The background is a vibrant red color. It features several abstract geometric shapes: a large teal semi-circle in the top-left corner, a blue semi-circle in the top-right corner containing a white circle, a dark blue horizontal bar in the top-right, a teal semi-circle in the bottom-right, and a blue vertical shape in the bottom-left containing a white circle. There are also smaller white circles and curved lines scattered throughout the design.

# Appendix M

## Road Safety Audits

Arup

**BusConnects Core Bus Corridors  
- Belfield / Blackrock to City  
Centre Core Bus Corridor**

**Stage 1 Road Safety Audit**

Arup

# BusConnects Core Bus Corridors - Belfield / Blackrock to City Centre Core Bus Corridor Scheme

## Stage 1 Road Safety Audit

Document Ref: P20-138-PSW3-RP-001

Rev	Prepared By	Reviewed By	Approved By	Issue Date	Reason for Revision
4.0	TAG	MAH	TAG	1 <sup>st</sup> June 2021	Final
3.0	TAG	AOR	TAG	17 <sup>th</sup> May 2021	Revised Draft (Scope Extension)
2.0	TAG	AOR	TAG	22 <sup>nd</sup> March 2021	Final
1.0	TAG	AOR	TAG	15 <sup>th</sup> Jan 2021	Draft Report

## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
<b>2</b>	<b>Project Description .....</b>	<b>2</b>
<b>3</b>	<b>Main Report.....</b>	<b>4</b>
<b>4</b>	<b>Observations .....</b>	<b>12</b>
<b>5</b>	<b>Road Safety Audit Team Statement .....</b>	<b>14</b>
	<b>Appendix A – Road Safety Audit Brief Checklist .....</b>	<b>15</b>
	<b>Appendix B – Documents Submitted to the Road Safety Audit Team .....</b>	<b>17</b>
	<b>Appendix C – Feedback Form .....</b>	<b>19</b>
	<b>Appendix D – Problem Locations .....</b>	<b>22</b>

# 1 Introduction

## 1.1 General

This report results from a Stage 1 Road Safety Audit on the proposed Belfield / Blackrock to City Centre Core Bus Corridor Scheme, carried out at the request of Mr Denis Crowley of Arup.

The members of the Road Safety Audit Team are independent of the design team, and include:

**Mr. Aly Gleeson**

(MBA, MEng, BSc, CEng, RSACert, FIEI)  
Road Safety Audit Team Leader

**Mr. Mazen Al Hosni**

(BEng, MIEI)  
Road Safety Audit Team Member

The Road Safety Audit took place during December 2020, January & May 2021 and comprised an examination of the documents provided by the designers (see Appendix B). In addition to examining the documents supplied, the Road Safety Audit Team visited the site of the proposed measures on the 9<sup>th</sup> December 2020. Weather conditions during the site visit were wet and the road surface was wet. Traffic volumes during the site visit were considered to be moderate, pedestrian and cyclist volumes were considered to be moderate and traffic speeds were considered to be generally within the posted speed limit.

Where problems are relevant to specific locations these are shown on drawing extracts within the main body of the report and their locations are shown in Appendix D. Where problems are general to the proposals sample drawing extracts are within the main body of the report, where considered necessary.

This Stage 1 Road Safety Audit has been carried out in accordance with the requirements of GE-STY-01024 - Road Safety Audit (December 2017), contained on the Transport Infrastructure Ireland (TII) Publication's website.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety and considers the perspective of all road users. It has not been examined or verified for compliance with any other standards or criteria. The problems identified in this report are considered to require action in order to improve the safety of the scheme and minimise collision occurrence.

If any of the recommendations within this road safety audit report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made within the report under the heading of Observations are intended to be for information only. Written responses to Observations are not required.

## 1.2 Items Not Submitted for Auditing

Details of the following items were not submitted for audit; therefore no specific problems have been identified at this stage relating to these design elements, however where the absence of this information has given rise to a safety concern it has been commented upon in Section 3: -

- Vehicle swept paths
- Visibility splays

## 2 Project Description

### 2.1 General

BusConnects is the National Transport Authority's (NTA) programme to improve bus and sustainable transport services. It is a key part of the Government's policies to improve public transport and address climate change in Dublin and other cities. The aim of BusConnects is to deliver an enhanced bus system that is better for the city, its people and the environment. BusConnects is included in the Programme for Government "Our Shared Future" 2020, as well as within the following Government strategies:

- The National Development Plan 2018 - 2027;
- Transport Strategy for the Greater Dublin Area 2016 – 2035; and
- The Climate Action Plan 2019.

Part of the overall BusConnects Programme is to create 16 radial core bus corridors (CBC), as illustrated in Figure 2-1. A CBC is an existing road with bus priority so that buses can operate efficiently, reliably and punctually. This generally means full length dedicated bus lanes on both sides of the road from start to finish of each corridor or other measures to ensure that buses are not delayed in general traffic congestion. The bus lanes are typically alongside segregated cycle lanes/tracks where feasible and general traffic.

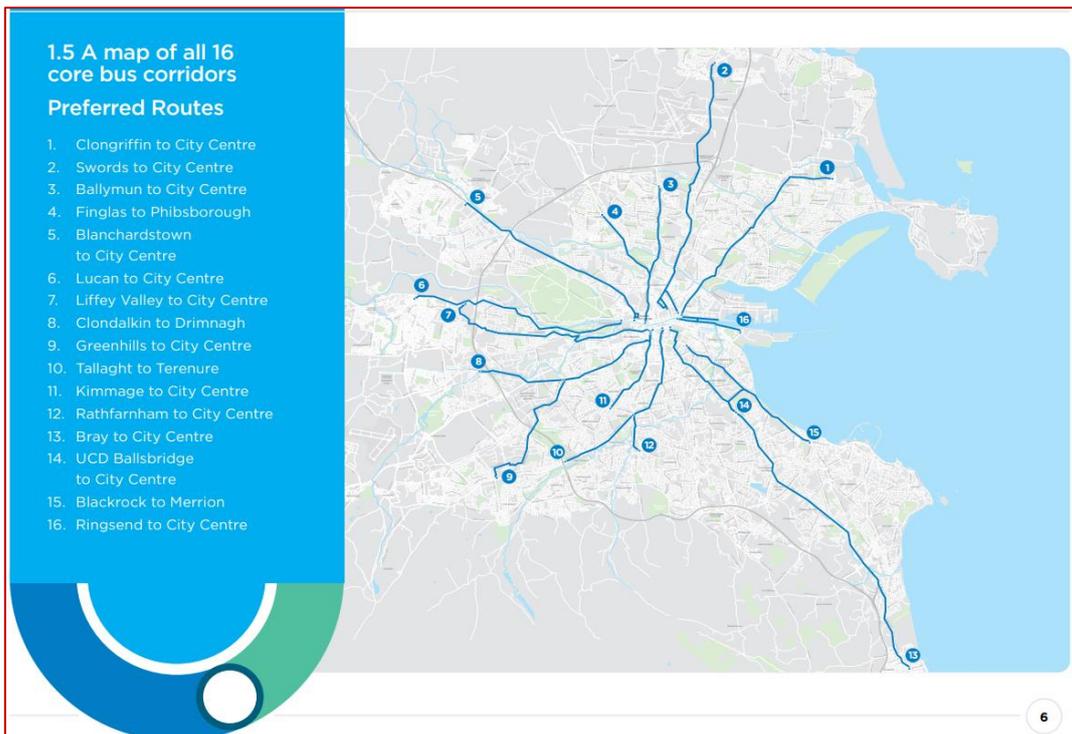


FIGURE 2-1 BUSCONNECTS RADIAL MAP (SOURCE: BUSCONNECTS.IE)

The Belfield to City Centre corridor (route 14 in Figure 2-1) and Blackrock to City Centre corridor (route 15 in Figure 2-1) travel in a southeast direction from the city centre. Their respective routes can be summarised as follows, and are illustrated in Figure 2-2:

**Belfield to City Centre (Route 14):** The Belfield to City Centre Core Bus Corridor commences on Fitzwilliam Street at the junction with Mount Street Upper / Merrion Square South / Merrion Square East. It routes along Fitzwilliam Street, turning onto the R816 Baggot Street Lower at its junction with Fitzwilliam Street Lower and is then routed along the R816 Baggot Street Lower, Baggot Street Upper, Pembroke Road, through its junction with Lansdowne Road, the R118 Pembroke Road, through Ballsbridge village and the R118 Merrion Road to its junction with Nutley Lane. It travels along Nutley Lane from the R118 Merrion Road to the R138 Stillorgan Road junction where it meets the Bray to City Centre Core Bus Corridor.

- Blackrock to City Centre (Route 15):** The Blackrock to City Centre Core Bus Corridor commences on the R118 Merrion Road at its junction with Nutley Lane. Buses are proposed to be routed along Rock Road joining the N31 at the Mount Merrion Avenue junction. The proposed scheme terminates at the junction of Temple Hill/ Monkstown Road and Stradbroom Road. The Blackrock to City Centre Core Bus Corridor connects to the route of the Belfield to City Centre Core Bus Corridor at the junction of Merrion Road and Nutley Lane, providing a continuous route from Blackrock to the City Centre.

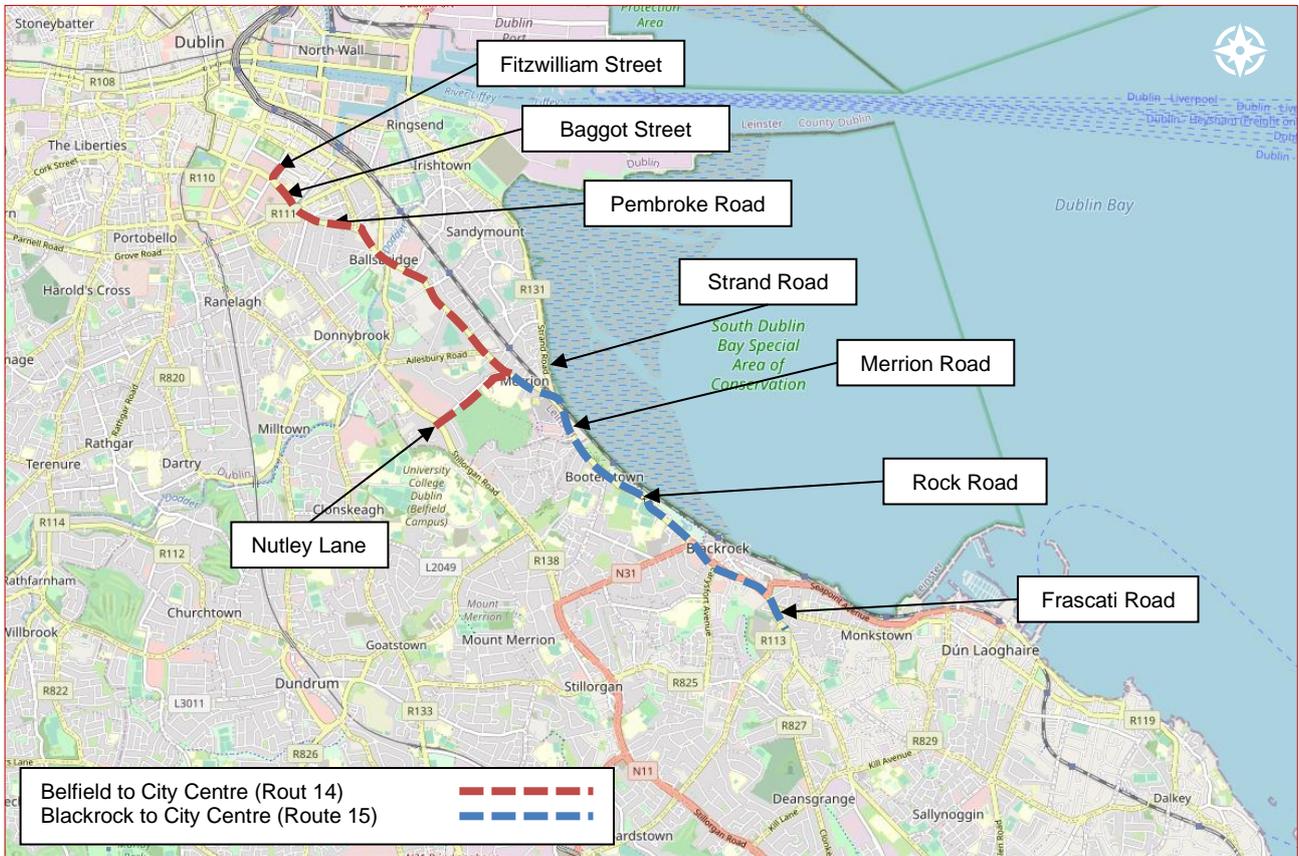


FIGURE 2-2: LOCATION PLAN

The key roads on both routes are highlighted in Figure 2-2, and comprise urban streets with 50kph speed limits, high pedestrian and cyclist volumes, existing bus stops and bus lanes, signalised junctions, pedestrian crossings, public lighting and a mix of public amenities (shops, parks, carparks etc.).

## 2.2 Collision History

The Audit Team were provided with historical collision data for the period 2005 to 2016, detailed in the Collision Analysis Report for the proposed Belfield to City Centre and Blackrock to City Centre Core Bus Corridors. The collision history can be summarised as follows:

**Belfield to City Centre:** A total of 156 collision occurrences were reported along the 4.3km long route, giving an average of 36 collisions per km. This included 1 No Fatal collision involving a pedestrian, and 1 No Fatal collision involving a vehicle. Of the 156 recorded collisions, 7 resulted in Serious Injury, and 147 resulted in Minor Injury. A total of 23% of recorded collisions involved pedestrians, 15% involved cyclists, approximately 4% involved buses, and 58% all other vehicles.

**Blackrock to City Centre:** A total of 146 collision occurrences were reported along the 4km long route, giving an average of 36 collisions per km. This included 1 No Fatal collision involving a Cyclist. Of the 146 recorded collisions, 19 resulted in Serious Injury, and 126 resulted in Minor Injury. A total of 14% of recorded collisions involved pedestrians, 18% involved cyclists, approximately 7% involved buses, and 61% all other vehicles.

## 3 Main Report

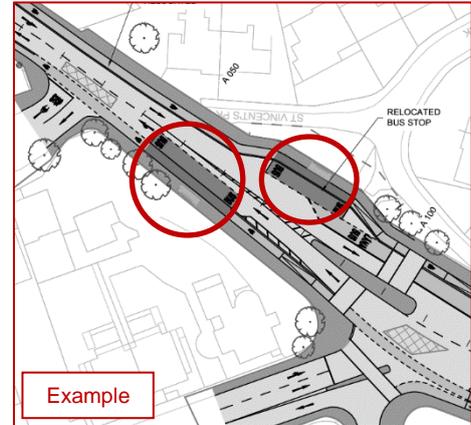
### 3.1 Problem

*Location: General Problem - Throughout the Scheme*

*Summary: Potential for cyclist/pedestrian collisions where cyclists approach the bus stop when passengers are boarding/d disembarking.*

The proposed arrangement for the cycle tracks at a number of the bus stops involves bringing cyclists up to the same level as the footpath, and widening the footpath out to the bus cage, with cyclists occupying the same space where passengers are boarding and disembarking.

Where bus frequencies are moderate to high (as would be expected on a Core Bus Corridor), and/or where cyclist volumes are moderate to high, this could lead to a risk of a cyclist striking a disembarking passenger, who would not expect to have a cyclist approaching alongside the stationary bus.



### Recommendation

Review the proposed cycletrack layout at bus stops, in particular the expected volumes of cyclists and buses, and where necessary amend the arrangements to reduce/remove the likelihood of collisions between cyclists and embarking/d disembarking passengers.

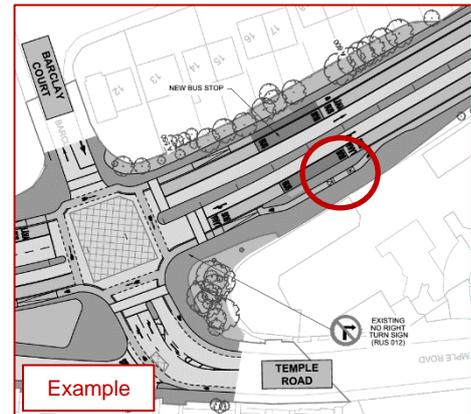
### 3.2 Problem

*Location: General Problem - Throughout the Scheme*

*Summary: Potential for cyclist/pedestrian collisions where bus passengers are required to cross the cycle track when accessing/leaving the floating/island bus stops.*

At some locations a footpath link is indicated between a bus stop and the adjacent footpath, with pedestrians & cyclists occupying the same space for a short distance.

At this early stage in the design process no tactile paving (either warning or guidance) has yet been indicated. Should insufficient guidance be provided at the shared surfaces between island bus stops and the adjacent footpath, this could result in an increased risk of collisions between cyclists and pedestrians where cyclists may be insufficiently aware of the shared area and of the need to moderate their speed, or even come to a halt.



An absence of Guidance Tactile Paving could result in increased difficulties for the visually impaired who may be unaware of how to access or leave the bus stop island.

### Recommendation

Guidance Tactile Paving should be provided to guide visually impaired pedestrians to/from the footpath & the bus stop island.

Measures should be provided on the cycle track approaches to these footpath links, for example Ladder & Tramline tactile paving & Yield road markings, so that cyclists are aware that they are approaching a footpath crossing and that they should slow down & yield to pedestrians at these locations.

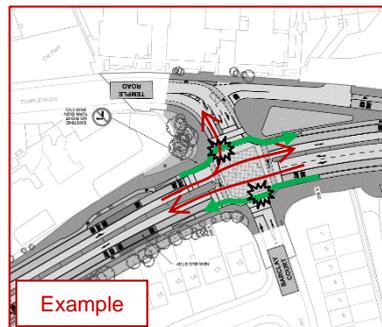
### 3.3 Problem

*Location:* At a number of junctions throughout the Scheme

*Summary:* Left turning manoeuvres are indicated during the same signal phase as straight-ahead cyclists where turning drivers may be insufficiently aware of a cyclist proceeding straight at a number of the protected intersections/junctions within the Scheme.

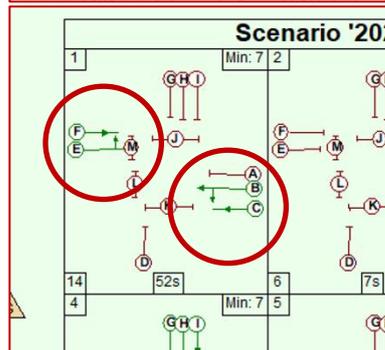
There is a risk that drivers, when given a green signal, may not anticipate a straight-through cyclist to proceed simultaneously. This could arise where a left-turning driver misinterprets the layout as a signalised/toucan crossing on a separate phase, or where a stationary bus at the stop line in the bus lane between the traffic lane and the cycle lane obscures a left-turning driver's view of a cyclist on the cycle lane, and vice versa.

Additionally, left turning drivers may also turn across the path of a bus in the bus lane, leading to side-on collisions.



### Recommendation

Reduce the lateral displacement of the straight through cycle lane from the left-turning traffic lane(s) to improve driver's awareness of possible straight through cyclists (e.g. amending the bus lane to also accommodate left-turning traffic on the immediate approach to the signals) and amend the left turn signals so that left turns are on a flashing amber.



This recommendation would also reduce the risk of left turning traffic moving in front of straight-ahead buses.

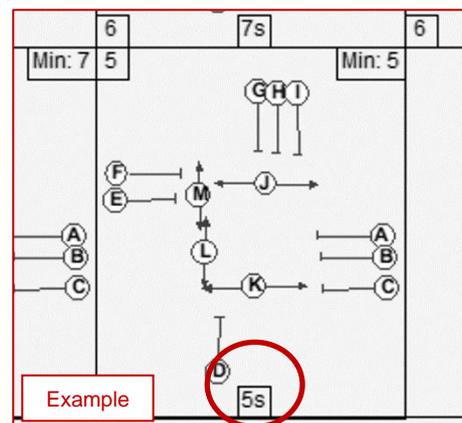
### 3.4 Problem

*Location:* General Problem - Throughout the Scheme

*Summary:* The timing proposed for pedestrian phases at a number of signalised junctions within the Scheme may not be sufficient to allow pedestrians, and in particular the mobility impaired, to complete a crossing safely.

At a number of signalised junctions within the Scheme, pedestrian phases have been indicated as being quite short (e.g. 5 seconds long). The Audit Team are concerned that this will not be sufficient time for non-motorised road-users, in particular the elderly & mobility impaired, to complete a crossing safely.

This could lead to pedestrians remaining within the carriageway when a subsequent green vehicular phase has been triggered increasing the risk of vehicle-pedestrian collisions.



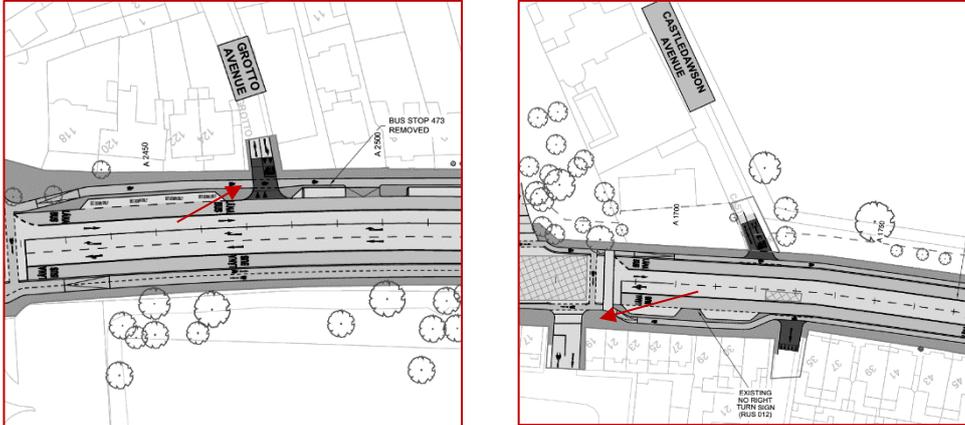
### Recommendation

Ensure pedestrian green phases are of a sufficient length such that all non-motorised road users can complete the crossing safely.

### 3.5 Problem

*Location:* BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0005 (Rev L01) and BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0007 (Rev L01)

*Summary:* Visibility (to cyclists/pedestrians) for drivers turning left into a side road may be impeded by vehicles parked in the parallel parking bays, leading to vehicle/pedestrian and vehicle/cyclist collisions.



Vehicles occupying parking areas or set-down areas may block visibility towards cyclists and pedestrians on the footway, resulting in possible vehicle/pedestrian and vehicle/cyclist collisions when traffic turns left into the respective side road.

### Recommendation

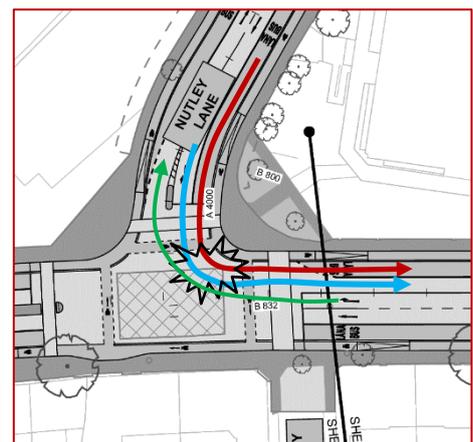
Ensure sufficient inter-visibility between drivers and pedestrians/cyclists is provided at these locations.

### 3.6 Problem

*Location:* BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0012 (Rev L01)

*Summary:* It is unclear if there will be sufficient space within the Nutley Lane/Merrion Road signalised junction to accommodate the swept path of HGVs and buses, particularly where adjacent turning lanes receive a green signal during the same phase.

Information regarding the swept path of vehicles undertaking turning movements at proposed signalised junctions within the Scheme have not been provided to the Audit Team. The Audit Team are concerned that there will not be sufficient space at all junctions to accommodate the swept path of all vehicles, particularly HGVs and buses, within the proposed junction layouts. This is a particular concern where adjacent turning lanes proceed simultaneously on one phase as drivers may encroach within the path of an adjacent vehicle resulting in low-speed side-swipe collisions.



Additionally, this problem may be exacerbated where left turners from Nutley Lane proceed within the same phase as right turners from Merrion Road.

### Recommendation

A comprehensive swept path analysis should be undertaken to demonstrate that all new, and revised, signalised junctions can sufficiently accommodate the swept path of all vehicles. Where constraints are identified, the layout should be revised to ensure all vehicle movements can be accommodated.

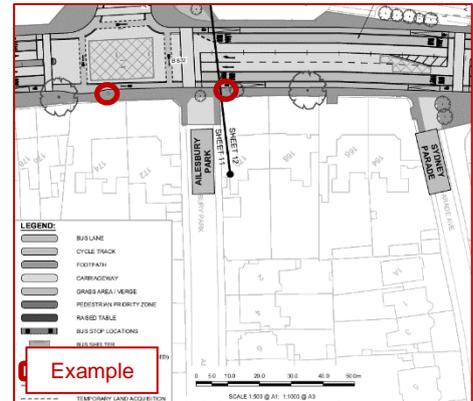
### 3.7 Problem

*Location: General Problem - Throughout the Scheme*

*Summary: Heritage features indicated within the footpath and cycle track may present obstacles to pedestrians and cyclists.*

A number of Heritage Features within the footpath and cycle track have been indicated as being retained throughout the project. It is unclear from the drawings provided what these features are and whether they will result in significant obstacles to pedestrians and cyclists.

Large features within the footpath and cycle track may also reduce the effective width of the footpath and cycle track which may lead to VRUs having to step into the cycle track, from the footpath, or adjacent carriageway to allow oncoming VRUs to pass resulting in an increased risk of being struck by a vehicle or cyclist.



### Recommendation

Ensure the retained Heritage Features do not present obstacles to pedestrians and cyclists.

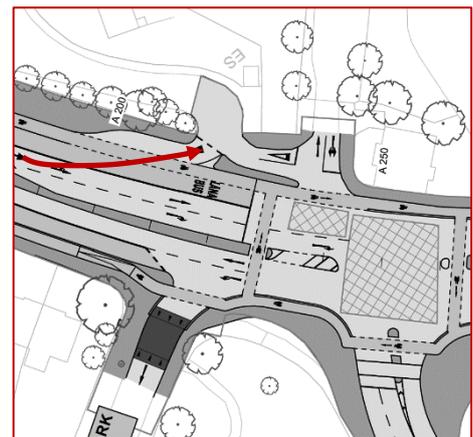
### 3.8 Problem

*Location: BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0001 (Rev L01)*

*Summary: Limited visibility to cyclists may lead to side-on and side-swipe collisions.*

Westbound vehicles wishing to access St Vincent’s Park must cross a Bus Lane and a cycle lane to access the left lane diverge/yield. The angle of approach may be such that visibility is limited for left turners, leading to side-swipe and side-on collisions with cyclists.

This problem may be exacerbated by a sense of urgency where drivers attempt to turn left ahead of a following bus, which may lead to a driver being less focussed on a cyclist.



### Recommendation

Left turning traffic should merge with the bus lane upstream of the side road access.

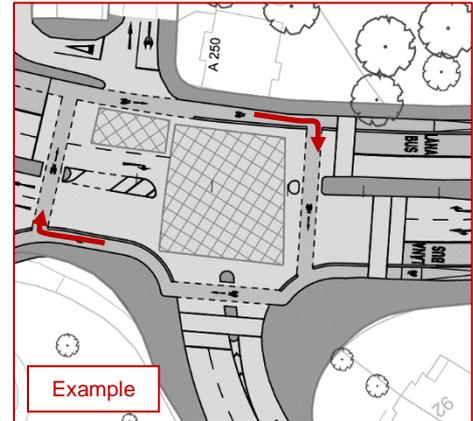
Alternatively, the left turn diverge should be removed, with left turns being incorporated within the signalised junction. This approach may also simplify pedestrian movement through the junction, which is currently unclear.

### 3.9 Problem

*Location: General Problem - Throughout the Scheme*

*Summary: Right turning cyclists may impede straight-ahead cyclist movement, leading to rear-end-shunt and side-swipe collisions.*

Cyclists waiting to turn right at signalised junctions will likely wait within the cycle track until they are given a green signal. However, the space within the cycle track is limited, so waiting cyclists may impede straight-ahead cycle movement, increasing the risk of rear-end-shunt collisions with following cyclists, or force cyclists to enter the footway or carriageway to continue around the stationary cyclists, leading to cyclist/pedestrian collisions, or side-swipe collisions with buses.



### Recommendation

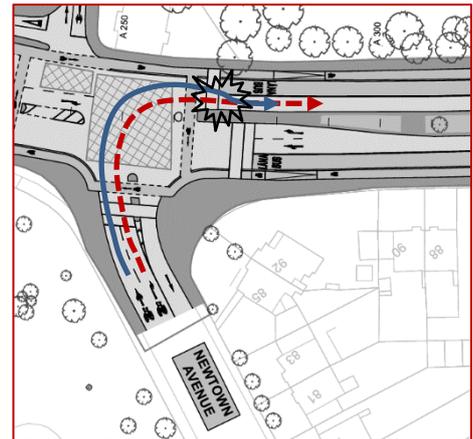
Stationary cyclists should be provided with space to wait, which is outside the path of straight-ahead cyclists.

### 3.10 Problem

*Location: BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0001  
(Rev L01)*

*Summary: Two right turn lanes in Newtown Avenue do not correspond with one single lane on Temple Hill and may lead to side-swipe collisions as drivers quickly attempt to exit the bus lane.*

Newtown Avenue is indicated as having two lanes ('left/straight/right' in the nearside lane and 'right only' in the offside lane). Temple Hill's westbound carriageway has a bus lane and a straight-ahead lane, so cannot accept two right turning vehicles. This may lead to right turning vehicles in the nearside lane having to suddenly merge with traffic in the offside lane when they observe the bus lane, leading to side-swipe collisions.



Additionally, it is unclear if two right turning vehicles can navigate the right turn manoeuvre at the same time. Insufficient width may lead to side-swipe collisions before entering Temple Hill.

### Recommendation

The nearside traffic lane on Newtown Avenue should be left and straight-ahead only.

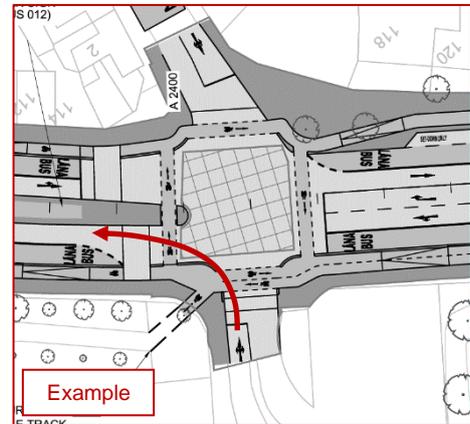
### 3.11 Problem

*Location: General Problem - Throughout the Scheme*

*Example: BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0007 (Rev L01)*

*Summary: It is unclear if there will be sufficient space within the signalised junction to accommodate the swept path of all vehicles.*

Information regarding the swept path of vehicles undertaking turning movements at proposed signalised junctions within the Scheme have not been provided to the Audit Team. The Audit Team are concerned that there will not be sufficient space at all junctions to accommodate the swept path of all vehicles, particularly HGVs and buses, within the proposed junction layouts. This is a particular concern where protected cycle lane infrastructure reduces the turning radii further.



### Recommendation

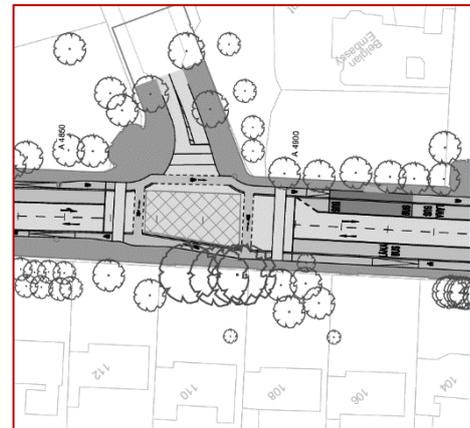
A comprehensive swept path analysis should be undertaken to demonstrate that all new, and revised, signalised junctions can sufficiently accommodate the swept path of all vehicles. Where constraints are identified, the layout should be revised to ensure all vehicle movements can be accommodated.

### 3.12 Problem

*Location: BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0014 (Rev L01) and BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0020 (Rev L01)*

*Summary: Road narrowing may lead to side-swipe collisions.*

Road users travelling east on Merrion Road may be unaware of the road narrowing at Shrewsbury Road, which will require buses to merge with general traffic. The relatively short merge length through the junction may lead to unsafe merging and side-swipe collisions, particularly during a green signal phase.



A similar concern exists at the junction of Baggot Street Lower and Herbert Place.

### Recommendation

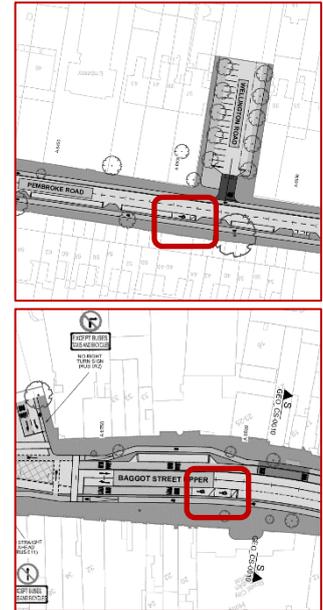
Provide appropriate signage to warn drivers of the road narrowing in good advance of the signalised junction.

### 3.13 Problem

*Location:* BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0018 (Rev L01) and BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0019 (Rev L01)

*Summary:* Insufficient width of mobility parking space may increase the risk of mobility users conflicting with moving traffic, leading to serious personal injury.

Parking space dimensions have not been provided to the RSA Team at this early stage in the design process, so the width of parking spaces is unknown. However, the mobility parking spaces on Pembroke Road and Baggot Street appear to share the same width as adjacent parking spaces, despite needing additional width to accommodate users getting in and out of their vehicles. Insufficient width for mobility users may increase the risk of personal injury should a user be struck by a moving vehicle when accessing/exiting their vehicle.



### Recommendation

Ensure the width of mobility parking spaces is compliant with the Traffic Signs Manual.

Additionally, ensure dropped kerbs and tactile paving is provided at each mobility parking space to support access between the parking space and the footway.

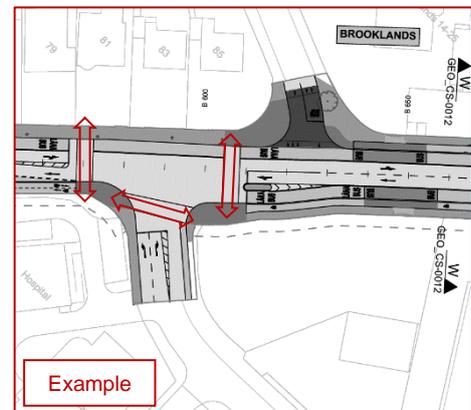
### 3.14 Problem

*Location:* General problem throughout the Scheme

*Example:* BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0023 (Rev L01)

*Summary:* Unclear if the crossings within signalised junctions will be Toucan crossings to allow cyclists to cross to other cycle facilities on the opposite side of the junction.

At a number of junctions within the Scheme, off-road cycle tracks are indicated as terminating upstream/at what is assumed to be a shared surface at the crossings within the junction. The Audit Team assume that cyclists wishing to access other arms of these junctions, where cycle facilities are not incorporated into the junction, will do so by using the signalised crossings in the junction.



It is unclear if these crossings will be Toucan crossings. If these crossings are not toucan crossings there is a risk that the crossing will not be sufficiently wide enough to safely accommodate pedestrians and cyclists and will not provide measures (separate push button/signal head) for cyclists. This could lead to an increased risk of conflicts between pedestrians and cyclists when accessing, waiting at, and using the crossing.

### Recommendation

Ensure all crossings at shared surfaces throughout the Scheme are Toucan crossings with a minimum width of 4m.

### 3.15 Problem

*Location: BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0016 (Rev L01)*

*Summary: Left turning traffic on Merrion Road is permitted access to Anglesea Road at the same time as the pedestrian stage for pedestrians crossing Anglesea Road, which may lead to pedestrian/vehicle collisions.*

The phasing diagram provided at the Merrion Road/Anglesea Road junction indicates that the pedestrian crossing of Anglesea Road shall share the same phase as the straight-ahead and left-turning movements on Merrion Road, which will bring pedestrian crossing movements into conflict with left turning movements from Merrion Road. This may increase the risk of a vehicle/pedestrian collision.



### Recommendation

The pedestrian and vehicle phase should be separated.

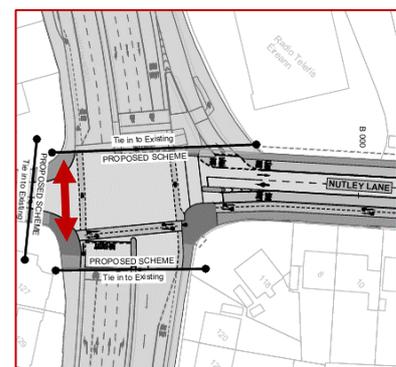
A thorough review of each signal phasing diagram should be undertaken to ensure further conflicting movements are avoided across the project.

### 3.16 Problem

*Location: BCIDC-ARP-GEO\_GA-1415\_XX\_01-DR-CR-0022 (Rev L05)*

*Summary: Lack of pedestrian facilities on Greenfield Park may lead to vehicle/pedestrian collisions.*

The provision of a high-quality bus corridor on Nutley Lane may increase the number of local residents choosing public transport when commuting to work, school or college. This growth will likely place increased demand on the existing pedestrian facilities on, or near, the new bus corridor. This may include residents from Stillorgan Road and Greenfield Park. However, there is currently no signalised pedestrian crossing on Greenfield Park. Pedestrians, particularly visually and mobility impaired pedestrians, traveling on Stillorgan Road (western side) and Greenfield Park (southern side) may find it difficult to navigate the crossings on route to the improved bus facilities, increasing the risk of vehicle/pedestrian collisions.



### Recommendation

A signalised pedestrian crossing on Greenfield Park should be incorporated into signalised junction, including dropped kerb and tactile paving.

Should this be outside the scope of this project, the Designer shall bring this to the attention of the Local Area Engineer for review and consideration.

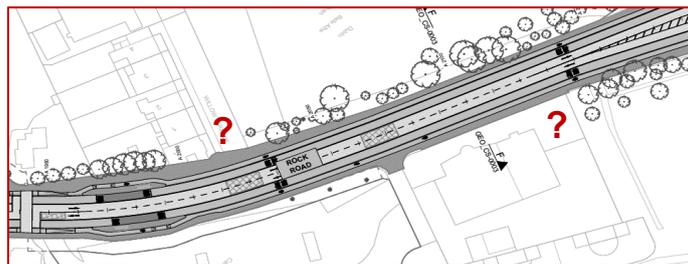
## 4 Observations

- 4.1 At this early stage in the design development no information has been provided in relation to the proposed dropped kerb locations, tactile paving provisions & transitions for cycle tracks between on-road and off-road locations. Possible safety issues can arise at these locations, for example for visually impaired pedestrians who may inadvertently enter a carriageway at a dropped kerb location should no tactile warning paving be provided (e.g. at uncontrolled crossing locations, or raised table crossing of side roads).

During the design development ensure that dropped kerbs are provided where necessary to facilitate mobility impaired road users, and that tactile paving is provided at these locations and where cycle tracks transition between on-carriageway and off-road locations, to advise visually impaired pedestrians of the carriageway hazard.

Where shared surfaces are provided, Ladder & Tramline tactile paving will be required in order to advise visually impaired pedestrians that they are entering a location shared with cyclists, and to prevent them from inadvertently exiting the shared space onto the cycle lane which could result in them entering the carriageway further downstream.

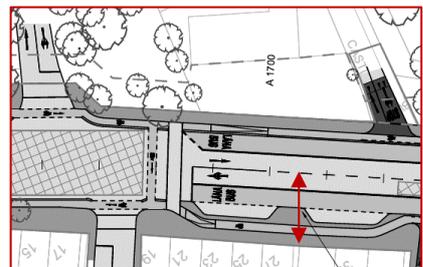
- 4.2 It is unclear if the widths of the two-way cycle track on Nutley Lane will be sufficient to accommodate two-way cyclists. The National cycle manual recommends a minimum of 2m wide lanes in each direction for a two-way cycle track.
- 4.3 Existing accesses on Rock Road have not been indicated in the design drawing (e.g. kerb, gap in cycle track kerb etc) for Willow Terrace and the Carpark/Dealership.



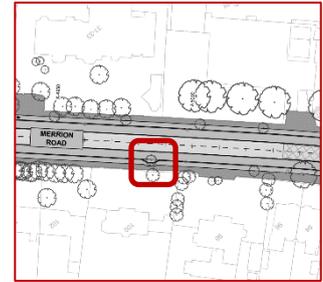
- 4.4 The existing cross section on the eastbound Rock Road carriageway includes a pedestrian footway, parallel parking, a nearside traffic lane (that includes an advisory cycle lane within it) and an offside traffic lane.

The proposed layout indicates a cross section that includes a pedestrian footway, an off-road cycle track, a buffer zone, parallel parking, a nearside bus lane and an offside traffic lane.

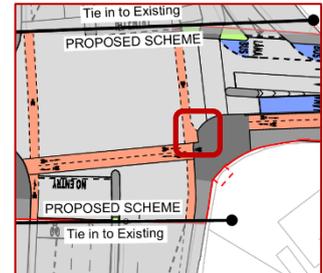
In the absence of dimensions, it is unclear to the RSA Team if the proposed layout can fit within the existing footprint. Ensure the proposed cross section can be accommodated within the available footprint.



- 4.5 It is proposed to retain a tree on the northern side of Merrion Road where a cycle lane is proposed. This will result in a sharp and short deflection on the cycle track, as well as an increased risk of tree roots deforming the cycle lane surface. The tree should be removed from the footway.



- 4.6 Kerb line at the eastern corner of the Stillorgan Road/Nutly Lane/Greenfield Park signalised junction is shown to have a sharp corner. This is assumed to be CAD error.



## 5 Road Safety Audit Team Statement

We certify that we have examined the drawings referred to in this report. The examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme.

The problems identified have been noted in this report together with associated safety improvement suggestions, which we would recommend should be studied for implementation.

No one on the Road Safety Audit Team has been involved with the design of the scheme.

### ROAD SAFETY AUDIT TEAM LEADER

Aly Gleeson

Signed:

  
\_\_\_\_\_

Dated:

1<sup>st</sup> June 2021  
\_\_\_\_\_

### ROAD SAFETY AUDIT TEAM MEMBER

Mazen Al Hosni

Signed:

  
\_\_\_\_\_

Dated:

1<sup>st</sup> June 2021  
\_\_\_\_\_

## **Appendix A – Road Safety Audit Brief Checklist**

Have the following been included in the audit brief?: (if 'No', reasons should be given below)

	Yes	No
1. The Design Brief	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Departures from Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Scheme Drawings	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Scheme Details such as signs schedules, traffic signal staging	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Collision data for existing roads affected by scheme	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Traffic surveys	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Previous Road Safety Audit Reports and Designer's Responses/Feedback Form	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Previous Exception Reports	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Start date for construction and expected opening date	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Any elements to be excluded from audit	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Any other information?**

(if 'Yes', describe below)

<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	-------------------------------------

---

---

---

---

---

---

---

---

---

---

## **Appendix B – Documents Submitted to the Road Safety Audit Team**

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REV
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-001	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-002	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-003	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-004	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-005	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-006	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-007	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-008	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-009	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-010	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-011	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-012	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-013	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-014	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-015	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-016	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-017	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-018	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-019	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-020	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-021	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-022	L01
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-023	L01
Traffic Signal Phasing Information	201028_Dashboard R1415	-
<b>Scope Extension</b>		
CBC 1415 Belfield/Blackrock to City Centre General Arrangement	BCIDC-ARP-GEO_GA-1415_XX_01-DR-CR-022	L05
<b>For Information</b>		
Collision Analysis Report – Route 15 Blackrock to Merrion WIP1		
Collision Analysis Report – Route 14 UCD Ballsbridge to City Centre WIP1		

## Appendix C – Feedback Form

## Road Safety Audit Feedback Form

**Scheme:** Belfield / Blackrock to City Centre Core Bus Corridor Scheme

**Route No.:** R113, N31, R118, and R816

**Audit Stage:** Stage 1 Road Safety Audit      **Date Audit Completed:** 14<sup>th</sup> January 2021

To Be Completed by Designer				To Be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
3.1	Yes	Yes		
3.2	Yes	Yes		
3.3	Yes	No	Where left-turn vehicles turn with straight ahead cyclists, the vehicles will be controlled with a flashing amber arrow. With respect to the lateral displacement of the cycle track at the junction, the displacement is necessary to accommodate the protection kerb on the corner. In collaboration with the Dublin Cycling Campaign, the approach taper to the junction will be elongated where possible to avoid any sudden left turns by cyclists on the corner, which may give the impression that cyclists are turning left.	Yes
3.4	No	No	The 5 seconds indicated represents the time that the solid green man is lit ('invitation to walk'), but there will be additional time whereby the flashing green man will be active, the duration of which is calculated based on the crossing distance.	Yes
3.5	Yes	Yes		
3.6	Yes	Yes		
3.7	Yes	Yes		
3.8	Yes	Yes		
3.9	Yes	Yes		
3.10	Yes	Yes		
3.11	Yes	Yes		
3.12	No	No	The proposed solution here is to provide bus priority signals	Yes

## Road Safety Audit Feedback Form

**Scheme:** Belfield / Blackrock to City Centre Core Bus Corridor Scheme

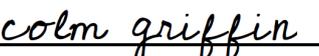
**Route No.:** R113, N31, R118, and R816

**Audit Stage:** Stage 1 Road Safety Audit      **Date Audit Completed:** 14<sup>th</sup> January 2021

To Be Completed by Designer				To Be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
			whereby the inbound general traffic lane and the bus lane are controlled by separate phases and will not be permitted to pass through the junction simultaneously.	
3.13	Yes	Yes		
3.14	Yes	Yes		
3.15	No	No	The stage includes the inbound bus phase active while the Anglesea Road ped phase is also active. There are no left turning buses so there is no conflict. Notwithstanding the above, the proposed staging arrangement of this junction has been amended and this pedestrian phase is no longer proposed to be active at the same time as the bus or cycle phase.	Yes
3.16	Yes	Yes		

**Signed:**       Designer      **Date** 1<sup>st</sup> June 2021

**Signed:**       Audit Team Leader      **Date** 1<sup>st</sup> June 2021

**Signed:**       Employer      **Date** 14th April 2022

## Appendix D – Problem Locations

