Chapter 03
Consideration of Reasonable Alternatives

Table of Contents

3 CONSIDERATION OF ALTERNATIVES 1
3.1 Environmental Impact Assessment Requirements 1
3.2 Strategic Alternatives 1
3.2.1 Galway Transport Strategy 1
3.2.2 'Do Nothing' Alternative 4
3.2.3 Transport Options 6
3.3 Walking and Cycling Integration 10
3.3.1 Walking and Public Realm 10
3.3.2 Cycling 10
3.3.3 Strategic Environmental Assessment of Alternatives 11
3.3.4 GTS Outcomes 11
3.4 Route Alternatives 11
3.4.1 Initial High Level Route Alternatives 12
3.4.2 Scheme Option Assessment Sections 14
3.4.3 Stage 2 - Route Options Assessment 39
3.4.4 Emerging Preferred Route 46
3.5 Design Alternatives 47
3.5.1 Consideration following Emerging Preferred Route Option Consultation 47
3.5.2 Development of the Preferred Scheme Option 48
3.6 Conclusion 49
3.7 References 50

List of Figures

Figure 3-1 GTS Strategy Development Process 2
Figure 3-2 Trips to, within and across Galway (GTS 2016) 3
Figure 3-3 Existing Galway City Bus Services (NTA,2023) 6
Figure 3-4 Galway City Proposed Bus Network Routes (GTS 2016) 7
Figure 3-5 Public Transport Mode Capacities (GTS 2016) 8
Figure 3-6 Study Area Sections 13
Figure 3-7 Spider Web of Route Option Links 14
Figure 3-8 Post Sifting Spiders Web 14
Figure 3-9 Section 1 Option 1 Indicative Scheme Design 15
Figure 3-10 Section 1 Option 1 Indicative Cross Section 15
Figure 3-11 Section 1 Option 2 Indicative Scheme Design 16
Figure 3-12 Section 1 Option 2 Indicative Cross Section 16
Figure 3-13 Section 1 Option 3 Indicative Scheme Design 17
Figure 3-14 Section 1 Option 3 Indicative Cross Section 17
Figure 3-15 Section 1 Option 4 Indicative Scheme Design 18
Figure 3-16 Section 1 Option 4 Indicative Cross Section 18
Figure 3-17 Section 2 Option 1 Indicative Scheme Design 25
Figure 3-18 Section 2 Option 1 Indicative Cross Section 25
Figure 3-19 Section 2 Option 2 Indicative Scheme Design 26
Figure 3-20 Section 2 Option 2 Indicative Cross Section 26
Figure 3-21 Section 2 Option 3 Indicative Scheme Design 27
Figure 3-22 Section 2 Option 3 Indicative Cross Section 27
Figure 3-23 Section 2 Option 4 Indicative Scheme Design 28
Figure 3-24 Section 2 Option 4 Indicative Cross Section 28

Figure 3-25 Section 2 Option 5 Indicative Scheme Design 29
Figure 3-26 Section 2 Option 5 Indicative Cross Section 29
Figure 3-27 Section 2 Option 6A Indicative Scheme Design 30
Figure 3-28 Section 2 Option 6A Indicative Cross Section 30
Figure 3-29 Section 2 Option 6B Indicative Scheme Design 31
Figure 3-30 Section 2 Option 6B Indicative Cross Section 31
Figure 3-31 Section 2 Option 6C Indicative Scheme Design 32
Figure 3-32 Section 2 Option 6C Indicative Cross Section 32
Figure 3-33 Section 2 Option 6D Indicative Scheme Design 33
Figure 3-34 Section 2 Option 6D Indicative Cross Section 33
Figure 3-35 Section 2 Option 7 Indicative Scheme Design 34
Figure 3-36 Section 2 Option 7 Indicative Cross Section 34
Figure 3-37 Section 2 Option 8 Indicative Scheme Design 35
Figure 3-38 Section 2 Option 8 Indicative Cross Section 35
Figure 3-39 Section 2 Option 9 Indicative Scheme Design 36
Figure 3-40 Section 2 Option 9 Indicative Cross Section 36
Figure 3-41 Section 1 Options Assessment Plan 41
Figure 3-42 Section 2 Options Plan 45
Figure 3-43 Public Consultation Key Issues 47

List of Tables

Table 3-1 Section 1 Main Option Sifting Summary 18
Table 3-2 Section 1 – Renmore Road Options 19
Table 3-3 Ballyloughane Road / Belmont Options 21
Table 3-4 Skerrit Roundabout Options 22
Table 3-5 Section 2 Sifting Summary 37
Table 3-6 MCA comparative advantage/disadvantage colour ranking table 40
Table 3-7 Section 1 MCA Summary Table 42
Table 3-8 Renmore MCA Summary Table 43
Table 3-9 Ballyloughane Road / Belmont / Dublin Road Junction MCA Summary Table 44
Table 3-10 Skerrit Roundabout MCA Summary Table 44
Table 3-11 Assessment Summary Table 46
Table 3-12 Public Consultation Suggestions & Responses Summary Table 48

3 CONSIDERATION OF ALTERNATIVES

3.1 Environmental Impact Assessment Requirements

Article 5(1)(d) of Directive 2011/92/EU, as amended by Directive 2014/52/EU (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 [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 BusConnects Galway: Dublin Road (hereafter referred to as the "Proposed Development") considering 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 Development and its specific characteristics are described in the subsequent sections of this chapter.

3.2 Strategic Alternatives

3.2.1 Galway Transport Strategy

The Galway Transport Strategy (GTS) was introduced in Section 2.2.5.1 of Chapter 2 (Need for the Proposed Development) of this EIAR, including the seven principles adopted to guide the measures needed to be implemented to support integrated transport solutions (both infrastructure and transport services) to allow Galway City and environs to continue to grow in a sustainable manner. In planning for the future, the GTS also took cognisance of existing development patterns within the city and environs.

While Galway has a compact walkable core, outside of the city centre, the suburbs have developed as a succession of low density residential and employment areas, which has led to a predominance of private car usage as a means of travel. As a result, the transport difficulties experienced across the city, particularly

at peak travel times, have a significant effect on the quality of life of residents and are also impacting on the economic functionality of the city.

The major proposals to be implemented under the GTS were also set out in Section 2.2.5.1 of Chapter 2 (Need for the Proposed Development) of this EIAR, including the Proposed Development. These were formulated as part of the transport strategy development process and through the assessment of travel demands generated by existing and future land use planning requirements.

The approach undertaken in developing the GTS is presented in Figure 3-1 and the measures are summarised below:

- To initially establish strategic objectives;
- To develop and test strategy options and alternatives; and
- to develop specific proposals to deliver maximum performance when brought together under the overall strategy.

Figure 3-1 GTS Strategy Development Process

More detail on the consideration of alternatives by mode as part of the GTS is presented in subsequent sections of this chapter. As illustrated in Figure 3-1, each was evaluated against set appraisal criteria in line with the (then) Department of Transport Guidelines on a Common Appraisal Framework (CAF) for Transport Projects and Programmes. These include the 'Environment', to 'encourage better integration between transport and urban form, thereby minimizing harmful transport emissions'. In formulating the overall GTS, and the infrastructure and services needed to support it, the most suitable means of travel (travel modes) to address the travel demand for each type of journey were assessed, and as illustrated in Figure 3-2.

Figure 3-2 Trips to, within and across Galway (GTS 2016)

This diagram illustrates the wide variety of trip types which can be classified into the following broad categories:

A-A – within the City Centre – for example, Eyre Square to Dominick Street.
These types of journeys should generally be made on foot or by bicycle. Journeys across the centre by car should be discouraged and drivers should be encouraged to either use public transport or park their car before travelling across the central area;

B-B – Outer City << >> City Centre – for example, Knocknacarra to Eyre Square. + Journeys on radial corridors should be possible by bus (or other forms of public transport) – provided that the service provision is of a high frequency. Safe cycle routes are also essential to encourage cyclists;

C-C – Outer City << >> External Areas (not crossing River Corrib) – for example, Ballybrit to Tuam. These journeys are difficult to cater for by public transport and are often not practical on foot or by bicycle. Use of Park & Ride bus services could however be attractive if the service is of a high quality and frequency;

D-D – City Centre << >> External Areas – for example, Eyre Square to Loughrea. These journeys are difficult to attract in large numbers to public transport, as travellers have a wide range of origins outside the city which cannot all be served by frequent public transport. Provision of Park & Ride bus services could however be attractive if the service is of a high quality and frequency;

E-E – Outer City << >> Outer City (crossing River Corrib and via the City Centre) – for example, Salthill to GMIT. At present, these journeys are generally made by car. However, safe and direct dedicated cycle routes would encourage cycling for this type and length of journey, and if a reliable public transport service was provided and operated via the city centre, some drivers would consider these options to be a reasonable alternative. Frequent and reliable bus services on a few radial corridors would allow passengers to transfer between services with a short wait;

F-F – External << >> Outer City (crossing River Corrib but not via the City Centre) – for example, Maigh Cuilinn to Parkmore. These journeys are difficult to attract to public transport, as travellers have a wide range of origins outside the city which cannot all be served by frequent public transport. An alternative to travel by car could be Park & Ride bus services if the service is of a high quality and frequency;

G-G – Outer City << >> Outer City (crossing River Corrib but not via the City Centre) – for example, Westside to Mervue. Journeys between peripheral areas can be difficult to serve by public transport, as

orbital public transport is generally not financially viable, and public transport via the city centre can often be much slower than travel by car if not on connecting public transport routes. Some travellers will however use public transport via the centre if it is of sufficient frequency and reliability. In addition, the provision of safe dedicated cycle routes could facilitate cycling for this type of journey;

H-H – External Area << >> External Area (crossing River Corrib but not via the City Centre) – for example, An Spidéal to Headford. These journeys are the most difficult to attract to public transport, as travellers have a wide range of origins and destinations outside the city which cannot all be served by frequent public transport. Travel by car is often the only practical mode; and

I-I – Short travel in Outer City Areas – for example, Renmore to Merlin Park. These types of journeys can often be made on foot or by bicycle and are generally difficult to make by public transport unless the journey is on a main radial bus corridor.

The assessment of travel demand and journey types concluded that, given the low-density nature of land-use development in Galway City and environs, the continued need for improvement in bus services as part of the overall GTS would be required.

This requirement was also assessed in combination with what needed to be done to:

- The traffic networks (traffic management, the road and street network, parking, and HGV management);
- Integrate with other local public transport measures;
- Integrate with regional public transport needs;
- Support walking and cycling; and
- Combine with other supporting transport measures (i.e. smarter mobility solutions, land-use integration, behavioural change, and demand management proposed measures).

The GTS also looked at a phasing approach to the implementation of supporting infrastructure and services in the short, medium, and longer-term over a 20- year period.

3.2.2 'Do Nothing' Alternative

As the population of Galway City and its suburbs is expected to rise to 50-60% by 2040 (Government of Ireland, 2023). The growth and development of Galway city and environs has been significantly constrained due to the impacts of traffic congestion and unreliable and limited public transport services. These key challenges and inefficiencies with respect to the movement of people and goods were set out in the GTS as being:

- An over-reliance on private cars;
- Peak hour congestion and journey time unreliability for all motorised transport;
- Safety concerns as a result of traffic congestion;
- Many key junctions within the city operating at, or over capacity;
- Connectivity issues on the National and Regional road network resulting in significant volumes of cross-county and strategic travel demand between east and west Galway being concentrated and funnelled through the city area in order to cross the River Corrib;
- The pattern of residential development in the area, along with the location of employment destinations, generating a large amount of cross-city as well as city-bound travel demand;
- Large amounts of residential development located proximate to major employment and educational destinations city-wide, but not readily accessible by walking, cycling or public transport, thereby encouraging travel by private car;
- The short distance between Lough Corrib and Galway Bay, two significant natural physical constraints impacting upon the city;
- A natural barrier to cross-city and cross-county travel formed by Lough Corrib, the River Corrib and Galway Bay, with the three principal river crossings experiencing heavy traffic flows, leading to congestion and delay;

- The position of Galway City as a major regional centre for employment and education for a large geographical area, leading to large numbers of long-distance commuters for whom public transport is not currently a viable option, which leads to greater numbers of cars entering the city;
- The impact of traffic congestion on the City's reputation, particularly with regard to inward development;
- The suburban nature of much of the residential areas, and the wide distribution of jobs across a number of central and non-central locations, which lead to a situation where travel by public transport is not a viable option at this point for many journeys;
- Long journey times and delays on the current bus network, due in part to the limited available road space in the city centre for introducing bus priority which both reduces its attractiveness to passengers and increases costs of operating; and
- Limited road space on most of the principal roads, which reduces opportunities for safe and comfortable cycling.

Congestion throughout Galway city and environs is particularly high with the number of cars on the road increasing resulting in 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.

Specifically, in relation to existing bus services in the region, in terms of the out-workings of a strategic "Do Nothing" alternative, currently, the bus network is characterised by discontinuity, whereby buses on routes have very limited dedicated bus lanes and / or supporting priority measures. This 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 safety issues for pedestrian and cyclists, delayed buses and unreliable journey times for passengers.

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 Galway 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 into and through Galway City.

In addition, without the provision of safe cycling infrastructure, intended as part of the Proposed Development, 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 Development. 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 Development.

Similarly, with the "Do Nothing" Alterative, there would be no significant strategic investment in improvements to the public realm and 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 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 Development.

3.2.3 Transport Options

3.2.3.1 System Choices

While there is considerable orbital daily travel demand around the city centre, for example between residential areas to the west of Galway and employment centres such as Ballybrit and Parkmore to the east, there are also very significant generators of travel demand within, and in proximity to the city centre area including the city centre retail core itself and social amenities such as the Hospital, NUIG and the Sports Grounds. It is therefore clear that a public transport network of services is required to provide for sufficient attractive accessibility to public transport for the widest population catchment possible.

The GTS utilised the Western Regional Model (WRM) to look at the potential for use of public transport services along the busiest movement corridors in Galway. This exercise identified that with high-frequency (and unconstrained) services in place, the maximum single direction passenger-demand generated was approximately 1,000 trips over a 1-hour period, equivalent of 80-90% of a high frequency bus service or less than 25% of the capacity of a frequent light rail service.

Any new public transport network proposed for Galway also needs to be cognizant of the vibrant nature of the city centre, to allow it to 'breath' by removing traffic congestion and to create an attractive environment for people to access and move around. An essential component of the GTS is to provide an efficient, reliable and attractive bus system for Galway, such that a high proportion of trips within the city and environs are made by bus. This is the concept behind the BusConnects: Dublin Road.

3.2.3.2 Bus Alternatives

Existing bus services along routes serving Galway City and its environs are presented in Figure 3-3 with further detail provided in Section 6.4.2 of Chapter 6 (Traffic and Transport) of this EIAR.

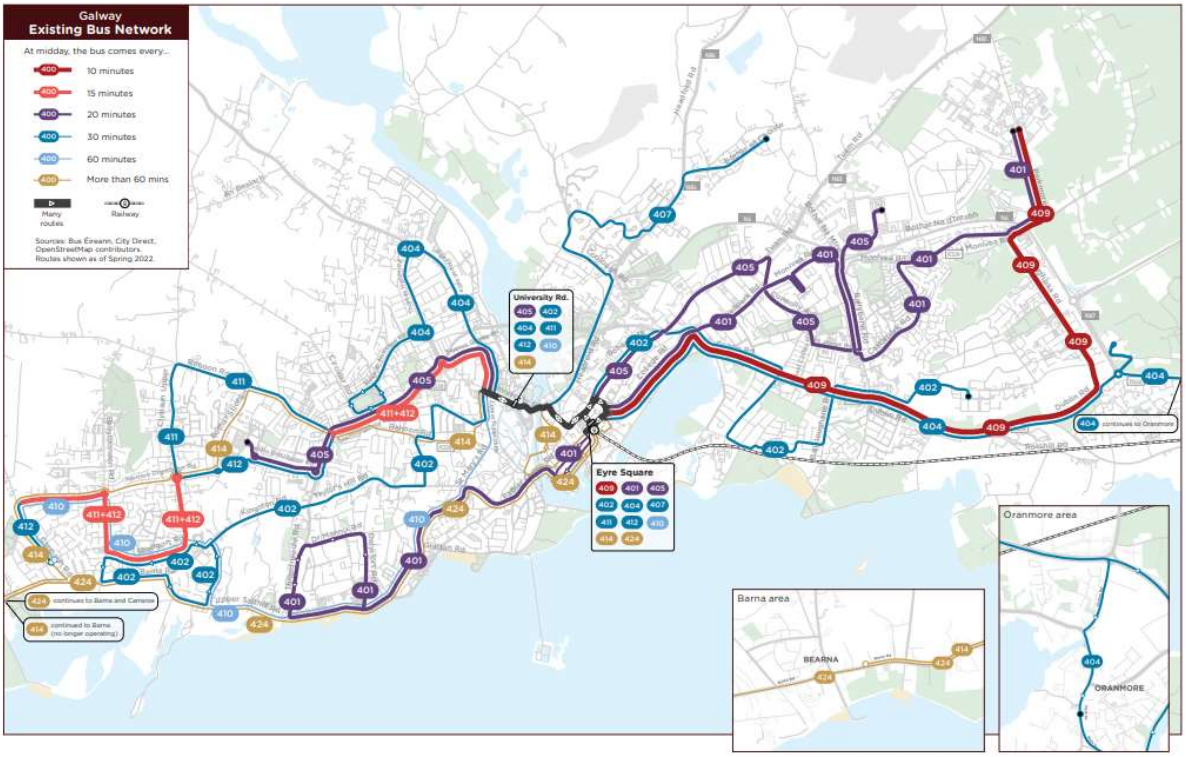


Figure 3-3 Existing Galway City Bus Services (NTA,2023)

The GTS identifies proposals for a revised future rationalized network of higher frequency bus services as illustrated in Figure 3-4. The Dublin Road corridor form part of the Brown Route shown in the figure below.

Figure 3-4 Galway City Proposed Bus Network Routes (GTS 2016)

The bus network identified in the GTS was seen to deliver up to 70% of residential, and between 72-93% coverage of commercial and primary and post primary schools with access to a high-frequency bus service.

These services, any variations thereof or further new services which route through the city centre, need to be supported by measures which ensure improved journey times and journey time reliability throughout the day. In doing so, measures adopted for bus services through the city centre do not preclude the potential for other services and supporting journey time reliability measures on other routes to cater for public transport demands into the future.

The concept for the BusConnects: Dublin Road therefore was to focus on the provision of infrastructure and supporting traffic management measures necessary to cater for existing and future bus services, which either approach and terminate in the city centre from the east and west or travel through the city centre from either direction.

In terms of bus service alternatives, 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.

The Proposed Development is therefore required to be sufficiently flexible to support different bus vehicle types, although there are no current plans in terms of the public bus fleet to provide either guided or fully segregated bus systems. These may require further additional infrastructure provision later should they ever be required to service changes in travel demand into the future.

3.2.3.3 Light Rail Alternatives

As set out in Section 3.2.3.1 of this chapter, the GTS identified a core need for the delivery of a public transport network with coverage to provide accessibility to alternative sustainable transport services to a significantly greater percentage of the low-density population catchments of the city and environs.

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.

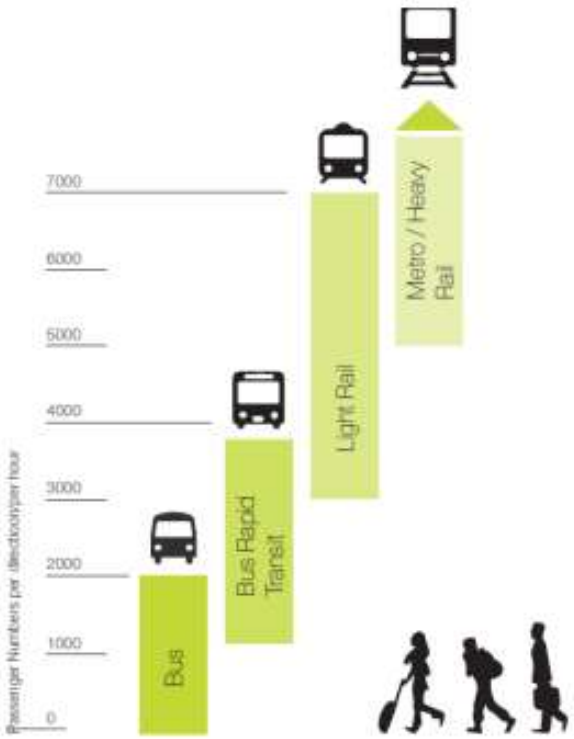


Figure 3-5 Public Transport Mode Capacities (GTS 2016)

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 (International Association of Public Transport (UITP) 2009), see Figure 3-5. 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 GTS recognised this when examining network options versus linear mass transit options. This does not preclude the potential for corridor approaches to emerge in the future, linked to more intense land-use development planning which would give rise to the potential to be served by light rail. Therefore, based on existing population demographics and any future development likely to emerge from current statutory land-use plans (i.e., the Galway City and County Development Plans), there would be insufficient demand to justify the provision of a light rail network alternative, particularly given the low to medium density nature of development along, and from existing corridors feeding into city centre. Similarly, the same reasoning applies to even higher mass transit options such as metro or heavy rail.

3.2.3.4 Rail Integration

Galway is serviced by heavy rail, with inter-city and regional services connecting into Ceannt Station. The rail line extends east to Athenry, with a stop at Oranmore / Garraun. From Athenry, rail lines continue towards Dublin and to Limerick.

Irish Rail intend to carry out an upgrade to the rail network serving Galway City through the provision of a second rail line between Galway and Athenry to provide a twin-track along this section and to increase services by 60% and improvement in journey times.

In considering options for the Dublin Road corridor in the GTS, a key objective was to deliver improved transport integration between regional and local bus services and the rail station in the city centre at Ceannt Station.

There is no existing heavy rail route within the area covered by the Proposed Development for which an upgrade could be considered.

3.2.3.5 Demand Management Alternatives

One of the primaries aims of the GTS is to significantly reduce demand for travel by private vehicles, particularly during the commuter peaks, and to encourage modal shift to 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, to 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.

In the context of Galway City and environs, there is a balance to be struck in terms of retaining accessibility to the city centre area for cars, while increasing accessibility by public transport, and in doing so, also planning for and facilitating the overall increased accessibility and economic activity in the city.

The strategic traffic management aims identified in the GTS relating to the city centre therefore are:

- To reduce through-car movement and traffic speeds in the city centre; and
- To prioritise public transport and active modes (walking and cycling) in the city centre.

To achieve this, the GTS identifies the need for an improvement in orbital routes around the core city centre area to both reduce through travel by cars and HGVs while at the same time retaining access to city centre car parks combined with a reduction in on-street parking in some locations to allow for improved public realm.

3.2.3.6 Technological Advances

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. 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.

Ultimately, however, 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 remain. Furthermore, the spectrum of potential technological capabilities does not obviate the need for the provision of safe cycling facilities and improved public realm and walking routes for pedestrians.

Overall, while certain technological advances do provide new opportunities in the transport area, particularly around 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 on their own to meet the transport needs of Galway city and environs.

The GTS describes Smarter Mobility as the way intelligent transport services are changing the way cities function. Intelligent Transport Solutions (ITS) use technology to increase efficiency, safety and co-ordination across transport networks. The GTS proposes Smarter Mobility policies and states that ITS will be used to support and future-proof proposed infrastructure, implement changes and add value to the operation of the transport network by maximising efficiency and ensuring the optimum performance of the entire network. The GTS categorises Smarter Mobility projects into three broad groups:

- Projects which provide additional capacity to the transportation network;
- Projects which incorporate demand management; and
- Projects which utilise intelligent systems to deliver overall efficiency and cost savings.

The Proposed Development developed within the GTS is considered to be a project that falls into all three categories of Smarter Mobility.

3.3 Walking and Cycling Integration

3.3.1 Walking and Public Realm

The BusConnects Galway: Dublin Road is intended to be about much more than improving bus and integrated public transport services. It also needs to be a catalyst for the creation of a more walkable and cyclable city and to connect 'places' within the city centre area.

The GTS identifies a series of aims and measures to provide a basis for developing plans and infrastructure proposals to better provide for pedestrian movement. These aims are:

- To provide improvements for pedestrians along city centre public transport corridors;
- To increase priority given to pedestrians over road traffic;
- To increase legibility and wayfinding; and
- To increase the quality, comfort, and safety of the pedestrian facilities.

Consideration of alternatives for the Proposed Development, both at GTS preparation stage, and in subsequent route and design development stages were required to meet these aims which ultimately shape the Proposed Development and all other projects emerging from the GTS.

Specifically in relation to public realm, Galway City Council is committed to delivering a public realm strategy. In the context of this project and its ability to better connect places, when considering alternatives at design development stages, cognisance was given to the opportunities for public realm enhancement identified in the Galway Public Realm Strategy where appropriate to do so.

3.3.2 Cycling

The GTS identifies a series of aims and measures to provide a basis for developing plans and infrastructure proposals to better provide for cycling. These aims are:

- To provide a primary 'trunk' cycle network which will provide a convenient and safe route for medium-distance radial commuter / leisure journeys;
- To provide a secondary cycle network which will provide a recognizable grid network for local journeys, and will be connected to the primary network for longer journeys;' and
- To increase options for cycling in and across the city centre.

Consideration of alternatives for the Proposed Development, both at GTS preparation stage, and in subsequent route and design development stages took cognisance of these aims which ultimately shape the emerging Proposed Development and all other projects emerging from the GTS.

3.3.3 Strategic Environmental Assessment of Alternatives

The preparation of the GTS was subject to Strategic Environmental Assessment (SEA). Article 1 of SEA Directive (2001/42/EC) states that the 'objective of this Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.'

SEA is a process for evaluating, at the earliest appropriate stage, the environmental quality and consequences of Plans / Programmes (PP). The purpose is to ensure that the environmental consequences of Plans / Programmes are assessed during their preparation and prior to their completion and the effect of the implementation of Plans / Programmes may also be subject to monitoring.

The SEA process also gives interested parties an opportunity to comment on the environmental impacts of the proposed Plan / Programme and to be kept informed during the decision-making process.

The SEA Environmental Report included an assessment of various alternative approaches for the GTS, comprising:

- The do-minimum approach;
- Prioritisation of a road transport-based approach;
- Prioritisation of a public transport-based approach; and
- An integrated transport-based approach.

The assessment of alternatives approaches found that the integrated transport-based approach as detailed in the GTS has the preferred outcome in terms of effectiveness and overall environmental benefit.

3.3.4 GTS Outcomes

The GTS concludes that the successful implementation of the strategy will result in positive outcomes for Galway and will provide long-term transport, tourism commercial and public realm benefits for the city and environs. These benefits include:

- Future proofing the City and Environs;
- Facilitating New Transport Infrastructure;
- Improved Efficiency;
- Improved Environment, Urban Realm and Ambience; and
- Tourism, Commercial and Retail Benefits.

3.4 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 Development. In 2020, a non-statutory consultation on an 'Emerging Preferred Route' took place. Since this consultation, significant changes in design and procurement guidance required a review of the proposed design, to ensure compliance with current 'good practice'. These changes include updates to the Public Spending Code, revised design guidance on layouts for bus corridors, and revised National Transport Authority Project Approval Guidelines.

As a result of these changes, and feedback from the first public consultation on BusConnects Galway: Dublin Road, the 'Emerging Preferred Route' has been updated.

Development of the Proposed Development has evolved in the following stages:

1) **Option Selection Report**: In early 2022, the NTA initiated plans to progress the development of the Galway BusConnects: Dublin Road as identified in the Galway Transport Strategy (GTS 2016). As part of this body of work, the Dublin Road Bus Corridor Options Selection Report (Appendix A3.1 in Volume 4 of this EIAR) was prepared which identified feasible options along the corridor, assessed these options and arrived at an Emerging Preferred Route;

2) Two non-statutory **Public Consultation events** were undertaken on the Emerging Preferred Route. The first was undertaken from the 8th October 2020 to 7th January 2021. Due to changes in the Public Spending Code, revised NTA Project Approval Guidelines and proposed revised layouts along Bus Corridors (NTA Preliminary Design Guidance Booklet for BusConnects Core Bus Corridor, 2021), the Strategic Assessment Report was redrafted, and the Proposed Development was subject to a revised Concept Development and Option Selection phase including a 2nd Non-Statutory Public Consultation which ran from the 13th January 2023 to the 13th February 2023;

3) Development of **Draft Preferred Route Option** (February 2023 to July 2023): Informed by feedback from the first round of public consultation, stakeholder engagement and the availability of additional design information, the design of the Emerging Preferred Route evolved with further alternatives considered;

4) 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 Development, was finalised.

Alternative options have been considered in a number of areas during the design development of the Proposed Development, such as the varying cross sections, junction layout, location of offline cycle routes and the road layout in constrained locations. The development of the design has also been informed by a review of feedback and new information received during each stage of public consultation and as the level of data, such as topographical surveys, transport and environmental data was collected and assessed.

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

The following key environmental aspects were considered:

- Archaeology and Cultural Heritage and Architectural Heritage;
- Biodiversity;
- Soils and Geology;
- Hydrology;
- Landscape and Visual;
- Air Quality and Climate;
- Noise & Vibration; and
- Land Use and Built Environment.

3.4.1 Initial High Level Route Alternatives

With the GTS broadly defining the route of the Proposed Development, the next stage involved examining potential scheme-level route variations in more detail. The Options Selection Report identified feasible options along the corridor, assessed them, and determined the Emerging Preferred Route, which then served as the foundation for the first phase of public consultation. A summary of this process is described below.

The Options Selection Report 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 route options in terms of ability to achieve Proposed Development objectives and whether they could be

practically delivered. The assessment included consideration of the potential high level environmental aspects as well as other indicators such as land take; and

- Stage 2 – Route options 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 (MCA) in accordance with the Department of Transport's (2016) Common Appraisal Framework for Transport Projects and Programmes.

The study area for the Dublin Road corridor comprised two sections:

- Section 1 (Moneenageisha Junction to Skerrit Roundabout) including; and
  - Renmore Road;
  - Ballyloughane Road / Belmont Road Junctions; and
  - Skerrit Roundabout.
- Section 2 (Skerrit Roundabout to Doughiska Junction).

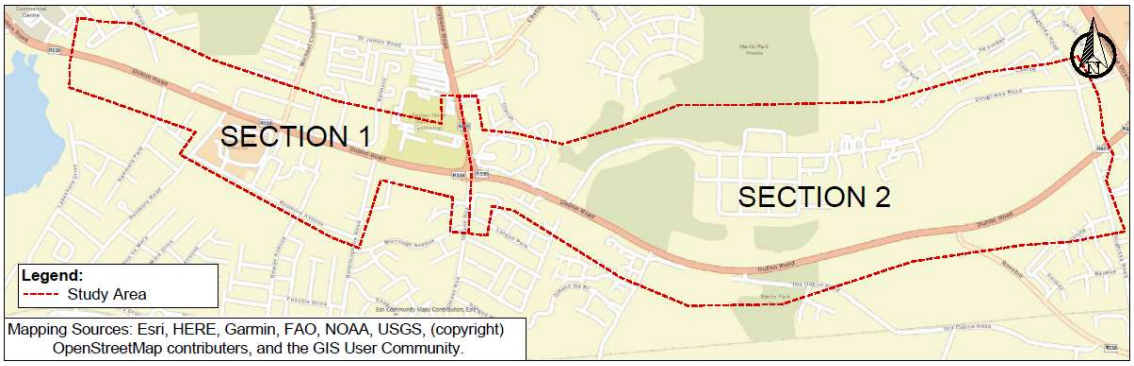


Figure 3-6 Study Area Sections

At the start of the Stage 1 assessment, a 'spider's web' of potential route options (consisting of 3 individual links) that could possibly form part of a multi-modal transport corridor were identified for the study area, refer to Figure 3-7 below. This 'spider's-web' of route options was chosen with reference to the multi-modal transport corridor system characteristics and in order to meet the Proposed Development objectives. Of particular relevance in developing the spider's-web was the potential for the road or route sections to facilitate fast and reliable journey times for buses and thereby be able to practically accommodate bus lane priority.

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

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

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

Figure 3-7 Spider Web of Route Option Links

Arising from 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 end-to-end options.

Figure 3-8 Post Sifting Spiders Web

Following the sifting of the links in the study area, the long list of options was examined, and in some cases developed further. These options were then assessed at a high level to determine if they were suitable to form part of the MCA assessment.

3.4.2 Proposed Development Option Assessment Sections

3.4.2.1 Section 1 Options

Four route options for the general cross section were developed for this section. These route options all follow Dublin Road, starting 120m east of Sáilín and finishing at the approach to Skerrit Roundabout. All options use the same route, and the difference is in the cross section provided, all options have a footpath and cycle lane on both sides of the road.

Option 1: Bus lane and traffic lane in both directions for full length of route.

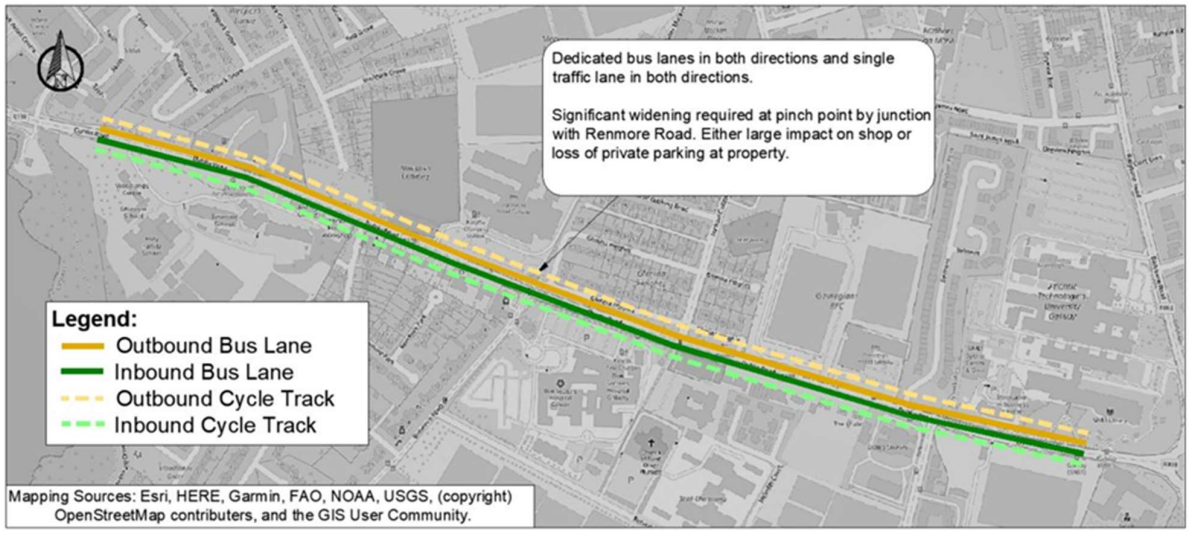


Figure 3-9 Section 1 Option 1 Indicative Scheme Design

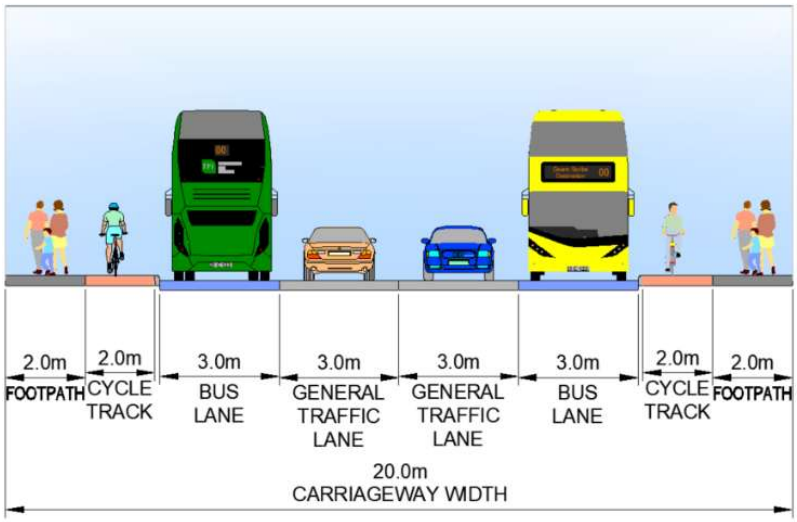


Figure 3-10 Section 1 Option 1 Indicative Cross Section

Option 2: Inbound traffic diverted around Renmore Road and Renmore Avenue, signals control traffic re-joining Dublin Road and give bus priority by doing so.

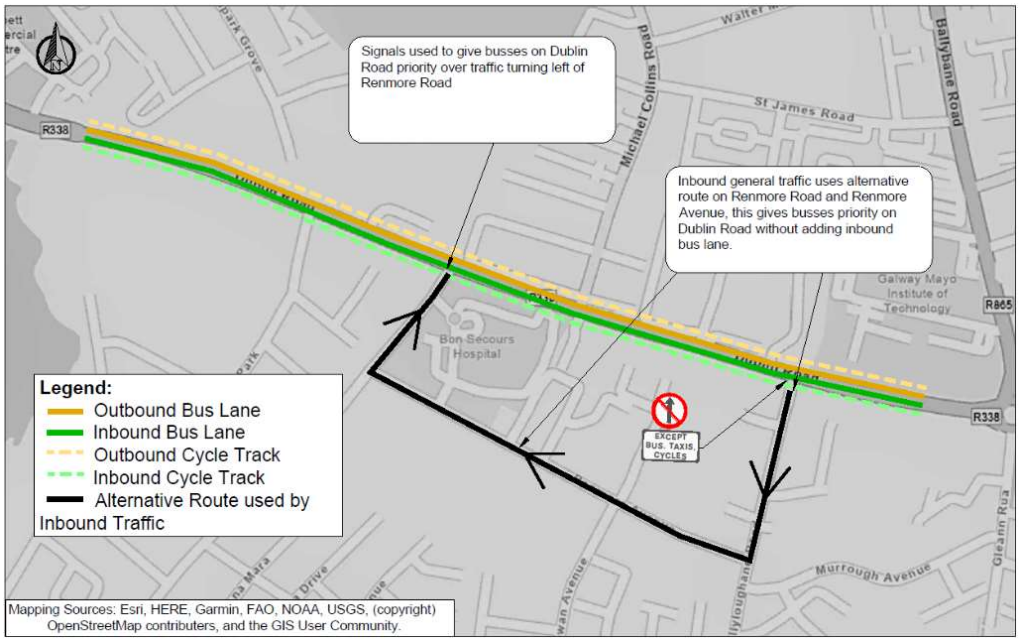


Figure 3-11 Section 1 Option 2 Indicative Scheme Design

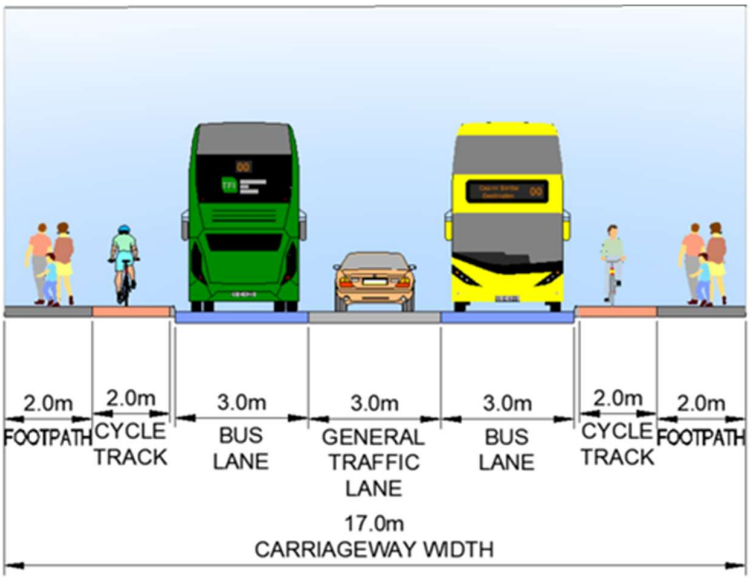


Figure 3-12 Section 1 Option 2 Indicative Cross Section

Option 3: Bus lanes on one side of the road at any one time (similar to the existing layout), generally placed on approach to junctions where there is queuing. General traffic lane in both directions.

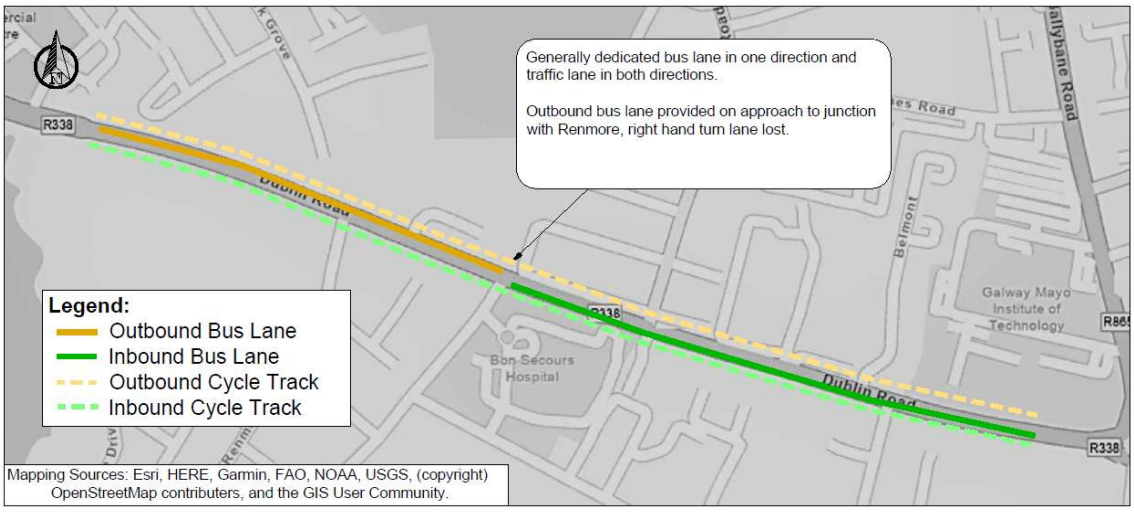


Figure 3-13 Section 1 Option 3 Indicative Scheme Design

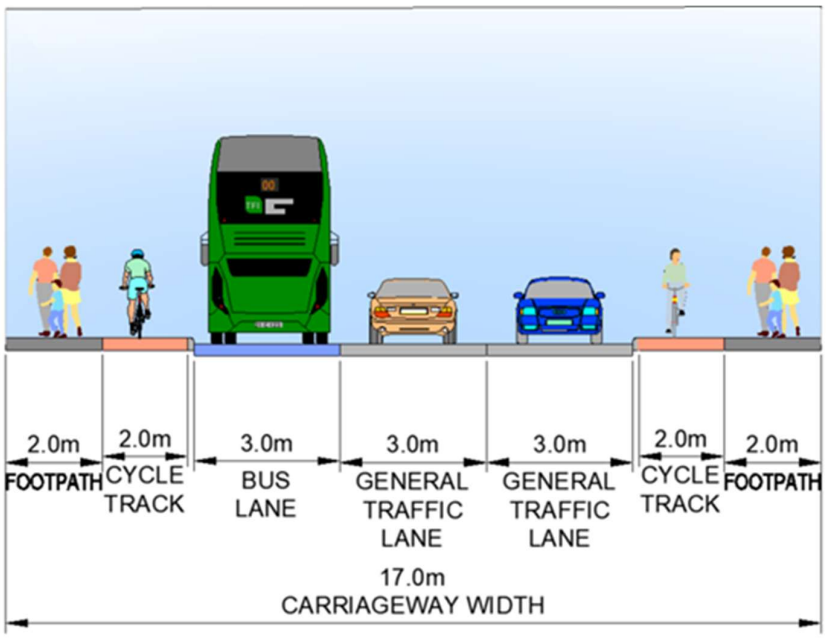


Figure 3-14 Section 1 Option 3 Indicative Cross Section

Option 4: This option has bus lanes in both directions but drops the inbound bus lane either side of Renmore Road junction to reduce the road widening needed. The bus would enter the general traffic lane for this section using a yellow box. This is the option that was previously bought forward to public consultation in 2020.

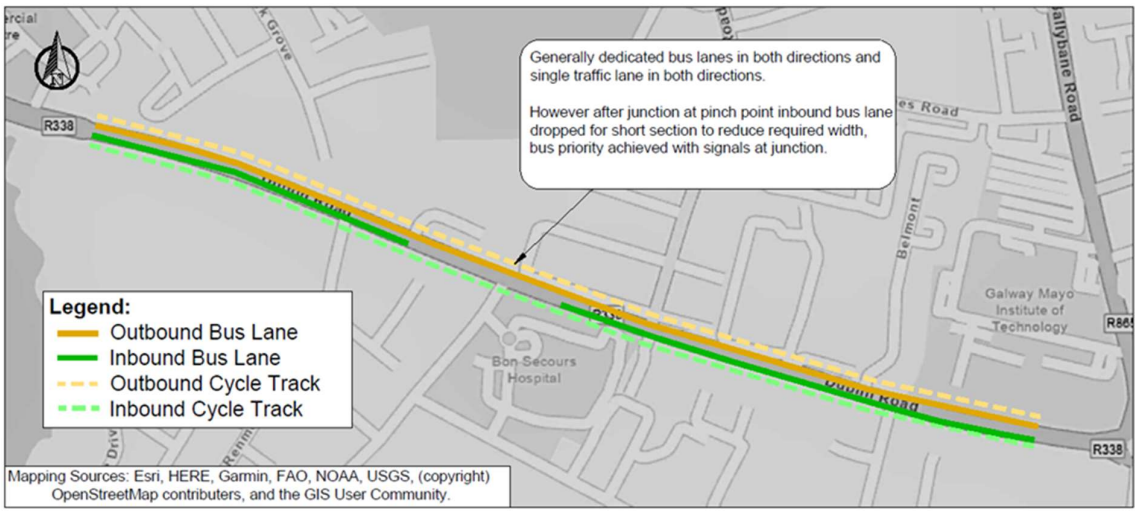


Figure 3-15 Section 1 Option 4 Indicative Scheme Design

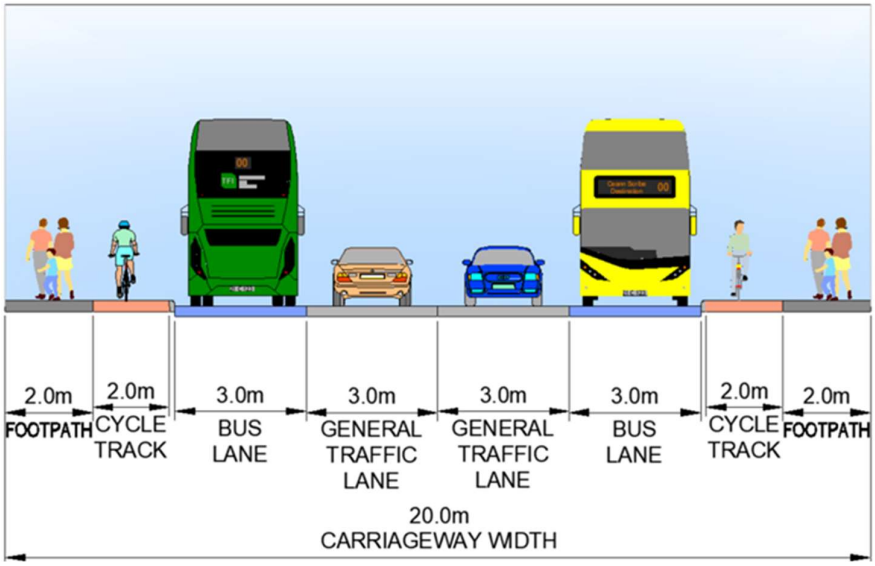


Figure 3-16 Section 1 Option 4 Indicative Cross Section

Table 3-1 Section 1 Main Option Sifting Summary

Option	Comment
Option 1: Bus lane and traffic lane in both directions for full length of route.	Passed, Progressed to MCA
Option 2: Inbound traffic diverted around Renmore Road and Renmore Avenue, signals control traffic re-joining Dublin Road and give bus priority by doing so.	Passed, Progressed to MCA

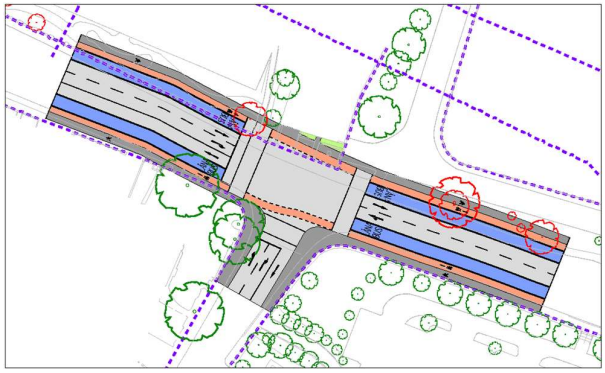
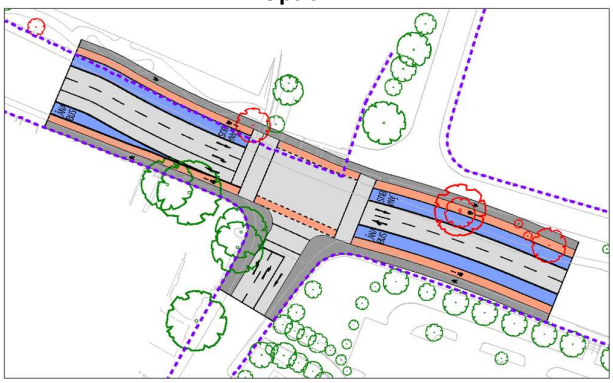
Option	Comment
Option 3: Bus lanes on one side of the road at any one time (similar to the existing layout), generally placed on approach to junctions where there is queuing. General traffic lane in both directions.	Failed, Not progressed to MCA
Option 4: Bus lanes in both directions but drops the inbound bus lane either side of Renmore Road junction to reduce the road widening needed. The bus would enter the general traffic lane for this section using a yellow box. This is the option that was previously bought forward to public consultation in 2020.	Passed, Progressed to MCA

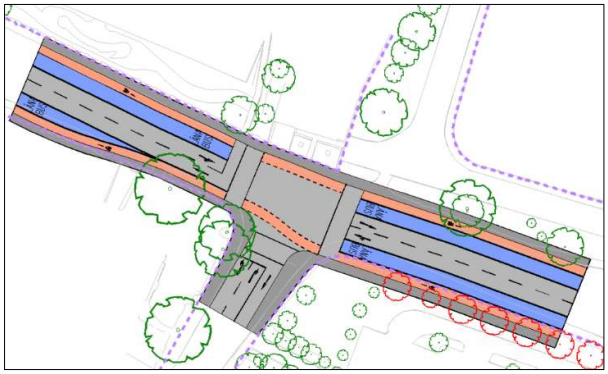
Section 1 Renmore Road Sub Options

This signalised junction is located to the west of Bon Secours Hospital where Renmore Road meets Dublin Road. Due to the constrained nature of the cross section here, a subset of options was developed to assess the optimum layout for the junction.

The options assessed for this junction are as set out in Table 3-2 below.

Table 3-2 Section 1 – Renmore Road Options

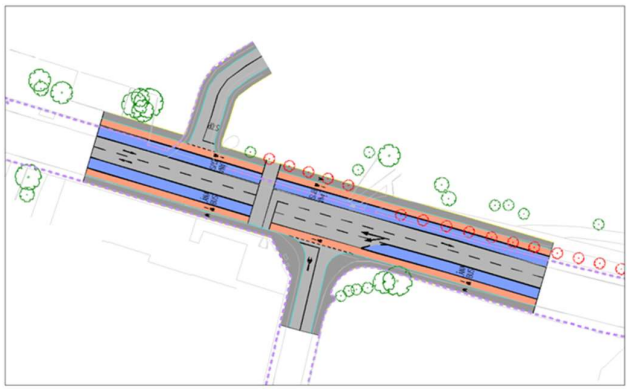
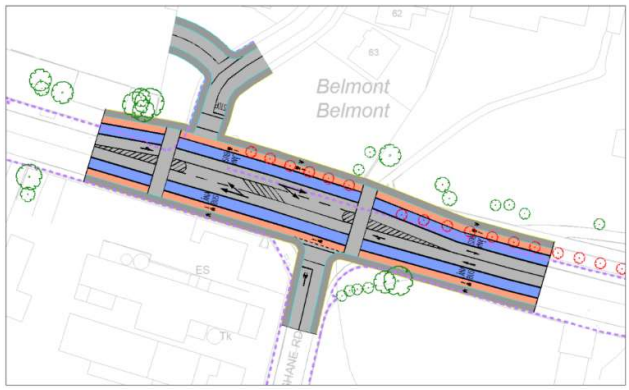
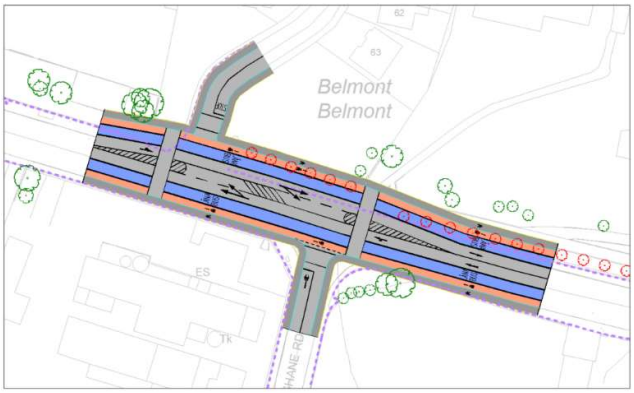
Options	Summary
Option 1 	Dedicated bus lanes would be provided for the full length in both directions, general traffic lanes and a dedicated right turn lane for traffic turning onto Renmore Road would also be provided. Due to the width of the cross section here land take would be required that could have a large impact in the properties either side of the carriageway. This option would meet all six main project objectives by providing continuous bus lanes, cycle paths and footpaths. For this reason, this option is carried forward to MCA. Passed, Progressed to MCA
Option 2 	To reduce the amount of land take required at the junction this option has the inbound bus lane dropped for 30m after the junction. The bus lane is then picked up again after the pinch point on the road. Buses would be given their own signal at the junction so would be given priority at the signals and would be able to skip any queue forming. This route option would meet the project objectives relating to improving cycle lanes and footpaths. However, as the inbound bus lane on this option is not continuous, it does not meet the main Economy objective which specifies the provision of a continuous high-quality multi-modal corridor. For this reason, this is not considered a viable option and is not carried forward to MCA stage. Failed, not progressed to MCA.

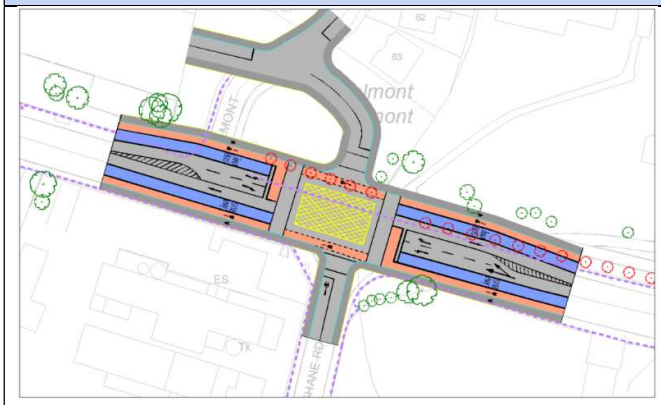
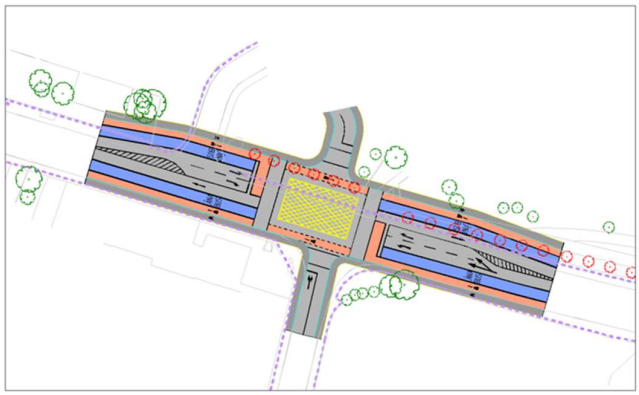
Options	Summary
Option 3 	To reduce the amount of land take required this option has no dedicated right turn lane provided on Dublin Road for traffic queuing to turn into Renmore. This would reduce the volume of general traffic that can pass through the junction. This option would meet all six main project objectives by providing continuous bus lanes, cycle paths and footpaths. For this reason, this option is carried forward to MCA. Passed, Progressed to MCA
Option 4 	To reduce the amount of land take required this option has the inbound bus lane dropped for 30m after the junction. The bus lane is then picked up again after the pinch point. This option would also not have a dedicated right turn lane for general traffic. This route option would meet the project objectives relating to improving cycle lanes and footpaths. However, as the inbound bus lane on this option is not continuous, it does not meet the main Economy objective which specifies the provision of a continuous high-quality multi-modal corridor. Furthermore, there would likely be large impacts on the traffic network associated with dropping the right turn lane. For these reasons this is not a viable option and is not carried forward to MCA. Failed, not progressed to MCA.
Option 5 	This option has the narrowest cross section of all options considered in this assessment. To reduce the amount of land take required the inbound bus lane is dropped for 30m after the junction, the bus lane is then picked up again after the pinch point. The outbound bus lane is also dropped 30m before the junction and a yellow box would allow outbound buses to enter the outbound traffic lane there. No dedicated right turn lane is provided for general traffic turning into Renmore Road. As both bus lanes on this option are not continuous, it does not meet the main Economy objective which specifies the provision of a continuous high-quality multi-modal corridor. Furthermore, there would likely be large impacts on the traffic network associated with dropping the right turn lane. For these reasons this is not a viable option and is not carried forward to MCA. Failed, not progressed to MCA.

Section 1 Ballyloughane Road / Belmont Sub Options

These two un-signalised junctions are located where Ballyloughane Road and Belmont meet the Dublin Road. They are currently staggered approx. 25m apart. To the west of the junction on the north of the Carriageway is Flannery's Hotel and Galwegians Rugby Club, currently the entrance to these is directly onto Dublin Road, these options also assess moving the access to these to Belmont.

Table 3-3 Ballyloughane Road / Belmont Options

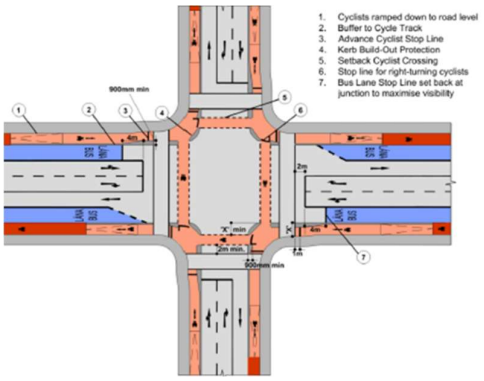
Options	Summary
Option 1 	Dedicated bus lanes would be provided for the full length in both directions, each junction remains separate and uncontrolled, the pedestrian crossing remains between the two junctions. No dedicated right turn lanes are provided. The existing entrance to Flannery's Hotel and Galwegians Rugby Club on Dublin Road remains in place. This option would meet all six main project objectives by providing continuous bus lanes, cycle paths and footpaths and therefore this option is carried forward to MCA. Passed, Progressed to MCA
Option 2A 	Dedicated bus lanes would be provided for the full length in both directions, each junction remains separate but is signalised, right turn lanes are provided and there are pedestrian crossings provided opposite each junction. The entrance to Flannery's Hotel and Galwegians Rugby Club is moved to access via Belmont. This option would meet all six main project objectives by providing continuous bus lanes, cycle paths and footpaths and therefore this option is carried forward to MCA. Passed, Progressed to MCA
Option 2B 	Dedicated bus lanes would be provided for the full length in both directions, each junction remains separate but is signalised, right turn lanes are provided and there are pedestrian crossings provided opposite each junction. The existing entrance to Flannery's Hotel and Galwegians Rugby Club on Dublin Road remains in place. This option would meet all six main project objectives by providing continuous bus lanes, cycle paths and footpaths and therefore this option is carried forward to MCA. Passed, Progressed to MCA
Option 3A	Dedicated bus lanes would be provided for the full length in both directions, the junctions are bought together, and signalised, right turn lanes are provided and there are pedestrian crossings

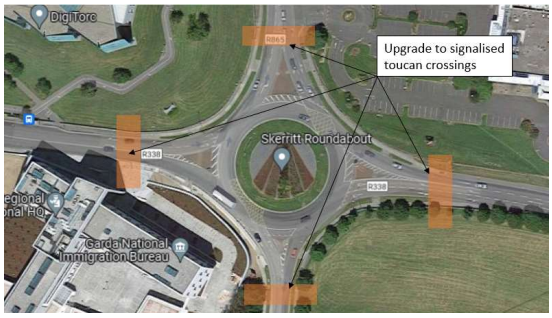
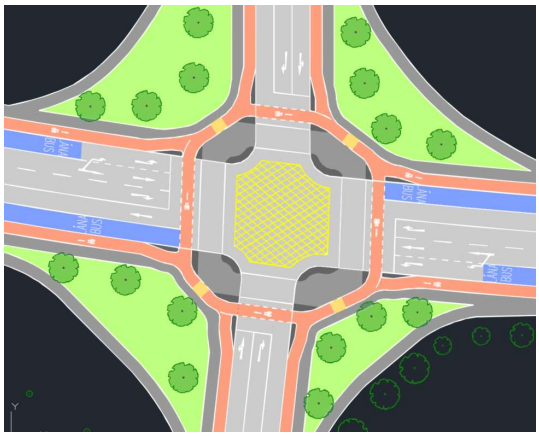
Options	Summary
	provided on each arm of the junction. The entrance to Flannery's Hotel and Galwegians Rugby Club is moved to access via Belmont. This option would meet all six main project objectives by providing continuous bus lanes, cycle paths and footpaths and therefore this option is carried forward to MCA. Passed, Progressed to MCA
Option 3B 	Dedicated bus lanes would be provided for the full length in both directions, the junctions are bought together, and signalised, right turn lanes are provided and there are pedestrian crossings provided on each arm of the junction. The existing entrance to Flannery's Hotel and Galwegians Rugby Club on Dublin Road remains in place. This option would meet all six main project objectives by providing continuous bus lanes, cycle paths and footpaths and therefore this option is carried forward to MCA. Passed, Progressed to MCA

Skerritt Roundabout

Skerritt Roundabout is currently an uncontrolled roundabout with 4 arms, there are 2 approach lanes on each arm. There are wide turning radii and clear sight lines which allow traffic to go round the roundabout at relatively high speeds. There is no cycle provision or signalised pedestrian crossings provided.

Table 3-4 Skerrit Roundabout Options

Options	Summary
Option 1: Rebuild as signalised junction as per BusConnects Guidance 	Upgrading the junction to a signalised crossing would allow bus priority to be controlled. By providing continuous bus, cycling and pedestrian infrastructure with signalised crossings this option would meet all 6 main objectives from the SAR. No large negative impacts are anticipated as a result of this option. For these reasons, this option is carried forward to MCA.

Options	Summary
Option 2: Keep as roundabout and have signalised toucan crossings provided on every arm, on approach to the junction in either direction on Dublin Road one of the traffic lanes is converted to a bus lane. 	Upgrading the junction to provide signalised crossing would allow safe usage for pedestrians. By providing continuous bus, cycling and pedestrian infrastructure with signalised crossings this option would meet all six main objectives from the Strategic Assessment Report (SAR). For these reasons, this option is carried forward to MCA.
Option 3: Convert the Skerritt Roundabout to a "Cyclops" style junction. 	Due to the amount of space around the Skerritt Roundabout there would be room to upgrade the junction to the Cyclops style layout. This would allow bus priority to be controlled and provide priority for pedestrians and cyclists. By providing continuous bus, cycling and pedestrian infrastructure with signalised crossings this option would meet all 6 main objectives from the SAR. No large negative impacts are anticipated as a result of this option. For these reasons, this option is carried forward to MCA.
Option 4: Convert the Skerritt Roundabout to a "Dutch style" roundabout to make it safer for active travel users. General traffic will yield to buses and pedestrians under this option. Provide dedicated one-way cycle lanes in both directions.	A Dutch style roundabout generally has a single lane of traffic at each arm of the junction. By adding more traffic lanes or bus lanes the roundabout no longer functions as a safe option for pedestrian and cyclist users. With only one lane at each arm of the roundabout the capacity of Skerritt roundabout would be significantly reduced, and it would not be possible to get buses to the front of the queue at the junction, thus reducing the effect of the bus lanes. Therefore, this option is not considered viable for this multi-modal transport corridor. However a modified verison of this where a signalised toucan crossing is provided at each of the arms of the junction, with a traffic lane and a bus lane maintaned on each approach and with dedicated one way cycle lanes in each direction is considered viable for this multi-modal transport corridor. This is Option 2 described above.
Option 5: Provide an active travel over bridge for the Skerritt Roundabout.	An overbridge structure would be very large and would require 8 on / off ramps in order to serve all directions of travel, each ramp would require approximately 100m of length to achieve the height necessary to clear the roundabout while maintaining appropriate gradients.

Options	Summary
	A structure of this scale is likely to be imposing on the surrounding landscape, and there would be landscape and visual impacts associated with this. The ramps would also require cyclists and pedestrians, especially those with disabilities, mobility issues and people travelling with children to go up and down extra height and would create longer distance journeys. An at-grade crossing would provide a flatter and more cyclist and pedestrian friendly junction route. The longer distance journey also creates a safety issue in that many people will not use the less desirable overpass and will cross the road without safe crossing facilities. The advantage of this option is that it allows pedestrians and cyclists to remain fully segregated from traffic, means that they don't have to wait for a signal in order to cross the junction, and it increases the efficiency of the junction as pedestrian signals could be removed meaning more green time for traffic and busses. However, despite those advantages, due to the scale and cost of the works and due to the extra effort put on cyclists and pedestrians this is not considered a viable option for this multi-modal transport corridor.
Option 6: Provide an active travel underbridge for the Skerritt Roundabout. 	Similar to the overbridge option an underbridge structure for cyclists and pedestrians would require large scale works with potential significant environmental impact. As the underbridges would lack passive surveillance from the road there would be issues with safety, perceived safety as well as increased potential for anti-social behaviour. This may lead to safety issues in that many people will not use the less desirable underpass and will cross the road without safe crossing facilities. There could also be issues with drainage and flooding associated with the underpass, potentially impacting on the pedestrians and cyclists that would be utilising it. Similar to the overbridge option the advantages of this is that it allows pedestrians and cyclists to remain fully segregated from traffic, means that they don't have to wait for a signal in order to cross the junction, and it increases the efficiency of the junction as pedestrian signals could be removed meaning more green time for traffic and busses. However, despite those advantages, due to the scale of the works required for this and the comparatively large disadvantages described above this is not considered a viable option for this multi-modal transport corridor.

3.4.2.2 Section 2 Options

All route options in section 2 start 75m east of Skerrit Roundabout and at the junction between Old Dublin Road and Doughiska Road. There are 9 full options considered and option 6 has 4 sub-options (6A, 6B, 6C & 6D), to give a total of 12 options. Options 1 - 4 & 9 have dedicated bus lanes for the length of the route. Options 5 – 8 have an inbound bus lane for the full length of the route, and an outbound bus lane on approach to junctions where queuing is most likely. All options have 2-way general traffic lanes for the length of the route.

Option 1
Footpaths and cycle tracks provided alongside the road carriageway for the length of the route, segregated with a grass verge. Bus lanes provided in both directions for full length of route.

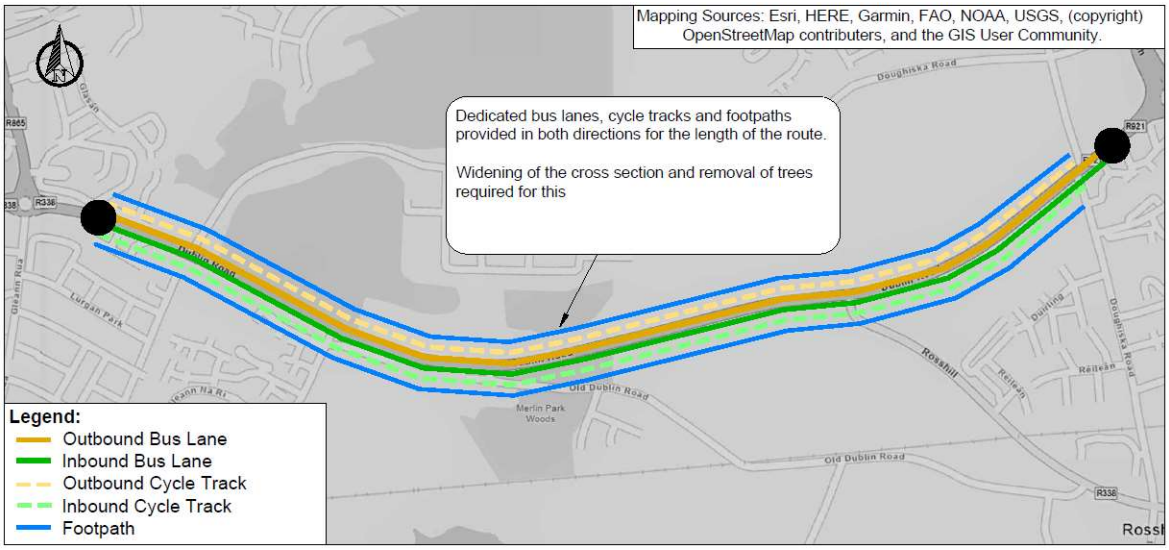


Figure 3-17 Section 2 Option 1 Indicative Scheme Design

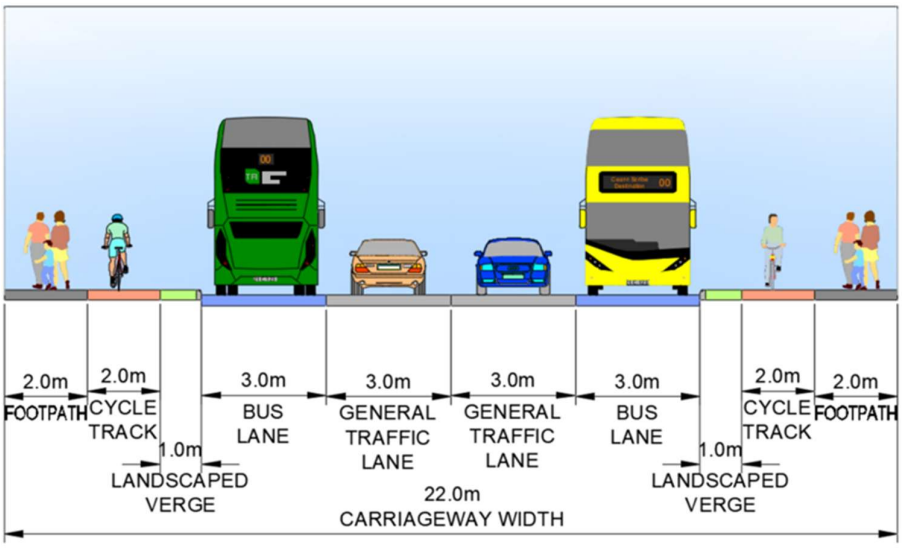


Figure 3-18 Section 2 Option 1 Indicative Cross Section

Option 2

Cycle tracks on both sides and a footpath on the southern side of the road provided adjacent to the carriageway for the length of the route. Bus lanes provided in both directions for full length of route. Footpath on northern side of route provided only where there is currently footpath provision, this includes where there are accesses and bus stops, appropriate crossings would be provided to maintain all access.

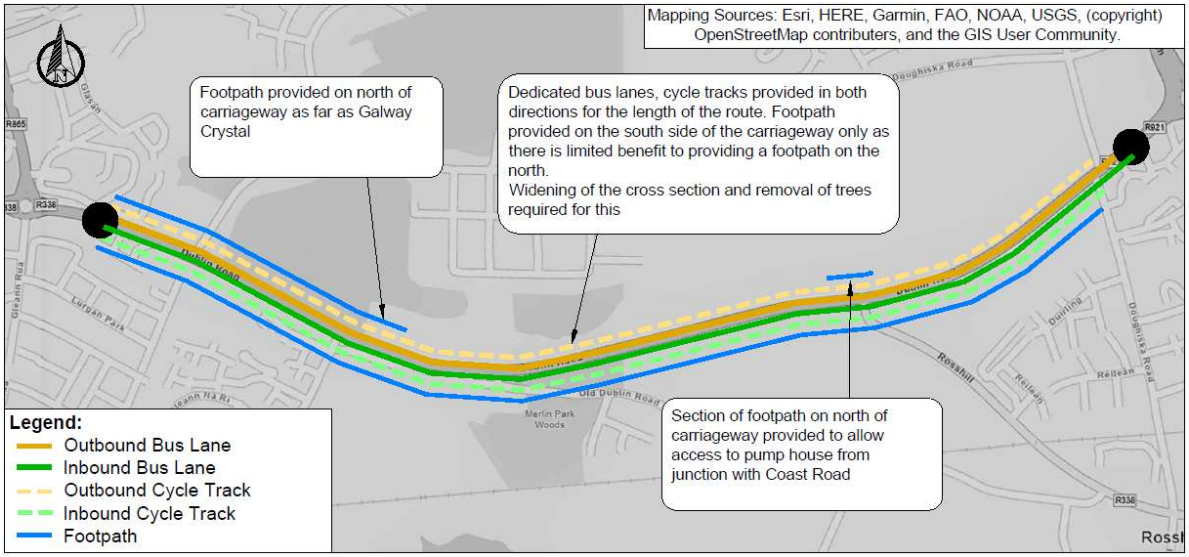


Figure 3-19 Section 2 Option 2 Indicative Scheme Design

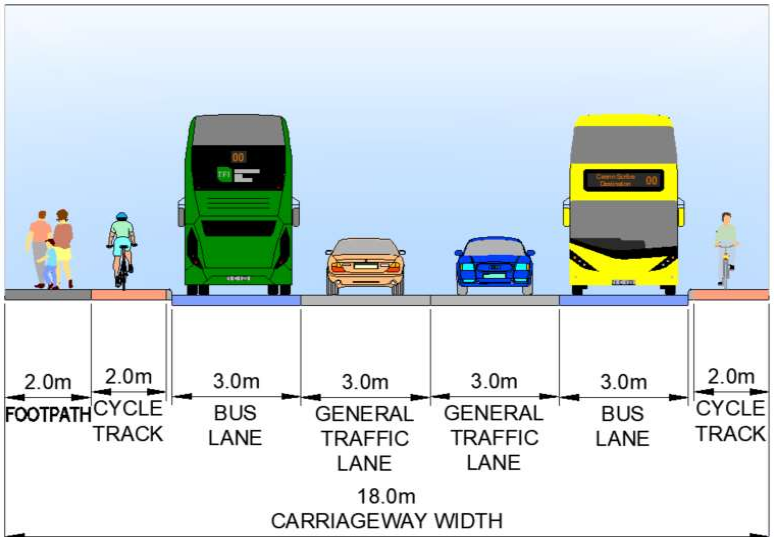


Figure 3-20 Section 2 Option 2 Indicative Cross Section

Option 3

Inbound cycle track and footpath provided adjacent to the carriageway on south of road. Outbound cycle track and footpath provided away from road carriageway through greenspace to the north of the route. Bus lanes provided in both directions for full length of route.

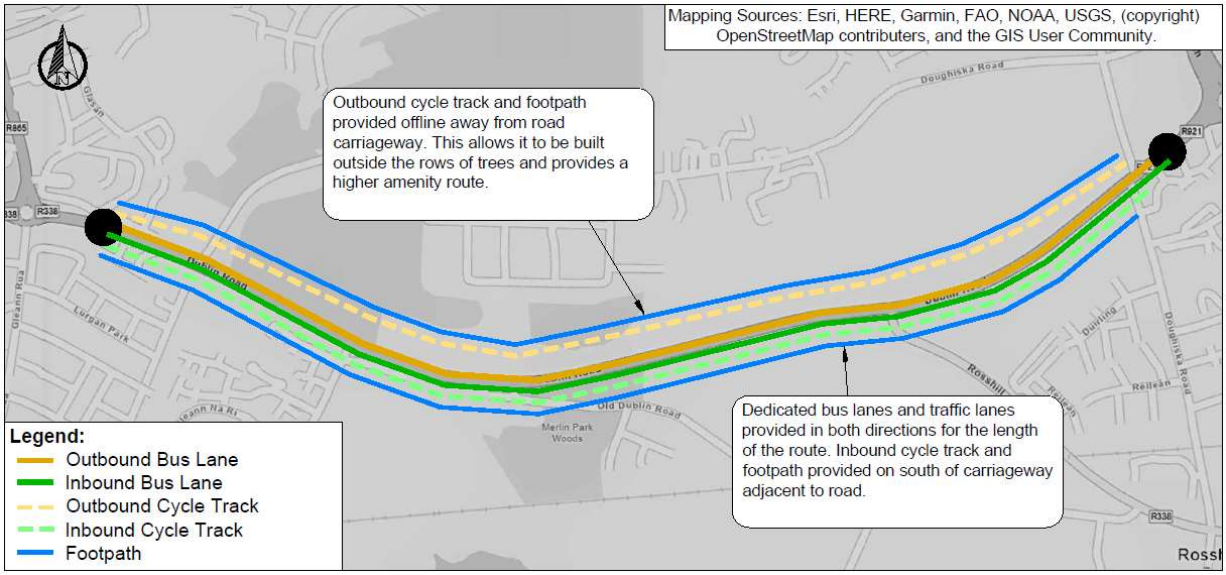


Figure 3-21 Section 2 Option 3 Indicative Scheme Design

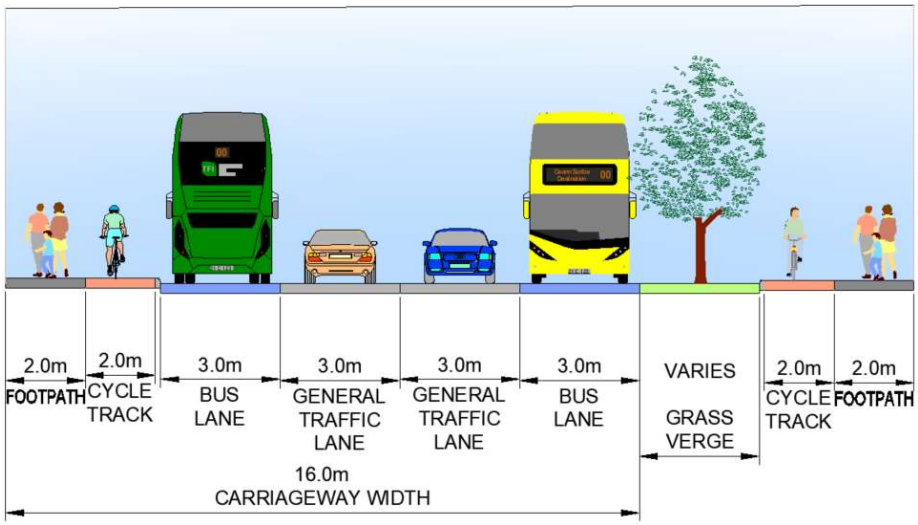


Figure 3-22 Section 2 Option 3 Indicative Cross Section

Option 4

Two-way cycle track provided offline through greenspace on the northern side of carriageway. Footpaths provided adjacent to the carriageway in both directions. Bus lanes provided in both directions for full length of route.

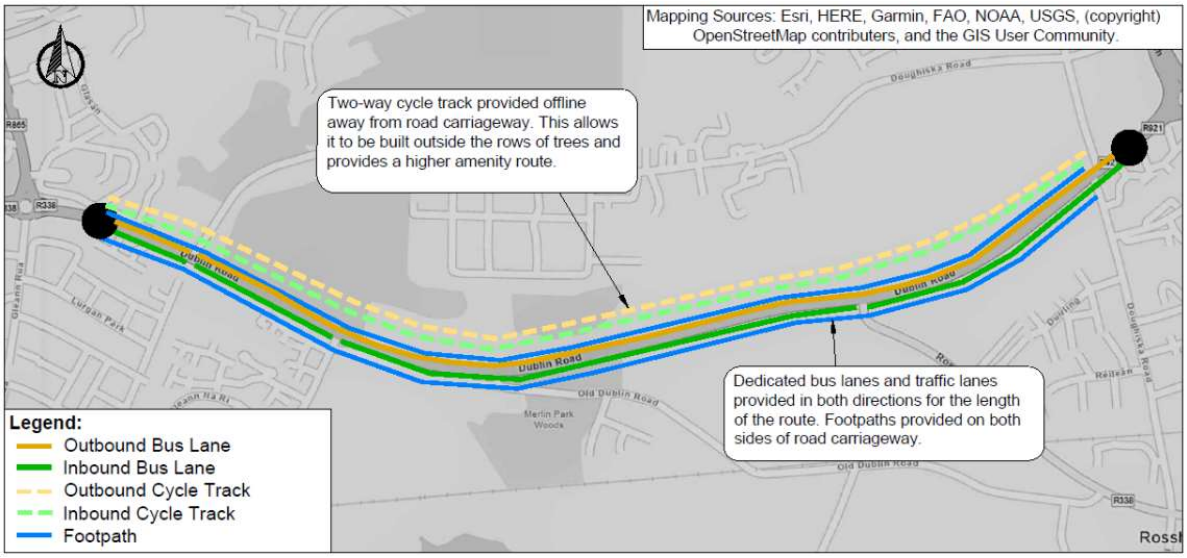


Figure 3-23 Section 2 Option 4 Indicative Scheme Design

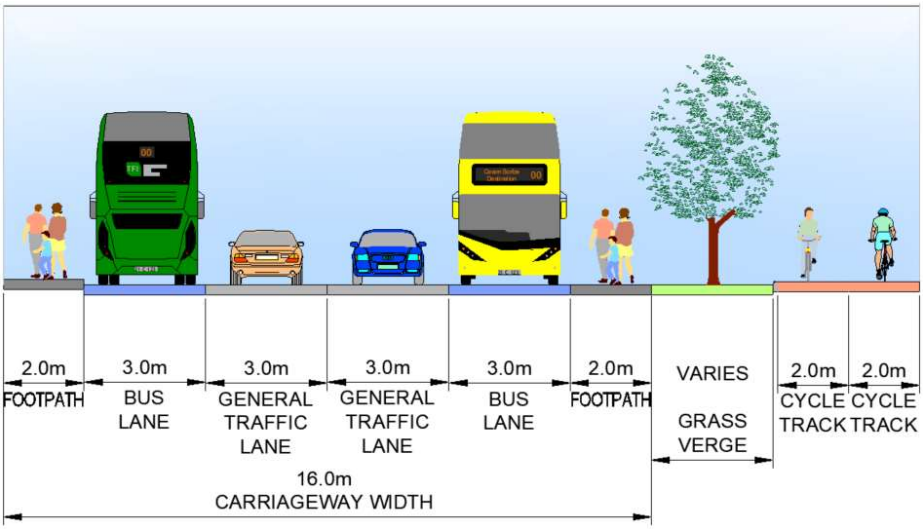


Figure 3-24 Section 2 Option 4 Indicative Cross Section

Option 5

Footpaths and cycle tracks provided adjacent to the road carriageway for the length of the route. Inbound bus lane provided for full length of the route; outbound bus lane provided on approach to junctions only.

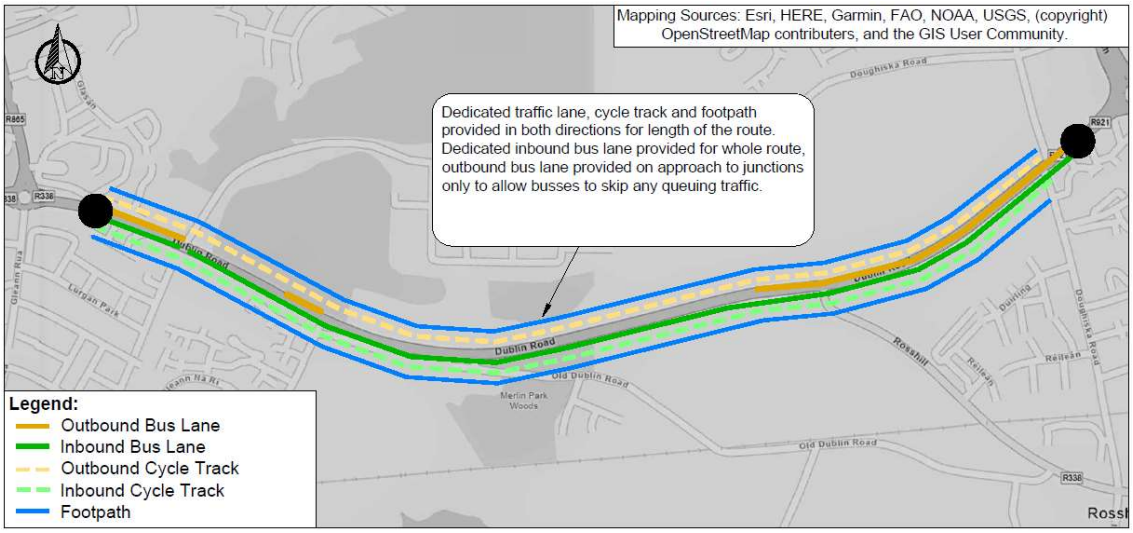


Figure 3-25 Section 2 Option 5 Indicative Scheme Design

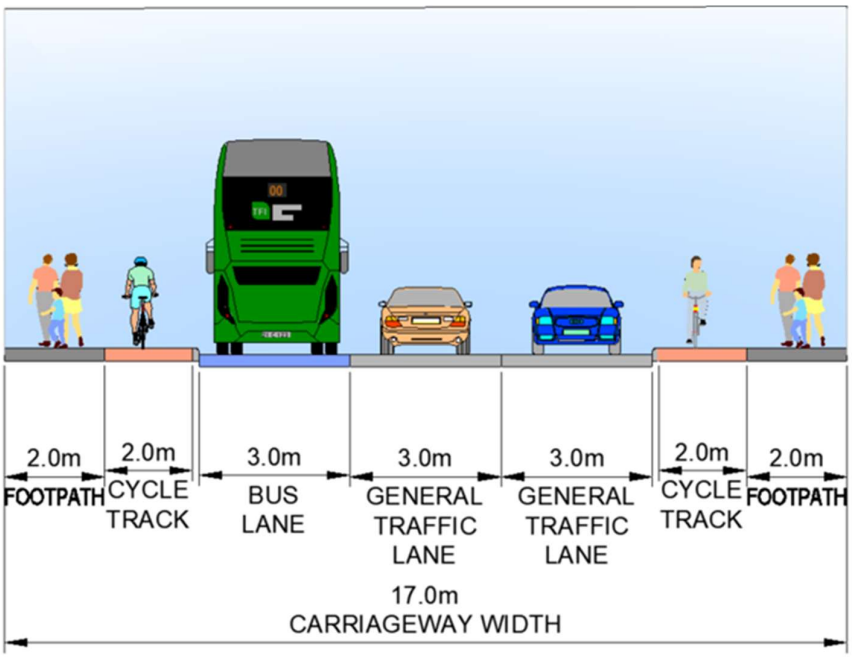


Figure 3-26 Section 2 Option 5 Indicative Cross Section

Option 6A

Cycle tracks either side of the road and a footpath on the southern side of the road provided adjacent to the carriageway for the length of the route. Footpath on northern side of route provided only where there is currently footpath provision, this includes where there are accesses and bus stops, appropriate crossings would be provided to maintain all access.

Inbound bus lane provided for full length of route; outbound bus lane provided on approach to junctions only.

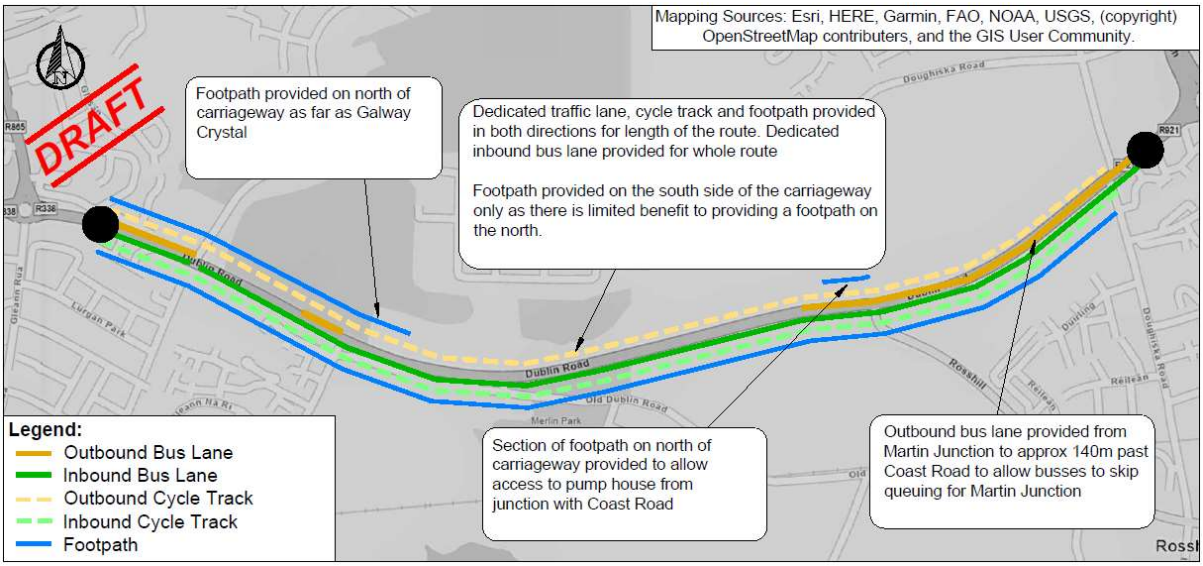


Figure 3-27 Section 2 Option 6A Indicative Scheme Design

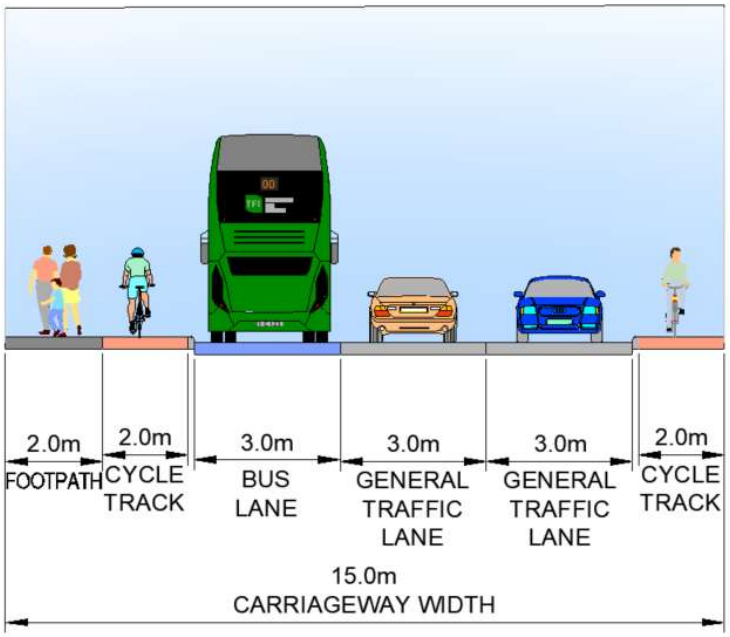


Figure 3-28 Section 2 Option 6A Indicative Cross Section

Option 6B

Cycle tracks either side of the road and a footpath on the southern side of the road provided adjacent to the carriageway for the length of the route. Footpath on northern side of route provided only where there is currently footpath provision, this includes where there are accesses and bus stops, appropriate crossings would be provided to maintain all access.

Inbound bus lane provided for full length of route. For the outbound bus lane, instead of having the bus lane provided from Doughiska to past the Coast Road, this option has more outbound bus lane provided on approach to the junction with Coast Road, and a gap in the outbound bus lane between Coast Road and where it's picked up again on approach to Doughiska. Traffic is held at the junction with Coast Road during times of busy traffic to allow buses to skip the queue into the bus lane provided on approach to Doughiska. This effectively moves the traffic queue to a different location and should provide a similar level of bus priority and transport integration to Option 6A. This reduces the impact on the trees adjacent to the road to the east of the scheme.

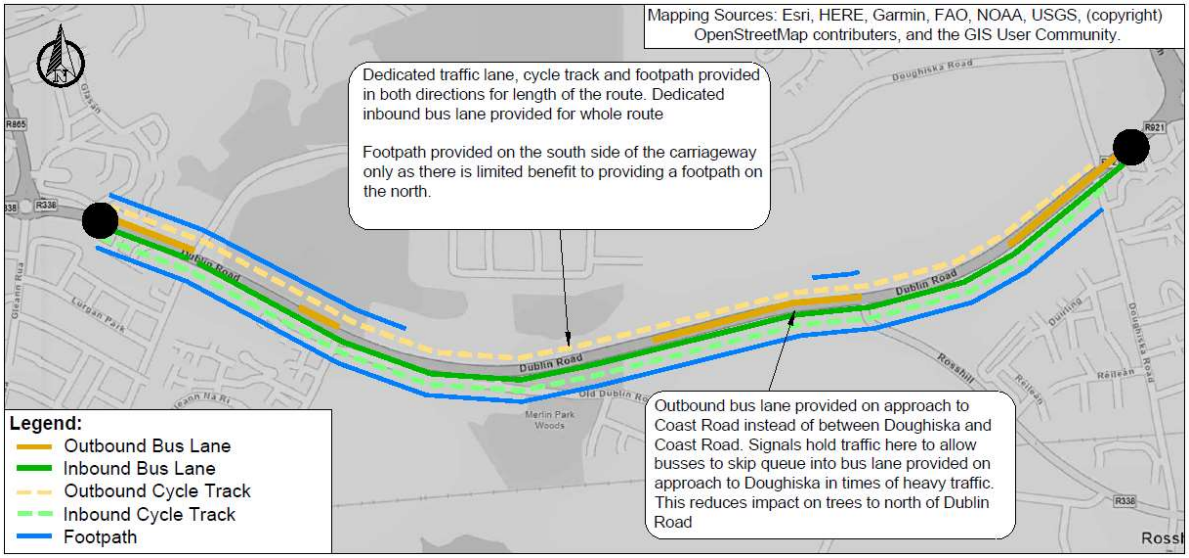


Figure 3-29 Section 2 Option 6B Indicative Scheme Design

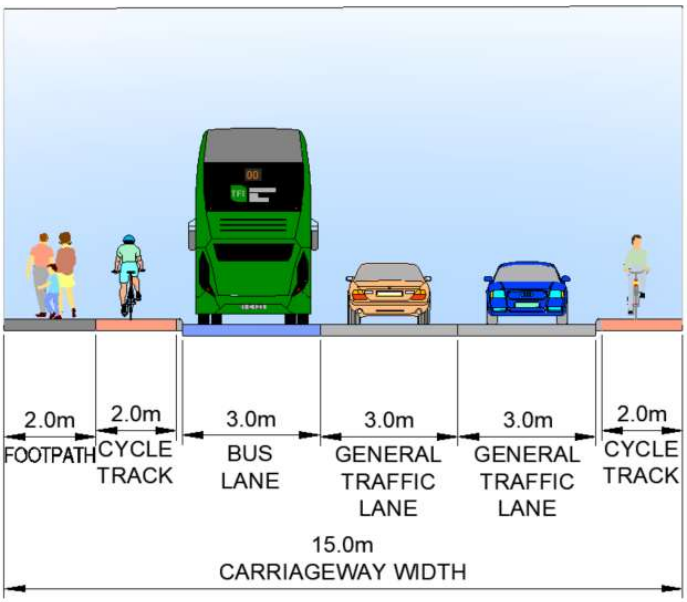


Figure 3-30 Section 2 Option 6B Indicative Cross Section

Option 6C

Cycle tracks either side of the road and a footpath on the southern side of the road provided adjacent to the carriageway for the length of the route. Inbound bus lane provided for full length of the route; outbound bus lane provided on approach to junctions only. Footpath on northern side of the route provided only where there is currently footpath provision, this includes where there are accesses and bus stops, appropriate crossings would be provided to maintain all access.

The difference between this and Option 6A is that east of Coast Road the outbound cycle tack is placed outside the row of trees on the north side of the carriageway. This reduces the number of trees impacted by the Proposed Development.

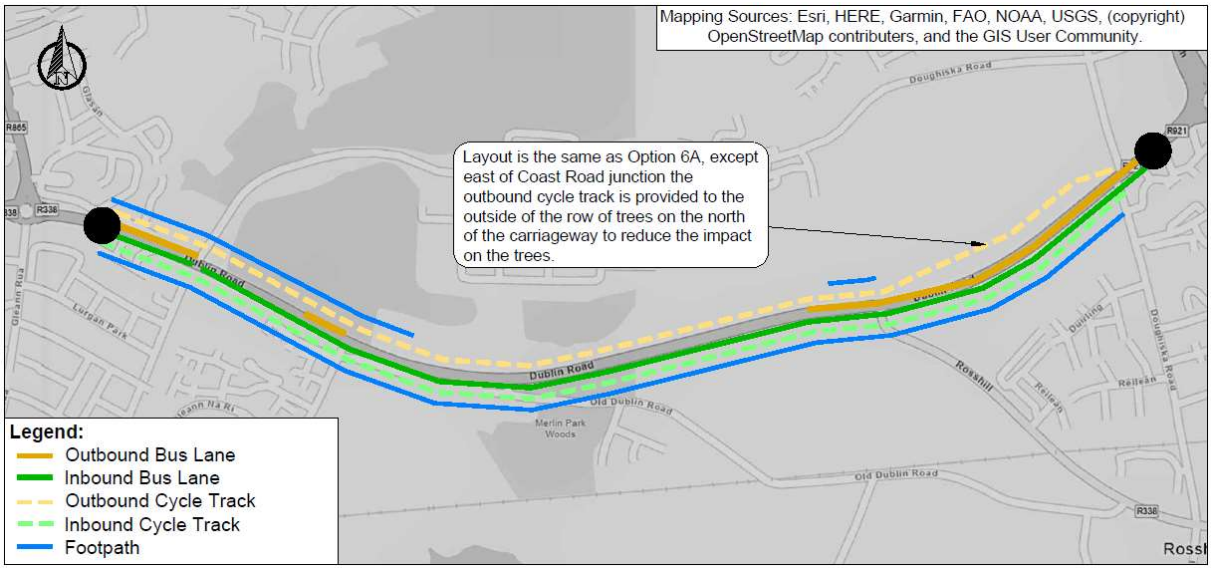


Figure 3-31 Section 2 Option 6C Indicative Scheme Design

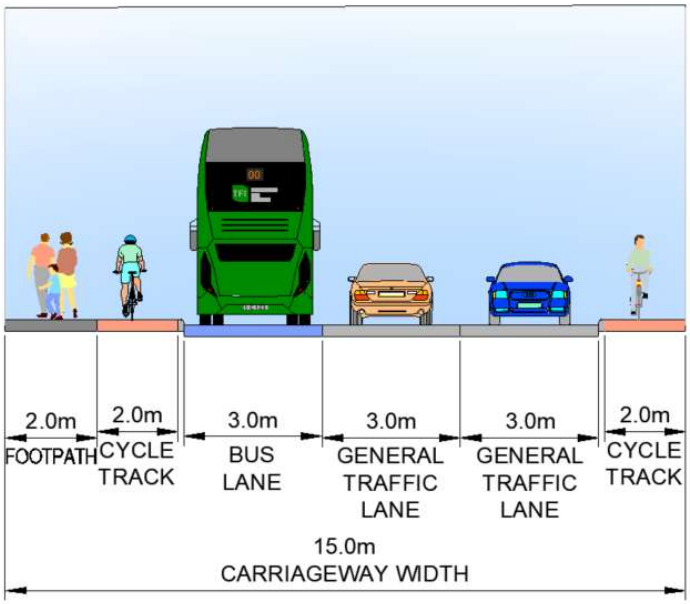


Figure 3-32 Section 2 Option 6C Indicative Cross Section

Option 6D

Cycle tracks either side of the road and a footpath on the southern side of the road provided adjacent to the carriageway for the length of the route. Inbound bus lane provided for full length of the route; outbound bus lane provided on approach to junctions only. Footpath on northern side of route provided only where there is currently footpath provision, this includes where there are accesses and bus stops, appropriate crossings would be provided to maintain all access.

The difference is that east of Coast Road the inbound cycle tack and footpath is placed outside the row of trees on the south side of the carriageway through the new development there. This reduces the number of trees impacted by the Proposed Development.

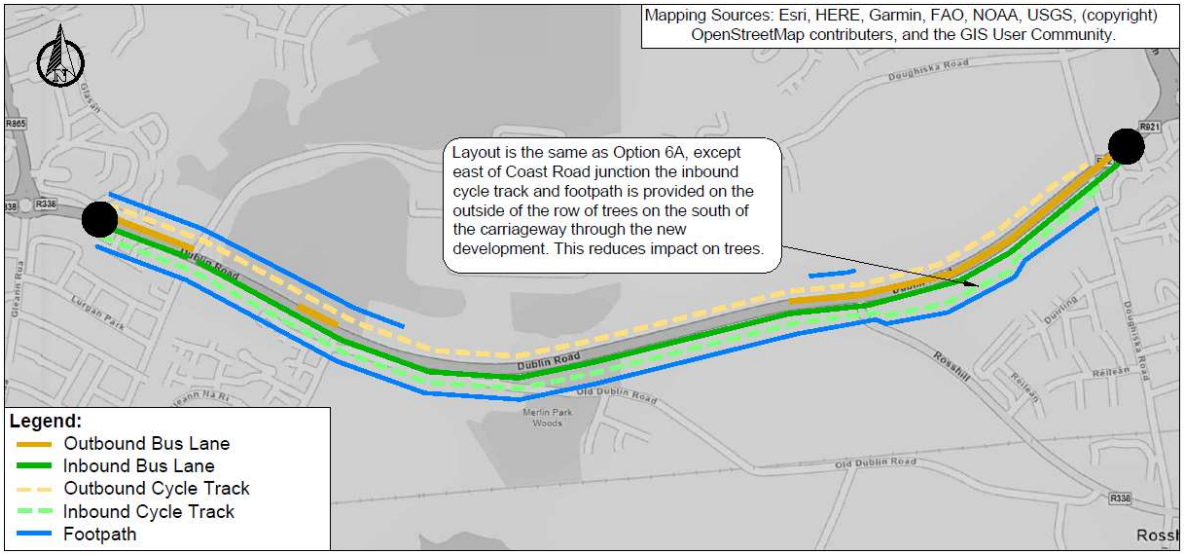


Figure 3-33 Section 2 Option 6D Indicative Scheme Design

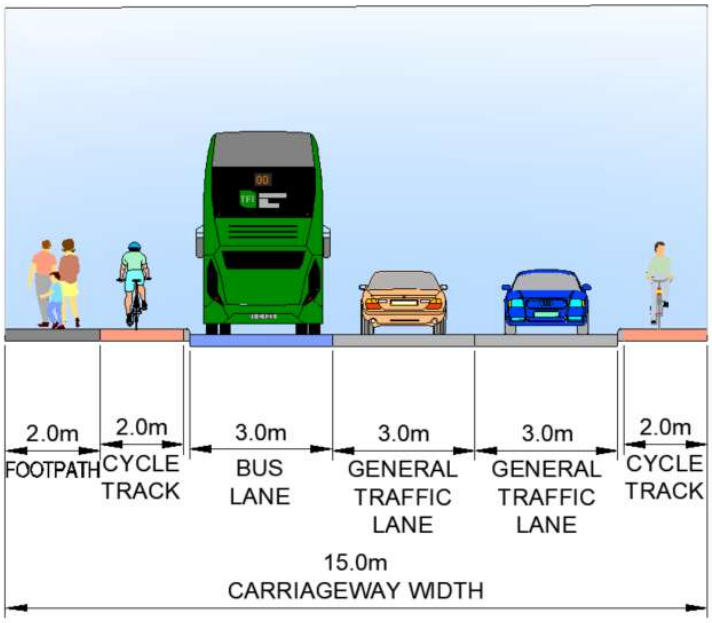


Figure 3-34 Section 2 Option 6D Indicative Cross Section

Option 7

Inbound cycle track and footpath provided adjacent to the carriageway on southern side of the road. Outbound cycle track and footpath provided away from road carriageway through greenspace to the north of the route. Inbound bus lane provided for full length of the route; outbound bus lane provided on approach to junctions only.

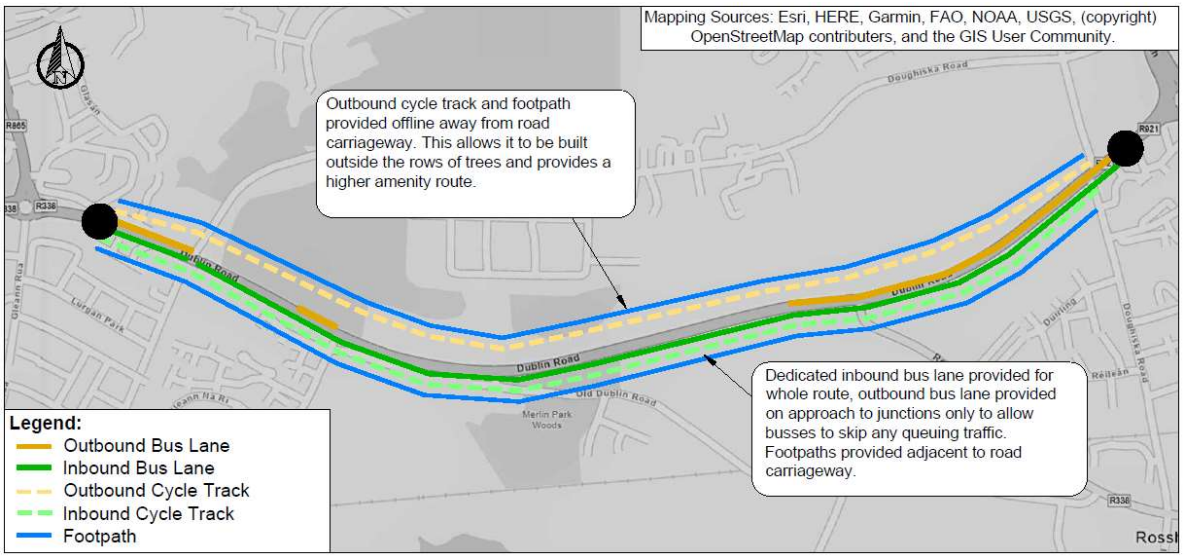


Figure 3-35 Section 2 Option 7 Indicative Scheme Design

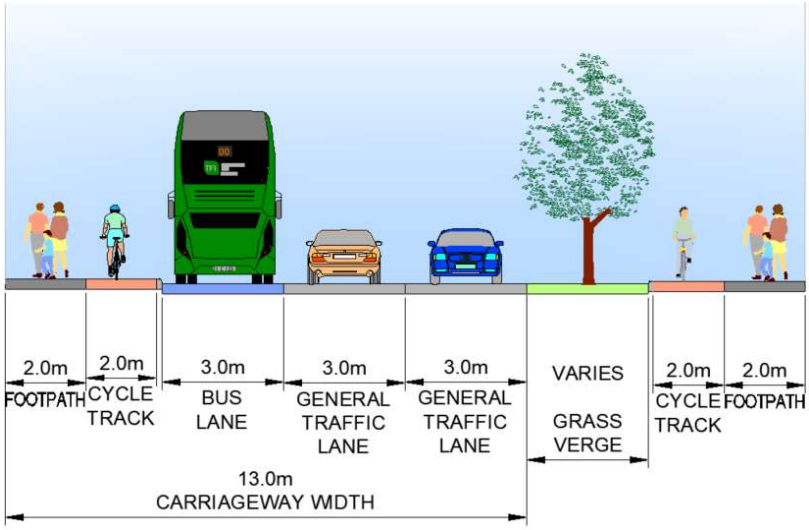


Figure 3-36 Section 2 Option 7 Indicative Cross Section

Option 8

Two-way cycle track provided offline through greenspace on the northern side of carriageway. Footpaths provided adjacent to the carriageway in both directions. Inbound bus lane provided for full length of the route; outbound bus lane provided on approach to junctions only.

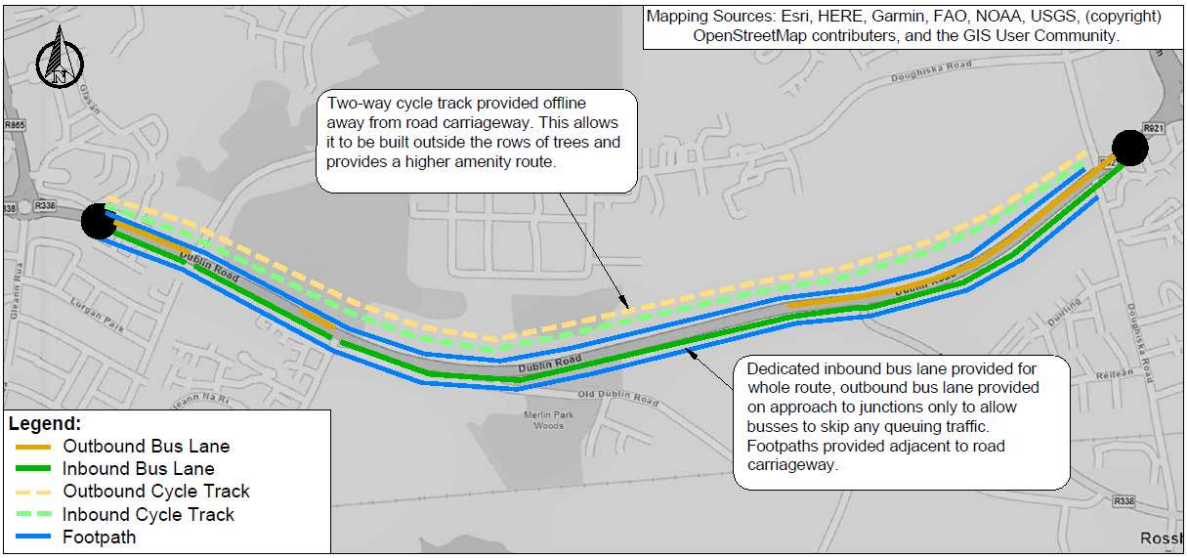


Figure 3-37 Section 2 Option 8 Indicative Scheme Design

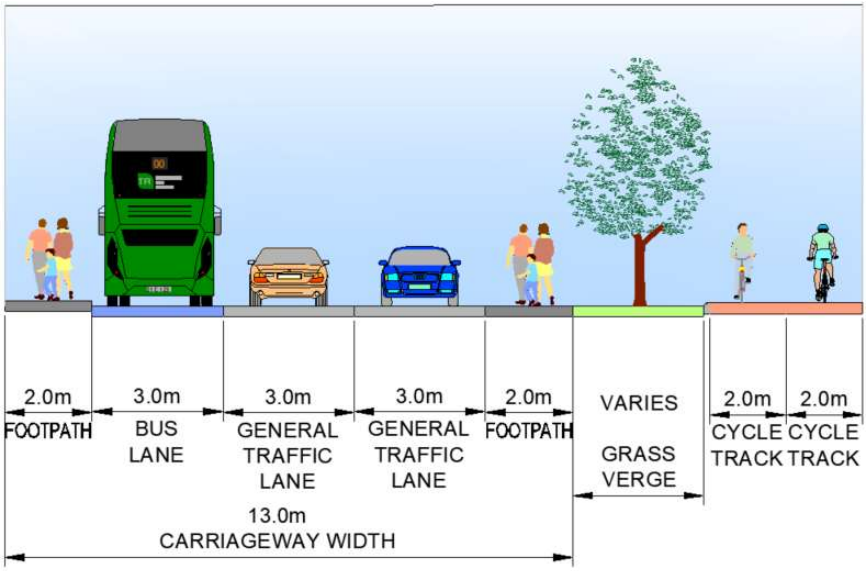


Figure 3-38 Section 2 Option 8 Indicative Cross Section

Option 9

Footpaths and cycle tracks provided adjacent to the road carriageway between Skerrit Roundabout and Coast Road. From Coast Road to Doughiska Junction a 2-way cycle track is provided to the north of the carriageway north of the row of trees that line the carriageway in this location, along here the footpath on the north of the route is also provided north of the row of trees. This allows most of the trees to remain in place. Bus lanes provided in both directions for full length of route.

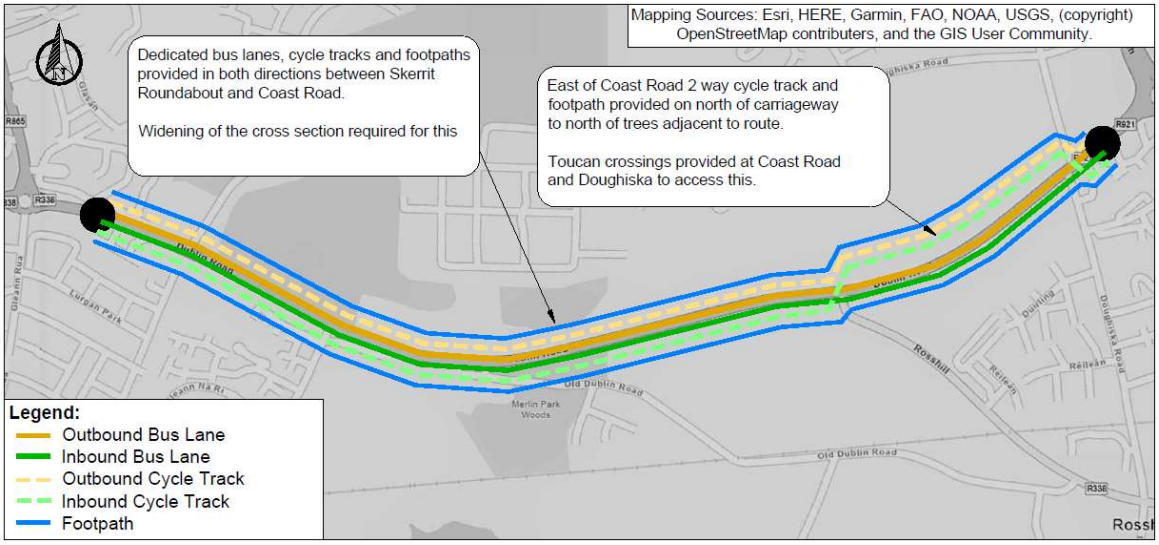


Figure 3-39 Section 2 Option 9 Indicative Scheme Design

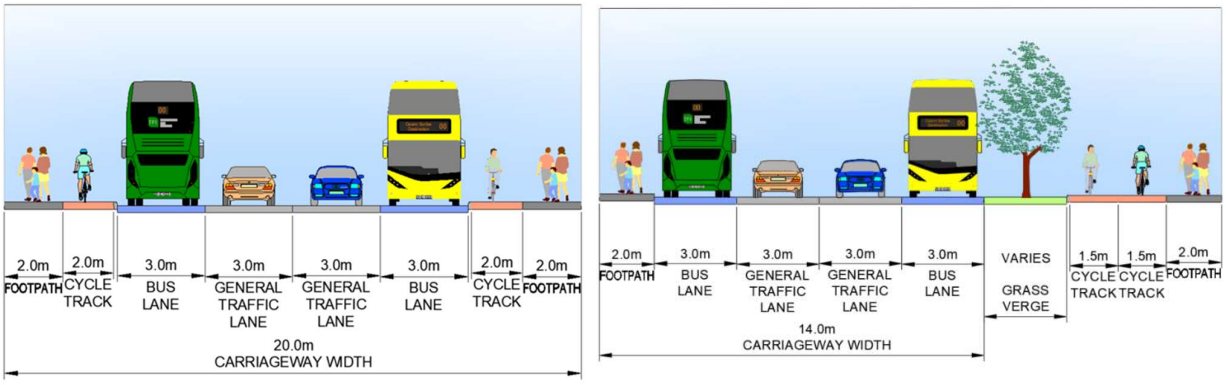


Figure 3-40 Section 2 Option 9 Indicative Cross Section

Section 2 Sifting Summary

- Options 1, 2, 3, 4 & 9 - Dedicated bus lanes in both directions
- Options 5, 6, 7 & 8 - Dedicated inbound bus lane provided for full length of route and outbound bus lane on approach to junctions only.

The outcome of the Section 2 sifting process is summarised in Table 3-5 below.

Table 3-5 Section 2 Sifting Summary

Options	Comment
Option 1: Footpaths and cycle tracks provided adjacent to the road carriageway for the length of the route.	By providing continuous bus, cycle and pedestrian provision in both directions for the length of the scheme this option meets all 6 of the main objectives of the project. There are likely impacts to the trees that bound the existing carriageway, however it is likely that these impacts can be mitigated with planting. For these reasons, this option is carried forward to MCA. Passed, Progressed to MCA
Option 2: Cycle tracks on both sides and a footpath on the southern side of the road provided adjacent to the carriageway for the length of the route. Footpath on northern side of route provided only where there is currently footpath provision, this includes where there are accesses and bus stops, appropriate crossings would be provided to maintain all access.	By providing continuous bus lanes, cycle lanes and improved footpaths this option would meet 5 of the 6 main project objectives. However, the Economy objective specifies that provision should be continuous, as the pedestrian provision for this scheme is not continuous this option does not fully meet that objective, although it does provide continuous cycling and bus infrastructure so mainly meets it. As this option provides a cycle path on the north of the carriageway but no footpath in some locations, it is likely that on occasion pedestrians will walk in the cycle path. This creates a potential conflict between pedestrians and cyclists and could cause safety issues as a result of collisions or users being forced onto the road carriageway. Furthermore, due to the width of the cross section, the trees that bound the route will still be required to be removed even if the footpath is dropped on the north of the road. This means overall this option performs worse than the options that provide a full footpath on the north side of the road. For these reasons, this option is not carried forward to MCA. Failed, Not progressed to MCA
Option 3: Inbound cycle track and footpath provided adjacent to the carriageway on south of road. Outbound cycle track and footpath provided away from road carriageway through greenspace to the north of the route.	By providing continuous bus, cycle and pedestrian provision in both directions for the length of the scheme this option meets all 6 of the main project objectives. Passed, Progressed to MCA
Option 4: Two-way cycle track provided offline through greenspace on the northern side of carriageway. Footpaths provided adjacent to the carriageway in both directions.	By providing continuous bus, cycle and pedestrian provision in both directions for the length of the scheme this option meets all 6 of the main project objectives. Passed, Progressed to MCA
Option 5: Footpaths and cycle tracks provided adjacent to the road carriageway for the length of the route.	By providing continuous cycle lanes, footpaths, and improved bus lanes this option would meet 5 of the 6 main project criteria. However, the Economy objective specifies that provision should be continuous, as the bus provision for this

Options	Comment
	scheme is not continuous this option fails to meet that objective. For this reason, this option is not carried forward to MCA. Failed, Not progressed to MCA
Option 6A: Cycle tracks either side of the road and a footpath on the southern side of the road adjacent to carriageway for length of route. Footpath on northern side of route provided only where there is currently footpath provision, this includes where there are accesses and bus stops, appropriate crossings would be provided to maintain all access.	By providing continuous cycle lanes, footpaths and improved bus lanes this option would meet 5 of the 6 main project criteria. However, the Economy objective specifies that provision should be continuous, as the bus provision for this scheme is not continuous this option fails to meet that objective. Failed, Not progressed to MCA
Option 6B: Same as 6A except traffic signals used to move traffic queuing at Doughiska to queue at Coast Road junction instead, same length of outbound bus lane provided overall, reduces impact on trees adjacent to carriageway.	By providing continuous cycle lanes, footpaths and improved bus lanes this option would meet 5 of the 6 main project criteria. However, the Economy objective specifies that provision should be continuous, as the bus provision for this scheme is not continuous this option fails to meet that objective. Failed, Not progressed to MCA
Option 6C: Same as 6A except outbound cycle track provided outside row of trees to north of carriageway between Coast Road and Doughiska.	By providing continuous cycle lanes, footpaths and improved bus lanes this option would meet 5 of the 6 main project criteria. However, the Economy objective specifies that provision should be continuous, as the bus provision for this scheme is not continuous this option fails to meet that objective. Failed, Not progressed to MCA
Option 6D: Same as 6A except inbound cycle track and footpath provided outside of row of trees to south of carriageway between Coast Road and Doughiska.	By providing continuous cycle lanes, footpaths and improved bus lanes this option would meet 5 of the 6 main project criteria. However, the Economy objective specifies that provision should be continuous, as the bus provision for this scheme is not continuous this option fails to meet that objective. Failed, Not progressed to MCA
Option 7: Inbound cycle track and footpath provided adjacent to the carriageway on southern side of the road. Outbound cycle track and footpath provided away from road carriageway through greenspace to the north of the route.	By providing continuous cycle lanes, footpaths and improved bus lanes this option would meet 5 of the 6 main project criteria. However, the Economy objective specifies that provision should be continuous, as the bus provision for this scheme is not continuous this option fails to meet that objective. Failed, Not progressed to MCA
Option 8: Two-way cycle track provided offline through greenspace on the northern side of carriageway. Footpaths provided adjacent to the carriageway in both directions.	By providing continuous cycle lanes, footpaths and improved bus lanes this option would meet 5 of the 6 main project criteria. However, the Economy objective specifies that provision should be continuous, as the bus provision for this scheme is not continuous this option fails to meet that objective. Failed, Not progressed to MCA

Options	Comment
Option 9: Footpaths and cycle tracks provided adjacent to the road carriageway between Skerrit Roundabout and Coast Road. From Coast Road to Doughiska Junction a 2-way cycle track is provided to the north of the row of trees that line the carriageway. Bus lanes provided in both directions for full length of route.	By providing continuous bus, cycle, and pedestrian provision in both directions for the length of the scheme this option meets all 6 of the main objectives of the project. This option will have a lower impact on the trees to the north of the carriageway than the options that keep the cycling adjacent to the road carriageway. However, it will require that cyclists travelling outbound cross the road in as much as an extra 2 locations, depending on which direction they are travelling onward from after. Passed, Progressed to MCA

3.4.3 Stage 2 - Route Options Assessment

Following completion of 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 progressed to a multi-criteria assessment. 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; and
5. Environment.

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 impacts on below ground archaeological remains, historic buildings (individual and areas), and historic landscapes and parks. The assessment had regard to RMPs, Sites of Archaeological or Cultural Heritage and on buildings listed on the National Inventory of Architectural Heritage along or adjacent to the corridor;

Biodiversity - The provision of the multi-modal transport corridor may have negative impacts on biodiversity, for example, through construction of new infrastructure through green field sites or removal of trees/hedges. These impacts are compared for each scheme under this criterion. Any potential impacts to areas with an environmental designation are identified and the likely impacts are compared, the environmental designations considered include but are not limited to: Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas and proposed Natural Heritage Areas.

Soils and Geology - Construction of infrastructure necessary for the provision of the multi-modal transport corridor has the potential to impact on soils and geology. For example, through land acquisition and ground excavation. These considerations were compared for each scheme under this criterion;

Hydrology - The provision of a multi-modal transport corridor infrastructure has the potential to impact on surface water bodies as a result of land-take (with particular emphasis on floodplains and flood zones). Any such impacts were considered for each scheme under this criterion.

L**andscape and Visual** – The provision of multi-modal transport corridor infrastructure has the potential to impact on the townscape/streetscape as well as the landscape and visual aspects of the area, for example, by the removal of front gardens or green spaces or the altering of streetscapes, character and features. Different schemes were compared, and any negative effects considered under this criterion;

Air Quality - The provision of multi-modal transport corridor 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 realignment;

Climate and Carbon - This criterion assesses the impacts of the Proposed Development in terms of the likely long-term effects on the climate, particularly with regard to Irelands aims to reduce transport related emissions. This mainly relates to how the scheme will impact user behaviour, for example a scheme could encourage a shift towards lower carbon modes of transport and therefore have the positive effect of reducing Irelands transport emissions.

Noise & Vibration - Provision of a multi-modal transport corridor infrastructure (e.g., the construction activities), has the potential to negatively impact on noise and vibration along the Proposed Development. These effects were compared for each scheme option under this criterion. The impact was quantified 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 road realignment; and

Land Use and Built Environment - This criterion assesses the impact of each scheme option on land use character, and measures impacts which prevent land from achieving its intended use, for example through land acquisition, reallocation of road space, severance of land, removal of parking or loading spaces, or changes to access arrangements.

Route options were assessed and 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.

Each route is given a comparative score (advantage/disadvantage) on a 5-point scale for each of the criteria listed in Table 3-6 below.

Table 3-6 MCA comparative advantage/disadvantage colour ranking table

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

3.4.3.1 Section 1: Route Option Assessment

The Figure 3-41 below shows a summary of the options considered in Section 1.

Figure 3-41 Section 1 Options Assessment Plan

Three route options for the general cross section have been developed tor this section. These route options all follow Dublin Road, starting 120m east of Sáilín and finishing at the approach to Skerritt Roundabout. All options use the same route, and the difference is in the cross section provided, all options have a footpath and cycle lane on both sides of the road.

- **Option 1**: Bus lane and traffic lane in both directions for full length of route;
- **Option 2**: Inbound traffic diverted around Renmore Road and Renmore Avenue, signals control traffic re-joining Dublin Road and give bus priority by doing so; and
- **Option 4:** This option has bus lanes in both directions but drops the inbound bus lane either side of Renmore Road junction to reduce the road widening needed. The bus would enter the general traffic lane for this section using a yellow box.

The Emerging Preferred Route identified in the Options Selection Report for Section 1 is Option 1, as shown in Figure 3-9. This section of the Emerging Preferred Route Option would widen the cross section along the length of the route to include dedicated bus lanes in both directions and dedicated traffic lanes in both directions. Cycle lanes and footpaths in both directions would also be provided.

Option 1 is recommended as the preferred option as it provides the highest overall ranking against the scheme objectives. In particular it would provide the fastest and most reliable service for buses, while having a smaller impact on the general traffic network than the other options. The speed and reliability of this option means more people are likely to use sustainable modes of transport in lieu of private car. Option 1 performs best overall despite performing slightly worse for the environmental criteria than Option 4.

Table 3-7 Section 1 MCA Summary Table

Assessment Criteria	Option 1	Option 2	Option 4
Economy			
Integration			
Accessibility and Social Inclusion			
Safety			
Environment			

It is considered that the options assessment presented in the Options Selection Report has appropriately assessed route options and that the selected corridor offers the most benefits for pedestrians, cyclists, and buses.

The proposed section of the route meets the Proposed Development objectives and is the Preferred Route Option for this corridor.

3.4.3.2 Section 1 – Renmore Road/Dublin Road Junction Sub Assessment

The options assessed for this junction are as follows:

- **Options 1A, 1B & 1C**: Full build, dedicated bus lanes provided in both directions for whole length, right turn lane provided on Dublin Road for traffic queuing to turn into Renmore. The difference between the options lies in which side of the road is affected by land take; and
- **Option 3A & 3B**: Full build except no dedicated right turn lane provided on Dublin Road. The difference between the options lies in which side of the road is affected by land take.

For all options dedicated and protected cycle lanes would be provided in both directions. Pedestrian footpaths would also be provided on both sides of the road and signalised pedestrian crossings provided for each arm of the junction.

A summary of the assessment and a relative ranking for each of the five assessment criteria is shown in the table below.

Table 3-8 Renmore MCA Summary Table

Assessment Criteria	Option 1A	Option 1B	Option 1C	Option 3A	Option 3B
Economy					
Integration					
Accessibility and Social Inclusion					
Safety					
Environment					

Overall Options 1A, 1B & 1C are preferable to Options 3A & 3B as they provide a faster and more reliable service for buses and have a significantly lower impact on the traffic network than Options 3A & 3B.

Options 1A, 1B & 1C perform equally for bus journey time and reliability and perform equally for Integration. Option 1B however, is likely to be more expensive and more impactful on the environment due to requiring the purchase and demolition of 18 Dublin Road, so performs the worst of these 3 Options. Option 1A is likely to impact fewer landowners overall and will have less impact on the parking outside Duggan's Spar, so performs better for the environment criteria than Option 1C.

Based on the assessments above Option 1A is recommended as the preferred option.

3.4.3.3 Section 1 - Ballyloughane Road / Belmont / Dublin Road Junction Sub Assessment

The options assessed for this junction are as follows:

- **Option 1**: Keep the layout as it currently is but with bus lanes and cycle lanes in both directions;
- **Option 2A & 2B**: Signalise, with the Belmont and Ballyloughane Road junctions remaining staggered, with a right turn lane provided; and
- **Option 3A & 3B:** Signalise, bring the Belmont to meet Dublin Road directly across from Ballyloughane Road so that there is just one junction with 4 arms. Right turn lane provided for general traffic.

For all options dedicated bus lanes and protected cycle lanes would be provided in both directions. Pedestrian footpaths would also be provided on both sides of the road.

A summary of the assessment and a relative ranking for each of the five assessment criteria is shown in Table 3-9 below.

Table 3-9 Ballyloughane Road / Belmont / Dublin Road Junction MCA Summary Table

Assessment Criteria	Option 1	Option 2A	Option 2B	Option 3A	Option 3B
Economy					
Integration					
Accessibility and Social Inclusion					
Safety					
Environment					

For the above reasons the emerging preferred option is Option 3B as it performs better for environment as it allows the existing accesses to remain open, which benefits the Land Use and Built Environment criteria.

3.4.3.4 Section 1 - Skerritt Roundabout Sub Assessment

The options assessed for this junction include:

- **Option 1:** Rebuild as signalised junction as per BusConnects Design Guidance Note;
- **Option 2:** Keep as roundabout and have signalised toucan crossings provided on every arm; and
- **Option 3:** Rebuild as signalised "Cyclops" style junction.

A summary of the assessment and a relative ranking for each of the five assessment criteria is shown in Table 3-10 below.

Table 3-10 Skerritt Roundabout MCA Summary Table

Assessment Criteria	Option 1	Option 2	Option 3
Economy			
Integration			
Accessibility and Social Inclusion			
Safety			
Environment			

Options 1 & 3 perform better for economy overall despite being more expensive than Option 2 as they have a better journey time and journey time reliability for busses. They also provide a better quality of service for pedestrians and cyclists than Option 2 so perform better for integration. Furthermore, they perform better for road safety than Option 2. For these reasons these options are preferable to Option 2.

Between Options 1 & 3, Option 3 performs slightly better as it has cyclists on a separate signal phase to traffic, meaning it provides a higher quality of service for cyclists, and it scores better for road safety and environment.

Based on the assessments above Option 3 is recommended as the preferred option.

3.4.3.5 Section 2 - Route Option Assessment

The figure below shows a summary of the options considered in Section 2.

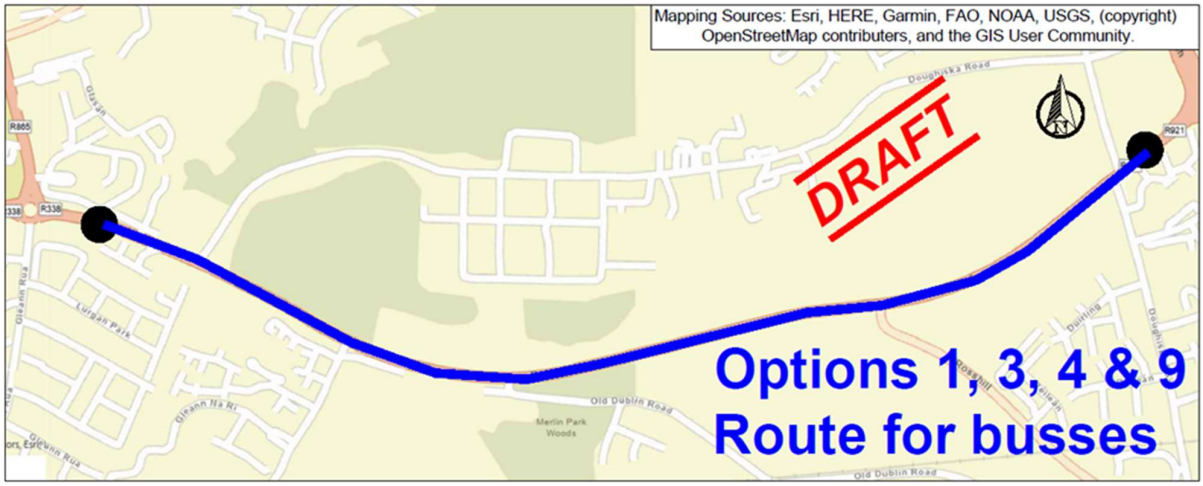


Figure 3-42 Section 2 Options Plan

All route options start 75m east of Skerrit Roundabout and finish at Doughiska Road Junction where the project ties in with the Martin Junction upgrade.

There are 4 options considered, all have dedicated bus lanes and 2-way general traffic lanes for the length of the route.

- **Option 1:** Footpaths and cycle tracks provided adjacent to the road carriageway for the length of the route;
- **Option 3:** Inbound cycle track and footpath provided adjacent to the carriageway on south of road. Outbound cycle track and footpath provided away from road carriageway through greenspace to the north of the route;
- **Option 4:** Two-way cycle track provided offline through greenspace on the northern side of carriageway. Footpaths provided adjacent to the carriageway in both directions; and
- **Option 9**: Footpaths and cycle tracks provided adjacent to the road carriageway between Skerrit Roundabout and Coast Road. From Coast Road to Doughiska Junction a 2-way cycle track is provided to the north of the row of trees that line the carriageway. Bus lanes provided in both directions for full length of route.

A summary of the assessment and a relative ranking for each of the five assessment criteria is shown in Table 3-11 below.

Table 3-11 Assessment Summary Table

Assessment Criteria	Option 1	Option 3	Option 4	Option 9
Economy				
Integration				
Accessibility and Social Inclusion				
Safety				
Environment				

All options equally meet the project Economy objectives and perform equally in terms of Capital Cost. Options 1 & 3 best meets the Integration objectives as they propose to have cycle tracks on either side of the road adjacent to the road carriageway for their length meaning they better serve cyclists. Option 9 which has cyclists on either side of the road for most of the scheme length performs better than Option 4 for this. All options promote a switch towards lower carbon forms of transport by providing continuous bus lanes, footpaths and cycle tracks. However, Options 1, 2 & 3 performs significantly worse for biodiversity than Option 9 as a result of impacting the trees adjacent to the carriageway and segregating the Annex 1 grasslands in Merlin Park. Option 1 also performs better for landscape and visual as it retains the most trees.

Based on the assessments above Option 9 is recommended as the preferred option despite performing slightly worse for Cyclist Integration than Options 1 & 3. This is because it performs significantly better for the Environmental criteria than Options 1, 3 & 4.

3.4.4 Emerging Preferred Route

Informed by the appraisal of options described in earlier section, the Emerging Preferred Routes were identified. The EPR is summarised as follows:

> *'The BusConnects Galway: Dublin Road development starts east of Moneenageisha Junction where it ties into the BusConnects Galway: Cross City Link proposals and follows Dublin Road as far as the Doughiska Junction.*
>
> *For the full length of the route dedicated bus lanes, segregated cycle lanes and footpaths are provided on either side of the road. Dublin Road remains 2 way for general traffic. All major junctions along the route are upgraded to signalised junctions with pedestrian and cyclist provision, including the Skerrit Roundabout.*

A non-statutory public consultation on this Emerging Preferred Route was undertaken from 13th January 2023 to 13th February 2023, providing feedback which was then meaningfully considered in the further development of the scheme proposal.

3.5 Design Alternatives

3.5.1 Consideration following Emerging Preferred Route Option Consultation

A total of 103 submissions were received as part of the Emerging Preferred Route Public Consultation. These submissions ranged from individual submissions by residents, commuters and local representatives, to detailed proposals from public bodies, various associations and private sector businesses.

177 separate issues were raised in total by the respondents. 69% of these were on the engineering aspects of the Proposed Development. 17% were in relation to safety and 14% were in relation to the environmental elements of the Proposed Development. Respondents raised concerns with the engineering arrangement of the Proposed Development the most of which concerned the lane widths (15%) that are proposed and the junction/signalling arrangements (14%).

The majority of the safety concerns raised were regarding signalling phasing at junctions (5%). Respondents were also concerned with the crossings for cyclists and pedestrians (3%). Environmental concerns raised include loss of green space and hedges (3%), concerns for the impact to Annex 1 habitats at Merlin Park Meadow (5%).

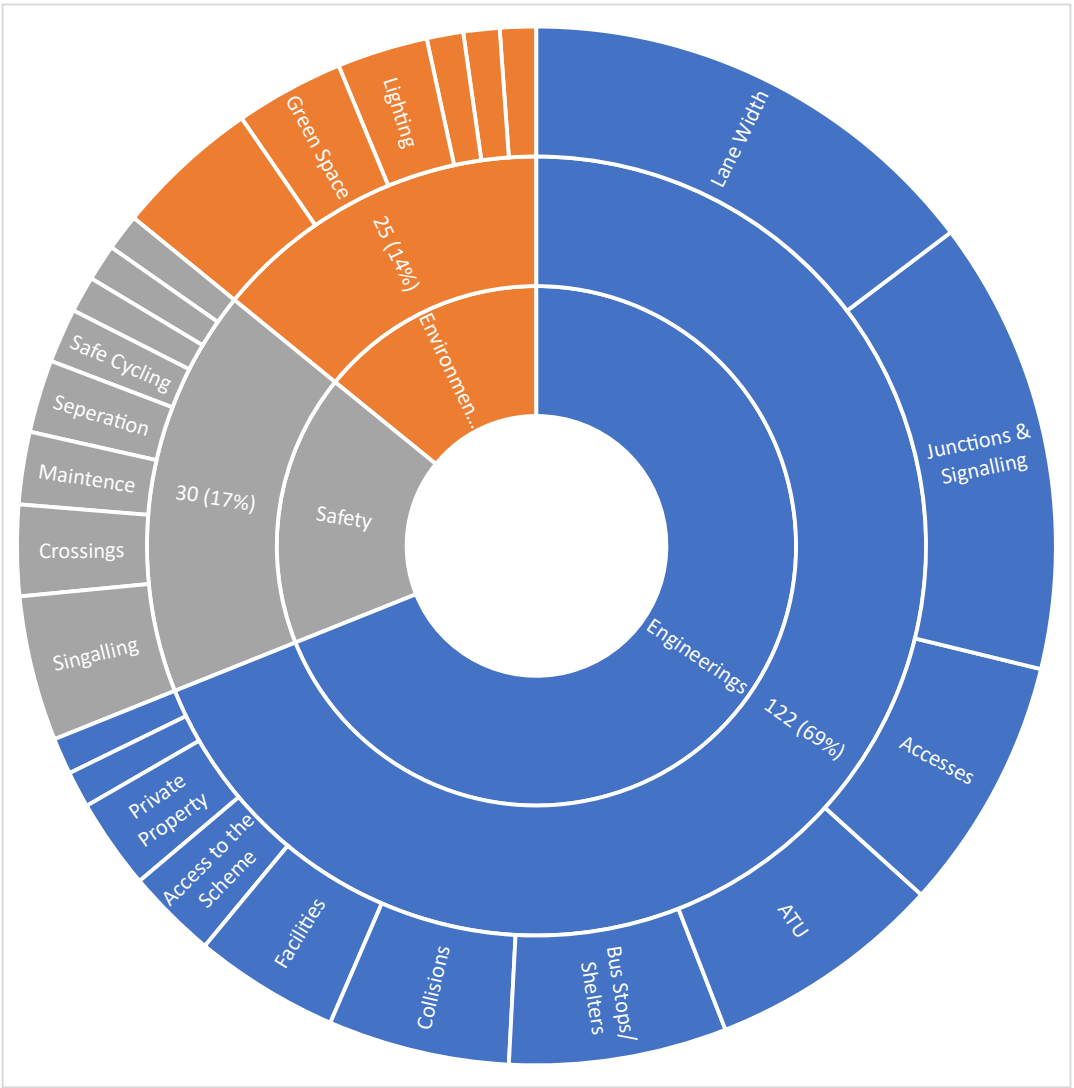


Figure 3-43 Public Consultation Key Issues

The public consultation feedback did not result in the need for any revisiting of alternative route options for the Proposed Development. The detail of the Emerging Preferred Route was however re-examined based on the submissions made and information received.

3.5.2 Development of the Preferred Route Option

Following the completion of the public consultation process in relation to the Emerging Preferred Route, various amendments were made to the scheme proposals to address, where practical to do so, the issues raised in submissions.

Furthermore, additional design development along the Proposed Development considering additional information gathered. This additional design development took account of:

- New and updated topographical survey information;
- Ground investigation information;
- Landscape design amendments;
- Arboricultural design inputs;
- Further engagement with developers and owners of adjacent lands;
- Drainage design amendments; and
- Ecologist inputs.

Table 3-12 Public Consultation Suggestions & Responses Summary Table

Suggestion	Response
Increase the width on the cycleways especially at junctions due to turning, waiting, and stacking.	Lane widths are to design standards. Consideration to be given to widening the southern footpath between Coast Road and Doughiska junctions.
Design to take account of the existing traffic problems at ATU bus stop	Design updated.
Use 'Cyclops' or 'Dutch' arrangement at all junctions.	Cyclops Junction has been considered and adopted for one of the junctions.
Provide physical separation between cycleways and traffic lanes	0.5m strip adopted as part of the preliminary design stage.
Provide lay-by bus stops at ATU	Adopted as part of the preliminary design stage.
Issue with right turning across footpath, cycleway, bus lane and traffic lane.	Providing a cycle track & bus lane would improve vehicle sightlines when exiting. Also, signalised junctions will provide gaps in traffic flow allowing egress. Dublin BusConnects referred to a number of examples which already exist which have set a precedence in response to exiting and turning right.
Pedestrian crossing across entrances is set back	Design updated.
Amend alignment at No. 18 Dublin Road to provide 600mm from garage.	Design updated.
Provide a yellow box on Michael Collins Road to allow properties facing Dublin Road right turn onto Michael Collins Road.	Issue with loop detector.
Provide a signalised junction at the entrance to Woodhaven and incorporate entrance to Merlin Gate.	This would result in two signalised junctions within 130m of each other which would be undesirable for Dublin Road traffic.
Use of old Dublin Road at Coast Road for cycle lane / footpath to avoid junction	Included as part of preliminary design.
Provide link to Greenway project.	To be considered as a separate commission.

Suggestion	Response
Amend the cycleway arrangement at Coast Road junction to have southbound cyclists cross the junction on the eastern side.	Design updated.
Woodhaven - remove trees and keep the cycleway / footpath route along bus lane.	Design updated.

3.6 Conclusion

The Proposed Development has been the subject of a systematic and comprehensive assessment of 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 Galway 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(1)(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 Development is described in full in Chapter 4 (Proposed Development Description) of this EIAR.

3.7 References

Department of Transport (2016). Common Appraisal Framework for Transport Projects and Programmes.

Galway City Development Plan (2023-2029).

Galway City Council (2019) Galway Public Realm Strategy.

Galway City Council (2021) Cross-City Link Public Consultation 2020-2021 Report (July 2021)

Government of Ireland (2023). Climate Action Plan 2024.

Galway County Council (2016) Galway Transport Strategy: An integrated transport management programme for Galway City and environs.

Galway County Development Plan (2022-2028), including the Metropolitan Area Strategic Plan.

Government of Ireland (2023) Project Ireland 2040, Northern and Western Region (update 2023).

International Association of Public Transport (UITP) 2009

NTA 2022: BusConnects Dublin Road Option Selection Report

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.

SEA Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes 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, as amended

The Roads Act 1993, as amended.