The background is a vibrant yellow. It is decorated with several abstract geometric shapes in shades of blue and teal. These include circles, teardrop shapes, and rounded rectangles, some of which are partially cut off by the edges of the page. The shapes are arranged in a way that creates a sense of movement and depth. The text is positioned in the upper left quadrant of the page.

Chapter 03
Consideration
of Reasonable
Alternatives

Contents

3.	Consideration of Reasonable Alternatives	1
3.1	Environmental Impact Assessment Requirements	1
3.2	Strategic Alternatives.....	1
3.2.1	GDA Transport Strategy	1
3.2.2	'Do Nothing' Alternative	4
3.2.3	Bus Rapid Transit (BRT) Alternative	5
3.2.4	Light Rail Alternative.....	6
3.2.5	Metro Alternative	6
3.2.6	Heavy Rail Alternative	7
3.2.7	Demand Management Alternative	8
3.2.8	Technological Alternatives	9
3.3	Route Alternatives	10
3.3.1	Initial High Level Route Alternatives.....	11
3.3.2	Stage 2 – Route Options Assessment	14
3.4	Design Alternatives.....	24
3.4.1	Development of the Draft Preferred Route Option	24
3.4.2	Consideration Following Draft Preferred Route Option Consultation (March 2020)	28
3.4.3	Further Consideration Following Updated Draft Preferred Route Option Consultation (November 2020).....	28
3.5	Conclusion	29
3.6	References	30

3. Consideration of Reasonable Alternatives

3.1 Environmental Impact Assessment Requirements

Article 5(1)(d) of Directive 2011/92/EU, as amended by Directive 2014/52/EU (hereafter known as the EIA Directive) requires that an Environmental Impact Assessment Report (EIAR) contains ‘a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and the main reasons for the option chosen, taking into account the effects of the project on the environment’.

In addition, Annex IV to the EIA Directive provides that the EIAR shall include:

‘A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.’

In addition, given the proposed road development for which approval is sought in this instance, Section 50(2)(b)(iv) of the Roads Act 1993, as amended (the Roads Act) states that that the EIAR shall contain the following information:

‘...a description of the reasonable alternatives studied by the road authority or the Authority, as the case may be, which are relevant to the proposed road development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed road development on the environment’

Section 50(2)(b)(vi) of the Roads Act also requires that ‘any additional information specified in Annex IV [as quoted above] that is relevant to the specific characteristics of the particular proposed road development or type of proposed road development and to the environmental features likely to be affected’ also be included in the EIAR.

Accordingly, this Chapter of the EIAR describes the reasonable alternatives studied and the main reasons for the selection of the proposed Liffey Valley to City Centre Core Bus Corridor Scheme (hereafter referred to as the Proposed Scheme), taking into account the effects on the environment.

It considers the alternatives at three levels:

- Strategic Alternatives;
- Route Alternatives; and
- Design Alternatives.

The reasonable alternatives studied which are relevant to the Proposed Scheme and its specific characteristics are described in the subsequent sections of this Chapter.

3.2 Strategic Alternatives

3.2.1 GDA Transport Strategy

The Transport Strategy for the Greater Dublin Area 2016-2035 (hereafter referred to as the GDA Transport Strategy) was prepared by the NTA pursuant to Section 12 of the Dublin Transport Authority Act 2008 (as amended) and was approved by the Minister for Transport, Tourism and Sport in April 2016.

The GDA Transport Strategy provides a comprehensive framework to guide the development of transport across the Greater Dublin Area (GDA) over the period of the strategy. Careful consideration was undertaken of the transport requirements across the seven counties located in the GDA, and the GDA Transport Strategy then formulated the appropriate transport responses to those requirements.

Various studies and reports were undertaken in the development of the GDA Transport Strategy, including:

- Area-based studies covering the GDA;
- Demand Management Study;
- Core Bus Network Study;
- Park & Ride Study;
- Transport Modelling Analysis; and
- Environmental reports.

Specifically, a Strategic Environmental Assessment (SEA) was undertaken on the GDA Transport Strategy (NTA 2016). As set out in the Environmental Report, in respect of which the SEA of the GDA Transport Strategy was undertaken, a number of reasonable alternative strategies were devised and assessed, taking into account the objectives and the geographical scope of the strategy. The provisions of the GDA Transport Strategy (including bus-based transport modes), were evaluated for potential significant effects, and measures integrated into the Strategy on foot of SEA recommendations in order to ensure that potential adverse effects were mitigated. In considering the alternative modes on a corridor basis, the environmental assessment undertaken considered that bus-based projects could contribute towards facilitating the achievement of Ireland's Green House Gas (GHG) emission targets in terms of emissions per passenger per kilometre.

In addition to direct studies and analyses undertaken as part of the strategy preparation work, the GDA Transport Strategy also took into account prior reports and plans in relation to transport provision. These prior studies included, inter alia, the following:

- GDA Cycle Network Plan (2013);
- Bus Rapid Transit – Core Network Report (2012);
- Fingal / North Dublin Transport Study (2015);
- Review of the DART Expansion Programme (2015);
- Various prior Luas studies (including Line B2 (Bray), Line D1 (Finglas), Line F1, and F2 (Lucan and Liberties), and Line E (2008)); and
- Analysis carried out for a 2011 Draft Transport Strategy.

Given the importance of bus transport as the main public transport mode for the overall region, the delivery of an efficient and reliable bus system forms an important element of the GDA Transport Strategy, integrated appropriately with the other transport modes. As Dublin is a low-density city with a large geographic footprint, there are few areas with the size and concentration of population necessary to support rail based public transport, and the bus system remains essential to serve the needs of much of the region.

The bus system has continued to remain an essential element of the public transport infrastructure since the publication of the GDA Transport Strategy. The bus system in the Dublin metropolitan area carried 159 million passengers in 2019 (the last full year before the COVID-19 pandemic), compared with 48 million passengers on Luas and 36 million passengers on the DART and rail commuter services over the same year. Converting to percentage figures, the bus system accounts for 65% of public transport passenger journeys in the Dublin region, roughly two thirds of all public transport passengers, with Luas carrying 20% and DART and commuter rail services delivering the remaining 15%.

The area-based studies referenced above provided an appraisal of existing and future land use and travel patterns, including identifying trends and issues, within eight transport corridors as presented in Image 3.1 (Figure 3.8 in the GDA Transport Strategy). These corridors were also divided into Outer Hinterland, Outer Metropolitan, and Inner Metropolitan areas in terms of character.

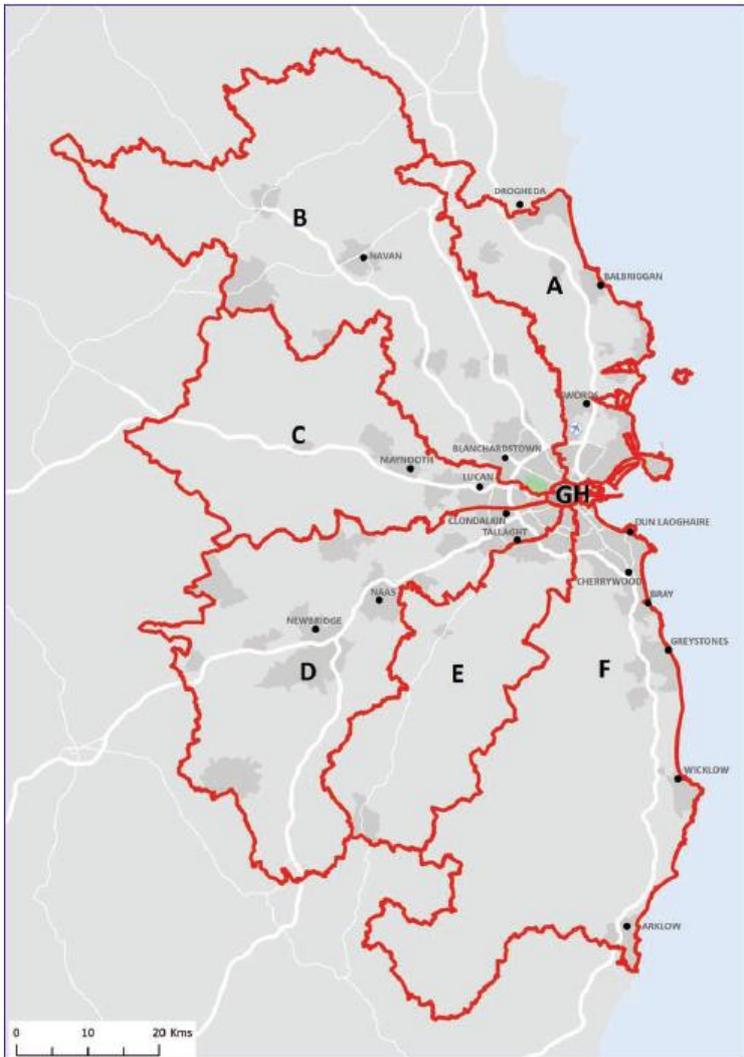


Image 3.1: Transport Strategy Corridors

The development of the GDA Transport Strategy took into account the data and analysis provided through the supporting studies and background information and formulated an overall integrated transport system to serve the needs of the GDA up to 2035. In relation to public transport, the GDA Transport Strategy set out a network of heavy rail, metro, light rail and bus proposals, with those networks combining to serve the overall public transport needs of the region.

The Liffey Valley to City Centre Core Bus Corridor Scheme aligns generally with Corridor C in the GDA Transport Strategy which extends from the core city centre area along the N4 and R148 Chapelizod Bypass corridor and contains two of the region's most important future residential and commercial development areas at Clonburris and Adamstown, both based on the Kildare rail line. Major employers are also located in this corridor in Leixlip and Celbridge. Other key areas of transport demand include Lucan village, Liffey Valley Shopping Centre, and Ballyfermot.

Through the work undertaken in the preparation of the GDA Transport Strategy, including its supporting studies, various alternatives to deal with the transport needs which are intended to be addressed by the Proposed Scheme were identified and considered. These are set out in the subsequent sections.

3.2.2 'Do Nothing' Alternative

The GDA Transport Strategy was developed as the economy was emerging from the post 2008 economic downturn. In turn, the GDA Transport Strategy set out a number of key challenges and opportunities within the GDA:

- Suburbanisation and the spread of population, employment and other land uses has continued;
- Arising from the above trend, the mode share of car use continues to increase;
- Car ownership – a key determinant of car use – is likely to increase further, up to saturation levels;
- Cycling has increased significantly in numbers and in mode share;
- Recovery is occurring in public transport use, but not in its mode share;
- Encouraging non-car use for trips to education is a significant challenge;
- There is no spare capacity on the M50 Motorway;
- Protecting and enhancing access to the ports and Dublin Airport is a strategic priority; and
- Current economic growth will mean that within the next few years, overall levels of travel demand are likely to exceed the travel demand experienced in 2006 and 2007, prior to the downturn.

Congestion throughout the GDA is particularly high with the number of cars on the road increasing and significant daily traffic delays. Without intervention, potential impacts could worsen for the region including:

- Continued growth of traffic congestion;
- Impacts on the ability of the region to grow economically due to increased congestion;
- Longer journey times and increased travel stress will diminish quality of life; and
- Environmental emissions targets will not be met.

Ultimately few areas within the GDA have the size and concentration of population to support rail-based public transport. For most transport corridors in Dublin, bus transport represents the most appropriate transport solution.

In terms of the out-workings of a strategic 'Do Nothing' alternative, it should be noted that, currently, the bus network is characterised by discontinuity, whereby corridors have dedicated bus lanes along less than one third of their lengths on average 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 lack of segregated space for different road users results in delayed buses and unreliable journey times for passengers. Issues related to frequency, reliability and a complex network have persisted for many years and will continue to do so without further intervention. In the absence of enhanced frequencies, journey time and reliability the ability to attract new passengers is limited, particularly from private car, and also impacts on the ability of the bus network to retain passengers and acts as a demotivator to travel by bus. Within the extents of the route of the Liffey Valley to City Centre Core Bus Corridor Scheme, bus lanes are currently provided on approximately 20% and 25% of the route outbound and inbound respectively, of which significant portions of the route are shared with cyclists and or parking lanes, which can in turn impact on bus reliability.

Adopting a 'Do Nothing' approach to infrastructure improvements, would be likely to result in an exacerbation of the problems arising from discontinuity – such as delayed buses and unreliable journey times. The capacity and potential of the public transport system would remain restricted by the existing deficient and inconsistent provision of bus lanes and the resulting sub-standard levels of bus priority and journey-time reliability. As such, in addition to the continuation of issues relating to existing bus services, future bus services, including the Bus Network Redesign currently being implemented as part of the wider BusConnects Programme, would also suffer from the same lack of journey-time reliability. This would severely impact the attractiveness of public transport as an alternative to private car usage for those who need to travel to / from various locations along the route of the Proposed Scheme.

In addition, without the provision of safe cycling infrastructure, intended as part of the Proposed Scheme, there would also continue to be an insufficient level of safe, segregated provision for cyclists who currently, and in the future would be otherwise attracted to use the route of the Proposed Scheme. Whilst, in the 'Do Nothing'

Alternative, ongoing improvements may be provided along the route of the existing corridor extents, this is likely to be piecemeal and disconnected without the wide-strategic benefits to be derived from the Proposed Scheme.

In addition, with the 'Do Nothing' alternative, there would not be significant strategic investment in improvements to the pedestrian environment. Rather, improvements would be limited to relatively limited interventions, for example, ongoing maintenance of existing footpaths and adjacent public spaces. The 'Do Nothing' alternative would not result in improvements to encourage more journeys generally at a local level by active travel, including connecting to and from bus stops for all pedestrians, and in particular improving facilities for the mobility and visually impaired.

For all of these reasons, and having regard to these environmental considerations in particular, a 'Do Nothing' alternative is not considered to be a viable alternative relative to the outcomes which can be realised by the Proposed Scheme.

3.2.3 Bus Rapid Transit (BRT) Alternative

Bus Rapid Transit (BRT) has emerged in recent years as an effective, cost efficient and high-quality public transport system. As BRT is a relatively new mode of transport, there are various definitions and interpretations as to what BRT comprises, and there are many different forms of BRT systems in operation worldwide. Definitions of BRT range from a Quality Bus Corridor (QBC) to being a fully guided, fully segregated bus system.

A Bus Rapid Transit (BRT) – Core Network Report, prepared in 2012 (NTA 2012) at feasibility study level, investigated the demand, technical, environmental, and economic feasibility of a proposed core BRT network. The feasibility study recommended that further and more detailed work should proceed on two cross city corridors namely the Blanchardstown to University College Dublin (UCD) corridor and the Malahide Road (Clongriffin) to Tallaght corridor.

Prior to the completion of these studies, the GDA Transport Strategy identified the development of a number of Core Bus Corridors as BRT schemes. These BRT routes formed part of the overall Core Bus Corridor network set out in the GDA Transport Strategy. As design and planning work progressed on the Core Bus Corridors, it became clear that the level of differentiation between the BRT corridors and the other Core Bus Corridors would, ultimately, be limited, and that all the corridors should be developed to a consistent standard, providing a more integrated, legible, and coherent overall bus system.

By way of illustration of the similarities between the BRT option and Core Bus Corridors (CBCs), all of the CBCs are proposed to be developed to provide a high level of priority for the bus vehicles, which is an essential component of a BRT system. Integrated, cashless ticketing systems are planned under the overall BusConnects Programme, delivering the type of functionality often required for a BRT system. While different types of vehicles are used around the world on BRT schemes, the longer routes present in Dublin, due to the low-density nature of the city, favours the use of double deck vehicles on both BRT and conventional bus corridors, given the better ratio of seated to standing passengers on such vehicles.

Accordingly, it is intended that all of the Core Bus Corridor Infrastructure Works including the Proposed Scheme, will be developed to provide a BRT level of service, rather than establishing a separate mode on some corridors. Consequently, the Proposed Scheme as a separate BRT mode was not progressed given the limited differentiation from the CBCs and the advantages identified above of a unified integrated bus system.

Environmentally the BRT option compared to the CBC proposal would be more impactful in terms of construction impacts, including flora and fauna, heritage, air and noise. BRT typically requires continuous unbroken physical lane infrastructure to achieve high-priority. This would involve significantly more land take and potentially involve demolition of buildings at pinch-points. In the case of the CBC proposals bus-priority can be achieved through short lengths at pinch-points by the use of signal-control priority.

Within the broader corridor two Core Bus Corridors were identified to meet the transport demand. The first, along the N4 and R148 Chapelizod Bypass will cater for demand close to Lucan Village as well as from Palmerstown. The second, (the Proposed Scheme) within Ballyfermot, is intended to cater for any specific demand that will not

be catered for by the proposed new Luas line to Lucan, and will aim to link origins and destinations not served by the fixed heavy rail lines.

3.2.4 Light Rail Alternative

The appropriate type of public transport provision in any particular case is predominately determined by the likely quantum of passenger demand along the particular public transport route.

For urban transport systems, bus-based transport is the appropriate public transport mode for passenger demand levels of up to 4,000 passengers per hour per direction (UITP 2009). Light rail provision would generally be appropriate to cater for passenger demand of between 3,500 and about 7,000 passengers per hour per direction. Passenger demand levels above 7,000 passengers per hour per direction would generally be catered for by heavy rail or metro modes, which would usually be expected to serve a number of major origins or destinations along a particular corridor. In the case of both the bus and light rail modes, higher levels of passenger demand than the above stated figures can be accommodated under specific conditions.

The development of the GDA Transport Strategy considered the likely public transport passenger demand levels across the region using the NTA's transport model and took into account the other studies referenced above, in addition to studies that had been carried out to investigate a potential light rail scheme within the area of this corridor. The GDA Transport Strategy found that the demand along this corridor was too high to be accommodated by a BRT solution and therefore, light rail will be required to be developed. Therefore, it is intended to further develop the light rail network along this corridor through the implementation of a Luas to Lucan.

The Luas Line to Lucan is intended to develop a high capacity east-west Luas line, commencing in the residential areas of Lucan to the south of the N4 national road, and connecting into Dublin City Centre. This will provide a high-capacity radial service from this area to the City Centre, sufficient to cater for the high transport demand along this corridor, and will serve Lucan, Liffey Valley and Ballyfermot along its route.

Arising from the various studies and analysis that had been carried out, and the specific assessment and transport modelling work undertaken for the GDA Transport Strategy, it was concluded that a high quality bus-based transport system supplemented by the implementation of the Luas to Lucan, would be part of the proposed public transport solution in the corridor of the Proposed Scheme.

3.2.5 Metro Alternative

As highlighted above, when considering the appropriate transport systems to meet the expected transport demand, Metro systems are a higher capacity form of light rail, generally designed for peak hour passenger numbers exceeding about 7,000 passengers per hour per direction, and often catering for multiples of that level.

Given the consideration of light rail provision, and the level of likely public passenger use along this overall corridor assessed in the transport modelling work, the development of the GDA Transport Strategy identified that a metro solution would not be economically justified within the area covered by this corridor. Accordingly, it was concluded that a high quality bus-based transport system would be part of the proposed public transport solution in the corridor of the Proposed Scheme.

Environmentally the metro option compared to the CBC proposal would be more impactful in terms of construction impacts, including flora and fauna, heritage, air and noise. Metro systems require unbroken physical lane infrastructure to achieve high-priority. This would involve significantly more land take and potentially involve demolition of buildings at pinch-points. In the case of the CBC proposals bus-priority can be achieved through short lengths at pinch-points by the use of signal-control priority.

In addition, the development of an underground metro would not remove the need for additional infrastructure to serve the residual bus needs of the area covered by the Proposed Scheme, nor would it obviate the need to develop the cycling infrastructure required along the route of the Proposed Scheme.

3.2.6 Heavy Rail Alternative

Commuter heavy rail systems are generally designed for high levels of passenger demand, usually designed to carry in excess of 10,000 passengers per hour per direction. Where a surface corridor does not already exist in a built-up urban area, there are major challenges in creating sufficient surface space for such provision, requiring large amounts of property acquisition and building demolition.

For those reasons, new heavy rail projects running at surface level are rarely developed in built-up urban areas. Instead, underground rail links, including metro schemes, are deployed to avoid the severe impacts that would accompany a new surface rail line. Environmentally the heavy rail option compared to the CBC proposal would be more impactful in terms of construction impacts, including flora and fauna, heritage, air and noise. Heavy rail requires unbroken physical lane infrastructure to achieve high-priority. This would involve significantly more land take and potentially involve demolition of buildings at pinch-points.

The appropriate locations for new heavy rail provision were carefully considered in the development of the GDA Transport Strategy. Having regard to the level of likely public passenger use (demand) along the overall corridor of the Proposed Scheme assessed in the transport modelling work, the GDA Transport Strategy did not consider that a new heavy rail solution would be required along this corridor and would not be economically justifiable.

In relation to underground provision, this issue was considered as part of the Metro analysis, given the similarity of underground heavy rail and underground metro schemes. Similar to the Metro considerations, the provision of an underground heavy rail solution would not remove the need for additional infrastructure to serve the residual bus needs of the area covered by the Proposed Scheme, nor would it obviate the need to develop the cycling infrastructure required along the route of the Proposed Scheme.

In addition to a new heavy rail solution, the potential expansion of the existing DART to include the upgrade of the existing Maynooth / Sligo line as far as Maynooth and M3 Parkway, and the Kildare Line to Hazelhatch which is contained within the broader corridor was considered as part of the development of the GDA Strategy.

In 2015, the NTA carried out a review of the key transport infrastructure projects that were proposed to support the growth of the Greater Dublin Region. This included a review of the DART Expansion Scheme which included DART Underground, the Fingal / North Dublin Study and a study of the orbital movements around Dublin all designed to inform the GDA Transport Strategy. Image 3.2 below shows the various projects in the DART Expansion Programme.

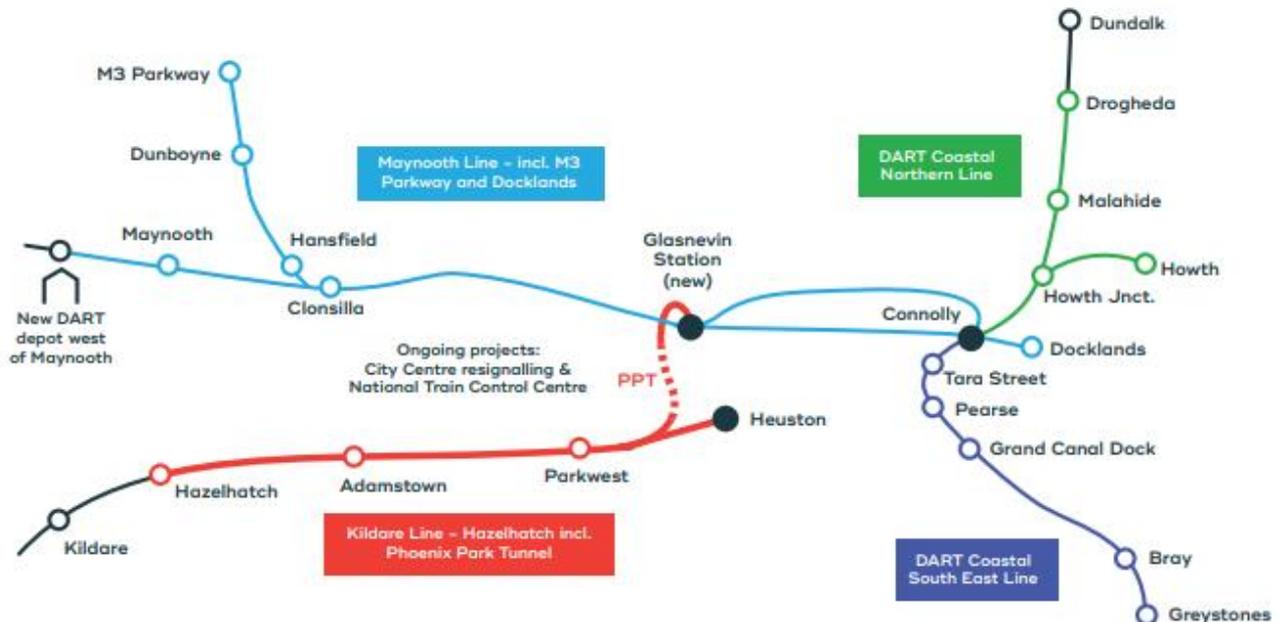


Image 3.2: DART Expansion Programme (Source: Irish Rail Website)

Arising from the various studies and analysis that had been carried out, and the specific assessment and transport modelling work undertaken for the GDA Transport Strategy, it was concluded that a high quality bus-based transport system supplemented by the expansion of the DART system on both the Maynooth / Sligo and Kildare line to provide fast, high frequency services to Maynooth, M3 Parkway, and Hazelhatch, as part of a phased delivery of DART Expansion (now DART + programme), would be part of the proposed public transport solution in the corridor of the Proposed Scheme.

3.2.7 Demand Management Alternative

One of the primary aims of the GDA Transport Strategy is to significantly reduce demand for travel by private vehicles, particularly during the commuter peaks, and to encourage use of walking, cycling and public transport. One of the mechanisms to achieve such reduction of private vehicle use is the use of measures to discourage travel by car – i.e. demand management.

Demand management can take many different forms, from restricting car movement or car access through regulatory signage and access prohibitions, to parking restrictions and fiscal measures (such as tolls, road pricing, congestion charging, fuel / vehicle surcharges and similar). All of these approaches discourage car use through physical means or by adding additional costs to car use, such that it becomes more expensive and alternative modes become more attractive. A key success factor of demand management is greater use of alternative travel modes, in particular public transport.

However, in the case of Dublin, the existing public transport system does not currently have sufficient capacity to cater for large volumes of additional users. In the case of the bus system, the increasing levels of traffic congestion over recent years prior to the COVID-19 pandemic added to bus delays and means that additional bus fleet and driver resources have been utilised simply to maintain existing timetables, rather than adding overall additional capacity. The objective of the GDA Transport Strategy is to significantly increase the capacity, and subsequent use, of the public transport system, focusing on the overall BusConnects Programme in the case of the bus system, the DART+ Programme in the case of heavy rail, and the Luas / Metro programme in the case of light rail.

Congestion is a significant contributor to GHG emissions and the related negative environmental impacts associated with poor air quality, noise levels, and related health and quality of life consequences. Demand management measures need to be associated with positive environmental benefits that can be achieved when

commuters change modes to high-quality public transport, walking, and cycling that can help reduce GHG emissions and bring associated health benefits. The objective of the GDA Transport Strategy to significantly increase the capacity, and subsequent use of these alternative modes requires that the necessary physical infrastructure is necessary to deliver the efficiencies to make the mode-shift attractive and environmentally beneficial.

In advance of a significant uplift in overall public transport capacity in the Dublin metropolitan area, the implementation of major demand management measures across that area would be unsuccessful. Effectively constraining people from making journeys by car and requiring them to use other modes, without those modes having the necessary capacity to cater for such transfer, would not deliver an effective overall transport system. Instead, the capacity of the public transport system needs to be built up in advance of, or in conjunction with, the introduction of major demand management measures in the Dublin metropolitan area. This is especially true in the case of the bus system where a major increase in bus capacity through measures such as the Proposed Scheme would be required for the successful implementation of large-scale demand management initiatives.

While the foregoing addresses the dependency of demand management measures on public transport capacity, it is equally correct that the provision of greatly enhanced cycling facilities will also be required to cater for the anticipated increase in cycling numbers, both in the absence of demand management measures and, even more so, with the implementation of such measures. Demand management initiatives by themselves will not deliver the level of segregated cycling infrastructure required to support the growth in that mode. Consequently, the progression of demand management proposals will not secure the enhanced safe cycling infrastructure envisaged under the Proposed Scheme.

Accordingly, the implementation of demand management measures would not remove the need for additional infrastructure to serve the bus transport needs of the corridor covered by the Proposed Scheme, nor would it obviate the need to develop the cycling infrastructure required along the route of the Proposed Scheme.

3.2.8 Technological Alternatives

Technological advances have opened-up new areas of potential in the delivery of transportation infrastructure. Driverless trains and smart highways are two examples. Some of these initiatives, such as driverless trains, are now in use. Technological advancements relating to car use have the potential to improve road safety by reducing potential for driver error and with the use of global positioning systems to be guided to the most efficient route. A shift to electric vehicles will help reduce GHG emission impacts, but road space is limited and three typical cars (electric or otherwise) still take the same road space for up to 12 occupants that a typical double-deck bus requires to carry up to 90 occupants. The environmental impact of continuing to build more road space for low-occupancy vehicles is unsustainable from both the construction environmental impact and operational environmental impact perspectives. Despite advancements in road-user technology road congestion is not reducing as populations grow, and old inner-city areas of Dublin do not have space to add more car lanes.

The shift to hybrid and ultimately electric buses will reduce both noise and air-quality impacts. The evolution of bike-share schemes and advancements in electric bike technology means that cycling is increasing in attractiveness and for longer distances. This attractiveness is only for the few however if cycling infrastructure in the form of safe segregated facilities is not available.

While road construction is costly and has a negative GHG impact there are little advancements in construction technology that present any viable alternatives when conversion of road infrastructure involves reconfiguration of lanes for bus priority, safer segregated cycle tracks and improved pedestrian facilities, or even more significantly for rail-related infrastructure. Road right-of-way space is still shared with multiple underground and overhead utilities that may require to be relocated, and road materials require to be resilient to minimize maintenance frequencies.

Ultimately, however, alternatives have to be able to accomplish the objectives of the project in a satisfactory manner, and should also be feasible including in terms of technology and other relevant criteria. In this context, there is no evidence that such developments will displace the need for mass transit, which is essential to the operation of a modern city. Accordingly, the need to improve the overall bus system will still remain.

Overall, while certain technological advances do provide new opportunities in the transport area, particularly in the area of information provision, they do not yet provide viable alternatives to the core need to provide for the movement of more people by non-car modes, including the provision of safe, segregated cycling facilities. Accordingly, there are no viable technological alternatives to meet the transport needs of this sector of the city.

3.3 Route Alternatives

Following on from the strategic alternatives considered earlier, this Section sets out the route alternatives which were considered as part of the process to establish the Proposed Scheme. Development of the Proposed Scheme has evolved in the following stages:

- 1) A **Feasibility and Options Report** was concluded in 2016, setting out the initial route options and concluding with the identification of the Emerging Preferred Route;
- 2) A first round of non-statutory **Public Consultation** was undertaken on the Emerging Preferred Route from 23 January 2019 to 30 April 2019;
- 3) Development of **Draft Preferred Route Option** (April 2019 to March 2020). Informed by feedback from the first round of public consultation, stakeholder and community engagement and the availability of additional design information, the design of the Emerging Preferred Route evolved with further alternatives considered;
- 4) A second round of non-statutory **Public Consultation** was undertaken on the Draft Preferred Route Option from 4 March 2020 to 17 April 2020. Due to the introduction of COVID-19 restrictions, some planned in-person information events were cancelled, leading to a decision to hold a third consultation later in the year;
- 5) Further development of an updated **Draft Preferred Route Option** was undertaken subsequent to the second round of public consultation, which took account of submissions received, continuing stakeholder engagement and additional design information;
- 6) A third round of non-statutory **Public Consultation** was undertaken on the updated Draft Preferred Route Option from 04 November 2020 to 16 December 2020; and
- 7) Finalisation of **Preferred Route Option**. Informed by feedback from the overall public consultation process, continuing stakeholder engagement and the availability of additional design information, the Preferred Route Option, being the Proposed Scheme, was finalised.

Alternative route options have been considered in a number of areas during the iterative design of the Proposed Scheme, such as the location of offline cycle routes and the road layout in constrained locations. The iterative development of the Proposed Scheme has also been informed by a review of feedback and new information received during each stage of public consultation and as data, such as topographical surveys, transport and environmental information was collected and assessed. In addition, the potential for climate impact was considered in all phases of the design process for the Proposed Scheme. As the design progressed climate was indirectly affected in a positive way by refining the design at each stage through reducing the physical footprint of the scheme coupled with the inclusion of technological bus priority measures.

Key environmental aspects have been considered during the examination of reasonable alternatives in the development of the Preferred Route Option for the Proposed Scheme. Environmental specialists have been involved in the iteration of key aspects of the Proposed Scheme with the engineering design team. The following key environmental aspects were considered:

- **Archaeological, Architectural and Cultural Heritage** – There is the potential for impacts on archaeological, architectural and cultural heritage when providing CBC infrastructure. The assessment had regard to Recorded Monuments and Protected Structures, Sites of Archaeological or Cultural Heritage and on buildings listed on the National Inventory of Architectural Heritage adjacent to the corridor;
- **Flora and Fauna** – The provision of the CBC could have negative impacts on flora and fauna, for example, through construction of new infrastructure through green field sites;
- **Soils and Geology** – Construction of infrastructure necessary for the provision of the CBC has the potential to negatively impact on soils and geology. For example, through land acquisition and ground excavation. There is also the potential to encounter ground contamination from historical industries;

- **Hydrology** – The provision of CBC infrastructure may include aspects (for example structures) with the potential to impact on hydrology;
- **Landscape and Visual** – Provision of CBC infrastructure has the potential to negatively impact on the landscape and visual aspects of the area, for example, by the removal of front gardens or green spaces or the altering of streetscapes, character and features;
- **Noise, Vibration and Air** – Provision of CBC infrastructure (e.g. the construction activities), has the potential to negatively impact on noise, vibration and air quality along a scheme. For example, through construction works;
- **Land Use and the Built Environment** – This criterion assesses the impact of each option on land use character, and measured impacts which would prevent land from achieving its intended use, for example through land acquisition, removal of parking spaces or severance of land; and
- **Climate** – Construction works involve negative GHG emissions impacts, while operational efficiencies of public transport, walking and cycling through modal shift from car usage has the potential to reduce GHG impacts.

3.3.1 Initial High Level Route Alternatives

The Feasibility and Options Report identified feasible options along the corridor, assessed these options and identified the Emerging Preferred Route, which then formed the basis of the first phase of public consultation. A summary of the process is described below.

The Feasibility and Options Reports used a two-stage assessment process to determine the Emerging Preferred Route, comprising:

- Stage 1 – an initial high-level route options assessment, or ‘sifting’ process, which appraised routes in terms of ability to achieve scheme objectives and whether they could be practically delivered. The assessment included consideration of the potential high level environmental aspects (summarised in Section 3.3) as well as other indicators such as land take (particularly the impact on residential front gardens); and
- Stage 2 – Routes which passed the Stage 1 assessment were taken forward to a more detailed qualitative and quantitative assessment. All route options that progressed to this stage were compared against one another using a detailed Multi-Criteria Analysis (described in Section 3.3.2) in accordance with the Department of Transport Document “Common Appraisal Framework for Transport Projects and Programmes”.

The study area for the corridor comprised three main sections. Section 1 examined feasible route options from Liffey Valley Shopping Centre to Le Fanu Road, Section 2 examined feasible route options from Le Fanu Road to Sarsfield Road and Section 3 examined feasible route options from Sarsfield Road to the City Centre. Further discussion on the route options assessment process is provided below.

At the start of the Stage 1 assessment, an initial ‘spider’s web’ of potential route options (consisting of in excess of 60 individual links across the three sections) that could accommodate a CBC was identified for each study area section as shown in Image 3.3 to Image 3.5 (extracted from the Feasibility and Options Report).

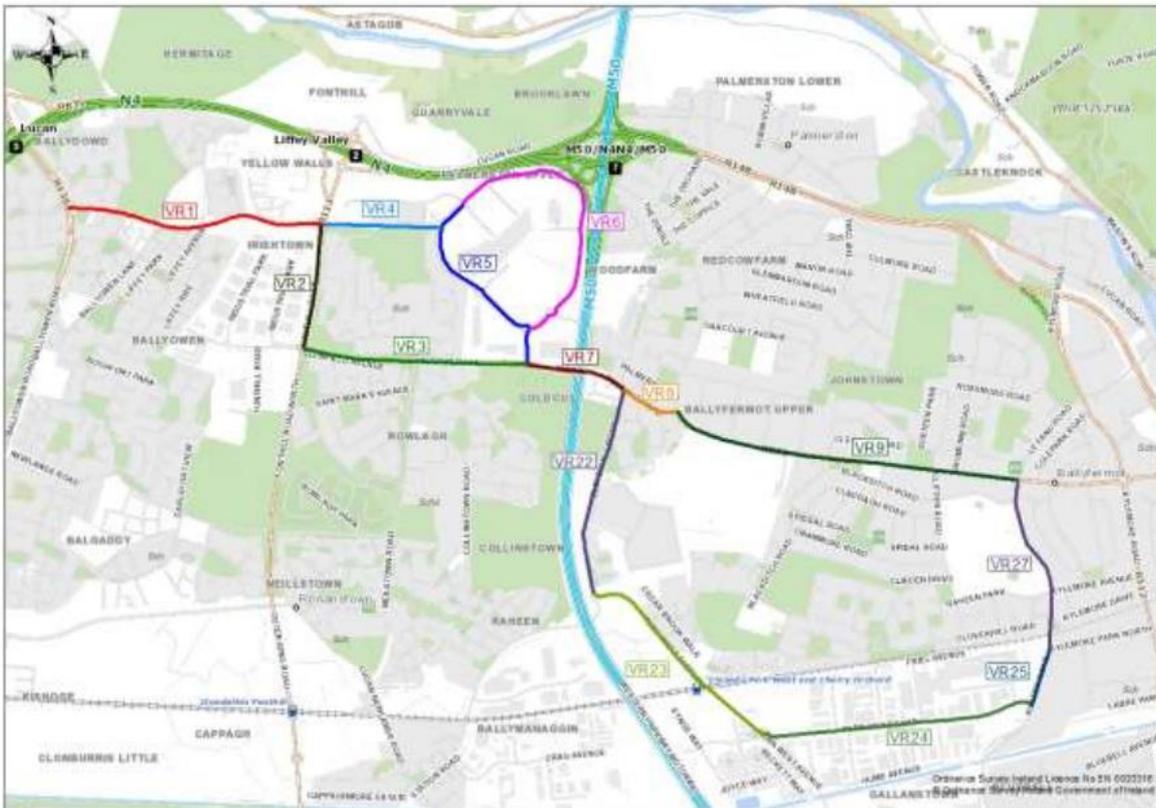


Image 3.3: Section 1 (Ballyowen Road to Le Fanu Road) Spider’s Web of Route Options Extracted from the Liffey Valley to Christchurch Core Bus Corridor Options Study - Feasibility Report (NTA 2016b)

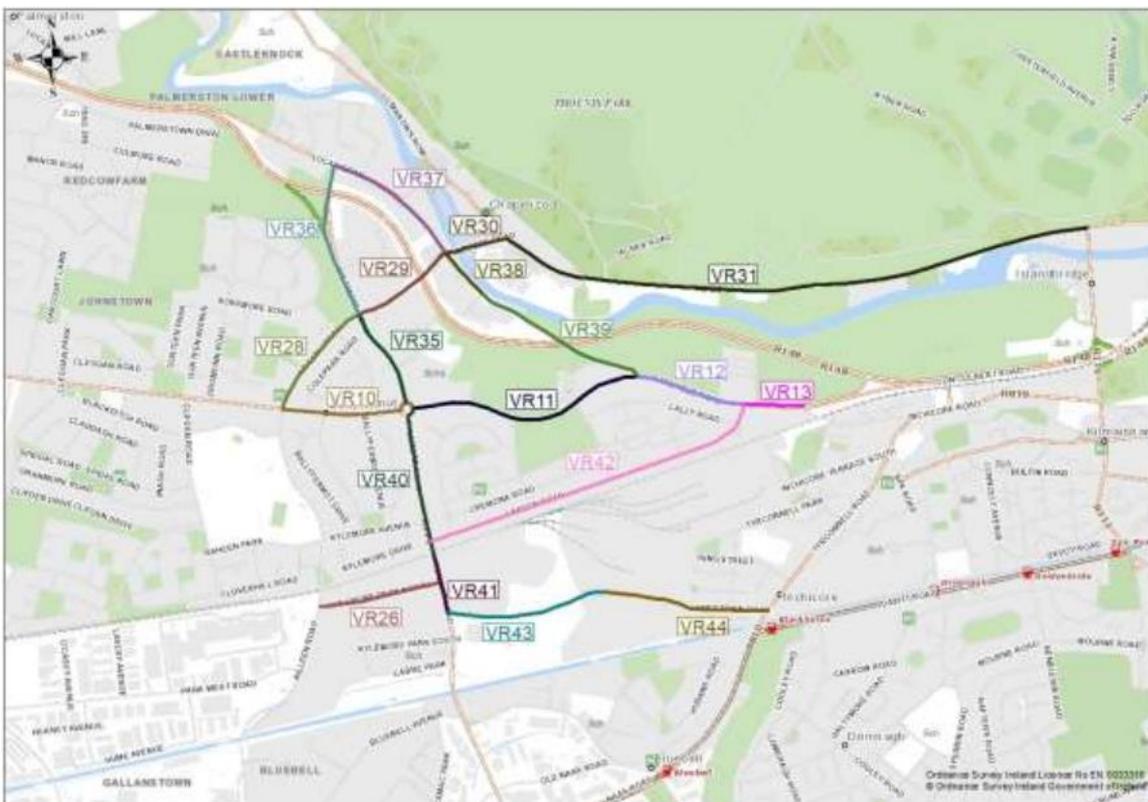


Image 3.4: Section 2 (Le Fanu Road to Sarsfield Road) Spider’s Web of Route Options Extracted from the Liffey Valley to Christchurch Core Bus Corridor Options Study - Feasibility Report (NTA 2016b)

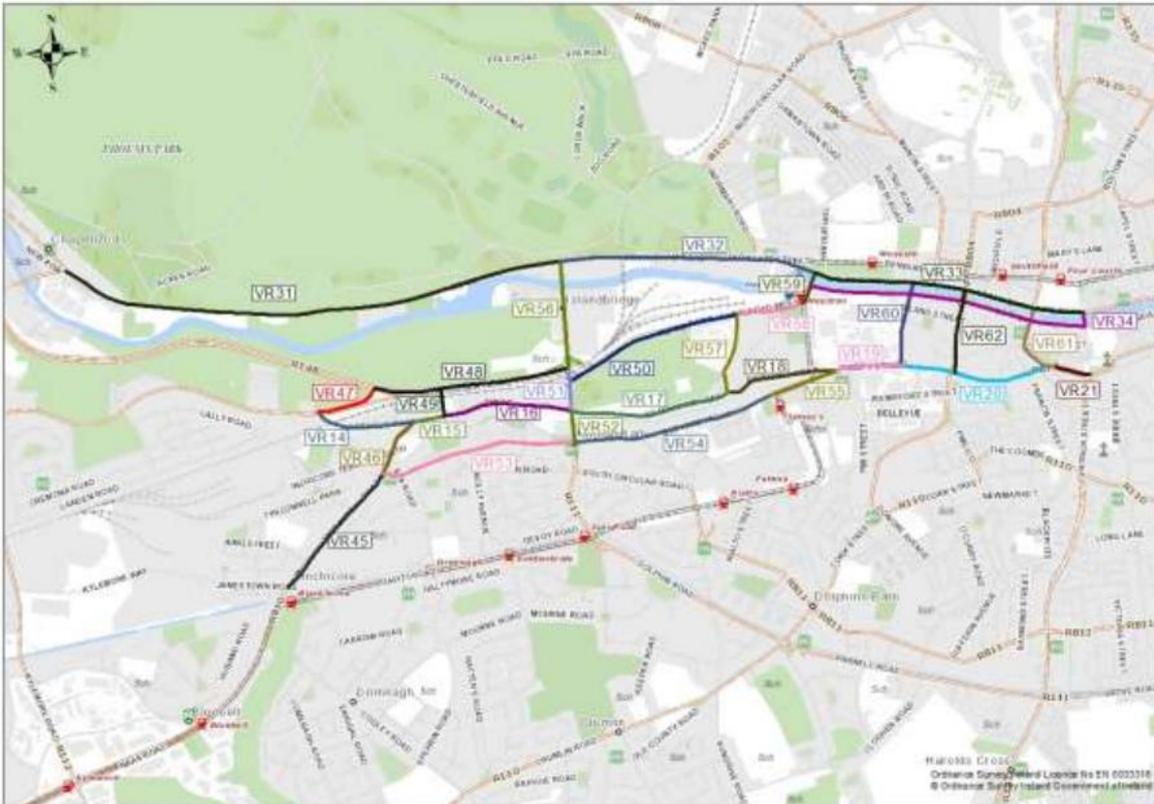


Image 3.5: Section 3 (Sarsfield Road to Christchurch) Spider's Web of Route Options Extracted from the Liffey Valley to Christchurch Core Bus Corridor Options Study - Feasibility Report (NTA 2016b)

The initial 'spider's web' was narrowed down using a high-level qualitative method based on professional judgement and a general appreciation for existing physical conditions / constraints within the study area. This exercise examined and assessed technically feasible route options, based upon the following specific objectives:

- *'Deliver the on street infrastructure necessary to provide continuous priority for bus movements along the Core Bus Corridor. This will mean enhanced bus lane provision on the corridor, removing current delays in relevant locations and enabling the bus to provide a faster alternative to car traffic along the route, making bus transport a more attractive alternative for road users. It will also make the bus system more efficient, as faster bus journeys means that more people can be moved with the same level of vehicle and driver resources.'*
- *Provide any cycle facilities along the route that are required under the Greater Dublin Area Cycle Network Plan (published by the NTA, 2013) to the target Quality of Service(s) specified therein and to give consideration to further providing cycle facilities along sections of the route where they may not be expressly required under the Cycle Network Plan.'* (NTA 2016b)

In addition to being assessed on their individual merits, routes were also assessed relative to each other enabling some routes to be ruled-out if more suitable alternatives existed.

The Stage 1 assessment considered engineering constraints, high-level environmental constraints and an analysis of population and employment catchments. Numerous links forming part of the 'spider's web' were not brought forward to the Stage 2 assessment due to space constraints, lack of appropriate adjacent linkages to form a coherent end-to-end route, unsuitability of particular routes, in addition to other factors. For example, St. Laurence's Road from the junction with St. Laurence's Grove (Option VR38 in Image 3.5). This is a narrow urban road with one general traffic lane in each direction. There is residential parking that cannot be relocated along the entire length of this route and the properties have no space to accommodate driveways. This, coupled with the fact that the width from building line to building line is too narrow to allow bus priority facilities means that this route was not considered a viable route option for the Proposed Scheme.

Arising from the consideration of the various permutations possible in respect of the 'spider's web', a reduced number of coherent end-to-end options were identified for specific sections for further assessment. In arriving at these options, those links which failed the initial sifting stage were removed as well as those links that were disconnected and could not clearly form part of the potential end-to-end options. These options are presented in Image 3.6.



Image 3.6: Route Options from Initial Sift (Liffey Valley to Christchurch Core Bus Corridor Options Study - Feasibility Report (NTA 2016b))

3.3.2 Stage 2 – Route Options Assessment

Following completion of the Stage 1 initial appraisal, the remaining reasonable alternative 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 evaluated using a Multi Criteria Analysis. 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 Multi-Criteria Analysis (MCA) which evaluated the route options under the assessment criteria set out below:

1. Economy
2. Integration
3. Accessibility & Social Inclusion
4. Safety
5. Environment
6. Physical Activity

Although it is noted, as set out in the Feasibility and Options Reports, Physical Activity was scoped out of the multi-criteria analyses at this stage. This is because all route options were considered to promote physical activity equally and as such it was not considered to be a key differentiator between route options.

Under each headline criterion, a set of sub-criteria were used to comparatively evaluate the options. For the Environment criterion the following sub-criteria were considered in the assessment to inform the Emerging Preferred Route:

- **Archaeological, Architectural and Cultural Heritage** – there is the potential for impacts on archaeological, architectural and cultural heritage when providing CBC infrastructure. The assessment had regard to Recorded Monuments and Protected Structures, Sites of Archaeological or Cultural Heritage and on buildings listed on the National Inventory of Architectural Heritage adjacent to the corridor;
- **Flora and Fauna** – The provision of the CBC could have negative impacts on flora and fauna, for example, through construction of new infrastructure through green field sites;
- **Soils and Geology** – Construction of infrastructure necessary for the provision of the CBC has the potential to negatively impact on soils and geology. For example, through land acquisition and ground excavation. There is also the potential to encounter ground contamination from historical industries;
- **Hydrology** – The provision of CBC infrastructure may include aspects (for example structures) with the potential to impact on hydrology;
- **Landscape and Visual** – Provision of CBC infrastructure has the potential to negatively impact on the landscape and visual aspects of the area, for example, by the removal of front gardens or green spaces or the altering of streetscapes, character and features;
- **Air Quality** – The provision of CBC infrastructure has the potential to impact the air quality along the route. These effects were compared for each scheme option under this criterion in relation to the volumes of traffic and on whether the road is moving closer to a sensitive receptor, for example road widening or new alignment;
- **Noise and Vibration** – Provision of CBC infrastructure (e.g., the construction activities), has the potential to negatively impact on noise, vibration and air quality along a scheme. For example, through construction works. The impact was quantified on whether the road is moving closer to a sensitive receptor, for example road widening or new realignment; and
- **Land Use Character** – The provision of CBC infrastructure has the potential to impact on land use character through land-take, severance or reduction of viability which prevents or reduces it from being used for its intended use.

Route options were compared based on a five-point scale, ranging from having significant advantages to having significant disadvantages over other route options. Route options could also be considered neutral when no apparent advantages or disadvantages are identified across all scheme options.

3.3.2.1 Section 1: Route Options Assessment

Following the Stage 1 sifting process, two viable route options for Section 1 were taken forward for assessment and further refinement. Long sections of these two routes are common due to the limited available remaining routes, with the difference between them generally being in the Liffey Valley Shopping area. The common sections of the route were as follows:

- The Ballyowen Road from its junction with Willsbrook Road, along Saint Lomans Road to its junction with the Fonthill Road; and
- The Coldcut Road from its junction with the entrance to Liffey Valley Shopping Centre along the Ballyfermot Road to its intersection of the Le Fanu Road.

The two route options in between these two common sections were:

- Route Option LV01 (VR2 and VR3 in Image 3.7): Along R113 Fonthill Road North between St. Loman's Road junction and R833 Coldcut Road; and
- Route Option LV02 (VR4 and VR5 in Image 3.7): Along the Fonthill Road to the west of Liffey Valley Shopping Centre, continuing onto R833 Coldcut Road.

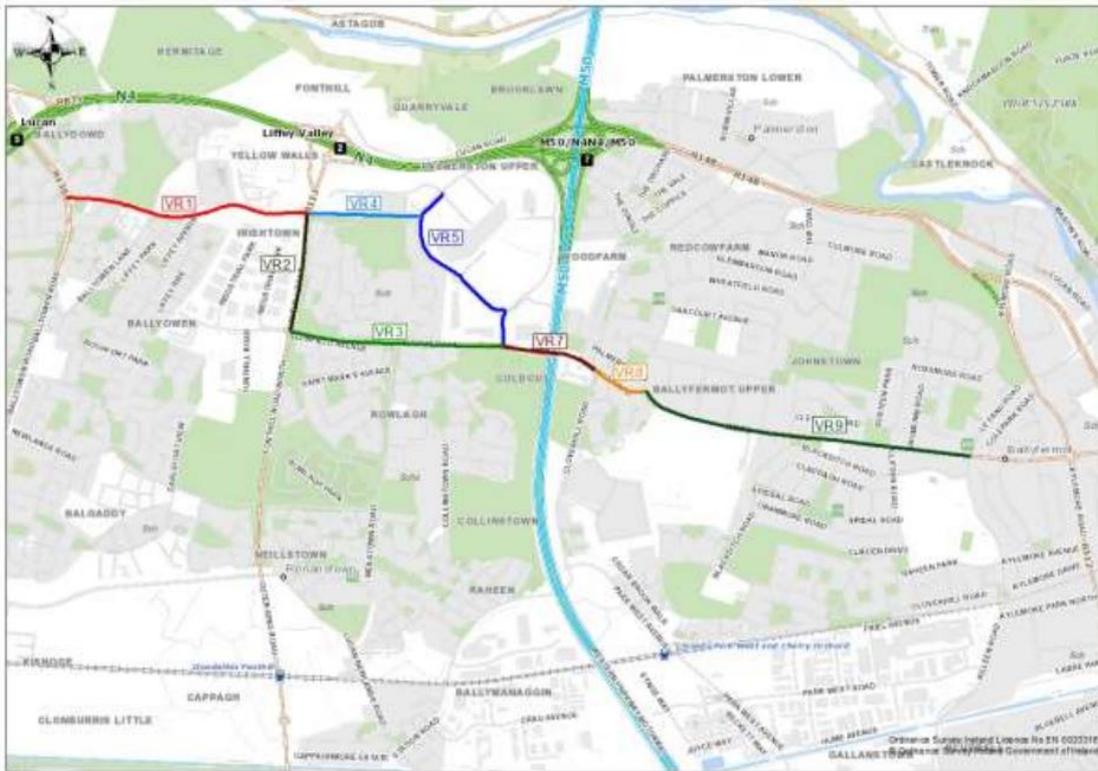


Image 3.7: Section 1 Route Options Remaining After Stage 1 Sifting (Liffey Valley to Christchurch Core Bus Corridor Options Study - Feasibility Report (NTA 2016b))

Route Option LV01 would commence at the roundabout junction between St. Loman’s Road and the R113 Fonthill Road North. The existing roundabout at the R113 junction would be left as existing in order to avoid negatively impacting the traffic capacity of this key junction. The route would travel along the section of the R113 Fonthill Road North between the St. Loman’s Road junction and the R833 Coldcut Road. There is a short section of existing bus lane on this section of road southbound, however, it was proposed to provide bus lanes, cycle tracks and pedestrian facilities in both directions by redistributing the existing road space and widening in some localised areas. Along the entire length of this section there is adequate space available for widening as there are central islands, central medians and grass verges in both directions that could be utilised to facilitate the proposed scheme. A significant number of young trees in the grass verge would be removed to cater for the widening. The existing traffic lane layout would be maintained throughout the section (unless otherwise stated) but would have reduced traffic lane widths to 3m. The existing roundabout on the R113 Fonthill Road North with its intersection of the R833 Coldcut Road would be upgraded in order to improve bus priority. Bus lanes would be provided (where possible), along with upgraded signals in order to minimise potential delays and improve bus priority.

Route Option LV02 would commence at the same point as LV01, but would travel along the Fonthill Road to the west of Liffey Valley Shopping Centre and continues on to Coldcut Road. It was proposed to provide bus lanes and cycle tracks in both directions around Liffey Valley by redistributing the existing road space and generally narrowing the existing central medians. The existing roundabouts along this route section would be upgraded to allow for improved bus priority. Bus lanes would be provided in both directions. Two all-vehicle lanes would be maintained in both directions on this route section including the existing roundabouts in order to ensure traffic capacity in the area is not negatively impacted. The existing traffic lane layout would be maintained throughout the section (unless otherwise stated) but would have reduced traffic lane widths to 3m. New Toucan crossings were proposed; on the Fonthill Road adjacent to the Liffey Valley Motor Hall, on the western arm of the roundabout adjacent to Greenfort Lawns, and on the north western arm of the roundabout adjacent to Greenfort Crescent. All existing pedestrian crossings located along this section would be upgraded to Toucan crossings. New bus stops on both sides are proposed. Throughout this section where there are proposed intersections, pedestrian crossing facilities in the form of toucan crossings would be provided, along with the upgrading of all existing pedestrian crossings to Toucan crossings.

As mentioned previously, each route option was evaluated using a multi-criteria assessment with one of the primary criteria being 'Environment', under which there was a number of sub-criteria which each route option was considered against comparatively.

Both routes were considered neutral when compared against one another under the Archaeological, Architectural and Cultural Heritage; Soils and Geology; Hydrology; Air Quality; Noise and Vibration; and Land Use Character criteria. Route Option LV02 (when compared to Option LV01), was considered more favourable under the Flora and Fauna, and Landscape and Visual criteria as there is no land acquisition required.

Overall LV02 was deemed to be a slightly more beneficial route under most of the main criteria, including Environment and therefore was brought forward into the Emerging Preferred Route.

Shortly after the Emerging Preferred Route was finalised, plans for a new bus interchange were proposed in the Liffey Valley shopping centre car park, in the area in front of the main entrance to the shopping centre. To align with these proposals, the starting point of LV02 was amended to tie into the new bus interchange.

3.3.2.2 Section 2: Route Options Assessment

Following the Stage 1 sifting process, four viable route options for Section 2 were taken forward for assessment and further refinement as follows:

- Route Option BF01 (VR28, VR38, VR37, VR30 and VR31 in Image 3.8): Along Le Fanu Road between the junction with R833 Ballyfermot Road and R112 Kylemore Road, then along Kylemore Road to the Lucan Road junction, continuing along Chapelizod Road;
- Route Option BF02 (VR10, VR35, VR28, VR38, VR37, VR30 and VR31 in Image 3.8): Along R833 Ballyfermot Road, continuing along R112 Kylemore Road to the Lucan Road junction and along Chapelizod Road;
- Route Option BF03 (VR10, VR11, VR12 and VR13 in Image 3.8): Along R833 Ballyfermot Road, continuing onto Sarsfield Road to the junction with Con Colbert Road; and
- Route Option BF04 (same as BF03).



Image 3.8: Section 2 Route Options Remaining After Stage 1 Sifting (Liffey Valley to Christchurch Core Bus Corridor Options Study - Feasibility Report (NTA 2016b))

Route Option BF01 would travel along Le Fanu Road from its junction with the R833 Ballyfermot Road to its junction with the R112 Kylemore Road. The junction at the intersection of R833 Ballyfermot Road and Le Fanu Road, and the intersection of Le Fanu Road and R112 Kylemore Road would be upgraded to provide bus priority. The route would then travel along R112 Kylemore Road to its junction with the Lucan Road. The junction at the intersection of R112 Kylemore Road and Lucan Road, and the intersection of the Lucan Road and Chapelizod Road would be upgraded to provide bus priority. The route would continue to travel along Chapelizod Road to the option's end point on the Chapelizod Road. The junction at the intersection of the Chapelizod Road with Main Street would be upgraded to provide bus priority. It was proposed to provide bus lanes and cycle tracks in both directions along this section except on the existing bridge over the River Liffey at Chapelizod Village. It would not be feasible to provide cycle facilities at this location due to lack of space and average speeds of buses currently using this route suggest that delays are often experienced in this location, therefore cyclists and buses would share space along this short length. Widening would be a combination of private and public land take, including setting back of boundaries and utilising grass verges. The existing traffic lane layout would be maintained throughout the section (unless otherwise stated) but would have reduced traffic lane widths to 3m.

Route Option BF02 would travel along the R833 Ballyfermot Road to the roundabout junction with the R112 Kylemore Road and continue along the R112 Kylemore Road to its junction with the R109 Lucan Road. From here the route would travel onto the bridge over on the River Liffey on the Chapelizod Road and run along the perimeter of Phoenix Park. There are a number of pinch points along this section of the R833 Ballyfermot Road which would preclude the provision of bus lanes and cycle tracks together on the Ballyfermot Road. It was proposed to provide new and upgraded bus lanes and footpaths in both directions along this length. As cycle tracks are not feasible on the Ballyfermot Road, due to the proximity of residential properties approaching the junction of Ballyfermot Road and Kylemore Road, an alternate cycle route was proposed. Inbound cyclists approaching the junction of the Ballyfermot Road and Le Fanu Road would travel along the Le Fanu Road and join up with the route section where Le Fanu Road intersects with the Kylemore Road. Outbound cyclists would travel this route in reverse. The existing roundabout on the Ballyfermot Road with its intersection with the Kylemore Road would be upgraded to a signalised junction in order to minimise the potential delays and improve bus priority. The Kylemore Road from the Ballyfermot Road to the Le Fanu Road has a number of schools that use on street parking. This parking would be removed in order to accommodate the proposed scheme. As a result, it would be

difficult to redistribute this parking elsewhere on the school grounds. This route is the same as BF01 from the Le Fanu Road junction on the Kylemore Road.

Route Option BF03 would travel along the R833 Ballyfermot Road from its junction with Le Fanu Road and continue along Sarsfield Road until its junction with the Con Colbert Road. It was proposed to provide new and upgraded bus lanes, cycle tracks and pedestrian facilities in both directions along the entire length of this route. However, there are two locations on the Ballyfermot Road where cycle tracks are not feasible due to the proximity of residential properties. Therefore, cyclists and buses would share space along these short lengths. Widening would be required in the form of setting back of road kerbing on the street running parallel to the Ballyfermot Road. Approximately 80m of boundary would be set back by 1m to accommodate the widening adjacent to the Bank of Ireland and similarly 20m of existing boundary would be set back by 1m to accommodate the widening adjacent to the Ballyfermot Credit Union potentially impacting on car parking adjacent to the row of businesses. It was estimated that 14 car parking spaces may be affected by the widening. Alternative parking could be accommodated on adjacent side streets. The pedestrian footpath would be reduced in the inbound and outbound direction to 1.8m to reduce the impact of the widening. The existing traffic lane layout would be maintained throughout the section but would have reduced traffic lane widths to 3m. The existing roundabout on Ballyfermot Road with its intersection with Kylemore Road would be upgraded to a signalised junction in order to minimise potential delays and improve bus priority. Bus lanes would be provided in both directions. Furthermore, the junction at the intersection of the Ballyfermot Road and Le Fanu Road would be upgraded to provide bus priority.

Route Option BF04 would travel along the R833 Ballyfermot Road from its junction with Le Fanu Road and continue along Sarsfield Road until its junction with the Con Colbert Road. It was proposed to provide new and upgraded bus lanes, cycle tracks and pedestrian facilities in both directions along the entire length of this section. Unlike Route Option BF03, this option would provide cycle tracks all through Ballyfermot Village. In order to achieve this, inbound general traffic through Ballyfermot Village would be prohibited, therefore only allowing outbound general traffic to travel through the village. Inbound general traffic traveling on Ballyfermot Road would turn left onto Le Fanu Road to its intersection with the Kylemore Road. From here, inbound traffic would travel along Kylemore Road to its intersection with Ballyfermot Road and to the point where it turns left towards the City Centre and re-joins Ballyfermot Road. Outbound traffic would operate as normal and travel through Ballyfermot Village. The extra space created by the exclusion of an inbound traffic lane would be redistributed to accommodate bus lanes, cycle tracks and pedestrian facilities in both directions, along with creating an improved public space in front of the businesses in Ballyfermot village. The existing roundabout on the Ballyfermot Road with its intersection with the Kylemore Road would be upgraded to a signalised junction in order to minimise potential delays and improve bus priority. On Le Fanu Road and Kylemore road, extensive paving works would be undertaken to bring their pavements up to standard in order to deal with the added traffic volume. Kylemore Road from Ballyfermot Road to Le Fanu Road has a number of schools that use on street parking. This parking would be removed in order to accommodate the Proposed Scheme. As a result, it would be difficult to redistribute this parking elsewhere on the school grounds. From the Kylemore Road junction on the Ballyfermot Road, this route section would continue onto Sarsfield Road until its junction with Con Colbert Road which is the same as Route Option BF03.

As mentioned previously, each route option was evaluated using a multi-criteria assessment with one of the primary criteria being 'Environment', under which there was a number of sub-criteria which each route option was considered against comparatively.

All four routes were considered neutral when compared against one another under the Soils and Geology; Landscape and Visual; Air Quality; Noise and Vibration; and Land Use Character criteria. Route Options BF03 and BF04 were considered more favourable under the Archaeology, Architectural and Cultural Heritage; Flora and Fauna; and Hydrology criteria. The reason for this is that these routes do not travel through areas near the River Liffey or through an Architectural Conservation Area, unlike BF01 and BF02.

Overall BF03 and BF04 were deemed to be the most advantageous routes under most of the main criteria, including Environment, with BF03 ultimately being preferred over BF04 due to the need to redistribute the Ballyfermot Village inbound traffic for BF04, and therefore BF03 was brought forward into the Emerging Preferred Route.

3.3.2.3 Section 3 Route Options Assessment

Following the Stage 1 sifting process, ten viable route options for Section 3 were taken forward for assessment and further refinement as follows:

- Route Option CCT01 (VR31, VR32, VR33, VR34, VR61 and VR21 in Image 3.9): Along R109 Conyngham Road until joining the quays before utilizing Lower Bridge Street and the R108 to access the Christchurch area;
- Route Option CCT02 (VR47, VR48, VR50, VR58, VR59, VR33, VR34, VR61 and VR21 in Image 3.9): Along Con Colbert Road and the R148 St. John's Road West before entering the City Centre via the North and South Quays, then utilizing Lower Bridge Street and the R108 to access the Christchurch area;
- Route Option CCT03 (VR14, VR46, VR53, VR54, VR55, VR19, VR20 and VR21 in Image 3.9): Along Sarsfield Road, Grattan Crescent and the R810 to the Christchurch area;
- Route Option CCT04 (VR47, VR48, VR51, VR52, VR54, VR55, VR19, VR20 and VR21 in Image 3.9): Along Con Colbert Road, the R148, R111 and the R810 to the Christchurch area;
- Route Option CCT05 (VR47, VR48, VR56, VR32, VR50, VR58, VR59, VR33, VR34, VR61 and VR21 in Image 3.9): Along R148 Con Colbert Road, turns onto South Circular Road, continuing onto the Conyngham Road, joining the quays and terminating in the Christchurch area via Lower Bridge Street;
- Route Option CCT06 (VR47, VR48, VR50, VR58, VR55, VR19, VR20 and VR21 in Image 3.9): Along Con Colbert Road and the R148 St. John's Road West, along Steeven's Lane, onto Bow Lane West, Thomas Street and terminating at the end of High Street;
- Route Option CCT07 (same as CCT03):
- Route Option CCT08 (same as CCT03);
- Route Option CCT09 (same as CCT03); and
- Route Option CCT10 (same as CCT03).

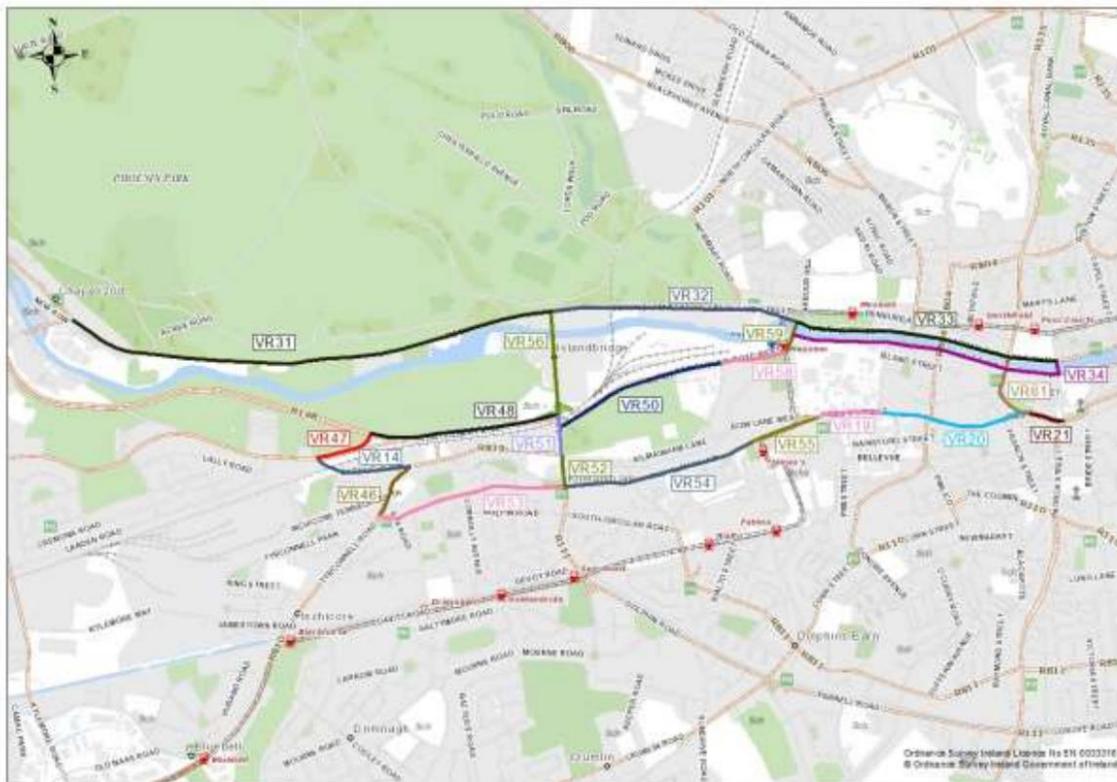


Image 3.9: Section 3 Route Options Remaining After Stage 1 Sifting (Liffey Valley to Christchurch Core Bus Corridor Options Study - Feasibility Report (NTA 2016b))

Route Option CCT01 begins at the end point of Route Options BF01 and BF02 from Study Area 'Section 2: Le Fanu Road to Sarsfield Road'. It travels along the R109 Conyngham Road until joining the quays before utilising Lower Bridge Street and the R108 to access the Christchurch area. It provides bus lanes and pedestrian footpaths in both directions along this length of this route. Due to the proximity of adjacent properties and a high retaining wall associated with the Phoenix Park along this section, dedicated cycling facilities would not be feasible. However, for the first 430m of this route option, cycle facilities were proposed on both sides. From here until the western end of the quays, cyclists and buses would share the bus lane. As an alternative for cyclists, it was proposed to provide cycle tracks through the Phoenix Park via the Kyber Road, Wellington Road and Chesterfield Avenue, re-joining the route on Park Gate Street. Some land take from private owners would be required in order to provide the required cross-section. Over the entire length of this route section (Chapelizod Road and Conyngham Road) there is restricted on street parking available that is used by adjacent residential and business properties, which would be removed to accommodate inbound and outbound bus lanes. This parking could be accommodated within the adjacent properties. An inbound traffic lane would be removed adjacent to The Criminal Courts of Justice and replaced with an inbound bus lane. Due to the proximity of adjacent building lines, cycle facilities are not feasible along Parkgate Street. The route option would continue along Wolfe Tone Quay, Sarsfield Quay, Ellis Quay, Arran Quay and over the Father Mathew Bridge in the inbound direction. Outbound the route would travel on the southern side of the River Liffey along Usher's Quay, Usher's Island, Victoria Quay and over the Frank Sherwin Bridge, and re-join the inbound section of the route on Wolfe Tone Quay. It was proposed to use the existing bus lanes along the quays. This route section would continue from Father Mathew Bridge onto Bridge Street, where it would terminate at the end of High Street. New bus lanes and upgraded footpaths in both directions are proposed along the length of this route section. Due to the proximity of adjacent building lines along this section, dedicated cycling facilities would not be feasible and cyclists would be required to share the bus lane.

Route Option CCT02 travels along Con Colbert Road and the R148 St. John's Road West before entering the City Centre via the North and South Quays. It would then utilise Lower Bridge Street and the R108 to access the Christchurch area. Bus lanes were proposed along the entire route except at some localised areas through junctions, and cycle tracks are provided in line with the Cycle Network Plan. On the Con Colbert Road, it was proposed to provide new and upgraded bus lanes, cycle tracks and pedestrian facilities in both directions along this length of the route section. From the junction between Con Colbert Road and South Circular Road to the quays, it was proposed to provide new and upgraded bus lanes, cycle tracks and pedestrian facilities in both directions along the R148 St. John's Road West by means of redistributing road space. Land take would be required on the approach to the junction of the R148 and South Quays in order to provide bus lanes. This land would be taken from green space adjacent to the Luas line at Heuston Station. Inbound buses would then travel along the existing bus lanes on the North Quays and outbound busses along the South Quays. In order to facilitate the extra space required for a proposed outbound bus lane and a cycle track in both directions, the existing taxi queuing lane outside Heuston Station would be removed. An increased area for taxi waiting could be accommodated within the Station. The route option would continue over the Frank Sherwin Bridge where it would continue the same as Route Option CCT01.

Route Option CCT03 would travel along Sarsfield Road, Grattan Crescent and the R810 to the Christchurch area. This would involve travelling along Emmet Road, Old Kilmainham, Mount Brown, James's Street, Thomas Street, terminating on High Street. Sarsfield Road is currently a one-way road with a contra-flow bus lane. It is not feasible to provide additional bus priority measures inbound due to the proximity of residential building lines and, as such, it was proposed to leave the existing layout as is. Due to the localised narrowing at the location of the railway over bridge on the Sarsfield Road, an outbound bus priority lane is not feasible for approximately 50m at this location. Also, due to lack of space, it is not feasible to provide cycle facilities along this section. As this is a designated primary cycle route, an alternative was proposed along the R148 and Memorial Road. It was proposed to provide new cycle tracks and pedestrian facilities in both directions along this alternative route section. It was proposed to provide new and upgraded bus lanes and pedestrian facilities on Grattan Crescent in both directions, and where possible on Emmet Road. For the first 70m, inbound, on the Emmet Road priority bus lanes would not be provided, due to the proximity of adjacent building lines. Outbound on the Emmet Road at its junction with Saint Vincent Street, signal controlled priority was proposed at the junction. From the junction at South Circular Road, the CBC continues along the Old Kilmainham, Mount Brown and James's Street to the junction with Bow Lane West. Due to the proximity of building lines along this route, it is not possible to provide bus lanes along the majority of the route. Cycle facilities were not proposed along this section and an alternative cycle facility would be accommodated along Kilmainham Lane and Bow Lane West, where it would re-join the route section on James's Street. From here it was proposed to provide bus lanes in both directions along Thomas Street to High Street, generally by redistributing the existing road space and reducing the width of the central median.

Route Option CCT04 would travel along Con Colbert Road, the R148, R111 and the R810 to the Christchurch area. This would involve travelling along Old Kilmainham, Mount Brown, James's Street and Thomas Street. Along Con Colbert Road it was proposed to provide new and upgraded bus lanes, cycle tracks and pedestrian facilities in both directions along this length of this route section. It was proposed to provide bus lanes in both directions along South Circular Road from its junction with Con Colbert Road and Old Kilmainham. A general traffic lane in both directions on South Circular Road (between Con Colbert Road and Kilmainham Lane) would be removed, and the existing road space redistributed (between Kilmainham Lane and Old Kilmainham), in order to accommodate a single general traffic lane and bus lane. Due to the lack of available space, cycle facilities would not be feasible along the South Circular Road, therefore cyclists and buses would share space along this length. From the junction at the R111 South Circular Road the route continues along Old Kilmainham, Mount Brown and James's Street to the junction with Bow Lane West. The remainder of this route option would continue the same as Route Option CCT03.

Route Options CCT05 would travel along R148 Con Colbert Road, turn onto South Circular Road where it would continue onto the Conyngham Road adjacent to the Phoenix Park. From here it would join the Quays and terminate at the Christchurch area via Lower Bridge Street. It was proposed to provide new and upgraded bus lanes, cycle tracks and pedestrian facilities in both directions along Con Colbert Road section of this route option. Widening would be undertaken by reducing the width of central medians along this section of the route option. A significant number of young trees in the grass verges would be removed to cater for the widening. It was proposed to upgrade all existing pedestrian facilities around this junction to toucan crossings. From here the route would travel onto South Circular Road. It was proposed to provide bus lanes and upgraded pedestrian facilities along its length by means of redistributing the existing road space. Bus lanes are not feasible for a section of 50m that travels onto the bridge over the River Liffey. It was proposed to provide bus lanes and pedestrian footpaths in both directions along the Conyngham Road from its junction with South Circular Road to the Quays. Due to the proximity of adjacent properties and a high retaining wall associated with the Phoenix Park along this section, dedicated cycling facilities are not feasible. From here until the western end of the quays, cyclists and buses would share the bus lane. As an alternative route for cyclists, it was proposed to provide cycle tracks in both directions along Saint John's Road West from its junction with South Circular Road to the Frank Sherwin Bridge, re-joining the route on the Quays. From here the route option would continue the same as Route Option CCT01.

Route Options CCT06 would travel along Con Colbert Road and St. John's Road West and turn onto Steeven's lane, where it would share space with the Red Line Luas. It would then continue onto Bow Lane West, Thomas Street and terminate at the end of High Street. Along Con Colbert Road from its junction with Chapelizod Bypass, it was proposed to provide new and upgraded bus lanes, cycle tracks and pedestrian facilities in both directions. Widening would be undertaken by means of redistributing road space. In general, this would require a reduction in the median, resulting in the removal of a number of trees. From the junction on Saint John's Road West to its intersection with Steeven's lane, it was proposed to provide new and upgraded bus lanes, cycle tracks and pedestrian facilities in both directions along St. John's Road West by means of redistributing road space. In order to facilitate the extra space required for a proposed outbound bus lane and cycle track in both directions, the existing taxi queuing lane outside Heuston Station would be removed. An increased area for taxi waiting could be accommodated within the Station. This route option would provide an inbound right turn bus lane at the Steeven's Lane junction for buses travelling from the R148. The route would then share the existing tram lanes in both directions with the Luas along Steeven's Lane. Provision of this right turn lane and redesign of this junction would require some land take from the open green space to the front of Dr Steeven's Hospital. Due to the lack of available space on this section and safety concerns with possible conflict with buses and trams, cycle tracks would not be feasible along this section. From Steeven's Lane it was proposed to provide bus lanes in both directions along Thomas Street to High Street, generally by redistributing the existing road space and reducing the width of the central median. Due to the proximity of adjacent building lines dedicated cycle facilities would not be feasible for sections along Thomas Street.

Route Option CCT07 would travel along Sarsfield Road, Grattan Crescent, Emmet Road, Old Kilmainham, Mount Brown, James's Street, Thomas Street and terminate on High Street. This route is similar to CCT03 described previously. The main difference is that in order to allow further bus lanes to be provided, it is proposed to close the entire section of the Emmet Road, Old Kilmainham, Mount Brown, James's Street to general traffic in the outbound direction. By removing one all-vehicle lane, this would allow inbound bus lanes to be provided along the entire (1.4km) section of this route while outbound bus lane provision would be approximately 2.2km. By removing an outbound traffic lane, full bus priority could be achieved along the Emmet Road while also retaining all existing on street parking.

Route Option CCT08 would travel along Sarsfield Road, Grattan Crescent, Emmet Road, Old Kilmainham, Mount Brown, James's Street, Thomas Street and terminate on High Street. This route is similar to CCT03 and CCT07 described previously. The main difference is that it was proposed to provide bus lanes in both directions where possible on Emmet Road between Tyrconnell Road and South Circular Road. Unlike Route Option CCT07, CCT08 maintains two-way public traffic along the Emmet Road. Due to the proximity of adjacent building lines, cycle facilities would not be feasible along this section.

Route Option CCT09 would travel along Sarsfield Road, Grattan Crescent, Emmet Road, Old Kilmainham, Mount Brown, James's Street, Thomas Street and terminate on High Street. This route is similar to CCT03, CCT07 and CCT08 described previously. One difference is that it is proposed to close this entire section of the Emmet Road between Tyrconnell Road and South Circular Road to general traffic in the outbound direction. By removing an outbound traffic lane, full bus priority could be achieved along the Emmet Road while at the same time retaining all existing on street parking. The other main difference is that in order to promote a level of bus priority along Old Kilmainham, Mount Brown and James's Street from South Circular Road to Bow Lane West, a bus gate was proposed on Old Kilmainham. As a result, no through public traffic would be permitted along Old Kilmainham, Mount Brown and James's Street between South Circular Road and Bow Lane West.

Route Option CCT10 would travel along Sarsfield Road, Grattan Crescent, Emmet Road, Old Kilmainham, Mount Brown, James's Street, Thomas Street and terminate on High Street. This route is similar to CCT03, CCT07, CCT08 and CCT09 described previously. One difference is that it is proposed to provide bus lanes in both directions where possible on Emmet Road between Tyrconnell Road and South Circular Road. Unlike route option CCT09, CCT10 maintains two-way public traffic along the Emmet Road. Similar to CCT09, a bus gate was also proposed on Old Kilmainham.

As mentioned previously, each route option was evaluated using a multi-criteria assessment with one of the primary criteria being 'Environment', under which there was a number of sub-criteria which each route option was considered against comparatively.

All ten routes were considered neutral when compared against one another under the Soils and Geology; and Land Use Character criteria. Route Options CCT01-CCT05 and CCT07-CCT10 were considered more favourable under the Archaeology, Architectural and Cultural Heritage criteria, due to the requirement for land take from the curtilage of Steeven's Hospital (a protected structure) under Route Option CCT06. Route Options CCT02-CCT10 were considered more favourable under the Flora and Fauna criteria, due to the potential for land take adjacent to the River Liffey for Route Option CCT01. Route Option CCT06 was considered the most favourable under the Hydrology criteria due to its distance from the River Liffey and low flood risk. Route Options CCT02-CCT10 were considered most favourable under the Landscape and Visual criteria due to the potential for detrimental effects due to road widening on Route Option CCT01. Route Options CCT01, CCT02, CCT04-CCT07 and CCT10 were considered most favourable under the Air Quality; and Noise and Vibration criteria due to the proximity to sensitive receptors on Route Options CCT03, CCT08 and CCT09.

Overall CCT10 was deemed to be generally the most advantageous route option under most of the main criteria, including Environment and therefore was brought forward into the Emerging Preferred Route.

3.3.3 Cycling Options

Consideration of alternative cycling route options was fundamental in the process of identifying the Emerging Preferred Route. In general, the Emerging Preferred Route proposed generally aligns with the primary routes 7a and 7 on the Greater Dublin Area Cycle Network Plan which is generally routed from Lucan South to the City Centre via Liffey Valley Shopping Centre, Ballyfermot, Inchicore and Kilmainham (7a) and Thomas Street to Christ Church (7).

During the Emerging Preferred Route stage, identification of alternative cycle routes separate to the Core Bus Corridor Emerging Preferred Route were not considered appropriate for this scheme as they were proposed as part of each of the route options identified.

3.3.4 Emerging Preferred Route

Informed by the appraisal of options as set out earlier, the Emerging Preferred Route was identified. That Emerging Preferred Route is summarised as follows:

'The Liffey Valley Core Bus Corridor (CBC) commences at a new terminus close to the Liffey Valley Shopping Centre, in the vicinity of the shopping centre car park access roundabout (exact location to be determined as part of a separate study), and is routed along the distributor roads to the west and south of the shopping centre to the junction with the R833 Coldcut Road. It is then routed via the R833 along Coldcut Road and Ballyfermot Road to the junction with Sarsfield Road. From here, the CBC is routed via Sarsfield Road, the R839 along Grattan Crescent, the R810 along Emmett Road, Old Kilmainham, Mount Brown, James's Street, Thomas Street, and Cornmarket, and the R108 along High Street to the junction with Nicholas Street and Winetavern Street, where it will join the prevailing traffic management regime in the City Centre. Priority for buses is provided along the entire route, consisting primarily of dedicated bus lanes in both directions with alternative measures proposed at particularly constrained locations.'

A public consultation on the Emerging Preferred Route was undertaken from 23 January 2019 to 30 April 2019, providing feedback which was then meaningfully considered in the further development of the scheme proposal.

3.4 Design Alternatives

3.4.1 Development of the Draft Preferred Route Option

Following the completion of the public consultation in relation to the Emerging Preferred Route, various amendments were made to the scheme proposals to address a number of the issues raised in submissions, including incorporating suggestions and recommendations from local residents, community groups and stakeholders, and/or arising from the availability of additional information. These amendments were incorporated into the designs and informed a draft Preferred Route Option.

This additional design development took account of:

- New and updated topographical survey information;
- Output from engagement and consultation activities on the Emerging Preferred Route and draft Preferred Route Option proposals;
- Further design development and options assessment; and
- Changes in the extent of the scheme.

Where substantial revisions had been made to the design since the publication of the Emerging Preferred Route options were assessed using MCA to determine the Preferred Route Option. The MCA assessed any newly developed options against the previously identified Emerging Preferred Route. The methodology and MCA used were consistent with that carried out during the initial route optioneering work (including consideration of the relevant environmental aspects), which informed the identification of the Emerging Preferred Route.

Following this design development process, the draft Preferred Route Option was identified. For ease of reference, the draft Preferred Route Option has been divided into three 'sections':

- Section 1 – Liffey Valley to Le Fanu Road;
- Section 2 – Le Fanu Road to Sarsfield Road; and
- Section 3 – Sarsfield Road to City Centre.

3.4.1.1 Section 1 – Liffey Valley to Le Fanu Road

The start of Section 1 originally extended from the Ballyowen Road to Le Fanu Road. The starting point was subsequently changed to tie in with the Liffey Valley Shopping Centre Bus Interchange and Road Improvement Scheme on Fonthill Road to align with proposals brought forward to develop a bus interchange facility to the north of their campus.

The design for the proposed bus interchange and road improvement works were progressed by the Liffey Valley shopping centre and a planning application was submitted to South Dublin County Council. The Proposed Scheme design and starting point was refined on Fonthill Road to tie into these proposals.

The removal of existing traffic calming measures along Ballyfermot Road was raised as an issue by the local community. As a result, new traffic calming measures were incorporated into the design using raised tables.

The design along Ballyfermot Road was also refined where the existing parallel access roads are located. To facilitate the proposed road widening in this area, the access roads will be removed which will result in a loss of parking outside the residential properties. To address this issue, new parallel parking was added to the design between Cloiginn Park and Drumfinn Road.

For Section 1 of the Proposed Scheme, no further alternatives were considered at the draft Preferred Route Option stage. The route proposed at the Emerging Preferred Route stage was considered to offer the most benefits and therefore the EPR Option was progressed as the Draft Preferred Route Option.

Consideration was given to widening the existing bridge over the M50 in order to provide continuous bus lanes and segregated cycling facilities. Due to the design of the existing bridge, widening the bridge was not progressed as an option. A new structure to the south was also ruled out due to local constraints including the Coldcut Park residential development. A new structure to the north was considered but not progressed as it did not offer a significant reduction in bus journey times when compared to providing Signal Controlled Priority on each side of the bridge. To enhance the walking and cycling facilities across the bridge, the two existing traffic lanes are proposed to be reduced in width to provide a wider shared footway and cycle track across the bridge.

3.4.1.2 Section 2 – Le Fanu Road to Sarsfield Road

Between Le Fanu Road and Colepark Road, the EPR originally proposed that cyclists would share the bus lane. In order to provide cycle facilities along this section of the route, two new options were considered.

- Option BF04 – this option proposes to divert citybound general traffic along Le Fanu Road and Kylemore Road in order to provide segregated cycle tracks for the full length of the section, without requiring any land acquisition through Ballyfermot Village. Citybound general traffic through Ballyfermot Village would be prohibited but local access would be permitted to access Colepark Road from the Le Fanu Road / Ballyfermot Road junction. Citybound general traffic would be required to turn left onto Le Fanu Road to its intersection with Kylemore Road, and then travel along Kylemore Road to the intersection with Ballyfermot Road. General traffic would then turn left and re-join Ballyfermot Road in the direction of the city centre. Outbound traffic would operate as normal and travel through Ballyfermot Village. Fully segregated cycling facilities would be provided in both directions; and
- Option BF05 – this option proposes to provide bus lanes, general traffic lanes, segregated cycle tracks and pedestrian facilities in both directions along Ballyfermot Road between Le Fanu Road and Kylemore Road. To provide this proposed cross section, widening and land take would be required along Ballyfermot Road between Le Fanu Road and Kylemore Road. Existing private land boundaries would be set back to accommodate the widening on both sides of the carriageway between Le Fanu Road and Colepark Road. The width of the pedestrian footpaths and cycle track on either side of the carriageway would be reduced to limit the impact of the widening. Fully segregated cycling facilities and bus lanes would be provided in both directions.

An MCA was completed for the original Emerging Preferred Route and the two new options. In terms of Environment, Option BF05 had some disadvantages due to the impacts as a result of the additional land take required along Ballyfermot Village to provide the full cross section compared to options BF03 and BF04 which retain the existing highway boundary. While in terms of Cycling Integration, Options BF04 and BF05 are considered to perform favourably as they provide continuous cycle tracks through Ballyfermot Village compared to option BF03 which requires cyclists to share the bus lane.

Based on the assessment undertaken, route Option BF04 was found to offer more advantages over other options. It performs well under the Economy, Integration and Environment criteria for the following reasons:

- It provides full physical bus priority throughout this section, ensuring reliability of journey time for the bus;
- It provides continuous cycle tracks through the section in line with primary Route 7a of the GDA cycle network; and
- It minimises the impact on properties along Ballyfermot Road in the vicinity of Ballyfermot village.

Option BF04 is the Preferred Route Option for the Le Fanu Road to Sarsfield Road section of the Proposed Scheme.

Other areas of Section 2 Le Fanu Road to Sarsfield Road which were amended were:

- To reduce the impact on Markievicz Park and the adjacent residential properties, the design was refined to provide signal controlled priority in lieu of a bus lane for inbound buses on Ballyfermot Road between Markievicz Park and St Laurence's Road. The inbound bus lane would then be reintroduced at St. Laurence's Road. To accommodate the revised arrangements, it is also intended to close Ballyfermot Road / O'Hogan Road junction of as part of the implementation of the signal controlled priority on Ballyfermot Road. The impact on the apartments at St. Laurence's Glen was also reduced by this design change. This revised option was considered to have some advantages in terms of lesser environmental impacts (cultural heritage, flora and fauna and landscape and visual), when compared to the EPR.
- On Ballyfermot Road between Clifden Road and Kylemore Road, the design was refined to provide urban realm enhancements along this section of the Proposed Scheme. These additional proposals would improve the landscape and amenity through Ballyfermot Village. Additional tree planting was also proposed along the schools and Ballyfermot resource centre to offset existing trees impacted by the Proposed Scheme.
- As part of the public consultation, a number of submission called for the existing roundabout at Ballyfermot Road / Kylemore Road to be retained. Consideration was given to this proposal. The option of signalising the existing roundabout was considered but was ruled out as it did not provide the same level of bus priority, walking and cycling facilities compared to the signalised junction design. The signalised junction design also allowed more space on the four corners of the junction to be reallocated to create enhanced pedestrian facilities and urban realm enhancements. The design also provided parking for the residential properties which fronted onto the junction.

3.4.1.3 Section 3 – Sarsfield Road to City Centre

Following the engagement and public consultation, concerns were raised due to the impact on the existing mature trees along Grattan Crescent which were removed in the EPR to facilitate the proposed road widening. As a result, two new options were considered for this section of the Proposed Scheme.

- Option CCT11 - proposes to provide new and upgraded bus lanes and pedestrian facilities on Grattan Crescent in both directions between Sarsfield Road and Emmet Road. To remove the need for carriageway widening and retain the existing mature trees, general traffic will be limited to a single lane along Grattan Crescent in a southbound direction between Sarsfield Road and Inchicore Terrace South. The space made available by removing a lane of general traffic will be utilised to widen the footways and carry out public realm works along Grattan Crescent. Some car parking will be retaining along this section, and a new pedestrian crossing would be provided between Grattan Crescent Park and Inchicore National School. To reduce the impact of the proposed traffic restrictions on local residents; Memorial Road will be converted to two-way general traffic, the junction between Inchicore Road and Memorial Road will be modified to accommodate the traffic movements, and a new right turn will be made available for cars accessing the Chapelizod Bypass from the western end of Sarsfield Road; and
- Option CCT12 - proposes to provide new and upgraded bus lanes and pedestrian facilities on Grattan Crescent in both directions between Sarsfield Road and Emmet Road. To remove the need for carriageway widening, general traffic would be limited to a single lane along Grattan Crescent in a northbound direction between Sarsfield Road and Inchicore Terrace South. The space made available by removing a lane of general traffic will be utilised to widen the footways and carry out public realm works along Grattan Crescent. Some car parking will be retained along this section, and a new pedestrian crossing would be provided between Grattan Crescent Park and Inchicore National School. As part of the analysis of this route, the re-routing of existing general traffic was

considered. Vehicles entering the city centre would be encouraged take the R148 (Chapelzod Bypass) from Sarsfield Road, while vehicles making more local journeys are to instead follow the R148, the R111 (South Circular Road), Inchicore Road and the R810. To reduce the impact of the proposed traffic restrictions on local residents; Memorial Road will be converted to two-way general traffic, the junction between Inchicore Road and Memorial Road will be modified to accommodate the traffic movements, and a new right turn will be made available for cars accessing the Chapelzod Bypass from the western end of Sarsfield Road.

An MCA was completed for the original EPR and the two new options. In terms of Environment, Option CCT10 (the option brought forward to the Emerging Preferred Route) had some disadvantages due to the impact as a result of the additional carriageway widening along Grattan Crescent which required the removal of the existing mature trees on both sides of the road. This would have a negative impact in terms of landscape and visual and the land use character of the area. Options CCT11 and CCT12 retain the existing trees along Grattan Crescent.

In terms of Integration, option CCT12 had a disadvantage as the proposed northbound one-way system for general traffic on Grattan Crescent did not tie in as well with exiting local traffic management arrangements in the area. CCT11 proposes a southbound one-way system for general traffic on Grattan Crescent which ties in with the existing one-way system on Inchicore Road.

Based on the assessment undertaken, route Option CCT11 appears to offer more benefits over other options. It performs well under the Economy, Integration and Environment criteria for the following reasons:

- It provides full physical bus priority throughout this section, ensuring reliability of journey time for the bus;
- It retains the existing mature trees along Grattan Crescent; and
- The proposed one-way system on Grattan Crescent ties in well with the existing local traffic management in the area.

Option CCT11 is the Preferred Route Option for the Sarsfield Road to City Centre section of the Proposed Scheme.

Other areas of Section 2 Le Fanu Road to Sarsfield Road which were amended were:

- A number of residents raised concern with the proposed right turn ban from Emmet Road to Grattan Crescent as it would impact access to Inchicore Works. As a result, this right turn ban for general traffic was removed from the Proposed Scheme.
- During the first round of public consultation on the Emerging Preferred Route, concerns were raised regarding the lack of pedestrian crossings along Mount Brown and Old Kilmainham. Two new signalised crossings were added to the Proposed Scheme Mount Brown and Old Kilmainham to address concerns raised.
- Consideration was given to providing segregated cycle tracks along Old Kilmainham, Mount Brown, and James's Street. The existing road width along this section is narrow due to the existing building lines on both sides of the road which limits the options available. Converting the section to a one-way system was ruled out as buses need to be able to travel in both directions along this section of the route and local access needs to be maintained. In order to provide cycling facilities along this section, it would require the existing on street parking to be removed which cannot be easily relocated on side streets. The width of the footway would need to be reduced below 1.8m in some locations and the width of the proposed cycle track would also have to be reduced to 1.5m which is below the desirable minimum width. Given these constraints this option was not progressed. An alternative parallel cycling route is provided along Inchicore Road, Kilmainham Lane and Bow Lane.
- The Cornmarket junction was also redesigned and enhanced to provide better walking and cycling provision. The priority of the junction was also changed from High Street / Thomas Street to High Street / Bridge Street Upper. High quality public realm is also proposed at Cornmarket junction which will improve the visual appearance of the area and create additional space for the pedestrian environment.
- A number of bus stops along the route were also redesigned as island bus stops. Bus stop locations were also modified in this revised proposal – some bus stops have been relocated or removed to achieve a better spacing between stops, while also ensuring that each stop is sited in the best location to serve surrounding neighbourhoods.

3.4.2 Consideration Following Draft Preferred Route Option Consultation (March 2020)

The draft Preferred Route Option was published in March 2020 and a second round of public consultation occurred between 04 March 2020 to 17 April 2020. Due to COVID-19 restrictions in mid-March 2020, the planned Public Information Events were impacted. There was a total of 39 submissions received during this second round of public consultation.

A number of changes to the design were made based on feedback received during the second round of public consultation and dialogue with stakeholders. However, the changes made to the draft Preferred Route Option were relatively small scale and no further option assessments using the MCA described in Section 3.3.2 were required.

Key changes for the Proposed Scheme implemented in the design of the draft Preferred Route Option include:

- Two existing roundabouts on the Fonthill Road were redesigned to signalised junctions to provide improved bus priority, walking and cycling facilities;
- The scheme design was refined on Coldcut Road to remove the land take requirement from Coldcut Park;
- Following further engagement with local community in the Mount Brown and Brookfield Road area, the proposed reversal of the existing one-way system on Brookfield Road will not be progressed and the existing one-way system will remain unchanged. This will reduce the amount of traffic that would travel along Brookfield Road;
- The proposed design on James's Street, Thomas Street and High Street was refined to provide continuous cycle tracks on both sides of the road. The existing kerb line is also retained in the proposed design; and
- An offline cycle route which avoids the Luas tracks via Echlin Street was also proposed to connect James's Hospital with James's Street. An alternative option of providing online cycle facilities parallel to the Luas tracks on James's Street was considered but was ruled out due to buildings fronting the road on both sides thus creating a pinch point.

3.4.3 Further Consideration Following Updated Draft Preferred Route Option Consultation (November 2020)

The third round of public consultation on the updated draft Preferred Route Option took place from 04 November to 16 December 2020 and was held virtually due to the continuing effect of the COVID-19 pandemic and associated restrictions. There was a total of 86 submissions received during this round of public consultation.

Arising from the feedback received during this consultation process, a number of design amendments were identified and incorporated into the scheme proposals. The key changes included in the updated design of the draft Preferred Route Option include the following:

- The bus gate on Mount Brown was amended with the eastbound bus gate being relocated to the St James's Street entrance to the hospital campus. The westbound bus gate location was retained but the length was shortened. The operational hours were also refined with the eastbound bus gate operating in the AM and the westbound bus gate operating in the PM. This revised arrangement for the bus gate will allow access at all times to Ceannt Fort, the Children's Hospital, Adult hospital, and local area from all directions;
- The design of Landen Road junction was refined to remove land take from the residential properties. A short section of westbound bus lane was removed and signal controlled priority was used to provide bus priority;
- The area outside Ballyfermot church was refined to enhance the urban realm and to retain vehicular access;
- Improvements were made to the cycling provision at junctions along Sarsfield Road, Grattan Crescent and Inchicore Road to provide a better connection with the 7A primary cycle route which run along Inchicore Road, Kilmainham Lane and Bow lane then re-joins the route at James's Street;

- The alignment design on Thomas Street as it approached Cornmarket was refined to avoid impacting the existing mature trees in the central median; and
- The design of the proposed footway and cycle track on Ballyfermot Road to the west of Cloiginn Park was refined to retain the existing tree along this section.

3.5 Conclusion

The Proposed Scheme has been the subject of a systematic and comprehensive assessment of reasonable alternatives during the course of its development, informed by extensive engagement with residents, businesses, the local authority and other interested stakeholders, public representatives and the general public.

As described in this Chapter, a significant range of alternatives have been considered at three levels:

- Strategic alternatives, particularly with regard to the GDA Transport Strategy;
- Route alternatives; and
- Design alternatives, incorporating detailed local level design development.

The assessment of alternatives took account of environmental impacts, alongside other relevant factors including the economy, safety and accessibility, at appropriate stages.

It is considered that the examination of alternatives presented in this Chapter meets and exceeds the requirements of the EIA Directive and Section 50(2)(b)(iv) of the Roads Act (as amended), which states that an EIAR must contain:

‘a description of the reasonable alternatives studied by the road authority or the Authority, as the case may be, which are relevant to the proposed road development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed road development on the environment’.

The Proposed Scheme is described in detail in Chapter 4 (Proposed Scheme Description).

3.6 References

DTTAS (2016). Common Appraisal Framework for Projects and Programmes

Irish Rail Website. [Online] Dart Expansion Programme available from -
<https://www.irishrail.ie/Admin/IrishRail/media/Content/projects-and-investments/DART-brochure.PDF>

NTA (2008). Dublin Transport Authority Act (as amended)

NTA (2012). Core Network Report 2012

NTA (2013). Greater Dublin Area Cycle Network Plan

NTA (2016a). Transport Strategy for the Greater Dublin Area 2016 – 2035.

NTA (2016b). Liffey Valley to Christchurch Core Bus Corridor Options Study – Feasibility Report

NTA (2019). Liffey Valley to City Centre Core Bus Corridor Emerging Preferred Route. Public Consultation November 2018

NTA (2020a). Liffey Valley to City Centre Core Bus Corridor Preferred Route. Public Consultation March 2020

NTA (2020b). Liffey Valley to City Centre Core Bus Corridor Preferred Route. Public Consultation November 2020

UITP (The International Association of Public Transport) (2009). Public Transport: making the right mobility choices.

Directives and legislation

Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment

S.I. No. 279/2019 - European Union (Roads Act 1993) (Environmental Impact Assessment) (Amendment) Regulations 2019

S.I. No. 296/2018 – European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018