Dún Laoghaire-Rathdown County Council

Sandyford Business District Pedestrian and Cycle Improvement Scheme

Preliminary Design Report

August 2021

Document Control Sheet

Client:	Dún Laoghaire-Rathdown County Council
Project Title:	Sandyford Business District Pedestrian and Cycle Improvement Scheme
Document Title:	Preliminary Design Report
File Name:	19407-BT-00-ZZ-RP-Z-00030 Preliminary Design Report

Document Revision				**Document Verification**			
Issue Date *(DD/MM/YY)*	**Revision Code**	**Suitability Code**	**Author** *(Initials)*	**Checker** *(Initials)*	***Reviewer*** As Per PMP *(Initials)*	**Approver** *As Per PMP (Initials)*	**Peer Review** *(Initials or N/A)*
24/02/2021	P01	S3	BE	BE	RC	PM	N/A
31/05/2021	P02	S3	BE			RC	
11/08/2021	P03	S4	BE			RC	

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SECTION 1: INTRODUCTION

The purpose of this report is to summarise the steps taken in completing the preliminary design of the Sandyford Cycle Routes Scheme. This report should be read in conjunction with preliminary design drawings 19407-BT-00-ZZ-DR-00018 - 00 to 12.

Background

Barry Transportation (BT) were appointed by Dun Laoghaire Rathdown County Council (DLRCC) to carry-out the design of improved cycle and pedestrian facilities within the Sandyford Business District in Dublin 18.

The extents of this scheme are shown in red in Figure 1.1 below. The scheme length is approximately 2km and is made up by Carmanhall Road, Burton Hall Road and Blackthorn Road.

Figure 1.1

The Sandyford Business District is a key developing economic area in the Dún Laoghaire- Rathdown County Council area. It consists of a number of distinct areas, each with their own character; Stillorgan Industrial Estate, Sandyford Business Estate, Central Park, South County Business Park, Legionaries of Christ and Leopardstown Park Hospital.

The Sandyford Business Estate is one of six areas within the Sandyford Business District which is defined in Figure 1.2 below.

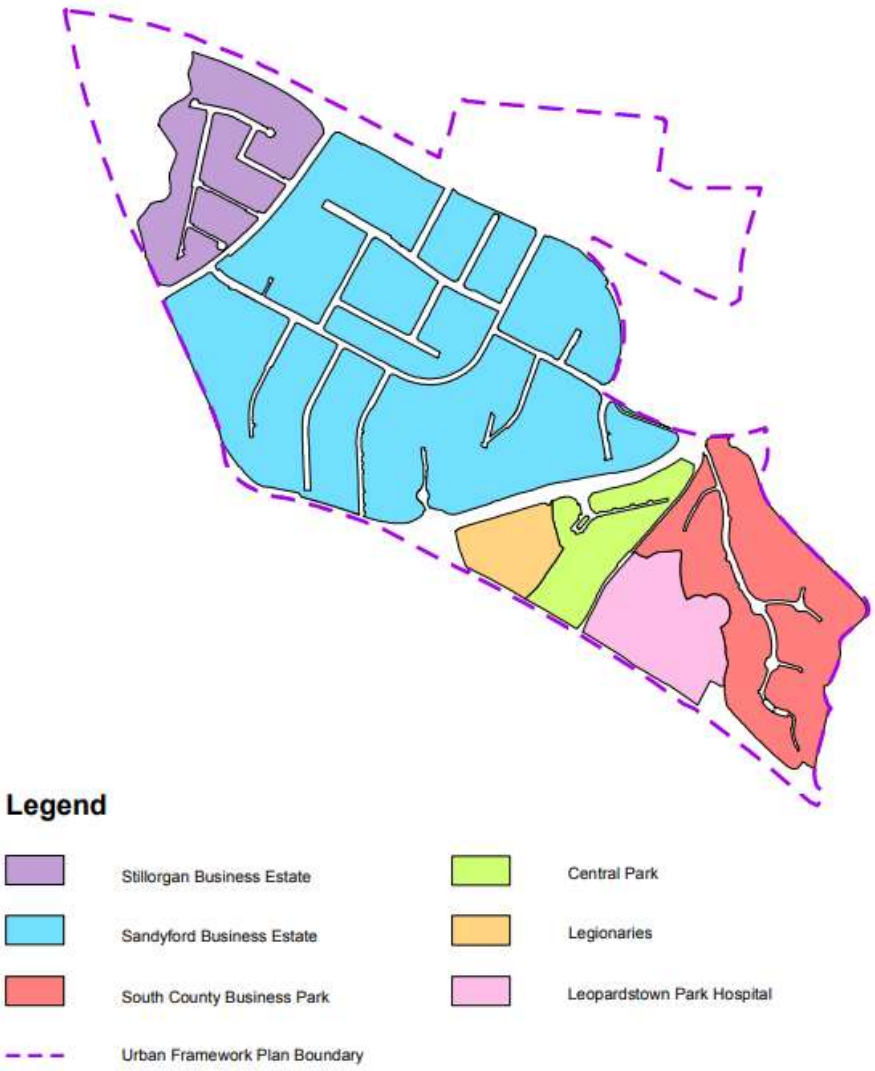


Figure 1.2

In 2010, Dún Laoghaire – Rathdown County Council chose Sandyford Business District for its first Smarter Travel Community (see www.sandyfordsmartertravel.ie). The vision of the Sandyford Smarter Travel is to develop a sustainable urban community with a strong sense of identity that provides quality of life to the people who live and work in the area, ensuring that development occurs at a pace where it is supported by sustainable transport choices. The project aims to provide for the transport needs of those living and working in the area through a holistic package of soft and hard measures aimed at achieving lasting behaviour change, reducing travel demand and the provision of new infrastructure.

A number of infrastructure schemes have been progressed in recent years in and around the Sandyford Business District to improve the facilities for pedestrians and cyclists. These include the development of the Sandyford Greenway and the provision of cycle routes along Blackthorn Avenue, Benildus Avenue and the Kilgobbin/Drummartin Link Road.

24-hour traffic speed and volume surveys were undertaken in July 2021. The highest speeds were recorded on Burton Hall Road and Blackthorn Road where 32% and 40% of drivers, respectively, were observed to be exceeding the speed limit. 16% of drivers were observed to exceed the speed limit on other roads. See Appendix A for more details of this survey. The high vehicle speeds and volumes contribute to a hostile environment for pedestrians and cyclist which this scheme aims to improve.

SECTION 2: DESIGN PRINCIPLES

The core objective underpinning the design of this scheme was to improve the pedestrian and cyclist experience in the Sandyford Business Estate. To achieve this, it was necessary to assess the existing infrastructure against the most recent guidance documents and implement changes when appropriate. The National Cycle Manual, the Design Manual for Urban Roads (DMURS) and the Traffic and Signs Manual were used throughout. DMURS defines pedestrians and cyclists at the top of the hierarchy for roads users, designers were cognisant of this in completing this layout. The following actions were taken consistently during the design of this scheme:

- Traffic lane widths were reduced in accordance with DMURS.
- Carriageway corner radii at junctions and side roads were tightened in accordance with DMURS.
- Left turn slips and pedestrian refuge islands were removed in accordance with DMURS.
- Dedicated cycle lanes provided to cater for all cycle movements in accordance with the National Cycle Manual.
- Segregation and physical protection provided to separate cyclists from motorists in accordance with the National Cycle Manual
- Pedestrian movements and desire lines were investigated with additional crossing points added where required. The crossings distances for pedestrians were reduced wherever possible.
- Crossings upgraded to toucan crossings to allow bicycles to use the signalised crossings where appropriate.
- Widened footpaths and increased pedestrian space.
- Increased the area available for landscaping and retained as many existing trees as possible. Areas were identified for potential new tree planting to compensate for any losses.
- The existing road centreline and crown was maintained where it was practical to do so. Minor alterations were made to suit site specific constraints.
- The existing on-street car parking spaces were maintained where possible.

SECTION 3: TYPICAL CROSS SECTION

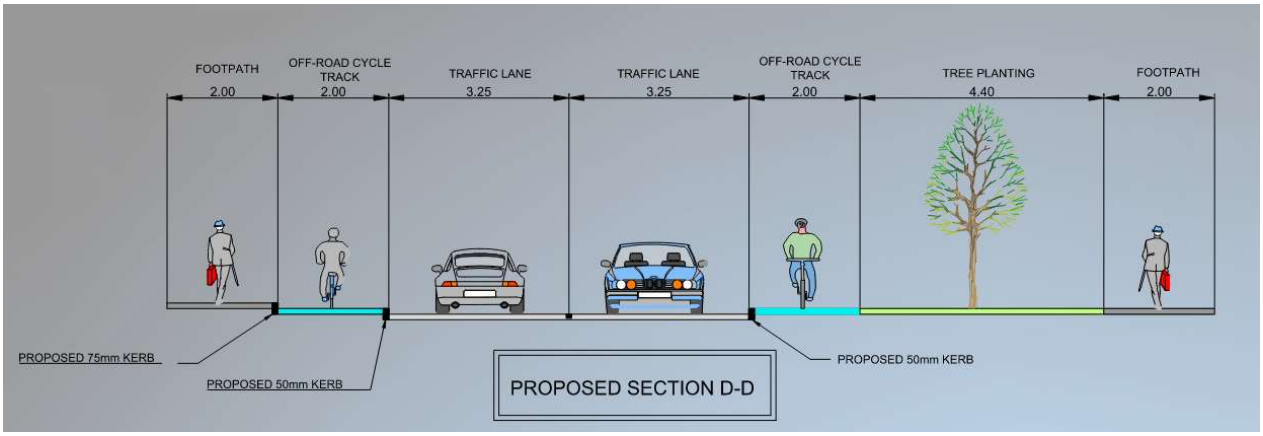


Figure 3.1 – Typical Cross Section

Figure 3.1 shows a typical proposed cross section on the scheme. The typical cross section was determined following consideration of a number of options with DLRCC at the outset of the project. It was a priority to provide additional space for pedestrians and cyclists, and a requirement to provide a width of 2 meters for cycle tracks.

The existing traffic lane widths vary between 3.5 and 4.6 meters. These were reduced to 3.25 meters, increasing to 3.5 meters around bends, which created additional space. Space was also gained by reducing the number of traffic lanes themselves and reducing the size of the grass verges. Existing footpaths will be increased in width to 2 meters where necessary.

SECTION 4: JUNCTION IMPROVEMENTS

There are five junctions located in the scheme extents, each junction was examined individually to determine the most efficient and safest solution. The proposed design maintains all turning movements which are currently permitted at each junction and has implemented guidance from DMURS to make junction improvements. The recurring changes which were made include the following:

- Introducing more direct and shorter crossings for pedestrians
- Removal of left turn slips and pedestrian refuge islands
- Tightened corner radii

Traffic signal timings have been examined and timings and sequences will be adjusted at the detailed design stage to reduce waiting times for pedestrians and cyclists.

Cycle facilities at junctions have generally been designed in accordance with the National Cycle Manual and it was a preference to have dedicated cycle lanes through each junction. Cycle-only traffic signals will be used to give cyclists a head start at junctions. A cycle-only phase will be used at the Burton Hall Road/Blackthorn Road junction to manage the conflict between right turning cyclist and left turning traffic. Junctions where the above arrangement has not been used are discussed individually below. The priority-controlled T junction at Carmanhall Road/Blackthorn Road is proposed to be converted to a signalised junction as part of the scheme.

Tactile pavings to guide the vision impaired will be provided at all pedestrian crossing points in accordance with best practice.

The two busiest and most complex junctions in the scheme are discussed individually in the sections following.

Burton Hall Road/ Blackthorn Avenue Junction

Figure 4.1 below shows the proposed layout at the Burton Hall Road/ Blackthorn Avenue Junction.

Traffic volumes are high at this junction with two lanes of fast-moving traffic travelling in the same direction on most arms, cyclists can also make many turning movements that are not permitted for general traffic due to the one-way systems. As a result, it was not considered practical or safe to have on road cycle movements as part of the main traffic signals here. Instead, cyclists making turning movements have been kept off road and will be required to use the shared areas and the signalised toucan crossings to pass through the junction. Three of the four pedestrian refuge islands are proposed to be removed and turning radii tightened to make crossings for pedestrians and cyclists more convenient.

The proposed arrangement shown below is suitable for less experienced cyclists and allows for all turning movements to be made safely and away from traffic. The change of surface type (from asphalt to concrete) on the shared surface area will indicate that cyclists will be required to yield to pedestrians in these areas, in accordance with the hierarchy of road users outlined in DMURS.

The proposed layout will not require any alterations to the existing Luas line.

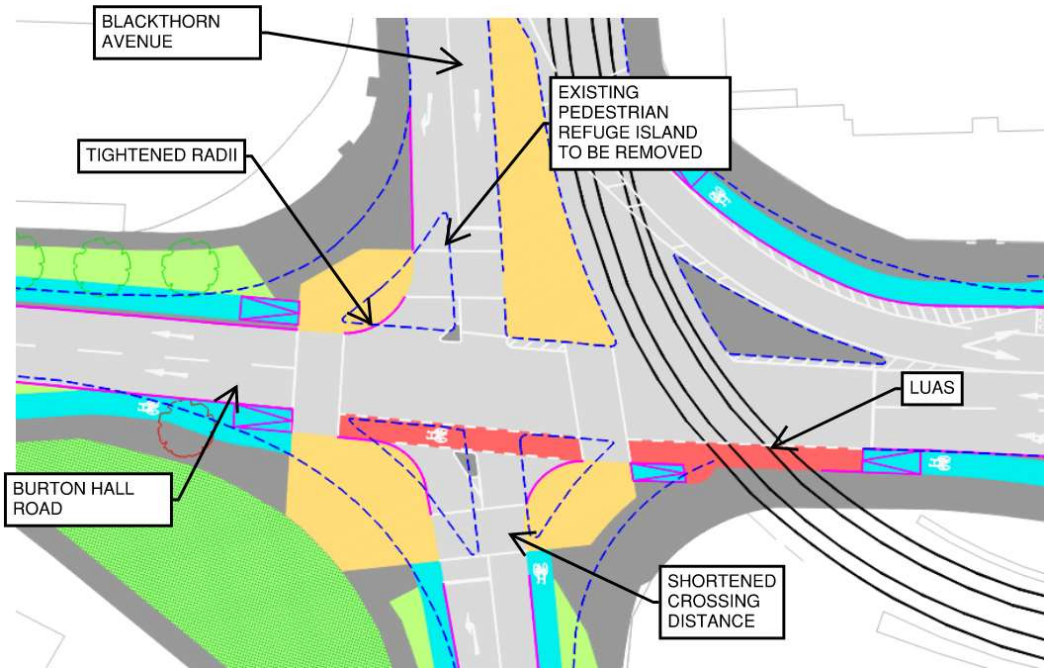


Figure 4.1 – Burton Hall Road/Blackthorn Avenue Junction

Blackthorn Road/ Blackthorn Drive Junction (at Beacon Hospital)

This is currently a busy car-oriented junction that is hostile for cyclists. There is a heavy movement of traffic, particularly in the AM and PM peaks, from Blackthorn Road (SW arm) to Blackthorn Dr (E Arm) as traffic enters and leaves the business park form the M50, there are two left turning lanes of traffic leaving the business park to cater for this volume. The right turning movement for cyclists leaving Blackthorn Dr (E Arm) was looked at in detail, as it conflicts with the primary traffic movement and presents possible safety issues.

Figs 4.2 & 4.3 below show two junction layouts that were considered for this junction.

Option 1 keeps cyclists on road with a dedicated cycle signal that would run separately to general traffic while on Option 2 cyclists making turning movements have been kept off road and would be required to use the shared areas and the signalised toucan crossings to pass through the junction. The pros and cons of each option were examined so that on balance the best option could be selected.

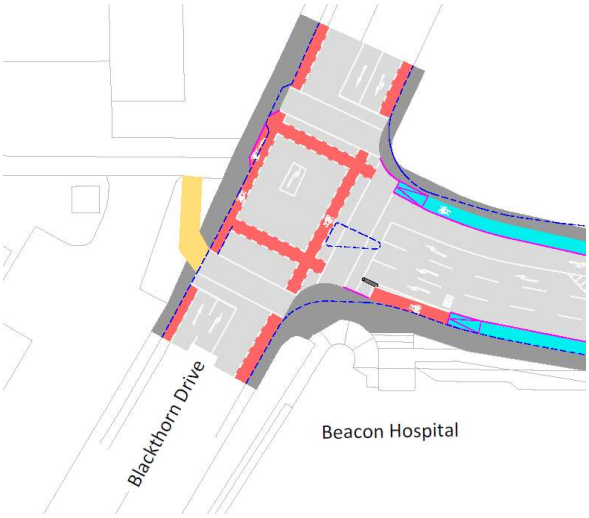


Figure 4.2 – Option 1

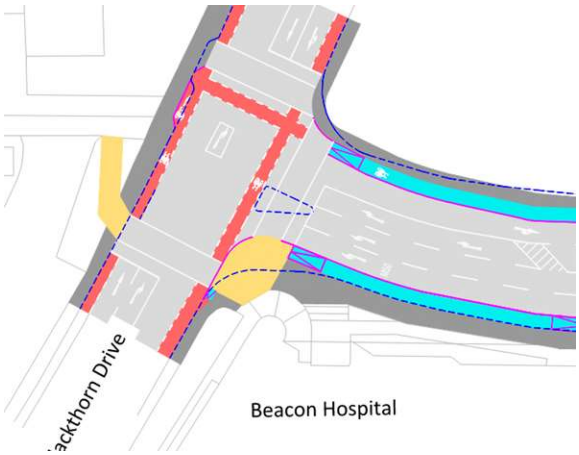


Figure 4.3 – Option 2

Option 1

Pros	Cons
• Cyclists kept on road which avoids any conflict with pedestrians • Direct route for right turning cyclists when they are given the green light	• Potential for cyclists to mistake the general traffic signal for their own and proceed into a dangerous conflict. • Separate cycle phase in the traffic will reduce capacity of junction for traffic. • Cyclists would be held while motorists proceed and could have long waiting times. Left turnings cyclists would likely ignore their light and proceed.

Option 2

Pros	Cons
• Turning cyclists kept away from traffic at all times • Left turning cyclists can proceed on red while only yielding to pedestrians	• Potential for cyclist/pedestrian collisions • Right turning cyclists required to use push button at toucan crossing

On balance the safety risks of Option 1 were considered to be greater due to the potential for collisions between right turning cyclists and left turning traffic/HGVs, Option 2 is also more convenient for left turning cyclists. For these reasons, Option 2 has been recommended as the preferred solution for this junction and is included as part of the preliminary design for this scheme.

The proposed arrangement in Option 2 is suitable for less experienced cyclists and allows for all turning movements to be made safely and away from traffic. The change of surface type (from asphalt to concrete) on the shared surface area will indicate that cyclists will be required to yield to pedestrians in these areas, this is in accordance with the hierarchy of road users outlined in DMURS.

SECTION 5: LANDSCAPING

The implementation of the proposed scheme has created an opportunity to develop the extent of existing landscaping within the study area. Where the carriageway alignment has shifted and lanes have been narrowed, designers have actively taken measure to reallocate space for the enhancement of landscaping features. Where possible it was considered preferable to include a large verge on one side of the road rather than two small verges on either side.

While every effort has been made to minimise this, it will be necessary to remove a number of existing trees to facilitate the scheme. Proposed tree planting locations have been included in the preliminary design drawings to compensate for these losses and a net positive result has been achieved. This is outlined in the table below.

Table 5.1

Item	No.
Proposed Trees	64
Trees to be removed	40
Additional Low-Level Planting (m^2)	353

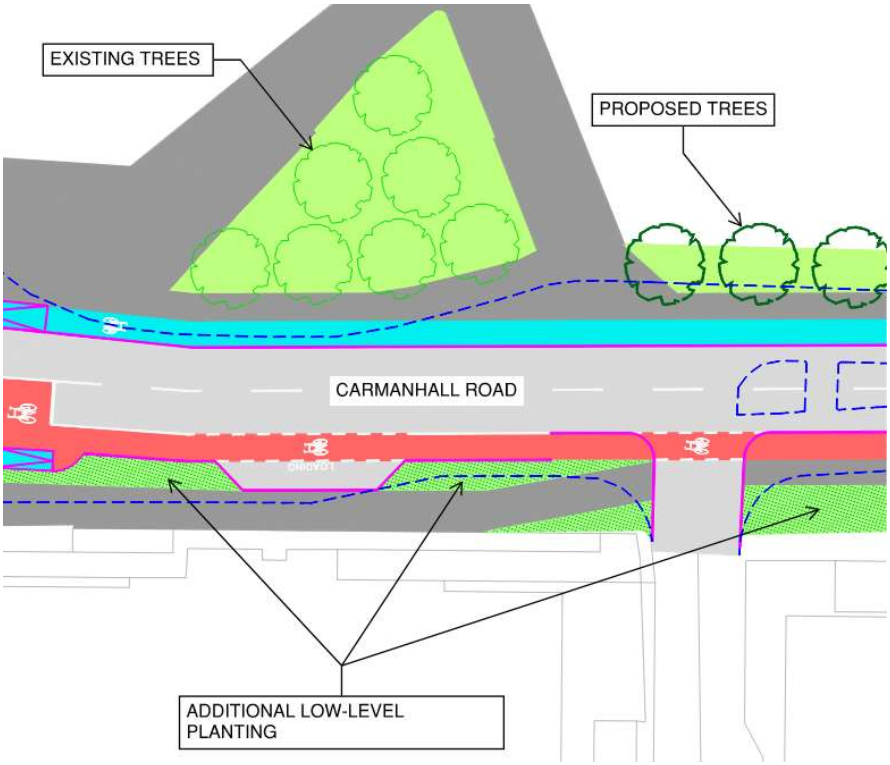


Figure 5.1

SECTION 6: DRAINAGE

Where possible the existing storm water drainage network within the study area will be maintained. The realignment of the existing carriageway will create a need for new gullies and connections to the existing mainline carrier drains. The change in total hardstanding area is negligible when considering any potential additional capacity requirements within the drainage network, the additional area is outlined in the table below. The addition of low-level planting areas will create opportunity to introduce Sustainable Urban Drainage Systems (SUDS).

Table 6.1

Scenario	Hardstanding Area (ha)
Existing	3.83
Proposed Design	3.89

SECTION 7: PAVEMENT

All road pavements will be rehabilitated to achieve a renewed design life of a minimum of ten years as part of this scheme. A pavement condition survey will be undertaken at the detailed design stage to highlight any areas where pavement defects are present. The road profile will also be regraded so that the of the crown of the road will follow the new road alignment. No areas of new road pavement will be constructed as part of this scheme.

The raised adjacent cycle track pavement build-up will be in accordance with Section 5.6 of the National Cycle Manual, details provided in Figure 6.1 below.

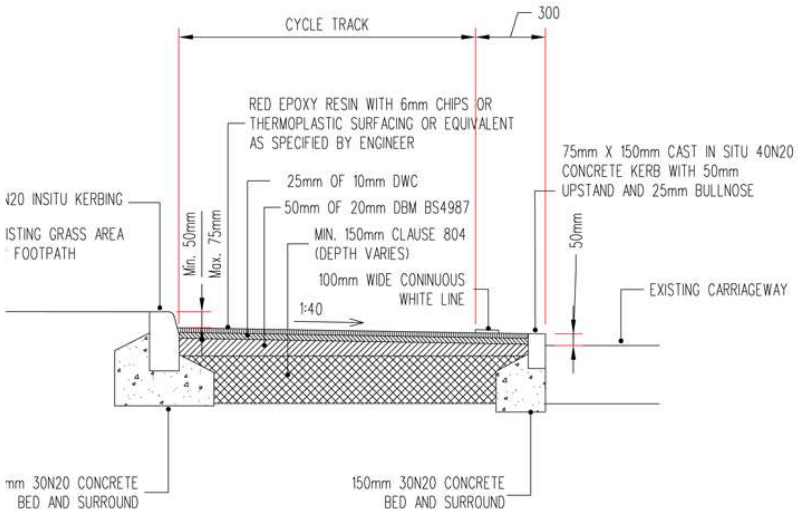


Figure 7.1 – Cycle Track Construction Detail

SECTION 8: UTILITIES

There will be a requirement to divert some sections of existing utilities, and their corresponding infrastructure (manholes, mini pillars etc) to facilitate this scheme. The following utilities are present on-site and may require diversion works

- Watermains
- Telecommunications (Including Fibre Optic Cabling)
- Foul Sewer
- Gas
- High Voltage and Low Voltage ESB
- Induction loop sensors

See example in Figures 7.1 and 7.2 below, where the existing traffic signal, mini pillar and ducting will need to be relocated to facilitate the scheme. A full design of all utility diversions required will be done at the detailed design stage.

Figure 8.1 – Area where existing utilities will need to be relocated

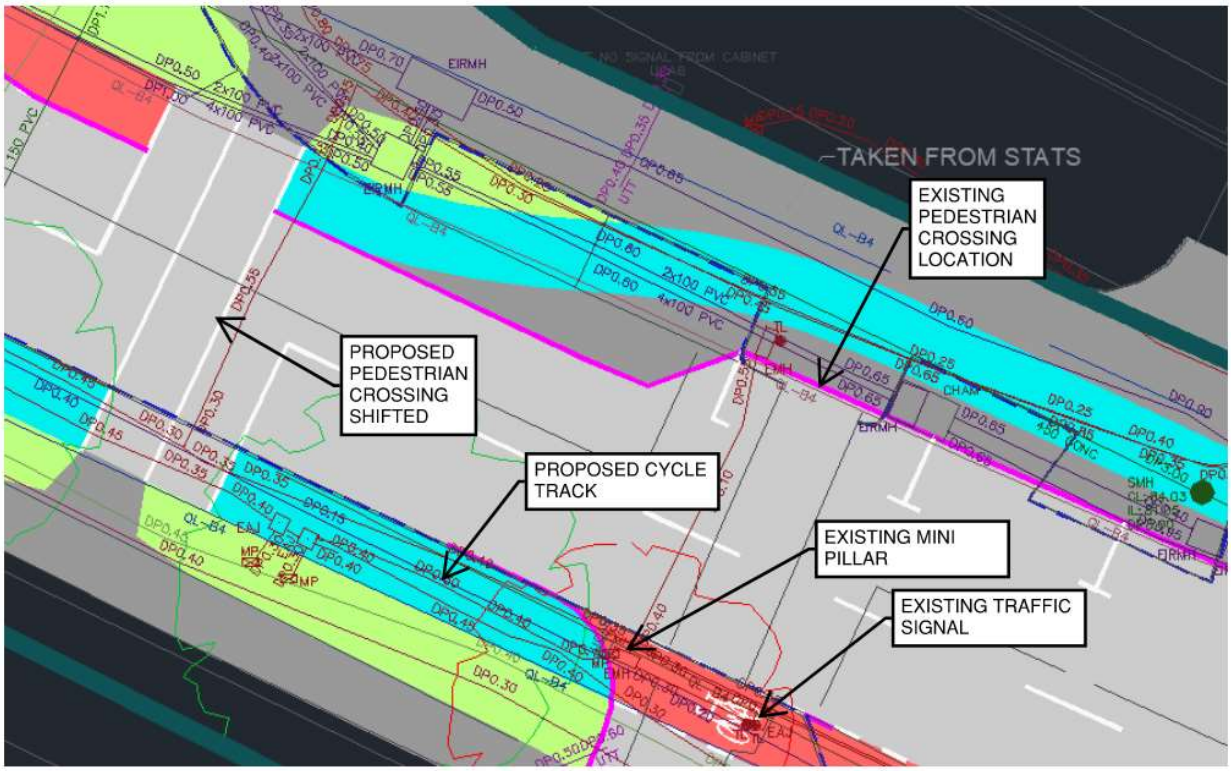


Figure 8.2 – Area where existing utilities will need to be relocated

SECTION 9: PUBLIC LIGHTING

There are currently 128 public lighting columns within the study area extents, approximately 90% of these will require relocation due to the construction of the scheme. As a result of this change an entirely new public lighting design for the study area will be prepared during the detailed design stage.

All new public lighting will be designed in accordance with best practice and will use LED energy saving lanterns.

SECTION 10: COST ESTIMATE

A preliminary cost estimate has been undertaken based on the level of design information available at this stage, and it is estimated that the construction cost of the scheme will be between **€4.2m and €4.8m.**

Note that this estimate does not contain allowances for VAT, inflation, risk or contingency.

SECTION 11: NEXT STEPS

This report summarises the steps taken in completing the preliminary design of the Sandyford Cycle Routes Scheme.

Moving forward, this scheme will be brought for non-statutory public consultation where suggestions from the public will be considered and implemented into the design where appropriate. Following this, the scheme will be subject to a Stage 1 Road Safety Audit.

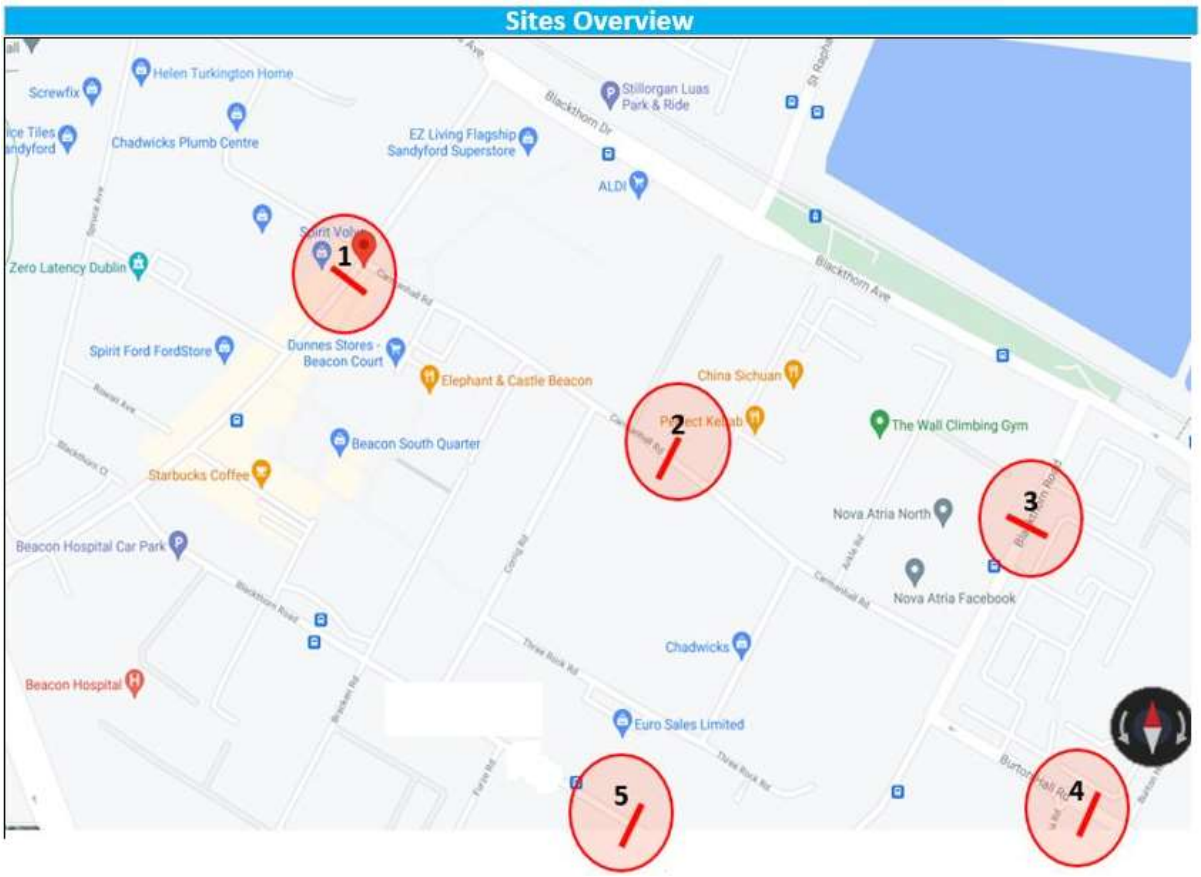
If granted approval to proceed the objective is to bring the project through the detailed design and tendering stages, with the construction stage commencing in the first half of 2022. The construction stage is expected to last approximately 9 months.

Appendix 1:
Traffic Speed and Volume Surveys

Traffic counts were undertaken by Irish Traffic Surveys over a 7-day period from 20th – 27th July 2021.

Surveys measured the speed and volume of traffic over the full 24 hours.

A plan showing the five locations where traffic counters were placed is shown below.



A table summarising the results of the surveys is show below

Site	Average Daily Traffic (ADT)	Mean Speed (km/h)	85th Percentile (km/h)	% of drivers exceeding the speed limit
1	9281	41.3	50.4	16%
2	2430	41.3	50.6	16%
3	7841	40.9	50.4	17%
4	8379	45.1	55.6	32%
5	5820	46	57.4	40%