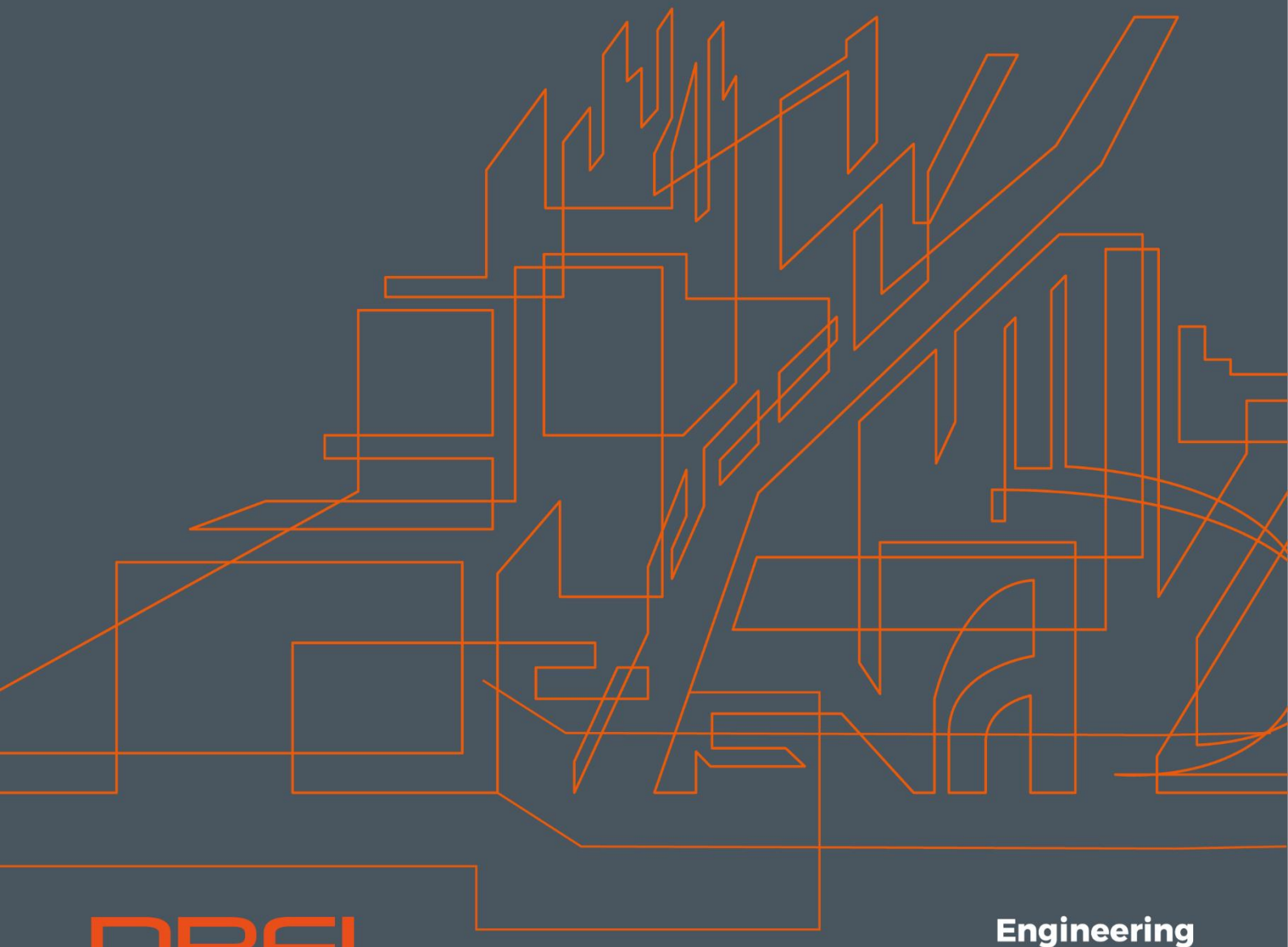
DLR Connector

Options Summary Report

210093-DBFL-TR-XX-RP-C-001

May 2025



DBFL CONSULTING ENGINEERS

Engineering Sustainable Futures

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1 Introduction

1.1 Background

DBFL Consulting Engineers (DBFL) have been commissioned by Dún Laoghaire Rathdown County Council (DLRCC) to develop the preliminary design for the Dundrum-Dún Laoghaire Active Travel Scheme hereafter called the 'DLR Connector'. The principal project requirements are to enhance facilities for active modes at key junctions, crossing points and link sections along a route extending from Barton Road East through to Monkstown Avenue via the towns of Dundrum, Stillorgan and Monkstown.

The proposed works aim to provide a safe, high-quality route which improves connectivity for pedestrians and cyclists travelling between these local centres. It is envisaged that the scheme will encourage a greater uptake in sustainable modes whilst also supporting the sustainable development of the local centres and the wider locality. This will be achieved by upgrading existing junctions and linked routes with segregated facilities for pedestrians and cyclists along with safe crossing points to deliver a protected and attractive route for vulnerable road users.

The overall scheme aims to transform the character and function of the existing route from a largely vehicle dominated environment to a high capacity urban street with defined nodal crossing points at both junctions and key destinations, and enhanced facilities for all road users. The scheme will also align and integrate with all relevant current and future development proposals in the wider area, including for example BusConnects.

1.2 Report Structure

This report provides a summarised version main Design Options Report prepared for the scheme. It presents a summary of the design options developed and assessed for each of the study junctions and link sections in an easy to follow, concise format for the purpose of the non-statutory consultation. The full Design Options Report will be submitted as part of a future application to An Bord Pleanála.

The structure for this Options Summary report is detailed as follows:

- Section 2: details the design options developed and considered for the key junctions
- Section 3: details the design options developed and considered for the link sections
- Section 4 provides a summary of the overall preferred route design

1.3 Location and Land Use

The proposed scheme area extends along Barton Road East (L3011), Ballinteer Road (R826), Kilmacud Road Upper (R826), Kilmacud Road Lower (R825), Fleurville, Annaville Terrace, Rowanbyrn, Monkstown Link Road (New Road L1024) and Monkstown Avenue.

The scheme from end to end is approximately 8.4km in length, however some sections have already been completed or are being progressed as separate DLRCC schemes. Therefore, the total length included in this subject scheme is approximately 6km. The overall route and location of key junctions is illustrated in **Figure 1.1** below.

1.4 Scheme Objectives

The scheme objectives were developed in accordance with national, regional and local policy and strategy documents. Accordingly, the objectives of the scheme are to:

- Design and deliver a high-quality active travel scheme that provides more direct walking and cycling routes serving key local education, employment, health, retail and community destinations for locals
- Design a high-quality active travel scheme which has a positive impact upon the public realm and helps to promote social integration and community development
- Ensure new facilities meet the needs of all road users by adhering to appropriate design standards and best practice
- Develop design options along link sections and junctions and produce an options report outlining the preferred options
- Meet all planning, statutory and procurement requirements
- Deliver the scheme in compliance with the Design Manual for Urban Roads and Streets (DMURS), the Cycle Design Manual (CDM) and latest relevant design standards
- Promote a shift towards a low-carbon, climate resilient and environmentally sustainable economy
- Comply with Safety, Health and Welfare at work requirements
- Engage with the local community and stakeholders and establish Dún Laoghaire-Rathdown County Council and National Transport Authority (NTA) requirements.

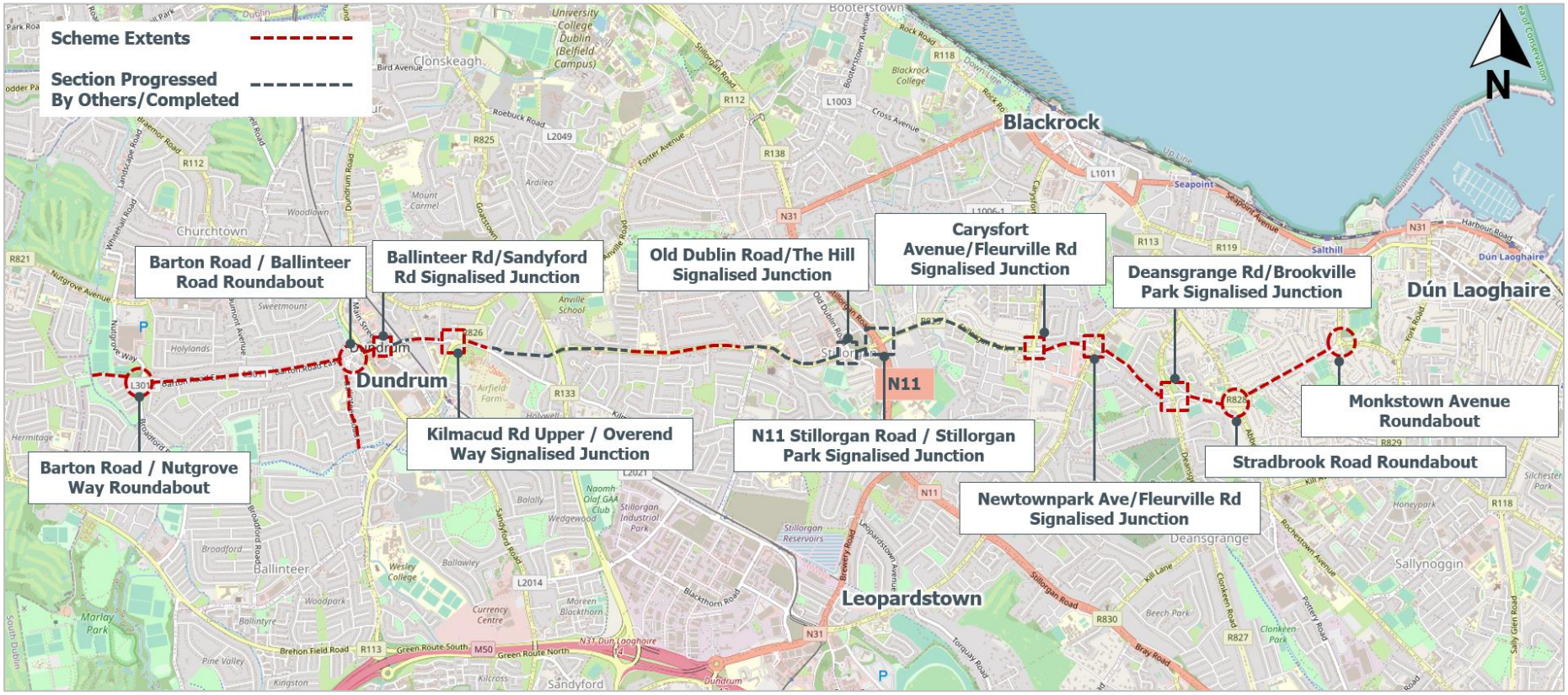

Figure 1.1: Study Area Location and Extents in Wider Context (Source: OpenStreetMap)

1.5 Policy Context, Design Guidance and Standards

Whilst undertaking the design options development, a review of current national, regional and local policy, as well as relevant design guidance and standards was undertaken and used to inform the development of the options considered for the DLR Connector Scheme. The key documents reviewed include, but are not limited to, the following:

Policy & Strategy Documents:
• National Planning Framework (2040)
• National Development Plan (2021-2030)
• National Sustainable Mobility Policy (2022)
• Climate Action Plan (2025)
• Greater Dublin Area Transport Strategy (2022-2042)
• BusConnects Network Redesign
• DLR County Development Plan (2022-2028)
• DLRCC Climate Change Action Plan (2024-2029)
• Dún Laoghaire Rathdown Age Friendly Strategy (2022-2026)
• Dún Laoghaire Rathdown Cycle Network Plan (2012)
Design Guidance & Standards:
• Design Manual For Urban Roads and Streets (2019)
• Cycle Design Manual (2023)
• Permeability Best Practice Guide (2015)
• Preliminary Design Guidance Booklet for BusConnects Core Bus Corridors (2022)
• GDA Cycle Network Plan (2022)

1.6 Existing Environment

A comprehensive review of the existing environment along the scheme extents was undertaken. This found that the existing route is largely car dominated in nature. Existing walking and cycling infrastructure is greatly lacking. Whilst limited provision has been made for cyclists, this is predominantly in the form of on-road facilities which provide little to no physical protection from vehicles.

Where provision has been made for those travelling on foot, this is generally poor quality, does not cater for desire lines nor support convenient, direct access to existing public transport facilities or local amenities and services.

The overall environment for pedestrians, cyclists and public transport users is therefore hostile, unwelcoming and unlikely to support any future aspirations for achieving a greater sustainable transport mode share.

2 Junction Design Options

2.1 Introduction

This section focuses on the design options considered for the ten key study junctions along the route. The junctions have been assessed individually with various design options discussed and appraised. The design options developed sought to provide safe, attractive infrastructure for pedestrians, cyclists and public transport users, as well ensure their alignment with the wider public realm aspirations and active school travel proposals currently being developed for the area.

2.2 Multi- Criteria Analysis (MCA)

An initial investigation and high level first sifting of potential suitable junction options was undertaken to determine which options should be brought forward for further consideration. In order to determine the preferred design option for each junction an options appraisal was carried out based on a number of criteria as set out in the Department of Transport guidelines. The 'Multi-Criteria Analysis' (MCA) is a structured approach to determine overall preferences among alternative options, where the options should accomplish multiple objectives. This MCA assessed the scheme against the set of criteria and sub-criteria shown below.

Full detail on the MCA is provided in the full Design Options Report which will accompany the planning application to An Bord Pleanála.

Criteria	Assessment Sub-Criteria
1. **Economy**	1a) Capital Cost
	1b) Constructability
	1c) Transport Reliability
2. **Integration**	2a) Cycle Network Integration
	2b) Pedestrian Network Integration
	2c) Traffic Network Integration
3. **Cycle Infrastructure**	3a) Functionality
	3b) Homogeneity
	3c) Legibility
	3d) Forgivingness
	3e) Self-Awareness
4. **Accessibility**	4a) Traffic Management
	4b) Universal Access
5. **Safety**	5a) Road Safety
	5b) Pedestrian Safety
	5c) Cycle Safety
6. **Environment**	6a) Flora & Fauna
	6b) Soils, Geology & Hydrology
	6c) Landscape & Visual
	6d) Air Quality, Noise & Vibration
	6e) Land Use Character

2.3 Junction 1: Barton Road East / Nutgrove Way / Stonemasons Way Roundabout

Figure 2.1: Existing Junction Layout

Existing Conditions: The existing Barton Road East / Nutgrove Way / Stonemasons Way Roundabout currently operates as a four-arm roundabout. At present, the roundabout works effectively from a traffic management perspective with minimal delays experienced by motorists travelling through the junction. However there is a notable lack of appropriate, safe pedestrian and cyclist infrastructure, except for a signalised pedestrian crossing on the eastern arm of the roundabout.

Key Design Considerations

To the immediate north of the roundabout, on Nutgrove Way is the Nutgrove Shopping Centre, whilst to the south is Scoil Naithí, Ballinteer Community School, St. Attracta's Junior National School and Dundrum Football Club and to the east is Loreto Park. The junction is therefore a key node in terms of people accessing these local facilities and amenities.

There are existing paths off to the northeast and southeast providing direct connections into the existing residential areas of Meadow Park and Meadow Mount respectively. While all movements at the junction will need to cater for large vehicles and buses, predominant bus flow movements at this junction will be to/from the Barton Road (east) and Nutgrove Way (north).

Design Options Considered:

- Option A – Upgraded Roundabout
- Option B – Protected 'Dutch Style' Roundabout

To note, the daily traffic flows for this junction are in the region of 18,000 vehicles. As per the Cycle Design Manual, roundabouts are suitable for traffic capacities up to 25,000 vehicles per day. A signalised junction layout was therefore not considered as the traffic volume figures did not warrant the need for signalised controls.

Option A – Upgraded Roundabout

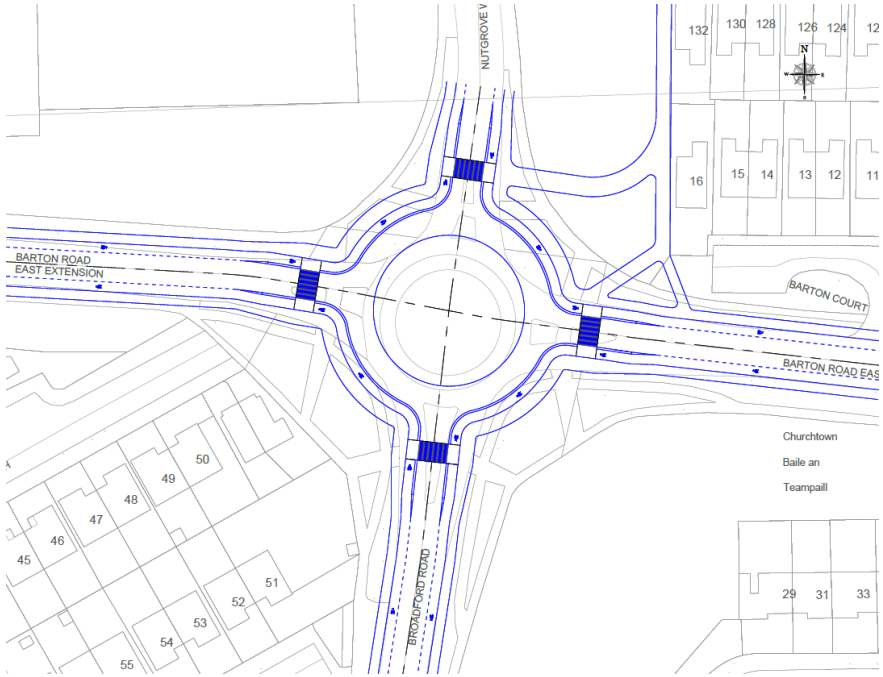

Figure 2.2: Option A – Upgraded Roundabout

Description: Combined Zebra crossings provided on each arm of the junction. New shared path to the northeast connecting to Meadow Park residential area. Existing desire lines formalised. Segregated cycle tracks are provided up to the Zebra crossing facilities on all arms of the junction. Segregated off road tracks are provided for cyclists around the junction. Existing green space areas surrounding the junction are substantial and improvements could be made to these areas.

Opportunities

- Controlled crossing facilities on all arms for pedestrians/cyclists which better meet desire lines compared to existing uncontrolled crossings
- Pedestrians and cyclists are kept segregated from vehicular traffic, reducing conflict points
- Maintains all existing movements for vehicular traffic
- Compact roundabout will promote lower vehicle speeds and improve road safety
- Does not require excessive infrastructure or expenditure

Constraints

- Zebra crossings introduce slight delays for vehicular traffic compared to existing situation
- Buses still have to share approach lanes with general traffic which may result in delays
- No freeing up of existing space for public realm enhancements
- Safety for pedestrians/cyclists improved compared to existing scenario, however combined Zebra crossings may result in conflicts between pedestrians/cyclists compared to segregated facilities
- Level of Service (LoS) for pedestrians and cyclists lower than that offered by Option B

Option B – Protected 'Dutch Style' Roundabout

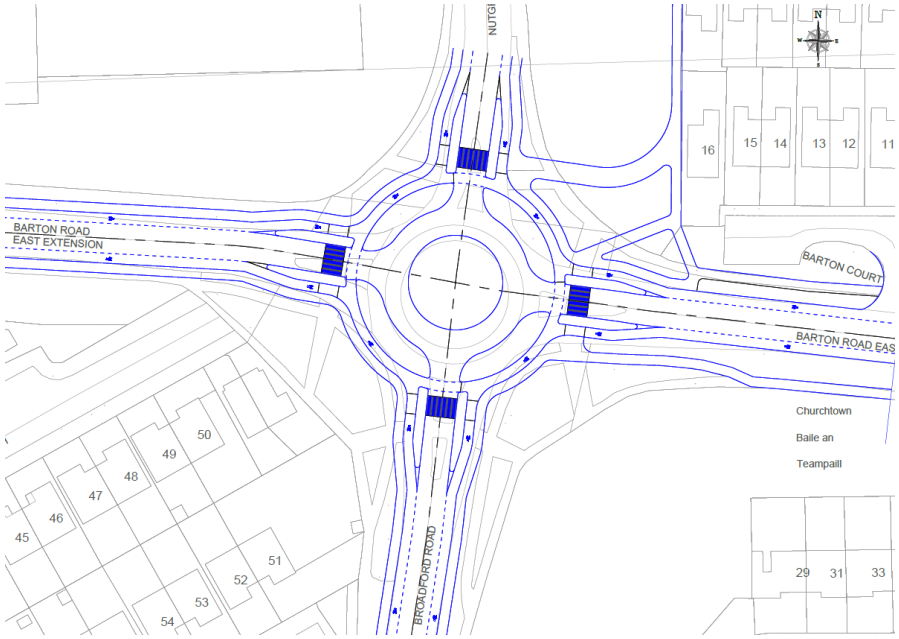

Figure 2.3: Option B – Protected 'Dutch' Style Roundabout

Description: Segregated crossings over each arm of the roundabout. New shared path provided off to the northeast connecting the existing Meadow Park residential area. Segregated cycle tracks on approach and departure from the roundabout and also a segregated orbital cycle track through the junction. Existing green space areas surrounding the junction are substantial and improvements could be made to these areas. This may include the formalisation of existing desire lines. Corner islands segregating motorised / non-motorised users could be landscaped with low level planting so as not to obstruct visibility.

Opportunities

- Controlled crossing facilities on all arms for pedestrians & cyclists, better meet desire lines compared to existing uncontrolled crossings
- Safety and LoS for pedestrians/cyclists improved compared to existing scenario and Option A as pedestrians / cyclists are kept segregated reducing potential conflict points
- Maintains all existing movements for vehicular traffic
- Compact junction size will promote lower vehicle speeds and improve road safety

Constraints

- Higher capital cost in comparison to Option A, to facilitate the segregated orbital cycle track
- Parallel crossings may introduce slight delays for vehicular traffic compared to existing
- No freeing up of existing space for public realm enhancements
- May take time for all roads users to adapt and familiarise themselves to its operation as it is a relatively new junction typology

Preferred Option

Following the MCA on the potential options, the preferred option was determined to be Option B a Protected 'Dutch' Style Roundabout, as shown below:

Figure 2.4: Barton Road East / Nutgrove Way / Stonemasons Way Preferred Option

2.4 Junction 2: Barton Road / Ballinteer Road Roundabout

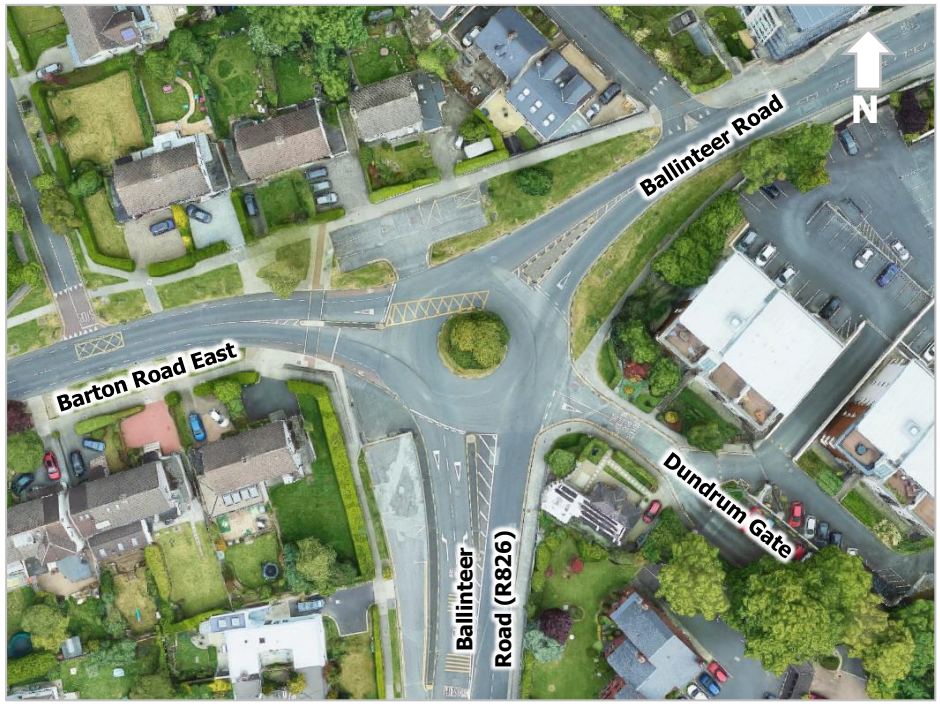

Figure 2.5: Existing Junction Layout

Existing Conditions:

The existing roundabout currently operates as a five-arm roundabout. With the exception of a controlled crossing on the western arm, there is a distinct lack of safe crossing facilities for pedestrians at the junction. Similarly, cycle facilities at the junction are greatly lacking with cyclists required to mix with vehicular traffic when travelling through the junction.

Key Design Considerations

At present, the fifth (northern) arm of the junction serves a small public car park area and provides vehicular access to two private properties, one of which is a local GP practice. Therefore, the design options must retain and facilitate safe, access to these properties. Similarly, access into the Dundrum Gate residential development to the east of the junction also needs to be retained as part of the options considered.

There is an existing hard paved area to the southwest of the junction which accommodates approx. six public pay & display car parking spaces but this area could form part of the proposals to enhance the public realm surrounding the junction.

Design Options Considered:

- Option A – Upgraded Roundabout
- Option B – Protected 'Dutch' Style Roundabout
- Option C – Standard Signalised Junction
- Option D – Cycle Protected Junction
- Option E – Cycle Optimised Protected Junction (CYCLOPS)

To note, the daily traffic flows for this junction are in the region of 12,000 vehicles. As per the Cycle Design Manual, roundabouts are suitable for traffic capacities up to 25,000 vehicles per day. A signalised junction layout was therefore not considered as the traffic volume figures did not warrant the need for signalised controls.

Option A – Upgraded Roundabout

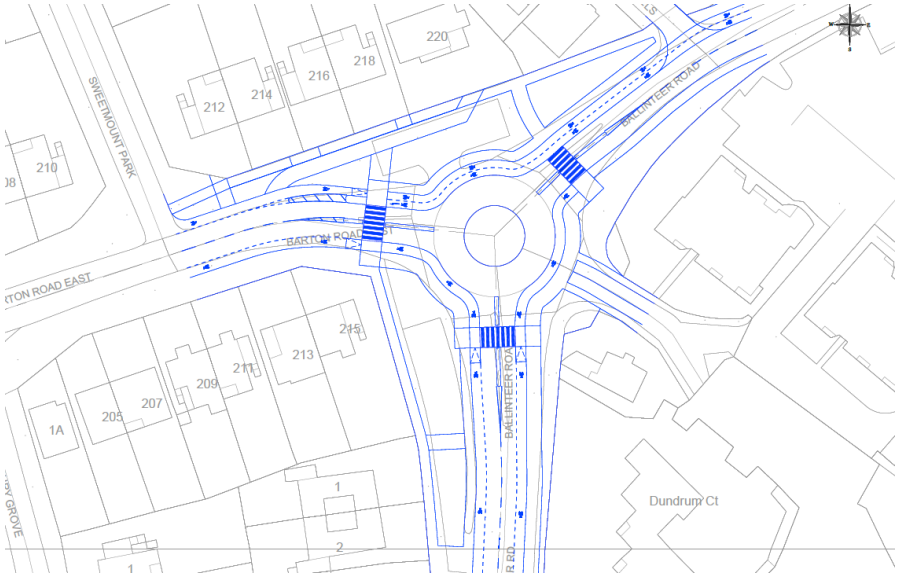

Figure 2.6: Option A – Upgraded Roundabout

Description: Combined Zebra crossings on all arms of the junction, with the exception of the Dundrum Gate access which has a raised continuous footpath. Segregated cycle tracks are provided on both sides of the western and southern arms and a segregated two-way cycle track is provided on the northern side of the north-eastern arm.

Additional space released to the north of the junction by realigning the private access, thereby enabling landscaping / public realm enhancements. The existing hard paved area to the southwest could also be repurposed from a car parking area to landscaped green space area providing for a better public realm.

Opportunities

- Controlled crossing facilities on all arms for pedestrians/cyclists better meet desire lines compared to existing scenario
- Pedestrians and cyclists are kept segregated from vehicular traffic, reducing conflict points
- Maintains all existing movements for vehicular traffic
- Realigned shared access serving properties to the north enables more efficient junction operation
- Opportunity to remove existing hard paved parking areas to the north and west of the roundabout and replace with landscaping
- Compact roundabout will promote lower vehicle speeds and improve road safety
- Does not require excessive infrastructure or expenditure compared to alternative options

Constraints

- Zebra crossings introduce slight delays for vehicular traffic compared to existing
- Buses still have to share approach lanes with general traffic which may result in delays
- Safety for pedestrians/cyclists improved compared to existing scenario, however shared Zebra crossings may result in conflicts between pedestrians and cyclists compared to segregated facilities
- Level of Service (LoS) for pedestrians and cyclists lower than that offered by other options considered
- Less adaptability in terms of traffic management compared to signalised junction

Option B – Protected 'Dutch Style' Roundabout

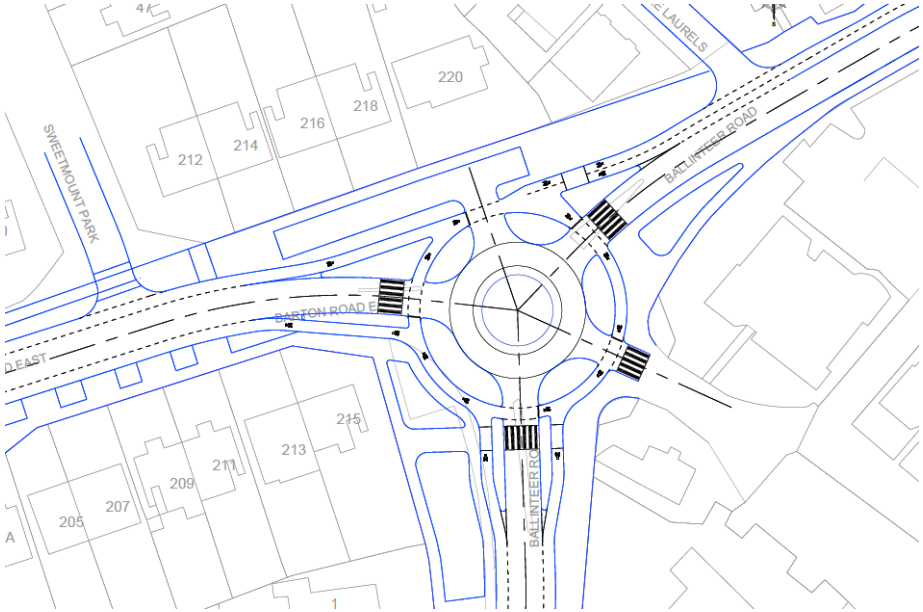

Figure 2.7: Option B – Protected 'Dutch Style' Roundabout

Description: Segregated crossing facilities on all arms of the junction. Segregated cycle tracks on the junction approaches/departures along with a segregated orbital cycle track through the junction. Two-way cycle track proposed on northern side of the northeast arm (Ballinteer Road) given the restricted road space width further upstream.

Access to private properties north of the junction is retained along with the existing car park area. The existing hard paved area to the southwest could be repurposed from car parking area to landscaped green space area.

Opportunities

- Controlled crossing facilities on all arms for pedestrians & cyclists, better meet desire lines compared to existing arrangements
- Safety and LoS for pedestrians/cyclists improved compared to existing scenario and Option A as pedestrians/cyclists are kept segregated reducing potential conflict points
- Maintains all existing movements for vehicular traffic
- Access to private properties to the north of the junction retained under current arrangements
- Compact junction size will promote lower vehicle speeds and improve road safety
- Existing parking area to the southwest of the junction could be repurposed with landscaping and public realm enhancements

Constraints

- Higher capital costs compared to Option A
- Retains five-arm arrangement of roundabout which makes it longer/more complex for vulnerable road users to navigate
- Five-arm roundabout less efficient in terms of traffic management and less adaptable compared to signalised junction options
- Parallel crossings may introduce slight delays for vehicular traffic compared to existing scenario
- May take time for all roads users to adapt and familiarise themselves to its operation as it is a relatively new junction typology

Option C - Standard Signalised Junction

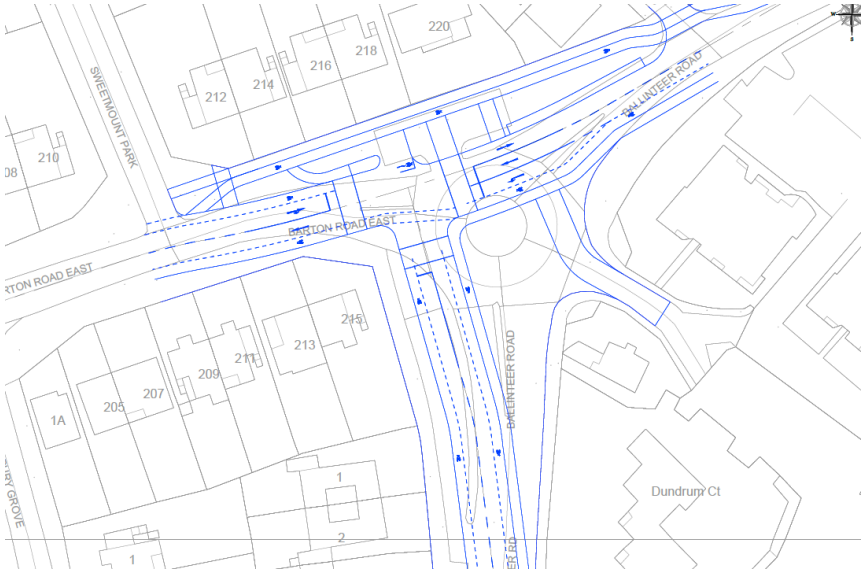

Figure 2.8: Option C – Standard Signalised Junction

Description: Footpaths provided on both sides and controlled pedestrian crossings provided over each junction arm. Segregated cycle tracks which ramp down on approach to the junction. Cyclists are required to travel on-road through the junction. Cyclists wishing to turn right can do so via a two-stage right turn box, or advanced cycle signals. A cycle by-pass is provided for eastbound cyclists.

The requirement to retain access to the properties to the north and provide pedestrian/cyclist facilities limits the available space for public realm enhancements to the north of the junction. Realignment of southern arm frees up significant area of land which could facilitate public realm and landscaping enhancements.

Opportunities

- Crossings are more direct, better meet desire lines and improve pedestrian journey times
- Safety and LoS for pedestrians/cyclists improved compared to existing scenario and Option A as pedestrians/cyclists are kept segregated reducing potential conflict points
- Cyclists could be provided advanced cycle signal
- Existing hard paved parking areas to the north and west are removed, but potential to accommodate on-street parking elsewhere in vicinity of junction if required
- Signalised junction allows for better level of control and adaptability for managing traffic through the junction
- Reduced junction size and signals will promote lower vehicle speeds and improve safety
- Reduced junction size may have positive impacts on air quality/noise due to reduced speeds
- Reduced junction size frees up additional areas for public realm and landscaping enhancements

Constraints

- Higher capital cost in comparison to Options A/B, as this requires the conversion of roundabout to signalised junction
- Safety and LoS lower than that offered by Options D and E as it offers little protection for cyclists through the junction, particularly from left turning vehicles

Option D – Cycle Protected Junction

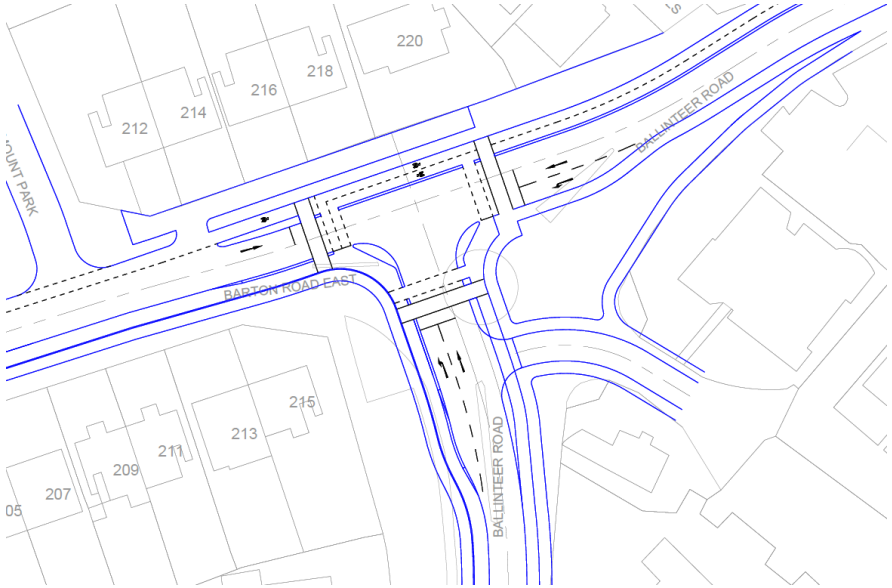

Figure 2.9: Option D – Cycle Protected Junction

Description: Controlled pedestrian crossings over each junction arm. Protective islands on the junction corners to enhance safety for cyclists. Could also include an early cycle signal for increased priority however, traffic capacity would be further impacted as a result. If required there may be potential to include bus priority measures. Alternative shared access proposed off the western arm to provide access to the private properties to the north. The Dundrum Gate access becomes a priority junction with the Ballinteer Road southern arm. Realignment of southern arm frees up a significant area of land to the southeast of the junction which could facilitate public realm and landscaping enhancements.

Opportunities

- Crossings are direct, better meet desire lines and improve pedestrian journey times compared to existing situation
- Offers high LoS and safety for pedestrians/cyclists compared to existing scenario and Option A as they are kept segregated reducing potential conflict points
- Cyclists could be provided an advanced cycle signal
- Improved level of safety for cyclists through the junction through the introduction of the corner islands protecting cyclists from left turning traffic
- Signalised junction allows for better level of control of vehicles through the junction and better adaptability for these type of junctions
- Reduced junction size and signals will promote lower vehicle speeds and improve road safety
- Reduced junction size may have positive impacts on air quality / noise due to reduced speeds
- Reduced junction size frees up additional areas for public realm / landscaping enhancements

Constraints

- Higher capital cost in comparison to Option A / B, as this requires to removal of the roundabout
- Less convenient for pedestrians compared to Option E given the inability to provide diagonal crossings, therefore longer two-stage crossings required when walking from opposite corners

Option E – Cycle Optimised Protected Junction

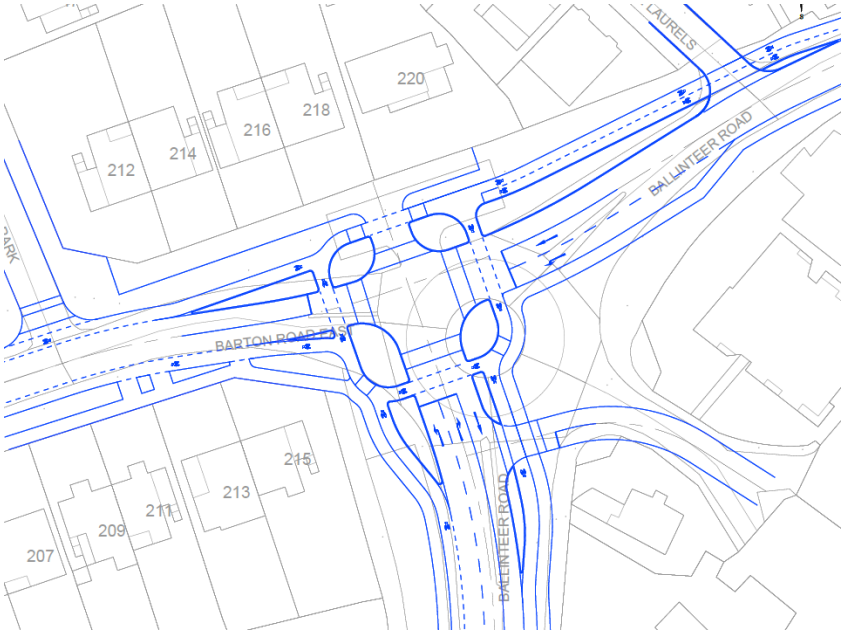

Figure 2.10: Option E – CYCLOPS Junction

Description: External cycle system enables pedestrian crossings to be accommodated on inside of the junction, thereby enabling diagonal crossing movements. Cyclists accommodated within an external orbital system around the junction. Cyclists are afforded comparable levels of protection with that of Option D with cycle stages being able to run simultaneously during an 'all red to traffic stage'. Cyclists can make fully protected two-stage right turns. Realignment of the southern arm (Ballinteer Road) frees up an area of land to the southeast of the junction which could facilitate public realm and landscaping enhancements.

Opportunities

- Controlled pedestrian phases are shorter and closer to desire lines
- Potential for diagonal pedestrian crossings
- Cycle phases can run simultaneously during 'all red to traffic' stage
- Controlled cycle and pedestrian phases need not conflict and can run simultaneously
- Larger orbit radius ensures more space for storage at cycle signals and more comfortable, longer turning radii for cyclists
- Cyclists can filter left onto and off the orbital route without signal control
- Potential for bus priority measures if required
- Frees up existing space for public realm enhancements to the west/east
- Signalised junction allows for better level of control for vehicles through the junction and better adaptability for these type of junctions
- Reduced junction size and signals will promote lower vehicle speeds and improve road safety
- Reduced junction size may have positive impacts on air quality/noise due to reduced speeds

Constraints

- Relatively new junction typology which may take road users time to adapt to its operation
- Higher capital cost in comparison to Option A/B, as this requires the removal of the roundabout
- Introduction of dedicated pedestrian / cyclist phases will introduce delays to general traffic
- Potential for pedestrian/cyclist conflict at zebra crossings which may be a concern for mobility impaired groups
- Larger footprint than Option D therefore less opportunity for public realm

Preferred Option

Following the MCA on the potential options, the preferred option was determined to be Option B a Protected 'Dutch' Style Roundabout, as shown below:

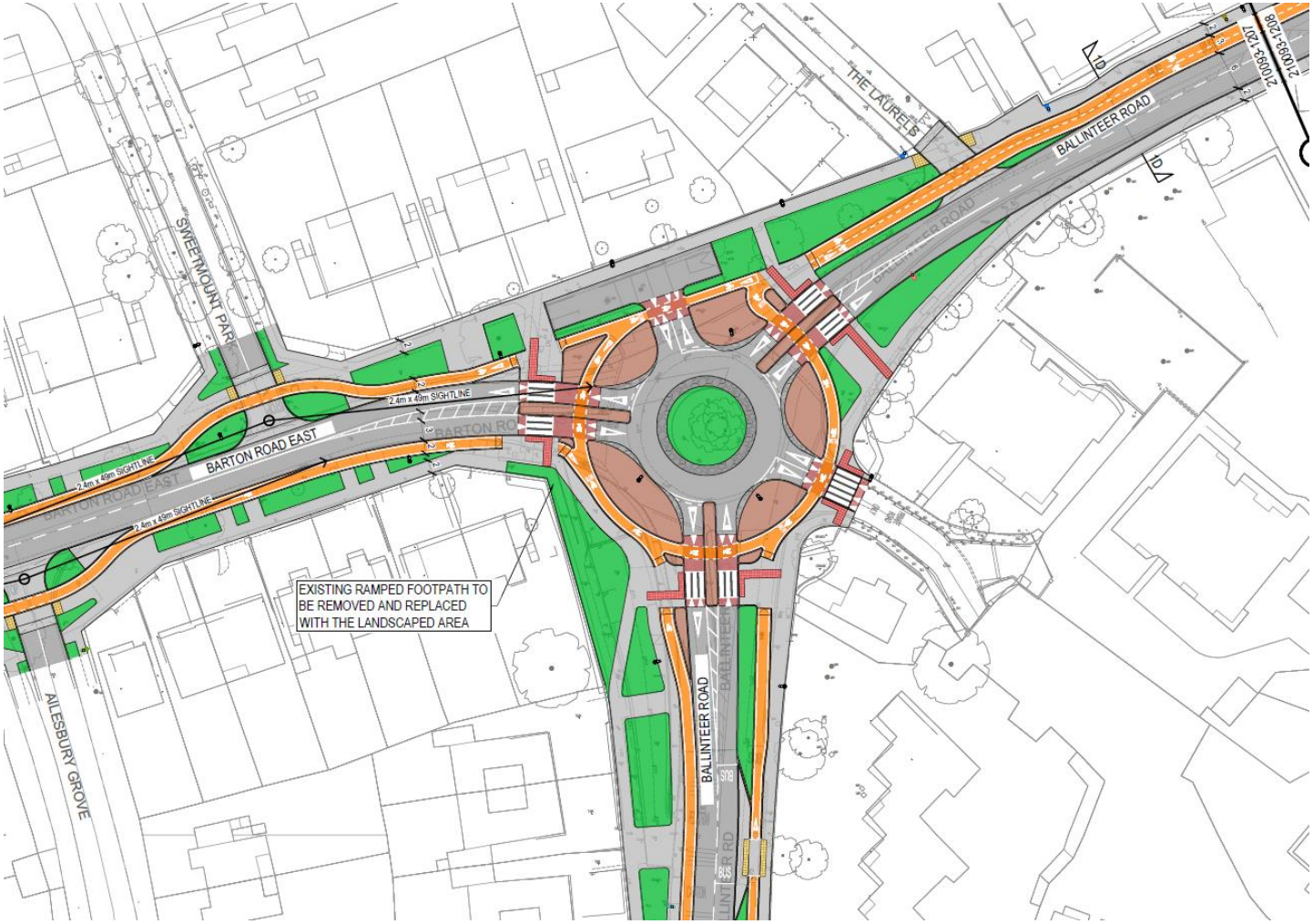

Figure 2.11: Barton Road East / Ballinteer Road Preferred Option

2.5 Junction 3: (Dundrum) Main Street / Sandyford Road / Ballinteer Road / Kilmacud Road

Figure 2.12: Existing Junction Layout

Existing Conditions: The Main Street / Sandyford Road / Kilmacud Road / Ballinteer Road four-arm signalised junction comprises a one-way traffic flow system from Sandyford Road (heading northwards) onto Main Street whilst both Sandyford Road and Main Street remain two-way at both ends. A one-way arrangement is also implemented westbound on Kilmacud Road upper for vehicles.

This signalised junction provides good quality footways with each arm offering pedestrian facilities and controlled crossings on all sides. Cyclists travelling northwards on Sandyford Road / Main Street and westward on Kilmacud Road Upper share the road with other vehicles.

A segregated contra-flow cycle lane is provided for southbound cyclists on Main Street and Sandyford Road. A short eastbound contra-flow cycle lane link is provided on Kilmacud Road Upper (R826).

Key Design Considerations

As part of the BusConnects Network redesign proposals, several interconnecting city bound and local bus routes will travel through this junction when accessing Dundrum village, these include:

- Branch **A2**: Dublin Airport – Dundrum (12 mins)
- Branch **A4**: Swords – Dundrum (12 mins)
- Radial Route **74**: Dundrum – Dublin City Centre (30 mins)
- Radial Route **87**: Belarmine – Mountjoy Square (60 mins)
- Radial Route **88**: Enniskerry – Mountjoy Square (60 mins)
- Local Route **L25**: Dundrum – Dún Laoghaire (15 mins)
- Local Route **L33**: Glencullen – Dundrum (60 mins)
- Local Route **L35**: Rockbrook – Dundrum (60 mins)

Design Options Considered:

- Option A – Full Bus Gate
- Option B – Turn Left for Cars Retained
- Option C – Full shuttle for Buses and Cars
- Option D – Retain Two Traffic Lanes on Western Arm

Option A – Full Bus Gate

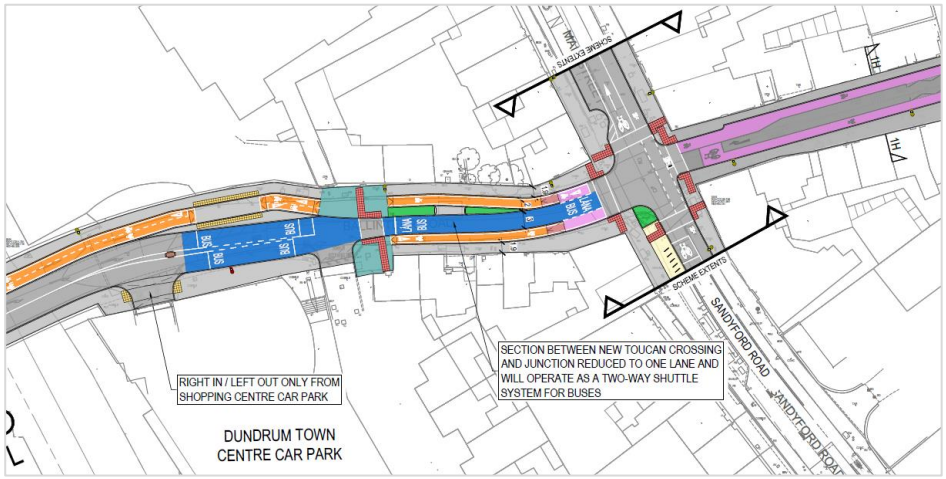

Figure 2.13: Option A – Full Bus Gate

Description: Provide a full bus gate arrangement on the western arm of the junction (Ballinteer Road). In this scenario general traffic movements at the junction will be restricted to:

- Right turn only from Kilmacud Road Upper to Main Street
- Northbound (ahead) only from Sandyford Road to Main Street

Under this layout public transport will be permitted the following movements:

- Left turn only from Ballinteer Road to Main Street
- Right turn from Kilmacud Road Upper to Main Street
- Westbound (ahead) from Kilmacud Road Upper to Ballinteer Road
- Northbound (ahead) only from Sandyford Road to Main Street

As a result of these proposed changes current access arrangements for general traffic wishing to access the Dundrum Town Centre car park would be restricted to right in / left out only movements.

Opportunities

- Provides fully segregated cycle facilities in both directions on Ballinteer Road arm of the junction
- Provides a full bus gate arrangement and hence a significant enhancement to the Level of Service for Public Transport services travelling through Dundrum centre with reduced delays and increasing reliability of services
- Junction operational performance for the Future Year (2028) is well within capacity
- Aligns with the Dundrum Local Area Plan (LAP)

Constraints

- Traffic movements for the Dundrum Shopping Centre green car park are restricted to right in / left out only movements
- Appropriate signage and enforcement required to ensure general traffic does not use the bus gate or cause obstructions if caught trying to turn around in advance of the bus gate

Option B – Left Turn Movement for Cars Retained

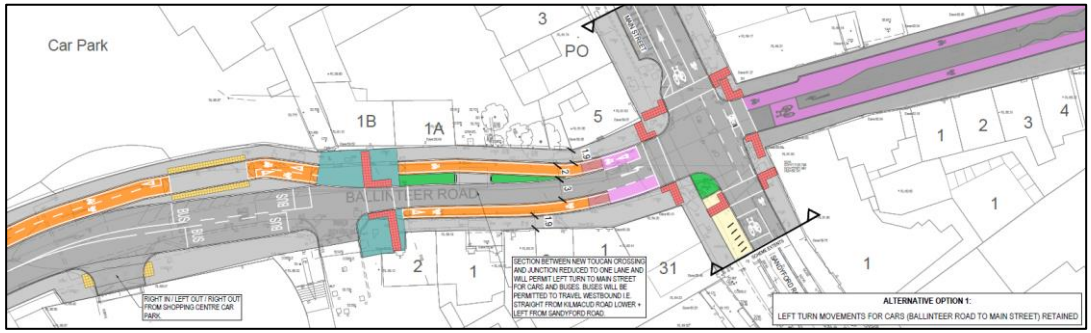

Figure 2.14: Option B – Left Turn For Cars Retained

Description: Similar to Option A, whereby the section between the new toucan crossing and the junction is reduced to one lane facilitating segregated cycle tracks on both sides of the road. However, rather than a full bus gate being implemented, left turn movements for cars from Ballinteer Road to Main Street would be permitted. Therefore, general traffic movements at the junction would be restricted to:

- Right turn only from Kilmacud Road Upper to Main Street
- Northbound (ahead) only from Sandyford Road to Main Street
- Left turn only from Ballinteer Road to Main Street

Public transport would be permitted the following movements:

- Left turn only from Ballinteer Road to Main Street
- Right turn from Kilmacud Road Upper to Main Street
- Westbound (ahead) from Kilmacud Road Upper to Ballinteer Road
- Northbound (ahead) only from Sandyford Road to Main Street

Access arrangements for general traffic wishing to access the Dundrum Town Centre car park would be restricted to right in and right out / left out movements.

Opportunities

- Provides fully segregated cycle facilities in both directions on Ballinteer Road arm of the junction
- Whilst it is not a full bus gate arrangement, there are still benefits to the Level of Service for Public Transport services travelling through Dundrum centre although to a lesser extent compared to Option A
- Junction operational performance for the Future Year (2028) is well within capacity

Constraints

- Legibility of this arrangement may be confusing for motorists (e.g. some motorists may still try to travel westbound from Kilmacud Road Upper to Ballinteer Road). Appropriate signage / enforcement required to ensure general traffic complies with traffic management arrangements
- Access to the Dundrum Shopping Centre car park slightly less restrictive compared to Option A, although it would be Right In / Left Out / Right Out

Option C – Full Shuttle System for Buses & Cars

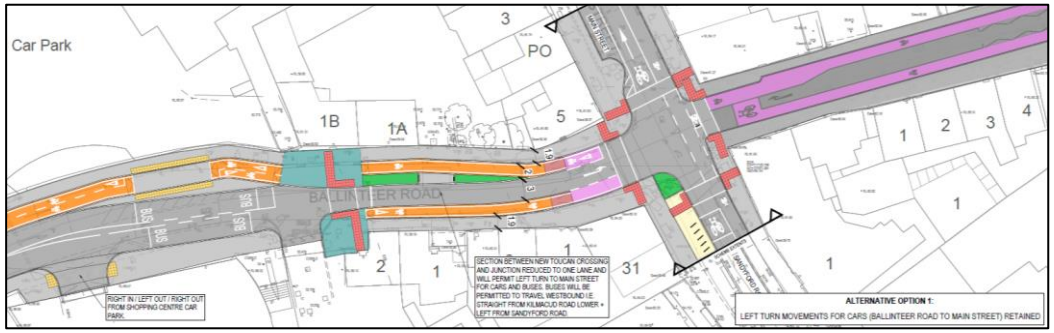

Figure 2.15: Option C – Full Shuttle System for Buses & Cars

Description: Similar to Option A whereby, the section between the new toucan crossing and the junction will be reduced to one lane facilitating segregated cycle tracks on both sides of the road. However a full signalised shuttle system for both buses and cars is introduced on the Ballinteer Road (western arm of the junction). Therefore, under this option general traffic movements at the junction would be as follows:

- Right turn and Straight Ahead only from Kilmacud Road Upper
- Northbound (ahead) and Left turn only from Sandyford Road
- Left turn only from Ballinteer Road to Main Street

Public transport would be permitted the following movements:

- Left turn only from Ballinteer Road to Main Street
- Right turn from Kilmacud Road Upper to Main Street
- Westbound (ahead) from Kilmacud Road Upper to Ballinteer Road
- Northbound (ahead) only from Sandyford Road to Main Street

Opportunities

- Provides fully segregated cycle facilities in both directions on Ballinteer Road arm of the junction
- All entry / exit movements (i.e. Right In / Left In and Right Out / Left Out) permitted from the Dundrum Shopping Centre car park
- Greater delays and queues experienced, particularly on the Kilmacud Road Upper and Sandyford Road arm in the PM compared with Option A and Option B, although junction still performs within capacity overall

Constraints

- Legibility of this arrangement may be confusing for motorists (e.g. some motorists may run red lights and get caught in the one lane shuttle section blocking oncoming traffic). Appropriate signage / enforcement required to ensure general traffic complies with traffic management arrangements
- No significant enhancement for Public Transport services as they would be required to mix with general traffic when passing through the shuttle system which results in delays compared to other options

Option D – Retain Two Traffic Lanes on Western Arm

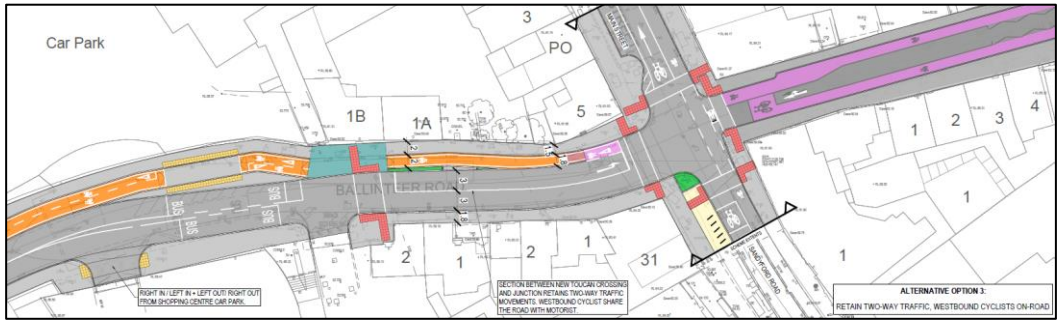

Figure 2.16: Option D – Retain Two Traffic Lanes on Western Arm

Description: Retain two traffic lanes between the new toucan crossing and the junction. Segregated cycle track facilitated on northern side of the road, however due to space constraints westbound cyclists would be required to share the road with motorists up to the toucan crossing where they could then join the two-way cycle track on the northern side. Segregated cycle track on the northern side (eastbound direction) rather than the southern side (westbound direction) as westbound cyclists can position themselves at the Advanced Stop Lines (ASLs) and be afforded an early green start to get ahead of traffic. General traffic movements restricted to:

- Right turn and Straight Ahead only from Kilmacud Road Upper
- Northbound (ahead) and Left turn only from Sandyford Road
- Left turn only from Ballinteer Road to Main Street

Public transport will be permitted the following movements:

- Left turn only from Ballinteer Road to Main Street
- Right turn from Kilmacud Road Upper to Main Street
- Westbound (ahead) from Kilmacud Road Upper to Ballinteer Road
- Northbound (ahead) only from Sandyford Road to Main Street

Opportunities

- All entry / exit movements (i.e. Right In / Left In and Right Out / Left Out) permitted from the Dundrum Shopping Centre car park
- Greater delays and queues experienced, particularly on the Kilmacud Road Upper and Sandyford Road arm in the PM compared with the Option A and Option B, although junction still performs within capacity overall
- More legible arrangement compared to Options B and C, therefore more likely that motorists would comply with traffic management arrangements

Constraints

- A segregated eastbound cycle track can be provided on the northern side, but due to space constraints westbound cyclists would be required to mix with traffic up to the Toucan crossing
- Due to space constraints there is a localised pinch point (1.5m) on the footpath on the northern side
- No significant enhancement for Public Transport services as they would be required to mix with general traffic when passing through shuttle system resulting in delays compared to other options

Preferred Option

Following the MCA on the potential options, the preferred option was determined to be Option A, the Full Bus Gate, as shown below:

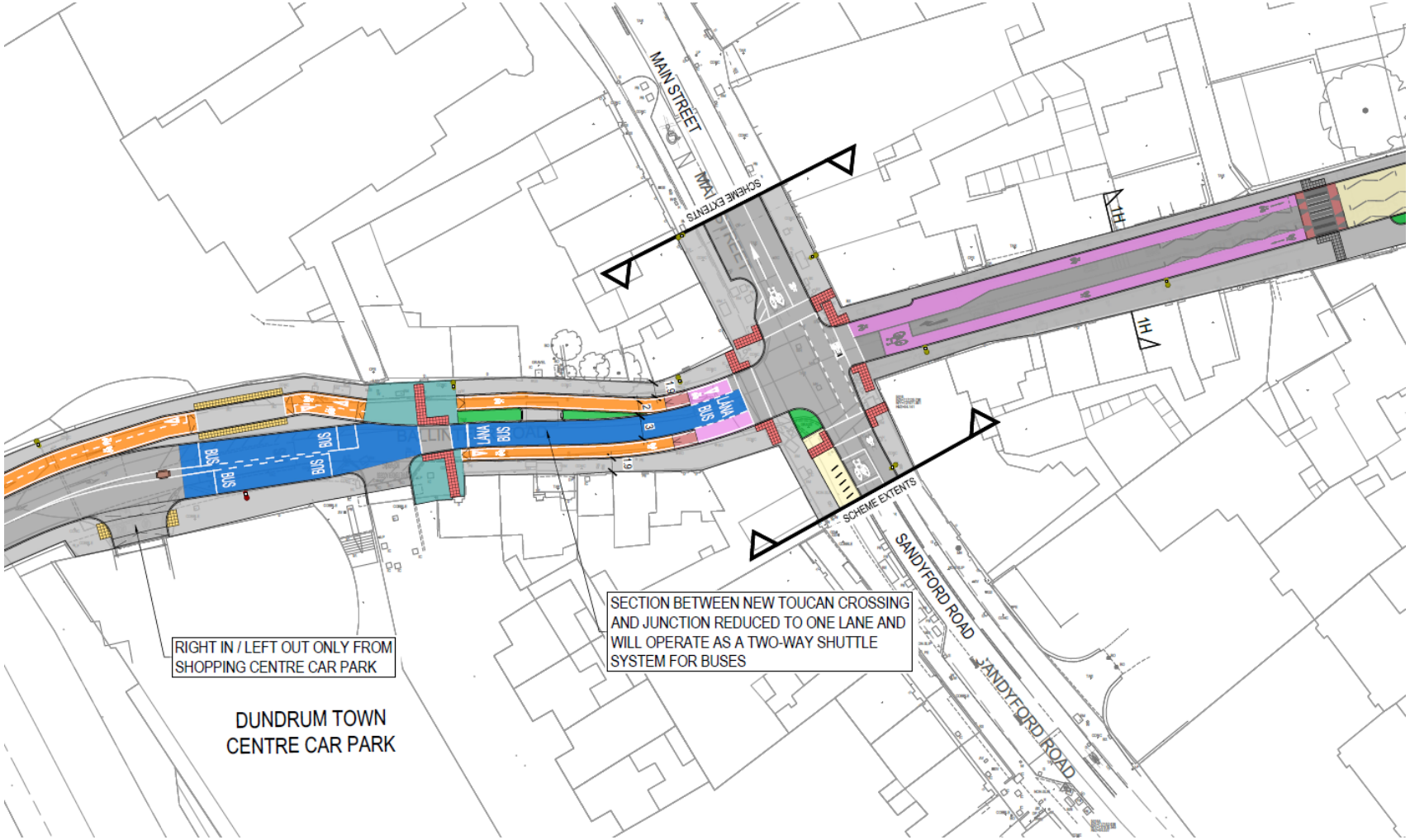

Figure 2.17: Main Street / Sandyford Road / Ballinteer Road / Kilmacud Road Upper Preferred Option

2.6 Junction 4: Kilmacud Road Upper / Overend Avenue / Birches Lane

Figure 2.18: Existing Junction Layout

Existing Conditions:

The existing Kilmacud Road Upper / Overend Avenue and Kilmacud Road Upper / Birches Lane junctions currently operate as two signal-controlled junctions. The current layout incorporates a left turn slip lane from Overend Avenue to Kilmacud Road Upper which can give rise to high speeds by left turning vehicles, whilst also making it slightly more complex for pedestrians to navigate and increases the risk of cyclists being struck by turning vehicles. There are existing on-road cycle lanes with flexible bollards providing light segregation from the traffic lanes.

Key Design Considerations

DLRCC previously developed an initial layout for this junction which has been reviewed and considered as part of the options development. This previous design proposal included the introduction of the following:

- Cycle tracks on both sides of Overend Avenue;
- Segregated two-way cycle track on the north side of Kilmacud Road Upper;
- Cycle tracks on both sides of Birches Lane; and
- A shared use section along the northern side of Kilmacud Road Upper, east of the Birches Lane junction.

Design Options Considered:

- Option A – Upgraded Signalised
- Option B – Protected Signalised

The roundabout junction typologies were not considered for these junctions due to the predominant Overend Avenue northbound flows which would mean that Kilmacud Road Upper would be constantly ceding priority to Overend Avenue traffic. Therefore, the signalised junction options were considered more appropriate in terms of traffic management for this junction. The proposed changes along Kilmacud Road Upper comprising its conversion to a one-way eastbound traffic management arrangement were also considered when developing and assessing junction design options. Under this arrangement, alternative routes are possible along Taney Road and Sydenham Road.

Option A – Upgraded Signalised Junction

Figure 2.19: Option A – Upgraded Signalised Junction

Description: Controlled pedestrian crossings over each junction arm which are segregated from cyclist movements. This option incorporates a two-way cycle track along the northern side of Kilmacud Road Upper. Segregated cycle tracks are also provided on both sides of Overend Avenue and the removal of the left turn slip lane helps improve safety for cyclists through the junction.

The separate left and ahead lanes on the western arm of the Birches Lane junction is replaced with a combined left/ahead lane. The current ban on the right turn from Kilmacud Road Upper to Birches Lane is retained.

The removal of the left turn lane releases additional land which can be used for greening and landscaping for an improved public realm at the junction.

Opportunities

- Pedestrian crossing facilities are more direct and better meet desire lines compared to existing scenario
- Pedestrians and cyclists are kept segregated from vehicular traffic, reducing conflict points
- Removal of left turn slip lane helps to minimise potential conflicts between left turning vehicles and cyclists, hence improves safety for cyclists
- Removal of the left turn slip lane frees up space for public realm / landscaping improvements

Constraints

- Removal of left turn slip lane and replacement of separate left and ahead lanes with a combined left / ahead may impact capacity at the junction

Option B – Protected Signalised Junction

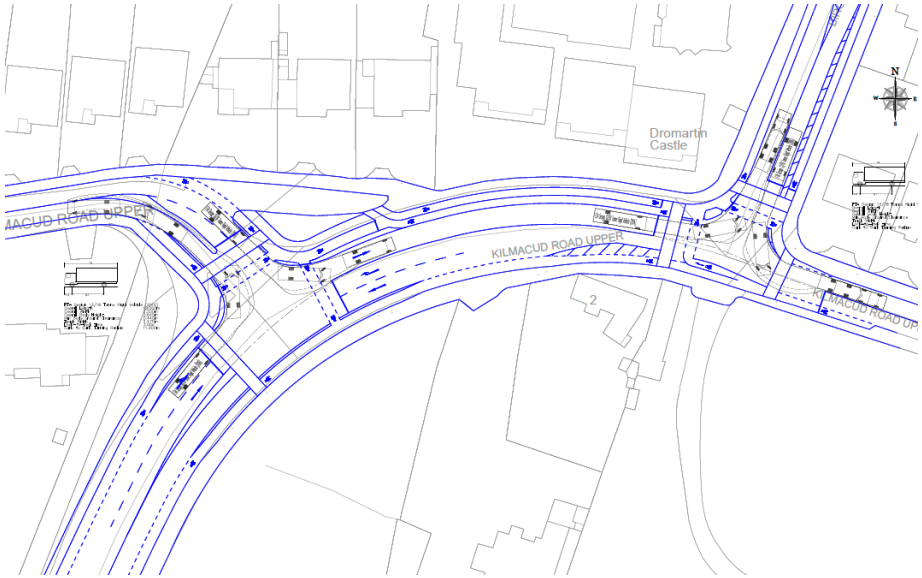

Figure 2.20: Option B – Protected Signalised Junction

Description: Controlled pedestrian crossings over each junction arm. Segregated cycle tracks on all approaches and a two-way cycle track on the northern side of road between Kilmacud Road Upper and Birches Lane. Enhanced safety for cyclists with protective islands at the junction corners.

The left turn slip lane from Overend Avenue to Kilmacud Road Upper is removed. The separate left and ahead lanes on the western arm of the Birches Lane junction is replaced with a combined left/ahead lane. Ban on right turn from Kilmacud Road Upper to Birches Lane retained. The removal of the left turn lane releases additional land which can be used for greening and landscaping for an improved public realm at the junction.

Opportunities

- Pedestrian crossing facilities are more direct and better meet desire lines compared to existing
- Pedestrians and cyclists are kept segregated from vehicular traffic, reducing conflict points
- Removal of left turn slip lane helps to minimise potential conflicts between left turning vehicles and cyclists, hence improves safety for cyclists
- Protective corner islands increase safety for cyclists travelling through the junction
- Provision of right turn cycle signal at Birches Lane junction enables connection for westbound cyclists to the two-way cycle tracks, as well as the northbound cycle track on Birches Lane
- Removal of left turn slip lane frees up space for public realm / landscaping improvements

Constraints

- Removal of left turn slip lane and replacement of separate left and ahead lanes with a combined left / ahead would impact capacity at the junction

Preferred Option

Following the MCA on the potential options, the preferred option was determined to be Option B, the Protected Signalised Junction, as shown below:

Figure 2.21: Kilmacud Road Upper / Overend Avenue / Birches Lane Preferred Option

2.7 Junction 5: Carysfort Avenue / Stillorgan Park Road / Fleurville Road Junction

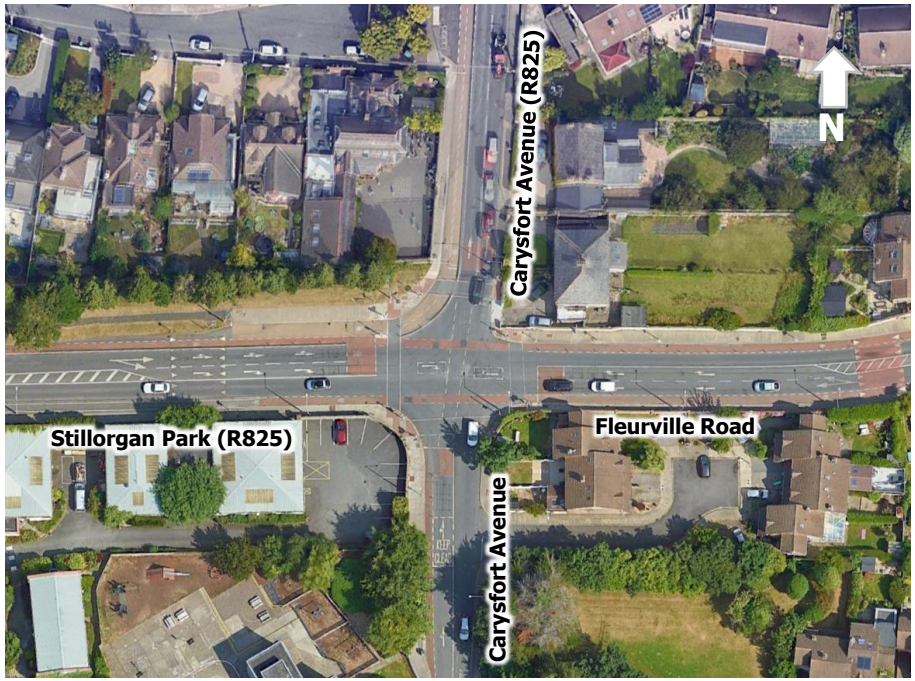

Figure 2.22: Existing Junction Layout

Existing Conditions:

The existing Carysfort Avenue R825 / Fleurville / Stillorgan Park junction operates as a four-arm signalised junction. Controlled pedestrian crossings are provided across all arms. There are on road cycle lanes through the junction with some light segregation from vehicles in the form of flexible bollards.

Key Design Considerations

A two-way cycle track was implemented on the western side of Carysfort Avenue (northern arm) by DLRCC in recent times. This also involved a reconfiguration of the traffic lanes on Carysfort Avenue at the time to allow for one northbound and one southbound traffic lane. The separate left turn lane on the western arm (Stillorgan Park Road) was also removed and a combined left/ahead lane provided instead. Cycle signals were also introduced on all arms of the junction as part of the scheme.

In addition to the above, there is another recently completed DLRCC Scheme on Stillorgan Park Road which terminates to the west of the junction. This comprises segregated cycle tracks on both sides of Stillorgan Park Road up to the N11 junction. Consequently, the option development process for the junction has sought to integrate these facilities / layouts into a unified layout for the junction.

Design Options Considered:

- Option A – Cycle Protected Signalised Junction
- Option B – Cycle Optimised Protected Junction (CYCLOPS)

The roundabout typologies were not considered for this junction due to levels of traffic management/control required at this junction, lands available and integration with recently implemented DLRCC schemes.

Option A – Cycle Protected Signalised Junction

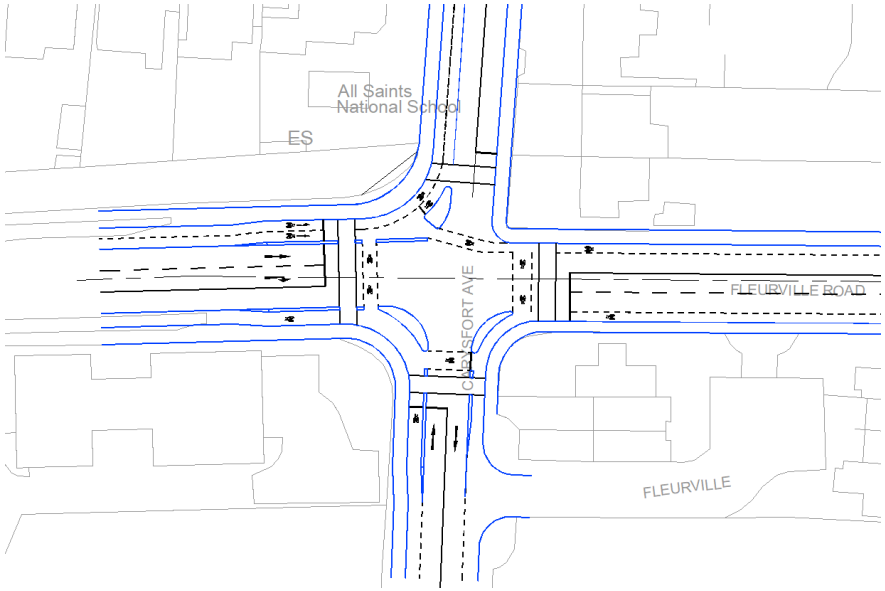

Figure 2.23: Option A – Cycle Protected Signalised Junction

Description: Controlled pedestrian crossings provided over each arm. Two-way cycle track retained on the western side of Carysfort Avenue (northern arm). Protective islands on junction corners increase safety for cyclists. This option retains the separate right turn traffic lane on the eastern arm (Fleurville) which limits the available space for increasing the cycle lane widths above the current c.1.5m wide lanes provided. However, the separate right turn traffic lane could be removed enabling 2.0m cycle tracks to be provided on both sides, although this would impact junction capacity. The permitted turning movements on all arms of the junction are therefore unchanged from the existing scenario.

Opportunities

- Offers high LoS and safety for pedestrians/cyclists compared to existing scenario as legible, segregated facilities are provided for both road user groups
- Cyclists could be provided an advanced cycle signal
- Improved level of safety for cyclists through the introduction of the islands on the corners protecting cyclists from left turning traffic
- Separate right turn lane on Fleurville could be removed to enable 2.0m wide cycle tracks on both side

Constraints

- If separate right turn lane on Fleurville is retained, then existing footpath and cycle lane widths are below desirable minimums
- Less convenient for pedestrians compared to Option B given the inability to provide diagonal crossings, therefore longer two-stage crossings required when walking from opposite corners
- Minimal opportunities for additional landscaping enhancements

Option B – Cycle Optimised Protected Junction

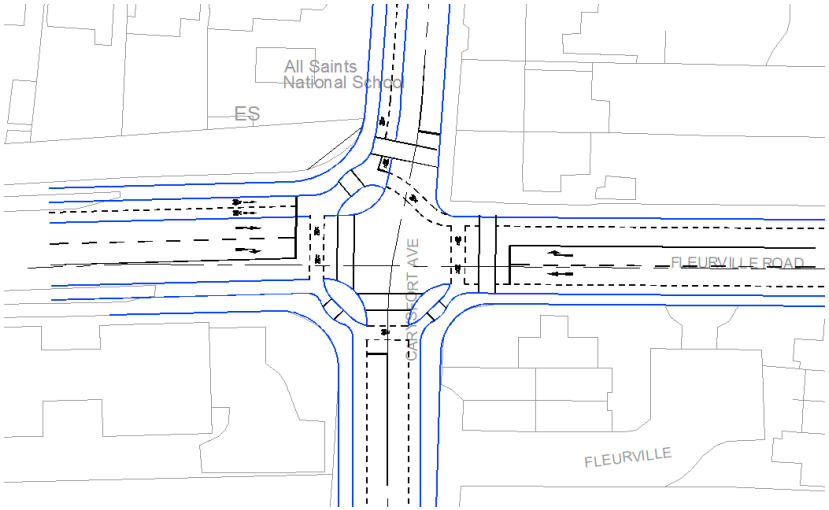

Figure 2.24: Option B – Cycle Optimised Protected Junction (CYCLOPS)

Description: External cycle system enables pedestrian crossings to be accommodated on inside of the junction, which enables diagonal crossing movements. Pedestrians wait within the large corner islands for a green signal to cross. Given the constraints on the northeast corner of the junction, it is not feasible to accommodate a corner island at this location. Cyclists can make fully protected two-stage right turns.

The CYCLOPs arrangement offers a convenient, legible tie into the two-way cycle track on the western side of the Carysfort Avenue (northern arm). The separate right turn traffic lane on the eastern arm limits the available space for increasing the cycle lane widths above the current c.1.5m wide cycle lanes. Removal of the right turn traffic lane should be considered to enable 2.0m cycle tracks to be provided on both sides.

Opportunities

- Potential for diagonal pedestrian crossings to be incorporated
- Cycle phases can run simultaneously during 'all red to traffic' stage
- Controlled cycle and pedestrian phases need not conflict and can run simultaneously
- Larger orbit radius ensures more space for storage at cycle signals and more comfortable, longer turning radii for cyclists
- Cyclists can filter left on / off the orbital route without signal control
- Separate right turn lane on Fleurville could be removed to enable 2.0m wide cycle tracks on both side

Constraints

- Relatively new type of junction design which may take time for all road users to adapt to its operation
- Slightly higher capital cost in comparison to Option A
- Introduction of dedicated pedestrian / cyclist phases will introduce delays to general traffic
- Not feasible to include pedestrian island on north-eastern corner due to space constraints
- If separate right turn lane on Fleurville is retained, then existing footpath and cycle lane widths are below desirable minimums
- Potential for pedestrian / cyclist conflict at zebra crossings over the cycle tracks which may be a concern for mobility impaired groups

Preferred Option

Following the MCA on the potential options, the preferred option was determined to be Option B, Cycle Optimised Protected Junction, as shown below:

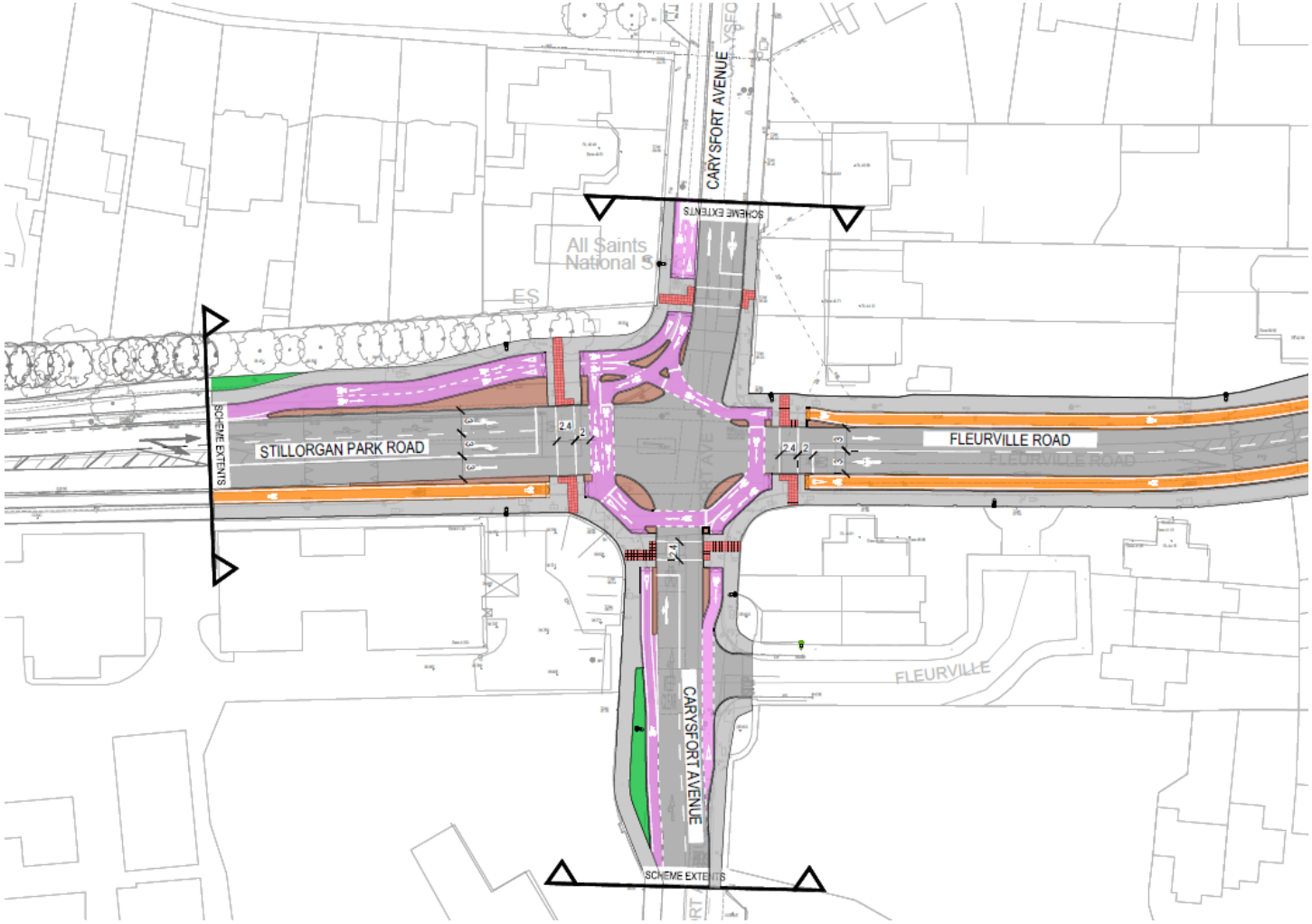

Figure 2.25: Carysfort Avenue / Fleurville Road / Stillorgan Park Road Preferred Option

2.8 Junction 6: Newtownpark Avenue / Annaville Terrace / Rowanbyrn Junction

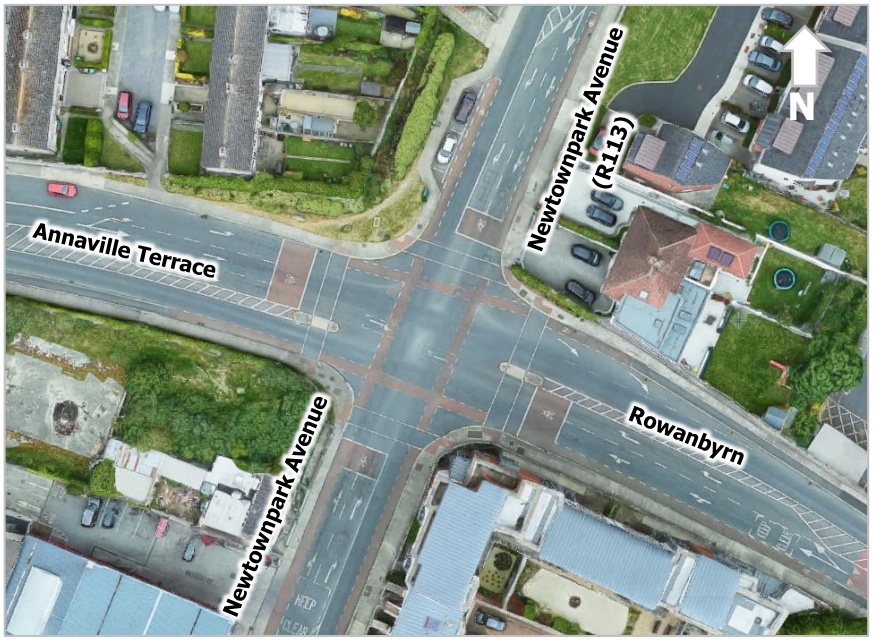

Figure 2.26: Existing Junction Layout

Existing Conditions:

The existing Newtownpark Avenue (R113) / Annaville Terrace / Rowanbyrn junction operates as a four-arm signalised junction. Controlled pedestrian crossings are provided on all arms of the junction. The existing traffic lane configurations result in excessively long pedestrian crossings on three of the arms, being between 15m-18m in length. There are on road cycle lanes on all arms of the junction, however these do not offer protection to cyclists from vehicles.

Key Design Considerations

There are a number of key local facilities and amenities in the vicinity of the junction including the Newpark Sports Centre and Hockey Club, Newpark Comprehensive School and the local retail Newpark Centre to the south.

The R113 Newtownpark Avenue is a key regional route. Under the BusConnects Network plan, several routes including the L25, L26, P11, P12 and S8 will pass through the junction.

Design Options Considered:

- Option A – Cycle Protected Signalised Junction
- Option B – Cycle Optimised Protected Junction (CYCLOPS)

The roundabout typologies were not considered for this junction due to a number of reasons, including levels of traffic management / control required at this junction and available lands surrounding the junction.

Option A – Cycle Protected Signalised Junction

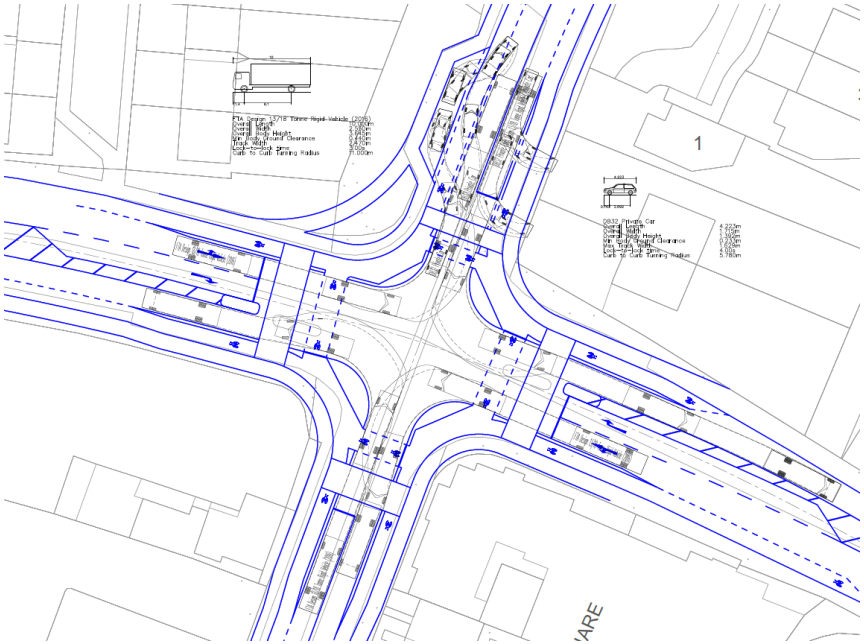

Figure 2.27: Option A – Cycle Protected Signalised Junction

Description: Footpaths provided on both sides of each arm of the junction and controlled crossings also over each arm. Formalise existing desire line through the green space area on the northwest corner. Protective corner islands increase safety for cyclists. A combined left / ahead lane is provided on Anaville Terrace. The separate right turn lanes on both the north and south Newtownpark Avenue arms are removed to facilitate the cycle tracks and junction geometry requirements to accommodate the corner islands. The merge lane on the departure side off the eastern arm (Rowanbyrn) is removed, enabling wider pedestrian / cyclist facilities to be provided on this side.

Opportunities

- Offers high LoS and safety for pedestrians / cyclists compared to existing scenario as legible, segregated facilities are provided for both road user groups
- Shorter crossing distances for pedestrians due to reconfigured traffic lanes
- Cyclists could be provided an advanced cycle signal
- Improved level of safety for cyclists through the introduction of the islands on the corners protecting cyclists from left turning traffic

Constraints

- Removal of separate left / right turn lanes will impact junction capacity
- Less convenient for pedestrians compared to Option B given the inability to provide diagonal crossings, therefore longer two-stage crossings required when walking from opposite corners
- Minimal opportunities for additional landscaping enhancements

Option B – Cycle Optimised Protected Junction

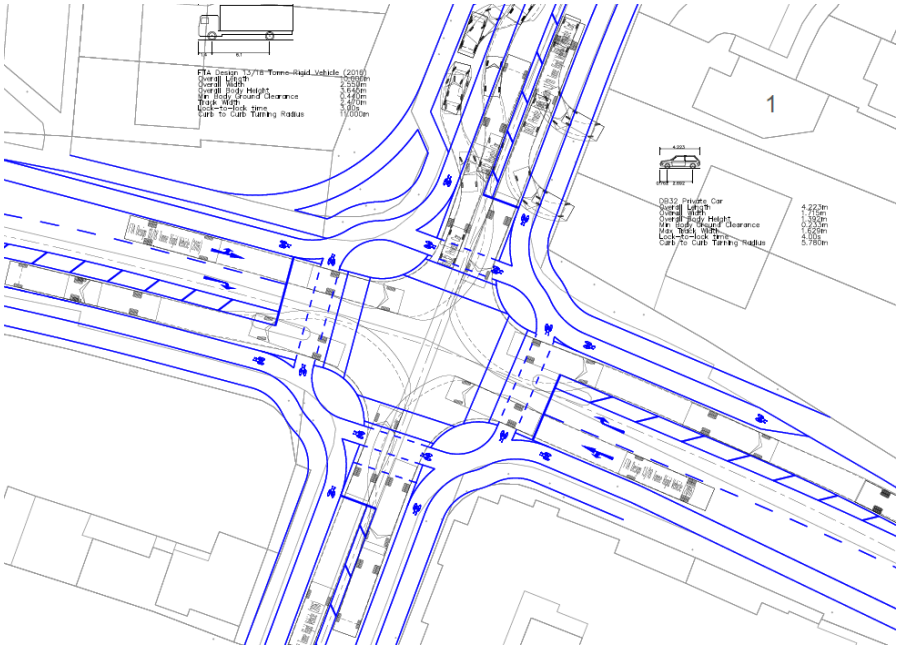

Figure 2.28: Option B – Cycle Optimised Protected Junction (CYCLOPS)

Description: Controlled pedestrian crossings over each junction arm. External cycle system enables pedestrian crossings to be accommodated on the inside of the junction, which enables diagonal crossing movements if required. Pedestrians can wait within the large corner islands for a green signal to cross. Cyclists can make fully protected two-stage right turns. The separate left turn lane from Annaville Terrace and separate right turn lanes on Newtownpark Avenue are replaced with combined turn lanes to accommodate the segregated cycle facilities and geometry changes required to facilitate the corner islands.

Opportunities

- Potential for diagonal pedestrian crossings to be incorporated
- Cycle phases can run simultaneously during 'all red to traffic' stage
- Controlled cycle and pedestrian phases need not conflict and can run simultaneously
- Larger orbit radius ensures more space for storage at cycle signals and more comfortable, longer turning radii for cyclists
- Cyclists can filter left onto and off the orbital route without signal control

Constraints

- Relatively new type of junction design which may take all road users some time to adapt to its operation
- Slightly higher capital cost in comparison to Option A
- Introduction of dedicated pedestrian / cyclist phases will introduce delays to general traffic
- Potential for pedestrian / cyclist conflict at zebra crossings over the cycle tracks which may be a concern for mobility impaired groups

Preferred Option

Following the MCA on the potential options, the preferred option was determined to be Option B a Cycle Optimised Protected Junction, as shown below:

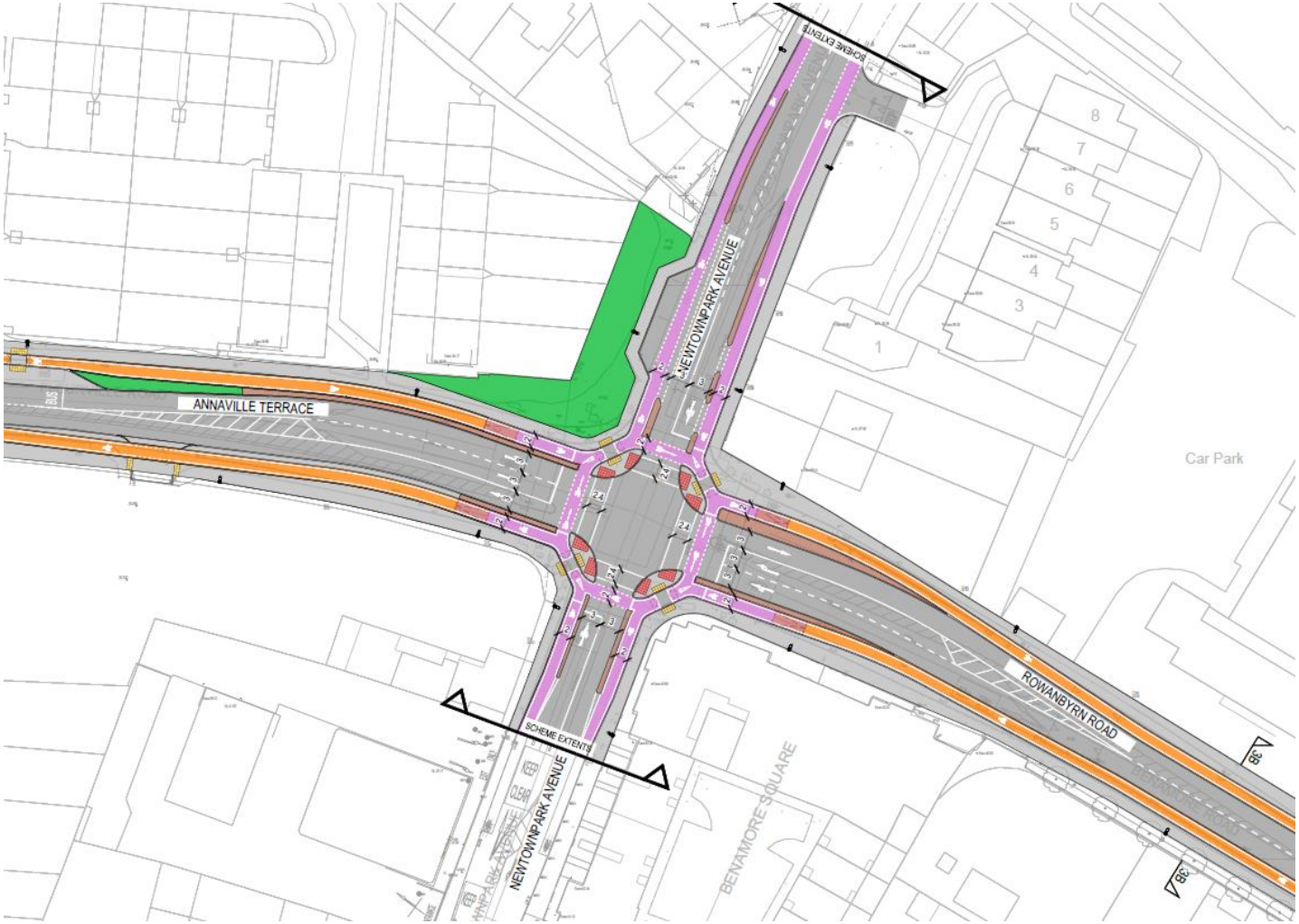

Figure 2.29: Newtownpark Avenue / Annaville Terrace / Rowanbyrn Road Preferred Option

2.9 Junction 7: Deansgrange Road / Brookville Road / Monkstown Link Road Junction

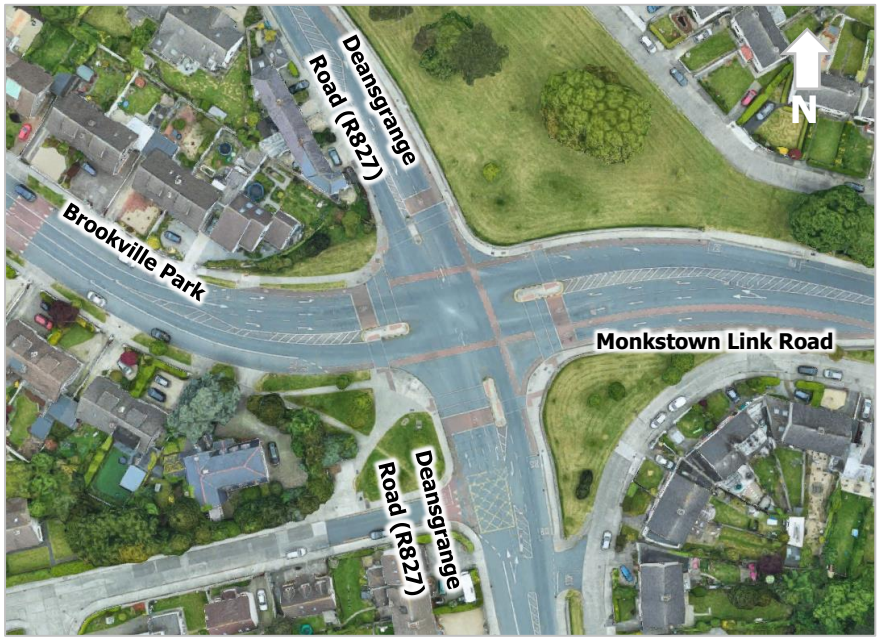

Figure 2.30: Existing Junction Layout

Existing Conditions:

The existing Deansgrange Road / Brookville Road junction operates as a four-arm signalised junction. The are multiple approach lanes on all arms of the junction. There are controlled pedestrian crossings on all arms of the junction. Due to the lane configurations, these crossings are excessively wide and are consequently two-stage crossings. There are on-road cycle lanes through the junction which offer no protection to cyclists from vehicles.

Key Design Considerations

DLRCC have recently implemented a segregated two-way cycle track along the western side of Deansgrange Road (southern arm). Two traffic lanes along Deansgrange Road in either direction have been retained. Consequently, the option development process for the junction has sought to integrate these facilities / layouts into a unified layout for the junction.

Design Options Considered:

- Option A – Cycle Protected Signalised Junction
- Option B – Cycle Optimised Protected Junction (CYCLOPS)

The roundabout typologies were not considered for this junction due to levels of traffic management / control required at this junction.

Option A – Cycle Protected Signalised Junction

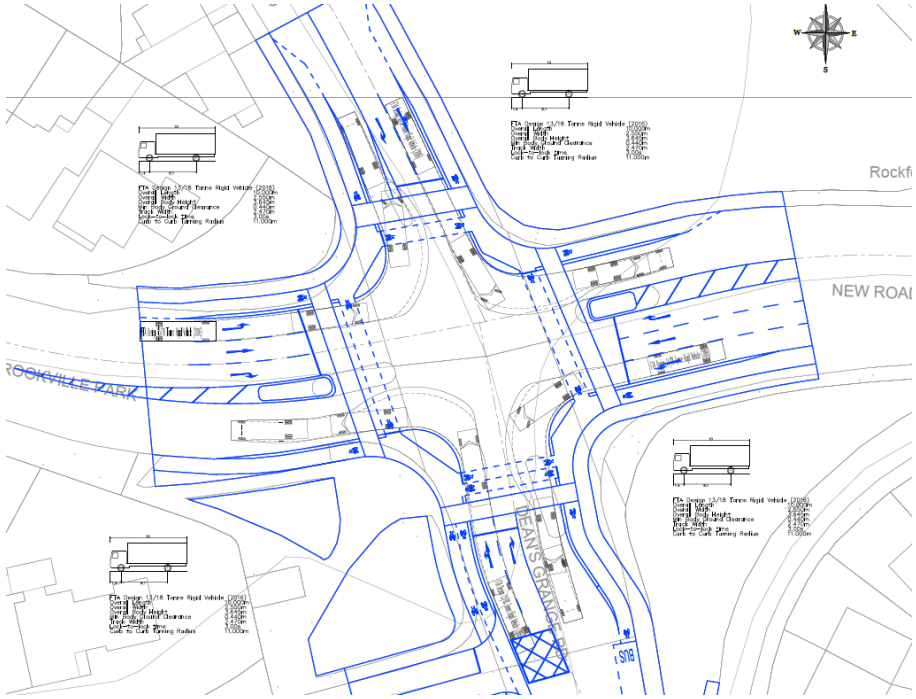

Figure 2.31: Option A – Cycle Protected Signalised Junction

Description: Controlled pedestrian crossings provided over each arm. Integrates the two-way cycle track on the southern Deansgrange Road arm. Protective corner islands increase safety for cyclists. Existing lane configurations on the west, north and east arms and permitted turning movements are unchanged from existing. A short left/ahead and right turn lane is provided on the southern arm. No significant freeing up of additional space, however the existing greenspace areas on the corners of the junction could be enhanced through landscaping / public realm improvements as part of this option.

Opportunities

- Offers good levels of integration with the Deansgrange Road two-way cycle scheme
- Offers a high LoS and safety for pedestrians / cyclists compared to existing scenario as legible, segregated facilities are provided for both road user groups
- Cyclists could be provided an advanced cycle signal
- Improved level of safety for cyclists through the introduction of the islands on the corners protecting cyclists from left turning traffic
- Opportunity to provide public realm / landscaping enhancements within existing green spaces on junction corners

Constraints

- Less comfortable transition for cyclists to / from the two-way cycle track compared to Option B
- Less convenient for pedestrians compared to Option B given the inability to provide diagonal crossings, therefore longer two-stage crossings required when walking from opposite corners
- No freeing up of any additional space public realm / landscaping enhancements

Option B – Cycle Optimised Protected Junction

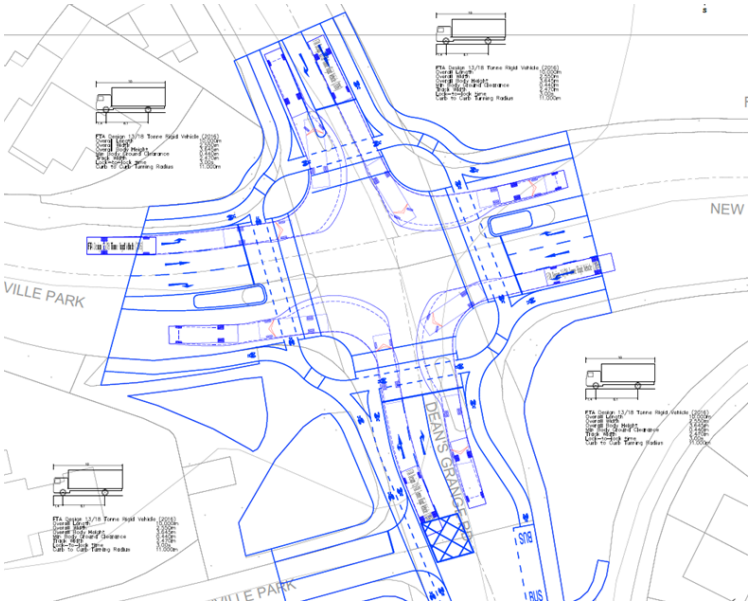

Figure 2.32: Option B – Cycle Optimised Protected Junction (CYCLOPS)

Description: Controlled pedestrian crossings over each junction arm. External cycle system enables pedestrian crossings to be accommodated on the inside of the junction, thereby enabling diagonal crossing movements. Pedestrians accommodated within the large islands at each corner of the junction where they can wait for a green signal to cross. Cyclists can make fully protected two-stage right turns. The proposed CYCLOPs arrangement offers a convenient and legible tie into the two-way cycle track on the western side of Deansgrange Road. All lane configurations and permitted turning movements are unchanged from existing. The short left / ahead and right turn lanes are retained on the southern arm as per the Deansgrange Road scheme proposals.

Opportunities

- Offers good levels of integration with the Deansgrange Road two-way scheme
- Potential for diagonal pedestrian crossings to be incorporated
- Cycle phases can run simultaneously during 'all red to traffic' stage
- Controlled cycle and pedestrian phases need not conflict and can run simultaneously
- Larger orbit radius ensures more space for storage at cycle signals and more comfortable, longer turning radii for cyclists
- Cyclists can filter left onto and off the orbital route without signal control

Constraints

- Relatively new type of junction design which may take all road users time to adapt to its operation
- Slightly higher capital cost in comparison to Option A
- Introduction of dedicated pedestrian / cyclist phases will introduce delays to general traffic
- Potential for pedestrian/cyclist conflict at zebra crossings over cycle tracks which may be a concern for mobility impaired groups
- Limited additional space freed up for public realm / landscaping enhancements

Preferred Option

Following the MCA on the potential options, the preferred option was determined to be Option B a Cycle Optimised Protected Junction, as shown below:

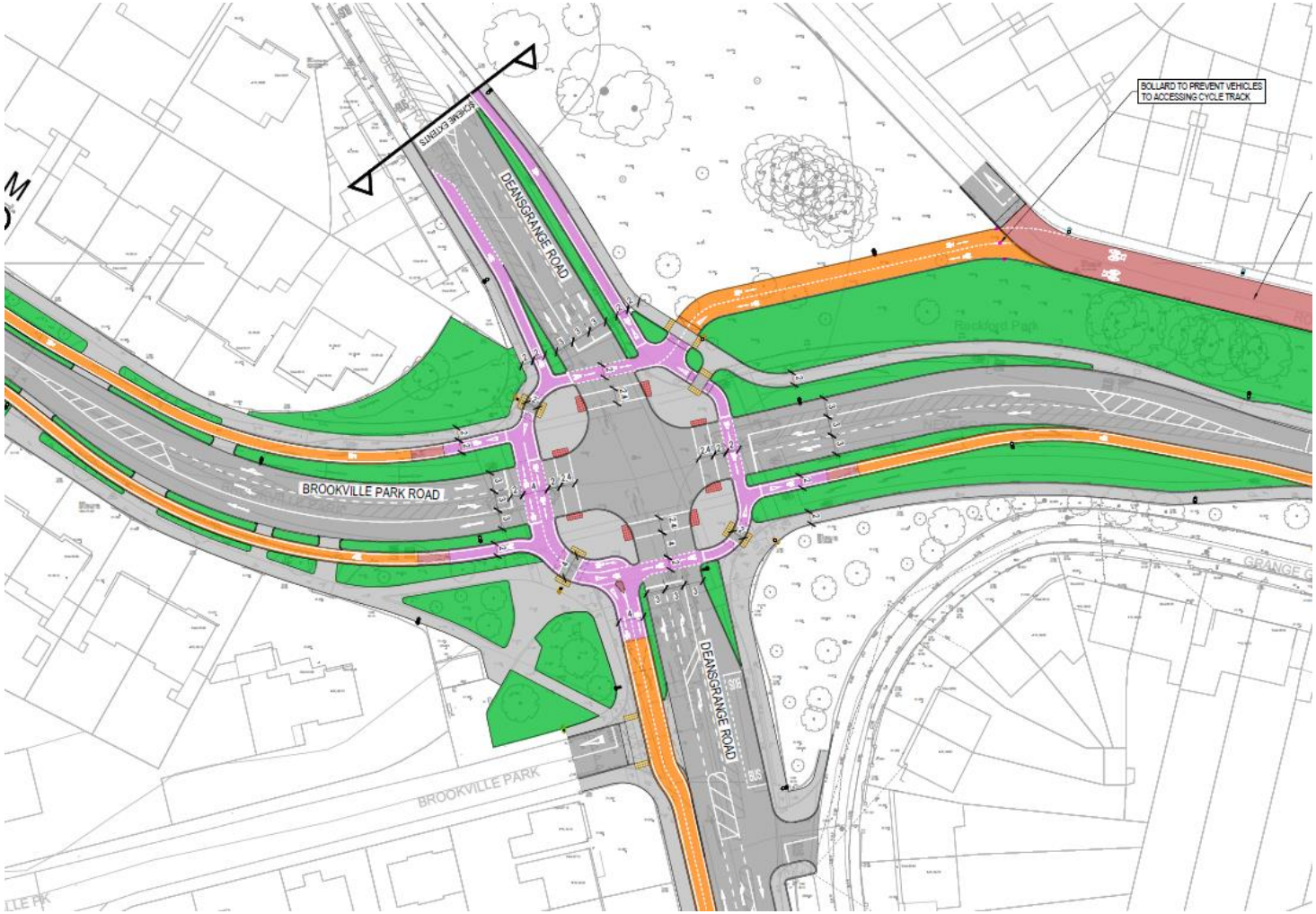

Figure 2.33: Deansgrange Road / Brookville Park Road Preferred Option

2.10 Junction 8: Stradbrook Roundabout

Figure 2.34: Existing Junction Layout

Existing Conditions:

The existing Stradbrook Roundabout currently operates as a four arm roundabout and has an irregularly shaped central island. All arms comprise single lane approach and departure lanes, separated by splitter islands. Three of the four approach arms have advisory cycle lanes but cyclists have to share the circulatory lane through the roundabout. Footpaths are provided on both sides of each arm of the roundabout with informal / uncontrolled crossings provided over each arm with refuge areas provided in the splitter islands.

At present, the roundabout can experience queues and congestion in the peak hours. This can be exacerbated by queues forming at the Monkstown Farm junction to the east extending back as far as the roundabout. There is also a high proportion of through traffic on Stradbrook Road and with these high traffic volumes it can deter less confident cyclists and vulnerable road users from accessing the local schools and other services/amenities by foot or on bike.

Key Design Considerations

The roundabout occupies an excessively large area, with a large irregularly shaped Inscribed Circle Diameter (ICD) >70m. The central island is landscaped including a number of trees. A loading bay is located off the eastern side, previously used to service the commercial unit on the Monkstown Avenue corner. Five bus routes will travel through this junction under the BusConnects bus network redesign proposals.

Design Options Considered:

- Option A – Upgraded Roundabout
- Option B – Protected 'Dutch Style' Roundabout
- Option C – Three Arm Protected 'Dutch Style' Roundabout
- Option D - Staggered Priority / Signalised Junctions
- Option E – Cycle Protected Signalised Junction
- Option F – Cycle Optimised Protected Junction
- Option G – Three Arm Cycle Optimised Protected Junction
- Option H – Grade Separated Junction

Option A – Upgraded Roundabout

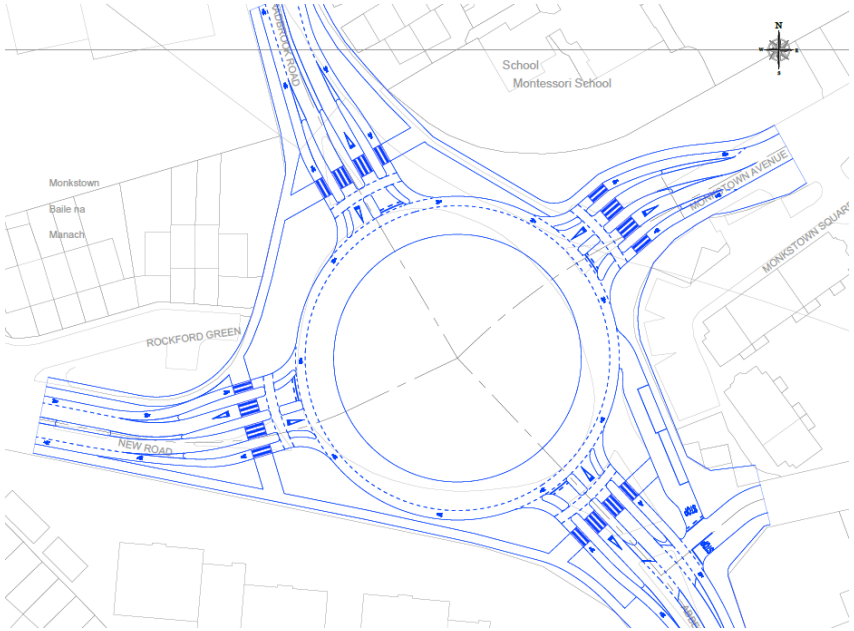

Figure 2.35: Option A – Upgraded Roundabout

Description: Crossing facilities in the form of Zebra crossings are provided for pedestrians over each arm of the junction. Segregated cycle tracks are provided on all arms of the junction and a circulatory cycle lane around the junction. Traffic flow through the roundabout would be regulated to some extent by the operation of the Zebra crossings, whereby traffic would be required to stop at the crossings when there is demand. This option may free up some additional space around the edges of the junction which could accommodate landscaping / public realm enhancements. However, these greenspaces would be relatively disjointed and it would not be possible to consolidate into a larger usable space.

Opportunities

- Controlled crossing facilities on all arms for pedestrians better meet desire lines compared to existing uncontrolled crossings
- Pedestrians and cyclists are kept segregated reducing conflict points
- Maintains all existing movements for vehicular traffic
- Roundabout ICD could be greatly reduced, thereby releasing lands for public realm / landscaping enhancements
- Compact roundabout could promote lower vehicle speeds and improve road safety

Constraints

- Zebra crossings introduce slight delays for vehicular traffic compared to existing scenario
- Not as efficient in terms of traffic management and adaptability as the signalised junction options
- Safety for pedestrians / cyclists improved compared to existing scenario, however circulatory cycle lane offers less protection for cyclists compared to other options
- Level of Service (LoS) for pedestrians and cyclists lower than that offered by other options

Option B – Protected 'Dutch Style' Roundabout

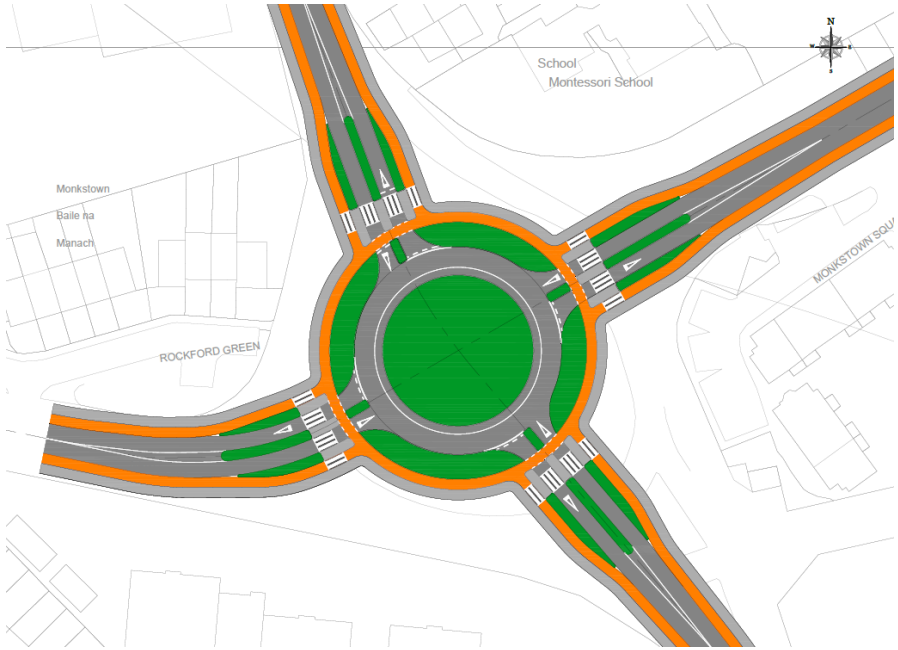

Figure 2.36: Option B – Protected 'Dutch' Style Roundabout

Description: Parallel crossings on all arms keep pedestrian and cyclist crossing movements segregated. Cyclists are provided with segregated cycle tracks on all junction arms and a segregated orbital cycle track through the junction. Traffic flow through the roundabout regulated to some extent by the operation of the parallel crossings. Traffic would be required to stop at the Parallel Crossings when there is demand for the crossing by pedestrians / cyclists. Could free up some additional space around the junction edges to accommodate landscaping / public realm enhancements. However, these greenspaces would be relatively disjointed and it would not be possible to consolidate into a larger usable space.

Opportunities

- Controlled crossing facilities on all arms for pedestrians & cyclists, better meet desire lines compared to existing uncontrolled crossings
- Safety and LoS for pedestrians / cyclists improved compared to existing scenario and Option A as pedestrians / cyclists are kept fully segregated from traffic reducing potential conflict points
- Maintains all existing movements for vehicular traffic
- Roundabout ICD could be greatly reduced, thereby releasing lands for public realm / landscaping enhancements
- Compact junction size would promote lower vehicle speeds and improve road safety

Constraints

- Slightly higher capital cost in comparison to Option A, to facilitate the segregated orbital cycle track
- Parallel crossings would introduce slight delays for vehicular traffic compared to existing scenario
- Not as efficient in terms of traffic management and adaptability as the signalised junction options
- Areas of landscaping around the junction are fragmented

Option C – Three Arm Protected 'Dutch Style' Roundabout

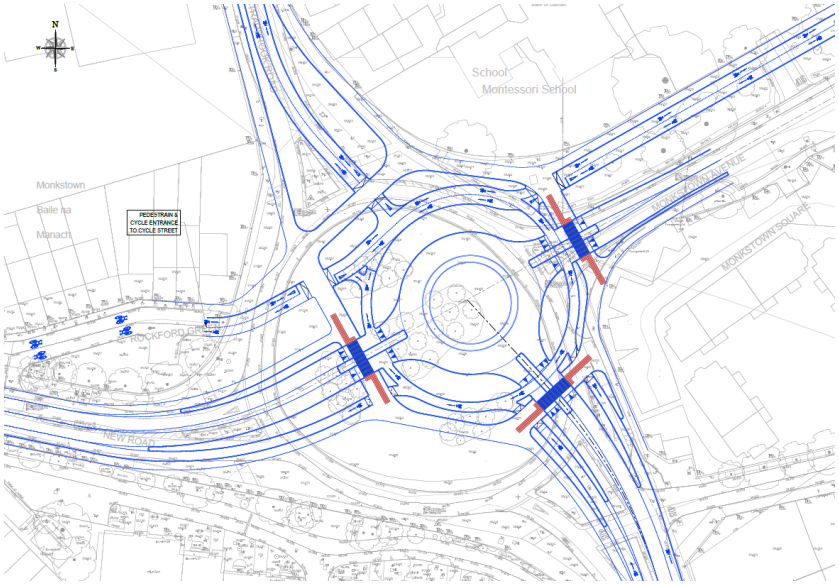

Figure 2.37: Option C – Three Arm Protected 'Dutch Style' Roundabout

Description: Parallel crossings on all arms keep pedestrian and cyclist crossing movements segregated. Cyclists are provided with segregated cycle tracks on all junction arms and a segregated orbital cycle track through the junction. Vehicle connection from Stradbrook Road replaced with a modal filter. The modal filter offers an attractive facility for pedestrians and cyclists and makes Stradbrook Road a quiet street. Local access retained for residents off Stradbrook Road. Traffic flow through the roundabout regulated to some extent by the operation of the parallel crossings. Could free up some additional space around the junction edges to accommodate landscaping / public realm enhancements. However, these greenspaces would be relatively disjointed and it would not be possible to consolidate into a larger usable space.

Opportunities

- Controlled crossing facilities on all arms for pedestrians & cyclists, better meet desire lines compared to existing uncontrolled crossings
- Pedestrian / cyclist junction bypasses could be created through the open space areas along desire lines
- Safety and LoS for pedestrians / cyclists improved compared to existing scenario as pedestrians/cyclists are segregated from traffic
- Modal filter removes through traffic from Stradbrook Road, enhancing air and noise quality for local residents
- Reduced junction size promotes lower speeds, improves safety and may have positive impacts on air quality/noise due to reduced speeds
- Reduced junction size releases lands for landscaping / public realm enhancements
- Avoids impacting on-street parking on Stradbrook Road as segregated cycle lanes not required with it becoming a quiet street

Constraints

- Higher capital cost in comparison to Option A and B with the creation of the modal filter and increased landscaped areas
- Parallel crossings would introduce slight delays for vehicular traffic compared to existing scenario
- Not as efficient in terms of traffic management and adaptability as the signalised junction options

Option D – Staggered Priority / Signalised Junctions

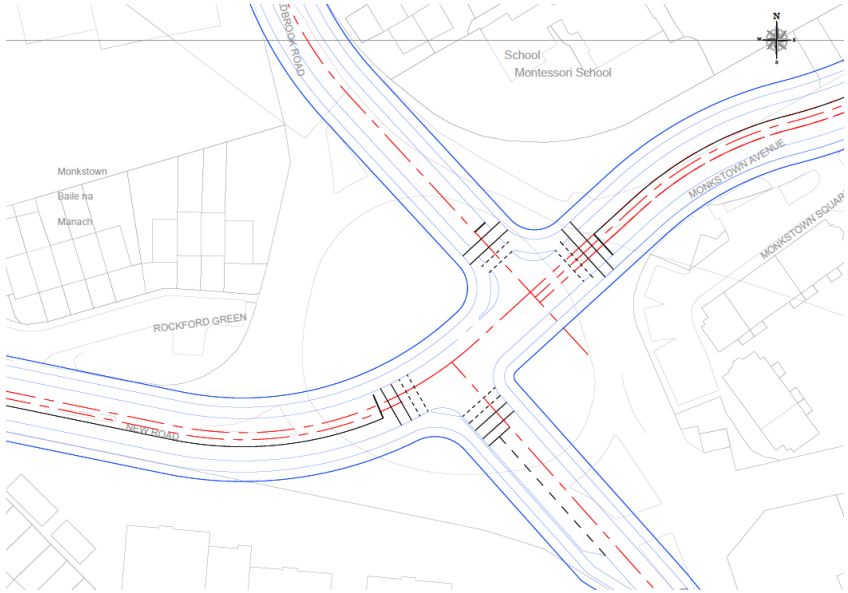

Figure 2.38: Option D – Staggered Priority / Signalised Junctions

Description: Roundabout split into a staggered junction which could operate as either priority or signalised junctions depending on results of traffic analysis. Controlled crossing facilities provided over each arm and footpaths created through the open space areas along desire lines. Segregated cycle tracks on all junction arms and protective corner islands to enhance safety for cyclists. Sufficient space available to accommodate bus priority measures if required. Staggered layout would offer greater regulation of traffic flow, particularly from north and south directions. Sufficient space to accommodate dedicated left/right turn lanes where required to assist in minimising delays. Frees up substantial area enabling larger consolidated greenspace areas by realigning the north/south junction arms facilitating landscaping / public realm improvements.

Opportunities

- More compact junction layout enables pedestrian / cyclist crossing facilities on all arms which better meet desire lines compared to roundabout layouts
- Pedestrian / cyclist junction bypasses could be created through the open space areas along desire lines
- Safety and LoS for pedestrians/cyclists improved compared to existing scenario as pedestrians/cyclists are segregated from traffic
- Protective corner islands enhance safety for cyclists
- Bus priority / advanced signal could be provided for buses if required
- Maintains all existing movements for vehicular traffic
- Signalised junction allows for better level of control for vehicles through the junction and better adaptability for these type of junctions
- Reduced junction size promotes lower vehicle speeds & improves safety
- Reduced junction size may have positive impacts on air quality / noise due to reduced speeds
- Reduced junction size releases lands for landscaping / public realm enhancements

Constraints

- Higher capital cost in comparison to Option A and B as this requires removal of roundabout
- Introduction of dedicated pedestrian / cyclist phases will introduce delays to general traffic
- Layout unlikely to be efficient from a traffic management perspective with many turning movements required in close proximity
- Open spaces on corners of the junction are still slightly disjointed

Option E – Cycle Protected Signalised Junction

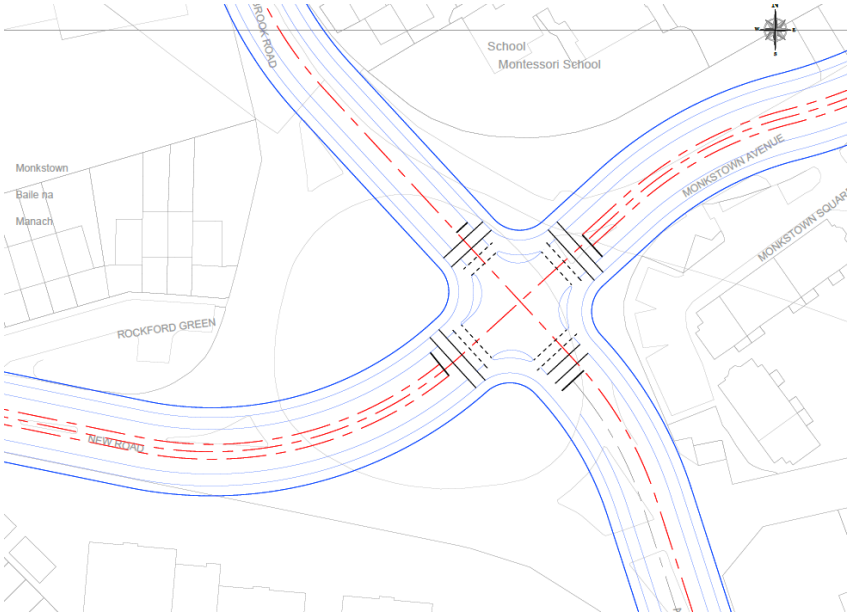

Figure 2.39: Option E – Protected Signalised Junction

Description: Controlled crossing facilities provided over each arm and footpaths created through the open space areas along desire lines. Segregated cycle tracks on all arms and protective corner islands enhance safety for cyclists. All turning movements would still be catered for and there is sufficient space available to accommodate bus priority measures if required. Offers greater regulation of traffic flow compared to the roundabout options. Frees up a substantial area of the land at the junction compared to the roundabout options. Larger consolidated greenspace areas are possible by pulling the alignment of the junction eastwards which would facilitate greater landscaping / public realm improvements compared to Options A, B and C.

Opportunities

- More compact junction layout enables pedestrian / cyclist crossing facilities on all arms which better meet desire lines compared to roundabout layouts
- Pedestrian / cyclist junction bypasses could be created through the open space areas along desire lines
- Safety and LoS for pedestrians / cyclists improved compared to existing scenario as pedestrians/cyclists are kept segregated from traffic
- Protective corner islands enhance safety for cyclists
- Bus priority / advanced signal could be provided for buses if required
- Larger, consolidated open space areas on the northwest and southwest junction corners with the junction alignment pulled eastwards, freeing up space for public realm enhancements
- Maintains all existing movements for vehicular traffic
- Signalised junction allows for better level of control for vehicles through the junction and better adaptability for these type of junctions
- Reduced junction size will promote lower vehicle speeds and improve road safety
- Reduced junction size may have positive impacts on air quality/noise due to reduced speeds

Constraints

- Higher capital cost in comparison to Option A and B as this requires removal of roundabout
- Introduction of dedicated pedestrian / cyclist phases will introduce delays to general traffic

Option F – Cycle Optimised Protected Junction

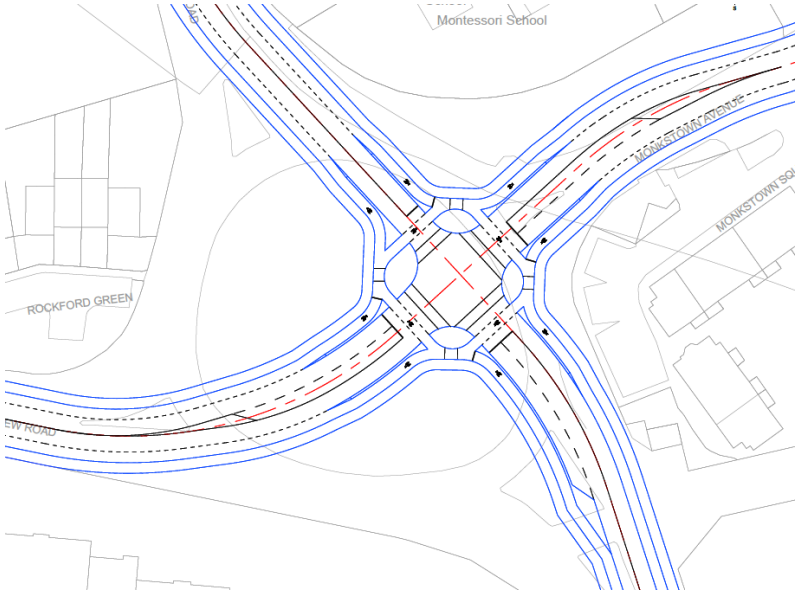

Figure 2.40: Option F – Cycle Optimised Protected Junction (CYCLOPS)

Description: Controlled pedestrian crossings over each junction arm. External cycle system enables pedestrian crossings to be accommodated on the inside of the junction, thereby enabling diagonal crossing movements. Accommodates cyclists within an external orbital system around the junction. Cyclists can make fully protected two-stage right turns. Sufficient space available to accommodate bus priority measures if required. CYCLOPs junction layout offers greater regulation of traffic flow compared to the roundabout options. Sufficient space to accommodate dedicated left / right turn lanes where required to assist in minimising delays. Frees up a substantial portion of the lands at the junction compared to the roundabout options which could facilitate greater landscaping / public realm improvements.

Opportunities

- Controlled pedestrian phases are shorter and closer to desire lines
- Potential for diagonal pedestrian crossings to be incorporated
- Cycle phases can run simultaneously during 'all red to traffic' stage
- Controlled cycle and pedestrian phases need not conflict and can run simultaneously
- Larger orbit radius ensures more space for storage at cycle signals and more comfortable, longer turning radii for cyclists
- Cyclists can filter left onto and off the orbital route without signal control
- Safety and LoS for pedestrians/cyclists improved compared to existing scenario as pedestrians / cyclists segregated from traffic
- Can incorporate bus priority measures if required
- Signalised junction allows for better level of control for vehicles through the junction and better adaptability for these type of junctions
- Larger, consolidated open space areas freeing up space for public realm enhancements
- Reduced junction size promotes lower speeds and improves road safety
- Reduced junction size may have positive impacts on air quality / noise due to reduced speeds

Constraints

- Relatively new type of junction design which may take all road users some time to adapt to its operation
- Potentially slightly higher capital cost in comparison to Option D
- Introduction of dedicated pedestrian / cyclist phases will introduce delays to general traffic
- Potential for pedestrian / cyclist conflict at zebra crossings over cycle tracks which may be a concern for mobility impaired groups

Option G – Three Arm Cycle Optimised Protected Junction

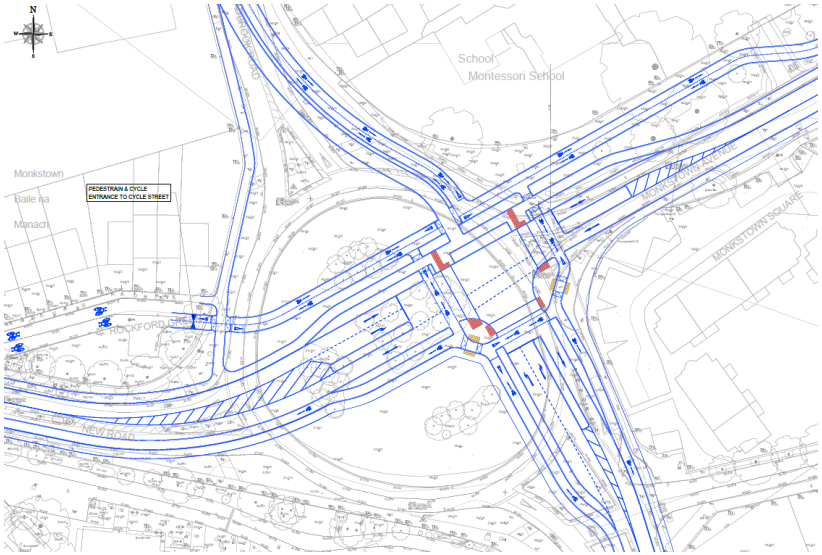

Figure 2.41: Option G – 3-Arm Cycle Optimised Protected Junction (CYCLOPS)

Description: Controlled pedestrian crossings over each junction arm. External cycle system enables pedestrian crossings to be accommodated on the inside of the junction, thereby enabling diagonal crossing movements. Vehicle connection from Stradbrook Road replaced with a modal filter. The modal filter offers an attractive facility for pedestrians and cyclists and makes Stradbrook Road a quiet street. Local access retained for residents off Stradbrook Road. CYCLOPs junction layout offers greater regulation of traffic flow compared to the roundabout options. Sufficient space to accommodate dedicated left/right turn lanes where required to assist in minimising delays. Frees up a very substantial portion of the lands at the junction compared to the roundabout options which could facilitate greater landscaping/public realm improvements.

Opportunities

- Controlled pedestrian phases are shorter and closer to desire lines
- Potential for diagonal pedestrian crossings to be incorporated
- Cycle phases can run simultaneously during 'all red to traffic' stage
- Controlled cycle and pedestrian phases can run simultaneously
- Attractive routes through new green space areas for pedestrians/cyclists
- Cyclists can filter left onto and off the orbital route without signal control
- Safety and LoS for pedestrians/cyclists improved compared to existing scenario as pedestrians/cyclists segregated from traffic
- Can incorporate bus priority measures if required
- Modal filter removes through traffic from Stradbrook Road, enhancing air and noise quality for local residents
- Signalised junction allows for better level of control for vehicles through the junction and better adaptability for these type of junctions
- Larger, consolidated open space areas freeing up space for public realm enhancements
- Reduced junction size promotes lower speeds, improves road safety and may have positive impacts on air quality/noise due to reduced speeds
- Avoids impacting on-street parking on Stradbrook Road

Constraints

- Relatively new type of junction design which may take all road users some time to adapt to its operation
- Potentially slightly higher capital cost in comparison to Option D
- Introduction of dedicated pedestrian / cyclist phases will introduce delays to general traffic
- Potential for pedestrian/cyclist conflict at zebra crossings over cycle tracks which may be a concern for mobility impaired groups

Option H – Grade Separated Junction

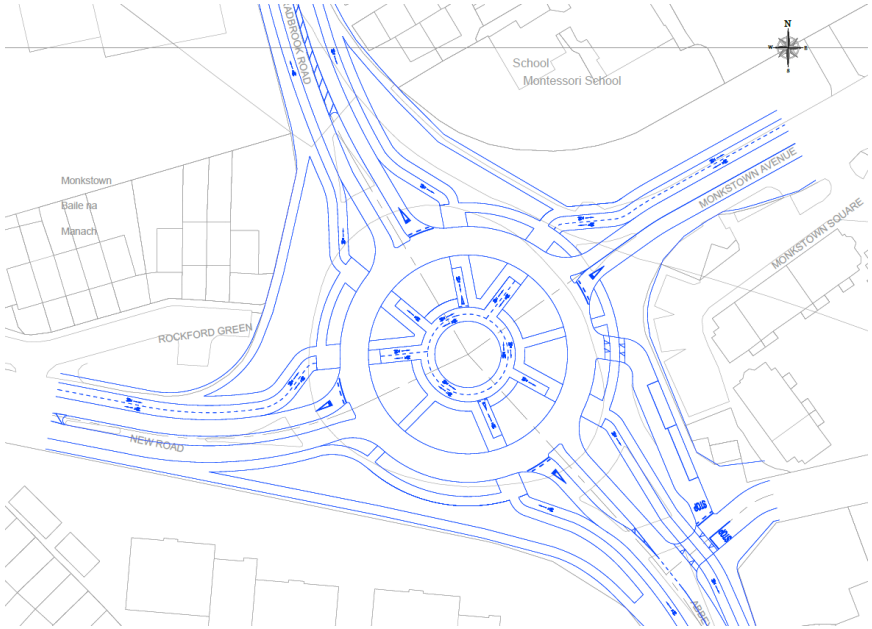

Figure 2.42: Option H – Grade Separated Junction

Description: Grade separated junction, whereby an underpass is provided for pedestrian / cyclist movements, whilst vehicle movements remain at grade. Pedestrians crossing movements would be facilitated via the underpass network of paths. The removal of at grade pedestrian / cyclist crossing movements removes potential conflicts with vehicles. Segregated cycle tracks are provided all arms of the roundabout. Buses would share approach lanes to the junction with general traffic but all turning movements would still be catered for. Removal of at-grade pedestrian/cyclist crossing movements would reduce delays to traffic flow through the roundabout. Given the space required to accommodate the transitions and gradients for the underpass facilities there is minimal space available for landscaping or public realm improvements.

Opportunities

- Reduces time delays for all users travelling through the junction
- Offers high levels of safety and LoS for pedestrians/cyclists as they are kept segregated from vehicle movements, wholly eliminating vehicle / Non Motorised User conflicts
- Maintains all existing movements for vehicular traffic

Constraints

- High capital cost in comparison to all other options due to significant earthworks and potential diversions to major underground utilities / services
- Significant land take required to achieve appropriate ramp gradients
- Less direct as ramp size / length likely to increase pedestrian / cyclist crossing distances compared to at-grade crossings
- Underpass may be perceived as unsafe by users as there is less passive surveillance, particularly during hours of darkness
- Significant public realm and visual impacts
- No freeing up of existing space for public realm or landscaping enhancements

Preferred Option

Following the MCA on the options, the preferred option was determined to be Option 3, a three arm Cycle Optimised Protected Junction, as shown below:

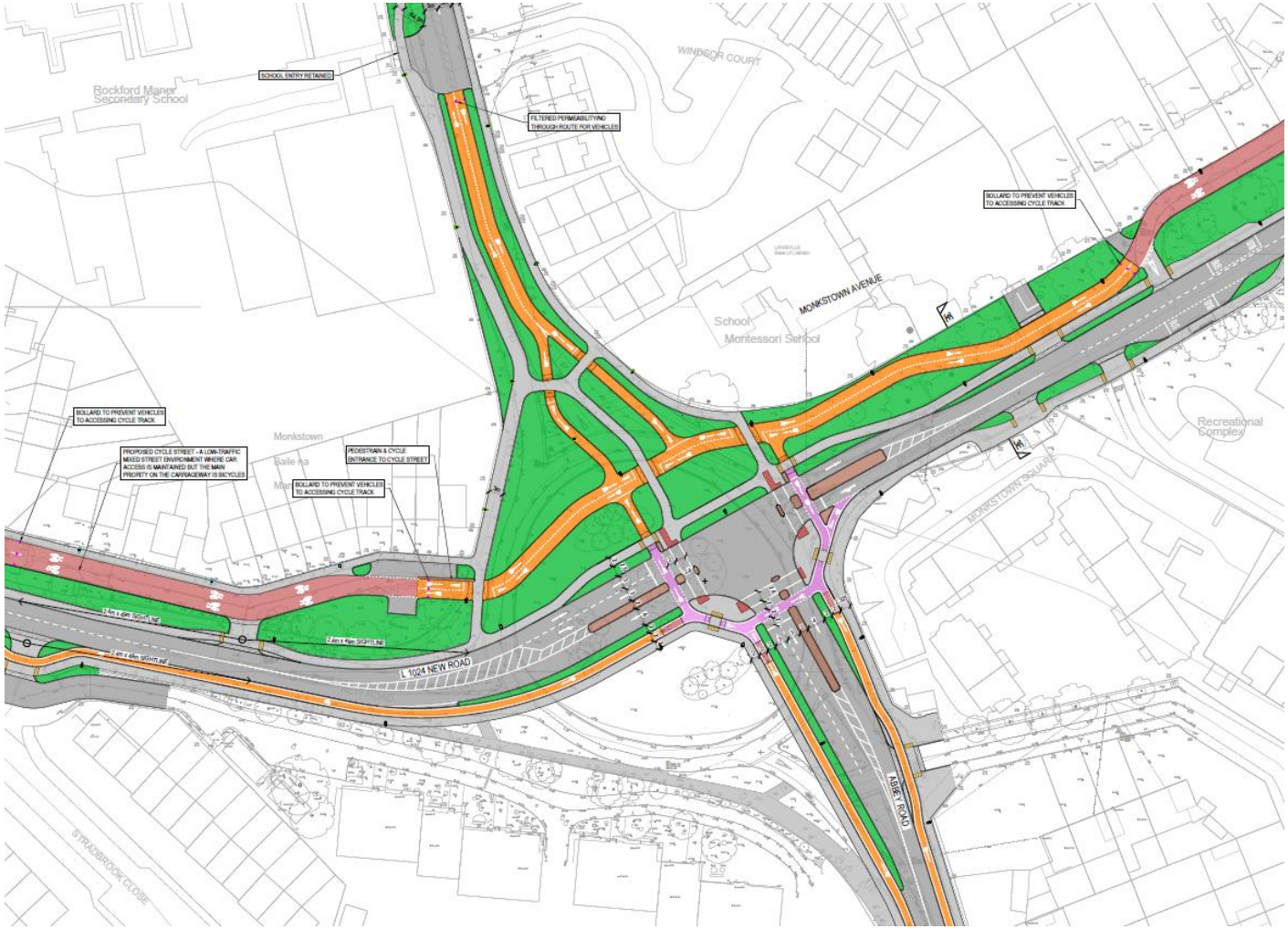

Figure 2.43: Stradbrook Junction Preferred Option

2.11 Junction 9: Monkstown Farm / Monkstown Avenue Junction

Figure 2.44: Existing Junction Layout

Existing Conditions: The existing Monkstown Avenue / Monkstown Farm junction currently operates as a three arm signal-controlled junction. The section of Monkstown Avenue (approximately 35m in length) immediately east of Monkstown Farm is constrained by private property boundary walls either side resulting in a 6.0m wide carriageway and sub – standard footpaths on both sides between 1.3m-1.8m wide. There are also two private property accesses on the northern side of the constrained section. There are a number of mature trees located in the greenspace areas both ends of this constrained section. The constrained width, together with the access point to properties and side roads mean that a conventional cross section is not achievable.

Key Design Considerations

This section of Monkstown Avenue between Monkstown Farm and Ashton Park is particularly constrained, being approximately 9.7m wide. There is often congestion and queuing, particularly during peak times which can extend back and impact the efficiency of the Stradbrook Roundabout. A range of options have been examined which seek to achieve high-quality pedestrian and cyclist facilities whilst also catering for general traffic, including bus services, along what is a relatively well trafficked section of the route.

Design Options Considered:

- Option A: Two-Way Cycle Track Connection East of Ashton Park & One Lane Shuttle System
- Option B: On-Street Connection with Dedicated Cycle Phase
- Option C: Two-Way Cycle Track, One Lane Shuttle System & Ashton Park Filtered Permeability
- Option D: On-Street Cycle Connection
- Option E: On-Street Cycle Connection & Realigned Crossings
- Option F: Two-Way Cycle Track Connection West of Ashton Park & One Lane Shuttle System

An option to provide a cycle lane to the southern side of Monkstown Avenue was considered unfeasible and undesirable. This is due to the main cycle route along Monkstown Avenue being continued along the quiet parallel access streets located on the northern side. Consequently, to minimise the number of crossing movements and create a more direct, legible route for cyclists, the options considered include cycle facilities along the northern side.

Option A – Two-Way Cycle Track Connection East of Ashton Park & One Lane Shuttle System

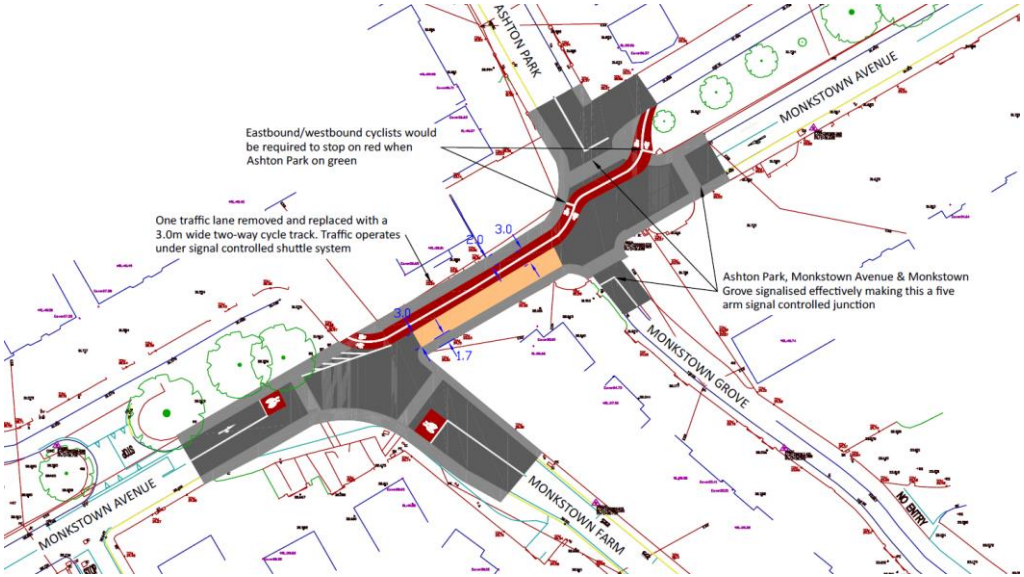

Figure 2.45: Option A - Monkstown Avenue / Monkstown Farm

Description: Two-way cycle track along the northern side of Monkstown Avenue connecting the two access streets which run parallel to Monkstown Avenue. Pedestrian and cyclist movements are kept largely separate. Controlled pedestrian crossings introduced over the Ashton Park and Monkstown Grove arms. Existing controlled crossing on Monkstown Avenue shifted east. One traffic lane is removed from Monkstown Avenue to facilitate a 3.0m wide two-way cycle track along the northern side. Cycle signals would be required either side of Ashton Park and cyclists would be required to stop and wait for a green signal before crossing the Ashton Park arm. As Monkstown Avenue is reduced to one traffic lane over the constrained section, traffic would operate under a signal controlled shuttle system. This option also requires bringing Ashton Park and Monkstown Grove under signal control. All vehicle turning movements to/from Ashton Park are retained under this option.

Opportunities

- High Level of Service & safety provided for cyclists via fully segregated two-way cycle track
- Pedestrians and cyclists segregated which reduces potential conflicts
- Motorists may be more likely to obey one-way shuttle system compared to Option B where both lanes are open and motorists may risk braking red lights
- Controlled pedestrian crossing provided over the Monkstown Grove and Ashton Park arms
- Minor impact on existing green space areas

Constraints

- Potential for slight delays for cyclists as they would be required to stop either side of the Ashton Park junction
- Private accesses on northern side of Monkstown Avenue along one-way section may require signals to ensure they enter shuttle system corresponding to green light direction
- The creation of the one-way shuttle operation and five arm signalised junction is likely to exacerbate traffic delays currently experienced along this section of the network

Option B – On-Street Connection with Dedicated Cycle Phase

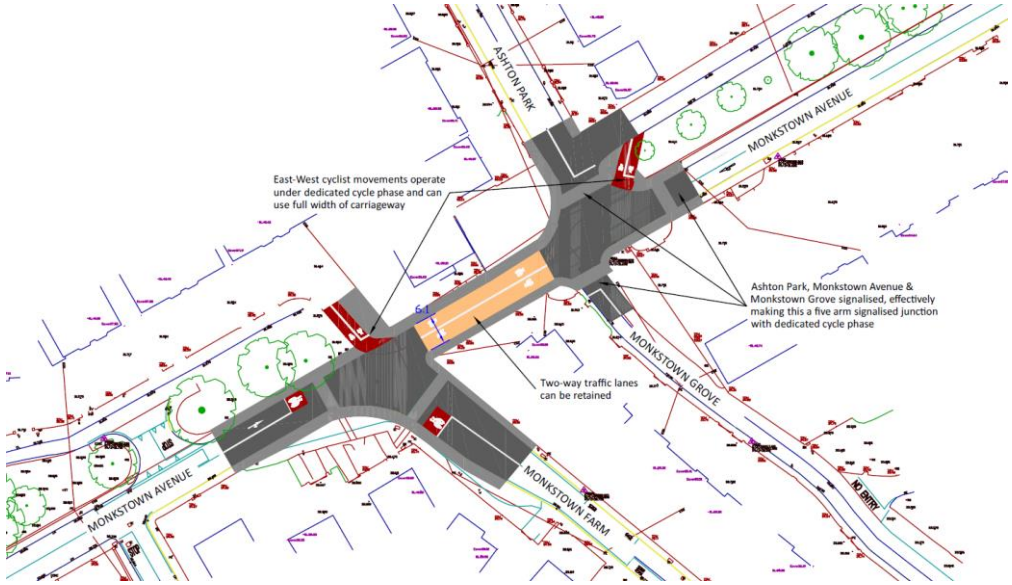

Figure 2.46: Option B – Monkstown Avenue / Monkstown Farm

Description: Retain the two traffic lanes on Monkstown Avenue and introduce a dedicated cycle phase for east/west bound cyclists. Controlled pedestrian crossings are introduced over the Ashton Park and Monkstown Grove arms. The existing controlled crossing on Monkstown Avenue is shifted east. Cycle signals are introduced either end of the parallel access streets. Cyclists would be required to wait for a dedicated all red to traffic phase before proceeding. Cyclists would be able to utilise the full carriageway width along the constrained section of Monkstown Avenue. Both traffic lanes on Monkstown Avenue is retained over the constrained section adjacent the Monkstown Farm junction. This option also requires bringing Ashton Park and Monkstown Grove under signal control. All vehicle turning movements to/from Ashton Park are retained under this option. The introduction of dedicated pedestrian/cyclist phases would introduce delays to general traffic.

Opportunities

- High Level of Service provided for cyclists via dedicated cycle only phase
- Pedestrians and cyclists segregated which reduces potential for conflicts
- Controlled pedestrian crossings provided over Ashton Park and Monkstown Grove arms
- Minor impact on existing green space areas

Constraints

- Some motorists may break the red lights during the cyclist phase as both lanes are still open leading to potential cyclist / vehicle conflict
- Cyclists must stop in both directions of travel
- Private accesses on northern side of Monkstown Avenue along one-way section may require signals to ensure they do not enter shuttle system during cycle phase
- The introduction of a dedicated cycle phase and five arm signalised junction is likely to exacerbate traffic delays currently experienced along this section of the network
- Proposed layout offers poorer legibility for all road users compared to other options

Option C – Two-Way Cycle Track, One Lane Shuttle System & Ashton Park Filtered Permeability

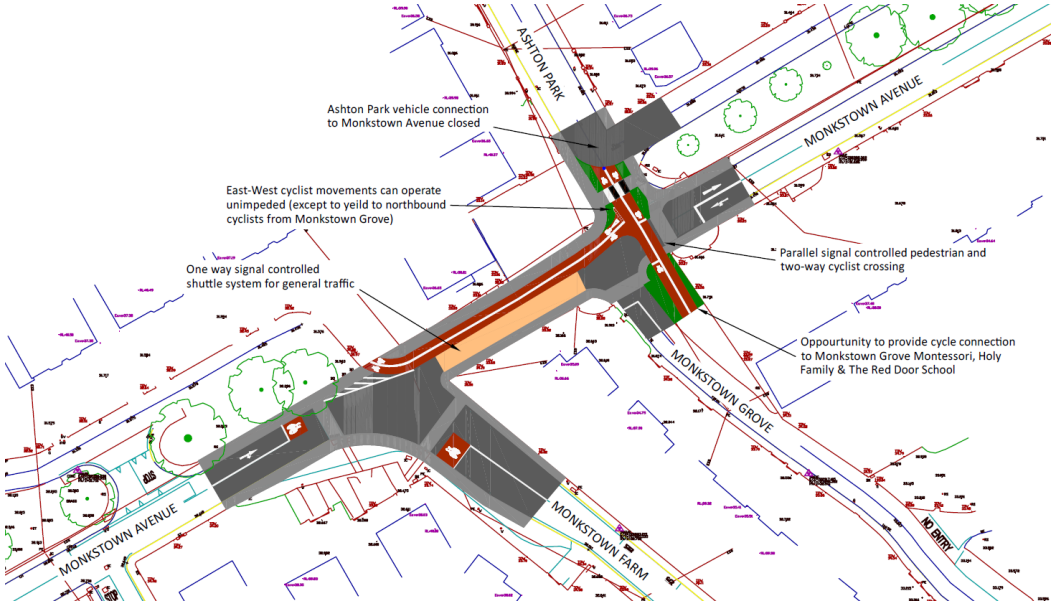

Figure 2.47: Option C – Monkstown Avenue / Monkstown Farm

Description: Two-way cycle track along the northern side of Monkstown Avenue. Ashton Park vehicular connection to Monkstown Avenue replaced with modal filter for pedestrian/cyclist movements only. Pedestrian and cyclist movements are kept largely separate. A controlled pedestrian crossing is introduced over the Monkstown Grove arm and the existing controlled crossing on Monkstown Avenue is shifted east. The proposed modal filter at Ashton Park facilitates the east-west cyclist route but also could facilitate a 3.0m two-way cycle connection to Monkstown Grove if required. East and west bound cyclists would experience minimal delays. Monkstown Avenue is reduced to one traffic lane over the constrained section adjacent the Monkstown Farm junction. Traffic would operate under a signal controlled shuttle system. This option also requires bringing Monkstown Grove under signal control.

Opportunities

- Motorists may be more likely to obey one-way shuttle system compared to Option B where both lanes are open and motorists may risk braking red lights
- This option is likely to be more efficient compared to Option A given the removal of the Ashton Park arm from the junction
- Minimal delays for east and west bound cyclists
- Opportunity to incorporate dedicated controlled cycle connection linking to the schools off Monkstown Grove
- Minimal disruption to Ashton Park residents as there are alternative routes to access Monkstown Avenue e.g. along the parallel access street
- Potential to provide additional landscaping adjacent modal filter connection

Constraints

- The creation of the one-way shuttle operation and four arm signalised junction is likely to exacerbate traffic delays currently experienced along this section of the network

Option D – On-Street Cycle Connection

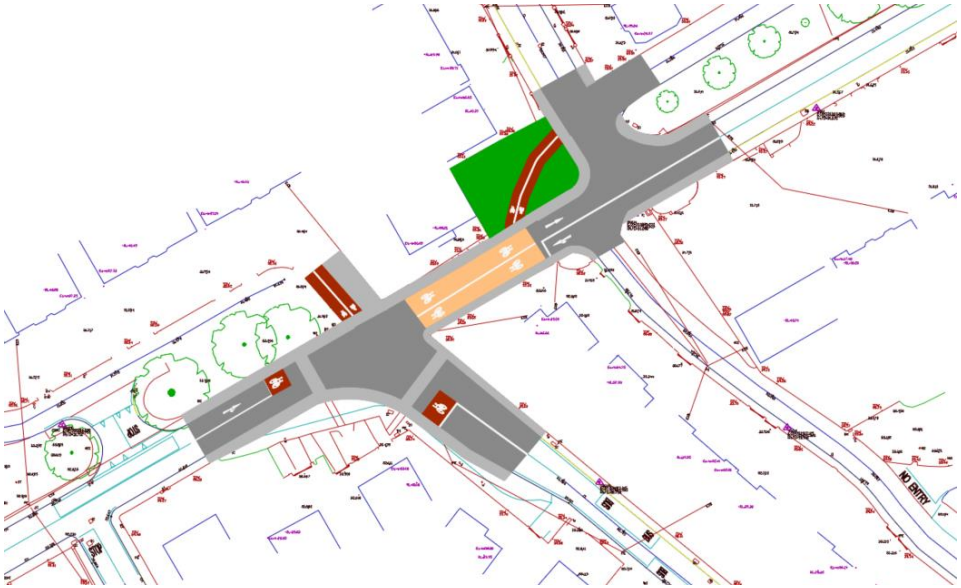

Figure 2.48: Option D – Monkstown Avenue / Monkstown Farm

Description: Cycle track through the open space adjacent Ashton Park with the stop line for vehicles also set west of the Ashton Park junction. Pedestrian and cyclist movements are kept largely separate. Cycle signals are introduced at the end of the parallel access street and the green space area. Cyclists would wait for a dedicated all red to traffic phase before proceeding. Cyclists would utilise the full carriageway width along the constrained section of Monkstown Avenue. Both traffic lanes on Monkstown Avenue are retained over the constrained section. However, unlike Option B this option does not require bringing Ashton Park and Monkstown Grove under signal control. Dedicated pedestrian/cyclist phases would introduce delays to general traffic, albeit to a lesser extent than Option B. Cycle track would go through the existing green space area on the Monkstown Avenue / Ashton Park corner. Suitable measures need to be implemented to protect tree roots.

Opportunities

- High Level of Service provided for cyclists via dedicated cycle only phase
- Pedestrians and cyclists segregated which reduces potential for conflicts
- Likely to be more efficient junction operation compared to Option B with potential delays to general traffic likely to be less than those as a result of Option B

Constraints

- Some motorists may break the red lights during the cyclist phase as both lanes are still open leading to potential cyclist / vehicle conflict
- Introduction of dedicated cycle phase may exacerbate traffic delays currently experienced along this section of the network
- Cyclists must stop in both directions of travel
- Proposed layout offers poorer legibility for all road users compared to other options
- Greater impact on open space as cycle track goes through green space west of Ashton Park
- Private accesses on northern side of Monkstown Avenue along one-way section may require signals to ensure they do not enter during cycle phase

Option E – On-Street Cycle Connection & Realigned Crossings

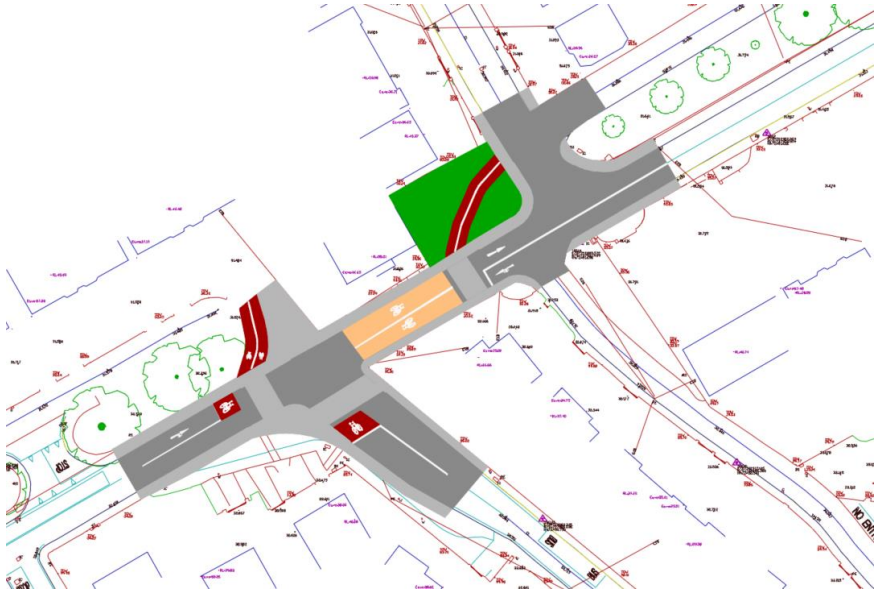

Figure 2.49: Option E – Monkstown Avenue / Monkstown Farm

Description: Cycle connection created to the west of Ashton Park (similar to Option D) but junction geometry also tightened up and algin the cycle tracks with Toucan crossings. Cycle signals introduced at the end of the parallel access street and the green space area. Cyclists wait for a dedicated all red to traffic phase before proceeding and using the full carriageway width along the constrained section of Monkstown Avenue. Both traffic lanes on Monkstown Avenue are retained over the constrained section. However, unlike Option B this option does not require bringing Ashton Park and Monkstown Grove under signal control. Dedicated pedestrian/cyclist phases would introduce delays to general traffic, albeit to a lesser extent than Option B. Suitable measures would need to be implemented to protect existing tree roots in the green space. Landscape/public realm improvements could be implemented on this corner to help integrate and reduce the impact of the cycle path through here.

Opportunities

- High Level of Service provided for cyclists via dedicated cycle only phase
- Toucan crossings positioned to better meet desire lines
- Pedestrians and cyclists segregated which reduces potential for conflicts
- Likely to be more efficient junction operation compared to Option B with potential delays to general traffic likely to be less than those as a result of Option B

Constraints

- Some motorists may break the red lights during the cyclist phase as both lanes are still open leading to potential cyclist / vehicle conflict
- The introduction of a dedicated cycle phase may still exacerbate traffic delays currently experienced along this section of the network
- Proposed layout offers poorer legibility for all road users compared to other options
- Greater impact on open space as cycle track goes through existing green space west of Aston Park
- Private accesses on northern side of Monkstown Avenue along one-way section may require signals to ensure they do not enter during cycle phase

Option F – Two-Way Cycle Track Connection West of Ashton Park & One Lane Shuttle System

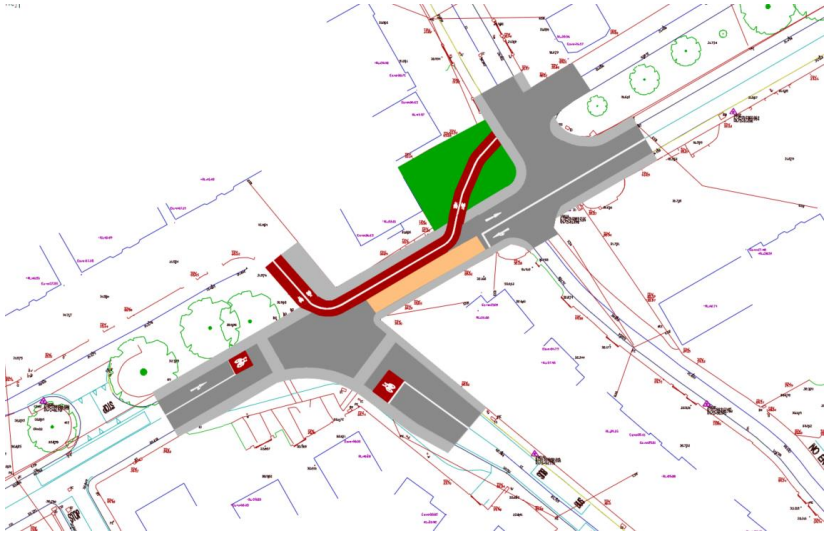

Figure 2.50: Option F – Monkstown Avenue / Monkstown Farm

Description: Create a one-way shuttle system for general traffic and a two-way cycle track on the northern side with a connection west of Ashton Park junction. One traffic lane is removed from Monkstown Avenue to facilitate a 3.0m wide two-way cycle track along the northern side. This connects the low trafficked access streets that run parallel to Monkstown Avenue. Monkstown Avenue is reduced to one traffic lane over the constrained section. Traffic would operate under a signal controlled shuttle system. This option avoids bringing Ashton Park and Monkstown Grove under signal control. Cycle track is routed through the existing greenspace area on the corner of the Monkstown Avenue / Ashton Park junction. Suitable measures would need to be implemented to protect existing tree roots. Following a review of existing traffic movements / delays, it was concluded that a more efficient operation of the junction could be achieved with the removal of the right turn from Monkstown Farm to Monkstown Avenue. The existing volume of right turn movements is relatively low and alternative routes are available on the strategic network via Abbey Road or Mounttown Road Lower.

Opportunities

- High Level of Service & safety provided for cyclists via fully segregated two-way cycle track
- Pedestrians and cyclists segregated which reduces potential conflicts
- Motorists may be more likely to obey one-way shuttle system compared to Option B and D where both lanes are open and motorists may risk braking red lights
- Removal of the right turn movement from Monkstown Farm to Monkstown Avenue enables a more efficient junction operation. Alternative routes available on the wider network for redistributed right turn movements.

Constraints

- One-way shuttle operation will impact traffic, although revised traffic management and removal of right turn movement will help to minimise delays / queues and optimise overall junction performance
- Greater impact on open space as cycle track goes through existing green space west of Aston Park
- Private accesses on northern side of Monkstown Avenue along one-way section may require signals to ensure they do not enter during cycle phase

Preferred Option

Following the MCA on the options, the preferred option was determined to be Option F, a 2-way cycle track and 1-lane shuttle system, as shown below:

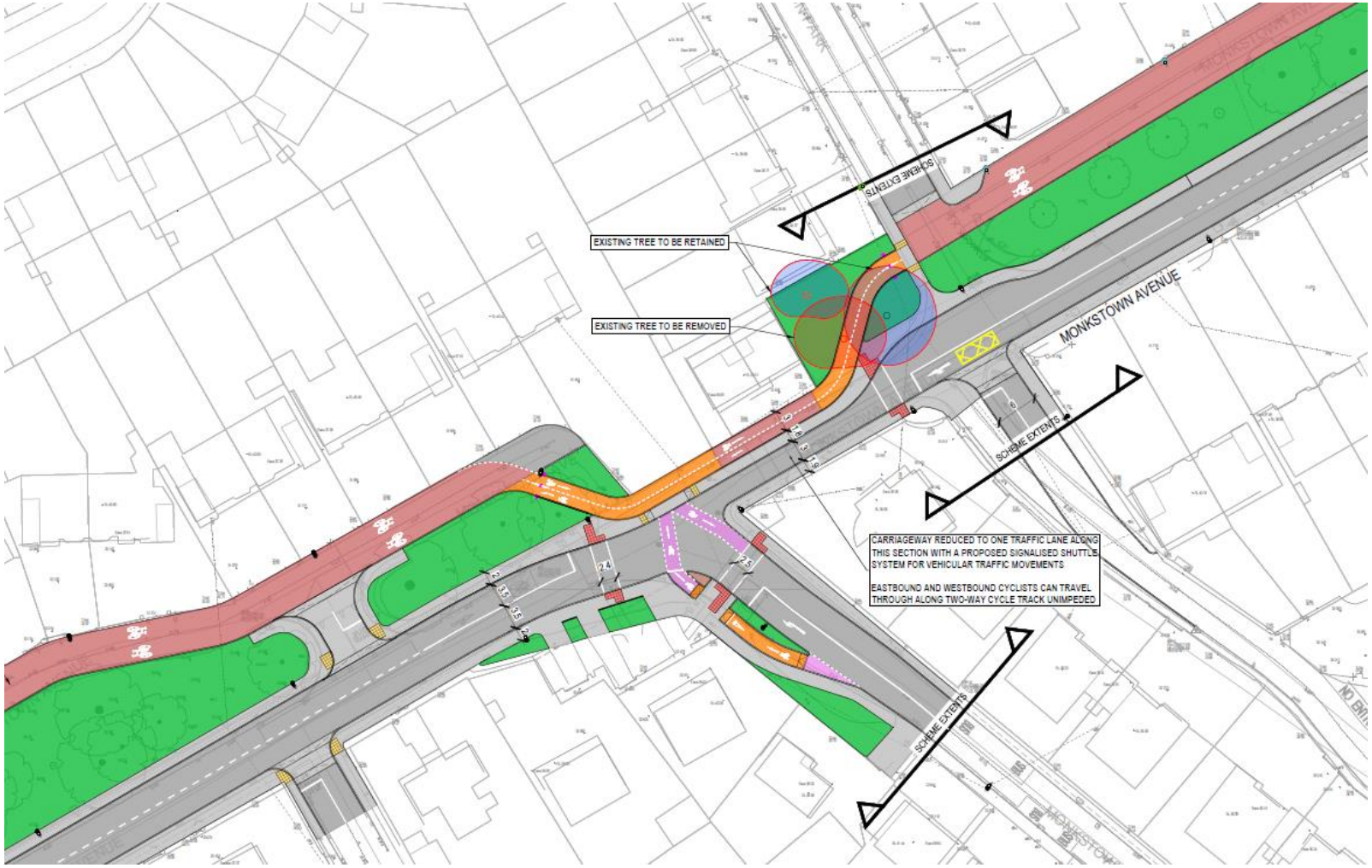

Figure 2.51: Monkstown Farm / Monkstown Avenue Junction Preferred Option

2.12 Junction 10: Monkstown Avenue / Carrickbrennan Road / Mounttown Road Upper/ Castle Park Roundabout

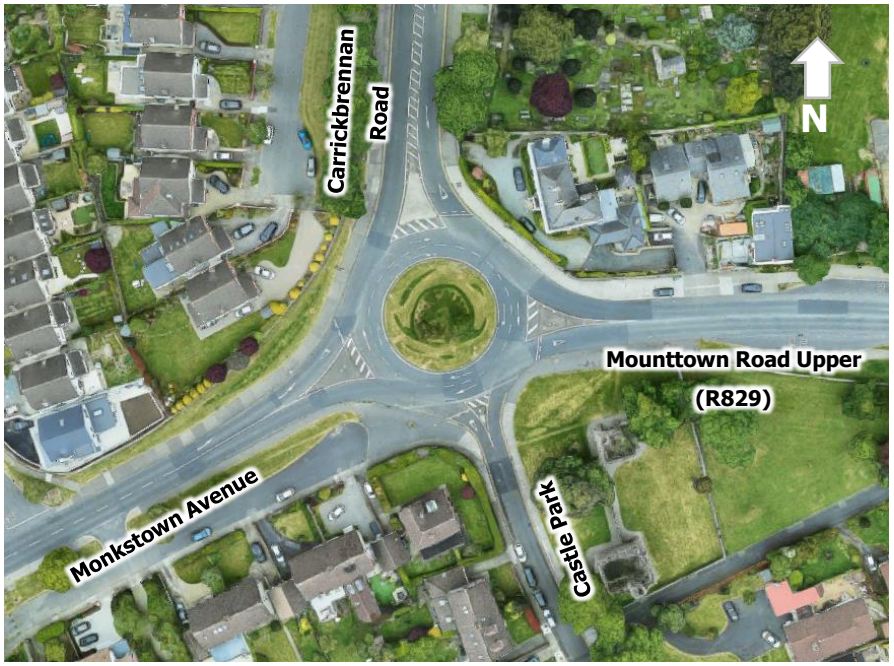

Figure 2.52: Existing Junction Layout

Existing Conditions:

The existing Monkstown Avenue / Carrickbrennan Road / Mounttown Road Upper / Castle Park junction operates as a four-arm roundabout. The roundabout has a central landscaped island (24m ICD). At present the roundabout works effectively from a traffic management perspective with minimal delays experienced by motorists travelling through the junction. However, there is a notable lack of appropriate, safe pedestrian and cyclist infrastructure.

Key Design Considerations

Monkstown Castle is a notable local historic landmark located on the southeast corner of the junction. At present the ruins are surrounded by a grassed area. There is an opportunity as part of the scheme to make this more of a focal point by providing public realm enhancements such as landscaping improvements, seating areas, bike parking etc.

Design Options Considered:

- Option A – Upgraded Roundabout
- Option B – Protected 'Dutch Style' Roundabout
- Option C – Three Arm Signalised-Junction

Option A – Upgraded Roundabout

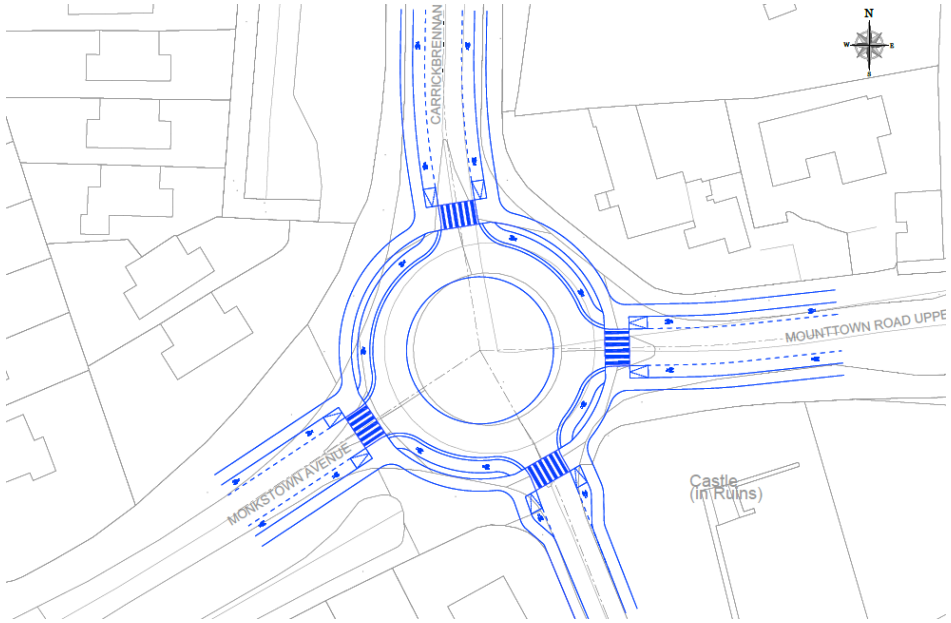

Figure 2.53: Option A – Upgraded Roundabout

Description: Shared crossing facilities in the form of Zebra crossings provided for pedestrians and cyclists on each arm of the junction. Segregated cycle tracks are provided on all arms of the junction and around the junction. Traffic flow through the roundabout would be regulated to some extent by the operation of the Zebra crossings. Traffic would be required to stop at the Zebra crossing when there is demand. There is no significant freeing up of additional space for landscaping or public realm improvements, however the existing green space areas surrounding the junction and Monkstown Castle could be enhanced.

Opportunities

- Controlled crossing facilities on all arms for pedestrians/cyclists better meet desire lines compared to existing scenario
- Pedestrians and cyclists are kept segregated from vehicular traffic, reducing conflict points
- Maintains all existing movements for vehicular traffic
- Compact roundabout will promote lower vehicle speeds and improve road safety
- Does not require excessive infrastructure or expenditure compared to alternative options

Constraints

- Zebra crossings introduce slight delays for vehicular traffic compared to existing
- Buses still have to share approach lanes with general traffic which may result in delays
- Safety for pedestrians/cyclists improved compared to existing scenario, however shared Zebra crossings may result in conflicts between pedestrians and cyclists compared to segregated facilities
- No freeing up of existing space for public realm enhancements
- Level of Service (LoS) for pedestrians and cyclists lower than that offered by other options considered

Option B – Protected 'Dutch Style' Roundabout

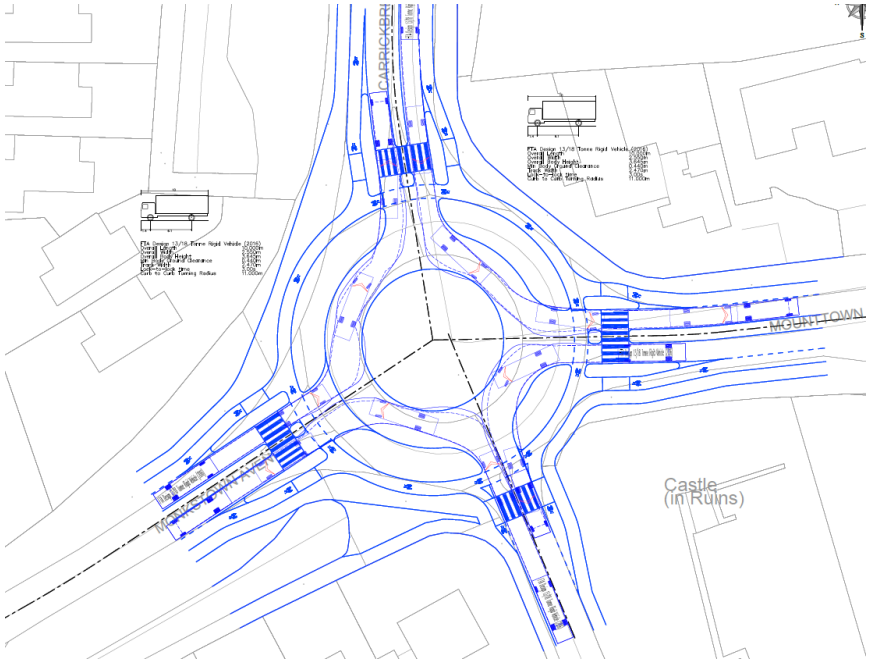

Figure 2.54: Option B – Protected 'Dutch Style' Roundabout

Description: Protected roundabout with segregated cycle lanes through the junction. The Parallel Crossings keep pedestrian and cyclist crossing movements segregated. Provides cyclists with physical protection from vehicles when travelling through the junction. The crossings for pedestrians and cyclists over each arm are separated reducing the potential for conflicts. Traffic flow through the roundabout would be regulated to some extent by the operation of the parallel crossings. There is no significant freeing up of additional space for landscaping or public realm improvements, however the existing green space areas surrounding the junction and Monkstown Castle ruins could be enhanced.

Opportunities

- Controlled crossing facilities on all arms for pedestrians & cyclists, better meet desire lines compared to existing arrangements
- Safety and LoS for pedestrians/cyclists improved compared to existing scenario and Option A as pedestrians/cyclists are kept segregated reducing potential conflict points
- Maintains all existing movements for vehicular traffic
- Compact junction size will promote lower vehicle speeds and improve road safety

Constraints

- Higher capital cost in comparison to Option A, to facilitate the segregated orbital cycle track
- No freeing up of existing space for public realm enhancements
- Parallel crossings may introduce slight delays for vehicular traffic compared to existing

Option C – Three Arm Signalised Junction

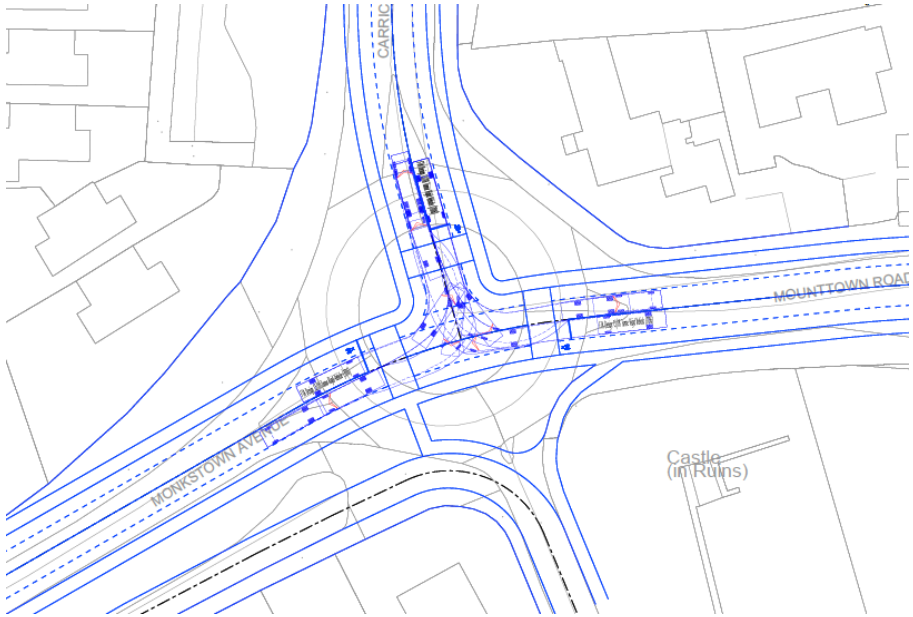

Figure 2.55: Option C – Three Arm Signalised Junction

Description: Three arm signalised junction with segregated cycle tracks. There is sufficient space on the junction corners to provide cycle by-passes through the greenspace areas if appropriate. This option proposes to convert the junction from a four arm to three arm junction through the realignment of the Castle Park arm to instead connect with the existing access street which runs parallel to Monkstown Avenue. This offers greater efficiencies in terms of the junction operation. Furthermore, it frees up additional space in front of the Monkstown Castle ruins. This allows for more consolidated and usable greenspace areas, as the footprint of the junction is reduced and the realignment of the Castle Park arm also releases lands adjacent the Monkstown Castle ruins which could be used for enhanced public realm and landscaping.

Opportunities

- Crossings are more direct, better meet desire lines and improve pedestrian journey times compared to existing arrangements
- Safety and LoS for pedestrians/cyclists improved compared to existing scenario and Option A as pedestrians/cyclists are kept segregated reducing potential conflict points
- Cyclists could be provided advanced cycle signal
- Creation of cycle by-passes would allow left turning cyclists to avoid the junction
- More compact junction frees up existing space for public realm enhancements particularly adjacent the Monkstown Castle ruins
- Signalised junction provides better level of control for vehicles through the junction and better adaptability for changing traffic patterns
- Reduced junction size and signals will promote lower vehicle speeds and improve safety
- Reduced junction size may have positive impacts on air quality and noise due to reduced speeds

Constraints

- Higher capital cost in comparison to Options A / B, as this requires to removal of the roundabout
- Castle Park traffic rerouted onto the access street which would increase traffic volumes on this lowly trafficked street

Preferred Option

Following the MCA on the potential options, the preferred option was determined to be Option C, the three arm signalised junction, as shown below:

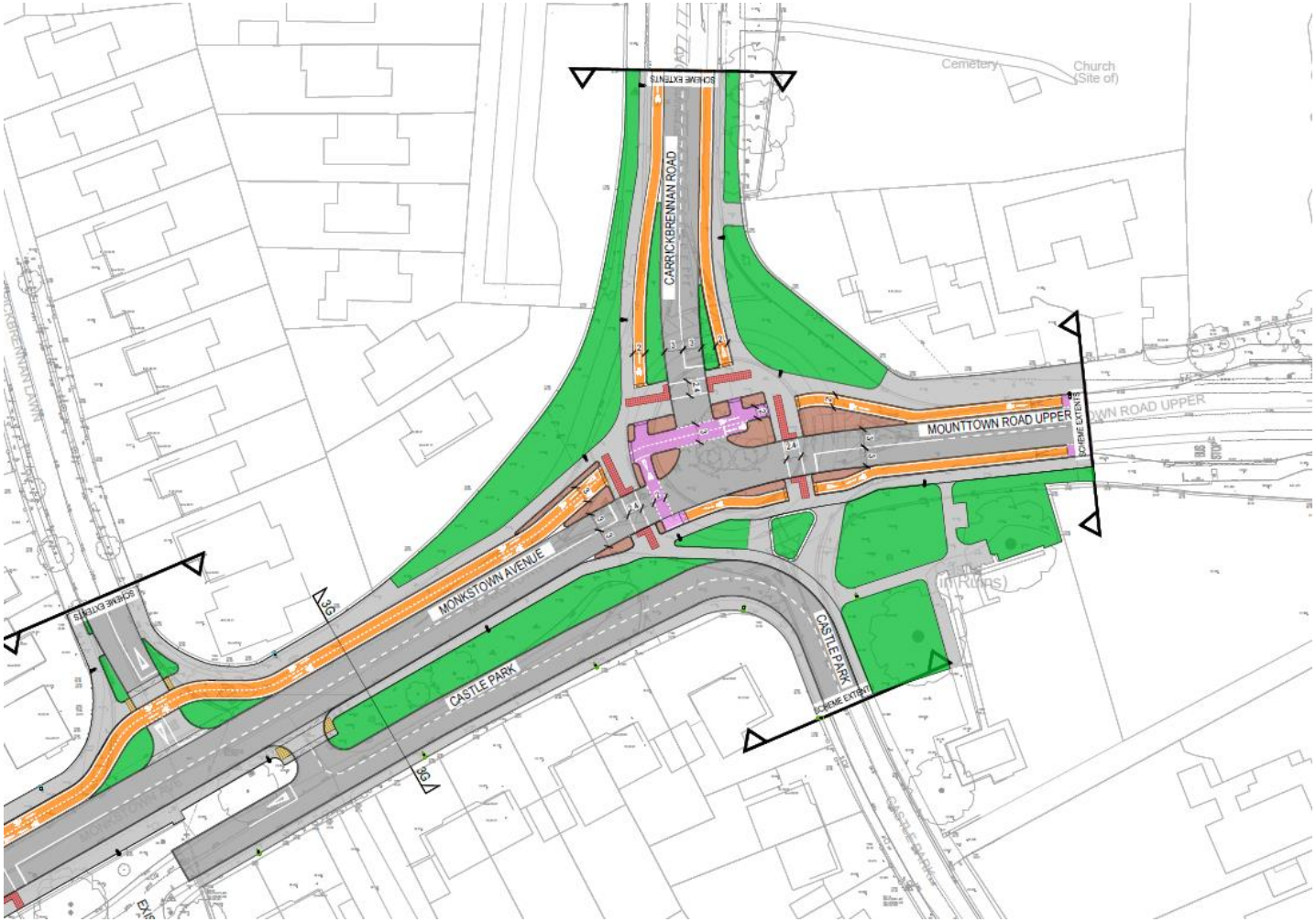

Figure 2.56: Monkstown Avenue / Carrickbrennan Road / Mounttown Road Upper / Castle Park Junction Preferred Option

3 Link Sections Design Options

3.1 Introduction

This section focuses on the design options considered for the various link sections along the route. A number of design options have been considered for each section of the route with regard to appropriate cycle provision between the junctions. The different cycle facilities considered along the key links of the proposed route included for example Shared Streets, Mandatory Cycle Lanes, Protected Cycle Lanes, Stepped Cycle Tracks and Segregated Cycle Tracks. As a starting point, the desired link cross section design would comprise the following:

- 3.0m wide general traffic lanes in both directions (3.25m lanes on bus routes where feasible)
- 2.0m wide cycle tracks in both directions
- 2.0m wide footpaths (reduced to 1.8m min in constrained locations)
- Retention of existing established street trees within verge areas and planting of new street trees/landscaping where possible

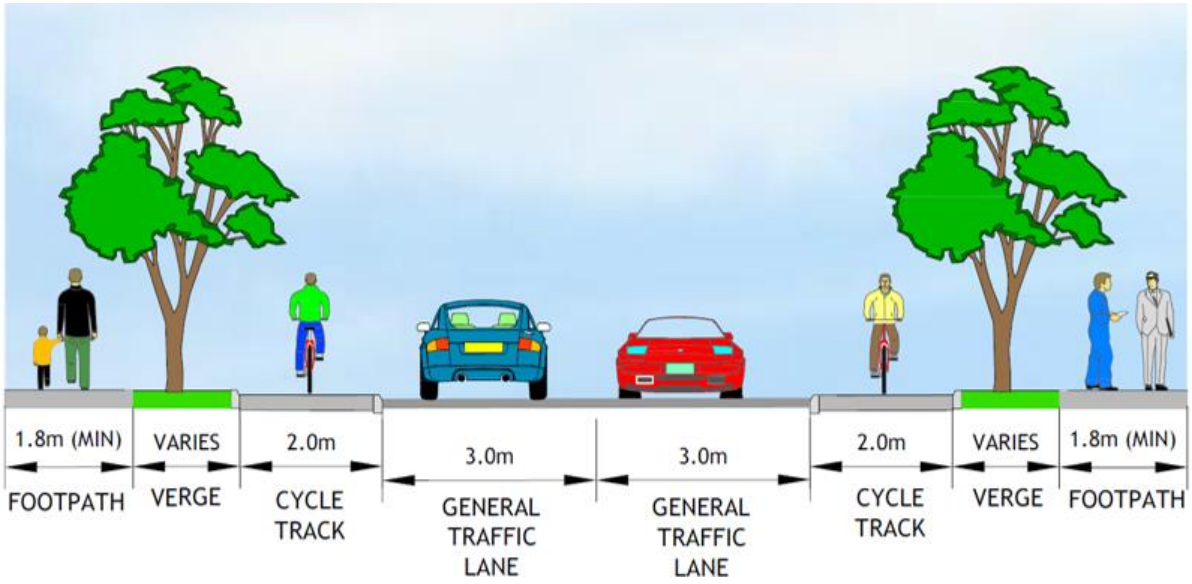

Figure 3.1: Proposed Link Design Cross Section

However, the available road width varies across the route, with a number of constrained sections where the cross section outlined above will not be feasible. Therefore, each of the link sections has been examined in detail to determine the available road space and options which cater for all road users as well as providing legible connections between junctions. The route has therefore been split into several individual link sections as illustrated on **Figure 3.2** on the following page.

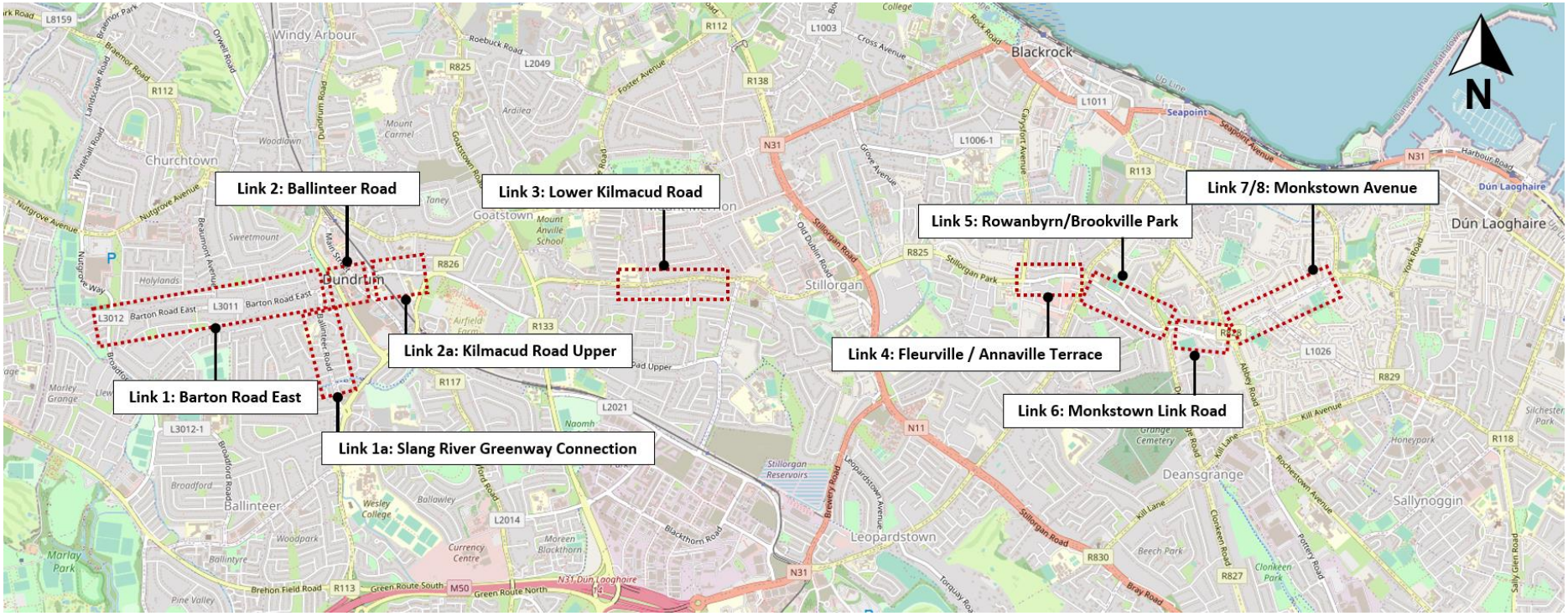

Figure 3.2: Proposed Link Sections Across Scheme

3.2 Link 1: Barton Road East (L3011)

Figure 3.3: Existing Cross Section on Barton Road East

Existing Conditions: The overall cross section width along Barton Road East is relatively generous being c. 22.8m wide. At present there are narrow 1.2m-1.4m wide on-road cycle lanes in both directions, 2.5m – 3.0m wide traffic lanes in both directions, verges on both sides in the region of 5.2m wide and 1.8m wide footpaths. Existing trees are located within the verge areas and there are frequent driveways off to either side. During various site visits, several incidents were observed where vehicles were parked on the grass verges.

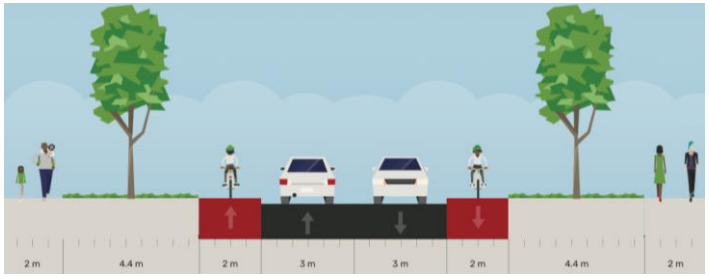

Figure 3.4: Option 1: Barton Road East Link Section

Option 1: Reallocates some of the existing road space to provide 2.0m wide segregated cycle tracks. It also proposes 3.0m wide traffic lanes in both directions and 2.0m wide footpaths on both sides. The slight increase in width for the cycle tracks would be achieved through repositioning of the existing kerblines and reducing the verge widths. Similarly, the wider footpaths can be achieved by reallocating some of the existing verge width.

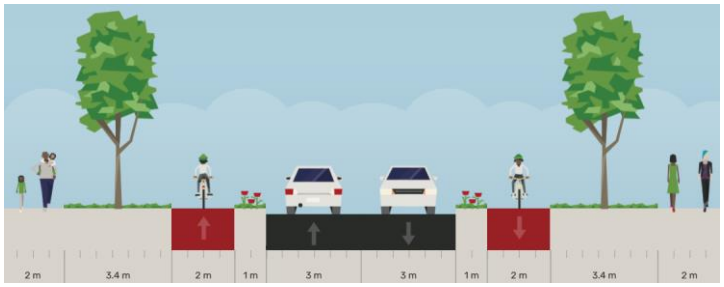

Figure 3.5: Option 2 Barton Road East Link Section

Option 2: Proposes a 1.0m wide landscaped buffer strip between the cycle tracks and traffic lanes, increasing the level of segregation from general traffic. It also provides an opportunity for planting and is a further deterrent to motorists parking on the grass verges. However, impacts on existing trees in the verges needs to be considered. Cycle tracks would also be slightly closer to the tree canopies requiring a maintenance regime to be implemented to ensure minimum clear height of 2.5m is maintained.

Preferred Option: Option 1 is the preferred option due to the fact that there is not sufficient space to provide the landscaped buffer without negatively impacting a significant number of existing trees. The design and construction should be developed to avoid impacting existing trees and also address any potential impacts of trees on the proposed cycle facilities (e.g. overhanging branches).

3.3 Link 1a: Slang River Greenway Connection

Existing Conditions: The Slang River Greenway connection comprises the Ballinteer Road south of the Ballinteer Road / Barton Road East roundabout, over a distance of approximately 550m, to the point where the existing Slang River Greenway crosses the Ballinteer Road just south of the Lynwood residential estate. At present Ballinteer Road comprises traffic lanes in both directions which vary between 3.0m - 3.5m wide. There is a footpath on the western side of the road, however on the eastern side there is no footpath for 260m (from the point opposite the Simpsons Hospital entrance to the Lynwood estate entrance). There are currently no dedicated cycle facilities along this section of Ballinteer Road.

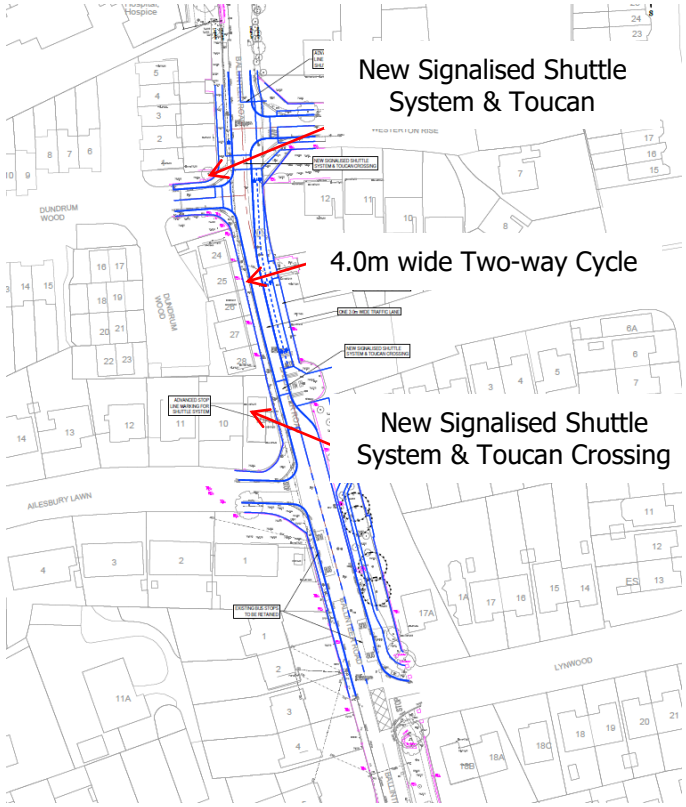

Figure 3.6: Option 1 Slang River Greenway Connection

Option 1: Proposes a segregated 4.0m wide two-way cycle track and 2.0m ide footpath along the eastern side of Ballinteer Road., between Dundrum Wood and Lynwood, with the onward cycle connection to the Slang River Greenway via Lynwood residential streets. This requires the removal of one traffic lane and consequently the introduction of a one lane shuttle system for general traffic.

This option involves bringing Westerton Rise and Dundrum Wood into the operation of the signalised shuttle system. This also includes two new Toucan crossings incorporated as part of the shuttle system, one on the north side of Dundrum Woods and one north of Ailesbury Lawn access. A new footpath could also be created on the eastern side linking the southbound bus stop at the Lynwood estate entrance.

However, the creation of the shuttle system will introduce delays to both general traffic and buses along Ballinteer Road. Furthermore, the requirement to bring Dundrum Wood and Westerton Rise into the operation of the signalised shuttle system is likely to make it quite inefficient and also introduce delays for residents accessing / egressing their respective estates.

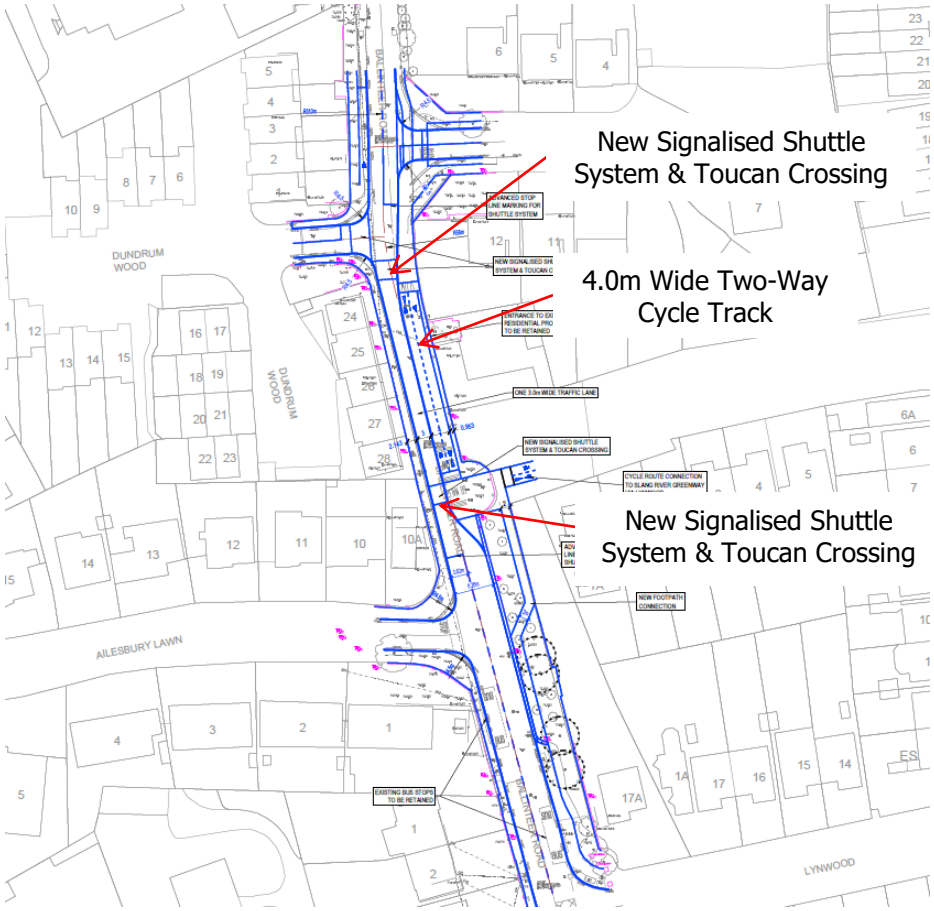

Figure 3.7: Option 2 Slang River Greenway Connection

Option 2: Proposes a 4.0m wide two-way cycle track on the eastern side of Ballinteer Road, between Dundrum Wood and Lynwood, with the onward cycle connection to the Slang River Greenway via Lynwood residential streets. A 2.0m wide footpath is continued along the western side of the road.

This layout requires the removal of one traffic lane and consequently the introduction of a one lane shuttle system for general traffic between Dundrum Wood and Ailsbury Lawn.

The key difference between this option and Option 1 is that it does not require bringing Dundrum Wood or Westerton Rise into the operation of the signalised shuttle system and would therefore likely be more efficient in terms of its operation compared to Option 1. However, it would still introduce delays to general traffic, including buses along Ballinteer Road.

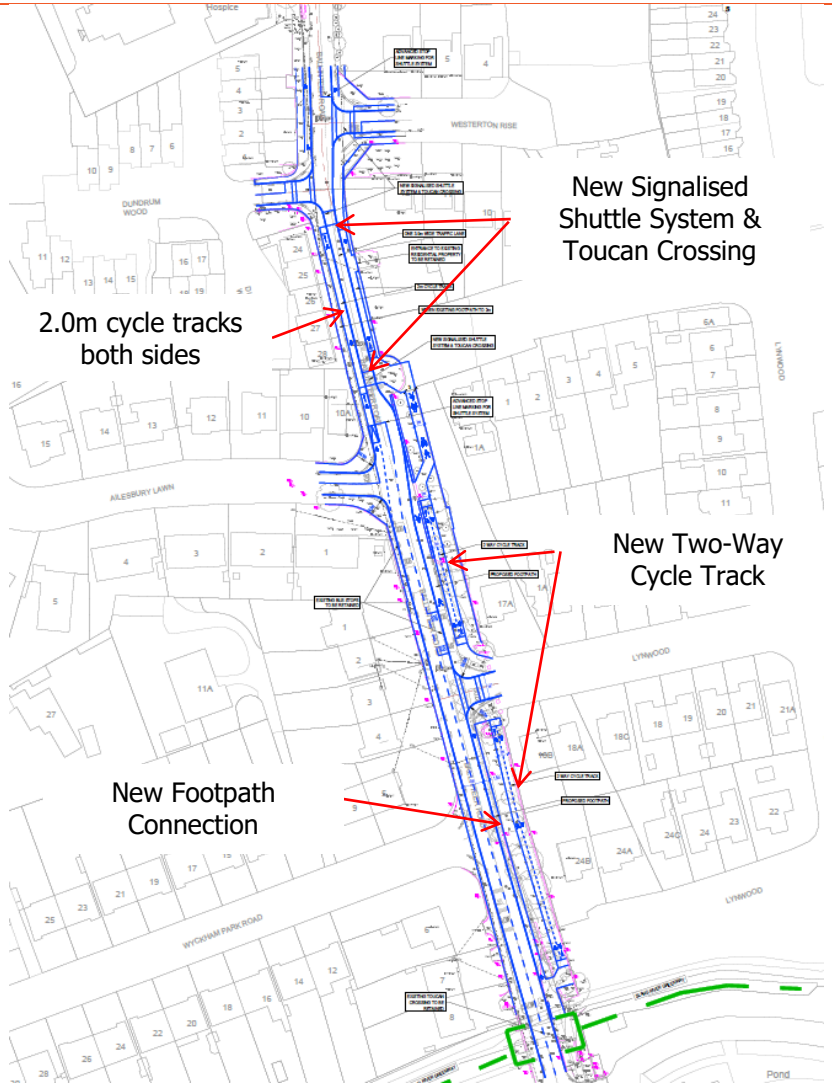

Figure 3.8: Option 3 Slang River Greenway Connection

Option 3: Proposes 2.0m wide cycle tracks on both sides of Ballinteer Road, which also requires the removal of one traffic lane and the introduction of a signalised shuttle system between Dundrum Wood and Ailesbury Lawn. This option would require bringing Dundrum Wood and Westerton Rise into the operation of the signalised shuttle system.

It also proposes a cycle track connection to the Slang River Greenway via a new two-way track on the east side of Ballinteer Road (along the Lynwood estate frontage), although this is likely to impact several established mature trees located here.

A new footpath is also proposed on the eastern side linking to the southbound bus stop and further south to the Greenway which would also likely impact existing established trees along here.

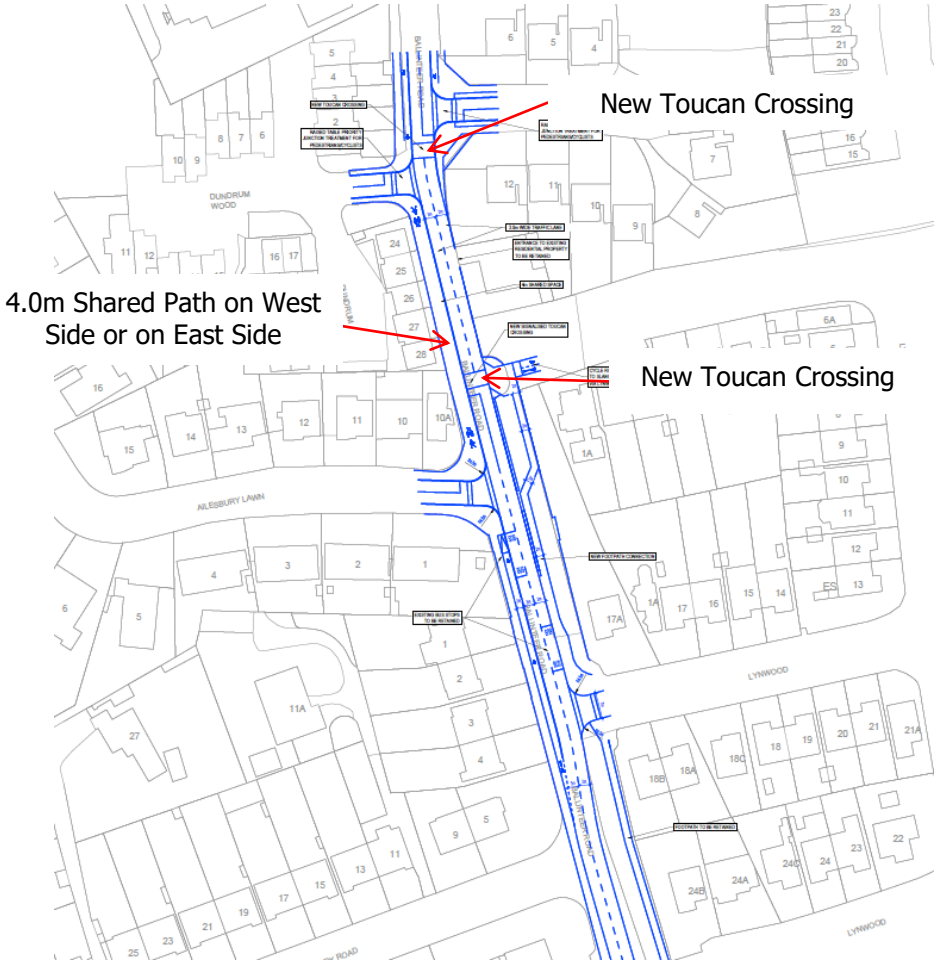

Figure 3.9: Option 4 Slang River Greenway Connection

Option 4: Proposes a 4.0m shared path on the western side (between Ailesbury Lawn and Dundrum Wood) and maintaining two traffic lanes and two-way traffic movements on Ballinteer Road. Alternatively, a 4.0m shared path could be provided on the eastern side.

Cyclists could make the connection from the shared path to the Slang River Greenway via the Lynwood residential streets. The shared path is essentially an extension of the same level of facilities currently in place on the Slang River Greenway which is also a 4.0m wide shared path.

The main advantage of this option is the ability to maintain two-way traffic flow on Ballinteer Road and minimises potential delays, particularly to bus services.

Preferred Option: Option 4 is considered to be the preferred option for this link section along Ballinteer Road. It provides significant improvements in terms of pedestrian / cyclist connectivity along this section, whilst balancing the requirement to minimise potential delays to traffic, specifically to public transport as this link also serves as a key bus route. The shared path would essentially be an extension of the same level of service currently in place on the Slang River Greenway which is also

3.4 Link 2: Ballinteer Road (R826)

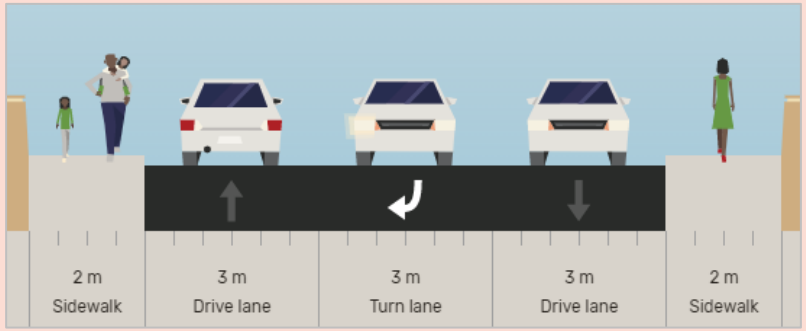

Figure 3.10: Existing Cross Section on Ballinteer Road

Existing Conditions: The current cross section on Ballinteer Road, between the Barton Road East Roundabout and Main Street signalised junction, is relatively constrained being in the region of c.13m-14m wide.

At the point on the bridge over the Dundrum Bypass, 2.0m wide footpaths are provided on both sides along with 3.0m wide traffic lanes in both directions as well as a 3.0m wide right turn pocket for traffic entering the shopping centre car park. East and westbound bus stops are also located on this section.

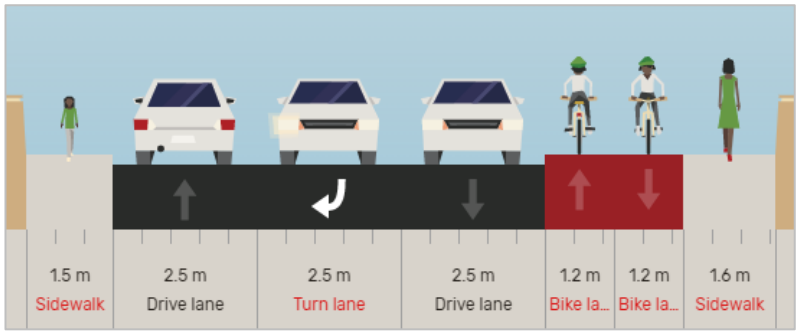

Figure 3.11: Option 1 Ballinteer Road Link Section

Option 1: Proposes a two-way cycle track on the northern side of Ballinteer Road with reduced traffic lane and turning lane widths. In order to provide the two-way cycle facility and maintain the dedicated right turn lane into the shopping centre car park, footpaths and cycle tracks would be below absolute minimum widths as specified in the CDM and DMURS guidance.

As this area is particularly busy in terms of pedestrian, the reduced footpath and cycle track widths are likely to have a significant impact on the Level of Service for active modes and decrease the attractiveness, safety and functionality of this section of the route. Furthermore, the reduced traffic lane widths may also pose an issue for bus movements along what is a well used bus route.

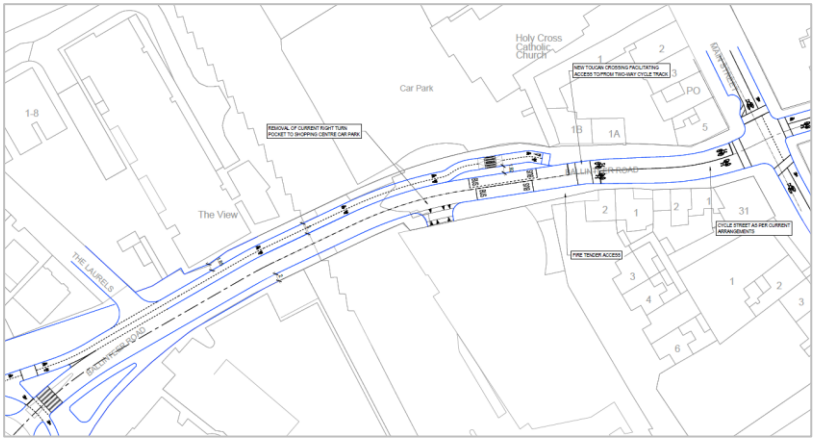

Figure 3.12: Option 2 Ballinteer Road Link Section

Option 2: Proposes removing the dedicated right turn lane into the shopping centre car park and reallocate the available space to pedestrian / cyclist infrastructure. This means that the desired minimum widths for both the footpaths and cycle tracks can be achieved and also maintains 3.0m wide traffic lanes in both directions.

However, the removal of the right turn lane may have implications in terms of capacity as queuing right turn vehicles would hold up eastbound traffic, including buses. If queuing extended back towards the Ballinteer Road / Barton Road East junction it could impact the operation of the junction.

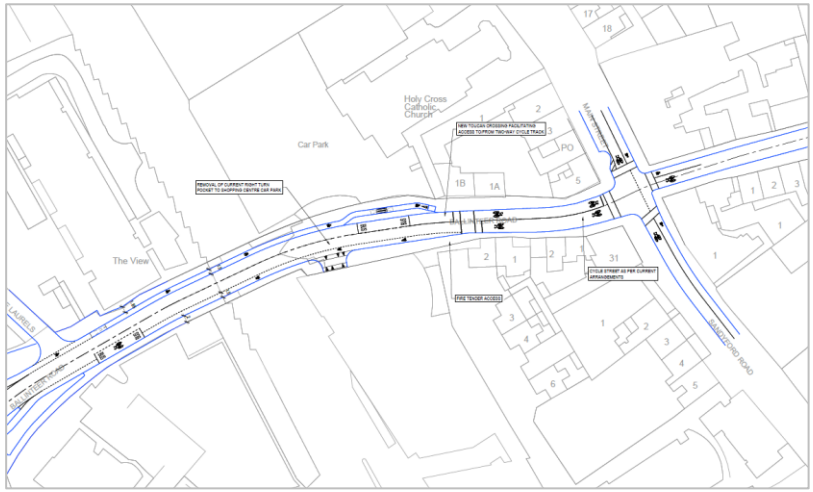

Figure 3.13: Option 3 Ballinteer Road Link Section

Option 3: Provide segregated cycle tracks on both sides of Ballinteer Road. To accommodate this, the dedicated right turn lane serving the shopping centre car park would have to be removed. Given the space constraints, it would also require the relocation of the westbound bus stop.

Nonetheless, the resulting cross section comprises cycle tracks which are less than desirable minimum widths at 1.5m wide at the particularly constrained points. The relocation of the westbound bus stop is also likely to be undesirable as it is located further away from key attractors and the shopping centre access.

Preferred Option: Option 2 in conjunction with revised traffic management arrangements at the Dundrum crossroads is the preferred option as it would provide a higher Level of Service for cyclists, maintain appropriate footpath widths, whilst also maintaining access for public transport. It is noted, however that this option may have implications on general traffic movements and rerouting on the wider road network.

3.5 Link 2a: Kilmacud Road Upper (R826)

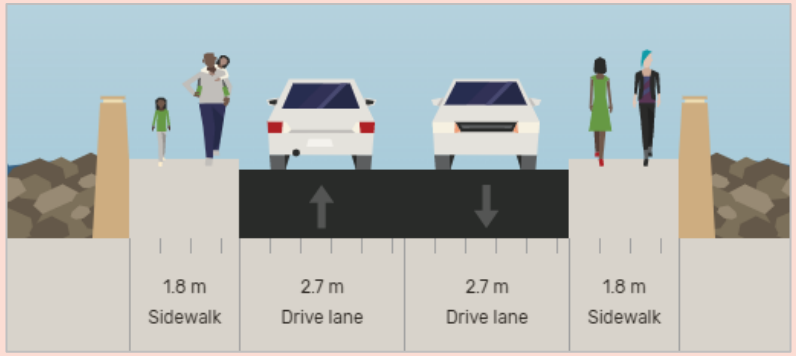

Figure 3.14: Existing Cross Section on Kilmacud Road Upper (East of Sydenham Villas)

Existing Conditions: The Kilmacud Road Upper link east of Dundrum village is another of the particularly constrained sections along the route. The overall road reserve width varies between 9.0m – 11.0m, with the narrowest point being east of the Sydenham Road / Sydenham Villas signalised junction.

Over this particularly constrained section, it is not feasible to provide fully segregated pedestrian/cyclist facilities and also maintain two-way traffic flow. The possibility of acquiring any additional adjacent land to facilitate road widening is likely to be cost prohibitive.

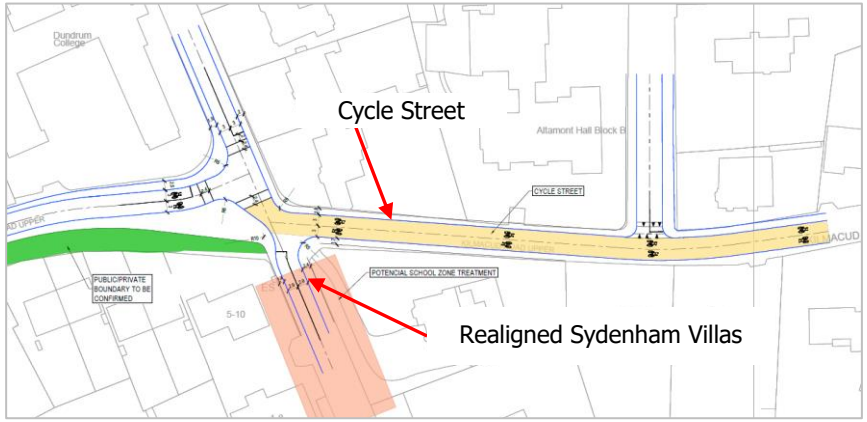

Figure 3.15: Option 1 Kilmacud Road Upper

Option 1: Analysis of the traffic surveys indicates two-way traffic flows in the region of 677 vehicles and 497 vehicles in the AM and PM peak hours respectively. The current posted speed limit is 50Km/h. In reference to the CDM, a shared street is only suitable in instances where two-way peak hour flows are <200 vehicles and the speed limit is 30Km/h or lower.

Option 1 proposes a shared cycle street arrangement on Kilmacud Road Upper, including the introduction of traffic calming measures to promote a low speed environment. It is also proposed to reconfigure the Kilmacud Road Upper / Sydenham Road signalised junction by realigning the Sydenham Villas arm to form a priority junction off of Kilmacud Road Upper (i.e. remove from current signalised junction operation). The reconfiguration of the junction, could help to reduce the volume of through movements along Kilmacud Road Upper and Dundrum centre.

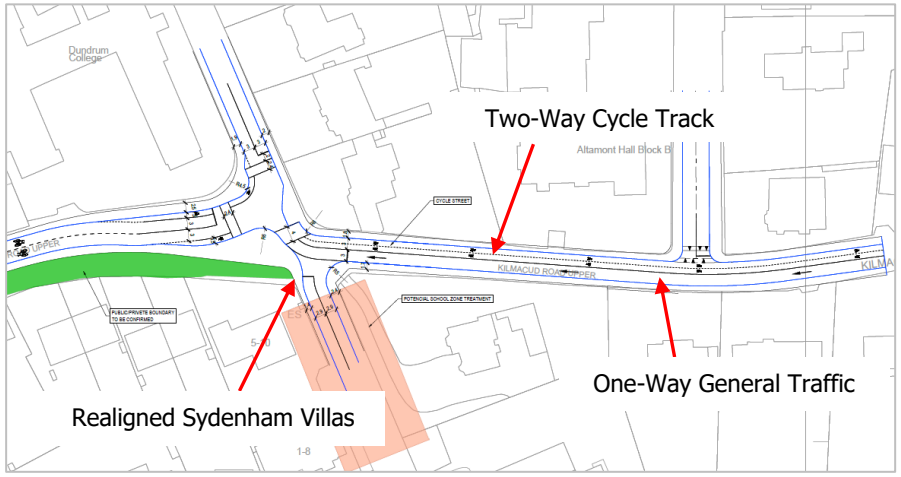

Figure 3.16: Option 2 Kilmacud Road Upper

Option 2: Proposes to convert Kilmacud Road Upper (east of Sydenham Villas) to one way for general traffic. It is understood there could be proposals to convert Sydenham Road to one-way southbound, consequently it may be desirable to have Kilmacud Road Upper operate one-way eastbound, providing for a anti-clockwise movement of traffic on the wider network.

The creation of a one-way traffic system on Kilmacud Road Upper would free up space to provide a 3.0m wide two-way segregated cycle track on the northern side.

Preferred Option: Option 2, which proposes the conversion of Kilmacud Road Upper (east of Sydenham Villas) to one-way operation, is the preferred option for this link section given the high Level of Service and safety offered to cyclists through the ability to create a fully segregated two-way cycle track. Footpaths of appropriate widths are also maintained. It is noted that this option will have implications on the routing of traffic on the wider network and will need to be considered in conjunction with changes proposed on the wider network separate to this scheme.

3.6 Link 3: Lower Kilmacud Road (R825)

Existing Conditions: This section has a current road reserve width in the region of 15m-18m including excessively wide traffic lanes (≈4.5m wide). While generous footpath widths are provided, on-site observations indicate parking on the footpaths to be a significant issue along this section. The scheme will tie into the recently completed scheme to the west of Mount Anville School. The adjoining scheme provides 3.25 traffic lanes, 2.0m cycle tracks and 2.0m wide footpaths on both sides with planting/landscaping between driveways and on junction corners.

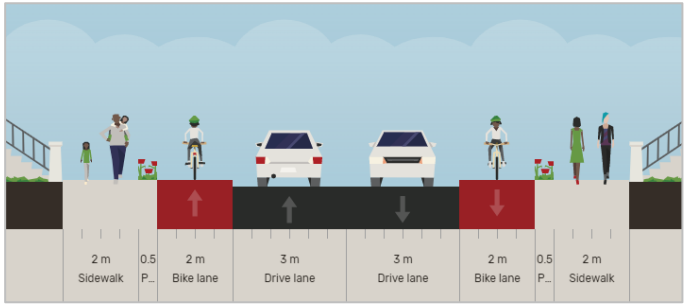

Figure 3.17: Option 1 Lower Kilmacud Road

Option 1: For the purposes of consistency in treatment and legibility for road users, this option proposes to continue with a similar treatment along Lower Kilmacud Road east of Mount Anville School.

This provides 2.0m footpaths, 2.0m segregated cycle tracks and 3.0m traffic lanes in both directions. Where feasible a buffer planting strip would be located between the cycle track and foot path.

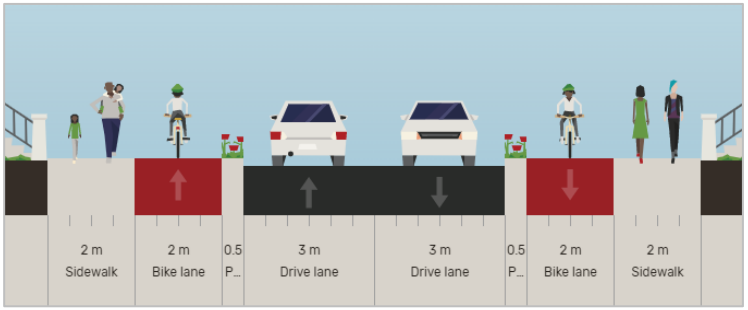

Figure 3.18: Option 2 Lower Kilmacud Road

Option 2: This option is similar to Option 1, the difference being the location of the buffer strip being provided between the traffic lanes and the cycle track where feasible.

It is envisaged that reduced traffic lane widths and buffer strips will help to change motorists perception of the street environment from being excessively wide and which is likely to induce high vehicle speeds, to one which feels more enclosed and encourages motorists to proceed more cautiously.

Preferred Option: The preferred option for this link section on Lower Kilmacud Road is Option 2, which provides for the landscaped buffer strips between the traffic lanes and cycle tracks on both sides where space permits. This will not only provide for enhanced segregation between cyclists and motorists but will also contribute to enhancing the overall aesthetics of the streetscape along this section.

3.7 Link 4: Fleurville / Annaville Terrace

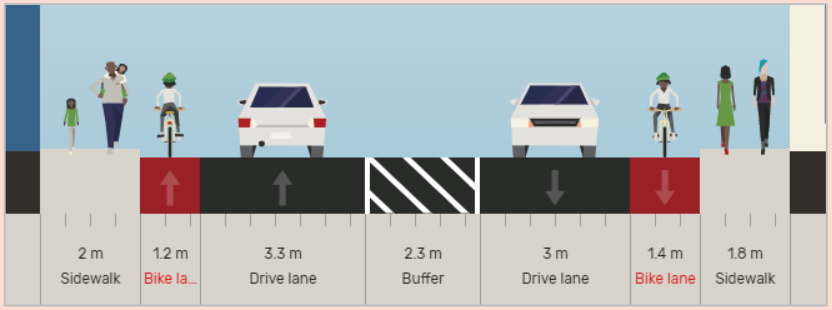

Figure 3.19: Existing Cross Section on Fleurville

Existing Conditions: Along Fleurville and Annaville Terrace at present is a mix of on-road cycle lanes and segregated cycle tracks, these are narrow in some sections (<1.5m wide). There are footpaths on both sides although these are also narrow in some locations. There are a series of raised tables to assist with traffic calming. The road reserve width varies between 14.5m-19.5, including a wide hatched median facilitating turning pockets.

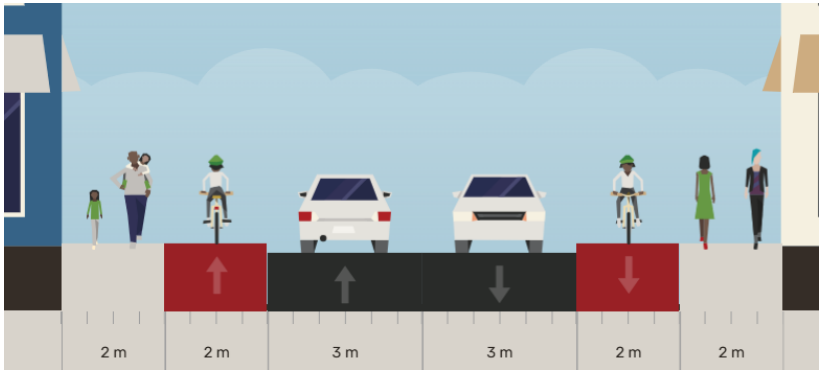

Figure 3.20: Option 1 on Fleurville and Annaville Terrace

Option 1: West of the Carysfort Avenue junction, the subject scheme will tie into a separate scheme on Stillorgan Park Road comprising 3.25m wide traffic lanes, 2.0m cycle tracks and 1.8m min footpaths. Landscaped verges are provided where space permits.

Therefore, for the purposes of consistency and legibility for users it is proposed to continue with a similar cross section along Fleurville and Annaville Terrace where feasible. The existing right turn pockets serving the residentials areas to the north and south will have to be removed in order to provide appropriate widths for the footpaths and segregated cycle facilities on either side.

Preferred Option: The preferred option for this link section is to continue with a similar cross section as per the adjoining Stillorgan Park Road scheme, which comprises 3.25m wide traffic lanes, 2.0m cycle tracks and 2.0m minimum footpaths.

3.8 Link 5: Rowanbyrn / Brookville Park

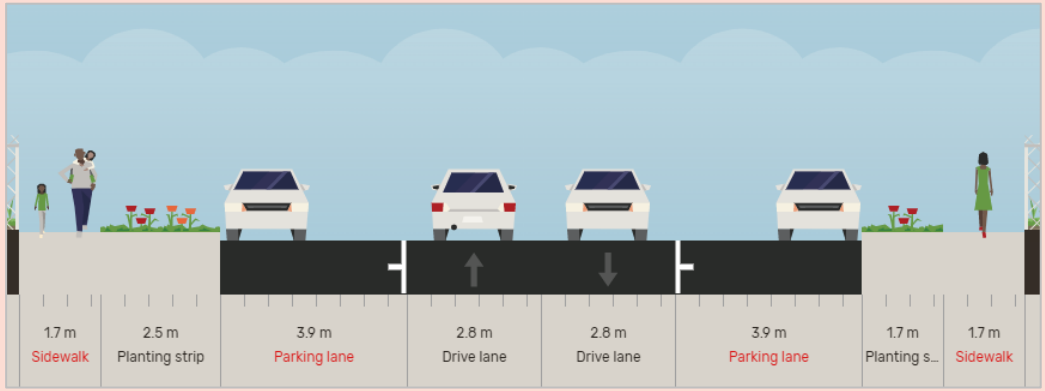

Figure 3.21: Existing Cross Section on Brookville Park

Existing Conditions: Rowanbyrn and Brookville Park up to the Deansgrane signalised junction at present has a road reserve c. 21m wide. In addition to two 2.8m wide general traffic lanes are two 3.8m wide lanes which were previously reserved for potential BRT.

Currently they are predominantly used as on-street parking areas. However, BRT is unlikely to eventuate along this section and therefore there is the opportunity to reallocate these lanes to pedestrian/cycle infrastructure and also landscaping.

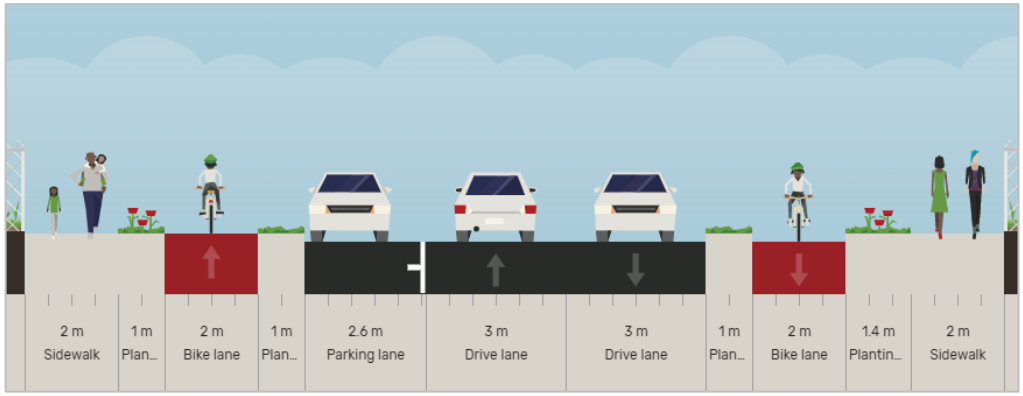

Figure 3.22: Option 1 Brookville Park Link Section

Option 1: Incorporates 2.0m wide cycle tracks on both sides. It also proposes wider footpaths (2.0m min) on both sides.

It retains some on-street parking on one side of the road, if warranted. However, it is noted that all properties with direct access off this section of Rowanbyrn and Brookville Park have off-street parking available, the majority of which can cater for at least 2 vehicles.

There is also sufficient space to provide landscaped buffer strips between the traffic lanes / parking and the cycle tracks.

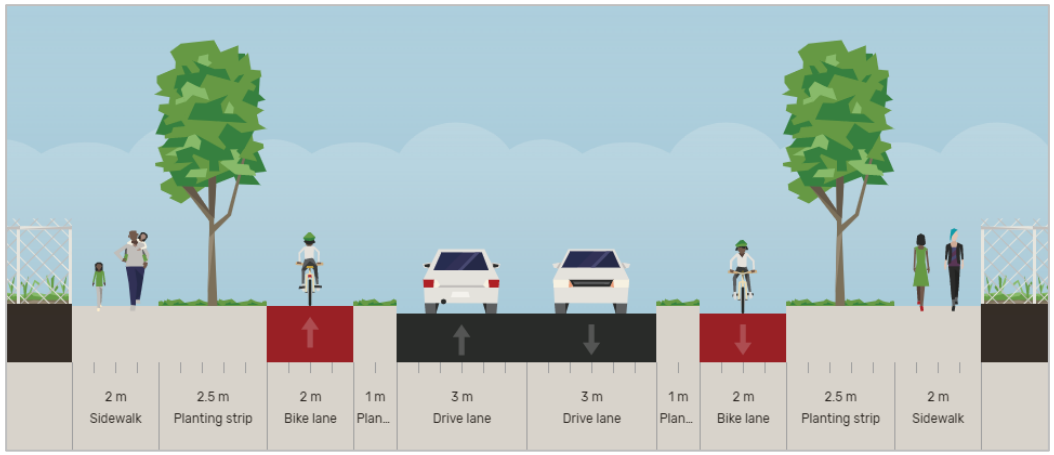

Figure 3.23: Option 2 Brookville Park Link Section

Option 2: Removes all on-street parking along Rowanbyrn and Brookville Park. Segregated 2.0m wide cycle tracks are provided on both sides of the road with landscaped buffer strips between the traffic lanes and cycle tracks.

Wide landscaped verges between the cycle tracks and the footpaths are also provided on both sides of the road. Footpaths are also widen to 2.0m. The greater levels of landscaping enhance the overall streetscape along this section and reduce the extent of existing hard paving.

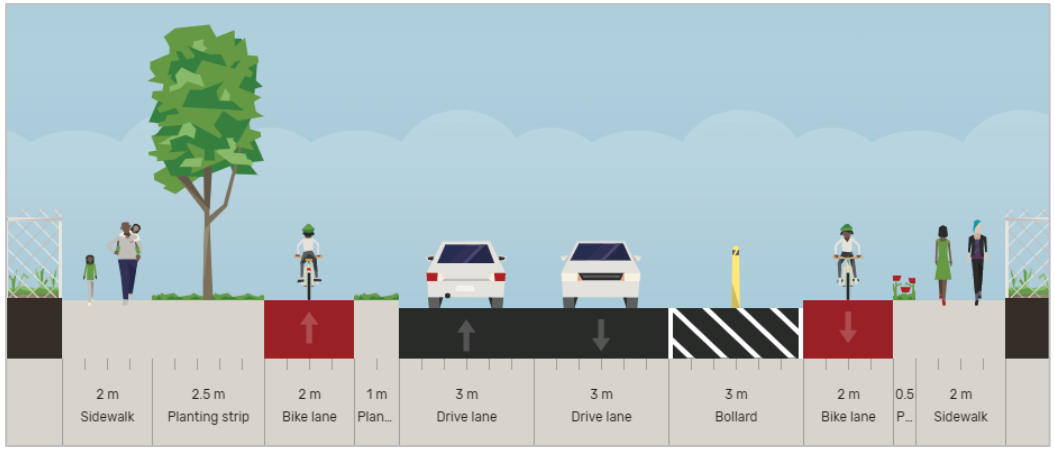

Figure 3.24: Option 3 Brookville Park Link Section

Option 3: Provides two 3.0m traffic lanes, but also retains a 3.0m wide lane on one side of the street which may be appropriate if it is determined that the scheme needs to make provision for a future bus lane along here.

Segregated cycle tracks, widened footpaths and landscaped verges would also be provided but to a lesser extent compared to other options.

Preferred Option: The preferred option for this link section is Option 2, which provides for landscaped buffer strips segregating cyclists / traffic as well as landscaped verges between the footpaths and cycle tracks. This will not only provide for enhanced segregation between cyclists/motorists and cyclists/pedestrians but will also contribute to enhancing the overall aesthetics of the streetscape along this section.

3.9 Link 6: Monkstown Link Road (New Road L1024)

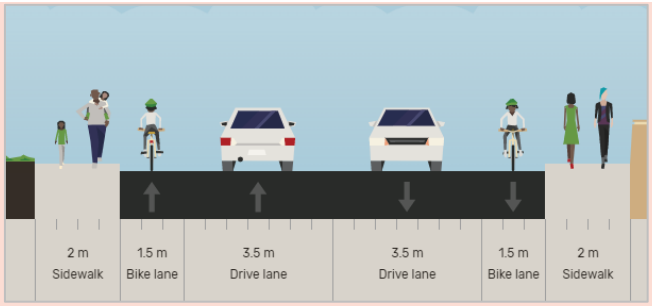

Figure 3.25: Existing Cross Section Monkstown Link Road

Existing Conditions: The cross section along the Monkstown Link Road at present generally comprises two 3.5m wide traffic lanes, 1.5m wide on-road cycle lanes and 1.6m-2.0m wide footpaths on both sides.
Parallel to Monkstown Link Road is Rockford Park, an access street serving a small number of residential dwellings. It is approximately 5.0m wide allowing for two-way traffic movements. A modal filter prevents vehicle through movements between Rockford Road and Rockford Green.

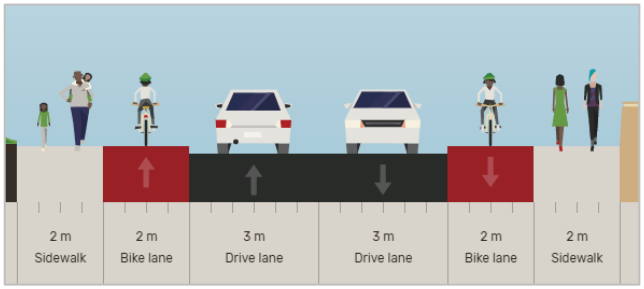

Figure 3.26: Option 1 Monkstown Link Road

Option 1: Proposes a reallocation of road space on Monkstown Link Road to provide a higher Level of Service and protection for cyclists in the form of segregated 2.0m wide cycle tracks on both sides of the road. This is achieved by reducing the current traffic lane widths from 3.5m to 3.0m. Footpaths are also upgraded to ensure a minimum of 2.0m wide footpaths on both sides of the road.

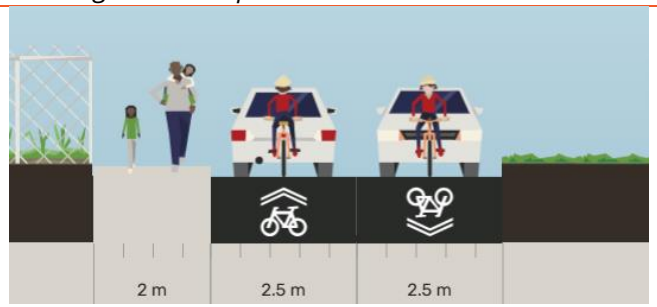

Figure 3.27: Option 2 Brookville Park Link Section

Option 2: Proposes a quiet street along Rockford Park and Rockford Green whereby cyclists would be required to share the street with vehicles. This option still retains full vehicular access to the properties accessed off Rockford Park and Rockford Green. The existing modal filter between the two streets would also be retained. New road surfacing and markings would be introduced to enhance the legibility of the route.

Preferred Option: The preferred option is Option 2 which creates a quiet street along Rockford Park and Rockford Green as this will provide an attractive quite route for cyclists along a lightly trafficked street. Access to the properties on Rockford Park / Rockford Green will be unchanged.

3.10 Link 7 / 8: Monkstown Avenue

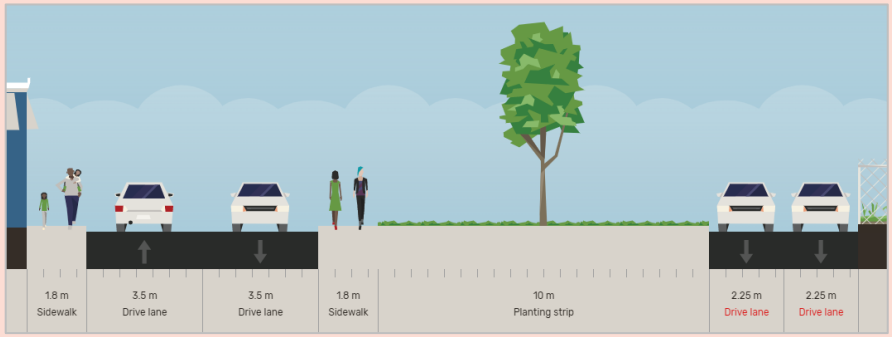

Figure 3.28: Existing Monkstown Avenue Cross Section

Existing Conditions: At present along Monkstown Avenue there are two 3.5m wide traffic lanes and footpaths (≈1.8m wide) on both sides. There are no dedicated cycle facilities.

Along most of its length, run parallel access streets on the northern side which serve a relatively small number of properties.

Separating Monkstown Avenue and these parallel access streets are wide green open space areas, of varying width, within which are numerous mature trees.

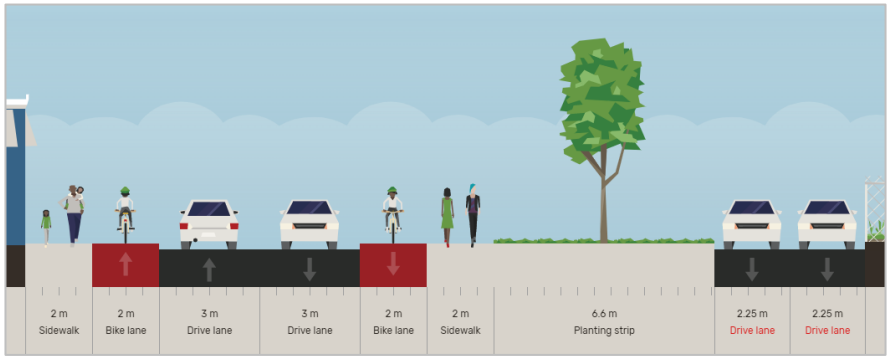

Figure 3.29: Option 1 Monkstown Avenue

Option 1: Proposes segregated cycle tracks on Monkstown Avenue. To achieve the appropriate widths for the cycle tracks would require encroaching into the green space areas along the northern side of the road. This could likely impact the tree roots of several of the existing trees located along here as well as loss of green space.

Two 3.0m traffic lanes would be retained along Monkstown Avenue and footpaths would also be upgraded to 2.0m min widths.

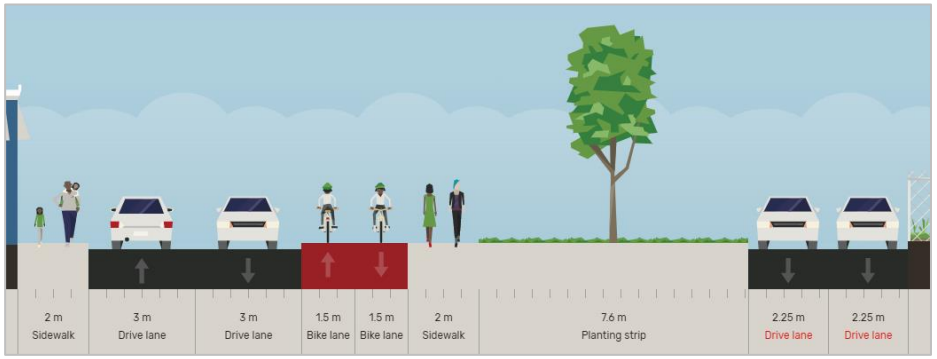

Figure 3.30: Option 2 Monkstown Avenue

Option 2: Proposes a two-way cycle track on the northern side of Monkstown Avenue. This would also require building into the existing green space area, albeit to a lesser extent than Option 1, as the two-way cycle track could be a 3.0m wide facility compared to the 2.0m wide cycle tracks on both sides. Nevertheless, this option would result in the loss of some existing green space and may also impact existing established trees.

Two 3.0m traffic lanes would be retained on Monkstown Avenue and footpaths would be upgraded to 2.0m min widths.

Figure 3.31: Option 3 Monkstown Avenue

Option 3: Proposes converting the parallel access streets to quiet streets with appropriate connections to/from the junctions at either end of this Link. These streets are lowly trafficked and would require minimal interventions to convert them to quiet streets suitable for accommodating cyclists.

The main advantage of this option is minimising/avoiding impacts on the existing green space area within the central landscaped area. The existing cross section on Monkstown Avenue would be retained as per the current layout.

Preferred Option: The preferred option for this Monkstown Avenue section is Option 3, which proposes converting the parallel access streets to quiet streets with appropriate connections to/from the junctions at either end. This is the preferred option primarily due to the fact that it minimises / avoids impacting the existing green space area and established trees within the central landscaped area, but will also provide an attractive quiet route for cyclists away from the more heavily trafficked Monkstown Avenue.

4 Summary

4.1 Overview

This report presents a summary of the Options Report which has been undertaken on behalf of the Dún Laoghaire Rathdown County Council (DLRCC) as part of the DLR Connector Active Travel Scheme. The proposed scheme is located within a highly populated residential and commercial area, passing through key local centres such as Dundrum and Stillorgan and in close proximity to numerous amenities and attractors including several schools and sports clubs.

The main objective of the overall scheme is to provide a safe, high-quality route which delivers enhanced facilities for all road users at key junctions and links with particular benefits for sustainable modes of transportation (cyclists and pedestrians), whilst aligning with current and future development proposals in the wider Dundrum / Dún Laoghaire area.

In general, the existing environment along this part of the DLRCC road network is heavily car dominated with limited existing provision for people walking, wheeling and cycling. The overall environment for pedestrians and cyclists is generally unwelcoming particularly for people with mobility or visual impairments or less confident cyclists. Consequently, the current situation is unlikely to support any aspirations for achieving a greater sustainable transport mode share.

4.2 Junctions Summary

A number of junction design options were identified at each of the study junctions and these were then assessed using a Multi-Criteria Analysis (MCA) to determine the preferred option for each junction. The resulting preferred option for each of the key junctions assessed were as follows:

- **Junction 1**: Barton Road East / Nutgrove Way / Broadford Road Roundabout
  The preferred option is a 'Dutch Style' Protected Roundabout comprising a segregated orbital cycle track and fully segregated pedestrian / cyclist crossings.
- **Junction 2**: Barton Road East / Ballinteer Road Roundabout
  The preferred option is a 'Dutch Style' Protected Roundabout comprising a segregated orbital cycle track and fully segregated pedestrian / cyclist crossings.
- **Junction 3**: Main Street / Sandyford Road / Ballinteer Road / Kilmacud Road
  The preferred option is the introduction of a full bus gate on the western arm (Ballinteer Road) of the junction.
- **Junction 4**: Kilmacud Road Upper / Overend Avenue / Birches Lane Signalised Junction
  The preferred option is the Protected Signalised junction.

- **Junction 5**: Carysfort Avenue / Fleurville Road Signalised Junction

  The preferred option is the Cycle Optimised Protected (CYCLOPS) Junction.
- **Junction 6**: Newtownpark Avenue / Annaville Terrace / Rowanbyrn Crossing

  The preferred option is the Cycle Optimised Protected (CYCLOPS) Junction.
- **Junction 7**: Deansgrange Road / Brookville Road Signalised Junction

  The preferred option is the Cycle Optimised Protected (CYCLOPS) Junction.
- **Junction 8**: Stradbrook Roundabout

  The preferred option is the 3-arm Cycle Optimised Protected (CYCLOPS) Junction.
- **Junction 9**: Monkstown Farm / Monkstown Avenue Signalised Junction

  The preferred option is the 2-way cycle track and 1-lane shuttle system.
- **Junction 10**: Monkstown Avenue Roundabout

  The preferred option is the three arm signalised junction.

4.3 Links Summary

A number of link sections were also examined, to determine the optimal cross sections in order to facilitate legible, safe and high-quality connections between the key study junctions. The desired link cross section comprises 3.0m wide traffic lanes, 2.0m wide cycle tracks and 2.0m wide footpaths. In general, there is sufficient road space width to allow for the reallocation of road space enabling the desired cross section to be achieved. However, there are a number of particularly constrained sections which will require more extensive interventions to provide appropriate facilities. The preferred option for each of the link sections are as follows:

- **Link 1: Barton Road East (L3011):** The preferred option comprises 2.0m segregated cycle tracks on both sides of the road. Cyclists and pedestrians are also fully segregated due to the existing wide verge areas on both sides.
- **Link 1a – Slang River Greenway Connection:** The preferred option is a 4.0m shared path on the eastern side (between Ailesbury Lawn and Dundrum Wood) and maintaining two traffic lanes on Ballinteer Road. Cyclists can make the connection from the shared path to the Slang River Greenway via the Lynwood residential streets.
- **Link 2: Ballinteer Road (R826):** The preferred option removes the right turn lane into the shopping centre and implements a two-way cycle track on the northern side with 2.0m footpaths. This ties into the revised traffic management arrangement at the Main Street / Sandyford Road junction to include a two-way bus gate / shuttle system.

- **Link 2a – Kilmacud Road Upper (R826):** The preferred option is the conversion of Kilmacud Road Upper (east of Sydenham Villas) to one-way operation for traffic and the implementation of a fully segregated two-way cycle track on the northern side.
- **Link 3 – Lower Kilmacud Road**: The preferred option is to provide landscaped buffer strips between the traffic lanes and cycle tracks on both sides where space permits.
- **Link 4 – Fleurville / Annaville Terrace**: The preferred option is to provide 3.0m - 3.25m wide traffic lanes, 2.0m cycle tracks and 2.0m footpaths on both sides.
- **Link 5 - Rowanbyrn / Brookville Park**: The preferred option is to reduce the current excessively wide carriageway by providing landscaped buffer strips segregating cyclists / traffic as well as landscaped verges between the footpaths and cycle tracks.
- **Link 6 – Monkstown Link Road**: The preferred option for this link section is to provide a quiet street along Rockford Park and Rockford Green which will allow the safe mixing of vehicles and cyclists.
- **Link 7 / 8 – Monkstown Avenue**: The preferred option for Monkstown Avenue is to convert the parallel access streets to quiet streets to allow the safe mixing of vehicles and cyclists with appropriate connections to / from the junctions at either end.

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Engineering Sustainable Futures

DBFL CONSULTING ENGINEERS

Dublin Office

Ormond House
Upper Ormond Quay
Dublin 7, Ireland
D07 W704

+ 353 1 400 4000
info@dbfl.ie
www.dbfl.ie

Cork Office

14 South Mall
Cork, Ireland
T12 CT91

+ 353 21 202 4538
info@dbfl.ie
www.dbfl.ie

Galway Office

Odeon House
7 Eyre Square
Galway, Ireland
H91 YNC8

+ 353 91 33 55 99
info@dbfl.ie
www.dbfl.ie

Waterford Office

Suite 8b The Atrium
Maritana Gate, Canada St
Waterford, Ireland
X91 W028

+ 353 51 309 500
info@dbfl.ie
www.dbfl.ie