ATKINS

Member of the SNC-Lavalin Group

Harry Reynolds Road Pedestrian and Cycle Route

Project Description Report

Fingal County Council

March 2020

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1. Project Description

1.1. The proposed scheme is predominantly located along Harry Reynolds Road and Hamiton Road in Balbriggan, Co. Dublin and includes numerous measures to improve pedestrian and cyclist facilities in the area.

1.2. The project consists of:

- Use of Barons Hall Grove and Chieftain's Drive as new shared street;
- 550m of new raised adjacent 1-way cycle tracks and upgraded footpaths along the northern section of Harry Reynolds Road between Moylaragh Road and Drogheda Street, incorporating minor road realignment;
- 1150m of new raised adjacent 1-way cycle tracks and upgraded footpaths along both sides of Harry Reynolds Road between its northern roundabout and Fingal Bay Business Park;
- 170m of new shared space and 2-way cycle track along existing church car park exit to link to Dublin Street roundabout;
- 240m of new segregated 2-way cycle tracks and upgraded footpaths on both sides of Hamilton Road and an additional 205m of new segregated 2-way cycle track and upgraded footpath on southern side only;
- Upgrade of existing uncontrolled crossing at Flemington Community Centre to new raised zebra crossing, provision of 3 no. new raised toucan crossings on Harry Reynolds Road and 1 no. new raised toucan crossing on Hamilton Road;
- Introduction of new traffic calming measures along Harry Reynolds Road and reduction of speed limit to 50 km/h along its entire length;
- Conversion of existing roundabouts at northern end of Harry Reynolds Road to cycle friendly roundabouts with raised zebra crossings on all arms;
- Upgrade of existing Harry Reynolds Road/Drogheda Street junction with toucan crossings on all arms;
- Upgrade of existing Harry Reynolds Road/Chapel Street junction with additional cyclist segregation measures and cycle priority traffic signals;
- Modification of existing Dublin Street roundabout with new raised zebra crossings on R132 northern and southern approaches and new toucan crossing on western arm;
- Upgrade of 150m of existing footpaths to shared pedestrian and cyclist path and provision of 50m of new pathway in Millpond Park;
- Removal of approximately 166 trees along the route along with 440m2 of ground cover vegetation and replacement with 225 new trees and 347 linear metres of native species hedgerow.

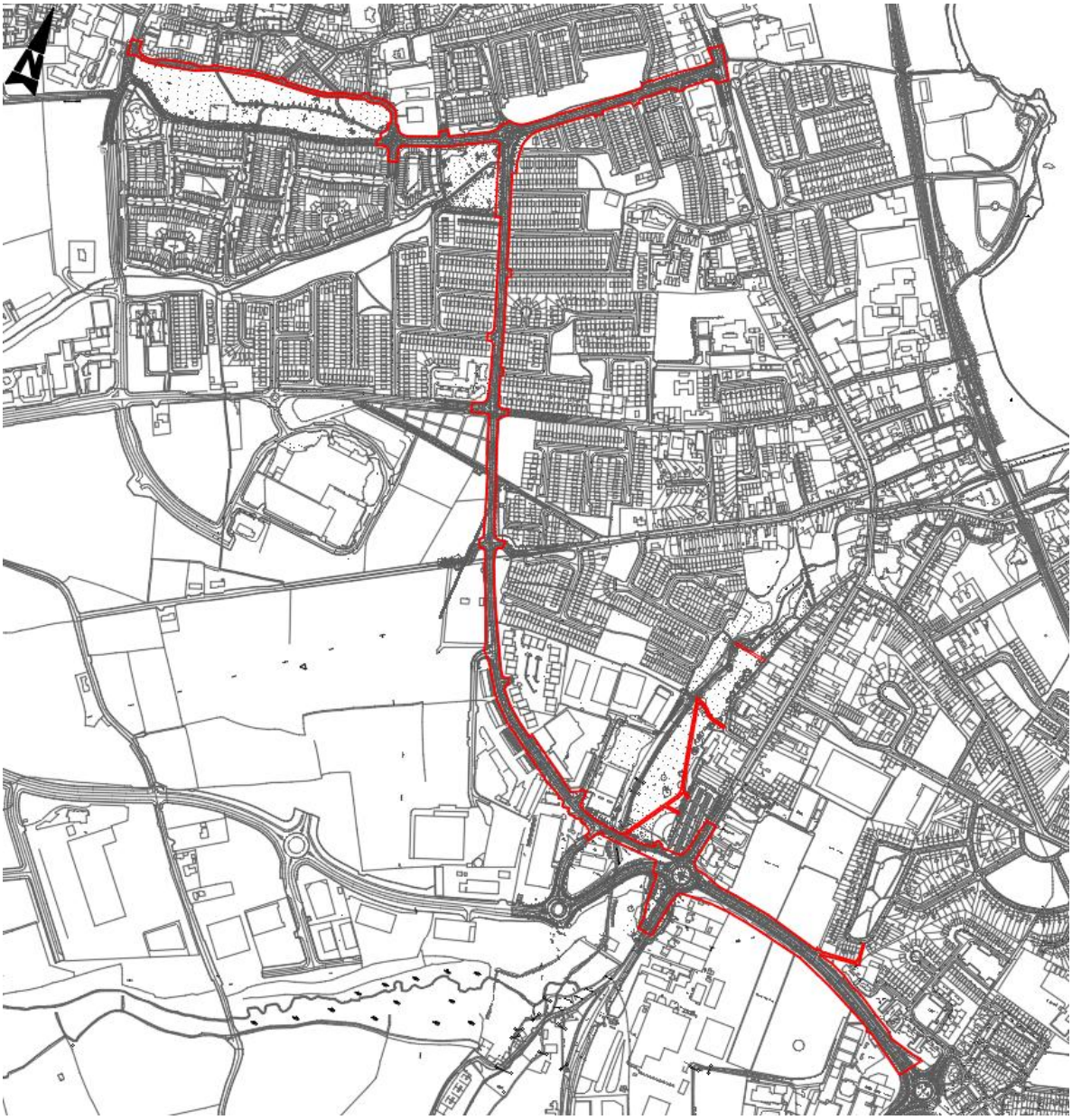
2. Purpose of the Scheme

Background

1.3. The Harry Reynolds Road Cycle Scheme, subject of this Part 8 planning application, forms part of the Greater Dublin Area Cycle Network Plan and links several schools and local amenities. It will, therefore, be an important element of infrastructure within the town of Balbriggan, serving a large part of the local population.

1.4. The extent of the scheme is shown outlined in red in the below figure.

Figure 2-1 - Scheme Extents



Project Aims & Objectives

1.5. Fingal County Council (FCC) propose to deliver a high-quality cycle route along the Harry Reynolds Road, Balbriggan, Co. Dublin. The proposed scheme will aim to deliver a minimum Level of Service A in accordance with the National Cycle Manual and will possibly allow for future links to a coastal greenway and other cycling routes in Balbriggan. It will provide an optimal balance of provision between the various competing transport modes along the route corridor.

1.6. The level of service is a measurement of the degree to which the needs of a cyclist are met. A high level of service will better meet the 5 needs of the cyclist. Those being:

- Road safety
- Coherence
- Directness
- Attractiveness
- Comfort

1.7. A level of service of A ensures that the following conditions are met which will provide for an attractive, usable cycle route with the following:

- Good pavement condition for smoother ride quality.
- Sufficient width for cyclists to pass.
- Minimised number of conflicts with other modes.
- Minimised journey time delays.

1.8. To achieve this objective, Fingal County Council engaged Atkins to develop route options and preliminary design and carry out a Part VIII planning process for the preferred route option. If the scheme is approved, Atkins will develop a detailed design for the project and progress it through construction.

1.9. The specific design objectives of the proposed cycle route are:

- To establish a quality cycle and pedestrian route delivering a level of service A;
- To provide links to existing cycle ways and surrounding schools;
- To promote and facilitate sustainable modes of transport in Balbriggan.

Need for the Scheme

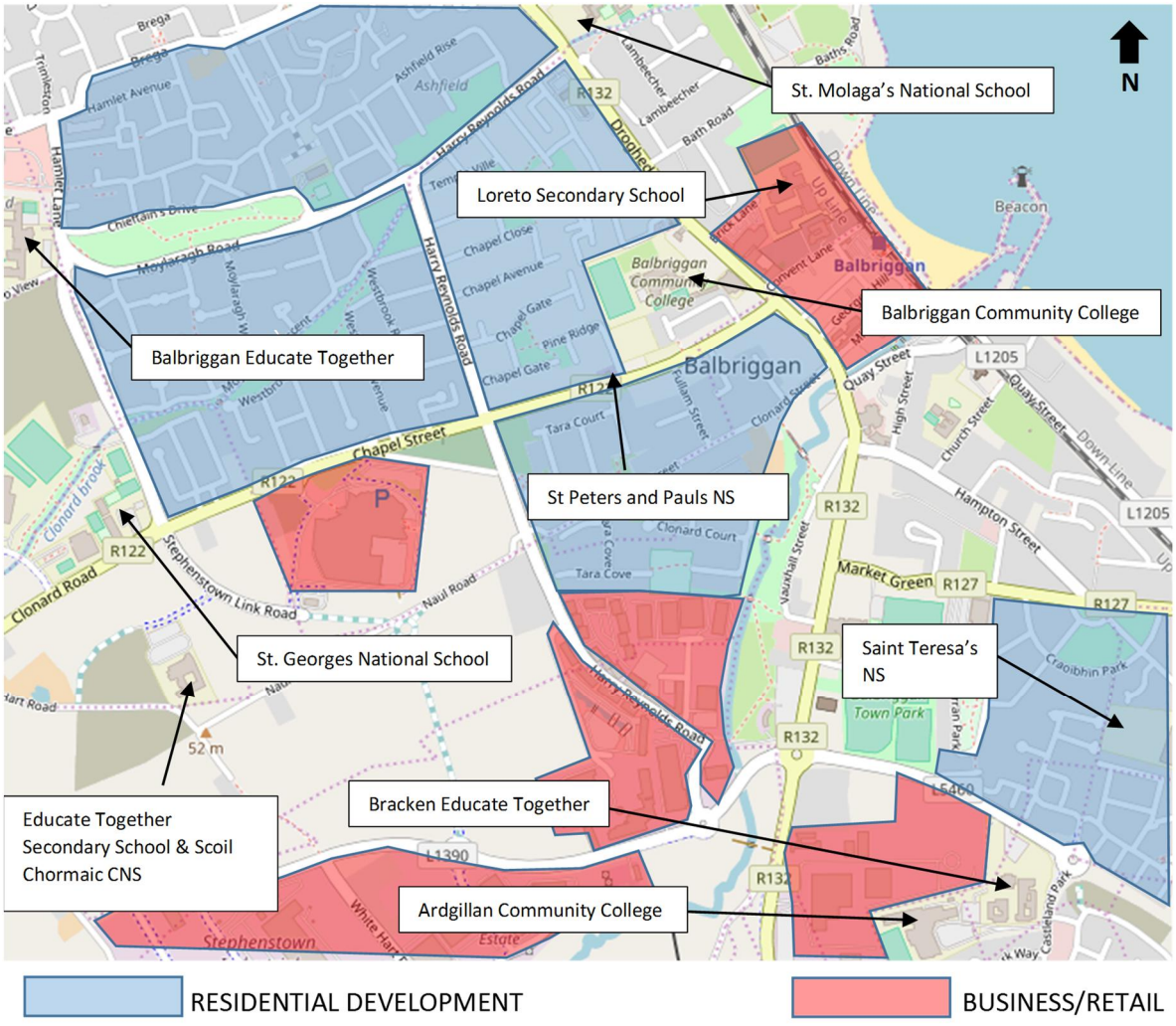
1.10. There is a large number of residential developments in the vicinity of the proposed facility. To the north of Chapel Street, the proposed route is surrounded by residential developments. As the scheme proceeds in a south-east direction there are significant residential developments along the eastern side of Harry Reynolds Road. Finally, in the southern section of the scheme there are further large residential developments located to the north of Hamilton Road.

1.11. A significant number of education centres are also noted in the vicinity of the scheme, many of which will be accessible from the proposed route, allowing safe and direct linkages for cyclists and pedestrians to schools in the area.

1.12. A number of designated business and retail areas are also located along and close to the route. Balbriggan town centre is located to the east of the scheme. Stephenstown Industrial Estate encompasses the southern section of Harry Reynolds Road while Millfield Shopping Centre, the major retail attraction in the area, is located to the east of the proposed route, along Chapel Street.

1.13. The figure below shows the location of these residential, education and business centres along the route.

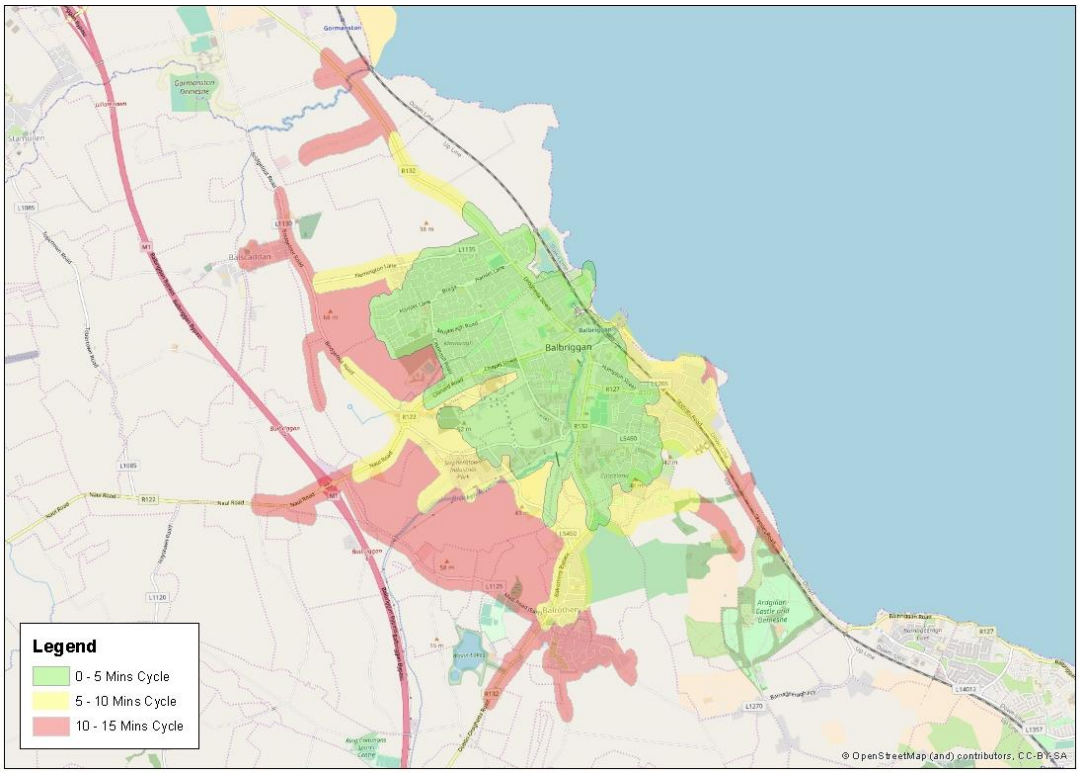
Figure 2-2 - Trip Generators and Attractors



Population

1.14. The figure below shows the areas reachable in 5, 10 and 15 minutes cycle from the proposed route.

Figure 2-3 - Harry Reynolds Road Cycling Times



1.15. The population statistics from the 2016 Census Small Areas for each of the above time periods is summarised in the table below.

Table 2-1 - 2016 Population Statistics

Time to Cycle	Population
0 – 5 Mins	17,904
5 – 10 Mins	21,106
10 – 15 Mins	22,756

1.16. From the above data it is clear that the provision of cycle facilities on Harry Reynolds Road will provide excellent service to the majority of those living within Balbriggan. Given its central location, the majority of the population is within 5 minutes cycling distance from the facilities and will have safe, direct and attractive facilities linking to a number of key trip attractors within the town.

2. Scheme Context

Planning Policy

2.1. The following National, Regional and Local planning policies have been considered as part of this study, with the relevant sections summarised below.

National Transport Policy

Smarter Travel and National Cycle Policy Framework

2.2. In February 2009, the Smarter Travel Policy document for achieving a sustainable transport system for Ireland was published, this document outlines a number of policies to encourage a modal shift away from private car use and promoting public transport, walking and cycling.

2.3. In April 2009, Ireland's first National Cycle Policy Framework (NCPF) was issued. The vision of the policy is:

2.4. *"All cities, towns, villages and rural areas will be bicycle friendly. Cycling will be a normal way to get about, especially for short trips".*

2.5. The aim of this framework is to encourage a culture of cycling to the extent that by 2020, some 10% of all trips will be completed by bicycle.

Regional Cycling Policy

Regional Planning Guidelines for the Greater Dublin Area: 2010-2022

2.6. This document provides the development strategy for the Dublin and Mid-East regions over the plan period. It emphasizes the role of the capital city in future economic growth of the region and the need to ensure it is an attractive, vibrant location for industry, commerce, recreation and tourism. Development in the Greater Dublin Area (GDA) shall be directly related to investment in high quality public transport and focused on achieving a compact urban form.

2.7. The strategy considers that a minimum of 10% of all trips should be by bicycle by 2020. It emphasizes the integration of cycle routes and infrastructure into new development and communities as key component of the delivery of greener transport travel patterns. Programmes to support this objective and create a culture of cycling should be pursued as well as promoting the tourism benefits of improved cycle networks within the GDA.

Transport Strategy for the Greater Dublin Area, 2016 – 2035

2.8. This document was published by the National Transport Authority in 2016 with its purpose being:

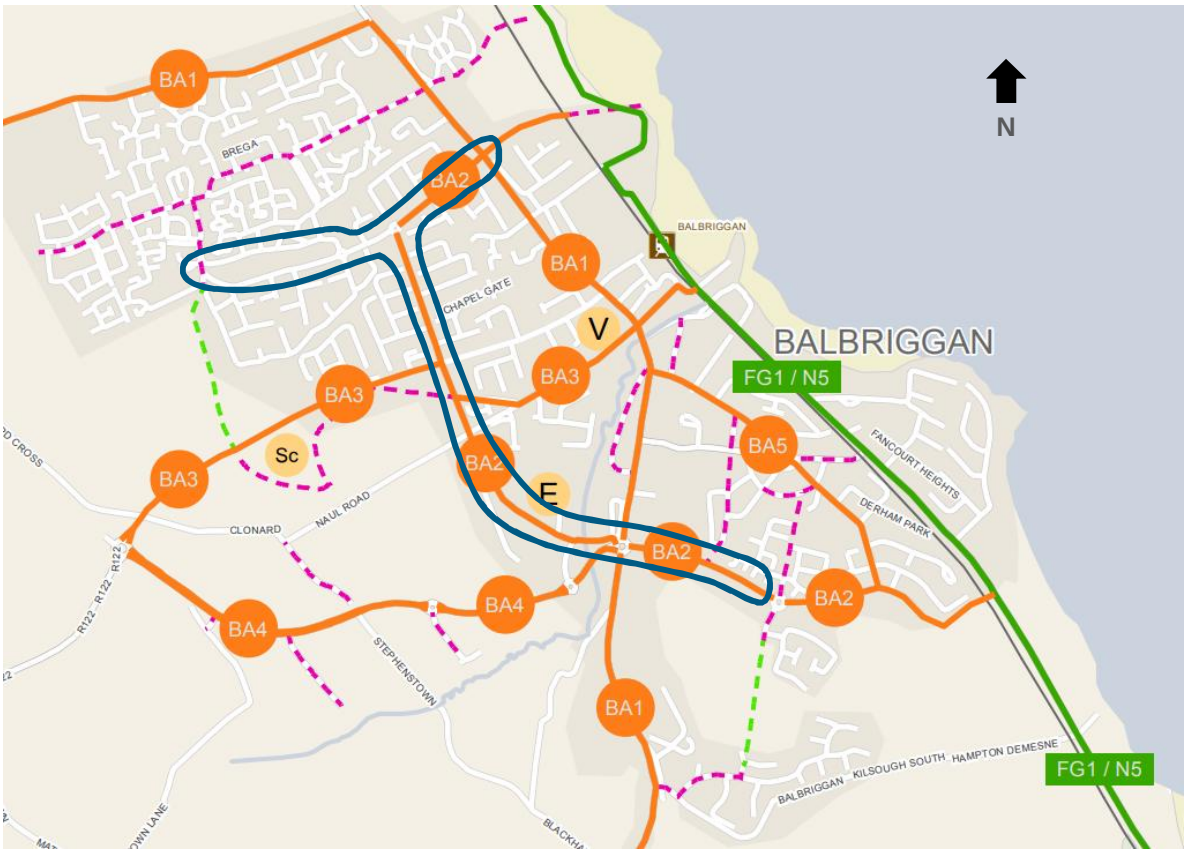
"…to contribute to the economic, social and cultural progress of the Greater Dublin Area by providing for the efficient, effective and sustainable movement of people and goods."

2.9. The plan provides the transport strategy for the GDA to 2035. It highlights the need to integrate land use and transport planning in achieving a consolidated urban area supported by non-private vehicle movement. The environment for pedestrians and cyclists needs to be improved to encourage a much greater proportion of trips to be made on foot, by bicycle or public transport. Dublin is to become a recognized walking and cycling city-region with a street environment that is attractive, safe and pedestrian/cyclist orientated in design.

Greater Dublin Area Cycle Network Plan

2.10. The Greater Dublin Area Cycle Network Plan was published by the NTA in 2013 and sets out the proposed cycle network in the GDA. The GDA categorises the proposed route along Harry Reynolds Road as BA2, a Primary/Secondary route. The figure below is an extract from the GDA showing the categorisation of proposed routes in the Balbriggan area along with the study area outlined in blue.

Figure 2-1 - GDA Route Categorization in the Balbriggan Area



2.11. There are feeder links indicated within the park surrounding the Bracken River and adjacent to the cemetery on Chapel Street. Both feeder links connect to the BA2 Primary/Secondary Route and are within the Study Area.

County Policy

Fingal County Development Plan, 2018 – 2023

2.12. The Fingal County Development Plan 2018-2023 sets out to promote and facilitate movement within and to the County through the integration of land use with a sustainable transport system, with priority given to public transport, walking and cycling. There are several relevant chapters in the Development Plan which relate to Cycling and Walking. The main objectives relevant to this scheme are summarised below:

- Objective 11: Ensure a safe and convenient road, pedestrian and cycle system promoting permeability, accessibility and connectivity between existing and new developments within the town. (Chapter 4).
- Objective MT17: Improve pedestrian and cycle connectivity to schools and third level colleges and identify and minimise barriers to children walking and cycling to primary and secondary schools. Parks, Open Space Recreation theme. (Chapter 7).
- Objective G126: Maximise the use and potential of existing parks, open space and recreational provision, both passive and active, by integrating existing facilities where appropriate. (Chapter 8).
- Objective G127: Provide a range of accessible new parks, open space and recreational facilities accommodating a wide variety of uses (both passive and active), use intensities and interests. (Chapter 8).

- Objective G128: Provide attractive and safe routes linking key green space sites, parks and open spaces and other foci such as cultural sites and heritage assets as an integral part of a new green infrastructure provision, where appropriate and feasible. (Chapter 8).

2.13. The figure below displays the planning objectives for the area surrounding the proposed pedestrian and cyclist facility.

Figure 2-2 - Fingal Development Plan 2018-2023 Planning Objectives

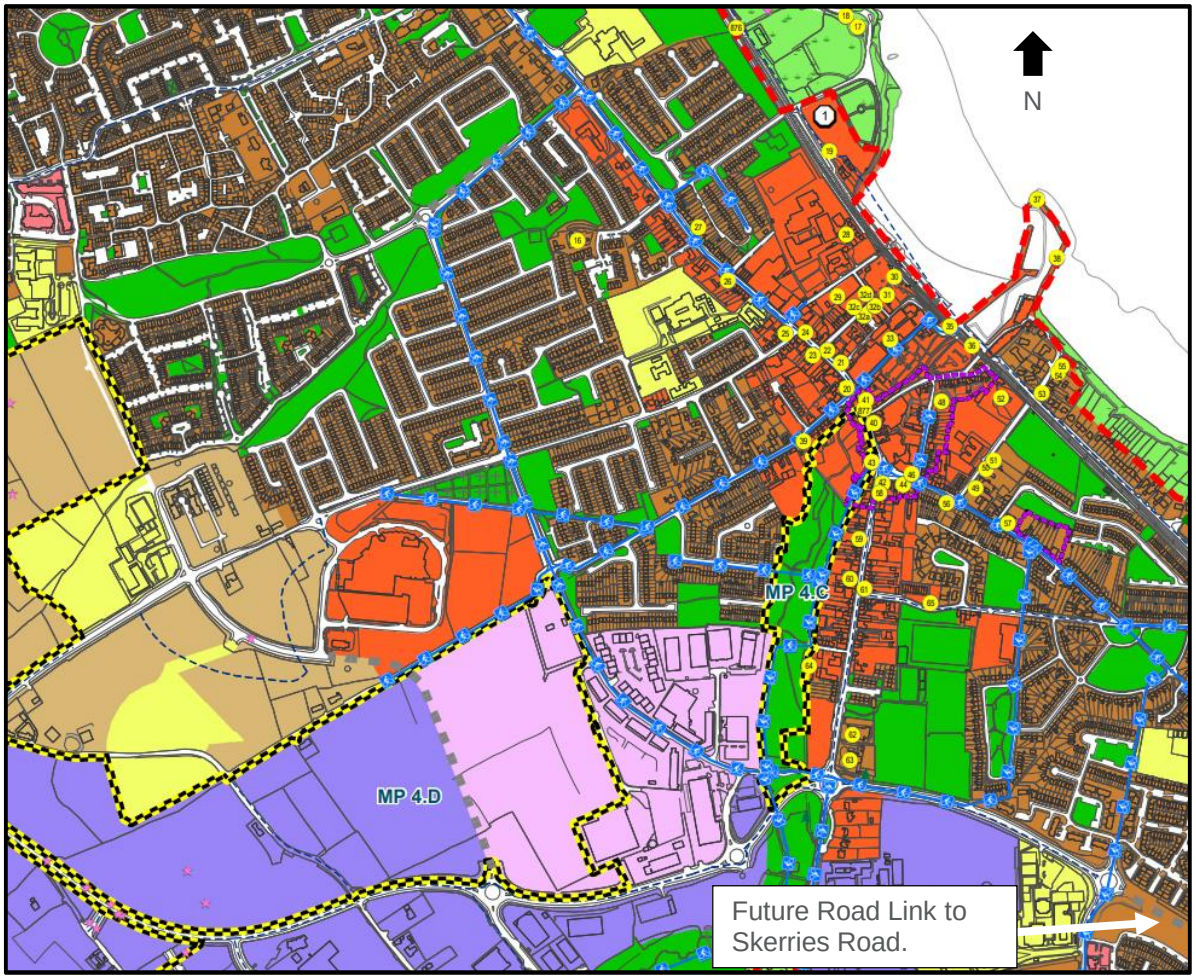
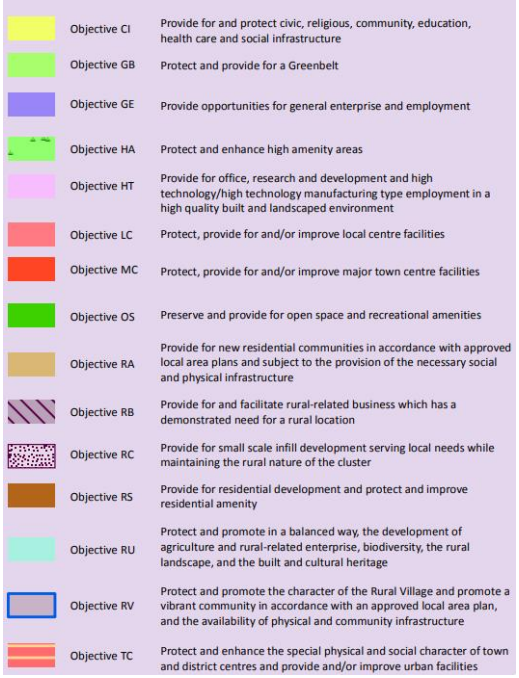


Figure 2-3 - Fingal Development Plan Legend



2.14. There are two masterplan areas in the vicinity of the proposed pedestrian and cycle facility, both of which lie in the southern section of the scheme.

- MP 4.C – Millpond Masterplan: Facilitate the development of Mill Pond to provide for passive and active recreational facilities and amenities including a feasibility study to develop the lake for the purposes of wildlife promotion.
- MP 4.D – Stephenstown Masterplan: Provide for architecturally designed buildings with high quality finishes fronting onto the Naul Road. The development of lands in this area will be guided by the principles contained in the 'Stephenstown Urban Design and Landscape Masterplan (2009).

2.15. The development plan also highlights the proposed cycle and pedestrian routes. With the exception of Moylaragh Road, all of the proposed scheme has been designated as a cycle/pedestrian route objective.

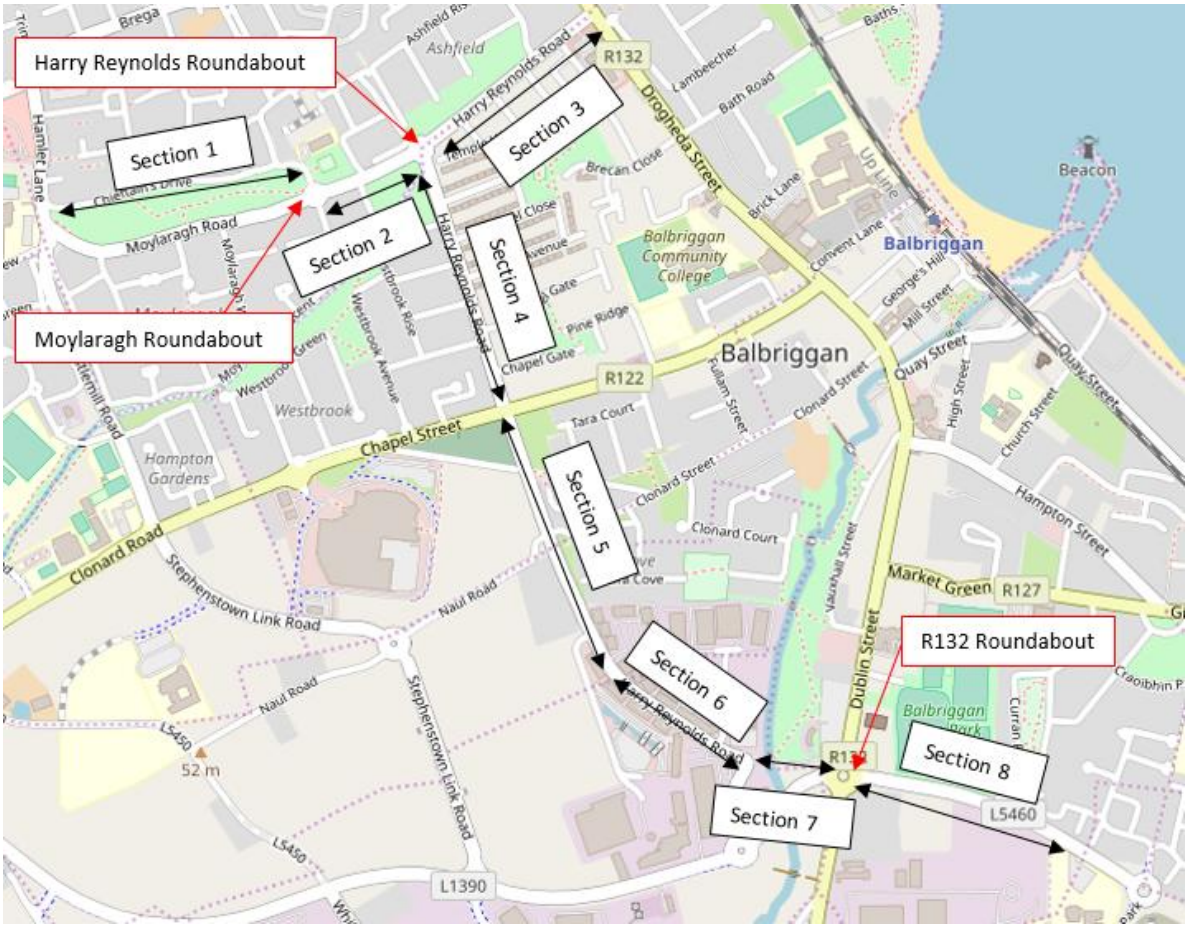
2.16. There is also a provision for a new road link to the Skerries Road at the eastern end of Hamilton road. This link will allow traffic from the Skerries area with a route that avoids the town centre and should reduce and redistribute traffic from Dublin Street to Hamilton Road.

3. Existing Transport Network

Road Network

3.1. The proposed route of the scheme extends from Chieftain's Drive along Harry Reynolds Road in a western direction to its junction with Drogheda Street. The proposed route travels in a southward direction along Harry Reynolds Road before crossing the R132 to Hamilton Road. In total, the proposed route extends over approximately 2.9km of urban road carriageway. For ease of discussion, the proposed scheme is broken into 8 no. sections which are illustrated in the figure below and are described in more detail following.

Figure 3-1 - Route Sections



Section 1

3.2. Section 1 covers the section of the route along Chieftain`s Drive to the roundabout junction at Moylaragh Road. The single lane carriageway has an overall width of approximately 5.0m. A footpath runs adjacent to the carriageway on the northern side of the carriageway. Residential properties and driveways directly front along this section of road along the majority of its length with a number of T-junctions providing access to other residential streets. This section of the scheme has a 50 kph speed limit in place.

Section 2

3.3. Section 2 covers the link road between the Harry Reynolds Road roundabout in Section 1 and the roundabout at Moylaragh Road. The single lane carriageway has an overall width of approximately 8m. Footpath and cycle lanes run adjacent to the carriageway on both sides. A buffer between the footpath and the carriageway is provided through a grass verge. There is one T-junction with a local

estate road and a relatively long section of parallel parking for residents on the southern side of this section of the route. This section of the scheme has a 50 kph speed limit in place.

Section 3

3.4. Section 3 extends from the junction between Harry Reynolds Road and Drogheda Street (R132) in a westerly direction to the roundabout junction where Harry Reynolds Road turns southward. The single carriageway has an overall width of approximately 6.5m. Footpaths run adjacent to the carriageway on either side and a buffer is provided by means of a grass verge. There are a number of T-junctions with local estate roads along this section of the route. This section of the scheme has a 50 kph speed limit in place.

Section 4

3.5. Section 4 extends along Harry Reynolds Road from the roundabout in Section 3 to the signal controlled junction with Chapel Street. The single carriageway has an overall width of approximately 9.0-10.0m. Footpaths run adjacent to the carriageway on either side. A buffer is provided by means of a grass verge also on both sides. A number of access junctions to residential streets are present along the carriageway. A cycle lane develops towards the south of the section on the eastern side. This section of the scheme has a 50 kph speed limit in place.

Sections 5 and 6

3.6. Section 5 and 6 covers the link road between Harry Reynolds Road and the three-arm roundabout to the south of Jack Murphy Outdoor Clothing. The single carriageway has an overall width of approximately 9.0m. Footpaths run adjacent to the carriageway on either side. A number of access junctions to industrial and commercial units are present along the carriageway. A permitted speed limit of 60 kph is allocated along section 5 and section 6.

Section 7

3.7. Section 7 covers the exit road from the public car park opposite to St Peter and Pauls Church. The carriageway is approximately 6.0m and operates in one-way travelling westwards. There is an existing footpath to the north of the road with a grass buffer. On the southern side lies a green area with some trees and vegetation. The footpath links to the existing roundabout on Dublin Street along the perimeter wall of the car park.

Section 8

3.8. Section 8 covers the link road between the roundabout on Dublin Street and the three arm roundabout on Castle Park Avenue. The single carriageway has an overall width of approximately 8.0m. Footpaths and cycle lanes run adjacent to the carriageway on either side. A buffer is provided along both sides by means of a grass verge. A speed limit of 60 kph is in place along this section of the scheme.

Junctions

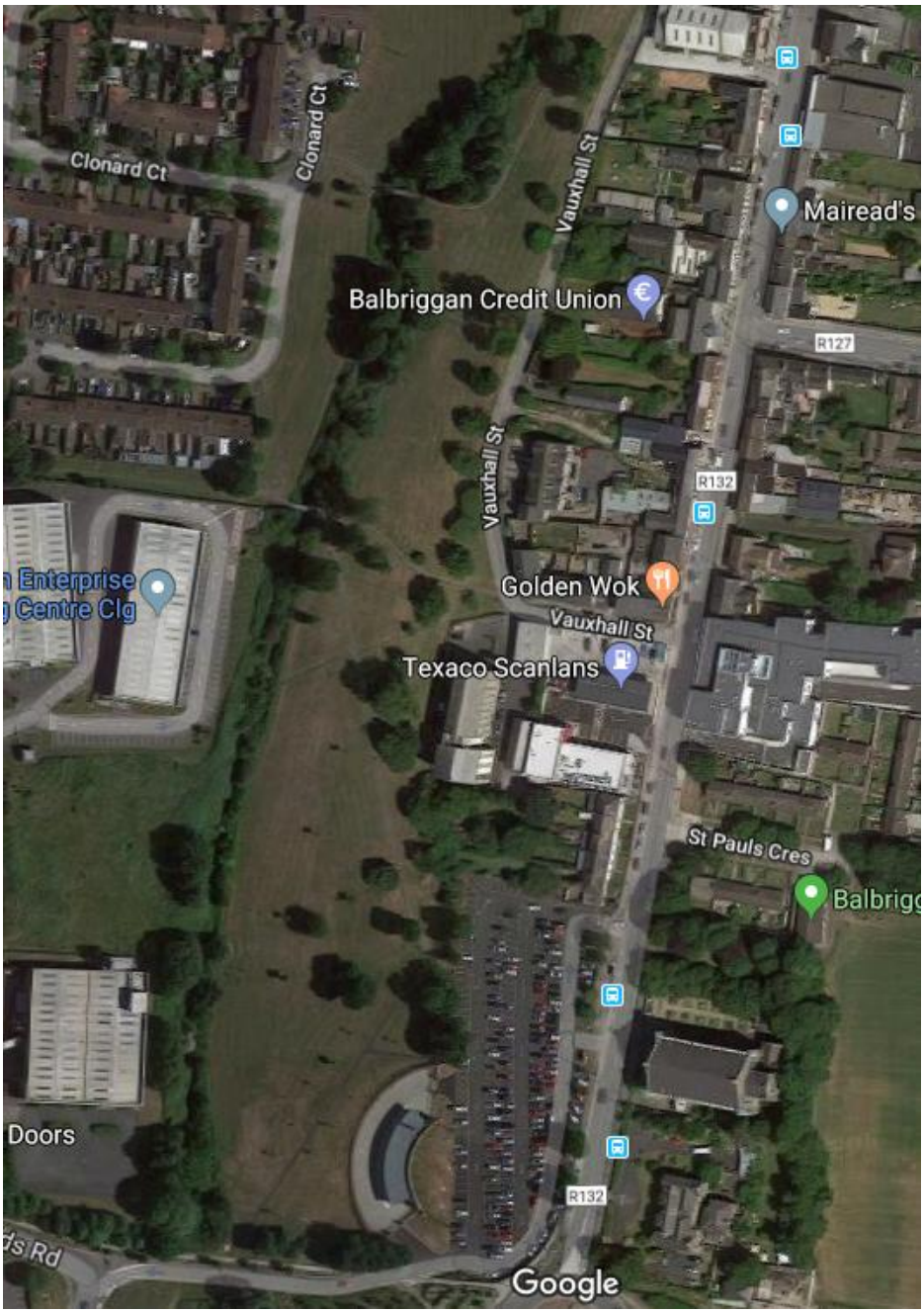
3.9. There are five key junctions within the extents of the scheme. Two of which are signal controlled junctions with the remaining three being roundabouts. In general, the existing signalised junctions already cater for or can be modified to cater for cyclists with minor changes. The existing roundabouts generally have no facilities for pedestrian or cyclists' crossings except for a toucan crossing on the Hamilton Road arm of the Dublin Street roundabout.

Millpond Park

3.10. The existing park that runs parallel to Dublin Street at the southern end of Harry Reynolds Road is generally linear in nature and follows the Bracken River. There are existing footpaths through the park which link to Harry Reynolds Road, the public car park, Clonard Court and Vauxhall Street. There are two existing bridge crossings of the river which are approximately 1.8m – 2.0m wide.

3.11. A Masterplan is currently being prepared for this parkland by Fingal County Council and a proposed new skate park is to be constructed within the next year. The parkland area is shown in the figure below.

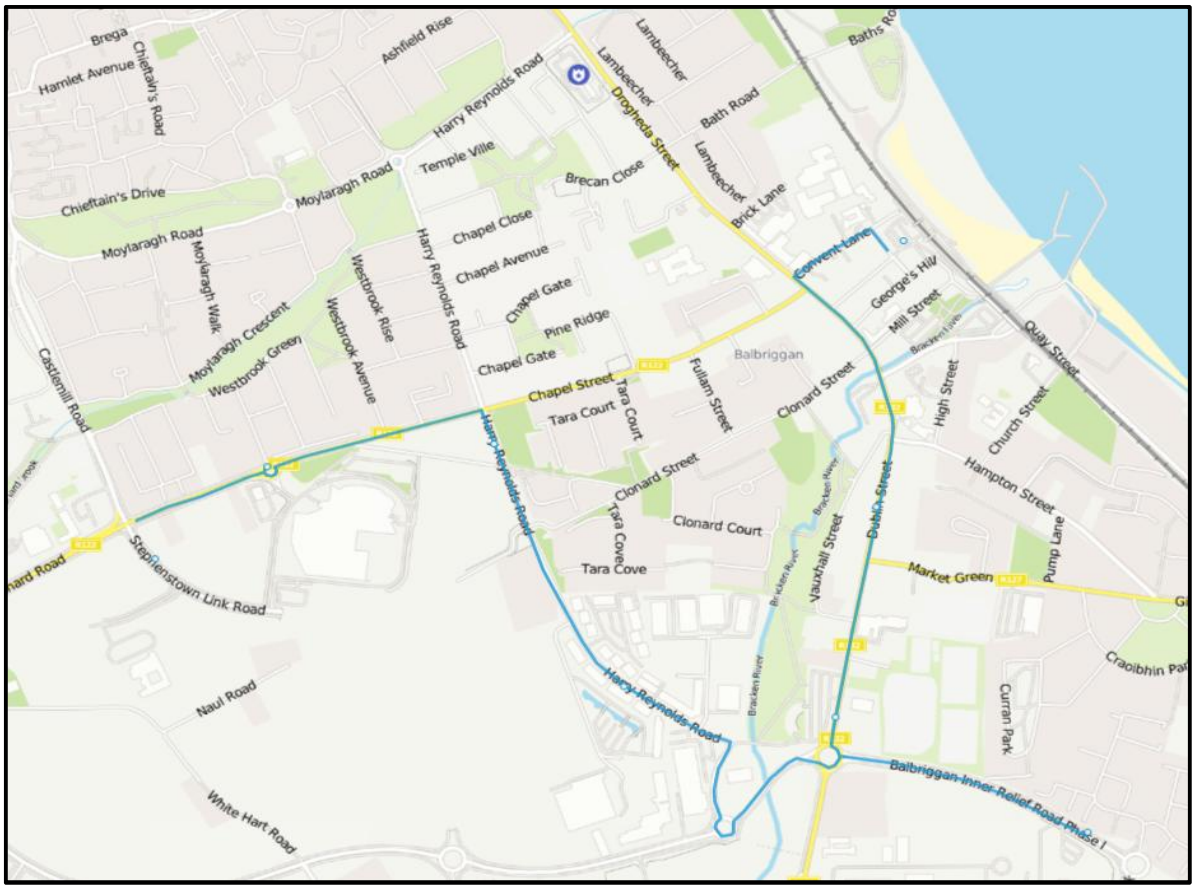
Figure 3-2 - Bracken River Park



Public Transport

3.12. The local Balbriggan town service B1 serves a section of the proposed route, with stops on Hamilton Road and Harry Reynolds Road. The route of this service is shown in Figure 3-3 below. This service operates on an hourly basis.

Figure 3-3 - Balbriggan Bus Route



Pedestrian and Cycle Facilities

3.13. There are some cyclist facilities along the proposed route. To the north of the scheme along Section 2 there is provision of a cycle track on either side of the carriageway.

3.14. Along Section 6 there is cycle provision on the western side of the carriageway through Fingal Bay Business Park.

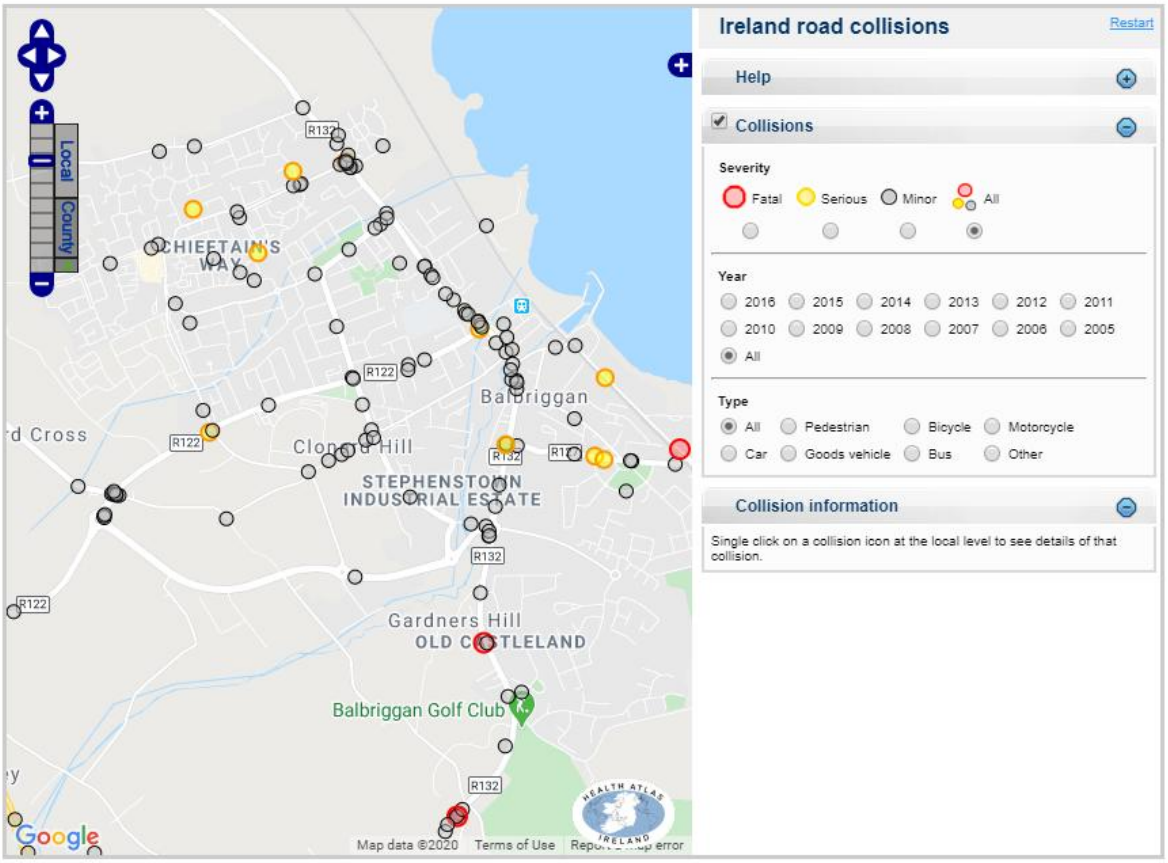
3.15. To the south of the scheme along Section 8, cycle provision is provided on either side of the carriageway.

3.16. There are footpaths provided throughout the scheme extents. However, these footpath widths vary throughout the scheme with some being relatively narrow. The footpath provision varies by location along the route, including footpaths along both sides of the carriageway in most location but footpaths on one side of the carriageway only for others.

Collision History

3.17. The collision history for the area was obtained from the Road Safety Authority Database and is shown in Figure 3-4 below.

Figure 3-4 - Collision History



3.18. There has been a total of 20 collisions along the proposed route of the scheme, all of which have been classified as minor incidents. Of these 20 collisions, 3 no. involved a pedestrian and 1 no. involved a cyclist.

4. Methodology

4.1. In order to develop the preliminary design, the following tasks have been carried out:

- Design Options Assessment
  - Constraints study.
  - Stakeholder consultation.
  - Site inspections were undertaken to collect up-to-date local information.
  - Appraisal of route options and selection of preferred route.
  - Commissioning of topographical survey.
- Commissioned topographical survey.
- Developed preferred route including changes and additions from concept design as required following further Stakeholder consultation.
- Quality of Service assessment of proposed route.
- Prepared preliminary cost estimate..

4.2. The following documents were referenced in preparing the preliminary design in order to understand the context for the scheme and to develop a design that adheres to current standards, i.e.:

- Transport Strategy for the Greater Dublin Area.
- Greater Dublin Area Cycle Network Plan.
- Fingal County Development Plan, 2017 – 2023.
- Design Manual for Urban Roads and Streets (DMURS).
- National Cycle Manual.

5. Options Assessment Process

Feasibility Study and Options Assessment

5.1. A Feasibility and Options Assessment Report was completed by Atkins in October 2018 with the following aims and objectives:

- To consider the context of the scheme in terms of Local and Regional Planning Policy.
- To identify significant engineering and environmental constraints.
- To set out the route options considered and to summarise their feasibility and relative ranking in terms of various relevant criteria.
- To appraise the route options and make a recommendation in relation to a preferred concept route option..

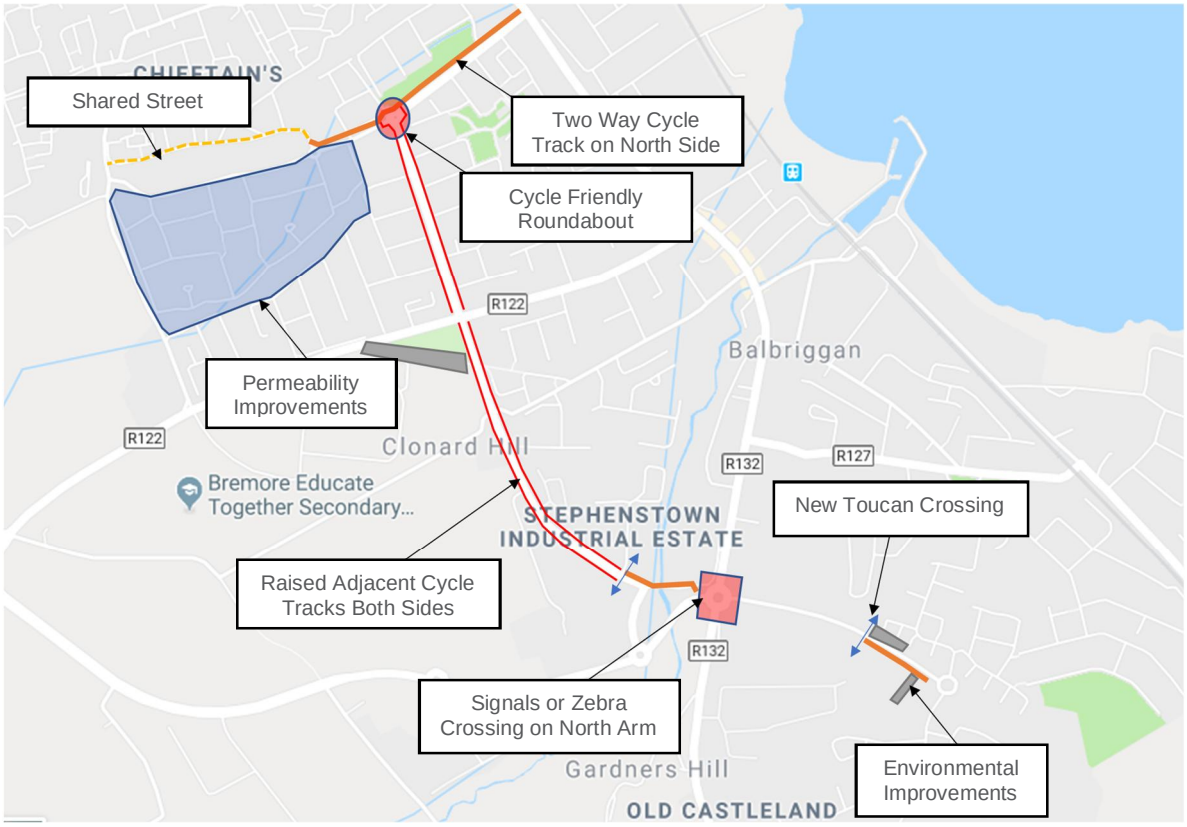
Methodology for Options Assessment

5.2. For the purposes of option assessment, the route was broken into a number of smaller sections with each analysed individually. Various cross section and junction options were assessed using a Multi-Criteria Analysis based on their performance in terms of the needs of the cyclist and impacts on the community and environment. Each option was assessed in a comparative manner to each other and the highest ranked option carried forward to become part of the Preferred Option. The full detail of this options assessment process is included in the Feasibility and Options Assessment Report submitted as part of the Part VIII application.

Preferred Route

5.3. On completion of the Multi-Criteria Analysis, the highest-ranking options for each section of the route were combined to form the Preferred Route, shown in the figure below.

Figure 5-1 - Preferred Option



5.4. The Emerging Preferred Route at this stage included:

- Permeability improvements in Moylaragh;
- New zebra crossing across Chieftain's Drive at the roundabout;
- New two-way cycle track on northern side of Moylaragh Road between Chieftain's Drive and Harry Reynolds Road;
- Existing roundabout at Harry Reynolds Road/Moylaragh Road to be reconfigured to cycle friendly roundabout;
- New two-way raised cycle track on Harry Reynolds Road between roundabout and Drogheda Street;
- New one-way raised adjacent cycle tracks on Harry Reynolds Road between roundabout and Chapel Street junction;
- Existing signal controlled junction at Chapel Street to be maintained as is;
- New one-way raised adjacent cycle tracks on Harry Reynolds Road between Chapel Street junction to just north of junction with public car park entrance;
- New toucan crossing on Harry Reynolds Road at change between one-way and two-way cycle tracks;
- New two-way cycle track adjacent to public car park exit road and beside existing car park boundary wall;
- New two-way cycle tracks around Dublin Street North arm of roundabout at Dublin Street/L1390/Hamilton Road;
- New zebra crossing at Dublin Street North arm;
- Existing cycle tracks on Hamilton Road to be maintained;
- New toucan crossing on Hamilton Road near entrance to Town Park;
- Provision of two way cycle track between the new toucan crossing and the school entrance;
- Environmental Improvements to the laneway to Curran Park and to the schools on Hamilton Road;
- New cycle track to be provided through park along Bracken River – exact route to be determined during preliminary design.

6. Preliminary Design

Link Design

6.1. The proposed scheme generally consists of raised adjacent cycle tracks throughout the scheme with the exception of at junctions and at Chieftain's Drive. The preliminary design is shown on drawings 5165984/HTR/SK/0101-0111 and is summarised below.

Speed Limits

6.2. A large section of the existing Harry Reynolds Road between Fingal Bay Business Park and the Chapel Street junction is currently subject to a 60 km/h speed limit. Given the nature of the proposed scheme and the proposed traffic calming and raised pedestrian crossings, the speed limit along this section will need to be reduced to 50 km/h. This lower speed limit is more appropriate given the new character of the street on completion of the proposed scheme.

6.3. The section of the route along Hamilton Road is also subject to a 60 km/h speed limit. However, as this is a distributor road in nature and two-way cycle tracks with buffers are proposed along the majority of its length, the retention of this speed limit could be considered.

6.4. The remainder of the scheme is subject to 50 km/h speed limits which are considered appropriate.

6.5. The figure below shows the existing and proposed speed limits on Harry Reynolds Road, Hamilton Road and other adjacent roads to the scheme.

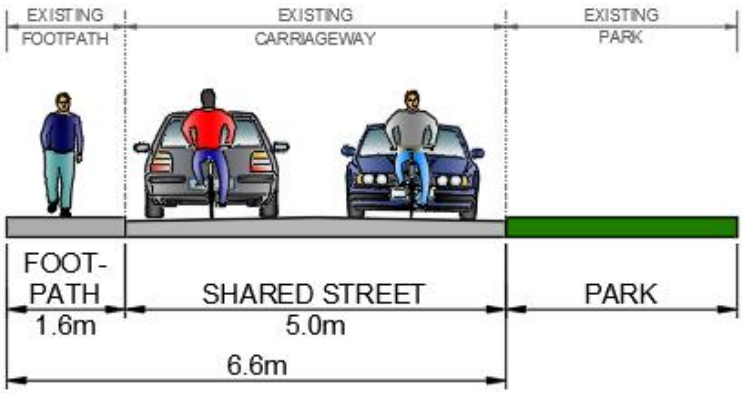
Figure 6-1 – Existing and Proposed Road Speed Limits

Section 1: Chieftain`s Drive

6.6. The proposed Cycle Scheme along this section of the route is to consist of a shared street provision. Vehicular traffic will be made aware of the provision by way of road markings and signage. The low volume and speeds along this road, as confirmed by traffic surveys, allow for the provision of a shared street it this location in accordance with the National Cycle Manual.

6.7. The existing kerb lines and parking will be maintained throughout this section. The existing raised, uncontrolled courtesy crossing on Castlemill Link Road will be upgrade to a raised zebra crossing to allow for safe and direct access from Chieftain's Drive to the schools and shops on the western side of the road.

Figure 6-2 – Section 1: Proposed Cross Section



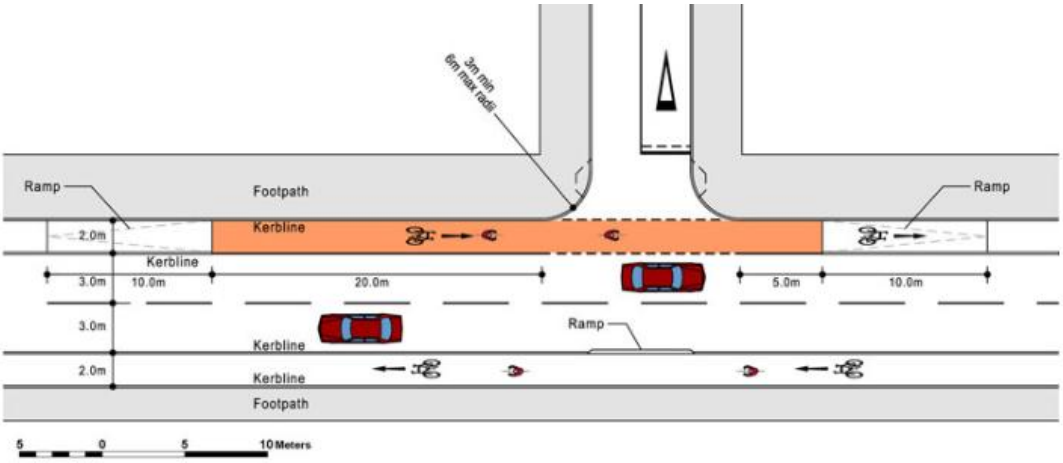
Section 2: Chieftain`s Drive Roundabout to Harry Reynolds Roundabout

6.8. The proposed Cycle Scheme along this section of the route is to generally consist of 2m wide raised adjacent cycle tracks and 2m wide footpaths along both sides of the carriageway. The cycle track will be raised by 50mm above the existing carriageway level and the footpath will be raised by 75mm above the cycle track to provide segregation for all users.

6.9. To allow for construction of this section, the existing kerb line on the northern side of the road will be removed and the existing carriageway moved approximately 1.5m northwards with the existing verge and trees removed. On the southern side of the road the existing kerbline, verge and footpath will be maintained with the cycle track constructed within the current carriageway. A minimum carriageway width of 6m is maintained throughout.

6.10. The entrance to Hampton Woods will be reconfigured with the cycle track dropping on road on approach as per the National Cycle Manual, illustrated in the figure below. Full height raised tables will allow pedestrians to cross the side roads at uncontrolled crossings.

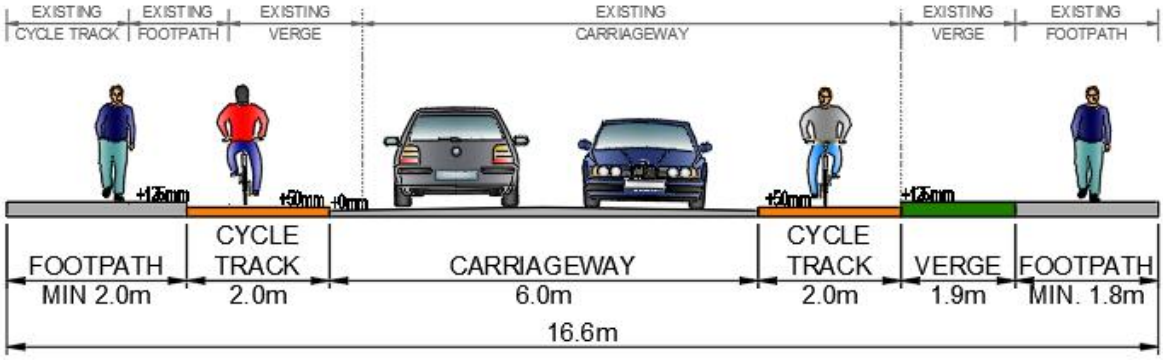
Figure 6-3 - NCM: Side Road Joining Street with Cycle Track



6.11. The parking on the southern side of the road will be maintained with the cycle track narrowing to 1.75m locally and travelling to the rear of the parking bay while maintaining a 0.75m buffer to protect cyclists from opening doors.

6.12. Figure 6-4 illustrates a schematic of the proposed cross section.

Figure 6-4 - Section 2: Proposed Cross Section



Section 3: Harry Reynolds Road Roundabout to Drogheda Street Junction

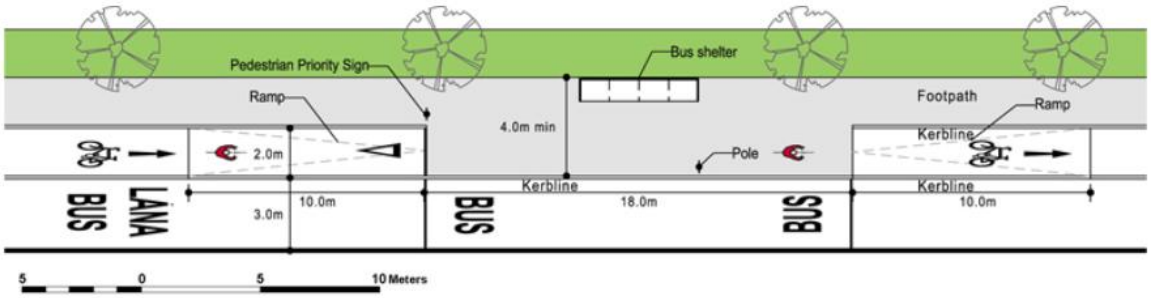
6.13. The proposed route along this section is as for Section 2 with a 2m wide raised adjacent cycle track to be provided on both sides of the road. On the northern side of the road the existing verge, including trees, is to be removed and the existing footpath to be upgraded to a minimum width of 2m. On the southern side of the road, the existing kerb, verge and footpath are to be maintained as is.

6.14. To allow for construction of this section, the existing kerb line on the northern side of the road will be removed and the existing carriageway moved approximately 1.5m northwards with a minimum carriageway width of 6.5m provided throughout.

6.15. The entrances to all side roads will be reconfigured with the cycle track dropping on road on approach as per the National Cycle Manual, outlined in the previous section. Full height raised tables will allow pedestrians to cross the side roads at uncontrolled crossings.

6.16. The existing bus stop will be upgraded to align with the design principles set out in the National Cycle Manual for an inline bus stop as shown in Figure 6-5 below. Given the low frequency of buses using this route, this layout will minimise cycle interactions with traffic while interactions with pedestrians will be very occasional.

Figure 6-5 - NCM: Inline Bus Stop



6.17. Figure 6-6 illustrates a schematic cross section of the proposed link type while Figure 6-7 shows a photomontage of the proposed layout following construction.

Figure 6-6 – Section 3: Proposed Cross Section

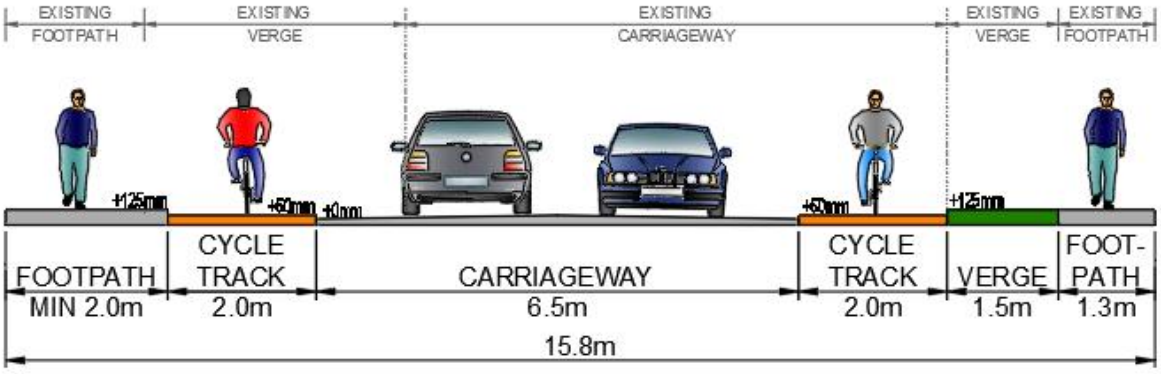


Figure 6-7 - Harry Reynolds Road Photomontage (At Ashfield)

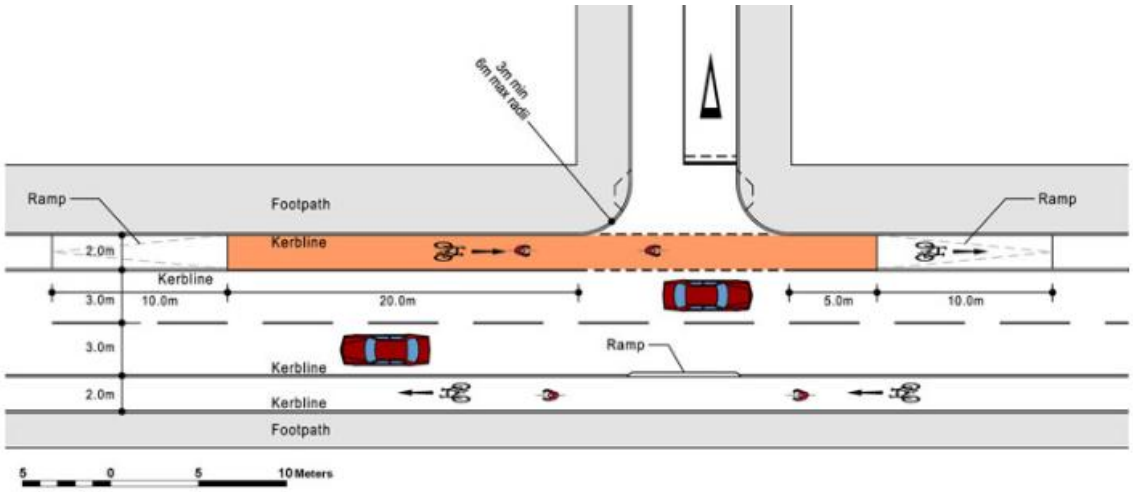
Section 4: Harry Reynolds Road – Roundabout to Chapel Street Junction

6.18. Throughout this section of the route, 2m wide one-way raised adjacent cycle tracks and 2m wide footpaths are proposed for the majority of the scheme. The cycle tracks will be raised by 50mm above the existing carriageway and footpaths will be raised a further 75mm to provide segregation between all users. Throughout this section, trees will be removed to facilitate the above provision.

6.19. To allow for the construction of the cycle track and footpath additional width is required on the eastern side of the carriageway. This width will be obtained by moving the existing kerb line on that side, narrowing the carriageway to a minimum width of 6.5m. The existing kerb line on the western side of the carriageway will generally be retained with kerbs being replaced to suit the new provision.

6.20. The entrances to Chapel Avenue and Westbrook Drive will be reconfigured with the cycle tracks dropping on road on approach as per the National Cycle Manual, illustrated in the figure below. Full height raised tables will allow pedestrians to cross these side roads at uncontrolled crossings.

Figure 6-8 - NCM: Side Road Joining Street with Cycle Track



6.21. The existing bus stops will be upgraded to align with the design principles set out in the National Cycle Manual for an inline bus stop as per the previous section.

6.22. The existing ramp on Harry Reynolds Road at Westbrook Rise will be removed to provide sufficient width for the cycle track and footpath. The ramp will be relocated to the green space behind the wall on the Westbrook Rise side and the existing footpath along the wall on this side widened by approximately 1.5m.

6.23. A new raised toucan crossing is proposed between Chapel Avenue and Westbrook Close, linking residential areas on both sides of Harry Reynolds Road to the scheme.

6.24. From the Westbrook Drive junction southwards to the Chapel Street junction, it is proposed to provide additional segregation for the cycle lane with a kerb protecting it from vehicular traffic along with upgrading of footpaths. Changes to the staging of the junction and provision of cycle only signals will be considered during the detail design stage.

6.25. Figure 6-9 illustrates a schematic of the proposed cross section while Figure 6-10 shows a photomontage of the layout following construction.

Figure 6-9 - Section 4: Proposed Cross Section

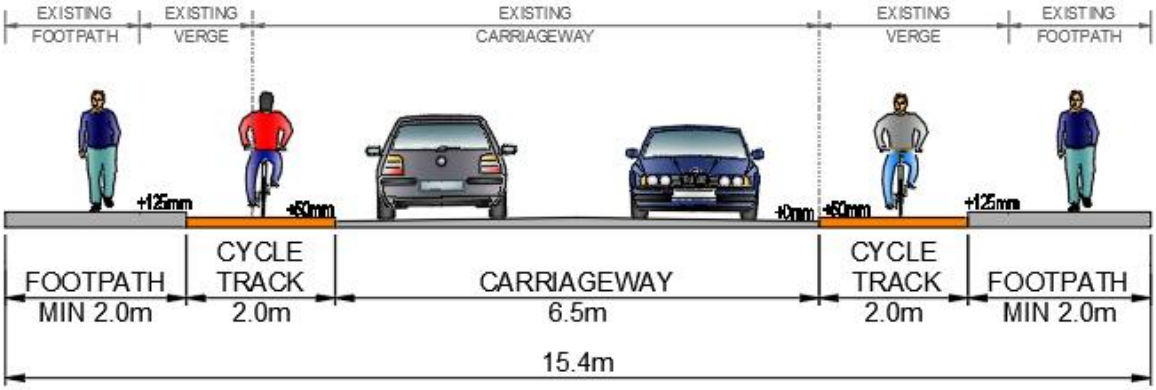


Figure 6-10 - Harry Reynolds Road Photomontage (North of Chapel Street)

Section 5: Harry Reynolds Road – Chapel Street Junction to Fingal Bay Business Park

6.26. The proposed Cycle Scheme along this section of the route is as the previous section with 2m wide raised adjacent cycle tracks and 2m wide footpaths provided on both sides. In general, the existing kerb on the eastern side of the road will be removed and the carriageway narrowed to a minimum of 6.5m. The existing kerb line on the western side of the road will be maintained in place and amended to suit the new provision. The proposed footpath on the western side of the road will be constructed in the existing grass verge on that side.

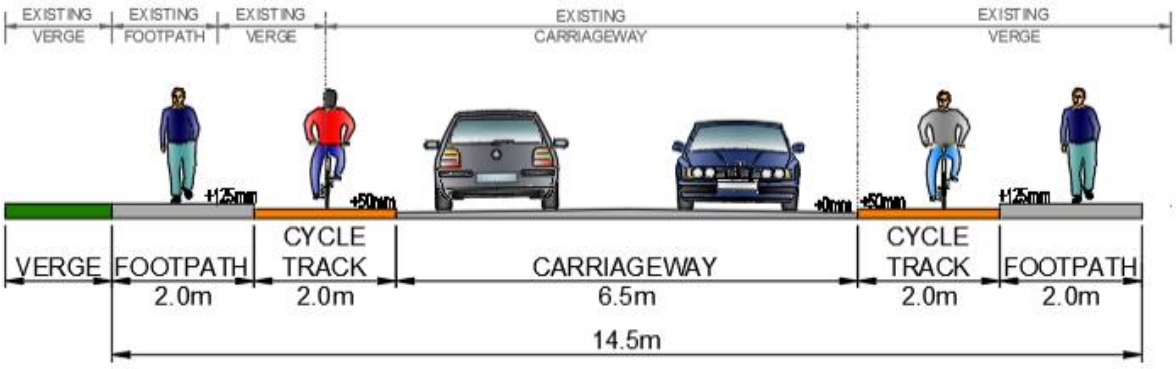
6.27. The existing crossroads at Clonard Street will be modified to provide tighter corner radii and narrower lanes in line with the Design Manual for Urban Roads and Streets (DMURS). Cycle lanes will be on road across the junction with raised entry treatments for uncontrolled pedestrian crossings also provided as discussed in the previous section.

6.28. A new raised toucan crossing is proposed just south of St. Peters and Pauls Cemetery. This crossing is located at the existing pedestrian accesses to both the residential areas in the east and towards the Millfield Shopping Centre in the west, therefore serving an important desire line.

6.29. Existing bus stops will be provided as in previous sections and existing trees along the eastern side of the road will be removed throughout.

6.30. Figure 6-11 illustrates a schematic of the proposed cross section.

Figure 6-11 - Section 5: Proposed Cross Section



Section 6: Fingal Bay Business Park

6.31. The scheme continues in a similar fashion through this section with 2m wide raised adjacent cycle tracks and 2m wide footpath provided by narrowing the existing carriageway and relocating the existing kerb line on the eastern side of the road. Side road junctions are treated as outlined in the previous two sections and existing trees are to be removed on the eastern side throughout.

6.32. There is a section of existing footpath and off-road cycle track on the western side of the road in front of a number of building. It is proposed to remove these and to provide a varying width of landscaping area between the proposed cycle track and footpath where it is proposed to plant new trees.

6.33. The existing indented bus bay in this section that is currently being used for parking will be removed and replaced with an inline bus stop. This Bus Stop will be designed to the principles set out in the National Cycle Manual for an inline bus stop as outlined in the previous sections.

6.34. A controlled toucan crossing will be provided approximately 25m from the entry to the corner turning south and a new traffic calming ramp is proposed just to the north of the Fingal Bay Business Park

6.35. The design criteria specified in DMURS specifies that a forward visibility of 49m is required along a bus route with a posted speed limit of 50kph. Due to the ninety-degree bend in the road just to the south, the forward visibility is somewhat obstructed when travelling north. To ensure sufficient forward visibility for the speeds at this location a speed survey was carried out. The data obtained from the survey found that the 85%ile speed when travelling north is 36.1 km/h. This speed equates to a required forward visibility of approximately 30 m. The proposed design allows for a forward visibility of approximately 35 m.

6.36. Figure 6-12 illustrates a schematic of the proposed cross section while Figure 6-13 shows a photomontage of the layout following construction.

Figure 6-12 - Section 6: Proposed Cross Section

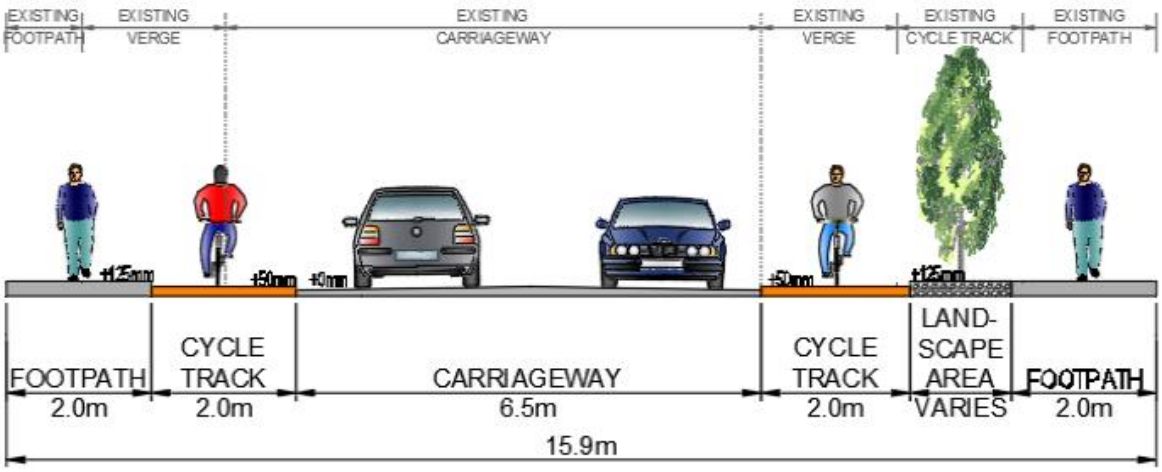


Figure 6-13 - Harry Reynolds Road Photomontage (Fingal Bay Business Park)

Section 7: Exit Road from Public Carpark

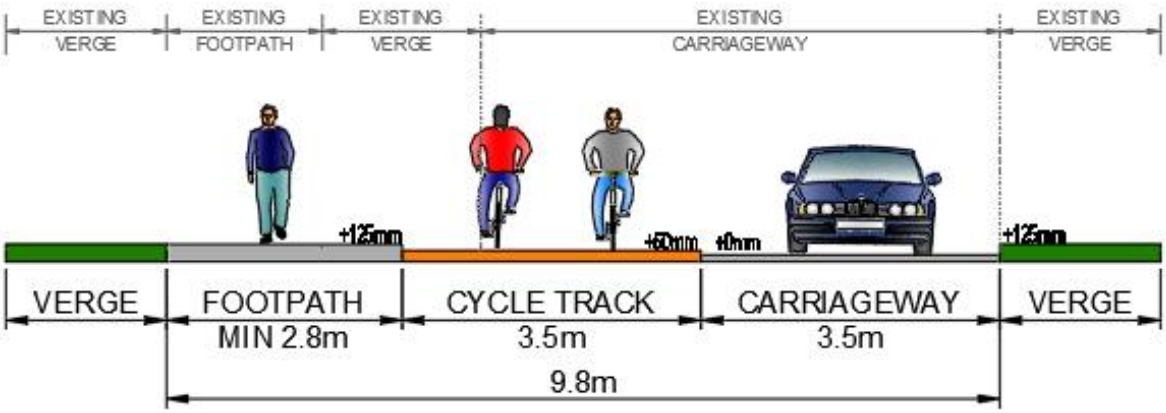
6.37. From the previous section, the scheme proceeds along the northern side of the existing car park exit road by means of approximately 40m of shared surface linking between the proposed toucan crossing and a 4m wide raised adjacent two-way cycle track and 2m wide footpath.

6.38. The existing kerb line on the northern side of the road will be relocated to provide the required width and the exit road reduced to 3m in width to control speeds. The existing kerb line on the southern side of the road will be maintained.

6.39. A 4.m wide raised zebra crossing will be provided adjacent to the car park which will link to a proposed 5m wide shared surface to facilitate pedestrian and cyclist movements to and from Drogheda Street. This width will be achieved by removing some of the landscaped area to the west of the R132 roundabout.

6.40. Figure 6-14 illustrates a schematic of the proposed cross section.

Figure 6-14 - Section 7: Proposed Cross Section



Section 8: Hamilton Road

6.41. Two-way cycle tracks are proposed on both sides of Hamilton Road from the Dublin Street roundabout to just east of the gated entrance to the adjacent playing pitches to the north. A buffer is provided on the northern side of the road while the cycle track will be placed to the rear of the footpath on the southern side to allow for set down areas. An at-grade toucan crossing is proposed at this location at which point the two-way raised adjacent cycle track continues on the southern side only as far as the roundabout at Castlelands.

6.42. The existing kerblines will be relocated along the majority of the route with a minimum width of 7.0m provided for the carriageway in all locations.

6.43. Figure 6-15 illustrates a schematic of the proposed cross section while Figure 6-16 shows a photomontage of the proposed layout.

Figure 6-15 - Section 8: Proposed Cross Section

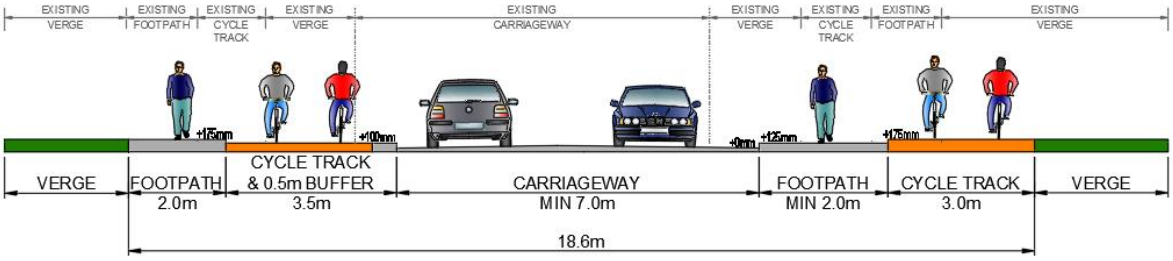


Figure 6-16 - Hamilton Road Photomontage

6.44. A new set down/drop off area and a new bus waiting area are proposed on the southern side of Hamilton Road in close proximity to the entrance to a number of schools in the area. It is proposed to narrow the existing carriageway lane widths to a minimum of 3.5m with a 0.5m – 1m wide concrete central island also proposed. This will help manage unsafe driving behaviours at school peak times and reduce speeds along the road. These lane widths are more than adequate to cater for the volume and type of traffic anticipated along this road and are in keeping with DMURS.

Junction Design

Moylaragh Road/Chieftain's Road Roundabout

6.45. The Moylaragh roundabout will be reconfigured to provide crossing points on all arms. The existing kerb lines on the eastern and southern arms will be modified to provide appropriate radii and lane widths. Raised zebra crossings at the junction will be provide on all arms with shared spaces provided around the entire roundabout. These will allow safe and direct crossing points for all vulnerable road users.

Harry Reynolds/Moylaragh Road Roundabout

6.46. Harry Reynolds Roundabout will be slightly reconfigured to provide a cycle friendly roundabout in accordance with the National Cycle Manual.

6.47. The ICD of the roundabout will be reduced to 30m. This will include reducing of entry and exit widths and radii.

6.48. The circulatory carriageway will be reduced to 4.0m with a 4.0m concrete overrun.

6.49. Raised zebra crossings will be provided on all approach arms. These crossings will be set back a distance of 6m from the roundabout circulatory carriageway and shared surfaces will be provided at all crossing locations and around the entire roundabout.

Harry Reynolds Road/Drogheda Street Signal Controlled Junction

6.50. The existing signalised junction at this location is to be upgraded with a new toucan crossing on the northern arm and upgraded toucan crossings on the remaining two arms. Shared surfaces will be provided around the junction and will link with the existing cycle and pedestrian facilities on Drogheda Street.

Dublin Street Roundabout

6.51. The Dublin Street (R132) roundabout configuration will generally be maintained with some modifications. Existing kerb lines will be relocated on the northern and southern arms to provide width for shared spaces.

6.52. New raised zebra crossings and traffic islands are proposed on both the northern and southern arms to allow safe, direct crossing points for pedestrians and cyclists. The existing toucan crossing on Hamilton Road is to be maintained while a new toucan crossing is proposed at a setback on the western arm.

Millpond Park

6.53. The existing paths through the park will be upgraded to 3m wide paths throughout with some additional links to Vauxhall Street also provided.

6.54. Provision of additional pathways and looped routes within the park will be investigated further as part of the overall park masterplan being carried out by Fingal County Council.

Drainage

6.55. Typically, drainage will be provided using new gullies and existing or new storm drainage pipes where appropriate. The new facilities will generally slope towards the road in order to minimise the need for additional drainage collection measures. In some areas, where this may not be possible, additional channels or measures may be required. The details of this will be developed as part of the detailed design.

Pavements

6.56. The exact construction depth for the footpath and cycle track pavements is subject to the outcome of ground investigations to be carried out at detailed design stage.

6.57. In order to give the highest quality of service for cyclists, it is envisaged that a smooth asphalt surface course will be used with 10mm aggregate as recommended by the National Cycle Manual but with sufficient base and foundation layers to prevent failure due to vehicles mounting the cycle track.

6.58. Shared surfaces and footpaths are intended to be concrete to provide contrast for visually impaired people.

Public Lighting

6.59. New public lighting will be provided as part of the scheme with columns set to the back of the new footpaths and LED luminaires providing high quality lighting.

Services

6.60. At the outset of the project, utility companies were contacted seeking information relating to their plant and ducting within the route corridor. The following information was received.

Table 6-1 - Summary Of Utility Companies' Infrastructure

Service Provider	Response Received	Services Present
Aurora Telecom	Yes	No
BT	Yes	Yes
Eir	Yes	No
Enet	Yes	No
ESB Networks	Yes	Yes
Bord Gais	Yes	Yes
Virgin Media	Yes	Yes
Irish Water	Yes	Yes
FCC surface & foul water	Yes	Yes
Irish Water	Yes	Yes

6.61. A Ground Penetrating Radar (GPR) and utility survey, including slit trenches for verification, will be carried out during the detail design stage to determine the location of services to the most accurate extent possible. Any service diversions or protections works will be required at that stage.

Land Take

6.62. The proposed route has been designed to avoid the requirement of private land take throughout. The entirety of the scheme is within the existing road boundaries with the exception of at the southern arm of the Dublin Street Roundabout. However, the lands required for construction of the modifications at this arm are also within the ownership of Fingal County Council.

6.63. Therefore, no land take is required for the construction of this scheme.

Development of Preliminary Design from Emerging Preferred Route

6.64. There were a number of changes from the Emerging Preferred Route identified at the concept/feasibility stage that arose during the development of the preliminary design and in consultation with key Stakeholders with Fingal County Council and the National Transport Authority. The key changes are summarised below with the reasons for each.

Table 6-2 - Changes Between Concept and Preliminary Design

Change	Reason
Permeability improvements throughout the scheme to be considered by Fingal County Council as separate scheme.	Improvements in this area to be considered as part of ongoing improvements in the area and as part of overall Balbriggan strategy.

Change	Reason
Zebra crossings now provided on all arms of Moylaragh Road/Chieftain's Drive roundabout	Pedestrian movement survey at this location identified desire lines at all crossing points
Additional zebra crossing on southern arm of Dublin Street roundabout and new toucan on western arm.	Crossing points on all arms required to facilitate links to all surrounding areas and to connect to all existing cycle/pedestrian facilities.
Additional section of two-way cycle track on southern side of Hamilton Road.	Required to link to existing two-way facility on R132 towards Balrothery & reduce volumes of pedestrians crossing Hamilton Road.
Removal of existing footpath/cycle track at Stephenstown Industrial area rather than reuse	Improves continuity of cycle facilities and allows for area for tree planting
Addition of new set down area and bus waiting area on Hamilton Road to serve schools	Reduces likelihood of parking on cycle track/footpaths during school peak times and stops parking from blocking through traffic.
Change from two-way cycle track on one side of the road to one-way cycle tracks both sides along northern section of Harry Reynolds Road between Moylaragh and Drogheda Street	Allows simplified design and cyclist priority at all side road junctions and provides additional linkage to a number of residential areas.

Proposals for Tree Removal and Planting of New Trees.

Summary

6.65. The provision of the new cycle and pedestrian facilties will require the removal of approximately 166 trees along the route. An additional 43 trees have been identified by FCC for removal within the Moylaragh open space, however, these are not a requirement for the proposed scheme. A tree survey was carried out by Cunnane Stratton Reynolds which identified the quality of the trees in the area and their suitability.

6.66. Tree planting will be undertaken in the open spaces and verges adjacent to the proposed scheme to mitigate the loss of existing tree planting. In total 225 trees (minimum 12-14cm girth size) will be planted. In addition, 347 linear metres of native species hedgerow will be planted using 1735 native species saplings. The existing trees that will be removed to facilitate the scheme, are predominantly classed as young and of poor quality, as per the Tree Survey Report 2020 by Cunnane Stratton Reynolds.

6.67. Tree species will be selected from the following species as recommend by Fingal Parks Department:

Acer 'Crimson King', Amelanchier arborea 'Robin Hill', Betula utilis 'Jacquemontii', Fagus sylvatica, Fagus sylvatica 'Purpurea', Fraxinus excelsior 'Aurea', Liquidamber styraciflua 'Worpleston', Malus 'Rudolf', Pinus Sylvestris, Prunus 'Yedoensis', Quercus robor, Quercus robor 'Fastigiata', Quercus rubra and Tilia cordata 'Greenspire'.

6.68. The tree planting proposals are described in detail below.

The Park to Moylaragh Road/ Harry Reynolds Road Roundabout

6.69. The scheme utilises the existing road at Barons Hall Grove, The Grove and Chieftains Drive up to the Moylaragh Road/ Harry Reynolds Road Roundabout. These streets face onto a large public open space which is also bounded by Moylaragh Road.

6.70. Following consultation with Officers from Fingal County Council Parks Department, the Parks department identified a preference to remove the existing avenue tree planting (consisting of willow tree species) within the public open space adjacent to Moylaragh Road and replace them with species more suitable for long term management and crown lifting; so that passive surveillance of the open space can be undertaken from the surrounding houses and streets. The existing willow trees have become overgrown which limits views into the open space from the surrounding houses and streets, which can make users feel insecure especially at night-time. As part of this scheme the existing avenue tree planting comprised of 44 number young willow trees assessed as low quality (refer to

Tree Group TG08, Tree Survey Report 2019 by Cunnane Stratton Reynolds) will be removed, however this will be carried out as part of a separate scheme and does not form part of the proposals to provide upgraded cycle tracks and footpaths.

6.71. 94 number new trees will be plated within the open space at Moylaragh Road to compensate for the removal of trees throughout the Harry Reynolds Road. Once the new planting matures the character of this open space will improve.

Moylaragh Road/ Harry Reynolds Road Roundabout to Harry Reynolds Road Roundabout by Ashfield

6.72. To facilitate the scheme 10 number young trees assessed as low quality (refer to Tree Groups, TG18 and TG19, Tree Survey Report 2020 by Cunnane Stratton Reynolds) will be removed from the existing grass verge alongside the east bound carriageway. To mitigate this loss and to provide a street tree avenue, new tree planting (15no.) is proposed along the perimeter fence to the playground, to the verge at the entrance to Hampton Woods, to fill in gaps in the existing tree planting to the verge along the westbound road carriageway, and to fill in gaps in tree planting along the northern boundary of an adjacent public open space. A native species hedge (75 linear metres) will also be planted along the wall bounding the Children's Village Creche. Once the new planting matures the character of this section of Harry Reynolds Road will improve.

Harry Reynolds Road Roundabout by Ashfield to Drogheda Street

6.73. To facilitate the scheme 43 young trees assessed as low quality (refer to Tree Groups, TG31, TG33 and TG34, Tree Survey Report 2020 by Cunnane Stratton Reynolds) will be removed from the existing grass verge alongside the east bound road carriageway. To mitigate this loss and to provide a street tree avenue; 10 trees will be provided to fill in gaps in the existing avenue tree planting (located within and to the boundary of the public open space at Ashfield) along the eastbound side of Harry Reynolds Road, 9 no. trees will be planted in the verge east of the junction with Ashfield Rise up to Drogheda Road, 39 no. trees will be planted within the remaining areas of the public open space at Ashfield. In addition, 272 linear metres of hedgerow will be planted alongside the existing boundary plinth wall and railing to Ashfield.

Harry Reynolds Road Roundabout by Ashfield to Chapel Street junction

6.74. To facilitate the scheme 22 young trees assessed as low quality (refer to Tree Groups, TG32 and TG36, Tree Survey Report 2020 by Cunnane Stratton Reynolds) will be removed from the existing grass verge alongside the south bound road carriageway.

6.75. Additionally, 6 young trees assessed as moderate quality (refer to Tree Group, TG29, Tree Survey Report 2020 by Cunnane Stratton Reynolds) will be removed from the existing grass verge alongside the north bound road carriageway. To mitigate this loss, 11 trees will be planted to firm up gaps in the tree planting within the public open space alongside the north bound carriageway and along the grass verge to the south east of the roundabout.

Chapel Street junction to Clonard Street

6.76. To facilitate the scheme 6 young trees assessed as low quality (refer to Tree Groups, TG40 and TG43, Tree Survey Report 2020 by Cunnane Stratton Reynolds) will be removed from the existing grass verge alongside the south bound road carriageway.

6.77. To mitigate this loss 13 trees are proposed; along the roadside verges at Clonard Rise and Tara Cove.

Clonard Street to Dublin Street Roundabout

6.78. 8 no. trees assessed as moderate quality (refer to Tree Group 46, Tree Survey Report 2020 by CSR) are to be removed adjacent to the northbound carriageway along an existing property boundary. These are to be replaced with approximately 55m linear metres of new hedgerow.

6.79. To facilitate the scheme 32 young trees assessed as low quality will be removed from the existing grass verge alongside the south and north bound road carriageway through Fingal Bay Business Park. The tree survey (Tree Survey Report 2019 by Cunnane Stratton Reynolds) identified these trees as young and low quality (Tree Groups TG47, TG48).

6.80. In addition, 3 no. trees of moderate quality are to be removed at the existing exit from the church car park (Tree Group 51) and 4 no. trees of low quality (TG 80) are to be removed from the existing planting area on the north-western corner of the R132 roundabout.

6.81. To mitigate this loss and to provide a street tree avenue, new tree planting (21no. trees) is proposed along the northbound carriageway by Fingal Business Park. Once the new planting matures the character of this section of Harry Reynolds Road will improve. Further off-site tree planting (38 trees) will be provided within Millpond Park to further compensate for any loss of trees throughout the scheme.

R132 Roundabout to Castlelands Roundabout

6.82. To facilitate the scheme 7 trees will be removed from the existing grass verge on the north bound approach to the R132 Roundabout (TG79) and one tree (TG54, Tree Survey Report 2019 by Cunnane Stratton Reynolds) of moderate age and moderate quality will be removed from the car park opposite Saint's Peter and Paul Church.

6.83. Approximately 260m^2 of existing ground cover vegetation is to be removed locally along a section of the southern side of Hamilton Road including the removal of 21 no. trees of moderate quality (TG78). Tree planting (13no.) will be provided to fill in gaps in the verge on both sides of the southern approach to the R132 Roundabout and within the verge along the east bound carriageway on Hamilton Road.

7. Route Assessment

General

7.1. The route has been designed to provide the highest quality of service possible for all users, within the constraints identified. Segregation along the majority of the route allows for minimal conflicts between pedestrians and cyclists, increasing comfort and attractiveness for both.

Quality of Service Assessment Criteria (QoS)

7.2. The National Cycle Manual provides five criteria on which the quality of service for cyclists is assessed. These are:

- **Pavement Condition Index (PCI):** a measure of the physical integrity of the cycling surface. It is determined by comprehensive visual inspection as set down by the Department of Transport. In the absence of a formal PCI score, use a locally derived marking system out of 100.
- **Number of adjacent cyclists:** this describes the capacity for cycling two abreast and/or overtaking. "2 + 1" accommodates two abreast plus one overtaking.
- **Number of conflicts:** a measure of the potential interruptions to a cyclist per 100m and may include bus stops, side roads, driveways, entrances, junctions, pedestrian crossings, parking and loading etc.
- **Junction time delay:** a measure of the actual time delay at junctions as a percentage of the overall journey time, assuming an average journey speed of 15 km/h.
- **HGV influence:** a measure of the number of HGVs and buses adjacent to cyclists as a percentage of the total traffic during peak hours.

7.3. The table**Error! Reference source not found.** below outlines the range within each criterion that the p roposed scheme must fall within to obtain a ranking. To achieve a particular QoS, at least four of the five criteria must be achieved with the fifth no more than one ranking lower.

Table 7-1 - Quality of Service Criteria

Quality of Service	PCI Range	No. Adjacent Cyclist	No. of Conflicts (per 100m)	Journey Time Delay	HGV Influence
Level A+	86 – 100	2 + 1	0 – 1	0 – 5%	0 – 1%
Level A	66 – 85	1 + 1	0 – 1	6 – 11%	0 – 1%
Level B	51 – 65	1 + 1	1 – 3	11 – 26%	2 – 5%
Level C	41 – 50	1 + 0	4 – 10	26 – 50%	6 – 10%
Level D	20 - 50	1 + 0	> 10	> 50%	> 10%

7.4. The paragraphs following show the quality of service assessment for the proposed scheme. As it is difficult to quantify the number of conflicts between pedestrians and cyclists at shared areas it has been assumed to be 1 conflict per 60m of shared area. Assumptions for the delay calculation are set out below.

- 15 seconds average delay at each Toucan crossing to be crossed.
- 30 seconds average delay at each signalised junction.
- No delay at each zebra crossing
- Average journey speed of 12 km/h (allowing for significant volumes of school children traffic)

7.5. The calculations for the number of conflicts and delay were carried out in both directions (northbound and southbound) and the worst case used for the QoS calculation. These are summarised below.

QoS Assessment

Table 7-2 - Number of Conflicts per 100m Calculation

Conflict Type	Northbound	Southbound
Total length of shared areas	470m	267m
Number of side roads	5	9
Number of bus stops	5	2
Number of signalised crossings	2	1
Number of zebra crossings	3	2
Number of signalised junctions	2	2
Total number of conflicts	24.8	20.5
Total length of route	2.50km	2.32km
No. of conflicts per 100m	**0.99**	**0.88**

Table 7-3 - Journey Time Delay Calculation

Conflict Type	Northbound	Southbound
Number of signalised crossings	2	1
Number of zebra crossings	3	2
Number of signalised junctions	2	2
Total delay	90s	75s
Total journey time (incl. delay)	840s	771s
Journey Time Delay	**10.7%**	**9.7%**

Table 7-4 - Quality of Service Assessment

PCI Range	No. Adjacent Cyclist	No. of Conflicts (per 100m)	Journey Time Delay	HGV Influence	Quality of Service
90	1 + 1	0.99	10%	4.8%	Level A

7.6. Four of the five criteria meet the requirements of a Level A quality of service while one meets Level B. As a result, the overall scheme achieves a quality of service of Level A.

8. Scheme Benefits and Impacts

Pedestrians

8.1. The new route will provide a safe, accessible and attractive route for pedestrians with minimum 2m wide footpaths in the vast majority of areas. New controlled crossings will allow pedestrians to cross all of the roads within the scheme extents in a safe manner. The location of many of these crossings will improve access and permeability for pedestrians to residential, educational and commercial areas throughout the scheme.

Cyclists

8.2. The provision of segregated raised adjacent cycle track will be very beneficial to cyclists travelling in the Balbriggan area. The vast majority of the scheme is proposed to utilise segregated cycle tracks, improving the cycling infrastructure in the area considerably.

8.3. New controlled crossing points are provided at all key junctions along the route, with zebra crossings at roundabouts being particularly beneficial to cyclists as they allow safe crossings with minimal delays.

8.4. The provision of this high-quality, segregated cycle infrastructure will provide attractive routes for cyclists linking a large number of residential, educational and commercial areas. In particular, these facilities should significantly improve the number of trips to and from school undertaken by bike and will help promote sustainable travel throughout the town.

Vehicular Traffic

8.5. In general, there will be limited impacts to the existing vehicular traffic on the surrounding road network.

Signal Controlled Junctions

8.6. The existing signalised junctions at Harry Reynolds Road/Drogheda Street and Harry Reynolds Road/Chapel Street are to be retained broadly as is, with minor changes to layouts proposed. However, these minor changes will not generally impact on the traffic movements at these junctions.

Moylaragh Road/Chieftain's Drive Roundabout

8.7. The roundabout at this location is proposed to be modified to provide zebra crossings on each arm of the junction. The geometry of the roundabout will be retained broadly as currently exists. Traffic flows and speeds are generally low in this area and the provision of these crossings is unlikely to impact on the function of the roundabout.

Moylaragh Road/Harry Reynolds Road Roundabout

8.8. The roundabout at this location is proposed to be modified to a cycle friendly roundabout in line with the National Cycle Manual. This includes narrowing of the circulating carriageway, reduction in entry and exit radii and lane widths along with provision of zebra crossings on all arms. This junction was modelled using Junctions 9 and the results for the Opening Year and +15 years scenarios, assuming traffic growth in line with the TII central growth rates for Dublin are shown below.

8.9. The results show that the proposed layout for this roundabout will have little effect on traffic with delays and queues being small on all arms in both the Opening Year and the +15 Year scenarios. The maximum RFC is 0.61, indicating that the roundabout will operate well within capacity into the future.

Figure 8-1 - Roundabout Junctions 9 Results

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Opening Year							
Moylaragh Road	1.0	8.50	0.50	A	0.4	6.26	0.30	A
Harry Reynolds Road (West)	0.8	8.47	0.44	A	0.4	6.17	0.30	A
Harry Reynolds Road (South)	0.4	5.70	0.26	A	0.7	6.92	0.40	A
	+ 15 Years							
Moylaragh Road	1.6	11.29	0.61	B	0.6	7.60	0.39	A
Harry Reynolds Road (West)	1.3	11.20	0.56	B	0.6	7.64	0.39	A
Harry Reynolds Road (South)	0.5	6.29	0.32	A	1.0	8.82	0.51	A

Dublin Street Roundabout

8.10. The geometry of the existing Dublin Street Roundabout is to be broadly retained as existing with some minor modifications to the northern and southern arms. Zebra crossings are proposed on both of these arms also while the existing toucan crossing on Hamilton Road to the east is to be retained and a new toucan crossing set back on the western arm is also proposed. Given the volume of traffic and strategic importance of this junction, the proposed layout was modelled using microsimulation in VISSIM including pedestrians and cyclists using these crossings. The use of microsimulation modelling allows for the impacts on the junction of the interaction of pedestrians and cyclists with vehicular traffic at the zebra crossings to be more accurately assessed.

8.11. Allowing for traffic growth in line with the TII central growth rates for Dublin, the results for the +15 Years scenario are shown in the table below.

Table 8-1 - Dublin Street Roundabout +15 Years VISSIM Results

	AM Peak	PM Peak
Dublin Street North		
Average Delay (s/veh)	12.2	5.62
Average Queue (pcus)	8.49	3.68
Hamilton Road		
Average Delay (s/veh)	5.31	6.66
Average Queue (pcus)	2.86	0.14
R132 South		
Average Delay (s/veh)	28.03	25.53
Average Queue (pcus)	4.49	5.71
L1360		
Average Delay (s/veh)	19.34	11.13
Average Queue (pcus)	3.77	0.70
Vehicle Network Performance		
Average Delay (s/veh)	29.72	20.66

8.12. The above results indicate that the roundabout has sufficient capacity in the +15 Years scenario even with the proposed adjustments to the current layout. The AM Peak is the critical time period owing to the presence of a number of schools off Hamilton Road. Average queues in the AM Peak are

reasonable but longer queues are seen to form from time to time, contributing to delays. The average delays on the R132 South and L1360 are relatively long indicating that the junction is nearing capacity at this future year scenario, especially on the R132 South arm. This is further confirmed by the average delays in the PM Peak on this arm being considerably longer than at any other arm.

8.13. The above analysis is based on the existing traffic movements. However, the opening of the new link road from Hamilton Road to the R127 may result in redistribution of traffic in the area and would change the performance of this roundabout. Additional measures for capacity may be required as a result in future years.

Hamilton Road

8.14. Formalised set down/drop off facilities along Hamilton Road in conjunction with reduced lane widths and a new central island will help to manage traffic problems at peak school hours and stop illegal parking from impacting the pedestrian and cyclist facilities.

Trees

8.15. To accommodate the provision of the necessary pedestrian and cyclist infrastructure, the proposed scheme necessitates the removal of trees at various locations along the scheme. An arboriculture tree survey was undertaken in February 2019 and updated in February 2020, which determined the value, age and condition of all trees along the proposed route. The trees highlighted for removal have been classified as being of moderate to low value, varying in condition and are relatively young. In total, approximately 166 trees are to be removed in order to construct the scheme.

8.16. In order to compensate the loss of these trees it is proposed to provide new trees in various locations along the scheme as identified in Section 7 above. In total it is proposed to plant 225 trees of more appropriate and suitable type along with 347m of new hedgerow. The proposed scheme will, therefore, increase the total number of trees compared to the existing situation.

9. Report Summary

9.1. The scheme is approximately 2.9km long and stretches from Chieftain`s Drive in the north to Hamilton Road in the south, along Harry Reynolds Road.

9.2. The preliminary design has developed the preferred route identified in the Design Options Assessment report and has done so in accordance with current best design guidance including DMURS and the National Cycle Manual.

9.3. The existing provision for pedestrians and cyclists along Harry Reynolds Road is limited and of poor quality. The proposed scheme will provide a comfortable, attractive and safe route for both pedestrians and cyclists while having minimal impacts on the vehicular network or surrounding land uses.

9.4. The proposed scheme will link a number of large residential areas with schools, commercial areas and leisure areas and will, therefore, encourage more people to use sustainable modes of transport for both local trips and for commuting. The scheme represents a high-quality pedestrian and cycle scheme that will have significant benefits for the town of Balbriggan.

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