Appendix M2
Stage 1 Road Safety Audit

Arup

BusConnects Core Bus Corridors - Blanchardstown to City Quays

Stage 1 Road Safety Audit

P·M·C·E

July 2021

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Rev	Prepared By	Reviewed By	Approved By	Issue Date	Reason for Revision
6.0	MAH/AOR	TAG	AOR	28th July 2021	Final(Added Designer Signature)
6.0	MAH/AOR	TAG	AOR	27th July 2021	Final
5.0	MAH/AOR	TAG	AOR	14th July 2021	Revised Draft
4.0	MAH/AOR	TAG	AOR	2nd July 2021	Draft (following discussion with Designer)
3.0	MAH/AOR	TAG	AOR	27th May 2021	Draft (Revised Scope)

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1 Introduction

1.1 General

This report results from a Stage 1 Road Safety Audit on the proposed BusConnects Core Bus Corridors – Blanchardstown to City Quays 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. Alan O'Reilly
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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 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 14th Dec. 2020. Weather conditions during the site visit were dry and the road surface was dry. Traffic volumes during the site visit high, pedestrian and cyclist volumes were moderate and traffic speeds were considered to be generally within the posted speed limit.

1.1.1 Revised Audit May 2021

In May 2021, a revised design was submitted to the Audit Team, which prompted the need for a revised Stage 1 RSA Report. Design changes were highlighted on a set of revised drawings (see Appendix B), and were submitted to the Audit Team for assessment. RSA Problems identified as part of the revised May 2021 audit are noted in Section 3.2 of this report, and should be read in conjunction with the problems identified in Section 3.1 (Original Design).

A supplementary site visit was undertaken on the 24th of May 2021. Weather conditions during this site visit were dry and the road surface was dry. Traffic volumes during the site visit were high, pedestrian and cyclist volumes were 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 (Original Design) and Appendix E (Revised May 2021 Design). 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

2 Project Description

2.1 General

The Blanchardstown to City Quays Core Bus Corridor (CBC) commences on the north side of the South Blanchardstown Road junction with the N3. The CBC proceeds on the R121 Blanchardstown Road South into the Blanchardstown Shopping Centre. From a new terminus to the north-west of Blanchardstown Shopping Centre the CBC is routed onto the N3 Navan Road via the Snugborough Road junction and follows the N3 and Navan Road as far as the junction with the Old Cabra Road. From here the CBC is routed along Old Cabra Road, Prussia Street and Manor Street to the junction with North Brunswick Street. The CBC is then routed via Blackhall Place as far as the junction with Ellis Quay and Arran Quay, where it will join the existing traffic management regime on the North Quays. Priority for buses is provided along the entire route, consisting primarily of dedicated bus lanes in both directions, with alternative measures proposed at particularly constrained locations.

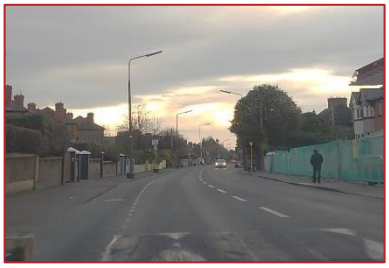
The CBC will primarily run along the following roads from its commencement in Blanchardstown to its termination on the north quays in Dublin City Centre: -

- **N3 Dual Carriageway**: the N3 is a dual carriageway road extending from its transition to the M3 motorway to the west of Blanchardstown to its interchange with the M50 at M50 Junction 6. It has three traffic lanes in each direction throughout this section and provides access to Connolly Hospital, the Blanchardstown Shopping Centre and Blanchardstown Village via a number of at-grade and grade separated junctions. The posted speed limit on the N3 from the rotary at the M50 interchange to the N3 Junction 4 is 80kph while it transitions to 100kph further west.

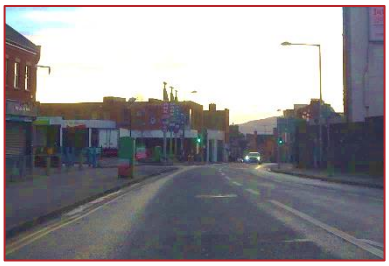
- **Navan Road:** the Navan Road commences to the east of the M50/N3 interchange and continues east for approximately 5km. Its is dual carriageway from the M50/N3 interchange to its junction with Phoenix Park Avenue where it transitions to a two-way single carriageway. Navan Road intersects a number of other roads at at-grade junctions, primarily signalised junctions, including Kinvara Road, Baggot Road, Nephin Road and Skreen Road and terminates at its junction with Ratoath Road, Cabra Road and Old Cabra Road.

  There is an existing roundabout junction on the Navan Road at Castleknock Road which provided access to the Ashtown Gate of the Phoenix Park. The Navan Road currently has footpaths and cycle tracks along its length, has a posted speed of 50kph and is fronted by residential properties along its length which access directly onto the Navan Road.

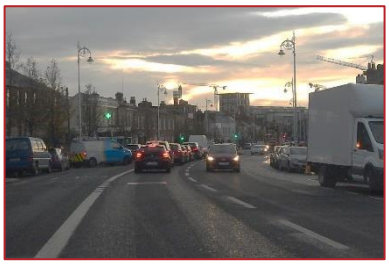
- **Old Cabra Road:** The Old Cabra Road extends from its junction with Navan Road to its junction with Prussia Street and the North Circular Road, a distance of approximately 1km. It is a two-way single carriageway road with a posted speed limit of 50kph. It is primarily residential in nature providing direct access to a number of residential properties and residential developments including Cabra Drive and Earls Court.



- **Prussia Street:** Prussia Street is a two-way single carriageway road with a posted speed limit of 50kph. It extends for approximately 500m between its junction with Old Cabra Road and the North Circular and provides direct access to residential properties, residential developments and commercial units such as shops and pubs.



- **Manor Street/Stoneybatter:** Manor Street and Stoneybatter are short sections of two-way single carriageway with a posted speed of 50kph. Parallel parking is provided on Manor Street for residents of properties which are located on both sides of the carriageway. Stoneybatter contains a number of commercial premises, residential properties and a school.



- **Blackhall Place:** Blackhall Place is a two-way single carriageway with a posted speed of 50kph. It provides access to a number of side roads including Brunswick Street, North King Street, Blackhall Street, Hendrick Street and Benburb Street. Blackhall place mainly serves a number of residential terrace houses.

To the south of the Navan Road, Ratoath Road and North Circular Road junction the route becomes more constrained due to its proximity to the city centre and a number of historical residential buildings.

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 Blanchardstown to City Centre Core Bus Corridor.

This data contains information on 348 collisions occurring on the road network in the vicinity of the proposed scheme, 8 of which resulted in Fatal collisions and 15 of which resulted in Serious Injuries. 16.7% of collisions involved pedestrians and 7.8% of collisions involved cyclists.

3 Main Report

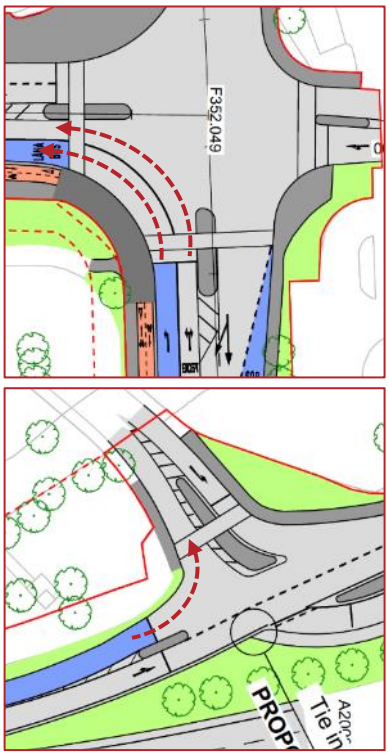
3.1 Original Design

3.1.1 Problem

Location: *At a number of junctions throughout the Scheme56*

Example: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0004 (Rev. L01);*
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0005 (Rev. L01)
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0014 (Rev. L01);
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0027 (Rev. L01)

Summary: *It is unclear if there will be sufficient space within signalised junctions to accommodate the swept path of all vehicles, especially 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 vehicles resulting in low-speed collisions.

Additionally, during the site visit, the Audit Team noted buses and large vehicles encroaching into adjacent traffic lanes at existing junctions when entering/exiting side roads, for example at the entrance to Connolly Hospital where a bus was observed straddling two lanes of traffic when entering Connolly Hospital. At this particular location it is proposed to provide physical islands which may lead to further difficulties for turning buses.

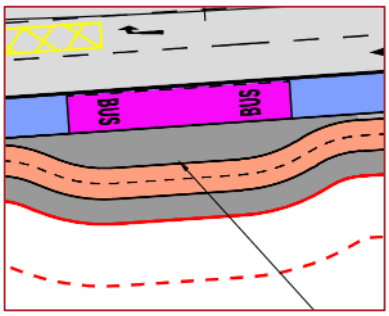
Recommendation

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.

3.1.2 Problem

Location: *General problem throughout the Scheme*

Summary: *It is unclear if there will be sufficient space at bus stops within the Scheme to accommodate bus shelters as these have not been indicated at any locations on the drawings provided.*



The Legend on the drawings provided contains a symbol for bus shelters however none of the bus stops along the Scheme indicate a bus shelter. While a bus shelter may not be provided at all bus stops within the Scheme it is likely that a number of bus shelters, particularly those indicated on widened sections of footpath and within shared surfaces, will contain bus shelters. Assuming that bus shelters will be provided at some locations, it is unclear if there will be sufficient effective residual footpath width for pedestrians, in particular mobility impaired pedestrians, at these bus stops to continue safely and independently along the footpath.

Recommendation

Where bus shelters are provided ensure a minimum effective residual footpath width of 1.2m is provided.

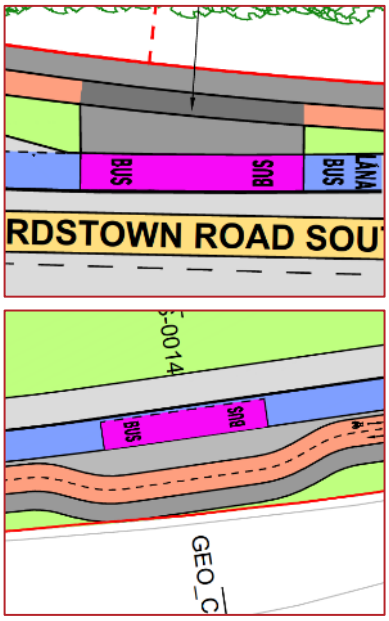
3.1.3 Problem

Location: *General problem throughout the Scheme*

Example: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0002 (Rev. L01);*
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0004 (Rev. L01);
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0017 (Rev. L01)

Summary: *Potential for cyclist/pedestrian collisions where bus passengers are required to cross the cycle track when boarding or alighting buses at bus stops throughout the Scheme.*

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



At other locations no footpath link has been indicated at these “floating” or “island” type bus stops and the cycle track is shown as being continuous through the bus stop location.

At this early stage in the design process no tactile paving (either warning or guidance) has been indicated. Should insufficient guidance be provided where a shared surface is indicated between the bus stop 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.

Where no connection has been indicated between the footpath and the bus stop island, this will result in mobility impaired & visually impaired road users being unable to access the public transport provisions, and there would be an increased potential for cyclist/pedestrian collisions as embarking/disembarking passengers traverse the cycle track.

Recommendation

A link should be provided between the proposed island/floating bus stops and the adjacent footpath, with the cycle track crossing the footpath link. Guidance Tactile Paving should be provided to guide visually impaired pedestrians to/from the footpath & the bus stop island.

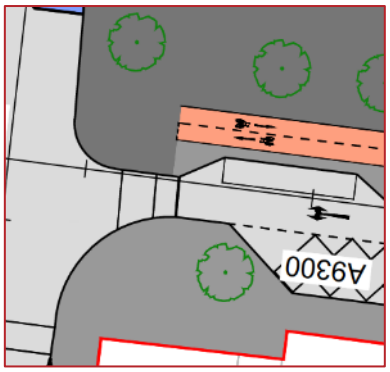
Measures should be provided on the cycle track approaches to these footpath links, for example Ladder & Tramline tactile paving & Yield road markings, so that cyclists are aware that they are approaching a footpath crossing and that they should slow down & give way to pedestrians at these locations.

3.1.4 Problem

Location: *General problem throughout the Scheme*

Example: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0004 (Rev. L01);*
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0006 (Rev. L01);
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0019 (Rev. L01);
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0034 (Rev. L01)

Summary: *Unclear if the crossings within the 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 pedestrian and cyclists when accessing, waiting at and using the crossing.

This problem is exacerbated at locations where narrow footpaths continue downstream of the shared surfaces (e.g. northern side of Bus Interchange Western Access in Blanchardstown Shopping Centre and north of Blackhall Place/Blackhall Street junction) which may not be sufficiently wide enough to accommodate both cyclists and pedestrians.

Recommendation

Ensure all crossings at shared surfaces throughout the Scheme are toucan crossings.

3.1.5 Problem

Location: *General problem throughout the Scheme*

Example: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0020 (Rev. L01)*
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0021 (Rev. L01)
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0022 (Rev. L01);
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0024 (Rev. L01)
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0035 (Rev. L01)

Summary: *Buses stopped at bus stops upstream of signalised junctions may block a driver's visibility to the signals.*

At a number of locations within the Scheme, bus stops have been indicated upstream of signalised junctions and signalised pedestrian crossings. A stationary bus at the bus stop may block visibility for a driver in the adjacent traffic lane to the nearside primary signal head on approach to the junction/crossing. This could lead to drivers being insufficiently aware of a red signal at the junction/crossing leading to them failing to moderate their speed and/or stop at the junction resulting in overshooting the stop line and possible collisions with pedestrians using the crossing or opposing vehicles within the junction.

Recommendation

If possible, bus stops should be located downstream of signalised junctions and pedestrian crossings.

Where this is not possible/practicable then ensure that secondary signal heads or high-mast signals are provided which are sufficiently visible to approaching drivers when there is a stationary bus at a bus stop upstream of signals.

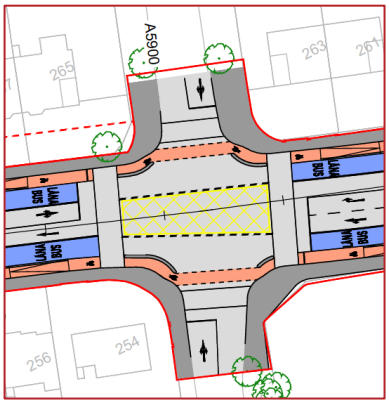
3.1.6 Problem

Location: *General Problem throughout the Scheme*

Example: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0023 (Rev. L01)*
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0025 (Rev. L01)
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0026 (Rev. L01)
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0030 (Rev. L01)

Summary: *Unclear how cyclists are intended to turn right at some protected intersections.*

Protected intersections have been indicated at a number of junctions within the Scheme including the Old Cabra Road/North Circular Road junction and on the Navan Road at its junctions with Kinvara Avenue, Nephin Road and Skreen Road. It is unclear how it is intended that cyclists should turn right at these junctions as no measures appear to be provided to facilitate this manoeuvre.



This could lead to cyclists entering/crossing traffic lanes where there is an increased risk of being struck by a vehicle. Alternatively, cyclists may attempt to use the pedestrian crossings which, if these are not toucan crossings, may not safely accommodate both cyclists and pedestrians.

Recommendation

Cyclist 'box turns' should be provided ahead of the stop line, but outside the through cycle lane at these junctions. This will allow right turning cyclists to exit the through cycle lane and wait in this right turn box for a green phase on the side road where they can then proceed straight ahead with through traffic. These may require the position of the pedestrian crossings and stop lines on the side roads to be amended.

3.1.7 Problem

Location: *General problem south of Prussia Street*

Example: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0032 (Rev. L01)*
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033 (Rev. L01)
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0034 (Rev. L01)

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

To the south of Prussia Street, a number of Heritage Features within the footpath and cycle track have been indicated as being retained. 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 trac) 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

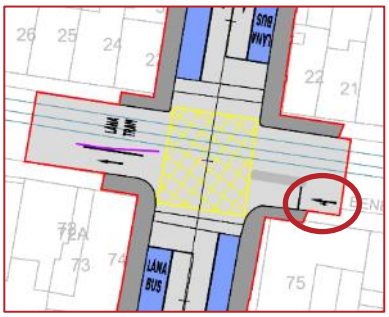
Ensure the retained Heritage Features do not present obstacles to pedestrians and cyclists.

3.1.8 Problem

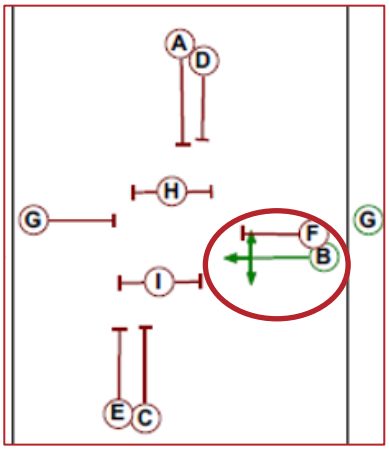
Location: *At a number of junctions throughout the Scheme*

Example: *Queen Street/Benburb Street Junction;*
Blackhall Place/Benburb Street Junction;
Manor Street/Brunswick Street Junction;
L3020/Westend Retail Road Junction

Summary: *The permitted movement at junctions do not match the movements indicated on the proposed signal phasing diagrams.*



At a number of signalised junctions within the Scheme including, but not limited to, those listed above, the movements permitted at the junctions, as indicated by arrow roadmarkings on the drawings are not reflected in the movements indicated within the proposed signal phasing diagrams. For example, in some cases, right turns are indicated in the phasing diagrams while the arrow roadmarkings indicated on the drawings permit only straight-ahead and left turning movements.



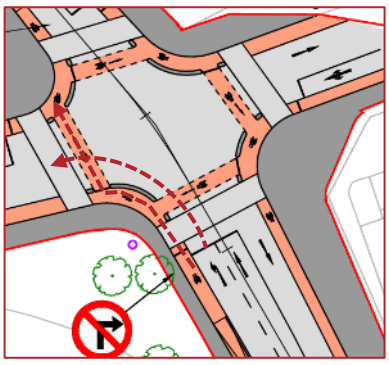
This could lead to inconsistencies between the information provided to drivers by the signal heads and the arrow roadmarkings resulting in driver confusion and the potential for drivers undertaking prohibited movements at signalised junctions increasing the risk of collisions with other road users.

Recommendation

Ensure the movements permitted in each phase at signalised junctions reflects the movements indicated at the junction. This may require amending the signal phases or amending the roadmarkings at junctions such that drivers are sufficiently aware of all permitted movements at junctions.

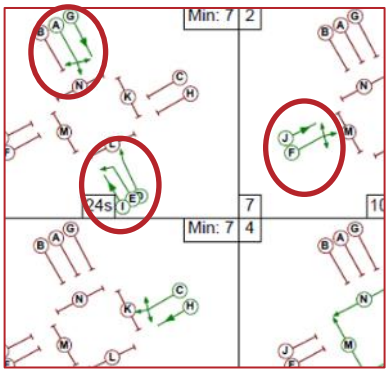
3.1.9 Problem

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



Example: *Queen Street/Blackhall Street Junction;*
Manor Street/Kirwan Street Junction;
Prussia Street/North Circular Road Junction;
Navan Road/Phoenix Park Road Junction

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



At a number of signalised protected junctions within the Scheme left turning manoeuvres are indicated as occurring during the same phase as straight-ahead cyclists. In some instances the, straight through cycle lane is offset from the adjacent traffic lane, and is positioned closer to the pedestrian crossing on the intersected road.

There is a risk that drivers, when given a green signal, may not anticipate a straight through cyclist, possibly misinterpreting the layout as a signalised/toucan crossing on a separate phase, resulting in possible vehicular/cyclist collisions.

In additon, there is a concern that some cyclists may choose to take a more direct route along their desire line, and enter the carrigway at the pedestrin crossing gap where they are at an increased risk of being struck by vehicle.

Recommendation

Reduce the lateral displacement of the straight through cycle lane from the adjacent traffic lane(s) to improve driver's awareness of possible straight through cyclists. Amend the left turn signals so that left turns are on a flashing amber.

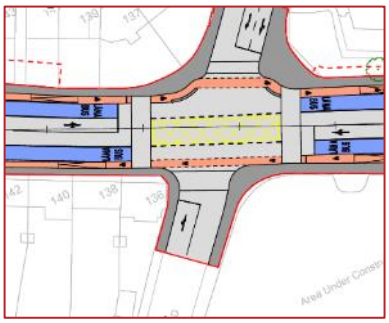
Alternatively, straight ahead cyclist movements at junctions should occur on a separate phase to vehicles.

3.1.10 Problem

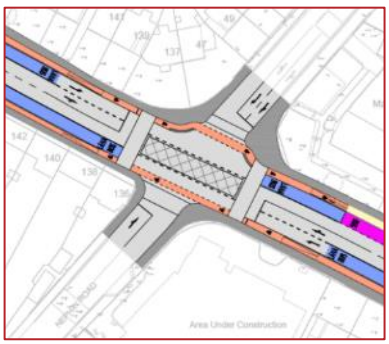
Location: *At a number of junctions throughout the Scheme*

Example: *Navan Road/Hampton Green Junction;*
Navan Road/Skreen Road Junction
Navan Road/Nephin Road Junction;
Navan Road/Ashtown Road Junction

Summary: *The layout of the bus lane at the stop line at signalised junctions on the drawings provided differs to the layouts which accompany the signal phase diagrams.*



There is an inconsistency in the layout of the proposed bus lane where it terminates at the stop line at a number of signalised junctions within the Scheme between the drawings provided and the images which accompany the signal phasing diagrams. On the drawings provided the bus lane is indicated as extending as far as the stop line while on the images accompanying the signal phase diagrams the bus lane is curtailed upstream of the junction and a left turn lane provided for left-turning vehicles at the junction.



The phasing diagrams indicate that straight ahead and left turn manoeuvres are permitted simultaneously. In the layout indicated on the drawings provided this would result in left-turning private vehicles turning across the path of straight-ahead buses resulting in an increased risk of side-on collisions.

Recommendation

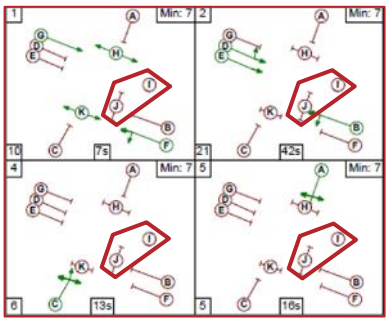
Ensure the proposed design drawings and the proposed signal phasing diagrams reflect the same junction layout. Permitted vehicle movements which reduce the number of potential conflict points at signalised junctions are preferable.

3.1.11 Problem

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

Example: *Manor Street/Brunswick Street Junction;*
Navan Road/Cabra Road Junction;
Navan Road/Auburn Avenue Junction
R121/Navan Road Northbound On-Ramp

Summary: *Cyclist and pedestrian phases not included in signal cycle.*



At a number of signalised junctions throughout the Scheme including, but not limited to, those listed above, the pedestrian and cyclist crossings have not been indicated within the proposed signal phasing diagrams, and in some cases have been included but do not get a green signal in any phase.

A failure to provide phases for vulnerable road users within signalised junctions may lead to pedestrians and cyclists becoming impatient and frustrated resulting in the potential for them to cross the carriageway during a red signal where there is an increased risk of being struck by a vehicle whose driver would not be anticipating a VRU to cross ahead of them.

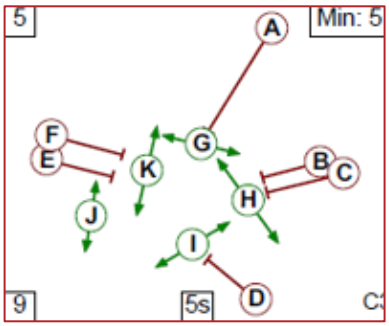
Recommendation

Ensure phases are provided for all pedestrian and cyclist movements at signalised junctions and that these occur independently of opposing vehicular movements.

3.1.12 Problem

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

Summary: *The timing proposed for pedestrian phases at a number of signalised junctions within the Scheme may not be sufficient to accommodate mobility impaired pedestrians.*



At a number of signalised junctions within the Scheme, pedestrian phases have been indicated as between 5, and 7, seconds long. The Audit Team are concerned that this will not be sufficient time for some non-motorised road-users (e.g. elderly & mobility impaired) to complete a crossing in one phase particularly where two-stage crossings are provided during the same phase.

This could lead to mobility impaired pedestrians remaining within the carriageway when a subsequent green vehicular phase has been triggered increasing the risk of vehicle-pedestrian collisions resulting in serious injuries or fatalities.

Recommendation

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

3.1.13 Problem

Location: *Amended junctions within the Scheme*

Example: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0027 (Rev. L01)*
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033 (Rev. L01)
Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0035 (Rev. L01)

Summary: *Revisions to junction layouts and permitted traffic movements at junctions within the Scheme may lead to capacity or safety issues at existing junctions outside the Scheme.*

It is proposed to amend the layout of a number of junctions within the Scheme including revisions to the lane configuration and permitted traffic movements, for example at the Queen Street/Arran Quay and the North King Street/George's Lane junction. Similarly, at the Cabra Road/Old Cabra Road/Ratoath Road junction private vehicles are no longer permitted to continue south onto Old Cabra Road and must instead proceed via Cabra Road.

These amendments may directly affect traffic volumes on roads and at junctions close to, but outside, the Scheme extents where there is a risk of congestion, driver frustration and the potential for unsafe manoeuvres.

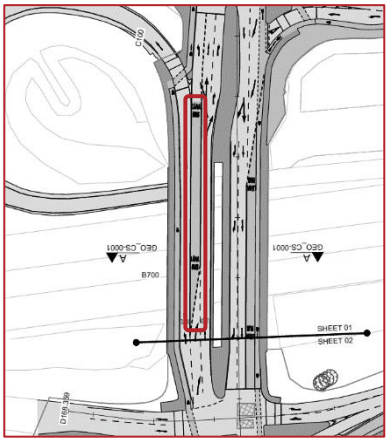
Recommendation

Ensure proposed amendments at junctions within the Scheme do not have a negative effect on traffic volumes on the adjacent road network outside the Scheme extents.

3.1.14 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0001 (Rev. L01)*

Summary: *Short length of northbound bus lane on the N3 overbridge (Blanchardstown Road North) requires vehicles to merge into one lane for a short distance before diverging again upstream of the junction which may lead to an increased risk of collisions.*



A short length of northbound bus lane (less than 100m) has been indicated on the N3 overbridge between the two signalised junctions on either side of the bridge on Blanchardstown Road. The bus lane requires northbound traffic to merge over a short distance downstream of the western junction before diverging again upstream of the eastern junction where the bus lane is curtailed at the left turn lane.

This could lead to an increase in the volume of merging/diverging traffic at this location resulting in an increased risk of side swipe collisions.

Recommendation

The northbound bus lane on the bridge should be removed and recommenced on Blanchardstown Road North downstream of the junction.

Drivers should be sufficiently warned however, and in good time, that the nearside lane is for left turns only at the downstream junction.

3.1.15 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0002 (Rev. L01)*

Summary: *The location of the proposed bus stop on the N3 northbound off-slip at junction 3 in close proximity to the exit from the Bus Lane leaving Blanchardstown Shopping Centre may result in conflicts.*

A new bus stop has been indicated on the N3 northbound off slip at junction 3 between the left-turn slip lane at the entrance to the Blanchardstown Shopping Centre and the exit from the bus lane exiting the Blanchardstown Shopping Centre.

Drivers following buses on the off-slip may be insufficiently aware of the commencement of the bus lane downstream and follow the bus into the bus lane resulting in sudden weaving manoeuvres into the adjacent lane and side swipe collisions with adjacent vehicles or collisions with the physical island at the stop line.

Also, it is unclear if there will be sufficient space available for buses exiting the bus stop and re-entering the traffic lane on the off slip between the two physical islands. If sufficient space is not provided there is a risk of kerb strikes and material damage as a bus leaves the bus stop.

Recommendation

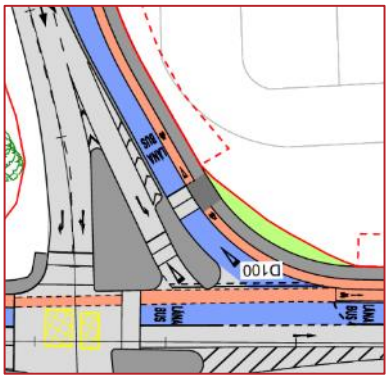
Ensure the layout of the carriageway on the off-slip is sufficiently conveyed to drivers and that they are advised of the commencement of the bus lane and bus gate arrangement downstream. Also, ensure buses can exit the bus stop and re-enter the off-slip carriageway without striking the adjacent kerbs.

3.1.16 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0002 (Rev. L01)*

Summary: *Two lanes exiting the N3 junction 3 northbound off-slip are indicated in close proximity to each other and may lead to an increased risk of collisions with cyclists.*

Two left turn lanes from the N3 junction 3 northbound off-slip onto Blanchardstown Road South have been indicated in close proximity to each other. The easternmost exit is for private vehicles while the westernmost exit is for buses.



Should insufficient inter-green time be allowed in the signal phasing to permit slower moving cyclists to clear the entire junction, visibility for a bus driver exiting onto Blanchardstown Road South towards a westbound cyclist may be restricted by a high-sided vehicle at the other exit leading to buses turning left onto Blanchardstown Road South when it is unsafe to do resulting in collisions.

Additionally, a driver of a private vehicle at the Yield line will be focussed on traffic approaching from their right when exiting and may not take due care and attention to a bus at the adjacent exit. This could lead to a driver turning left onto Blanchardstown Road South when a gap in traffic becomes available at the same time as a bus exits the adjacent access resulting in a risk of side swipe, or rear end shunt, collisions with an exiting bus.

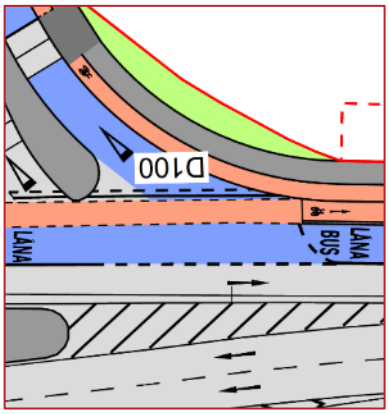
Recommendation

Ensure adequate inter-green between phases to allow westbound cyclist to clear the two downstream left-turn lanes, and provide guidance road markings onto the general traffic lane on Blanchardstown Road South for the first (general traffic) left-turn.

3.1.17 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0002 (Rev. L01)*

Summary: *The left turn bus lane from the N3 junction 3 northbound off-slip onto Blanchardstown Road South directs buses into the kerbline where the cycle track transitions from the carriageway to the off-road facility.*



The westbound cycle track transitions from the carriageway of the Blanchardstown Road South to off-road cycle facilities immediately downstream of the exit for buses from the N3 junction 3 northbound off-slip. A kerb is indicated as developing at this location where the cycle track rises from the carriageway. The kerb is located such that left turning buses from the adjacent off-slip may strike the kerb when entering the westbound bus lane resulting in material damage.

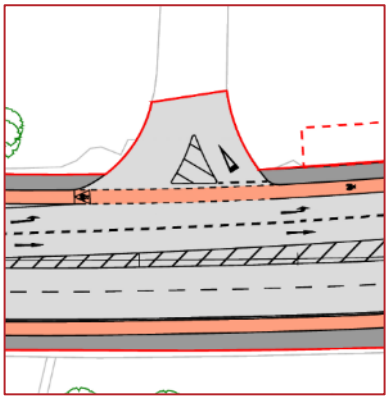
Recommendation

Ensure that the kerb line between the slip road and Blanchardstown Road South directs turning buses into the bus lane, and not onto the cycle lane. In addition, undertake a swept path analysis to ensure that buses can undertake a turning manoeuvre without mounting the downstream kerb at the commencement of the raised/protected cycle lane.

3.1.18 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0002 (Rev. L01)*

Summary: *Unclear if a crossing is to be provided across the existing left-in left-out access to the loading area on the southern side of Blanchardstown Road South.*



There is an existing left-in left-out loading access to the retail park within the Blanchardstown Shopping Centre on the southern side of Blanchardstown Road South which currently includes an uncontrolled pedestrian crossing with dropped kerbs and tactile paving and a physical refuge island.

It is unclear from the drawing provided if it is proposed to retain the pedestrian crossing at this location. If a crossing is not retained at this location mobility impaired pedestrians may be unable to safely and independently access the footpath downstream while visually impaired pedestrians may be insufficiently aware of the access and inadvertently enter the carriageway where there is an increased risk of being struck by a vehicle.

Additionally, the existing physical island at the access is indicated as being removed and a hatched island provided in its place which may result in a lengthy crossing for VRUs without a sufficient area to take refuge. Removing the physical island from this location may lead to drivers turning right out of the access where there is an increased risk of collisions with vehicles on retail park within the Blanchardstown Road South.

Recommendation

A physical island should be retained/provided at this access. An uncontrolled crossing with dropped kerbs and the appropriate tactile paving should be provided on both sides of the access and within the physical island.

3.1.19 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0003 (Rev. L01)*

Summary: *Southbound drivers may be insufficiently aware of the reduction from two lanes to one lane on Blanchardstown Road South downstream of the proposed bus stop.*

It is proposed to amend the existing roundabout junction of Blanchardstown Road South and Blakestown Way to a signalised junction. Two southbound through lanes have been indicated on Blanchardstown Road South at the proposed signalised junction which are maintained on the southern side of the junction. To the south of the existing roundabout there is only a single through traffic lane and a bus lane on the nearside. The proposed Scheme terminates at a bus stop to the south of the junction where two lanes continue. It is unclear if the nearside lane will tie-into the existing bus lane further downstream. If this is the case, there is a irks that drivers will be insufficiently aware of the lane drop south of the junction resulting in an increased risk of side swipe collisions as drivers suddenly merge into the adjacent lane.

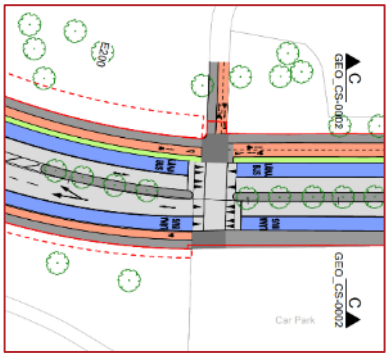
Recommendation

Drivers should be advised of the need to merge immediately downstream of the junction (i.e. swerve arrows).

3.1.20 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0003 (Rev. L01)*

Summary: *Trees within the central median may block a driver's visibility to the traffic signal heads on the approach to the signalised crossing.*



There is an existing signalised crossing of the access road to the Blanchardstown Shopping Centre which is proposed to be retained. Trees have been indicated within the central median to the east and west of the crossing. The location of the trees may lead to a driver's visibility towards the traffic signals at the crossing being obscured. This could lead to drivers being insufficiently aware of a red signal at the crossing resulting in them failing to moderate their speed and stop at the stop line resulting in overshoot of the stop line and an increased risk of collisions with pedestrians using the crossing.

Similarly, a bus using the bus lane may restrict a driver's visibility to the nearside signal head leading to the same issue described above.

Recommendation

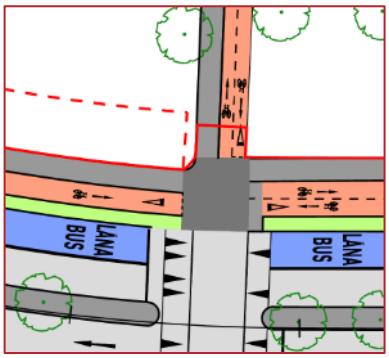
Ensure trees do not block a driver's visibility to the signal heads at the crossing. Secondary signal heads should also be provided facing drivers approaching from both directions should the nearside signal head be blocked by a bus in the bus lane.

3.1.21 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0003 (Rev. L01)*

Summary: *The eastbound cycle track on the access road to the Blanchardstown Shopping Centre aligns with the westbound cycle track on the other side of the shared surface where there is a risk of head-on collisions between cyclists.*

The one-way eastbound cycle track on the northern side of the access road to the Blanchardstown Shopping Centre terminates at a shared surface at the signalised crossing. The two-way cycle track on the same side of the access road terminates on the opposite side of the shared surface at this location. The cycle tracks are aligned such that the eastbound one-way cycle track is directly opposite the westbound cycle track.



This could lead to cyclists travelling in either direction being insufficiently aware that the downstream cycle track is for the opposing direction resulting in them entering the cycle track where there is an increased risk of head-on collisions with opposing cyclists.

Recommendation

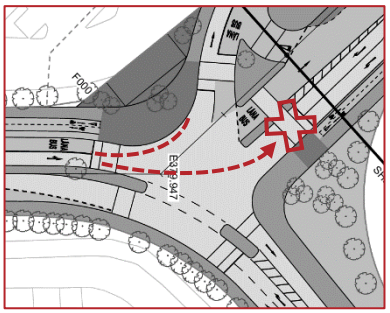
The eastbound cycle track should be realigned such that eastbound cyclists are directed into the eastbound cycle track downstream of the shared surface. Any proposed realignment of the cycle track at this location should not result in the width of the adjacent footpath being compromised.

3.1.22 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0003 (Rev. L01)*

Summary: *Straight ahead and left turn movements occur at the same time as the adjacent bus lane at the Bus Interchange Western Access signalised junction in the Blanchardstown Shopping Centre.*

The straight ahead and left turn eastbound movements at the Bus Interchange Western Access signalised junction in the Blanchardstown Shopping Centre are indicated as occurring on the same phase as the adjacent bus lane. Priority has not been clearly indicated for buses within the signals at this location and this will lead to left turning drivers turning across the path of straight-ahead buses resulting in side-on collisions.



Additionally, left turning drivers may mistake the northbound bus lane or southbound traffic lane for their lane as this is located within the natural turning arc of a left turning vehicle. Should a left-turning driver mistake the southbound lane for their downstream lane there is an increased risk of head-on collisions.

Recommendation

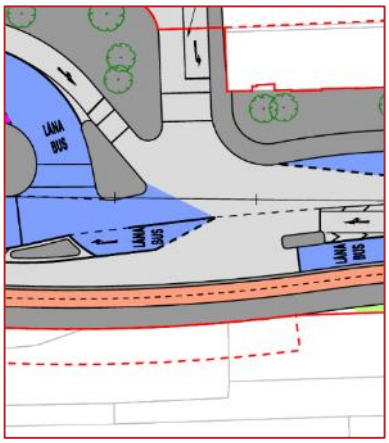
A physical island should be provided between the bus lane and adjacent traffic lane and the bus movements provided on a separate phase to the adjacent traffic lane.

Additionally, during the design development ensure left turning drivers are clearly advised of the location of the downstream lane and the location of the opposing traffic lanes, via appropriate road marking and signage.

3.1.23 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0004 (Rev. L01)*

Summary: *Unclear if the proposed right turn lane for buses entering the bus interchange at its eastern entrance will be of a sufficient size to accommodate buses without encroaching into the westbound traffic lane.*



A short section of bus lane has been indicated on the eastern side of the proposed bus interchange in the Blanchardstown Shopping Centre to allow a right turning bus to wait outside of the through traffic lane. It is unclear if there is sufficient space within this lane for a bus to wait for a green signal without encroaching into the through traffic lane. If the right turn bus lane does not provide sufficient space to accommodate a stationary bus within its extents, there is a risk that the overhang of a bus may block the westbound traffic lane resulting in the potential for collisions between westbound vehicles and a stationary right-turning bus.

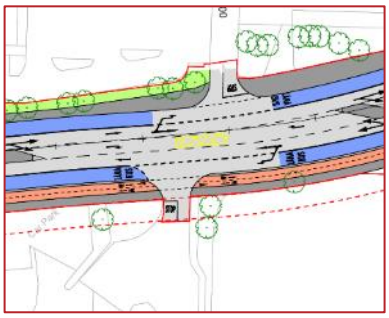
Recommendation

Ensure there is sufficient space for a right turning bus to wait within the right turn lane without encroaching into the adjacent traffic lane.

3.1.24 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0005 (Rev. L01)*

Summary: *Opposing right turning lanes with no physical delineation may results in head-on conflicts.*



A number of carpark accesses are located on the access road within the Blanchardstown Shopping centre between the proposed signalised junction at the Crowne Plaza Hotel and the proposed signalised junction at the L3020/Westend Office Park. It is proposed to provide a series of right turn lanes to these car park entrance resulting in a number of opposing right turn lanes being created.

All of the opposing right turn lanes on this road are physically separated by splitter islands with the exception of the opposing right turn lanes closest to the L3020/Westend Office Park junction which is delineated by yellow box roadmarkings only. These measures may not be sufficient to warn drivers of the opposing right turn lane, particularly as the roadmarkings may fade overtime, leading to a risk of drivers overshooting the end of their lane resulting in head-on collisions with oncoming right turning vehicles.

Recommendation

A physical island between these opposing right turn lanes should be provided.

3.1.25 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0009 (Rev. L01)*

Summary: *It is unclear if the gradients of the proposed ramps from Mill Road to the proposed bus stops on the N3 will safely accommodate mobility impaired pedestrians.*

It is proposed to provide two bus stops within the dual carriageway section of the N3. Access to these bus stops for pedestrians is proposed via steps and ramps from Mill Road which runs in a north to south direction beneath the N3 carriageway.

Information regarding the gradients of the ramps have not been included on the drawings provided and it is therefore unclear if the gradients associated with the ramps will be sufficient for pedestrians, particularly mobility impaired pedestrians. Steep gradients may make it difficult for pedestrians, particularly mobility impaired pedestrians and the elderly, to safely and comfortably navigate the pedestrian ramps, leading to slips, trips and falls.

While landings have been indicated between the rises it is unclear if these are of a sufficient size for a wheelchair user to stop and turn safely.

Recommendation

Ensure ramp gradients are suitable for all users, and that the landings are in accordance with the National Disability Authority's document, "Building for Everyone: A Universal Design Approach."

3.1.26 Problem

Location: *Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0009 - 19 (Rev. L01)*

Summary: *Unclear if adequate width will be available to accommodate Vehicle Restraint System at locations where these are required.*

At this early stage in the design development, it is not expected that details would be available in relation to proposed Vehicle Restraint Systems. However, it is necessary to ensure that adequate land is available, or acquired where this is necessary, to accommodate a vehicle restraint system at locations where they are required.

It is likely that a vehicle restraint system will be required along sections of the N3 where hazards (e.g. height hazard) exist. The provision of vehicle restraint system will require a lateral offset from the trafficked carriageway, and level ground within the working width of the chosen restraint system.

Recommendation

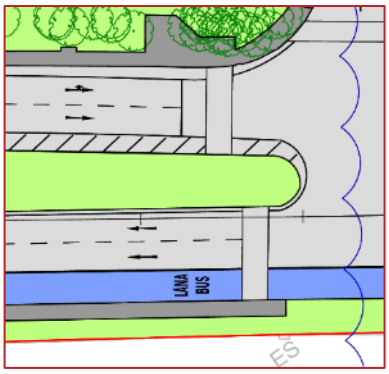
Ensure that adequate space is available to include a vehicle restraint system at locations where one is likely to be required, including adequate space to accommodate the working width of the barrier system.

The available width should also be sufficient to ensure that no items of roadside furniture are positioned within the working width of the selected barrier system.

3.1.27 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0011 (Rev. L01)*

Summary: *No footpath has been indicated within the central verge between the staggered pedestrian crossings of the N3 carriageway on the western arm of the Navan Road/Connolly Hospital Access (Northbound) junction.*



A two-stage staggered pedestrian crossing has been indicated across the N3 on the western arm of the Navan Road/Connolly Hospital Access (Northbound) junction. There is currently no footpath provided in the median verge and one has not been indicated on the drawings provided. A failure to provide a footpath through the central median verge linking the pedestrian crossings will lead to pedestrians having to travel within the grassed median where there is a risk of slips, trips and falls during wet weather.

Similarly, mobility impaired pedestrians, particularly wheelchair users, may experience difficulty in traversing the grassed median and visually impaired pedestrians may be unable to locate the downstream crossing. This will result in visually, and mobility, impaired pedestrians being unable to safely, and independently, navigate the road layout.

Recommendation

Provide a footpath in the grassed central median linking the two crossings.

3.1.28 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0012 (Rev. L01)*

Summary: *It is unclear if the lanes at the eastbound and westbound entries to the rotary will sufficiently accommodate the swept path of adjacent vehicles due to the horizontal bend on the approaches.*

A bus gate has been indicated on the nearside on the eastbound and westbound approaches to the rotary at the interchange between the M50 and the N3 with a splitter island between the bus lane and the adjacent traffic lanes. Horizontal curves are located upstream of the entries to the rotary on both of these approaches. It is unclear if the horizontal alignment and splitter island can accommodate the swept path of large vehicles entering the rotary.

Should there be insufficient space within the traffic lanes at the eastbound and westbound entries to the rotary there is a risk of vehicles encroaching into the adjacent lane and side swipe collisions or kerb strikes at the splitter island between the traffic lane and bus lane.

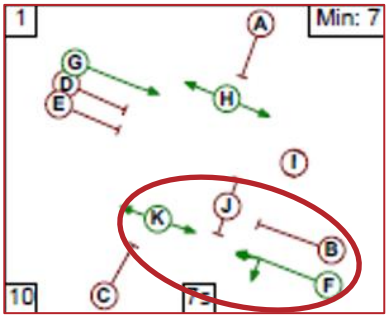
Recommendation

Ensure the widths of the traffic lanes provided at the entries and exits to/from the rotary can safely accommodate all vehicles without encroachment into adjacent lanes.

3.1.29 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0014 (Rev. L01)*

Summary: *Risk of pedestrians crossing Auburn Avenue being struck by left-turning vehicles.*



In Phase 1 of the proposed traffic signal cycle at the junction of the Navan Road and Auburn Avenue the westbound straight ahead and left turn lane on Navan Road is indicated as being given a green signal at the same time as the pedestrian crossing of Auburn Avenue. This will lead to an increased risk of pedestrians crossing Auburn Avenue being struck by left-turning vehicles.

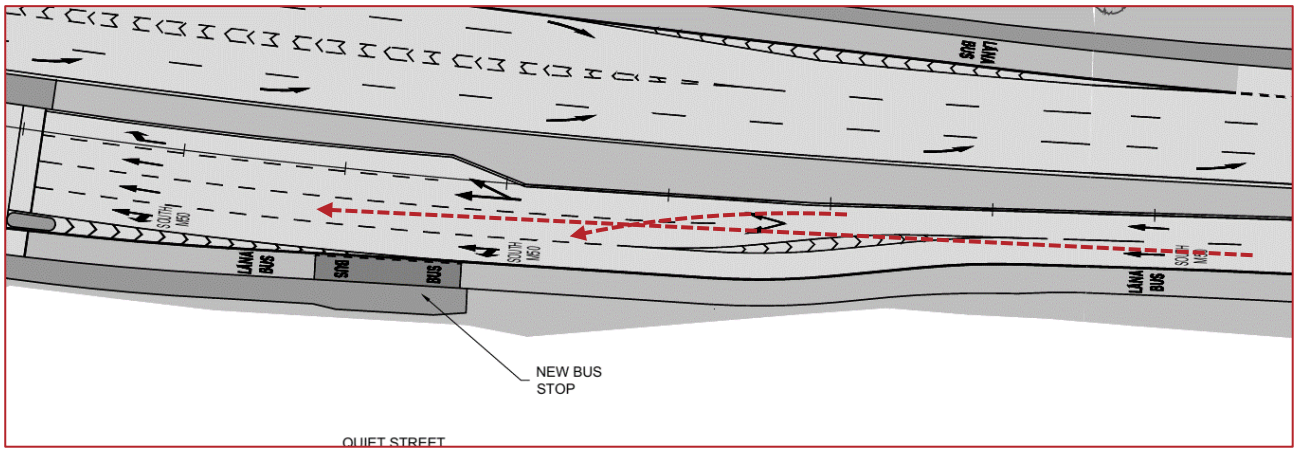
Recommendation

The pedestrian crossing of Auburn Avenue should occur on a separate phase to left-turning vehicles from Navan Road.

3.1.30 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0014 (Rev. L01)*

Summary: *Lane configuration may result in side-swipe collision.*



The proposed road layout on the N3 westbound carriageway approaching the intersection with Auburn Avenue & Dunsink Lane requires vehicles in the nearside traffic lane to move left, while the offside lane splits into two straight-ahead lanes and one right-turn lane.

This arrangement is conveyed via a hatched roadmarking. There is a concern that drivers in the nearside lane may fail to observe the direction to move left, in particular as the hatched roadmarkings may fade over time, leading to potential side-swipe collisions with vehicles from the offside lane moving into the centre straight-ahead lane.

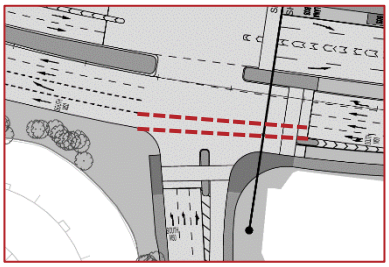
Recommendation

It is recommended that the nearside lane at this location proceed straight-ahead, with a new lane developed on the left-hand side catering for traffic wishing to access the M50 southbound or to turn left onto Auburn Avenue.

3.1.31 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0014 (Rev. L01)*

Summary: *Guidance markings may be required to guide westbound drivers into the M50 Southbound lane downstream of the N3/Auburn Avenue junction.*



The straight-ahead lane for the M50 southbound does not align with the upstream lane on the western side of the junction. This may lead to westbound drivers being insufficiently aware of the need to move left when travelling through the junction resulting in poor lane discipline and the potential for drivers to encroach into the path of vehicles in the adjacent lane resulting in potential side swipe collisions.

Recommendation

Guidance markings should be provided through the junction linking the M50 southbound lanes upstream and downstream of the junction.

During the detail design stage, gantry signs should be provided also clearly indicating the destinations accessible from each traffic lane downstream of the junction.

3.1.32 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0020 (Rev. L01)*

Summary: *The roundabout at the intersection of the Navan Road, Castleknock Road and Ashtown Road may not be of a sufficient size to operate safely as a signalised roundabout.*

It is proposed to signalise the existing roundabout junction of the Navan Road, Castleknock Road and Ashtown Road located adjacent the Halfway House bar/restaurant. The proposed signalised arrangement includes three lanes on the Navan Road approaches, a bus lane and left turn lane, a straight-ahead lane and a right turn while the Ashtown Road approach includes two lanes and the Castleknock Road approach a single lane. Three lanes are proposed on the roundabout circulating carriageway with spiral markings indicated guiding drivers into the appropriate lanes as they traverse the roundabout. Signalised pedestrian crossings are indicated on all arms and four stop lines are indicated on the circulating carriageway.

The proposed layout could result in a number of safety issues, as follows: -

1. The distance between the stop lines on the roundabout circulating carriageway is short such that there is a risk of queues extending to the upstream stop line, pedestrian crossings and entries to the roundabout blocking access to traffic and potentially leading to congestion.

2. The three approach lanes may lead to poor lane discipline at the entries and exits particularly at the entry on the northern arm where left turning drivers are directed into the eastbound bus lane which may result in late lane changes and side swipe collisions.

3. The spiral markings terminate at the stop lines on the roundabout circulating carriageway and may not sufficiently direct a driver into the appropriate lane when exiting, particularly at the exits to the Navan Road arms where there is a risk of side swipe collisions with buses in the adjacent bus lane.

4. It is necessary that a number of traffic signals will be required at the junction and the layout of the junction, combined with its size, may result in drivers sighting onto signals intended for other drivers. As a result, the proposed layout may not be easily discernible to drivers increasing the risk of collisions.

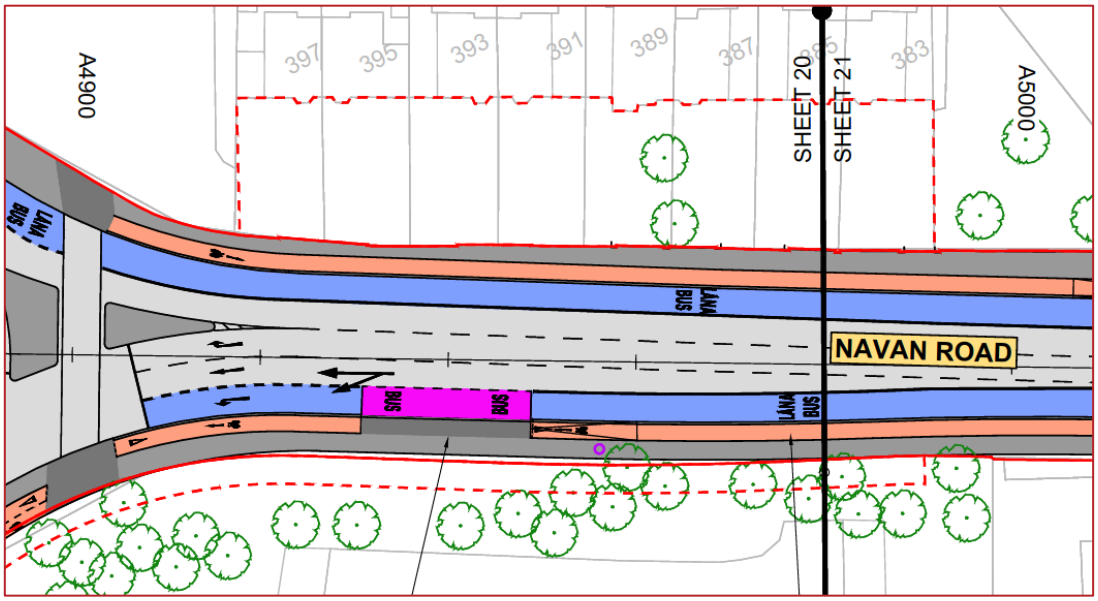
Recommendation

The proposed layout at this junction should be reviewed further and an arrangement proposed that will maintain traffic flow through the roundabout such that excessive queues do not develop. The layout of the roundabout should be easily understood by drivers.

3.1.33 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0020/21 (Rev. L01)*

Summary: *The westbound straight-ahead lane continues into the right turn lane at the roundabout at the Halfway House bar/restaurant.*



The westbound straight-ahead lane on the Navan Road continues to form the right turn lane upstream of the proposed signalised roundabout junction at the Halfway House bar/restaurant. Westbound drivers may be insufficiently aware of the lane becoming a right-turn-only lane on the approach as only a single right turn arrow is indicated immediately upstream of the stop lane. This could lead to westbound drivers becoming aware of the change in road layout immediately upstream of the roundabout resulting in late lane-change manoeuvres and possible side-swipe collisions.

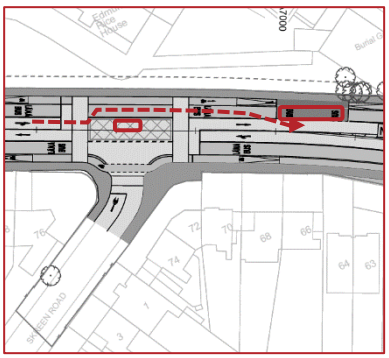
Recommendation

Amend the commencement of the additional traffic lane on the Navan Road so that traffic continues in the straight-ahead lane, with a bifurcation arrow provided downstream advising drivers of the development of the offside lane should they wish to turn right at the junction.

3.1.34 Problem

Location: *Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0023 (Rev. L01), BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0025 (Rev. L01) & BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0026 (Rev. L01)*

Summary: *Through traffic passing right-turning vehicles at junctions may collide with a stationary bus at the bus stop downstream of the junction.*



Eastbound bus stops have been indicated on the Navan Road immediately downstream of its junctions with Kinvara Avenue, Nephin Road and Skreen Road. There is a single traffic lane for eastbound drivers at these junctions and right turning, and straight-ahead, vehicles are given a green signal during the same phase.

This may lead to right turning vehicles blocking through traffic as they wait for a gap in westbound traffic. Should the adjacent bus lane be clear, through traffic may pass a stationary right turning vehicle on the nearside to proceed eastbound. However, should an eastbound bus be slowing down, or stopping, at the bus stop downstream, and an undertaking driver be insufficiently aware of this prior to passing the right turning vehicle, there is a risk of rear end shunts with vehicles at the bus stop.

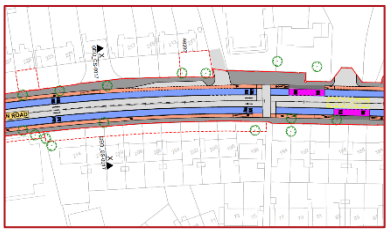
Recommendation

The bus stops downstream of these junctions should be relocated further east of the junction to allow passing drivers sufficient space to re-enter the through traffic lane.

3.1.35 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0024 (Rev. L01)*

Summary: *Risk of a number of conflicting manoeuvres on the Navan Road at the Our Lady Help of Christians Church.*



There are a number of residential accesses on both sides of the Navan Road adjacent the entrance to a national school, a service station and the Our Lady Help of Christians Church which will generate a large volume of entry and exit manoeuvres especially during school drop-off and pick-up times. A number of collisions, including a fatal collision, have been recorded at this location in the past.

Large volumes of right turning vehicles into, or out of, the school, church or service station may lead to an increased risk of conflicts with through traffic. There is also a risk of residents or those travelling to the school passing a queue of traffic by entering the bus lane where there is an increased risk of side swipe collisions with buses & cyclists, or collisions with vehicles exiting accesses.

Recommendation

This area should be assessed further as the design progresses and measures provided to prevent unsafe passing manoeuvres in the bus lane.

3.1.36 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0024 (Rev. L01)*

Summary: *Unclear if existing set-down area, which is proposed to be retained, at the school adjacent Our Lady Help of Christians Church is sufficiently wide enough to accommodate a bus without it encroaching into the adjacent cycle track.*

There is an existing set-down area located on the northern side of the Navan Road at the school adjacent the Our Lady Help of Christians Church which is assumed to be used by school buses during school drop-off and pick-up times. The width of the set-down area is unclear, and the Audit Team area concerned that it may not be sufficiently wide enough to accommodate a bus without the bus encroaching into the adjacent cycle track. Should the bus encroach into the cycle track there is a risk that cyclists may enter the bus lane to avoid a stationary school bus resulting in an increased risk of being struck by a bus.

During the site visit, the Audit Team noted a number of cars using this set down area during school drop-off times. If it is intended for buses only, and is occupied by private cars, there is a risk that school buses may block the adjacent cycle track or bus lane when dropping off or picking up students increasing the risk of cyclists and buses suddenly entering into the eastbound traffic lane and colliding with westbound traffic.

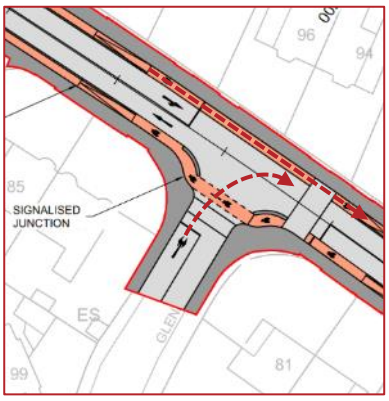
Recommendation

Ensure the set-down area is sufficiently wide to accommodate a stationary bus. If intended to be used for buses only measures should be provided to advise drivers that parking in the set-down area is prohibited.

3.1.37 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0028 (Rev. L01)*

Summary: *Risk of right-turning drivers from Glenbeigh Road encroaching into the straight-ahead cycle track on Old Cabra Road resulting in the potential for collisions with southbound straight-ahead cyclists.*



Left turns and right turns from Glenbeigh Road at its junction with Old Cabra Road are permitted during the same green signal phase as southbound cyclists on Old Cabra Road. Right-turning drivers exiting Glenbeigh Road may not anticipate southbound cyclists to proceed at the same time and potentially swing wide when turning right and encroach into the cycle track, where it is located at carriageway level, which could lead to an increased risk of side swipe collisions with southbound cyclists.

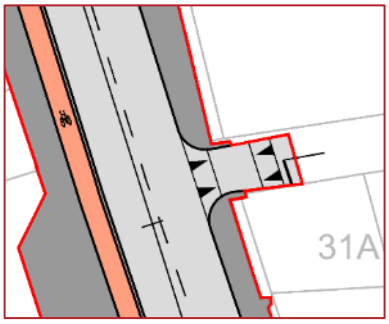
Recommendation

Either, amend the proposed signal phasing so that the turning manoeuvres out of Glenbeigh Road occur on a separate phase to southbound cyclists to reduce the risk of collisions, or keep the cycle lane vertically separated from the carriageway through the junction, and ramping down only on the immediate approach to the pedestrian crossing.

3.1.38 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0030 (Rev. L01)*

Summary: *Proposed raised table at St. Joseph's Place does not align with the adjacent footpath.*



A raised table has been indicated on St. Joseph's Place at its junction with Prussia Street. The level top of the raised table however does not align with the footpath either side of St. Joseph's Place. This could lead to trips and falls for pedestrian who, should they follow the line of the building boundary when crossing St. Joseph's Place, will be travelling on ramped surface.

Mobility impaired pedestrians may also be unable to cross St. Joseph's Place as they will be required to descend the kerb where the raised table ramps towards the carriageway. Similarly, visually impaired pedestrians may be insufficiently aware of the location of the crossing of the raised table as it is inset into the side road. This will result in visually, and mobility, impaired pedestrians being unable to safely and independently navigate the road layout.

Recommendation

The flat top of the raised table should be aligned with the footpaths on either side of St. Joseph's Place. If this is not possible the raised table should be located away from the pedestrian crossing point and dropped kerbs and tactile paving provided to facilitate pedestrian crossings at this location.

3.1.39 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0032 (Rev. L01)*

Summary: *Inter-visibility between cyclists and drivers turning left at a number of accesses may be restricted by vehicles in the adjacent/nearby parallel parking spaces or by a stationary bus at the bus stop.*

Parallel parking has been indicated immediately upstream of a number of private accesses on Manor Street. Additionally, a bus stop is also indicated immediately upstream of two accesses to the north of the parallel parking bays.

There is a risk that, should a bus be stopped at the bus stop or vehicles parked in the parallel parking bays, drivers turning left into these accesses may have insufficient visibility towards an approaching cyclist on the adjacent cycle track leading to possible vehicle/cyclist collisions.

Recommendation

Ensure sufficient visibility is provided towards the cycle track for drivers turning left into these accesses.

3.1.40 Problem

Location: *Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0032 (Rev. L01) & BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033 (Rev. L01)*

Summary: *The width of the parallel parking spaces indicated on Manor Street and Blackhall Place are unclear.*

Parallel parking spaces have been indicated on Manor Street and Blackhall Place. The width of these parking spaces is however unclear from the drawing provided and the Audit Team are concerned that they may not be sufficiently wide to accommodate vehicles without them encroaching into the adjacent traffic lane, as they appear narrow relative to the traffic lanes. Should the vehicles encroach into the traffic lane there is a risk that drivers may cross the centreline/edge of traffic lane and enter the opposing traffic lane to avoid a stationary vehicle resulting in an increased risk of head-on, or material damage, collisions.

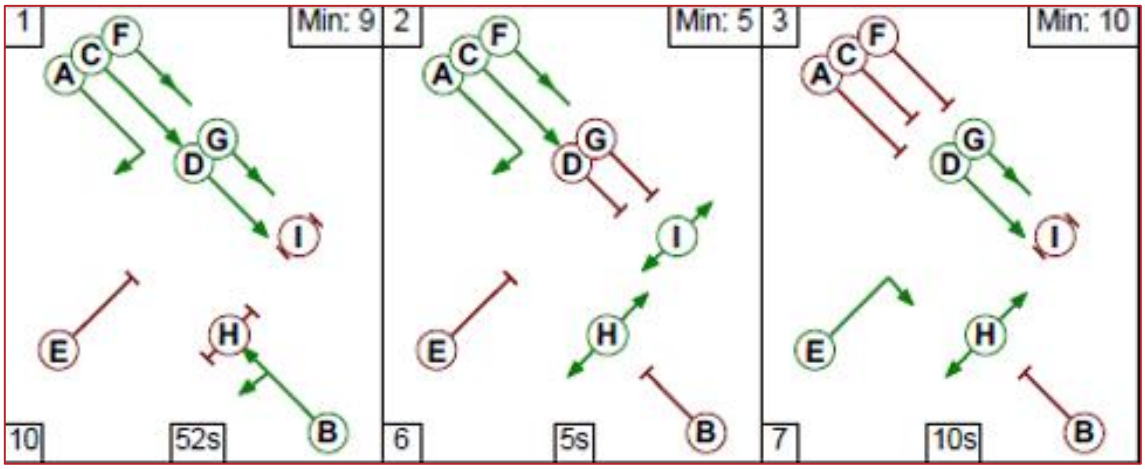
Recommendation

Ensure the parallel parking spaces are sufficiently wide enough to accommodate a stationary vehicle.

3.1.41 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0032 (Rev. L01)*

Summary: *The proposed signal phasing diagrams at the Aughrim Street/Manor Street Junction does not appear to match the layout of the junction indicated on the drawings provided.*



The signal phasing diagrams provided for the Aughrim Street/Manor Street junction do not appear to match the layout indicated on the drawings provided. A single southbound lane is indicated on Manor Street to the north of Aughrim Street which directs traffic, with the exception of buses, taxis and cyclists, to turn right into Aughrim Street where a right turn lane is provided. Further south of the right turn lane a southbound bus lane and cycle track develop. Similarly, travelling northbound, traffic, with the exception of buses, taxis and cyclists, is directed to turn left into Aughrim Street while a northbound bus lane develops downstream and cyclists transition from the cycle track onto the carriageway.

Phase 1 permits southbound traffic and northbound traffic to proceed simultaneously with right turning traffic into Aughrim Street required to give way to northbound traffic. During Phase 2, northbound traffic and southbound buses and cyclists are given a red signal while right turning traffic into Aughrim Street is given a green signal. There is however no stop line indicated for southbound buses and cyclists to wait during this phase. Pedestrian crossings of Manor Street are also indicated as receiving a green signal during this phase however the pedestrian crossing of Manor Street is located such that it would conflict with right turning traffic that also receive a green signal during this phase.

Phase 3 permits buses to turn right from Aughrim Street into Manor Street while also permitting southbound buses and cyclists to proceed and pedestrians to cross Manor Street, three movements which result in direct conflicts and an increased risk of collisions.

It is also unclear from the drawings provided if a sufficient amount of time will be provided between Phases 2 and 3 to allow vehicles entering Aughrim Street to clear the one-way section before contraflow buses are given a green signal. If sufficient time is not allowed between these phases there is a risk of buses proceeding while vehicles continue to enter Aughrim Street where there is a risk of head-on collisions or unsafe reversing manoeuvres back along Aughrim Street, or back onto Manor Street, resulting in an increased risk of rear end shunt collisions.

Recommendation

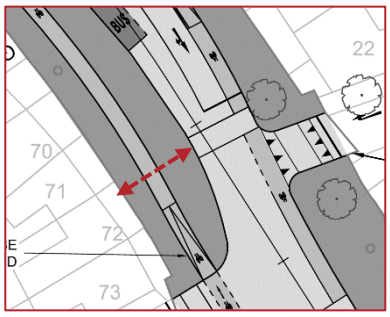
While the Audit Team do not consider the layout of the junction to be unsafe in principle, the signal phasing should be further reviewed and refined to ensure it sufficiently reflects the layout proposed and does not result in conflicting movements operating during the same phase.

Also, ensure adequate time is allowed between Phases 2 & 3 to ensure the one-way section of Aughrim Street is clear of traffic.

3.1.42 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0032 (Rev. L01)*

Summary: *Pedestrians are required to cross the cycle track to access the pedestrian crossing on the northern arm of the Manor Street/Kirwan Street junction.*



The cycle track is indicated as traversing the wide footpath on the western side of Manor Street, immediately north of its junction with Kirwan Street such that pedestrians accessing the crossing from the rear of the footpath on the northern arm of the junction are required to cross the cycle track to do so.

It is unclear who has priority at this location. This could lead to cyclists and pedestrians believing that they have priority and proceeding without due care and attention resulting in an increased risk of pedestrian-cyclist collisions.

Recommendation

Provide measures to clearly advise pedestrians and cyclists of the priority at this location.

3.1.43 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033 (Rev. L01)*

Summary: *Pinch point in the footpath at the corner of the North King Street/Stoneybatter junction.*

The existing building line on the north-eastern corner of the North King Street/Stoneybatter junction results in a pinch point in the footpath, reducing the effective width of the footpath. It is likely that items of roadside furniture such as traffic signals and signs will also be required at this location which may further reduce the effective width of the footpath. This could lead to pedestrians having to step into the carriageway to avoid oncoming pedestrians where there is an increased risk of being struck by a vehicle.

Recommendation

During the design development ensure that the effective width of the footpath at this location is a minimum of 1.2m, and that items of roadside furniture do not create obstacles for non-motorised road users.

3.1.44 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033 (Rev. L01)*

Summary: *Northbound buses/cyclists stopped at the stop line on Manor Street at its junction with Brunswick Street may block access/egress to/from Arbour Hill.*

The stop line for northbound buses and cyclists on Manor Street at its signalised junction with Brunswick Street is located such that drivers stopped at this location may block access/egress to/from Arbour Hill which is not included within the signalised junction. This could lead to driver frustration, should they experience delays when entering/exiting Arbour Hill, resulting in a risk of unsafe entry/exit manoeuvres to/from Arbour Hill and a resultant increased risk of collisions.

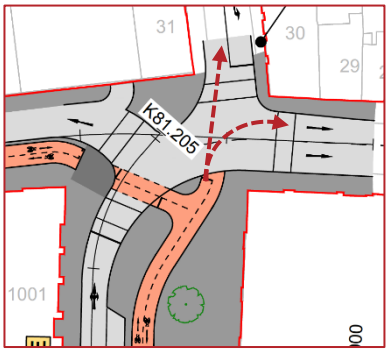
Recommendation

The stop line on Manor Street for northbound buses/cyclists should be relocated further upstream and the existing yellow box junction markings at the junction should be retained.

3.1.45 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033 (Rev. L01)*

Summary: *Unclear how northbound cyclists on the two-way cycle track on George's Lane enter the junction at Brunswick Street as they do not appear to be included in any phases at the junction.*



The two-way cycle track, travelling from north to south along George's Lane, is indicated as terminating at the signalised junction of George's Lane/Brunswick Street/Grangegorman Lower. It is assumed that a dropped kerb will be provided at the northern end of the cycle track and that southbound cyclists on Grangegorman Lower wishing to enter the southbound cycle track will do so on the same phase as vehicular traffic exiting Grangegorman Lower. It is unclear however how northbound cyclists will proceed onto the carriageway as this movement does not appear to be included in any of the phases indicated. If they were to proceed with vehicular traffic on George's Lane, there is a risk of conflicts between vehicles turning right into Brunswick Street and northbound cyclists entering the carriageway.

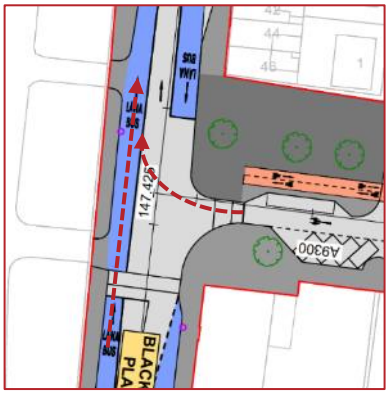
Recommendation

An on-demand phase should be included in the traffic signal cycle allowing northbound cyclists to proceed unopposed into Brunswick Street or Grangegorman Lower. Alternatively, this movement should be incorporated into Phase 1.

3.1.46 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0034 (Rev. L01)*

Summary: *Risk of right-turning drivers from Blackhall Street encroaching into the straight-ahead bus lane on Blackhall Place resulting in the potential for collisions with straight-ahead buses or taxis.*



Left turns and right turns from Blackhall Street at its junction with Blackhall Place are permitted during the same green signal phase as northbound buses on Blackhall Place. Right-turning drivers exiting Blackhall Street may not anticipate northbound buses or taxis to proceed at the same time and potentially swing wide when turning right and encroach into the bus lane which could lead to an increased risk of side swipe collisions with northbound buses or taxis.

The problem will be further exacerbated should a taxi exit the side road and enter the bus lane at the same time as a northbound bus/taxi.

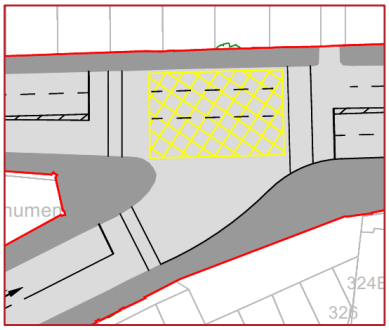
Recommendation

Turning manoeuvres out of Blackhall Street should occur on a separate phase to northbound buses to reduce the risk of collisions.

3.1.47 Problem

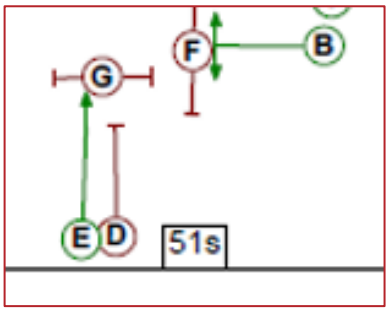
Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0036 (Rev. L01)*

Summary: *Unclear if the indicated width of the pedestrian crossings of Cabra Road and the North Circular Road are sufficient.*



The widths of the proposed pedestrian crossings of Cabra Road and the North Circular Road appear to be quite narrow relative to other crossings within the Scheme and may not sufficiently accommodate the volume of pedestrians at this location.

Recommendation

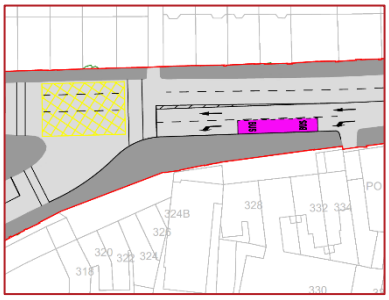


The width of the pedestrian crossings on Cabra Road and the North Circular Road should be increased in accordance with the Design Manual for Urban Roads and Streets (DMURS) which recommends a minimum width of 4m for pedestrian crossings in busy urban areas.

3.1.48 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0036 (Rev. L01)*

Summary: *Proposed bus stop within the left turn lane upstream of the signalised junction on North Circular Road may result in conflicts between vehicles approaching the junction and buses exiting the bus stop.*



A left turn and straight-ahead lane for westbound traffic has been indicated on North Circular Road on the approach to its junction with Cabra Road. An online bus stop has also been indicated within the left-turn lane upstream of the signals. Should a bus be stopped at the bus stop there is a risk that left turning drivers may attempt to take a rushed overtaking manoeuvre, particularly if the signals are green, leading to side swipe collisions with through traffic in the adjacent lane.

Also, it is unclear if the bus route at this location continues straight through the junction onto Cabra Road or turns left to continue on North Circular Road. If the bus route continues straight ahead buses exiting the bus stop may conflict with vehicles entering the left turn lane, or potentially be unable to enter the through traffic lane should there be a queue of vehicles in the adjacent lane during a red signal.

Recommendation

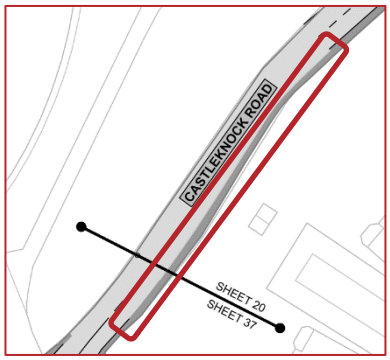
The bus stop should be relocated downstream of the junction or further upstream of the junction prior to the development of the left turn lane.

Alternatively, provide yellow box roadmarkings within the through traffic lane adjacent the bus stop to allow buses to re-enter the through traffic lane should their route continue on Cabra Road.

3.1.49 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0037 (Rev. L01)*

Summary: *Footpath on the western side of Castleknock Road is narrow and may not be sufficiently wide enough to cater for opposing pedestrians.*



The footpath indicated on the western side of Castleknock Road is very narrow and may not be sufficiently wide enough to accommodate opposing pedestrians. This could lead to pedestrians having to step into the carriageway to avoid oncoming pedestrians where there is an increased risk of being struck by a vehicle.

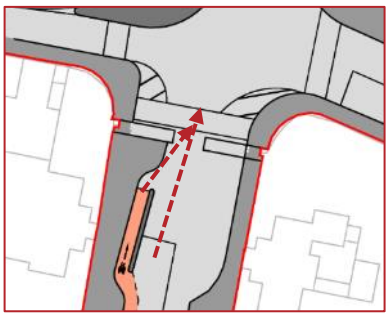
Recommendation

The footpath at this location should be a minimum of 1.8m wide.

3.1.50 Problem

Location: *Drawing no. BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0037 (Rev. L01)*

Summary: *Risk of conflicts between cyclists and vehicles exiting the Phoenix Park at the proposed signalised junction of Castleknock Road and Blackhorse Avenue.*



It is proposed to signalise the existing junction of Castleknock Road, Blackhorse Avenue and the Phoenix Park Ashtown Gate. Information regarding the proposed signal phasing for this junction has not been provided and it is therefore unclear if cyclists and vehicles will exit the Phoenix Park during the same phase. There is a pinch point at the Phoenix Park gate and if these movements where to occur during the same phase there is a risk of cyclists being squeezed by vehicles as they exit the park and potentially being struck.

Recommendation

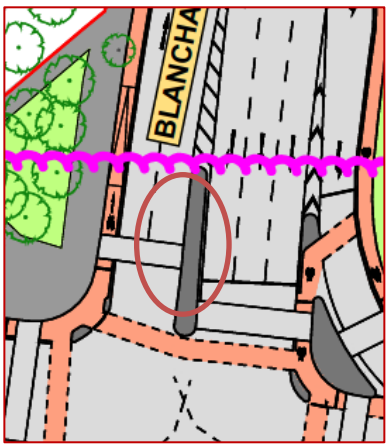
Either provide separate phases should be provided for cyclists and vehicles exiting the Phoenix Park, or ensure that there is adequate width for cyclists and vehicles to safely exit simultaneously.

3.2 Revised Drawings

3.2.1 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0001 (Rev. L03)*

Summary: *It is unclear if there is sufficient space within the central refuge island for a pedestrian to wait safely.*



The proposed refuge island on the eastern arm of the R121 Blanchardstown Road South junction with the Navan Road appears to be relatively narrow. It is therefore unclear if there will be sufficient space for pedestrians, particularly wheelchair users and those pushing strollers, to wait within the island during the two-stage crossing. If the island is insufficiently wide enough for the expected volumes of pedestrians to wait there is an increased risk of pedestrians waiting in close proximity to, or stepping into the, traffic lane increasing the risk of being struck by a vehicle.

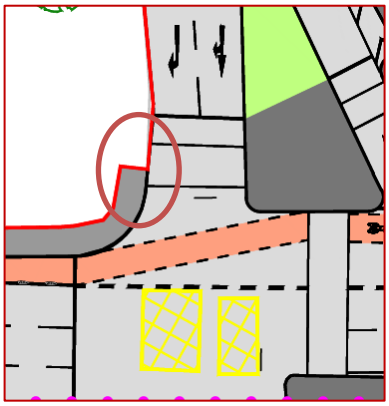
Recommendation

Ensure the island can accommodate the expected pedestrian volumes using the crossing and that it is sufficiently wide to accommodate wheelchair users and pedestrians with strollers.

3.2.2 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0003 (Rev. L03)*

Summary: *The footpath does not extend across the full width of the pedestrian crossing.*



A pedestrian crossing is indicated across the N3 off-slip on the south-eastern arm of the R121 Blanchardstown Road South junction with the N3 northbound off-slip. The footpath on the northern side of the crossing is indicated as terminating in the middle of the proposed crossing. This may lead to pedestrians, particularly the mobility and visually impaired, being unable to access the crossing, or footpath, resulting in them continuing within the carriageway where there is an increased risk of being struck by a vehicle.

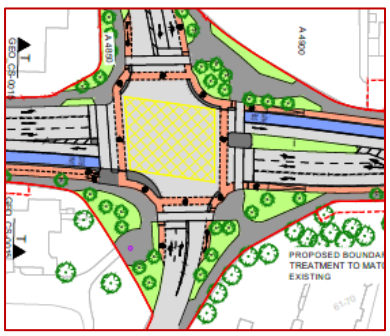
Recommendation

Extend the footpath across the full width of the crossing.

3.2.3 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0021 (Rev. L03)*

Summary: *Unclear if the width of the pedestrian crossings is sufficient.*



It is proposed to remove the Ashtown Roundabout and provide a signalised junction in its place. However, the widths of the proposed pedestrian crossings at the signalised junction appear to be quite narrow relative to other crossings within the Scheme. This may lead to these crossings failing to sufficiently accommodate the volume of pedestrians and cyclists at this location resulting in potential conflicts.

Recommendation

Ensure the pedestrian crossings are sufficiently wide enough to accommodate the expected volume of pedestrians, noting that DMURS recommends at least 4m wide crossing widths in urban areas.

3.2.4 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0022 (Rev. L03); BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0023 (Rev. L03) BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0027 (Rev. L03)*

Summary: *A sufficient gap has not been provided within the cycle track kerb to allow cyclists to turn right from side roads into the cycle track.*

At three-arm signalised junctions along Navan Road the kerb adjacent the cycle track is indicated as continuous opposite the minor arm of the junction. Cyclists turning right out of the minor arms, from the advance stop lines indicated, will be unable to safely enter the cycle track leading to them having to continue within the traffic lane where they are at an increased risk of being struck by a vehicle or traversing the kerb resulting in falls from their bicycle.

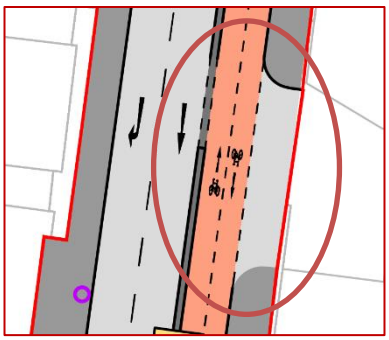
Recommendation

Provide a sufficiently sized gap in the cycle track kerb opposite side road junctions to allow right-turning cyclists to safely enter the cycle track.

3.2.5 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0035 (Rev. L03)*

Summary: *Gap in kerb at carpark entrance/exit does not extend across the full width of the access.*



It is proposed to provide two-way cycle lanes along the eastern side of Queen Street, with kerbs indicated to segregate the cycle lanes from the adjacent traffic lane. An existing car park structure is accessed via Queen Street at this location. A gap has been indicated in the kerb however it does not extend across the full width of the access. This may lead to cars having to mount the kerb when entering/exiting the carpark increasing the risk of material damage collisions or to drivers attempting to enter/exit via the narrow gap indicated increasing the risk of low speed head-on collisions.

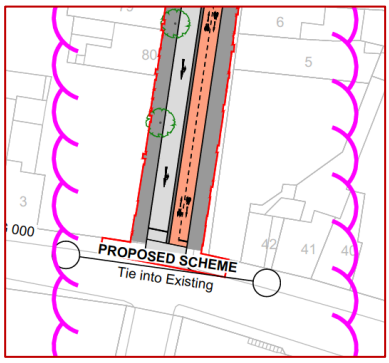
Recommendation

The gap in the kerb should be extended across the full width of the carpark access.

3.2.6 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0036 (Rev. L03)*

Summary: *Unclear how cyclists in the proposed two-way cycle lane will access existing cycle facilities on Arran Quay.*



It is proposed to provide a two-way cycle lane along the eastern side of Queen Street. The two-way cycle lane commences/terminates at the Queen Street / Arran Quay / Liam Mellowes Bridge / Ellis Quay signalised junction. There are existing cycle lanes along the southern side of the North Quays at this location however it is unclear how cyclists will safely transition between the existing and proposed facilities. This may lead to cyclists attempting to travel between the cycle facilities on Queen Street and the Quays when it is unsafe to do so resulting in an increased risk of conflicts with other road users.

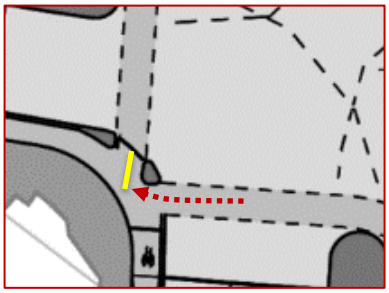
Recommendation

Provide separate signal phases for cyclists to access adjacent cycle facilities at this junction.

3.2.7 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0002 (Rev. L03)*
BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0021 (Rev. L03)
BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0022 (Rev. L03)
BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0023 (Rev. L03)

Summary: *Right-turning cyclists may block straight through cyclists at signalised junctions.*



It is proposed to provide protected cycle lanes at a number of signalised junctions within the Scheme. However, it is unclear from the drawing if there will be sufficient space at stop lines to allow cyclists to wait outside the path of an adjacent cyclist. Should there be insufficient space for a cyclist to pass a stationary cyclist, there is a risk of collisions between cyclists or to cyclists entering the carriageway, to pass a stationary cyclist, at locations where drivers may be less attentive to a cyclist entering the carriageway increasing the risk of collisions.

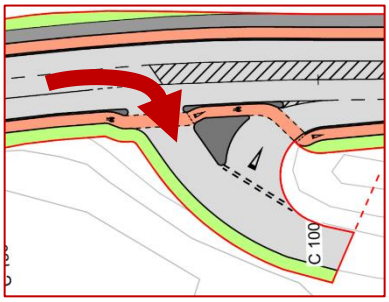
Recommendation

Ensure sufficient space is provided at cyclist stop lines for a stationary cyclist to wait out of the path of an oncoming cyclist.

3.2.8 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0002 (Rev. L03)*

Summary: *It is unclear if there is sufficient space within the junction to accommodate the swept path of right-turning HGVs entering the N3 on-slip.*



It is proposed to amend the layout of the existing junction of the N3 on-slip and the Old Navan Road. The amendments would include the provision of a dedicated left-turn lane for northbound traffic with this manoeuvre having to give way to traffic turning right into the on-slip. It is unclear if there is sufficient space within the junction to accommodate the swept path of large vehicles from the right-turn lane. If sufficient space is not provided to accommodate right-turning vehicles there is an increased risk of them mounting the splitter island when turning and striking cyclists in the cycle lane.

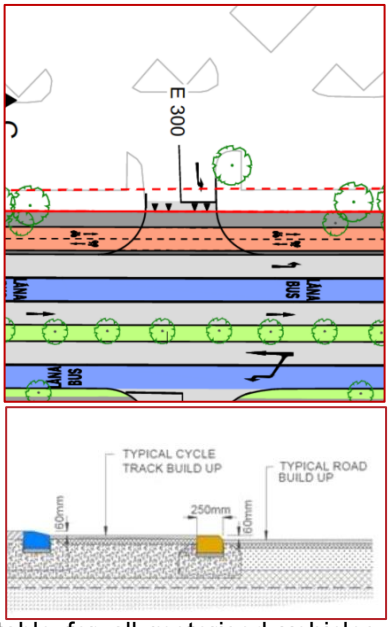
Recommendation

Ensure that the swept path of large vehicles can be accommodated when turning right at this junction.

3.2.9 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0004 (Rev. L03)*

Summary: *Height, and type, of the proposed kerb at the entry to the car park may result in difficulties for motorcyclists when traversing the kerb leading to loss of control.*



Continuous segregated cycle and pedestrian facilities have been indicated across the carpark access into the Blanchardstown Shopping Centre with a change in level provided between the footpath and cycle track and subsequently the cycle track and carriageway. It is proposed to provide a 60mm high kerb between the carriageway and the cycle track and a 60mm high kerb between the cycle track and footpath. Whilst both kerbs are splayed, the kerb between the carriageway and cycle track has a more pronounced profile which may not be suitable for motorcyclists, and may increase the risk of motorcyclists experiencing difficulty when turning into the carpark, resulting in loss of control collisions.

Recommendation

Ensure the height, and type, of kerb proposed at both transitions is suitable for all motorised vehicles, especially powered two-wheelers, such that it will not result in loss of control collisions when entering the carpark.

3.2.10 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0004 (Rev. L03)*

Summary: *Unclear if there is sufficient space within the junction for right-turning buses.*

The proposed signal phasing for the Bus Interchange West Access Junction in the Blanchardstown Shopping Centre permits right and left turning movements out of the bus lane. However, it is unclear from the drawings provided if there is sufficient space within the junction to accommodate the swept path of a right turning bus, or if this manoeuvre can be easily undertaken within the layout of the junction. If sufficient space is not available to accommodate right and left turning buses within the junction there is an increased risk of buses mounting splitter islands or footpaths and material damage.

Recommendation

Ensure all proposed movements from the Bus Interchange can be accommodated within the proposed junction layout.

3.2.11 Problem

Drawing: *BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0037 (Rev. L03)*

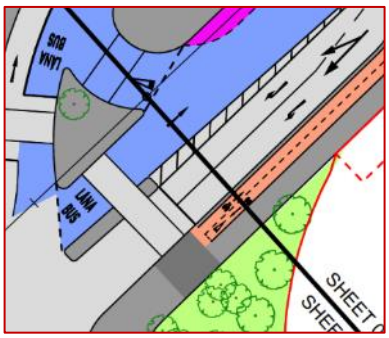
Summary: *Drivers may continue to turn right from Castleknock Road should they consider the manoeuvre possible within the amended junction layout.*

It is proposed to signalise the existing junction of Castleknock Road, Blackhorse Avenue and the Phoenix Park Ashtown Gate which is currently under priority-control. The proposed amendments also include restricting the western arm of the junction to left-turn only when exiting. The proposed amendments to the junction layout however appear to physically accommodate right-turns from Castleknock Road despite the left-turn arrow indicated which may not be adhered to by drivers who consider right turns possible at the junction. This may lead to drivers from Castleknock Road, who wish to enter the Phoenix Park or Blackhorse Avenue, turning right at the junction when it is unsafe to do so resulting in collisions with traffic from opposing arms that may have a green signal.

Recommendation

The shape of the proposed island should be amended such that right turn manoeuvres from Castleknock Road will not be possible. A ‘No Right Turn’ sign should also be provided to supplement the road marking.

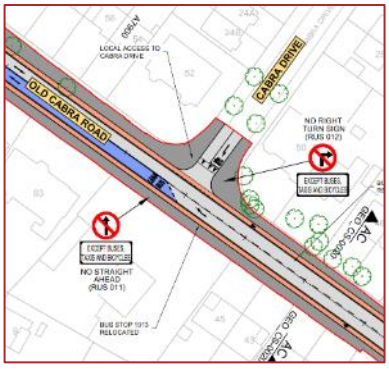
4 Observations



4.1 It is unclear if the widths of the two-way cycle track through the scheme will be sufficient to accommodate two-way cyclists particularly at the two-way cycle track adjacent the southbound traffic lane at the proposed bus interchange in the Blanchardstown Shopping Centre.

The National cycle manual recommends a minimum of 2m wide lanes in each direction for two-way cycle track.

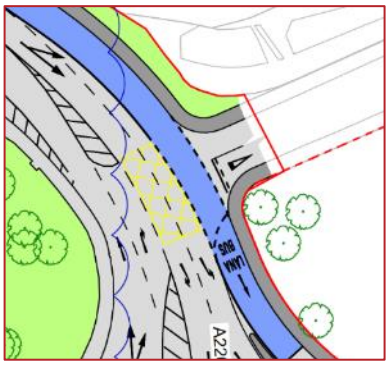
4.2 Existing bus stops (No. 1697 & 1665) located on both sides of the Navan Road at Darling Estate have been indicated as being relocated however their proposed locations have not been indicated on the drawings provided. It is therefore unclear if the proposed relocated bus stops will be provided at safe locations such that they do not present hazards to drivers or impede a driver's visibility towards signs, signals and vulnerable road users. Ensure these bus stops are located where they will not result in hazards to other road users.



4.3 Residents exiting Cabra Drive at its junction with Old Cabra Road are prohibited from turning right where a northbound bus lane has been indicated. Drivers wishing to turn right from Cabra Drive are unlikely to turn left and follow a lengthy detour to reach their destination should it be north of Cabra Drive. This may lead to drivers not adhering to the restrictions and turning right when exiting Cabra Drive.

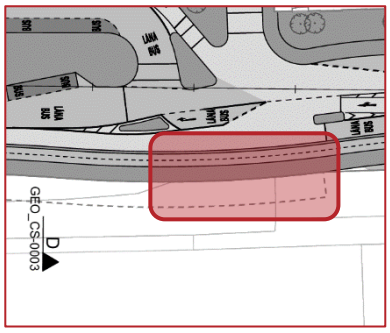
4.4 There is existing on-street parking located on both sides of Aughrim Street which, when occupied, reduces the effective width of the traffic lane such that the street currently operates via an informal give-take arrangement. The proposed layout of the Aughrim Street/Manor Street junction will result in an increased volume of traffic using the section of Aughrim Street outside the extents of the Scheme as all northbound and southbound traffic are now being directed into Aughrim Street.

It is unclear if the existing road layout on Aughrim Street will sufficiently cater for these increased traffic volumes. An assessment of the increase in traffic volumes using Aughrim Street should be undertaken and, if necessary, the road layout upgraded to ensure it can sufficiently accommodate the expected increase in the volume of traffic using this road.



4.5 The access to the Junction 6 Castleknock Health and Leisure Village is located on the overbridge to the north of the Navan Road/Connolly Hospital Access (Northbound) junction. Footpaths have been indicated on both sides of the access to this development however there is no pedestrian crossing currently at the access, nor does it appear that one is to be provided as part of the Scheme. A failure to provide a crossing point, with associated dropped kerbs and tactile paving, could lead to mobility impaired pedestrians being unable to continue across the access to the downstream footpath. An uncontrolled crossing, with dropped kerbs and tactile paving, should be provided across the access to this development.

4.6 There is an existing gated delivery entrance on the southern side of the carriageway to the west of the proposed signalised junction at the Crowne Plaza Hotel in the Blanchardstown Shopping Centre. This delivery access has not been indicated on the drawings provide and it is therefore unclear if it is proposed to retain this entrance. If this entrance is to be removed an alternative delivery entrance may be required. Measures should be provided within the Scheme to facilitate deliveries at this location.

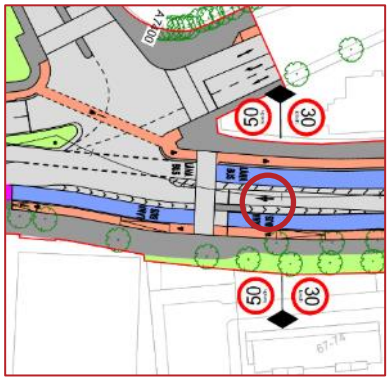


4.7 During the site visit, the Audit Team noted that a new service station is currently under construction on the southern side of the Old Cabra Road adjacent the Earls Court residential development. This service station has not been reflected in the proposed design at this location. The access/egress to this service station will require crossings of the proposed footpath and cycle track at this location. Measures should be provided in the Scheme to accommodate safe entry and exit to this future service station.

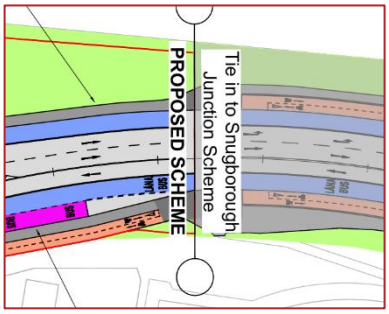
4.8 Trees have been indicated within the footpath and cycle track at a number of locations on both sides of the Navan Road, for example upstream of its junction with Kinvara Avenue. The Audit Team assume that this is a CAD error however the drawings should be amended to ensure all trees within the Scheme are located where they will not present obstacles to pedestrians and cyclists.

4.9 Equestrians currently travel between the northern arm of the existing roundabout at the Halfway House on the Navan Road and the southern arm (Castleknock Road) to access the Phoenix Park. During the design development ensure that equestrians can use the junction safely.

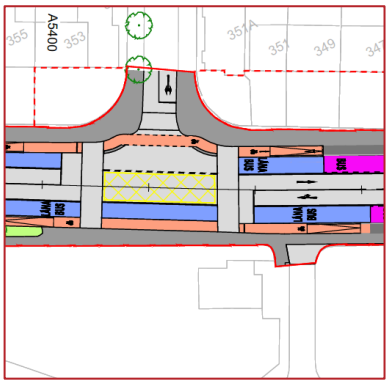
4.10 The arrow roadmarkings upstream of the stop line in the westbound lane on Old Cabra Road at its junction with Cabra Road and Ratoath Road contains a straight-ahead, left turn and right turn arrow. There is no side road located to the left of this lane at this location. The left turn arrow should be removed from the roadmarkings and a straight-ahead and right turn arrow only provided.



4.11 The L3020 is proposed to tie-into a separate scheme at the Snugborough Interchange. A two-way cycle track is indicated on the northern side of the L3020 within the adjacent scheme however it is unclear if measures will be provided for cyclists to access this facility from the facility on the southern side of the L3020 within this Scheme. Through liaisons with the Designers of the adjacent scheme, ensure a toucan crossing is provided on the L3020 linking the two cycle facilities.



4.12 The access to the Daughters of Charity Disability Support Services on the southern side of the Navan Road is located in close proximity to the stop line at the signalsied junction of the Navan Road and Ashtown Grove. The volumes of traffic entering/exiting this facility has not been provided to the Audit Team however if large volumes enter and exit this facility daily measures may be required (e.g. yellow box markings) to ensure drivers can safely enter and exit this access.

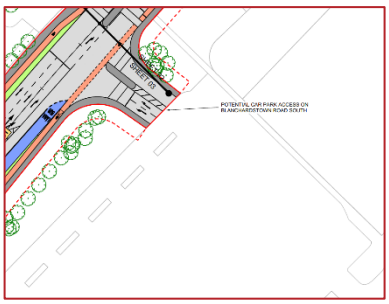


Alternatively, this access should be closed and access/egress to the Daughters of Charity Disability Support Services be provided from the other accesses further east and west of the junction.

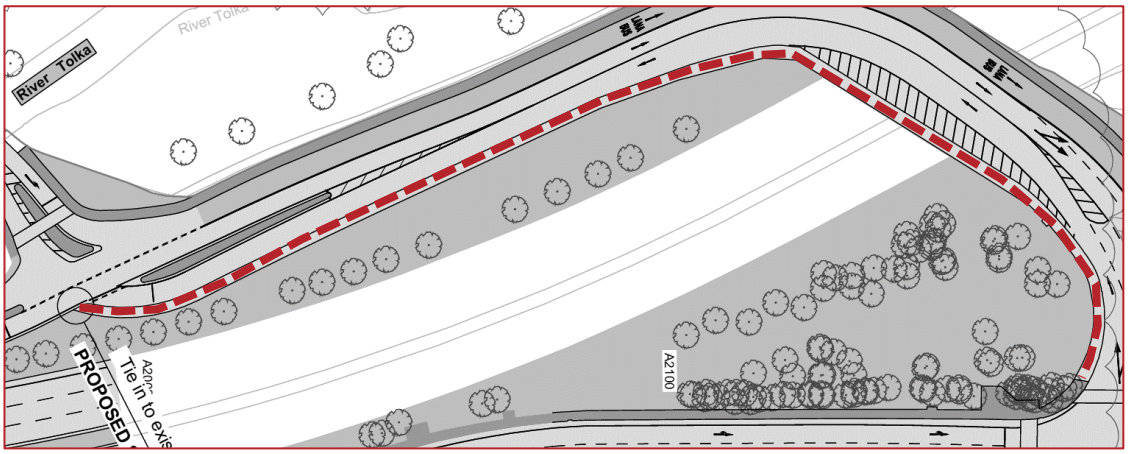
The access is also located at a ramp in the cycle track which may lead to discomfort for drivers when enteirng should they have to mount a kerb at the ramp. The cycle track should be amended to remove the ramp from in front of the access

4.13 There are a large number of residential accesses located on both sides of the Navan Road throughout the Scheme. At this early stage in the deisgn development details of how these accesses are to be arranged relative to the footpath and cycle track have not been indicated. As the design progresses ensure access to these residential properties is maintained without compromising the proposed pedestrian and cycle facilities within the Scheme.

4.14 A new signalsied access to the car park at TK Maxx in the Blanchardstown Shopping Centre from Blanchardstown Road South has been indicated. While the Audit Team have not raised any safety issues with the provision of the access in principle, if this access is included as the deisgn progresses, ensure the approach through the existing car park is such that parked vehicles will not impede vehicles entering and exiting via this access.



4.15 It is unclear if right turns will be permitted from the Navan Road at its junction with Kempton Avenue. The arrow roadmarkings, and phasing diagrams, at this junction suggest that right turns will be prohibited. Kempton Avenue leads to a large residential development. The only access to this development is through this junction. It is expected that this development will generate a large number of turning manoeuvres daily especially during peak times. If right turns are prohibited at this location, drivers will be required to continue west and perform a u-turn at the downstream roundabout which may lead to the roundabout experiencing capacity issues. Right turns into Kempton Avenue should be permitted from the Navan Road as in the current junction arrangement.

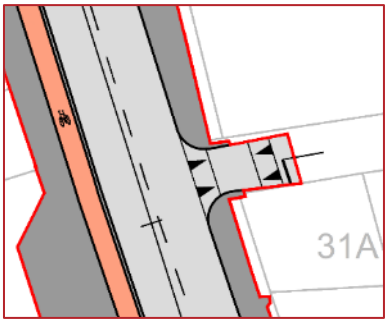


4.16 It is unclear if a footpath is proposed on the western side of the overbridge at Connolly Hospital Blanchardstown. The area to the edge of the carriageway has been hatched the same colour as the adjacent traffic lane however it is not clear if this is to be a footpath, part of the carriageway or a kerbed verge.

The Audit Team would not considered appropriate to provide a footpath on this side of the overbridge as there are no measures for pedestrains to cross the carriageway at the terminal opposite the entrance to the hospital. The drawings should be amended to clearly indicate this area as a verge and not a footpath.

4.17 At this early stage in the design process, information regarding proposed roadside furniture has not been provided to the Audit Team. It is assumed that public lighting columns and other roadside furniture will be amended, relocated and/or provided throughout the scheme Ensure all roadside furniture is located such that it provides sufficient width for passing pedestrians, is sufficiently visible to drivers (signs etc.) and is set back a minimum of 450mm from the edge of the carriageway.

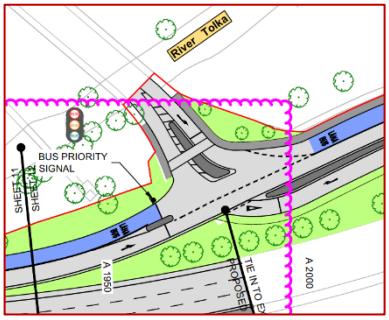
4.18 It is unclear if St Joseph's Place and Fingal Place can safely cater for two-way traffic at their junctions with Prussia Street.



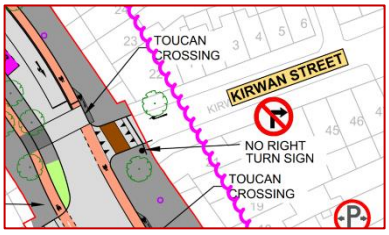
Ensure adequate inter-visibility is available between a driver waiting at the stop line and a driver wishing to enter from Prussia Street so that one can wait and allow the other to exit before proceeding.

5 Revised Drawings Observations

1. Yield road markings have been indicated for right turning vehicles at the Navan Road / Connolly Hospital Access signlised junction. Right turning traffic however is provided with a green signal on a separate phase and proceeds unopposed, resulting in the Yield symbol being redundant. It is assumed that this is CAD error and no Yield control will be provided at this location however the drawing should be amended and the Yield symbol removed.



2. A right turn arrow marking has been indicated at the exit from Kirwan Street advising drivers that they must turn right when exiting while a 'No Right Turn' sign has also been indicated facing exiting drivers. These provide conflicting information to drivers which may lead to confusion and unsafe manoeuvres. Review the layout of this junction and remove the element which provides the incorrect information.



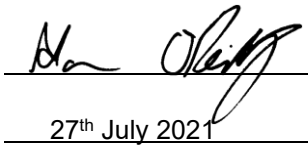
6 Road Safety Audit Team Statement

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.

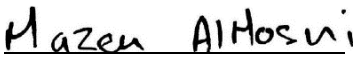
No one on the Road Safety Audit Team has been involved with the design of the scheme.

ROAD SAFETY AUDIT TEAM LEADER

Alan O'Reilly Signed: 

Dated: 27th July 2021

ROAD SAFETY AUDIT TEAM MEMBER

Mazen Al Hosni Signed: 

Dated: 27th July 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	☐	☑
2.	Departures from Standard	☐	☑
3.	Scheme Drawings	☑	☐
4.	Scheme Details such as signs schedules, traffic signal staging	☐	☑
5.	Collision data for existing roads affected by scheme	☐	☑
6.	Traffic surveys	☐	☑
7.	Previous Road Safety Audit Reports and Designer's Responses/Feedback Form	☐	☑
8.	Previous Exception Reports	☐	☑
9.	Start date for construction and expected opening date	☐	☑
10.	Any elements to be excluded from audit	☐	☑

Any other information?

(if 'Yes', describe below) ☐ ☑

Appendix B – Documents Submitted to the Road Safety Audit Team

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0001	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0002	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0003	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0004	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0005	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0006	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0007	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0008	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0009	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0010	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0011	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0012	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0013	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0014	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0015	L01
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CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0017	L01
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CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0019	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0020	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0021	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0022	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0023	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0024	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0025	L01
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CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0027	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0028	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0029	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0030	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0031	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0032	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0034	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0035	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0036	L01
CBC 0005 BLANCHARDSTOWN TO CITY CENTRE GENERAL ARRANGEMENT	BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0037	L01
Updated Drawings		
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0001	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0002	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0003	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0004	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0005	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0006	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0007	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0008	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0009	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0010	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0011	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0012	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0013	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0014	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0015	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0016	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0017	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0018	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0019	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0020	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0021	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0022	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0023	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0024	L03

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0025	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0026	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0027	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0028	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0029	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0030	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0031	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0032	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0033	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0034	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0035	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0036	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0037	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0038	L03
CBC 0005 Blanchardstown to City Centre General Arrangement	BCIDC-SRP-GEO_GA-0005_XX_00-DR-DR-0039	L03

Appendix C – Feedback Form

Road Safety Audit Feedback Form

Scheme: BusConnects Core Bus Corridors

Route No.: N3, M50, Navan Road, Old Cabra Road, Prussia Street, Manor Street, Stoneybatter, Blackhall Place

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 27th May 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)**
3.1.1	Y	Y		
3.1.2	Y	Y		
3.1.3	Y	Y		
3.1.4	Y	Y		
3.1.5	Y	Y		
3.1.6	Y	N	Right turners will be via protected junction layout in line with Preliminary Design Guidance Booklet. Current layouts will be reviewed for consistency.	Yes
3.1.7	Y	Y		
3.1.8	Y	Y		
3.1.9	Y	N	Managing the potential conflict between cyclists and left turning vehicles is still under review but the current proposal proposes use of a flashing amber signal to alert motorists to the potential conflict. Consideration will be given to phase separating these movements if the left turning vehicles is high (e.g. greater than 150vph). Further details are presented in Section 7 of the Preliminary Design Guidance Booklet	Yes
3.1.10	Y	Y		

Road Safety Audit Feedback Form

Scheme: BusConnects Core Bus Corridors

Route No.: N3, M50, Navan Road, Old Cabra Road, Prussia Street, Manor Street, Stoneybatter, Blackhall Place

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 27th May 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)**
3.1.11	Y	N	Phases will be added for all pedestrian movements. However, managing the potential conflict between cyclists and left turning vehicles is still under review but the current proposal proposes use of a flashing amber signal to alert motorists to the potential conflict. Consideration will be given to phase separating these movements if the left turning vehicles is high (e.g. greater than 150vph). Further details are presented in Section 7 of the Preliminary Design Guidance Booklet.	Yes
3.1.12	Y	Y		
3.1.13	Y	Y		
3.1.14	Y	Y		
3.1.15	Y	Y		
3.1.16	Y	N	Layout has been amended. Cyclist will cross the bus lane at signal-controlled crossing.	Yes
3.1.17	Y	Y		
3.1.18	Y	Y		
3.1.19	Y	Y		
3.1.20	Y	Y		

Road Safety Audit Feedback Form

Scheme: BusConnects Core Bus Corridors

Route No.: N3, M50, Navan Road, Old Cabra Road, Prussia Street, Manor Street, Stoneybatter, Blackhall Place

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 27th May 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)**
3.1.21	Y	N	Eastbound cycle track will be terminated 10m before current layout of shared surface, with an extended shared surface provided to allow cyclist to change to correct side of cycle track.	Yes
3.1.22	Y	N	Layout has been revised to add an additional lane to allow left turners to turn without conflict with the bus lane.	Yes
3.1.23	Y	N	Signal staging will ensure the right turning bus will not block westbound traffic.	Yes
3.1.24	Y	Y		
3.1.25	Y	Y		
3.1.26	Y	Y		
3.1.27	Y	Y		
3.1.28	Y	Y		
3.1.29	Y	Y		
3.1.30	Y	Y		
3.1.31	Y	Y		
3.1.32	Y	N	The roundabout has been amended to a four-arm signal controlled crossroads.	Yes

Road Safety Audit Feedback Form

Scheme: BusConnects Core Bus Corridors

Route No.: N3, M50, Navan Road, Old Cabra Road, Prussia Street, Manor Street, Stoneybatter, Blackhall Place

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 27th May 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)**
3.1.33	Y	Y		
3.1.34	N	N	Bus stops are to be located as shown, apart from Skreen Road Bus Stop which has been moved further east back to its current location. Moving bus stop at other locations results in greater walking distance for local catchment area. Further measures to deter illegal movements will be considered at detail design stage.	Yes
3.1.35	Y	Y		
3.1.36	Y	N	This area is not intended for bus usage and will be signed accordingly.	Yes
3.1.37	Y	Y		
3.1.38	Y	Y		
3.1.39	Y	N	Proposed layout is considered appropriate as the speed of vehicles making a left turn will be low (with 3m radius corner) – and hence forward visibility of between 7m and 14m for left turning traffic (in line with DMURS for 10 – 20kph design speed) is considered appropriate.	Yes
3.1.40	Y	Y		
3.1.41	Y	Y		

Road Safety Audit Feedback Form

Scheme: BusConnects Core Bus Corridors

Route No.: N3, M50, Navan Road, Old Cabra Road, Prussia Street, Manor Street, Stoneybatter, Blackhall Place

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 27th May 2021

	To Be Completed by Designer			To Be Completed by Audit Team Leader
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3.1.42	Y	Y		
3.1.43	Y	Y		
3.1.44	Y	N	The stop line for bus lane moved closer to Brunswick Street junction. There is low traffic level to/from Arbour Hill and bus lane will only allow traffic to exit after buses and ensure buses have priority as per scheme objective. Movements can be reviewed post-construction and yellow box can be installed if required at this location.	Yes
3.1.45	Y	Y		
3.1.46	Y	Y		
3.1.47	Y	Y	.	
3.1.48	N	N	Bus movements will not change at this junction. Buses in the left lane will only turn left and ahead bus movements do not require use of the bus stop on the approach to the junction.	Yes
3.1.49	Y	N	This section is outside the core bus corridor scheme. The red line boundary will be amended to exclude this section of Castleknock Road from the drawings. This matter will be brought to the attention of the Local Authority.	Yes
3.1.50	Y	Y		

Road Safety Audit Feedback Form

Scheme: BusConnects Core Bus Corridors

Route No.: N3, M50, Navan Road, Old Cabra Road, Prussia Street, Manor Street, Stoneybatter, Blackhall Place

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 27th May 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)**
3.2.1	Yes	Yes		
3.2.2	Yes	No	The footpath shown is the existing layout. We have amended the alignment of the crossing to tie in with existing footpath.	Yes
3.2.3	No	No	2.4 m wide pedestrian crossings are being provided which is sufficient for volume of pedestrians expected.	Yes
3.2.4	No	No	There is a 3.9 m opening for cyclists to enter the cycle track using this manoeuvre.	Yes
3.2.5	Yes	Yes		
3.2.6	No	No	The cycle movement will be signalised into the existing junction at Ellis Quay/Arran Quay.	Yes
3.2.7	No	No	The cycling space at junction corner areas is 2m minimum width which allows a cyclist to pass another stationary cyclist at the stop line. A 2m width provides space in accordance with the Cycle Manual (**https://www.cyclemanual.ie/** manual/thebasics/width/) - which indicates an appropriate width build-up of a 0.25m inner buffer, 1.25m for single file and overtaking, and 0.5m to the outer kerb. It is also noted that the proposed signal operation at junctions will ensure that conflict between waiting and passing cyclists at corner areas will be limited as follows:	Yes

Road Safety Audit Feedback Form

Scheme: BusConnects Core Bus Corridors

Route No.: N3, M50, Navan Road, Old Cabra Road, Prussia Street, Manor Street, Stoneybatter, Blackhall Place

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 27th May 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)**
			1) Across-the-side-road-and-right-turn cyclist held at the forward stop line (at the starting edge of the crossing) will naturally arrive at the stop line with their bicycle aligned to allow following cyclists to pass on the left. 2) Straight-ahead-and-across-the-main-road cyclist (from a side road) will also naturally arrive at the crossing stop line with their bicycle aligned to allow following left-turn cyclists to pass to the left. 3) With respect to signal staging, across-the-side-road-and-right-turn cyclist and straight-ahead-and-across-the-main-road cyclist will operate in different signal stages. For example, any cyclist held at the crossing stop line at the end of the last crossing stage will clear the stop line area at the start of the next crossing stage - and before the next cyclist arrives – thus minimising any risk of blocking back occurring within the corner areas.	
3.2.8	Yes	Yes		
3.2.9	Yes	Yes		
3.2.10	Yes	Yes		
3.2.11	Yes	No	The geometry of the proposed traffic island is optimised for the space available at the junction. A 'no right turn' sign will be introduced on the island, and a left turn only sign is	Yes

Road Safety Audit Feedback Form

Scheme: BusConnects Core Bus Corridors

Route No.: N3, M50, Navan Road, Old Cabra Road, Prussia Street, Manor Street, Stoneybatter, Blackhall Place

Audit Stage: Stage 1 Road Safety Audit **Date Audit Completed:** 27th May 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)**
			currently proposed ahead of the junction.	

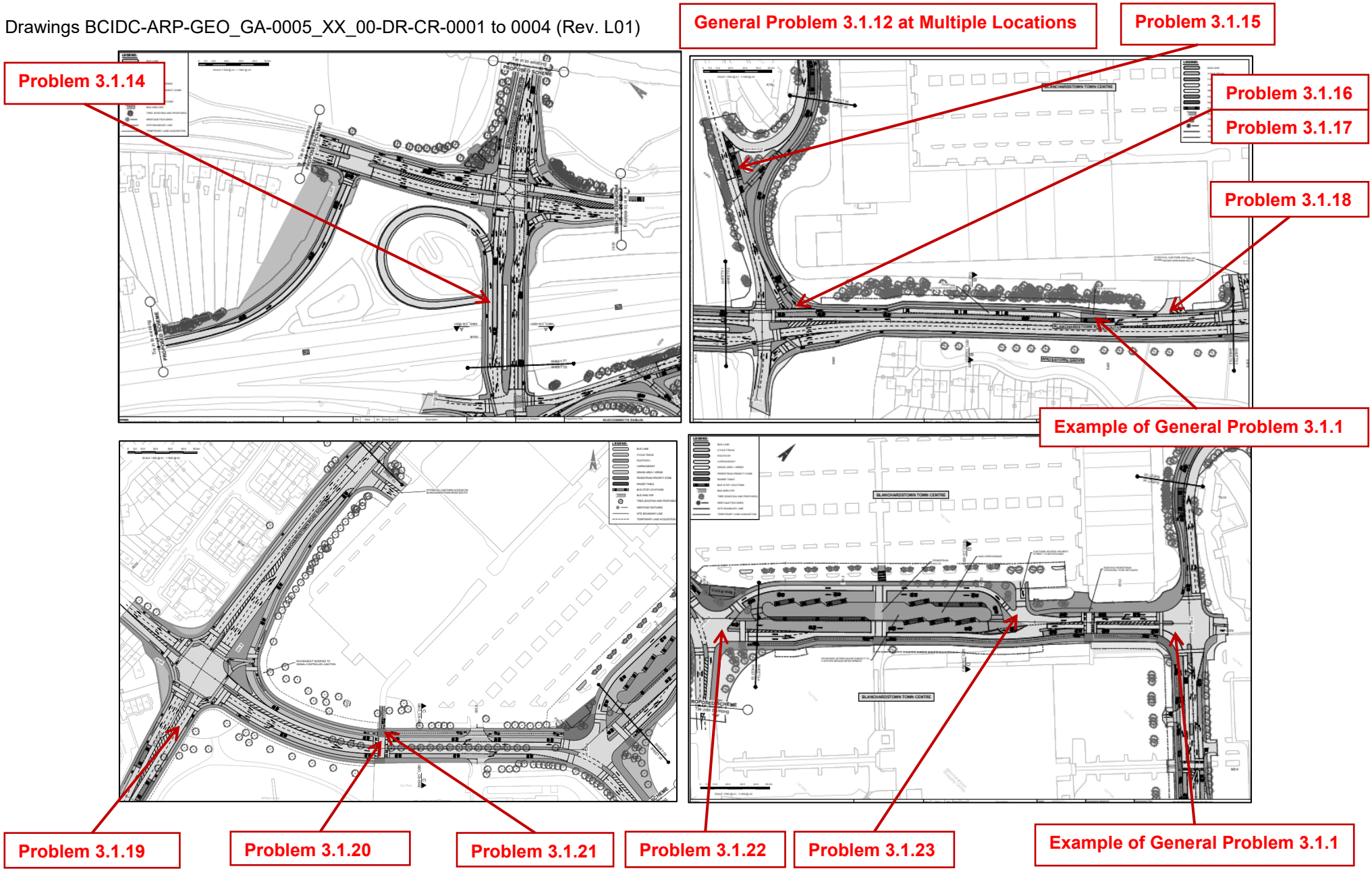
Signed: _____ Designer **Date** 27/7/21

Signed: _____ Audit Team Leader **Date** 27th July 2021

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

Appendix D – Problem Locations

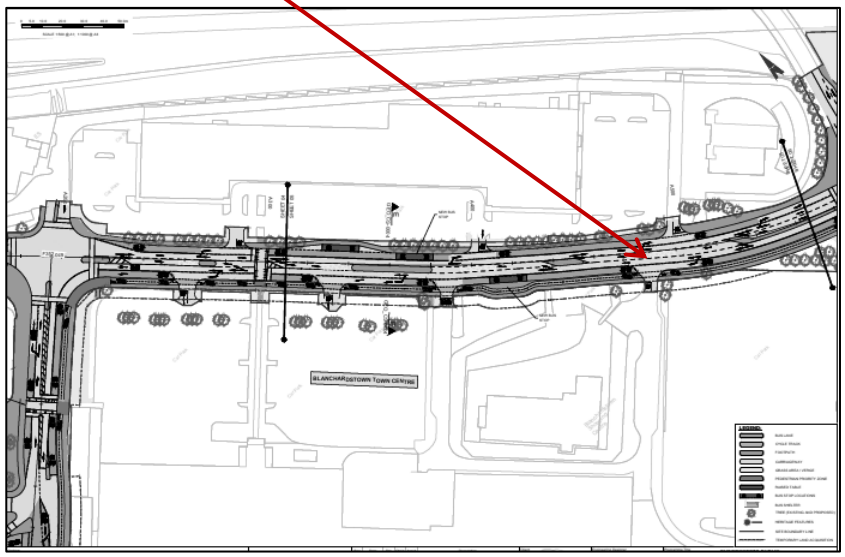
Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0001 to 0004 (Rev. L01)

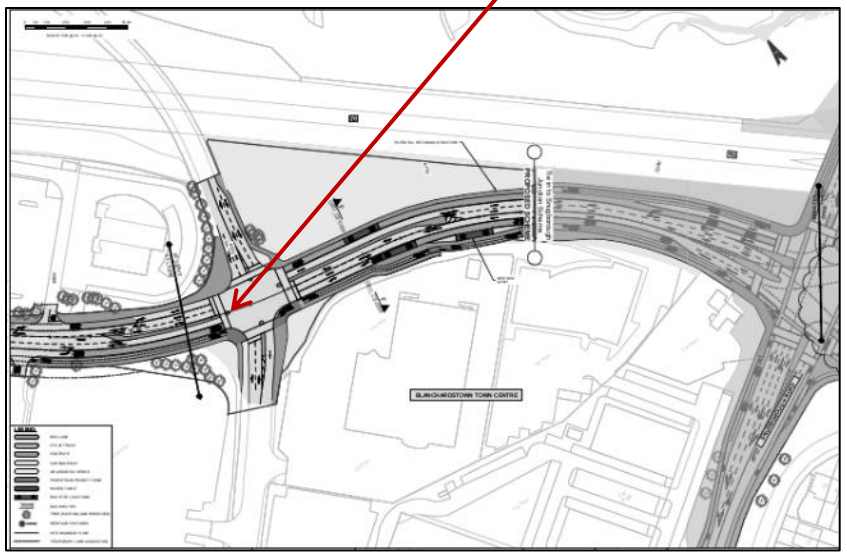


Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0005 to 0008 (Rev. L01)

Problem 3.1.24

Example of General Problem 3.1.4

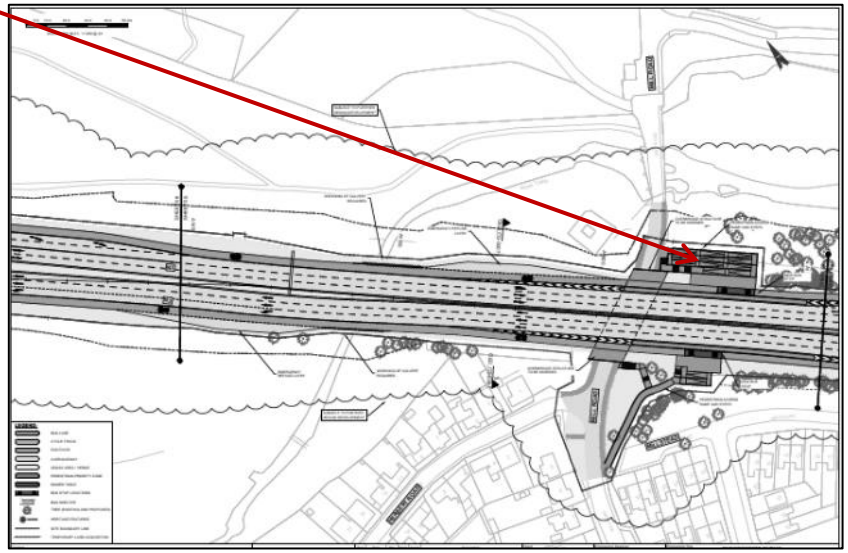


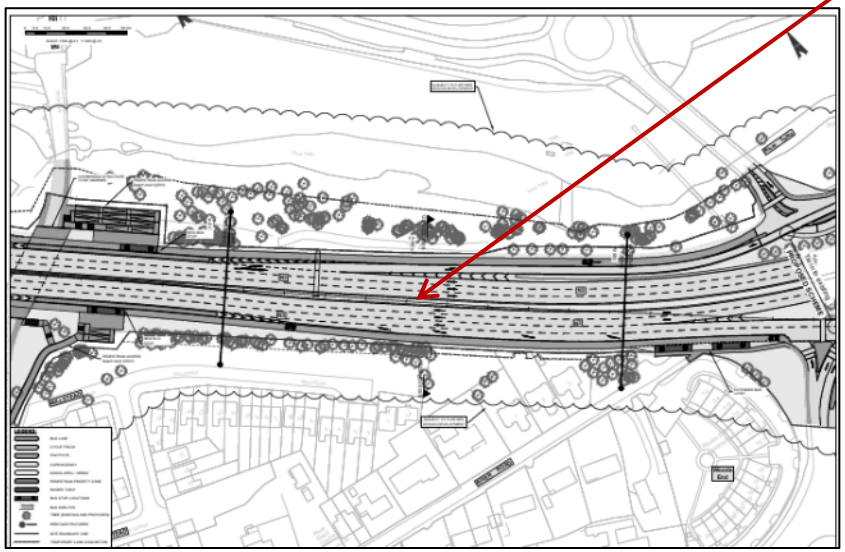


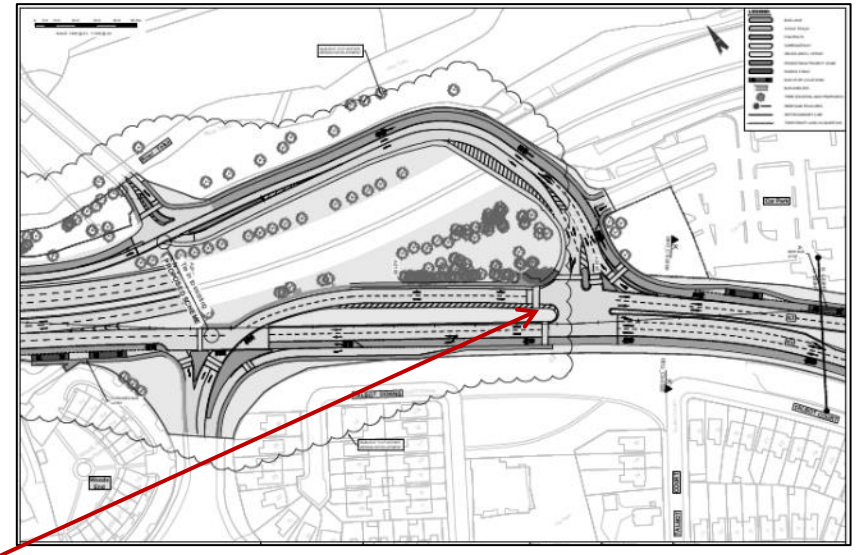
Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0009 to 0012 (Rev. L01)

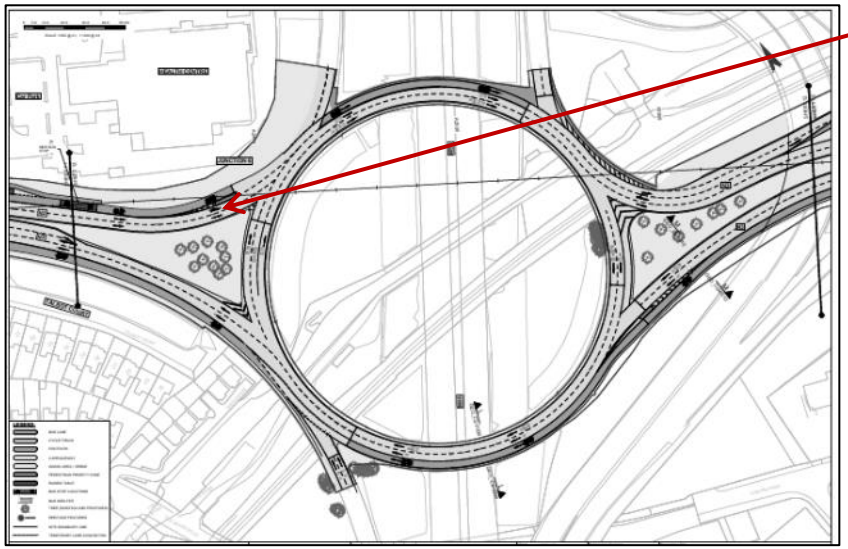
Problem 3.1.25

Problem 3.1.26





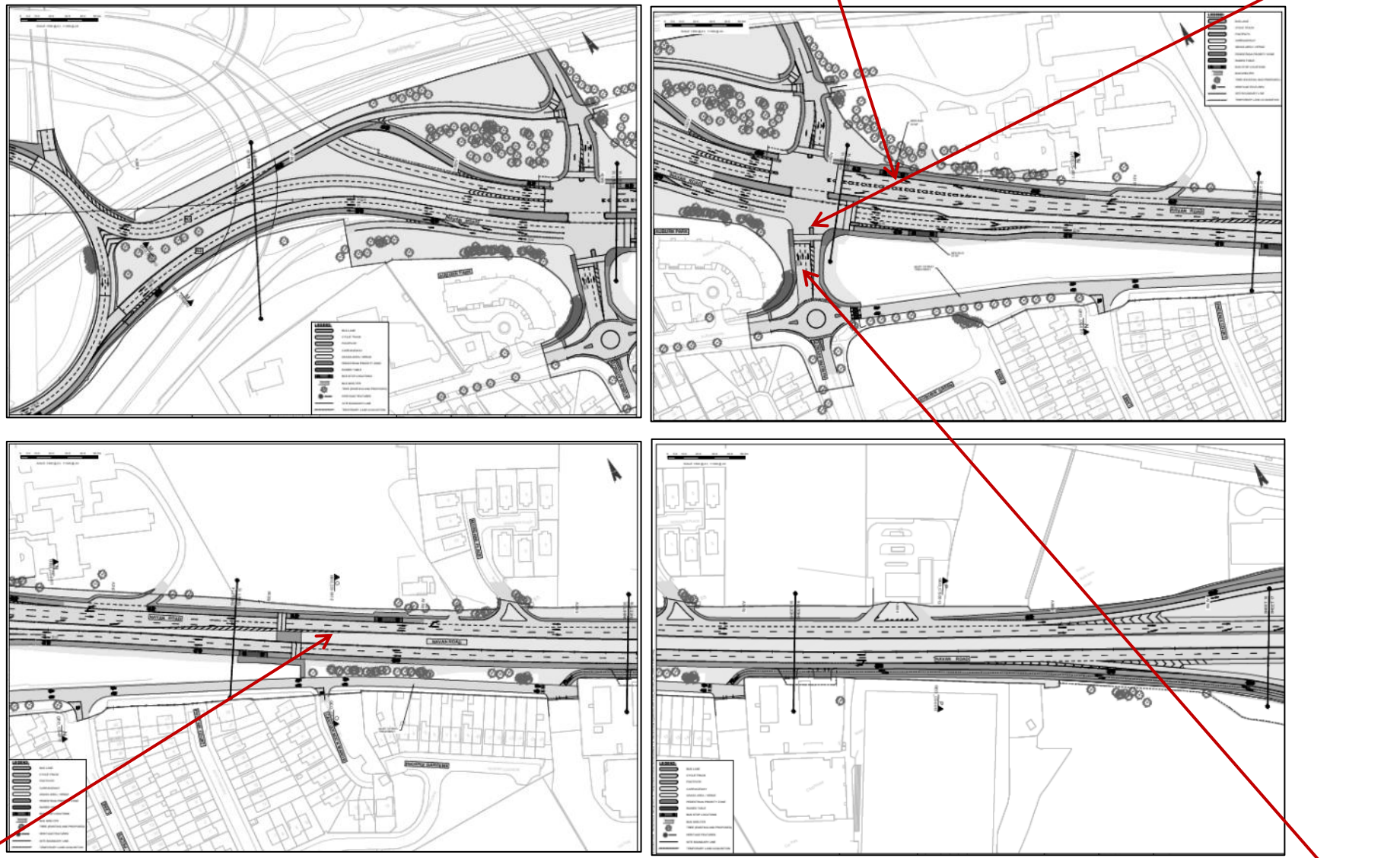




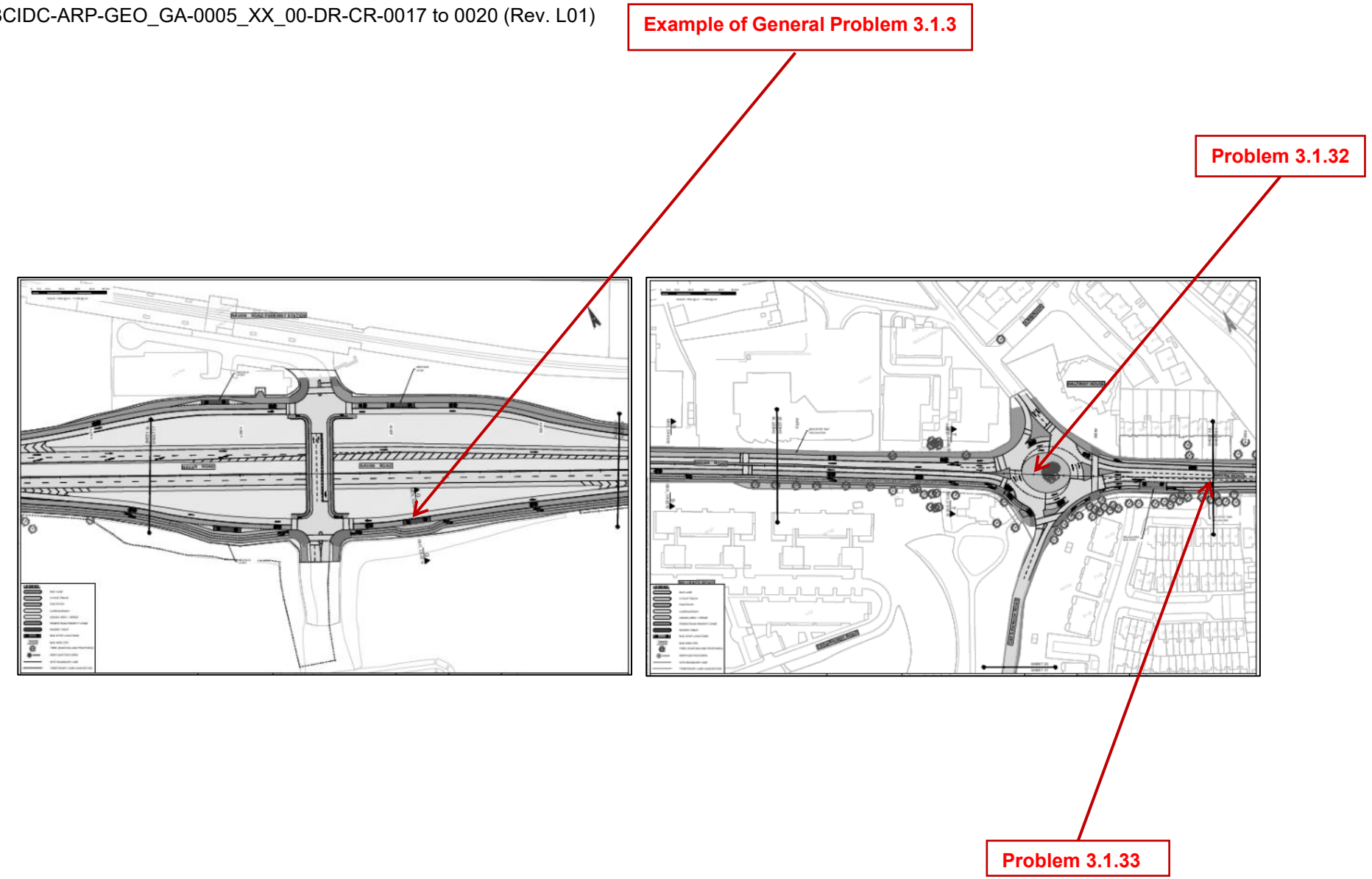
Problem 3.1.28

Problem 3.1.27

Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0013 to 0016 (Rev. L01)

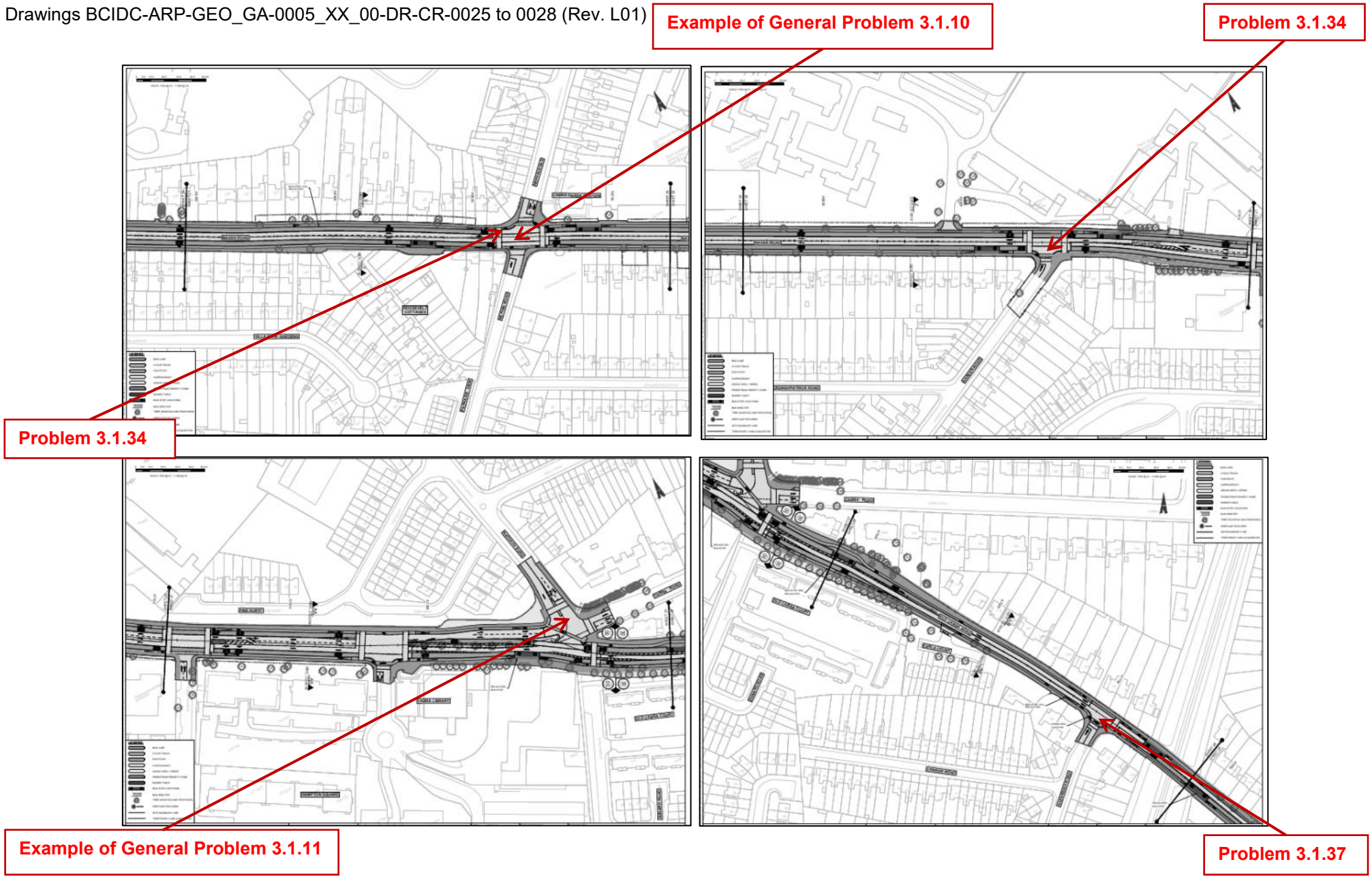


Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0017 to 0020 (Rev. L01)

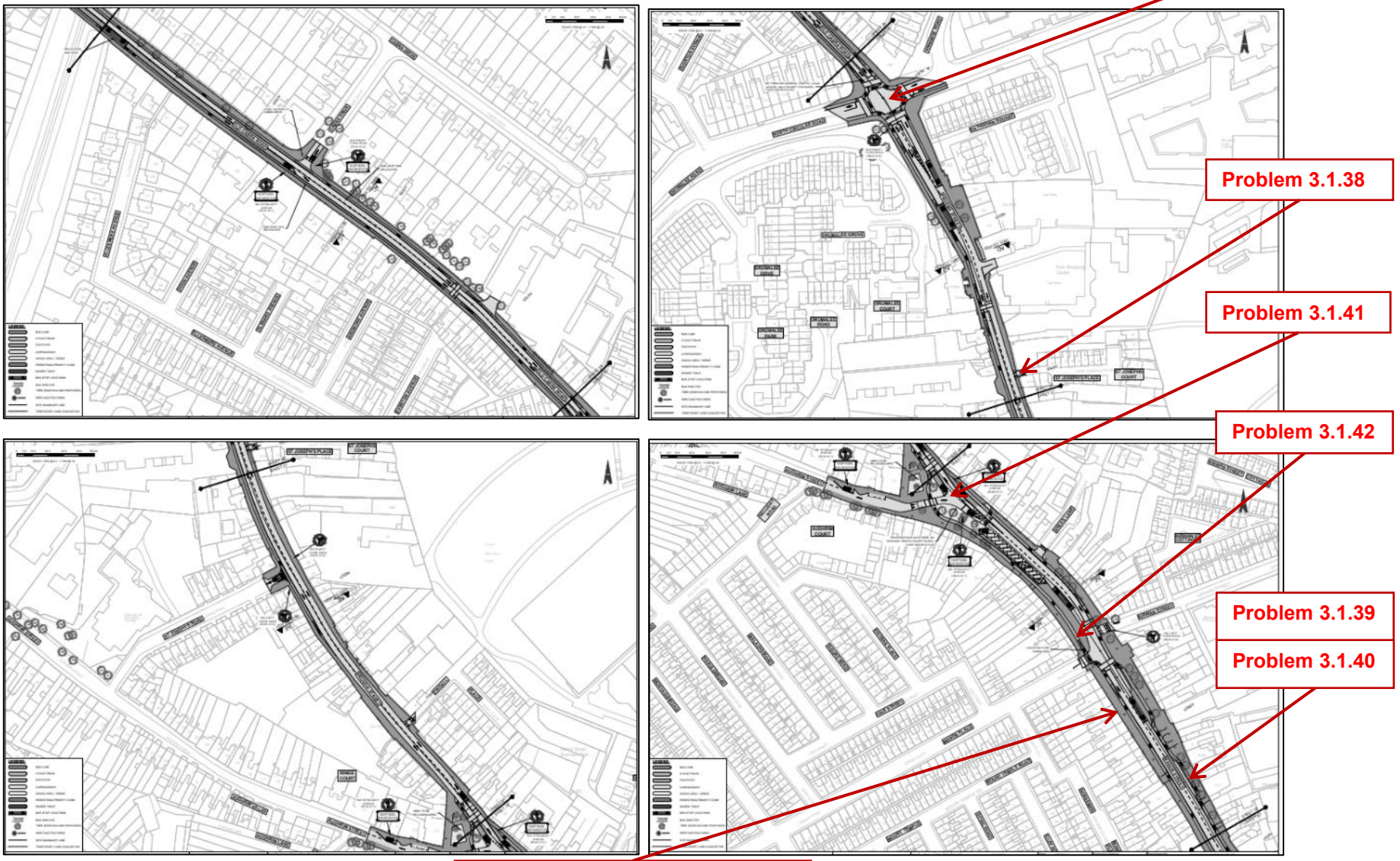


Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0021 to 0024 (Rev. L01)

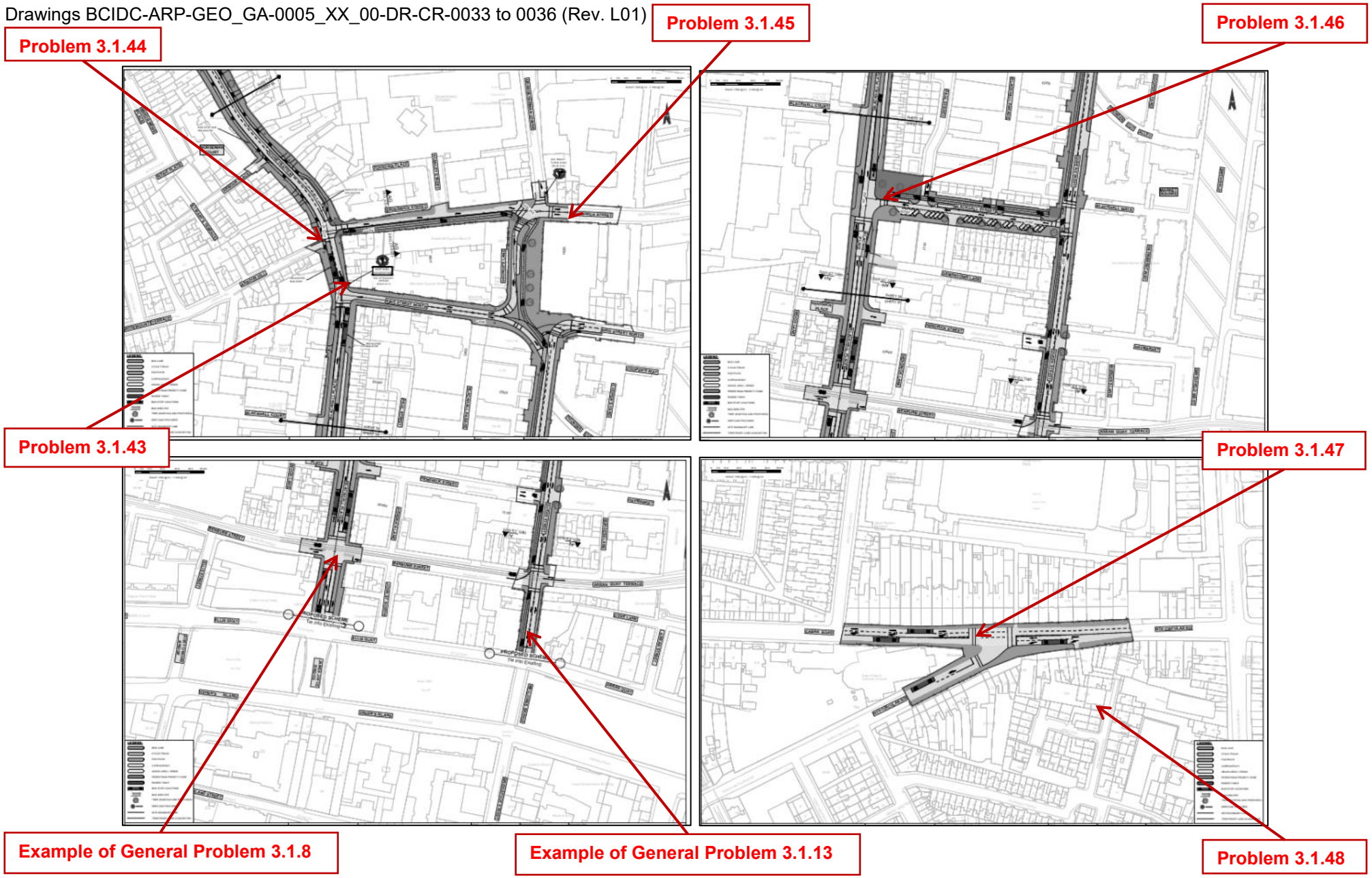
Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0025 to 0028 (Rev. L01)



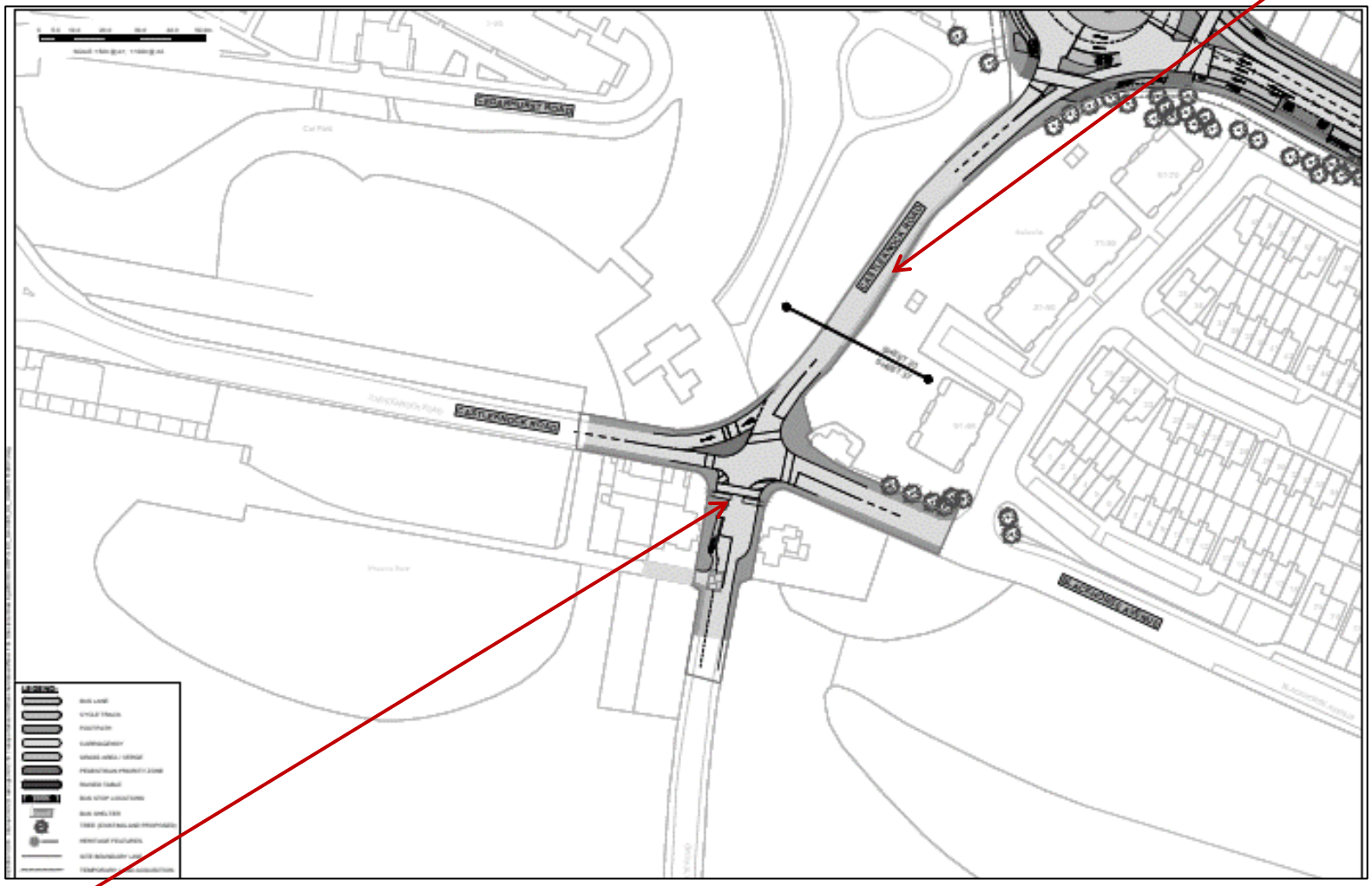
Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0029 to 0032 (Rev. L01)



Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033 to 0036 (Rev. L01)

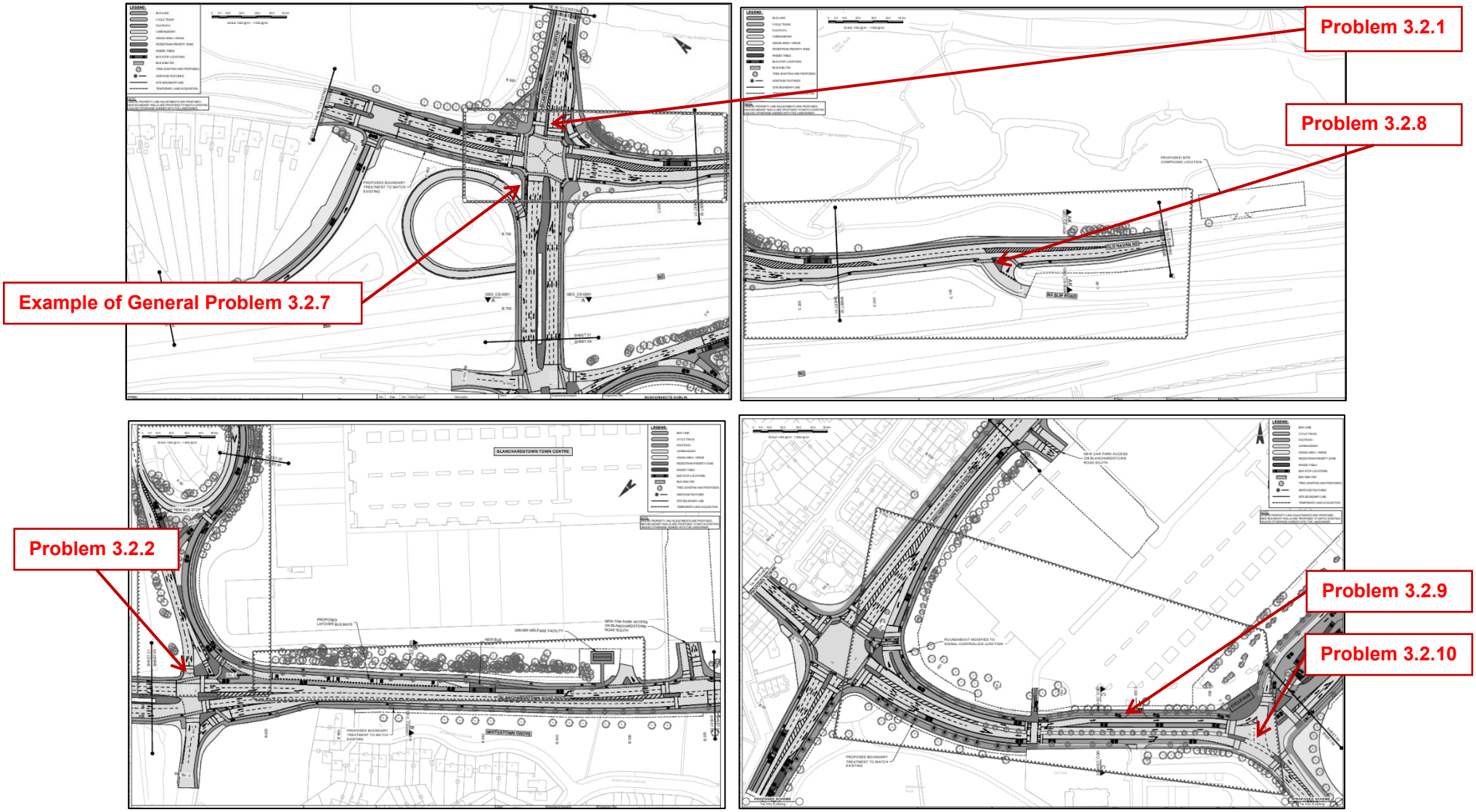


Drawing BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0037 (Rev. L01)

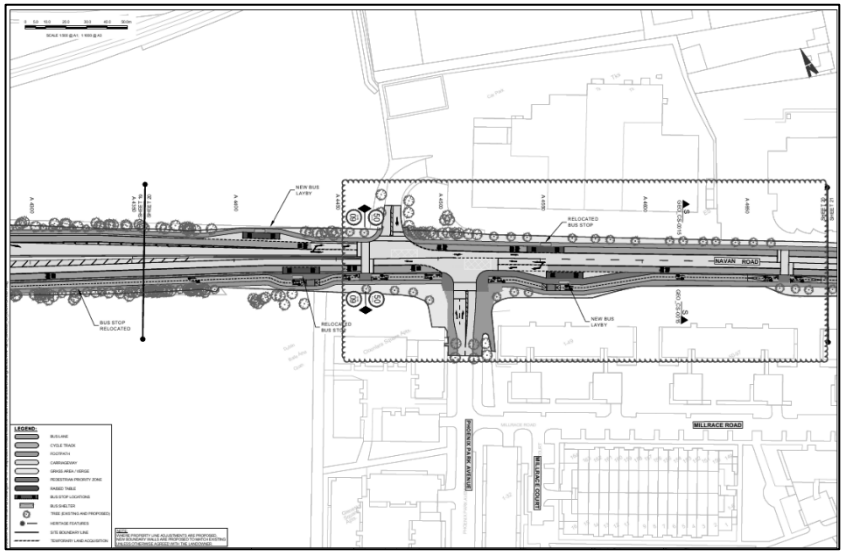


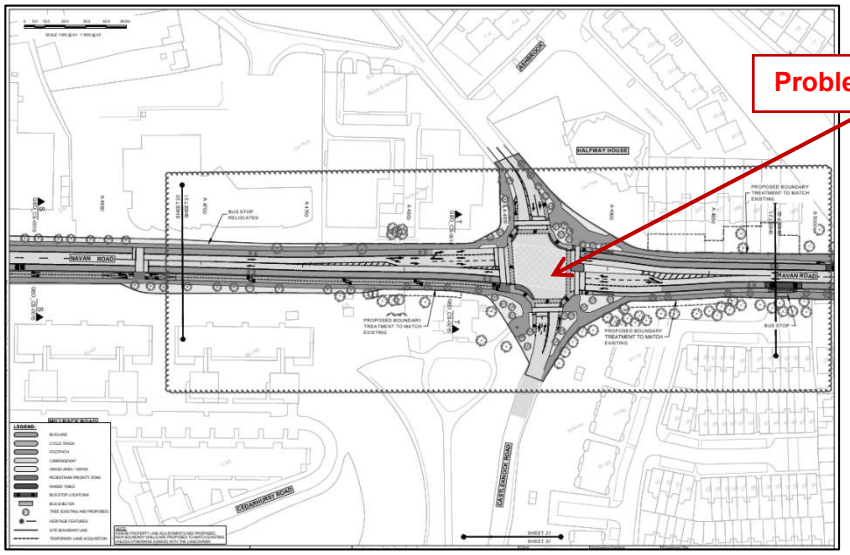
Appendix E – Problem Locations of Revised design drawings

Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0001 to 0004 (Rev. L03)

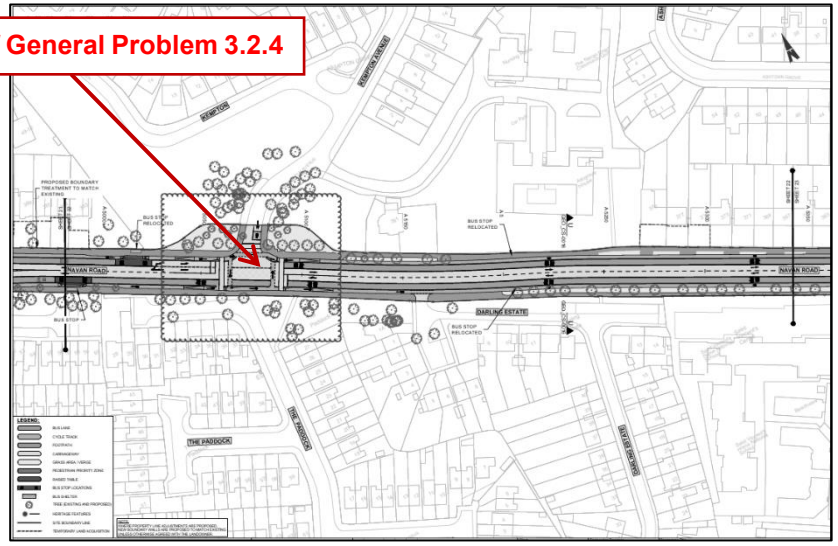


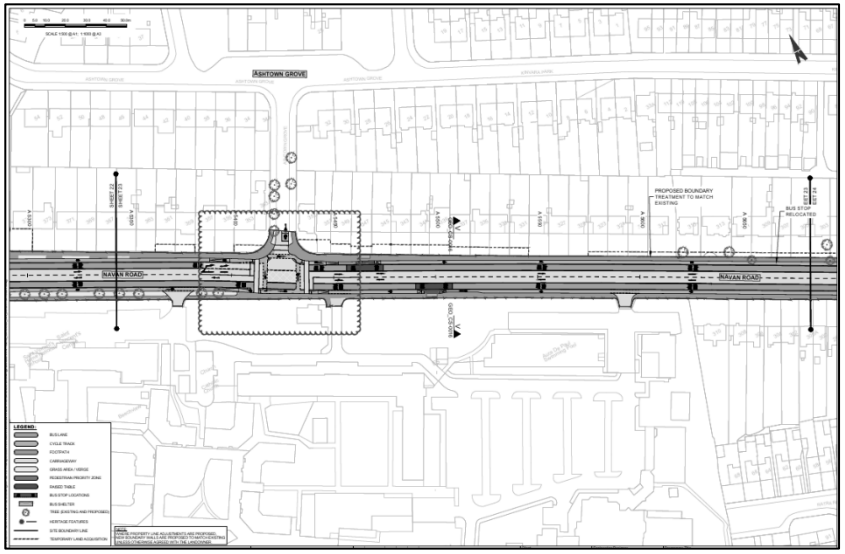
Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0020 to 0023 (Rev. L03)





Example of General Problem 3.2.4





Drawings BCIDC-ARP-GEO_GA-0005_XX_00-DR-CR-0033, 0035, 0036 & 0037 (Rev. L03)