Bus Lanes		
Inbound	7.5	9.2 (95%)
Outbound	6.3	8.6 (89%)
Total Bus Priority (both directions)	13.8	17.8
NB – all bus priority is physical; no virtual priority proposed		(+21%)

Table 7-2 Cycle Facility Comparison

Cycle Facilities	Existing (km)	Proposed (km)
Cycle Lanes – Segregated		
Eastbound	0.7	6.4
Westbound	0.7	6.3
Cycle Lanes – Non-segregated		
Eastbound	0.84	0.3
Westbound	1.5	0.4
Total Cycle Facilities (both directions)	3.8	13.4
		(+252%)

Notes on Table 7-2

The cycle provision figures are based on the GDA Cycle Network Plan Primary Cycle Route 6 and Secondary Route 6A along the route of the Proposed Scheme, which does not include the section of the route along the Chapelizod Bypass which has no cycle provision in accordance with the GDA Cycle Network Plan. Also, the figures do not include the significant cycle provision feeding into Primary Cycle Route 6 from side roads.



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