Appendix M2

Road Safety Audit

- Stage 1

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Contents

1. Introduction

This report results from a Stage 1 Road Safety Audit of the Bray to City Centre Core Bus Corridor Scheme.

The Audit has been prepared in accordance with TII Publication GE-STY-01024 (HD 19/15) Road Safety Audit. The Audit Team has examined and reported on only the road safety implications of the scheme and has not examined or verified the compliance of the design to any other criteria.

The Audit Team was as follows:

G. Turley Team Leader	MEng, HDip PM, H Dip H'ways & Geo, CEng MIEI, Senior Associate Director, Merrion House, Merrion Road, Dublin
P. Kelly Team Member	MEng, BEng MIEI Senior Engineer, Merrion House, Merrion Road, Dublin

The Audit was carried out in 2 stages due to the impact of COVID-19 between Monday 12th November and Friday 21st January 2021 and Monday 16th August and Friday 30th August.

The first stage of the Audit was carried out to TII guidance from January 2021 which stated

- *The following concessions are acceptable for Road Safety Audits on TII funded Schemes:*
  - *Stage 1, Stage 2 and Stage 1/2 Safety Audits may be done without completing a site visit at this time*
  - *Google maps may be used as a substitute for the initial audit report (NB. All reports prepared in this manner shall be clearly marked in red: 'INTERIM REPORT – Full site visit still to be completed')*

The second stage consisted of a full site visit and revised report following lifting of restrictions. The site visit was completed on Tuesday 17th August 2021.

Weather conditions during the site visit were dry with periods of sunshine.

It is noted that the UCD bus interchange area had restricted access due to ongoing construction works and the presence of a Covid 19 Vaccination centre. Therefore the full site could not be visited, however it is noted that the works are to tie into UCD Masterplan proposals, which were not observed by the Audit team.

The Design Team and Employer (Client) is reminded that the Road Safety Audit Designers Response (separate document accompanied with this audit) shall be completed and returned to the Road Safety Audit Team Leader for sign off.

2. Site Specific Problems Identified

2.1 General

2.1.1 Problem

The drawings indicate the provision of a cycle track throughout the scheme. The drawings do not indicate where the cycle track changes to an on-road cycle lane on the approach to pedestrian crossings, accesses or junctions.

Recommendation

The Design Team should ensure that the drawings differentiate between cycle lanes and cycle tracks and show clearly where the cycle track ramps up and ramps down.

2.1.2 Problem

The drawings provided are not clear or consistent on the approach to driveways/ commercial premises as to whether the footpath/ cycle track will continue through the junction (through a dished or bevel kerb) or whether the cyclist/ pedestrian is to cross the mouth of an access, and the motorist has priority.

Recommendation

The Design Team should ensure that where appropriate, the footpath and cycle lane continue across an access to provide an increased sense of priority for cyclists and pedestrians.

2.1.3 Problem

It is noted that there are multiple pedestrian phases across the junctions in addition to multiple phases across individual arms on a junction. The Audit Team are unclear how the audio tactile push buttons will operate where poles are in close proximity. There is a risk of confusion for some pedestrians as a result.

Recommendation

The Design Team should ensure that appropriate consideration is given to this element to ensure the pedestrians do not become confused with the audio indication from different phases of pedestrian crossing.

2.1.4 Problem

The Audit Team notes that there is a lack of cycle yield symbols at some junctions (Treesdale/ Priory Drive) where there is a yield line proposed. There are concerns cyclists may not observe the yield line in sufficient time putting them into conflict with other road users such as other cyclists, and/or pedestrians.

Recommendation

The Design Team should ensure that all yield lines have associated yield symbols road markings implemented.

Figure 2.1 Priory Drive/ N11 Stillorgan Rd

2.1.5 Problem

The Audit Team notes that there is a narrowing of the cycle track in the vicinity of bus stops (e.g. Ch 8+800). There is concern these narrow sections of cycleway may cause cyclist to stray into adjacent footpath or passengers waiting areas putting pedestrians and cyclists in conflict with each other.

Recommendation

The Design Team should ensure that the minimum cycle track width as per Preliminary Design Guidance Booklet.

2.1.6 Problem

The Audit Team notes that there is an inconsistent approach to the ramp down to carriageway level on approaches to junctions. There is a risk of cyclists rolling forward in conflict with pedestrians crossing.

Recommendation

The Design Team should ensure a consistent approach to the location of the transition from cycle track to cycle lane on approaches to junctions, by setting the ramp back in accordance with the National Cycle Manual.

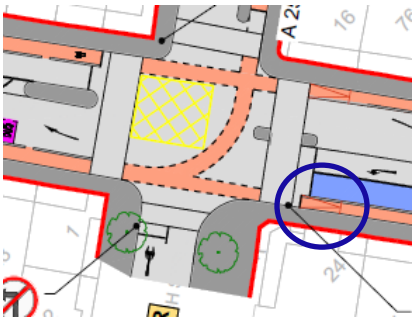


Figure 2.2 Pembroke St/ Leeson St Junction

2.1.7 Problem

The drawings indicate the provision of a cycle lights in close proximity within the junction in various locations. There is concern that the alternative green phase of these lights will cause cyclists confusion putting them into conflict with either vehicular traffic or other vulnerable road users.

Recommendation

The Design Team should ensure cycle signals and associated stop lines are located in such a way not to cause confusion.

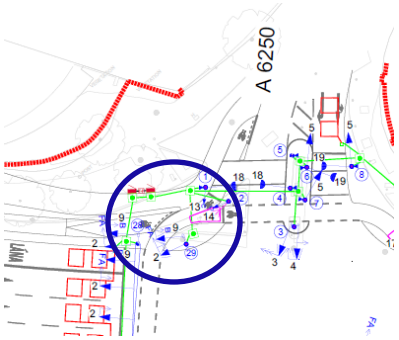
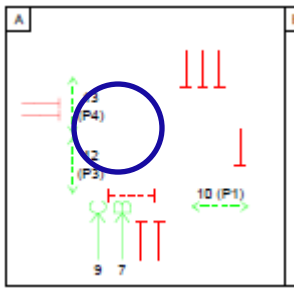


Figure 2.3 N11 Stillorgan Rd / Priory Dr / Old Dublin Rd

2.1.8 Problem

The Audit Team notes that at some junctions, the signal phasing indicates that the cyclist 'green' movement proceeds at the same time as the bus lane 'green'. The Audit Team note that the cycle stop line is placed ahead bus stop line but is concerned that where the bus lane is used by taxi or private coaches to undertake a left turn movement and are unaware of the need to yield to cyclists crossing, increasing the risk of cyclist and vehicular conflicts.



Recommendation

The Design Team should ensure that the signal phasing for the Bus Lane and Cyclist movements are independent where a left turn is involved.

2.1.9 Problem

The drawings identify cycle lanes with associated stop line markings in close proximity to each other. There is a concern that there may be insufficient cycle stacking room for cyclists waiting at some locations who will have a red light while the adjacent cycle lane may have green. This could cause frustration and lead to some cyclists either mounting the footpath or entering the carriageway, putting them into conflict with other road users.

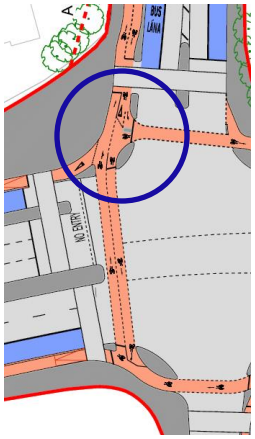


Figure 2.4 Greenfield Pk/ Nutley Lane/ Stillorgan Rd

Recommendation

The Design Team should ensure there is sufficient stacking room for future level of cyclists need.

2.1.10 Problem

Significant cracking of pavements was observed onsite which makes navigation particularly difficult for mobility impaired pedestrians. It is unclear from the drawings provided how this issue will be addressed as part of the proposed scheme. The Audit Team is concerned there is an increased risk of damaged footway along the proposed scheme due to mature tree roots resulting in slipping and tripping hazards.

Figure 2.5 Trip Hazards along Leeson Street Upper due to impact of roots on mature trees

Recommendation

Where footways are being retained, the Design Team should ensure that damaged sections should be repaired as appropriate.

2.1.11 Problem

The Audit Team noted evidence of potential ponding of water in the carriageway at various locations. The widening of the carriageway to facilitate additional lanes may increase the risk of ponding of water increased the risk of loss of control type collision due to ice during cold conditions.

Figure 2.6 Evidence of ponding in the carriageway at Eglinton Terrace/ Donnybrook Rd junction

Recommendation

The Design Team should ensure the drainage design is sufficient to positively drain the carriageway and that gullies are provided upstream of pedestrian crossings.

2.1.12 Problem

The Audit Team is concerned that the use of cantilevered signal gantries are inconsistent along the N11 Stillorgan Rd. There is a risk of motorists failing to understand the road layout ahead leading to an increased risk of collision

Recommendation

The Design Team should consider providing a consistent approach to cantilevered signal gantries along the N11 Stillorgan Rd.

2.1.13 Problem

The Audit Team is concerned with the presence of existing street furniture (Traffic Signal Cabinets, Post boxes, Public lighting poles, etc) along the route. There is concerns that the narrowing of footway in some locations will leave inadequate room for all existing street furniture.

Recommendation

The Design Team should ensure all existing and proposed street furniture is considered during the design and appropriate residual footway widths are maintained.

2.1.14 Problem

The Audit Team are concerned that vehicle accesses in close proximity could lead to increased risk of slips trips and falls, by vulnerable footpath users

Figure 2.7 Leeson Street Upper

Recommendation

The Design Team should review all locations where multiple accesses are in close proximity and consider providing alternative solutions such as single dished footway across the accesses

2.1.15 Problem

The Audit Team notes there is a lack of stops markings on the roads of numerous side alleys, streets and roads. This may lead to vehicles overshooting the junction and coming in conflict with vulnerable road users crossing the junctions.

Recommendation

The Design Team should ensure appropriate markings are used throughout the scheme. Where raised tables are used markings should be in advance of the tables.

3. General Arrangement Drawings

3.1 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0001

3.1.1 Problem

The Audit Team notes there is a part time bus gate at northern end of Leeson Street Lower. There are concerns that this part time restriction may lead to confusion to motorists.

Recommendation

The Design Team should review the layout including markings to reduce the possibility of driver confusion and ensure sufficient Advanced Directional Signage is provided.

3.1.2 Problem

The Audit Team is concerned that the proposed markings and signage may cause confusion to motorists travelling easterly direction on Hatch Street Lower.

Recommendation

The design team should review the markings to reduce the possibility of driver confusion.

3.1.3 Problem

The Audit Team notes the cycle lane on Pembroke Street Upper is noted as "Tie-in to existing carriageway". It was noted that there are currently no cycle lanes on Pembroke Street Upper.

Recommendation

The Design Team should review the layout and ensure appropriate tie-ins are utilized.

3.1.4 Problem

It was observed that the existing cycle lane is in the centre of the carriageway along St Stephens Green. The Audit Team is concerned that the cyclists may have to weave across a bus lane in conflicts with buses leading to an increased risk of collision.

Recommendation

The Design Team should review the layout and ensure appropriate tie-ins are utilised.

Figure 3.1 Existing cycle Lane in middle of carriageway

3.2 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0002

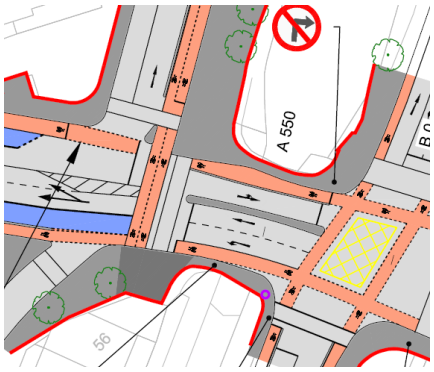


Figure 3.2 Wilton Terrace

3.2.1 Problem

The Audit Team is concerned that the cycle lanes lack arrow road marking to confirm the direction of travel leading to an increased risk of head on collisions.

Recommendation

The Design Team should provide appropriate road markings to indicate the direction of travel.

3.2.2 Problem

The Audit Team is concerned with the tie in of the 2-way cycle lane on western side of Leeson Street Lower at the junction of Wilton Terrace leading to increased conflicts between cyclists using the crossing.

Recommendation

The Design Team should review the crossing layout and where possible provide onward travel surfaces through dedicated cycle lanes or designated shared surfaces.

3.2.3 Problem

The Audit Team is concerned that southbound along Fitzwilliam Place, the left turn movement onto Leeson St Lower may result in longer wheel-based vehicles mounting the protected cycle lane due to small kerbed radii, increasing the risk of conflict with cyclists

Recommendation

The Design Team should ensure there is a complete swept patch analysis to ensure that HCVs can make this left turn manoeuvre safely.

3.2.4 Problem

The Audit Team note that there is no provision for right turning cyclists at the Grand Parade/ Leeson St Upper junction at chainage A550. This poses a risk of cyclists making hazardous movements through the junction, in the absence of any appropriate facility.

Recommendation

The design team should provide facilities for right turning cyclists at the junction though toucan crossings or jug turn road markings.

3.2.5 Problem

The Audit Team note that there are no "Triangular Yield Markings," provided. This may lead to an increased risk of motorists failing to understand the road layout ahead, leading to an increased risk of overshooting the junction.

Recommendation

The Design Team should ensure suitable road markings are provided.

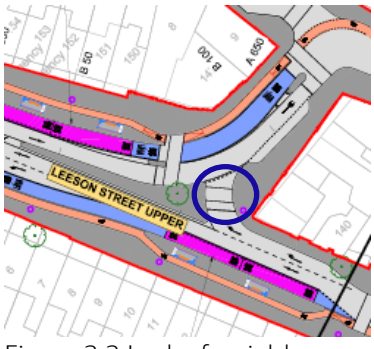


Figure 3.3 Lack of a yield symbol

3.2.6 Problem

The Audit Team is concerned that the central island on Leeson Street Upper and Link road to Sussex Terrace, may not have adequate room to provide sufficient space for the foot path the presence of the large tree. This may lead to visible impaired users coming in conflict with the tree while trying to complete the crossing.

Figure 3.4 Existing Mature Tree along Leeson St Upper

Recommendation

The Design Team should review the crossing locations and layout and ensure there is sufficient space or rearrange the layout if required.

3.3 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0003

3.3.1 Problem

The Audit Team is concerned that the proposed ramps may hinder access to existing dwelling (Fig 3.2 Blue Circle) leading to an increased risk of loss of control type collisions.

Figure 3.5 Existing Access

Recommendation

The Design Team should relocate the ramp to a more appropriate location.

3.3.2 Problem

The Audit Team is concerned that the existing "No Entry" road markings do not form part of the proposed scheme leading to an increased risk of inappropriate manoeuvres and head on collisions (Fig 3.2 Red Circle).

Recommendation

The Design Team should provide appropriate road markings to prevent unsafe turning movements.

3.4 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0004

3.4.1 Problem

In the absence of swept path analysis, the Audit Team are concerned that right turning larger vehicles out of Wellington Place may over run the proposed concrete island resulting in an increased risk of loss of control type collisions.

Recommendation

The Design Team should review the swept path analysis for right turning movement for larger vehicles out of Wellington Place to ensure it does not impact upon proposed concrete islands.

3.4.2 Problem

The Audit Team is concerned that cyclists may navigate the cycle lanes in an anti-clockwise direction due to the absence of arrow/ no entry road markings. This may lead to an increased risk of conflict with oncoming cyclists or cyclist/ vehicular conflicts.

Recommendation

The Design Team should provide additional road markings to ensure cyclists perform right turns or u-turns in a clockwise direction.

3.4.3 Problem

The Audit Team notes that a proposed cycle ramp may impact upon an existing office entrance on the southern side of Lesson St Upper at chainage A1+260.

Recommendation

The Design Team should ensure that the proposed crossing does not block access to the existing private access.

3.5 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0005

3.5.1 Problem

The Audit Team notes the tabletop ramp on Morehampton Road (Chainage A1600), the sloped part of the ramp is within the desire line of pedestrians on the footway. There are concerns that this may lead to increased risk of slips for pedestrians crossing the road.

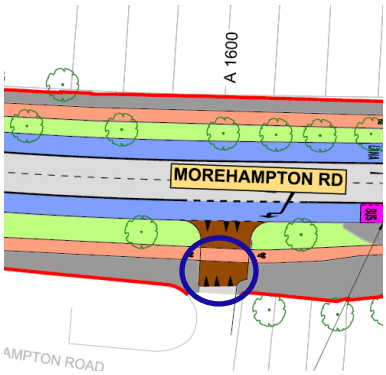


Figure 3.6 Proposed Table Ramp

Recommendation

The Design Team should ensure the tabletop ramp is sufficiently wide to cover the pedestrian desire lines.

3.5.2 Problem

The Audit Team is concerned that existing vehicle accesses to the houses along Morehampton Road, have not being considered and may result in vehicles crossing the grass verge/ mounting kerb resulting in detritus material being left on the cycleway/footway.

Recommendation

The Design Team should ensure all vehicle access are provided with suitable paved surface.

3.6 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0006

3.6.1 Problem

It is noted that the existing yellow box-junction at chainage A1650 has not been maintained in the proposed drawings. The Audit Team are concerned that right turners will experience difficulty in undertaking the manoeuvre during peak periods, leading to an increased risk of driver frustration and head on/ side impact type collisions.

Recommendation

The Design Team should reinstate the yellow box at this location.

3.6.2 Problem

The Audit Team is concerned that the proposed verge along Morehampton Rd between chainage A1600 and A1950 may hinder access to and from existing driveways leading to loss of control type collisions.

Recommendation

The Design Team should ensure that safe access to private driveways is maintained.

3.6.3 Problem

The Audit Team note the loss of parallel parking between Chainage A1750 and A1950, which could lead to an increased risk of cars parking on the cycle lane, forcing cyclists onto the footpath or carriageway in conflict with pedestrians or vehicles.

Recommendation

The Design Team should consider measures to ensure the cycle lane is not blocked by parked cars.

3.6.4 Problem

At chainage A1990 and A2020, the Audit Team is concerned that the width of the pedestrian crossing (>4 lanes) may result in vulnerable road users having insufficient time to cross the carriageway.

Recommendation

The Design Team should ensure that sufficient green time is provided to allow vulnerable road user to cross the road in a single movement.

3.6.5 Problem

The Audit Team note that at the existing uncontrolled crossing on Auburn Avenue, there is a lack of buff coloured tactile paving to warn visually impaired pedestrians of the nature of the crossing, resulting in an increased of collision with oncoming vehicles.

Recommendation

The Design Team should ensure a safe footway for all users and highlight the hazard to the visually impaired though provision of appropriate tactile paving.

Figure 3.7 Existing In line crossing at Auburn Avenue Junction

3.7 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0007

3.7.1 Problem

The Audit Team is concerned that the proposed cycle lane at chainage A2170 is of insufficient width and may lead to an increased risk of loss of control type collisions.

Recommendation

The Design Team should provide a cycle lane of sufficient width.

3.7.2 Problem

It is noted that the existing yellow box-junction at chainage A2100 (Fire Station) has not been maintained in the proposed drawings. The Audit Team are concerned that fire engines will have difficulty accessing Donnybrook Rd during peak periods, leading to an increased risk of driver frustration and head on/ side impact type collisions.

Recommendation

The Design Team should reinstate the yellow box at this location.

3.7.3 Problem

The Audit Team is concerned that the two adjacent right turning pockets at Ch A2+000, could block each other's forward visibility of the oncoming traffic and bus lanes. This would lead to an increased risk of side impact type collisions due to the right turning movements.

Recommendation

The Design Team should provide a separate phase for right turning movements onto the minor arms.

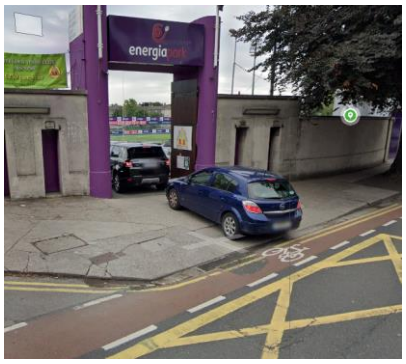


Figure 3.8 Entrance to Energia Pk

3.7.4 Problem

The Audit Team notes there is a vehicle access into Energia Park located at the proposed toucan crossing at Eglinton Terrace and Donnybrook Road which does not seem to be catered for in the design. There are concerns that this will lead to vehicle and Vulnerable Road Users conflicts.

Recommendation

The Design Team should revise the junction layout to incorporate this access.

3.7.5 Problem

The Audit team noted deterioration of the pavement at the mouth of the Eglinton Terrace Junction with Donnybrook Road (Ch A2300) which could leave to ponding of water. This may lead to slips, trips and falls at the pedestrian crossing or loss of control during cold conditions.

Recommendation

The Design Team should ensure that the pavement design is sufficient to cater for the traffic volumes and loadings.

Figure 3.9 Pothole at Junction Bellmouth

3.8 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0008

3.8.1 Problem

The Audit Team notes the crossing on the Stillorgan road is staggered in such a fashion that turns pedestrians backs to the traffic. There are concerns that this may cause pedestrians to step out in front of vehicular traffic.

Recommendation

The design team should provide a straight crossing or where a stagger is required have it in such a manner that the pedestrians turn to face the oncoming traffic.

3.8.2 Problem

The Audit Team is concerned that east bound cyclists along Donnybrook Rd wishing to turn right will block cyclists wishing to go straight ahead as no refuge is available. This may lead to cyclists blocking the westbound lane of Anglesea Rd during signal phases C & D.

Recommendation

The Design Team should consider provision of a jug turn dwell area for right turning cyclists.

3.8.3 Problem

The Audit Team noted a number of vehicular access point to Donnybrook rugby club between chainage A2450 and A2500. It is unclear to the drawing provided whether these accesses are to be maintained. There is the risk of loss of control due to vehicles attempting to mount the kerb to gain access to the grounds.

Recommendation

At detailed design stage, the Design Team should consider a consistent approach to access whether using a bevel kerb or dished crossing.

3.9 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0009

3.9.1 Problem

The Audit Team are concerned that the lack of cycle ramps at chainage A2970, will inhibit access to an existing junction (Donnybrook Close) and adjacent vehicle access to properties. Motorists may be unaware of the presence of kerbing leading to loss of control type collisions.

Recommendation

The Design Team should ensure the cycle lane is at carriageway level through the junction.

3.10 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0010

3.10.1 Problem

The Audit Team are concerned that the proposed parking between chainage A3060 and A3180 may be of insufficient width, leading to cars parking within the buffer zone and cyclists at risk of conflict with car doors opening

Recommendation

The Design Team should ensure the parallel parking bays are of sufficient width.

3.10.2 Problem

The Audit Team are concerned about a potential clash between the bus stops at CH A3030 and existing vehicular access to properties 10 &11 on the Stillorgan Rd. This may lead to loss of control type collision as vehicles cross a high kerb, and/ or conflicts between pedestrians waiting to alight buses at the stops and vehicles crossing.

Recommendation

The Design Team should ensure the bus stops are sufficiently located away from these accesses to avoid conflicts with traffic.

3.10.3 Problem

The Audit Team are concerned that the cycle tie-in to the access into RTE A3200 is incorrect as there is a 2-way cycle lane on the southern side of the access. An inappropriate tie in may lead to road user confusion and increase risk of conflicts between cyclist and motorist.

Recommendation

The Design Team should review the tie in and ensure it is appropriate to tie into existing infrastructure.

Figure 3.10 Existing off road cycle infrastructure at RTE access

3.11 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0011

3.11.1 Problem

The Audit Team are concerned that the lack of cycle ramps at chainage A3300 (Thornfield), will inhibit access to existing junctions. Motorists may be unaware of the presence of kerbing leading to loss of control type collisions.

Recommendation

The Design Team should ensure the cycle lane is at carriageway level through the junction.

3.11.2 Problem

The Audit Team notes that a proposed pedestrian crossing may impact upon an existing entrance on Greenfield Park.

Recommendation

The Design Team should ensure that the proposed crossing does not block access to the existing private access.

Figure 3.11 Existing Entrance (El Carmen)

3.11.3 Problem

The Audit Team is concerned that the lack of yield road markings may increase the risk of cyclists joining the carriageway without give way to passing vehicles leading to an increased risk of cyclist/ motorist conflicts.

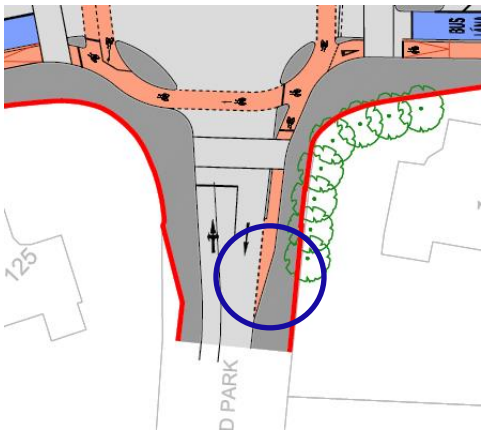


Figure 3.12 Missing Yield Road Markings

Recommendation

The Design Team should ensure that Yield road markings are provided to highlight road user priority.

3.11.4 Problem

The Audit Team notes existing vehicle access to property number 118 on the corner of Nutley Lane Stillorgan Road. Non consideration of the access may lead to conflicts between vehicles and other road users.

Recommendation

The Design Team should ensure safe access is provided to the property.

3.12 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0012

3.12.1 Problem

The Audit Team is concerned that the access to Belfield Court (Chainage A3750) could encourage higher entry/ exit speeds.

Recommendation

The Design Team should consider methods due reduce the bell mouth of the crossing and give pedestrians a greater sense of priority.

3.13 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0013

3.13.1 Problem

The Audit Team notes the existing road markings indicate 'Yield' road markings at this existing priority junction at chainage A3975m on the Stillorgan Rd. There is the increased risk of vehicular collision with some vehicles rolling forward before there is an acceptable a gap in oncoming traffic.

Recommendation

The Design Team should provide 'STOP' road markings and warning signage at these priority junctions.

3.14 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0014

3.14.1 Problem

The Audit Team are unclear if the existing parallel parking to the west side of the of the local link road is being retained or being removed. There is a concern that if this parking is removed and the cross section is not appropriately narrowed, this may lead to an increase in vehicle speeds and risk of collisions.

Figure 3.13 Local Link Road

Recommendation

The Design Team should retain this parking where possible. If the parking is to be removed ensure the cross section of the carriageway is reduced to an appropriate width.

3.15 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0015

3.15.1 Problem

The Audit Team notes there are no stop markings for traffic exiting from Seafield Road. The Audit team notes there is an existing yield sign in this location. There are concerns that the lack of markings may cause driver confusion and increased risk of vehicular conflict.

Recommendation

The Design Team should remove the existing yield and replace with a stop sign and associated stop road markings.

3.16 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0016

3.16.1 Problem

The Audit Team notes the 2-way cycle track on the west side of the Stillorgan Road ends at the junction with Foster's Avenue. At this point. a cyclist must make a left turn to cross the carriageway. There are concerns that cyclist may try and cross Fosters Avenue instead of turning left. This could cause cyclists head-on type collisions.

Recommendation

The Design Team should determine if the crossing at Foster's avenue should be upgraded to a 2-way crossing (to provide access to Fosters Avenue, or a left turn arrow marking should be placed at the end of the cycle track.

3.16.2 Problem

At chainage A4950, the Audit Team is concerned that the width of the cycle crossing (>7 lanes) in a single movement may result in insufficient time to cross the carriageway.

Recommendation

The Design Team should ensure that sufficient green time is provided to allow cyclists to cross the road in a single movement.

3.16.3 Problem

At chainage A4950, the Audit Team is concerned that cyclists may be forced to give way to cyclists travelling in a north south direction, leading to an increased risk of conflict with buses.

Recommendation

The Design Team should ensure that cyclists crossing the carriageway have priority over the cyclists on the two-way cycle lane.

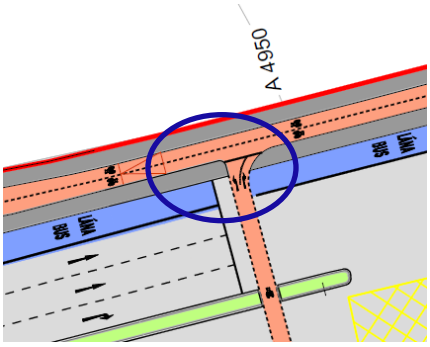


Figure 3.14 Potential conflict between cycle lanes

3.17 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0018

3.17.1 Problem

The Audit Team note that the tie in of the cycle track on the northern side of N31 Mount Merrion Avenue have no provisions as there is currently no infrastructure beyond the site boundary lines. There is concern that users following the cycle track will enter the carriageway suddenly, putting them into conflict with vehicular traffic.

Recommendation

The Design Team should provide a suitable tie in with the existing cross section.

3.17.2 Problem

The Audit Team notes there is 2 cycle lanes on the western side of N31 Mount Merrion Avenue Junction. There is concern that this may cause confusion with cyclists, leading to rear shunt or side swipe type collisions.

Recommendation

The Design Team should provide arrows on the lanes to identify one is for turning right and the other for straight ahead traffic.

3.18 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0019

3.18.1 Problem

Along Trees Road Lower, the Audit Team are concerned that the westbound cycle lane may have insufficient width leading to loss of control type collisions be cyclists.

Recommendation

The Design Team should ensure that the proposed cycle lane provides a sufficient level of service.

3.18.2 Problem

The Audit Team notes there is 2 lanes of traffic turning left from Old Dublin Rd to Stillorgan Road. There are concerns that the lack of lane guidance markings may lead to side swipe type collisions.

Recommendation

The Design Team should ensure there are appropriate lane guidance markings across the junction.

3.19 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0020

3.19.1 Problem

The Audit Team note that there is an existing Garda Platform at Ch A6700 which to be removed. There is concern that An Garda Síochána may be forced to mount footpath and park in footpath/ verge leading to a risk of loss of control type collisions/ conflict with pedestrians.

Recommendation

The Design Team should determine if the Garda platform is to be retained.

3.19.2 Problem

The Audit Team notes there is an existing pedestrian underpass at A6700. It is unclear to the Audit team if this underpass is to be retained. The Audit team notes the new pedestrian crossing point at this location. There are concerns that this new pedestrian crossing point will increase the risk of rear end shunts and potential vulnerable road users' conflicts in this vicinity.

Recommendation

The Design Team should retain the existing underpass and provide access to this from the cycle tracks.

3.20 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0022

3.20.1 Problem

The Audit Team notes there is an existing "No Entry" marking on the exit slip from N11 Stillorgan Road to Stillorgan Grove. There are concerns that the removal of this marking may lead to vehicles access the N11 inappropriately

Recommendation

The Design Team should reinstate these markings

3.20.2 Problem

The Audit Team notes there are existing "Caution Children Crossing" markings with associated bar markings on the N11 at A7200. There are concerns that the removal of these markings may lead to increased speed putting the Vulnerable Road Users at an increased risk of conflict.

Recommendation

The Design Team should reinstate these markings.

3.20.3 Problem

The Audit Team notes there are existing road markings due to St Brigid's National School associated on Glenalbyn Rd. There are concerns that the removal of these markings may lead to increased speed putting the Vulnerable Road Users at an increased risk of conflict.

Recommendation

The Design Team should reinstate these markings.

Figure 3.15 Road Markings outside St Brigid's National School

3.21 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0023

3.21.1 Problem

The Audit Team notes there is 2 lanes of traffic turning left from N31 Brewery Road to Stillorgan Road. There are concerns that the lack of lane guidance markings may lead to side swipe type collisions.

Recommendation

The Design Team should ensure there are appropriate lane guidance markings across the junction.

3.21.2 Problem

The Audit Team notes there are no proposed "STOP" road markings for traffic exiting from Beachwood Court. There are concerns that traffic may fail to stop and come into conflict with either Cyclists or vehicular traffic on the Stillorgan Road.

Recommendation

The Design Team should ensure appropriate "STOP" markings are provided.

3.21.3 Problem

The Audit Team is concerned that the lack of yield road markings on Farmleigh Avenue eastbound may increase the risk of cyclists joining the carriageway without give way to passing vehicles leading to an increased risk of cyclist/ motorist conflicts.

Recommendation

The Design Team should ensure that Yield road markings are provided to highlight road user priority.

3.22 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0024

3.22.1 Problem

The Audit Team notes there is a "NO ENTRY" markings on the exit from Belmont Terrance A8150. There are concerns that the lack of "STOP" markings at this location may result in vehicles exiting from this location not stopping and coming into conflict with Cyclists, or other vehicular traffic.

Recommendation

The Design Team should ensure there is appropriate "STOP" markings at this location.

3.22.2 Problem

The Audit Team is concerned that the proposed bus stop at Chainage A8030 may block forward visibility of the pedestrian crossing signals for vehicles on the inside lane. This may lead to an increased risk of late breaking and rear shunt type collisions.

Recommendation

The Design Team should review sightlines at this location and consider installing a cantilever secondary signal on the western side of the road to enhance driver visibility of the signals for westbound traffic.

3.23 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0025

3.23.1 Problem

The Audit Team are unclear as to the markings for pedestrians crossing the cycle track at the Junction of N11 Stillorgan Road and Leopardstown Road Junction. There is also an inconsistent approach to the start and end of pedestrian crossing around this junction. There are concerns this will lead to VRU confusion putting them into conflict with cyclists.

Recommendation

The Design Team should review this junction and provide a consistent approach with respect to pedestrian crossings on the carriageway and cycle track.

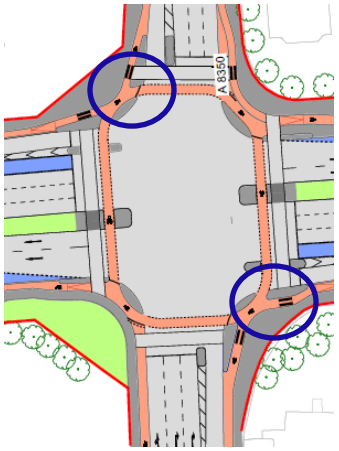


Figure 3.16 Inconsistent approach to pedestrian crossings

3.24 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0027

3.24.1 Problem

The Audit Team notes there is 2 cycle lanes to the west side of N11 Stillorgan Rd/Kill Lane Junction. There is concern that this may cause confusion with cyclists, leading to shunt type collisions.

Recommendation

The Design Team should provide arrows on the lanes to identify one is for turning right and the other for straight ahead traffic.

3.24.2 Problem

The Audit Team is concerned that the proposed pedestrian crossing and cycle ramps may hinder access to and from existing driveways at Chainage 9075 on N11 Stillorgan Rd leading to loss of control type collisions.

Recommendation

The Design Team should ensure that safe access to private driveways is maintained.

3.24.3 Problem

The Audit Team notes there is an existing emergency access to the Church of Our Lady of Perpetual Succour at chainage A9250. It is unclear to the Audit team if this is to be retained and suitable dishing will be provided. There is the risk that a vehicle may have to mount the kerb leading to loss of control type collisions.

Recommendation

The Design Team should determine if the existing emergency access is to be retained.

3.25 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0028

3.25.1 Problem

The Audit Team notes there are existing "Caution Children Crossing" markings with associated bar markings on the N11 at A9725. There are concerns that the removal of these markings may lead to increased speed putting the Vulnerable Road Users at an increased risk of conflict.

Recommendation

The Design Team should reinstate these markings.

3.25.2 Problem

The Audit Team is concerned that the proposed pedestrian crossing and cycle ramps may hinder access to and from existing driveways at Chainage 9510 on N11 Stillorgan Rd leading to loss of control type collisions.

Recommendation

The Design Team should ensure that safe access to private driveways is maintained.

3.25.3 Problem

The orientation of the staggered pedestrian crossing on the northern arm of the Westminster Rd/ N11 Stillorgan Rd will result in pedestrians being forced to turn their back on the traffic stream which they are about to cross. This may result in pedestrians stepping off the footway into approaching traffic.

Recommendation

The Design Team should consider laying out the staggered crossings in such a way that pedestrians are forced to face the traffic stream which they are about to cross.

3.26 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0029

3.26.1 Problem

The Audit Team notes there are existing "Caution Children Crossing" markings with associated bar markings on the N11 at A10050 northbound. There are concerns that the removal of these markings may lead to increased speed putting the Vulnerable Road Users at an increased risk of conflict.

Recommendation

The Design Team should reinstate these markings.

3.27 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0031

3.27.1 Problem

The Audit Team is unclear as to the tie in- in the verge/parking area on Clonkeen Road. The Audit Team are concerned if the existing green verge adjacent to Cabinteely Way is removed, vehicular traffic looking to use the parking area may access from Cabinteely Way, causing side swipe collisions or hinder the visibility splay at the Clonkeen Rd/ Cabinteely Way junction.

Recommendation

The Design Team should ensure the existing landscaped area is maintained.

3.27.2 Problem

The orientation of the staggered pedestrian crossing on the western arm of the Clonkeen Rd/ N11 Bray Rd will result in pedestrians being forced to turn their back on the traffic stream which they are about to cross. This may result in pedestrians stepping off the footway into approaching traffic.

Recommendation

The Design Team should consider laying out the staggered crossings in such a way that pedestrians are forced to face the traffic stream which they are about to cross.

3.28 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0033

3.28.1 Problem

It is noted there is a section of footpath located between cycle track and the carriageway (Ch A11300-11350). The Audit Team is concerned that pedestrians who disembark from a bus, may walk along this section of footway, and not be able to use the crossing facilities and be put at risk of conflict with either cyclists or vehicular traffic.

Recommendation

The Design Team should remove this section of footpath by moving the cycle track to the kerb edge of provide the hard standing in a different material or colour to differentiate from the footpath

3.28.2 Problem

The Audit Team notes the junction is large in area with concerns that right turners from N11 Bray Road NB to Johnstown Road could turn short to enter the westbound lanes resulting in an increased risk of head on collisions with traffic waiting at the lights.

Recommendation

The Design Team should provide lane guidance through the junction.

3.29 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0033

3.29.1 Problem

The Audit Team notes that the existing Zigzag Markings and Terminal Lines on the approach to the pedestrian crossing at chainage A11825 are absent in the proposed scheme. This may lead to an increased risk of late breaking and rear shunt type collisions for drivers unfamiliar with the road layout.

Recommendation

The Design Team should provide appropriate road markings approaching the pedestrian crossing.

3.30 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0035

3.30.1 Problem

The Audit Team notes there is a section of footpath located between cycle track and the carriageway (Ch A12150). There are concerns pedestrians who disembark from a bus may walk along this section of footway and may not be able to use the crossing facilities and be put at risk of conflict with either cyclists or vehicular traffic.

Recommendation

The Design Team should remove this section of footpath by moving the cycle track to the kerb edge of provide the hard standing in a different material or colour to differentiate from the footpath.

3.31 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0037

3.31.1 Problem

The Audit Team have concerns that there is no "No Entry" markings are proposed on the one-way parallel access road at chainage A12750 (westbound) There is an increased risk of head on collisions should vehicles exit incorrectly.

Recommendation

The Design Team should ensure there are appropriate marking in place to prevent unintended manoeuvres.

Figure 3.17 "No Entry" road markings

3.32 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0038

3.32.1 Problem

The Audit Team have concerns that there is no "No Entry" markings are proposed at the mouth of various junction arms as per the existing arrangements. There is an increased risk of head on collisions should vehicles make incorrect manoeuvres

Recommendation

The Design Team should ensure there are appropriate marking in place to prevent unintended manoeuvres

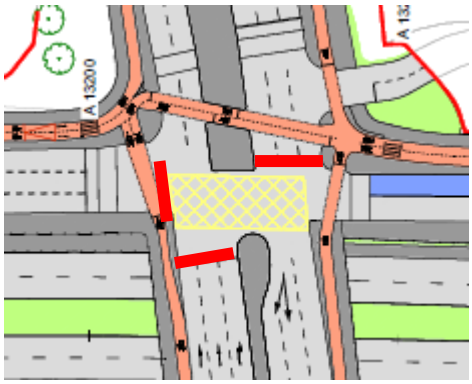


Figure 3.18 No Entry markings required

3.32.2 Problem

The Audit Team notes the northbound cycleway narrows on the bridge. There is concern that there may be insufficient room for cyclists on approach to the signalized junction.

Recommendation

The Design Team should ensure there is appropriate space for cyclists on approach to the junctions.

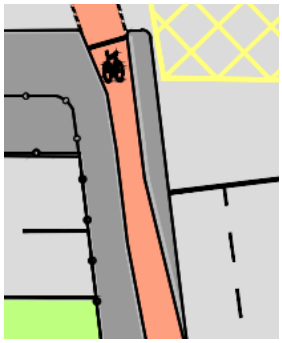


Figure 3.19 Cycle Lane narrows

3.32.3 Problem

It is noted that there is a 2-way cycle track behind a double bus stop at chainage A13300 which narrows behind the proposed bus stopping area. The Audit Team is concerned that this may result in head on collisions between cyclists or an increased risk of conflict between pedestrians and cyclists.

Recommendation

The Design Team should provide a cycle lane that is sufficiently wide to provide two-way flow.

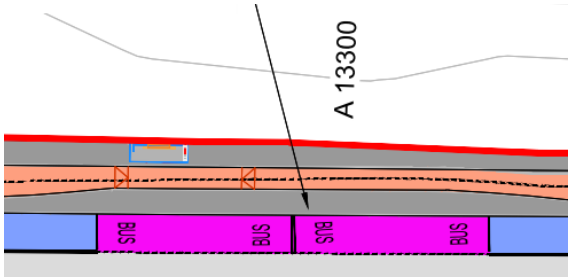


Figure 3.20 Cycle Lane narrows

3.32.4 Problem

The Audit Team notes at chainage A13+175m on the southbound off slip lane, the middle lane indicates a right turn only for all vehicles except buses. This is contradiction to the existing layout that permits a straight-ahead movement. This may result in an increased risk of driver confusion,

Recommendation

The Design Team should ensure that the road markings are appropriate to the permitted turning movements.

3.33 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0039

3.33.1 Problem

The Audit Team are concerned that the lack of "No Entry" road markings on the western side of the N11 Bray Road which may result in vehicles exiting the parallel access road, turning right onto the N11 leading to an increased risk of head on type collisions.

Recommendation

"No Entry" road markings should be provided.

3.33.2 Problem

It is unclear from the drawings provided, how pedestrians cross the Cherrywood Road, where uncontrolled crossing facilities are presently in place. There is an increased risk of vehicular/ pedestrian conflicts.

Recommendation

The Design Team should ensure that pedestrian crossing facilities are provided.

Figure 3.21 Lack of pedestrian facilities

3.34 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0040

3.34.1 Problem

It is noted that there is a 2-way cycle track which becomes a 1-way track at chainage A13900. The Audit Team are concerned that this will result in an increased risk of cyclist confusion/ head on cyclist collisions or encroachment by cyclists onto the footpath in conflict with pedestrians.

Recommendation

Figure 3.22 Cycle Lane narrows

The Design Team should review the design to provide the 2-way cycle all along this route. Where this is not possible the distance of 1 way should be minimised to shortest possible length and appropriate warning put in place such as signage yield markings etc.

3.34.2 Problem

The Audit team notes there are some incomplete markings (Yield Symbol) for the approaches to and on the roundabout (hatching). There is concern this may lead to poor lane discipline causing potential side swipe type collisions.

Recommendation

The Design Team should ensure there is appropriate markings and arrows on the approaches and on the roundabout circulatory carriageway.

3.35 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0041

3.35.1 Problem

The Audit Team notes the bell mouth into Seaview Park appears wider than necessary for a residential access. There are concerns that this may allow vehicle to enter the road at high speed potentially putting vulnerable road users at risk of conflict.

Recommendation

The design team should review this access and reduce the bell mouth to the minimum possible size.

3.36 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0042

3.36.1 Problem

The Audit Team note that, in the context of the Junction Intervisibility Zone, that drivers at some of the stop lines at the Stonebridge Rd/ R837 junction in will not be able to fully see the stop lines on other arms of the junction. This compromises visibility and safety of vulnerable road users resulting in the potential for injury by being struck by a vehicle.

Recommendation

The design team should review the need for the compromised Junction Intervisibility zone and move pedestrian crossing closer to the centre of the junction.

3.36.2 Problem

The Audit Team note that, in the context of the Junction Intervisibility Zone, that drivers at some of the stop lines at the junction may not be able to fully see the stop lines on other arms of the junction depending on the proposed boundary treatments. This compromises visibility and safety of vulnerable road users resulting in the potential for injury by being struck by a vehicle.

Recommendation

The design team should review the need for the compromised Junction Intervisibility zone and move pedestrian crossing closer to the centre of the junction.

3.36.3 Problem

The Audit Team is unclear how vehicle access will be maintained to the properties south west corner of the Stonebridge Road Junction. There are concerns that driver frustration will be caused by the introduction of the new traffic island.

Recommendation

The design team should ensure clear access is provided to all relevant properties.

3.36.4 Problem

The Audit Team notes the current vertical alignment of Stonebridge road does not provide a dwell area and has a steep gradient.

Recommendation

The design team should consider measures to improve the vertical alignment through this section from the current situation.

3.37 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0043

3.37.1 Problem

The Audit Team notes that the existing Zigzag Markings and Terminal Lines on the approach to the pedestrian crossing at chainage A14980 are absent in the proposed scheme. This may lead to an increased risk of late breaking and rear shunt type collisions for drivers unfamiliar with the road layout.

Recommendation

The Design Team should provide appropriate road markings approaching the pedestrian crossing.

3.37.2 Problem

The Audit Team notes there is no cycle facilities being provided from the junction of Shanganagh Road through Shankill village. It is unclear where cyclists are to travel, increasing potential conflicts with motorists

Recommendation

The Design Team should review the facilities for cyclists. Where alternative routes cannot be provided, then additional signage and markings should be provided.

3.37.3 Problem

The Audit Team note that on the Shanganagh Rd, south of the signalised junction, there is an existing entrance to St Anne's Church where access is maintained adjacent to the signalised junction. The Audit Team is concerned that a vehicle may not be able to turn right in due to queued vehicles be forced to sit in the southbound lane, there is an increased risk of driver frustration or rear sunt type collisions.

Recommendation

The design team should ensure that box junction or "keep clear" road markings are provided to allow access when turning right.

3.38 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0044

3.38.1 Problem

It is noted that there is an unsignalised junction (Cluain na Greine Court) immediately adjacent to the signalised crossroads at A15300. The Audit Team are concerned that, in the absence of a yellow box or integrated signals, right turners from this access will be unable to exit here resulting in driver frustration causing erratic manoeuvres.

Recommendation

The Design Team should provide a yellow box or integrated, vehicle activated signals to allow motorists to egress Cluain na Greine Court safely.

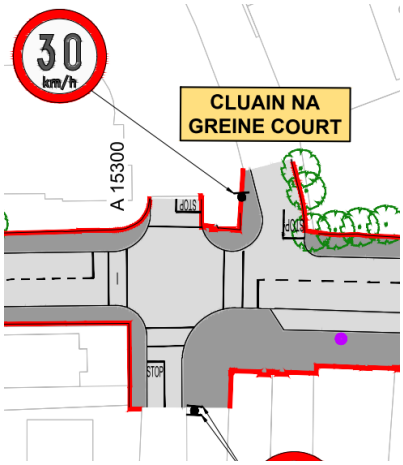


Figure 3.23 Cycle Lane narrows

3.38.2 Problem

The Audit Team notes it is unclear from the drawings if the parking on the east side of Dublin Road (Ch A15400) is being retained. There is concern that removal of this parking may lead to illegal parking, or obstructions to surrounding roads, thereby potentially impeding access to emergency services.

Recommendation

Where parking is to be removed, they should ensure there is appropriate alternative parking provided in nearby location and that parking on the footpath is prevented through use of appropriate street furniture.

3.39 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0045

3.39.1 Problem

The Audit Team is concerned that the proposed traffic islands at chainage A15750, may constitute a hazard due to the reduced width of the traffic lanes at this location.

Recommendation

The design team should provide appropriate road markings and signage in advance of the bus gate and ensure the road widths are sufficient.

3.40 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0046

3.40.1 Problem

The Audit Team notes the northbound cycle track suddenly terminate at the Crinken lane junction. There are concerns this sudden termination will displace cyclists onto the carriageway, putting them in conflict with vehicular traffic.

Recommendation

The design team should provide appropriate transition from cycle track to carriageway.

3.40.2 Problem

The Audit Team notes a number of toucan crossings with unclear desire lines. Excess crossings may lead to increased driver frustrations, and potential conflicts between motorists and Vulnerable road users

Recommendation

The design team should review the need for all crossings and rationalise where possible.

3.41 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0048

3.41.1 Problem

The Audit Team notes there is a domestic access in close proximity to the signals at the junction of Dublin Road and Woodbrook Downs. There are concerns the access to this property will be obstructed by traffic waiting at the signals, leading to side swipe or T-bone type collisions.

Recommendation

The Design Team should review the feasibility of relocating this access to Woodbrook Downs. Where this is not possible the design team should implement appropriate measure to ensure safe access and egress from this property.

3.42 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0049

3.42.1 Problem

It is noted the M11 merge road markings indicate 2 lanes westbound and the current layout is a single lane. The Audit Team are concerned that the proposed line marking may result in driver confusion and increased risk of conflict with motorists.

Recommendation

The Design Team should review the road markings at this location.

3.42.2 Problem

The Audit Team notes that the traffic exiting the general traffic lane on the northbound arm may not have adequate guidance through the junction in the absence of traffic islands, to mitigate against head-on collisions with traffic waiting in the right turn lane on the opposite arm.

Recommendation

The design team should review the junction design to remove this risk using guidance lines and/or traffic islands.

Figure 3.24 Risk of Head on Collisions

3.43 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0050

3.43.1 Problem

The Audit Team are concerned at the lack of cycling facilities to facilitate right turn movements on the Corke Abbey Avenue/ Dublin Rd/ Old Connaught Avenue Junction in the absence of toucan crossings.

Recommendation

The Design Team should provide jug turns where appropriate.

3.44 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0051

3.44.1 Problem

It is noted the proposed integration of new cycleway on the scheme with an existing offline cycle route at this location. The Audit Team are concerned about the potential for pedestrian and cyclist conflict at this location.

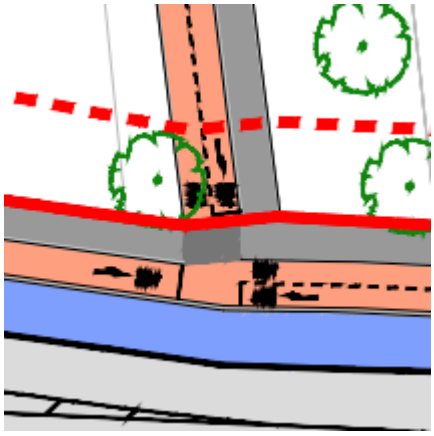


Figure 3.25 Cycle Lane Integration

Recommendation

The Design Team should ensure that this cycle way layout is suitable for all road users, including visually impaired pedestrians through provision of appropriate corduroy paving.

3.44.2 Problem

The Audit Team notes the current vertical alignment of Dublin Road to Upper Dargle Road has a steep gradient. There is a concern that vehicles stopping for the lights may roll back/ forward coming into conflict with other vehicles on the road. There is also the risk of steep crossfalls leading to over topping by high sided vehicles

Recommendation

The design team should improve the vertical alignment through this section from the current situation.

3.45 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0052

3.45.1 Problem

The Audit Team note the relocation of the pedestrian crossing from chainage A18420 to A18370. This desire line to Castle Street Shopping Centre may result in an increased risk of jay walking

Recommendation

The Design Team should consider relocating the pedestrian crossing back to the existing location.

Figure 3.26 Footpath to shopping centre

3.46 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0053

3.46.1 Problem

The Audit Team are concerned the proposed crossing at chainage e200 is in close proximity to the parallel parking which may obscure sightlines for pedestrians and the approaching traffic leading to an increased risk of pedestrian/ vehicular conflicts.

Recommendation

The Design Team should relocate the crossing or reduce the parallel parking in the vicinity of the crossing through provision of sig zag road marking.

4. System Design Drawings

4.1 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0009

4.1.1 Problem

The Audit Team are concerned that the secondary signal on Leeson St Lower northbound located on the nearside of the carriageway may be obscured by buses in the bus lane, leading to an increased risk of vehicles overshooting the stop line in the general traffic lane.

Figure 4.1 Secondary signal

Recommendation

The Design Team should consider relocating the secondary signal to the proposed traffic island opposite the stop line.

4.2 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0010

4.2.1 Problem

On Adelaide Rd, the Audit Team is concerned that no secondary signal has been provided for vehicles travelling eastbound. The lack of a secondary signal make result in driver confusion for the motorist at the stop line.

Recommendation

The Design Team should provide a secondary signal head.

4.2.2 Problem

On Leeson St Lower (Chainage A540), the Audit Team is concerned that no secondary signal has been provided for vehicles travelling northbound. The lack of a secondary signal make result in driver confusion for the motorist at the stop line. It is noted that an additional cantilever signal head has been provided at the current junction to inform traffic in both directions.

Figure 4.2 Cantilevered Signal Head on Leeson St Lower

Recommendation

The Design Team should provide a cantilever secondary signal head to match the current layout.

4.3 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0012

4.3.1 Problem

On Leeson Street Upper northbound, the Audit Team is concerned that cyclists will have to weave across the carriageway, should they wish to turn right onto Sussex Road southbound. This may lead to an increased risk of conflict with buses and taxis.

Recommendation

The Design Team should separate the Bus Lane and Cycle Lane signal phases

4.4 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0014

4.4.1 Problem

Along Sussex Rd eastbound at Chainage B400, the Audit Team note that existing vegetation may block visibility of the proposed secondary signal head (Signal Head 4). This may lead to an increase in driver confusion.

Figure 4.3 Visibility of signal head due to vegetation

Recommendation

The Design Team should ensure that existing vegetation does not hinder visibility of the proposed secondary signal head.

4.5 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR0017

4.5.1 Problem

The Audit Team is concerned the pedestrian crossings on Leeson Street upper appear very wide, potentially leading to insufficient time for Vulnerable roads users completing crossing in sufficient time.

Recommendation

The design team should ensure there is sufficient time allowed for the crossing to be completed by all road users.

4.5.2 Problem

The Audit Team is concerned that Swan Place (small lane opposite Wellington Place) has not been included within the proposed signal arrangement. This could lead to driver confusion and increased risk of collision.

Recommendation

The design team should consider signalising this arm and provide suitable road marking to indicate whether the lane is one way or two way.

4.6 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR0018

4.6.1 Problem

The Audit Team notes RTS 003 type head is proposed for signal head 2. It is noted a full aspect would be appropriate here, leading to reduced number of aspects, reducing traffic light clutter, and thereby reducing potential driver confusion.

Recommendation

The design team should consider using the full aspect traffic light in this location.

4.7 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR0024

4.7.1 Problem

The Audit Team is concerned the pedestrian crossings on Stillorgan Road appear very wide, potentially leading to insufficient time for Vulnerable roads users completing crossing in sufficient time.

Recommendation

The design team should ensure there is sufficient time allowed for the crossing to be completed by all road users.

4.7.2 Problem

The Audit Team notes for phase B of the signal rotation there is a concurrent flashing amber for both cyclists and left turning traffic from N11 Stillorgan Road into Nutley Lane or Greenfield Pk. There is concern that the vehicle traffic may not understand the purpose of the flashing amber or may not see a cyclist due to the distance between vehicle and cyclists due to the presence of the bus lane, resulting in conflicts between vehicle traffic and cyclists.

Recommendation

The Design Team should separate these movements to ensure there is no conflict between cyclists and vehicle. traffic.

4.8 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0029

4.8.1 Problem

The Audit Team is concerned that the northbound cycle right turn phase (8) may conflict with the southbound straight ahead cyclist movement (11) leading to an increased risk of cyclist conflicts.

Recommendation

The design team should consider separating these two movements.

4.8.2 Problem

It is noted that a cantilevered signal gantry is proposed for southbound lanes on Stillorgan Rd. The Audit Team are concerned that the same measures are not proposed on the northbound approach lanes leading to an increased risk of vehicles overshooting the stop line.

Recommendation

The design team should consider providing a consistent approach to cantilevered signal gantries along the N11 Stillorgan Rd.

4.8.3 Problem

The Audit team notes that phase D signal 3 is incorrect as the only possible movements are either left or right turn. This may lead to confusion.

Recommendation

The design team should ensure the stick diagram is correct.

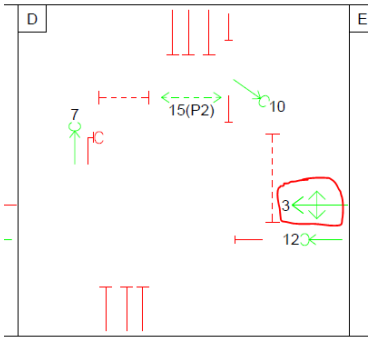


Figure 4.4 Incorrect stick diagram

4.9 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0030

4.9.1 Problem

The Audit Team is concerned that the right turning movements on Trees Road Lower and Treesdale during signal phase D may lead to an increased risk of conflict.

Recommendation

The design team should consider separating these two movements.

4.10 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0031

4.10.1 Problem

The Audit Team notes for phase B of the signal rotation there is a concurrent flashing amber for both cyclists and left turning traffic from N11 Stillorgan Road into Priory Drive or Old Dublin Road. There is concern that the vehicle traffic may not understand the purpose of the flashing amber or may not see a cyclist due to the distance between vehicle and cyclists due to the presence of the bus lane, resulting in conflicts between vehicle traffic and cyclists.

Recommendation

The Design Team should separate these movements to ensure there is no conflict between cyclists and vehicle traffic.

4.11 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0032

4.11.1 Problem

The Audit Team notes for phase B of the signal rotation there is a concurrent flashing amber for both cyclists and left turning traffic from N11 Stillorgan Road into Stillorgan Pk Rd or Lower Kilmacud Rd. There is concern that the vehicle traffic may not understand the purpose of the flashing amber or may not see a cyclist due to the distance between vehicle and cyclists due to the presence of the bus lane, resulting in conflicts between vehicle traffic and cyclists.

Recommendation

The Design Team should separate these movements to ensure there is no conflict between cyclists and vehicle traffic.

4.12 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0033

4.12.1 Problem

The Audit Team notes a flashing amber during phase B for Left turning traffic and cyclist carrying straight ahead on the Stillorgan Road. There are concerns that these phases do not provide a clear priority for either cyclists or vehicular traffic, potentially causing confusion and risks of a conflict between cyclists and vehicular traffic undertaking taking a left turn movement

Recommendation

The Design Team should separate these movements to ensure there is no conflict between cyclists and vehicle traffic.

4.13 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0038

4.13.1 Problem

The Audit Team notes for phase B of the signal rotation there is a concurrent flashing amber for both cyclists and left turning traffic from N11 Stillorgan Road into Bray Rd. There is concern that the vehicle traffic may not understand the purpose of the flashing amber or may not see a cyclist due to the distance between vehicle and cyclists due to the presence of the bus lane, resulting in conflicts between vehicle traffic and cyclists.

Recommendation

The Design Team should separate these movements to ensure there is no conflict between cyclists and vehicle.

4.14 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0042

4.14.1 Problem

The Audit team notes for Phase A of the signal rotation, there is a conflict in movements for cyclists between signals 6, 9 & 10. There are concerns that there is no clarity on whom has priority at the confluence beside Signal 10.

Recommendation

The Design Team should review the junction layout to ensure there are no conflicts between cycle movements.

4.14.2 Problem

It is noted that there is a bi-directional cycleway across the northern arm of the large junction. The Audit Team are concerned that there is a risk of cyclists having to wait on the central reservation with associated blocking back onto the carriageway and resulting risk of motorists striking cyclists.

Recommendation

The Design Team should review the operations of the signalized crossing to ensure queuing in the central reservation does not encroach on the carriageway.

4.15 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0043

4.15.1 Problem

It is noted that there is a signalized crossing at A 14160. It is not clear if these signals are integrated to the proposed signalisation of the adjacent roundabout and the Audit Team is concerned that this may result in traffic blocking back across the roundabout gyratory blocking other motorists and causing driver frustration and erratic maneuvers causing rear-shunt and sideswipe type accidents.

Recommendation

The Design Team should consider integrating these signal sets through a greenwave to ensure traffic doesn't block back across the gyratory.

4.15.2 Problem

The Audit Team notes in phase B of the signal rotation there is a missing stop stick on the southern arm. This could give rise to the signals being phased incorrectly leading to vehicular conflicts on the roundabout.

Recommendation

The Design Team should ensure all appropriate stop/go sticks are in place.

4.16 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0044

4.16.1 Problem

The Audit Team notes there is a conflict in movements for Phase B for right turning traffic from R837 Dublin Road to Stonebridge Road. There are concerns that this movement may cause head on type collisions.

Recommendation

The Design Team should separate this movements to avoid this conflict.

4.16.2 Problem

The Audit Team are concerned with the layout of the junction in relation to the southbound right turning traffic onto Stonebridge road. There are concerns that the layout of the ghost island, will lead to driver confusion. In addition, there are concerns of head on and or side swipe collisions between the northbound traffic and vehicles waiting to turn right in the right turn pocket.

Recommendation

The Design Team should review the junction layout and remove the risk of head on collisions through providing a right turn lane prior to the lights and giving a separate phase for this movement or maintain the existing layout and ensure the movements identified in phase B are separated into 2 separate phases.

4.17 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0051

4.17.1 Problem

The Audit Team notes the existing traffic signal for traffic exiting from North Wicklow Educate Together does not seem to be reinstated. There are concerns that this may result increased risk of side swipe collisions as vehicles try to leave this premises.

Recommendation

The Design Team should review the signal layout at this location.

4.18 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0052

4.18.1 Problem

It is noted during Phase D of the signals, that the minor arm on Eglinton Rd (3) has a green phase at the same time as the southbound bus lane on Donnybrook Rd (4). The Audit Team is concerned that taxis exiting Eglinton Rd may wish to join the bus lane, unaware of oncoming traffic from Donnybrook Rd leading to an increased risk of side swipe type collisions.

Recommendation

The Design Team should consider separating these two movements.

4.18.2 Problem

The Audit Team notes a flashing amber during phases B & C for Left turning traffic and cyclist carrying straight ahead on Donnybrook Road. There are concerns that these phases do not provide a clear priority for either cyclists or vehicular traffic, potentially causing confusion and risks of a conflict between cyclists and vehicular traffic undertaking taking a left turn movement

Recommendation

The Design Team should separate these movements to ensure there is no conflict between cyclists and vehicle traffic.

4.19 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0053

4.19.1 Problem

It is noted that there are adjacent pedestrian and cyclist crossings at A13050. The phasing arrangement at this location is such that these two modes will cross simultaneously however once passed the carriageway there is a pedestrian priority across the cycle track via zebra crossing road markings. The Audit Team are concerned that in the absence of formal signals, there is an increased risk of pedestrian/ cyclist conflicts at this location.

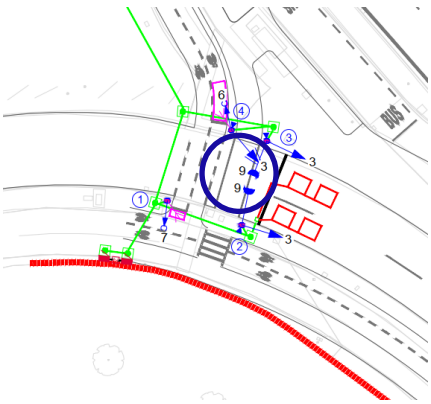


Figure 4.5 Cycle & footway interaction

Recommendation

The Design Team should extend the pedestrian crossing, across the two-way cycle lanes.

4.20 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0054

4.20.1 Problem

The Audit Team notes there is a conflict in Phase D of the signals with traffic entering N11 Northbound from the parallel access road. There are concerns this may lead to side swipe collisions

Recommendation

The Design Team should review the signal layout and phasing.

5. UCD Bus Interchange

5.1 BCIDB-JAC-ENV-LA-13-IN-00-DR LL-0001

5.1.1 Problem

It is noted the proposed road markings indicate 'Yield' road markings at priority junctions within the bus interchange. The Audit Team is concerned that vehicles may not come to a complete halt and give sufficient time to understand the layout ahead and determine to if it is same to join the adjacent carriageway.

Recommendation

The Design Team should provide 'STOP' road markings and warning signages witin internal priority junctions.

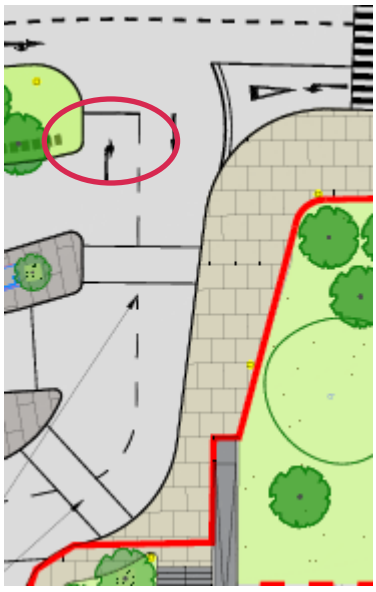


Figure 5.1 Lack of road markings directing buses

5.1.2 Problem

The Audit Team is concerned that the lack of appropriate road markings may result in an increased risk of buses entering the shared street lanes on the western perimeter in conflict with cyclists and where there are no turning facilities.

Recommendation

The Design Team should provide sufficient road markings to advise buses of the road layout ahead.

5.1.3 Problem

The Audit Team is concerned about the proximity of the retractable bollards to the bus stop/ bus cage. A parked bus at this location may block visibility of warning signage or hinder the forward visibility of the bollard by other buses approaching leading to an increase of bollard/ bus conflicts.

Recommendation

The Design Team should consider removing the bus stop immediately adjacent to the retractable bollards.

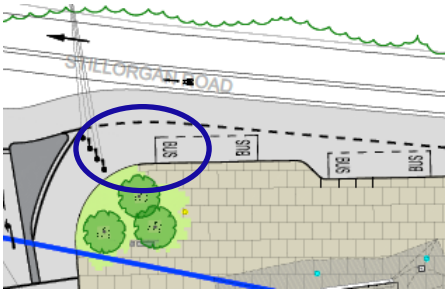


Figure 5.2 Retractable Bollards

5.1.4 Problem

The Audit Team notes a lack of stop markings and stop sign for vehicle performing a right turn manoeuvre (Red Circle – Figure 5.1). There are concerns that vehicles exiting this development may not give priority to the main traffic arm.

Recommendation

The Design Team should ensure that 'STOP' road markings are placed in appropriate location at the junction.

5.1.5 Problem

It is noted that the uncontrolled crossing within the Bus Interchange include road markings that indicate the presence of a controlled crossing, there is an increased risk of confusion for the visually impaired.

Recommendation

The Design Team should ensure the road markings for uncontrolled crossings are adequate.

5.2 BCIDB-JAC-ENV-LA-13-IN-00-DR LL-0002

5.2.1 Problem

The Audit Team are concerned that the signalised pedestrian crossing adjacent to the UCD Gates is missing stop lines and the lack of appropriate road markings may result in an increased risk of pedestrian/ vehicle conflicts.

Recommendation

The Design Team should ensure suitable road markings (stop lines in advance of the crossing).

5.2.2 Problem

Its noted cyclists are to share space with pedestrians between toucan crossings and cycle parking facilities. The Audit Team are concerned that this arrangement will lead to an increased risk of pedestrians and cyclist conflicts.

Recommendation

The Design Team should consider measures to segregate pedestrians and cyclists or ensure this shared space encourages low speeds as part of an urban realm design and that the needs of the visually impaired are considered.

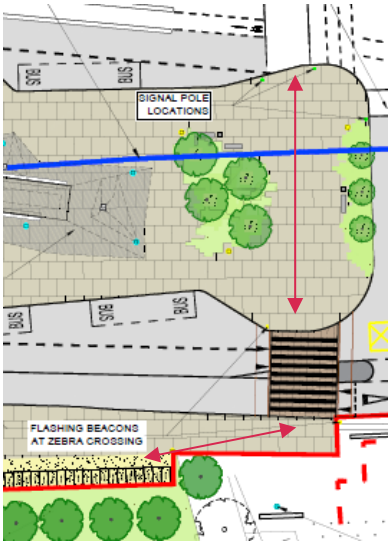


Figure 5.3 Cyclist desire line

6. Supplementary Audit

In November 2021, the Design Team requested a supplementary Road Safety Audit on the Drawings listed in Appendix D, which were updated following a round of Public Consultation on the proposed scheme and internal design updates

6.1 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0008

6.1.1 Problem

The Audit Team note a single jug turn for westbound cyclists is proposed at the Anglesea Rd/ Beaver Row/ Stillorgan Road junction or right turners onto Anglesea Rd, but this is not reciprocated for right turners on the other arms of the junction. Toucan crossings are provided on all arms so this inconsistent approach may lead to confusion for cyclists.

Recommendation

The Design Team should provide a consistent approach for cyclists to perform right turn manoeuvres.

6.1.2 Problem

It's unclear from the drawings provided how the proposed westbound section of Anglesea Rd (three lanes) ties in with the existing cross section (four lanes). This could lead to driver confusion and an increased risk of side swipe type collisions.

Recommendation

The Design Team should provide an appropriate tie into the existing cross section on Anglesea Rd.

6.1.3 Problem

Is noted that the existing box junction road markings on the Donnybrook Rd at chainage A2525. There is a risk that vehicles will queue in this location and prevent right turners from Eglington Rd & Donnybrook Rd leading to an increase in driver frustration.

Recommendation

The Design Team should ensure the road markings are appropriate.

6.1.4 Problem

The Audit Team are concerned that cyclists turning right out of the Eglinton Road junction will be unable to safely join the proposed cycle track and will be forced to mount the kerb, leading to an increased risk of loss of control type collisions.

Recommendation

The Design Team should ensure that cyclists can safely access the cycle track.

6.1.5 Problem

The Audit Team are concerned that cyclists traveling Northbound on Donnybrook Road looking to turn right onto Dodder Greenway may impede onward traveling cyclists on the cycle track at the toucan crossing.

Recommendation

The Design Team should there is an appropriate waiting area for right turning cyclists

6.2 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0013

6.2.1 Problem

Dashed lines are indicating crossings are shown on the drawing. It is unclear if these are controlled crossings consistent with the bus interchange drawing BCIDB-JAC-ENV_LA 13 IN_00 DR LL 0001.

Recommendation

The Design Team should ensure the road markings are appropriate.

6.2.2 Problem

The Audit Team is concerned there is no Stop markings at the Northern side of the UCD Interchange (see Figure 6.1 No "STOP" road markings

Recommendation

The Design Team should ensure all road markings are appropriate.

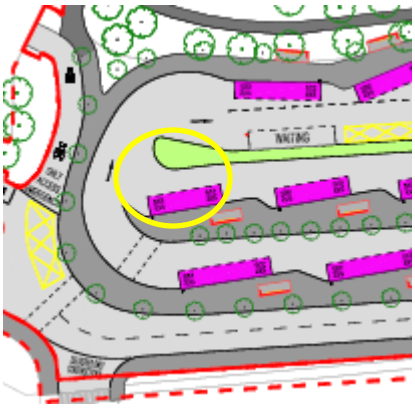


Figure 6.1 No "STOP" road markings

6.2.3 Problem

The Audit Team are concerned with the swept path of buses leaving the UCD campus and turning left onto the Northbound on slip, may impact upon the protected cycle way due to larger buses mounting the kerb.

Recommendation

The Design Team should ensure appropriate swept path analysis is carried out

6.3 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0041

6.3.1 Problem

At chainage A14500, the Audit Team notes the tabletop ramp on Kentfield Road, the sloped part of the ramp is within the desire line of pedestrians on the footway. There are concerns that this may lead to increased risk of slips for pedestrians crossing the road.

Recommendation

The Design Team should ensure the tabletop ramp is sufficiently wide to cover the pedestrian desire lines.

6.4 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0041

6.4.1 Problem

At chainage A14375, the footpath extends to only half of the raised table, which may result in a visually impaired pedestrian walking onto the verge, leading to an increased risk of trips and falls.

Recommendation

The Design Team should widen the footpath to capture the full width of the raised table.

6.5 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0042

6.5.1 Problem

At chainage E50 it is noted that the cycle track ties into the slope of the table ramp. This could lead to destabilising cyclists.,

Recommendation

The Design Team should ensure the cycle track ties into the tabletop ramp appropriately

6.6 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0043

6.6.1 Problem

At the tie in of the Eastbound cycle track to the Corbawn Lane, the Audit Team is concerned that cyclist may come into conflict with motorists in a head on collision.

Recommendation

The Design Team should review the layout and give consideration to the cyclist's priority to cross the road.

6.7 BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0052

6.7.1 Problem

At chainage A18360, the Audit Team notes the tabletop ramp on Dwyer Park, the sloped part of the ramp is within the desire line of pedestrians on the footway. There are concerns that this may lead to increased risk of slips for pedestrians crossing the road.

Recommendation

The Design Team should ensure the tabletop ramp is sufficiently wide to cover the pedestrian desire lines.

6.7.2 Problem

At chainage A18500, it is unclear as to how the eastbound cycle lane ties in with existing road cross section. There is a risk of cyclists colliding with the wall along the River Dargle

Recommendation

The Design Team should ensure an appropriate tie in at this location.

6.8 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0008

6.8.1 Problem

The Audit Team note that the left turn from St. Stephens Green South is controlled by a flashing amber. The Audit team are unclear as to the purpose of the flashing amber, and therefore it may lead to motorists ignoring such signals.

Recommendation

The Design Team should review the necessity of the flashing amber.

6.9 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0010

6.9.1 Problem

The Audit Team is unclear as to the location of the primary signal head for traffic heading northbound on Leeson Street Lower wishing to turn right onto Fitzwilliam Place, they are concerned that they may overshoot the junction.

Recommendation

The Design Team should review the layout of the signals.

6.9.2 Problem

The Audit Team is concerned the advanced stacking lane may cause confusion to cyclists on Adelaide Road particularly those wishing to turn right onto Leeson Street Lower as they may have no access to the Southbound cycle track.

Recommendation

The Design Team should review the layout of the cycle track.

6.10 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0017

6.10.1 Problem

The Audit Team note that Toucan Crossings are proposed on all junction arms in addition to the on-road facilities for right turning cyclists emerging from Wellington Place. It is not clear how cyclists access the toucan crossings, as no ramp to the footpath or no refuge is available. There is concern that cyclists queuing to use the toucan crossings will block the cycle lane leading to an increased risk of vehicular/ cyclist conflicts.

Recommendation

The design team should consider provision of a jug turn dwell area for right turning cyclists.

6.11 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0027

6.11.1 Problem

During Signal Phase F, the Audit Team are concerned that the contraflow cycle lane travelling westbound on the northern side of the junction may conflict with pedestrians crossing Stillorgan Rd and the two-way cycle lane.

Recommendation

The design team should include signals to allow pedestrians cross the two-way cycle lane

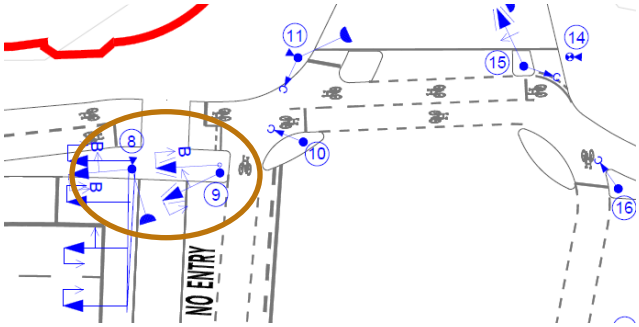


Figure 6.2 Risk of Pedestrian/ Cyclist conflicts

6.11.2 Problem

The Audit Team is concern at the North East Corner of the junction the 2-way cycle track crosses East bound cycle track and it is unclear whom has priority, potentially leading to cyclist confusion or cyclist-cyclist conflicts.

Recommendation

The Design Team should review the layout and ensure there is clear priority for all cyclists.

6.12 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0033

6.12.1 Problem

The orientation of the staggered pedestrian crossing on the southern arm of the Farmleigh Avenue/ N11 Stillorgan Rd will result in pedestrians being forced to turn their back on the traffic stream which they are about to cross. This may result in pedestrians stepping off the footway into approaching traffic.

Recommendation

The Design Team should consider laying out the staggered crossings in such a way that pedestrians are forced to face the traffic stream which they are about to cross.

6.12.2 Problem

The Audit Team notes that there is two left turning lanes of traffic coming out of Brewery Rd. There is concern the lack of lane guidance may lead to increased conflicts between traffic.

Recommendation

The Design Team should review the road markings.

6.13 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0044

6.13.1 Problem

During Phase A, its noted that vehicles turning right onto Stonebridge Road must yield to oncoming northbound traffic along the Dublin Road. The Audit Team are concerned that the right turn pocket will only facilitate a single vehicle before blocking the straight-ahead lane. There is a risk of side swipe type collisions as vehicles move into the bus lane to avoid queueing vehicles in the straight-ahead lane.

Recommendation

The Design Team should consider measures to ensure lane discipline.

6.14 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0050

6.14.1 Problem

The Audit Team are concerned there is a risk of the small traffic island in the vicinity of signal 4 may be at risk of buses having to swerve to avoid.

Recommendation

The Design Team should consider appropriate road markings to direct vehicles away from this island.

6.14.2 Problem

The Audit Team are concerned that the RTS 001 Secondary at signal pole no 13 may encourage inappropriate maneuvers during signal phase A and B.

Recommendation

The Design Team should consider a RTS 003 Secondary at this location.

6.14.3 Problem

The Audit Team are concerned that phase E of the signals is putting cyclists and pedestrians in conflict at the North East Corner.

Recommendation

The Design Team should review the signaling to remove this conflict.

6.14.4 Problem

The Audit Team notes that during phases B, C & D that the cycle signal on poles 5 and 12 could be green. There is concern that inappropriate reds could lead to cyclist disobeying signals and coming into conflict with users during other phases.

Recommendation

The Design Team should review the signaling phases.

6.15 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0052

6.15.1 Problem

The Audit Team is concerned that cyclists are not facilitated in making a right turn from Donnybrook Road on to Eglinton Rd, as the crossing on Eglinton Rd is not a Toucan Crossing.

Recommendation

The design team should consider provision of a Toucan Crossing across Eglinton Rd.

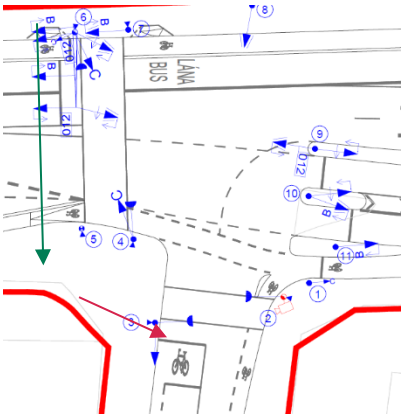


Figure 6.3 Facilities for cyclists

6.16 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0056

6.16.1 Problem

Signal Phase B would indicate a conflict between straight ahead and right turners in the opposite direction along the Dublin road which could lead to an increased risk of side impact type collisions.

Recommendation

The Design Team should provide for a separate phase for right turn movements or indicate via a dashed line that right turners to not have priority.

6.16.2 Problem

Its unclear form the drawings provided how cyclists make right turns from the Dublin road travelling westbound, since no jug turns, or toucan crossing is provided.

Recommendation

The Design Team should provide for cyclists turning right from Dublin Road onto Chapel Lane.

6.17 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0058

6.17.1 Problem

The Audit Team is concerned that the vehicles will be unable to exit from the Barbeque Centre due to queued vehicles and will be forced to sit in the southbound lane in order to force entry onto the northbound lane, there is an increased risk of head on/ side impact type collisions.

Recommendation

The design team should ensure that box junction or “keep clear” road markings are provided to allow egress from the access when turning right.

6.18 BCIDB-JAC-ENV_LA 13 IN_00 DR LL 0002

6.18.1 Problem

The right turn pocket at the entrance to UCD appears narrow and could lead to an increased risk of side swipe collisions.

Recommendation

The design team should ensure that the width of the right turn pocket is appropriate.

6.19 BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0054

6.19.1 Problem

The audit team is concerned of the proximity of the priority junction on the parallel link road to the signal junction, where motorists may get confused when the traffic lights are green overshooting the stop markings, leading to potential T-Bone type collisions.

Recommendation

The Design team should ensure appropriate covers are applied to the green aspect to ensure lights are only visible at an appropriate distance.

7. General Comments

- No detailed landscaping proposals were provided to the Audit Team. Landscaping proposals may inhibit visibility of pedestrian crossings, traffic signals and warning/ regulatory signage both in the edge of carriageway and central reserve. The design team should ensure that landscaping proposals are adequate.
- No lighting information has been provided, this information is required at Stage 2 Road Safety Audit to ensure all proposed facilities are adequately lit to prevent areas of darkness, which can contribute to collisions. Lighting columns should be placed at the back of the footpath/ cycle lane preventing any potential shadowing caused by high frequency double-decker bus services.
- Clear visibility splays shall be maintained at all junctions;
- Advanced Stacking Lanes (ASLs) should be provided to facilitate right turn for cyclists. The ASL should be "fed" by a cycle lane to ensure that cyclists can pass stationary traffic and get to them. This should be applied in locations such as Appian Way (Sheet Number 04)
- Use of Kassel Kerbs at Bus Stops.
- STOP signs and markings shall be included at all on-site junctions
- Clear forward visibility splays shall be maintained around alignment radii on the site;
- Drainage gullies should be located on the upstream side of the dished kerbs to prevent water flowing across the low kerbs and depositing loose debris underfoot of pedestrians;
- Accesses in close proximity to junctions should have "KEEP CLEAR" markings utilised to allow traffic turning right into these premises access while the arm is on a red Phase.

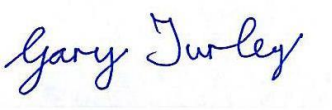
8. Audit Team Statement

We certify that we have examined the drawings and documents listed in the appendices to this report.

The examination and subsequent report was made with the sole purpose of identifying any features of the scheme that could be removed or modified in order to improve the safety of the proposals.

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

No one on the Audit Team has been involved in any way with the scheme design.

Audit Team Leader		
Name:	Gary Turley MEng HDip H'ways & Geo, HDip PM, CEng MIEI	Signed: 
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Position:	Senior Engineer	Dated: 21st December 2021
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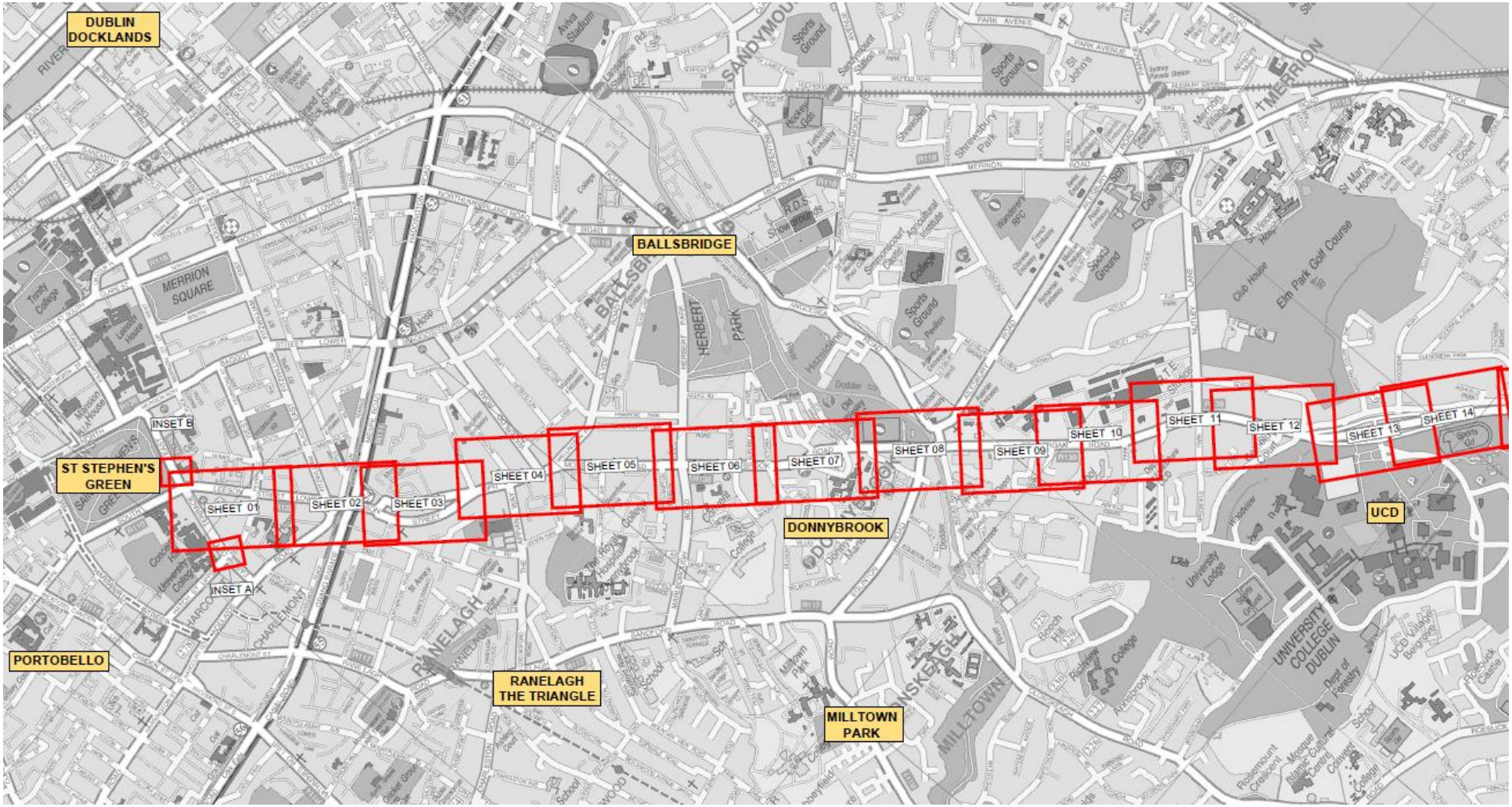
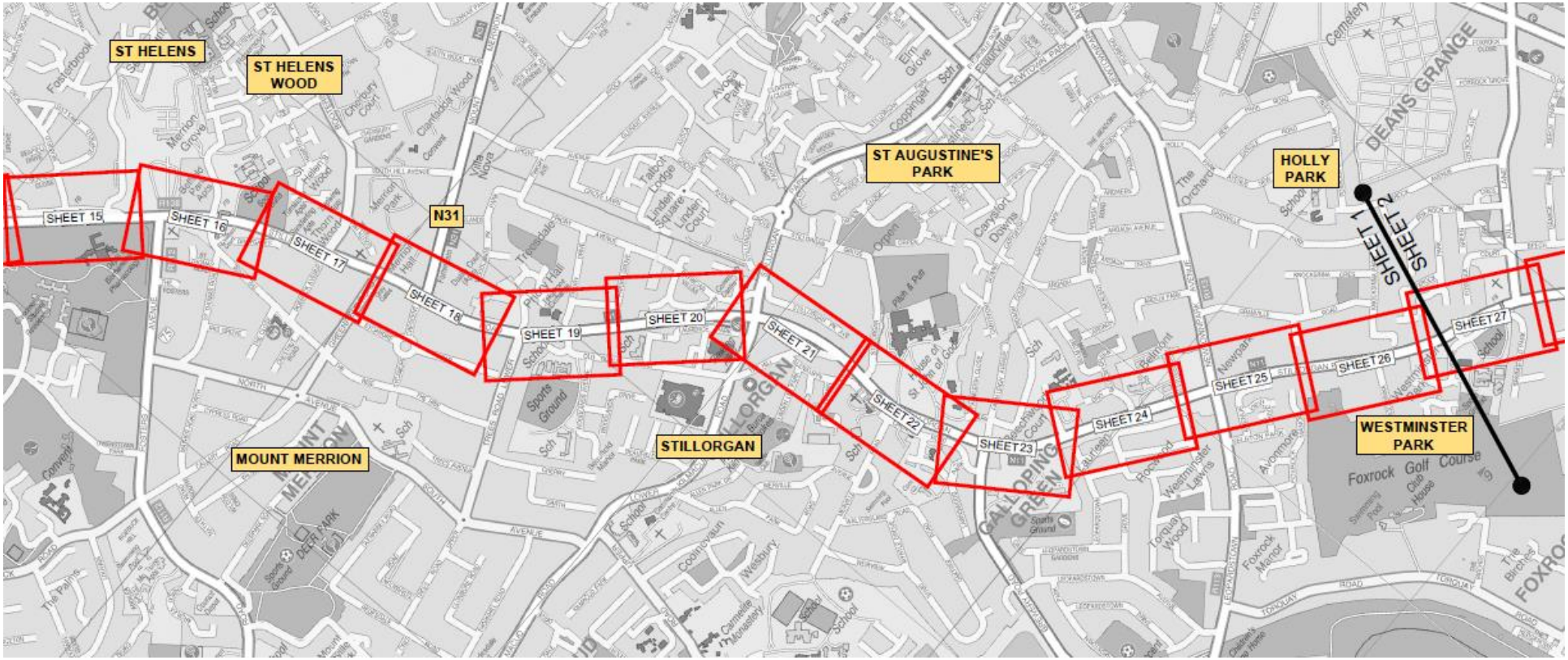
Appendix A. Location Maps


DUBLIN DOCKLANDS
BALLSBRIDGE
MERRION SQUARE
ST STEPHEN'S GREEN
INSET B
INSET A
SHEET 01
SHEET 02
SHEET 03
SHEET 04
SHEET 05
SHEET 06
SHEET 07
SHEET 08
SHEET 09
SHEET 10
SHEET 11
SHEET 12
SHEET 13
SHEET 14
DONNYBROOK
UCD
PORTOBELLO
RANELAGH THE TRIANGLE
MILLTOWN PARK


ST HELENS
ST HELENS WOOD
N31
ST AUGUSTINE'S PARK
HOLLY PARK
MOUNT MERRION
STILLORGAN
WESTMINSTER PARK
SHEET 15
SHEET 16
SHEET 17
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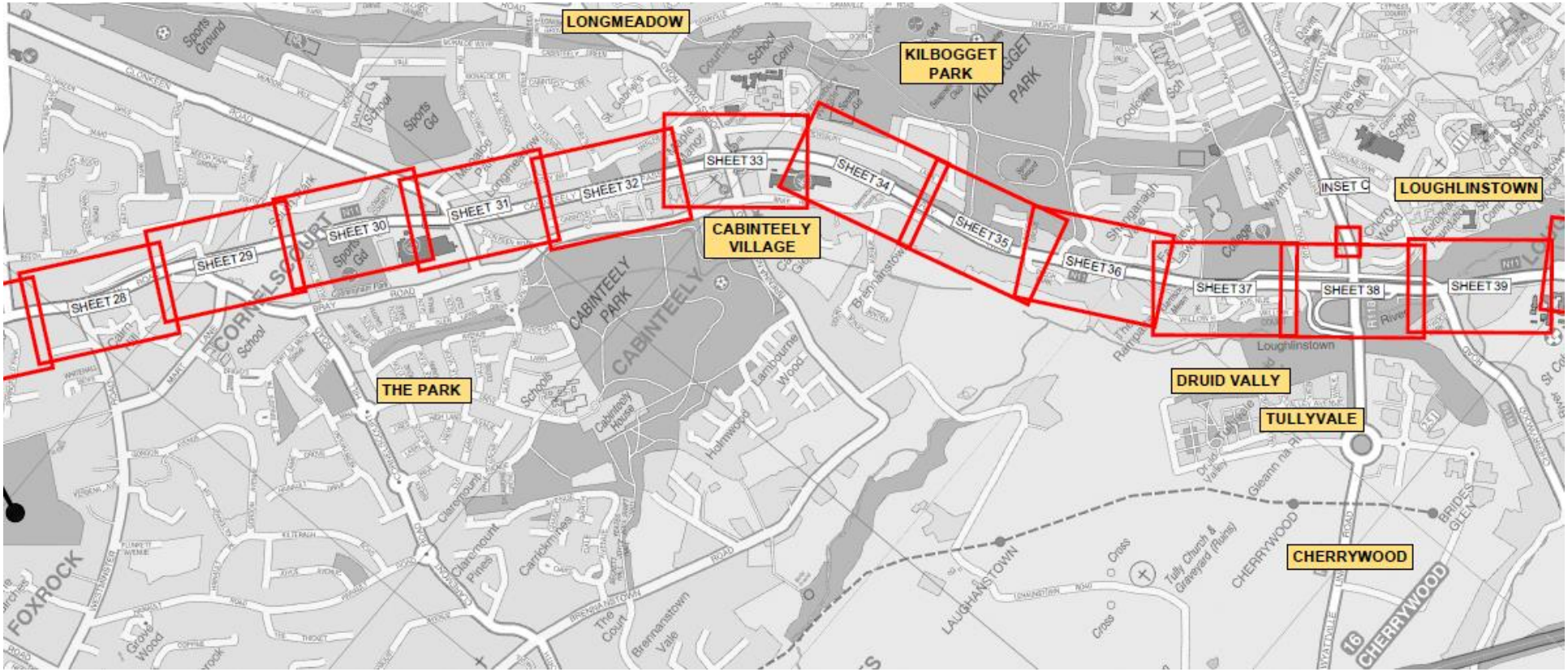
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KILBOGGET PARK
CABINTEELY VILLAGE
THE PARK
DRUID VALLY
TULLYVALE
CHERRYWOOD
LOUGHLINSTOWN
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SHEET 29
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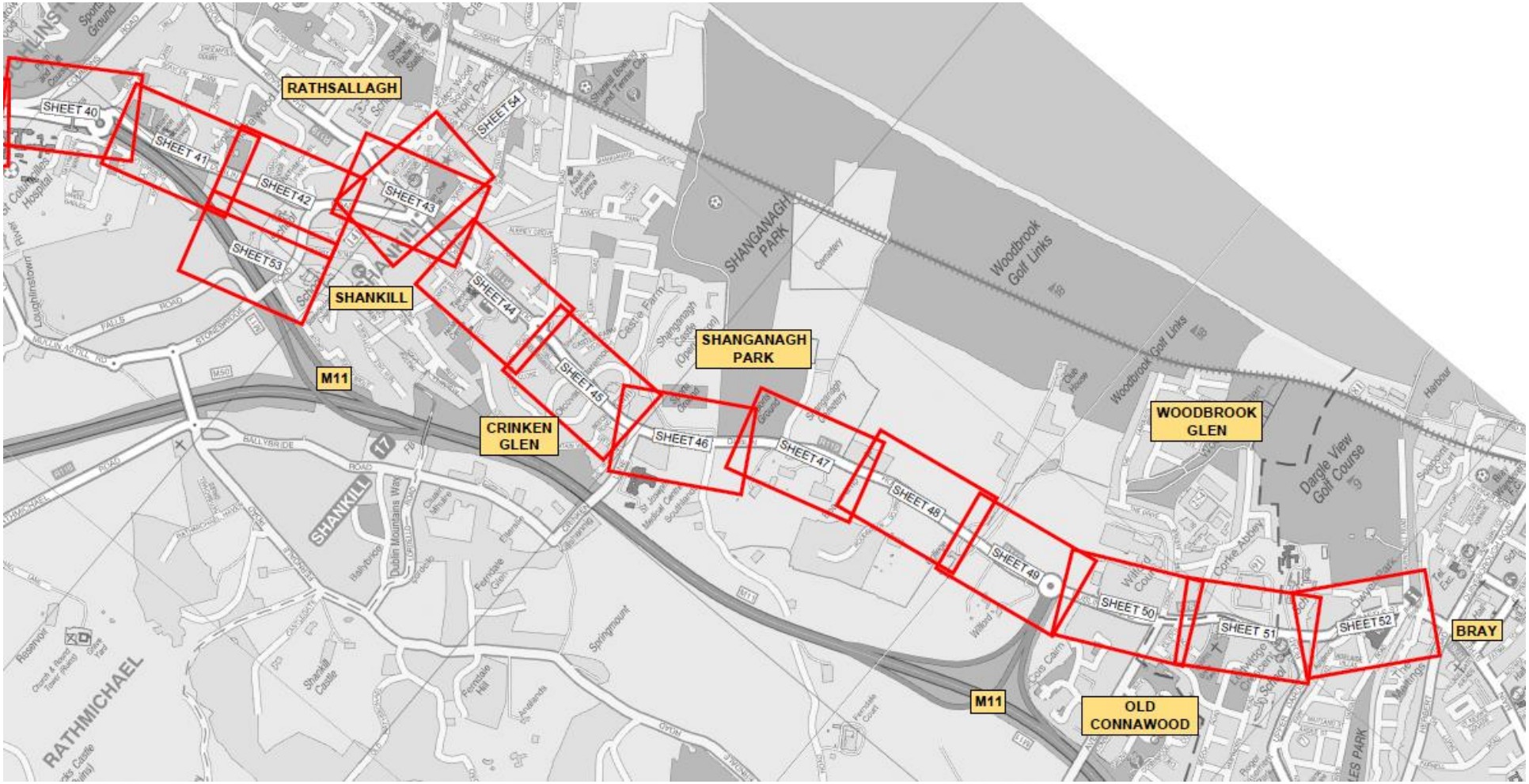
RATHSALLAGH
SHEET 40
SHEET 41
SHEET 42
SHEET 43
SHEET 54
SHEET 53
SHANKILL
SHEET 44
SHANGANAGH PARK
SHEET 45
SHEET 46
SHEET 47
SHEET 48
SHEET 49
SHEET 50
SHEET 51
SHEET 52
BRAY
M11
CRINKEN GLEN
WOODBROOK GLEN
OLD CONNAWOOD
RATHMICHAEL
Woodbrook Golf Links
Dargle View Golf Course

Appendix B. Drawings & Documents Supplied

Dwg No	Rev	Drawing Title
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0001 to 0054	L01	General Arrangement Plan Sheets 1 to 54
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0004	L04	General Arrangement Plan Sheet 4
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0039	L04	General Arrangement Plan Sheet 39
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0043	L04	General Arrangement Plan Sheet 43
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0008	L01	System Design – St Stephen Green South/ Leeson St/ Earlsfort Terrace
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0009	L01	System Design – Leeson St Lower/ Pembroke St/ Hatch St
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0010	L01	System Design – Leeson St Lower / Fitzwilliam Place / Adelaide Rd / Wilton Terrace
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0013	L01	System Design – Sussex Road/ Sussex Terrace Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0014	L01	System Design – Leeson St Upper/ Burlington Rd
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0017	L02	System Design – Leeson St Upper / Wellington Place Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0019	L01	System Design – Morehampton Rd / Bloomfield Avenue Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0022	L01	System Design – Donnybrook Road / Anglesea Rd / Beaver Row Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0029	L01	System Design – N11 Stillorgan Rd/ Mount Merrion Avenue
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0030	L01	System Design – N11 Stillorgan Rd/ Treesdale/ Trees Road
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0031	L01	System Design – N11 Stillorgan Rd/ Priory Drive/ Old Dublin Road
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0032	L01	System Design – N11 Stillorgan Rd/ Lower Kilmacud/ Stillorgan Pk
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0033	L01	System Design – N11 Stillorgan Rd/ Farmleigh Avenue/ Brewery Rd Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0040	L01	System Design – N11 Bray Rd/ Johnstown Rd Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0041	L01	System Design – N11 Bray Rd/ Cherrywood Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0042	L01	System Design – N11 Bray Road Southbound Slips/ Wyattviille Rd
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0043	L01	System Design – Loughlinstown Roundabout
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0044	L01	System Design – Dublin Rd/ Stonebridge Road Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0046	L01	System Design – Shanganagh Rd/ Beechfield Manor Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0047	L01	System Design – Dublin Rd/ Lower Rd

BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0048	L01	System Design – Dublin Rd/ Quinn Rd/ Cherrington Rd
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0049	L01	System Design – Dublin Rd/ M11 Slip Roads
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0050	L01	System Design – Dublin Rd/ Corke Abbey Avenue/ Old Connaught Avenue
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0051	L01	System Design – Dublin Rd/ Upper Dargle Road
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0052	L01	System Design – Donnybrook Rd/ Eglinton Road Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0053	L01	System Design – N11 Bray Road / Wyattviille Northbound Slips
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0054	L02	System Design – N11 Bray Road / Cherrywood Rd/Silver Tassie
BCIDB-JAC-ENV-LA-13-IN-00-DR LL-0001	L01	UCD BUS INTERCHANGE GENERAL ARRANGEMENT - Sheet 1 of 2
BCIDB-JAC-ENV-LA-13-IN-00-DR LL-0002	L01	UCD BUS INTERCHANGE GENERAL ARRANGEMENT - Sheet 1 of 2

Appendix C. Road Safety Feedback Form

ROAD SAFETY AUDIT FEEDBACK FORM

Scheme: BRAY TO CITY CENTRE BUS CORRIDOR

Audit Stage: Road Safety Audit Stage 1

Date Audit Completed: 30th August 2021

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
2.1.1	Yes	Yes	Ensure that all onto road level and off-road level cycle tracks (crossing junctions etc.) have appropriate ramp markings. Ramps now shown on all GAs at cycle lane to cycle track changes	
2.1.2	Yes	Yes	Noted, this should be reviewed at the Detailed Design stage. For preliminary design where cycle tracks and footpaths cross driveways and commercial premises, consideration has been taken of their interaction	
2.1.3	Yes	Yes	If pedestrian crossings are to be implemented as "walk with traffic", an audible signal will not be provided. A tactile signal indication will be provided instead to notify visually impaired users when it is safe to cross.	
2.1.4	Yes	Yes	All yield lines at junctions with cyclist-cyclist / cyclist-ped conflict should have associated yield markings. This will be focused on in final drawing production and checked again at Detailed Design stage.	
2.1.5	Yes	Yes	Ensure minimum cycle track behind bus stops of 1.5m. Narrowing of cycle tracks on approach to island bus stop layouts is to impress on cyclists that they are approaching an area of potential pedestrian interaction, and this has been agreed in the BusConnects Design Guide	
2.1.6	Yes	Yes	Ensure cycle track ramps are following the same rules throughout to maintain consistency: Distance between end of ramp and beginning of junction crossing point: 10m Distance between end of junction and beginning of ramp: 10m	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			Approach to side roads / uncontrolled crossings: 10m Recede from side roads / uncontrolled crossings: 5m Approach to pedestrian crossings (controlled): 2m Recede from pedestrian crossings (controlled) 0m (start ramp at and of crossing)	
2.1.7	Yes	Yes	We have attempted to minimise this risk through design. The intention is that the cycle signal heads will be orientated to distinguish which route it is intended for. It is difficult to fully appreciate any associated risk in this respect until the signals are positioned on site, at which point if it is found to be a problem further mitigation would be provided. This could be through signal sequencing so that cycle greens/red only appear at the same time (leading to safer but lesser provision for cyclists), the use of cowls/louvres to minimise viewing angles/see through or the addition of directional arrows on the signal indications. It is expected that this would be reviewed further at detailed design.	
2.1.8	Yes	No	Cycle movements are only specified to run alongside bus movements where a signal indication stating "ahead only" has been provided for the bus lane movement. A taxi or other vehicle wishing to turn left would be breaking traffic regulations under these scenarios and would, therefore, be expected to move into the adjacent lane prior to the junction stop line in order to make a legal left turn movement. Signage for this will be considered during the Detailed Design stage. This strategy is as per the BusConnects Design Guide. Where bus movements are allowed to turn left, cycle movements will be separated in the Phasing strategy.	Yes
2.1.9	Yes	Yes	The stop line markings for cycle tracks should be pushed back to allow for additional stacking room, when in proximity to other cycle track movements (two or three cycle lanes meeting at a junction	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			corner, for example). This is to be considered in detail during the Detailed Design stage.	
2.1.10	Yes	Yes	An Accessibility Audit of the route has been carried out, along with a Pavement Condition Analysis. These are feeding into the Pavement and Footpath designs which will detail areas in need of repair and maintenance to ensure they are of an acceptable standard for all road users.	
2.1.11	Yes	Yes	The design for the carriageway, cycle tracks and footpaths will ensure that there are no areas where ponding can occur, and that all areas of the public roadway and footpath will drain positively. This will be further addressed in the Detailed Design.	
2.1.12	Yes	No	Response as per 4.6.2. It is considered that visibility of appropriate signals is more critical than consistency (given we have sites where mast arms cannot be applied to both approaches (i.e., at pedestrian overbridges)	Yes
2.1.13	Yes	Yes	Both an Accessibility Audit and a Road Infrastructure Audit have been carried out to help inform the preliminary design. Where current street furniture is inconsistent with the BusConnects Design Guidance booklet, itself informed by DMURS, The National Cycle Manual, and other design guidance documents, these elements will be relocated to provide a more consistent and accessible design for all.	
2.1.14	Yes	Yes	As part of the next stage of cycle track and footpath design, common, lengthened dropped kerb locations should be considered as part of the Detailed Design.	
2.1.15	Yes	Yes	As part of the Detailed Design, the road marking designs shall take all side road and minor junctions into consideration	
3.1.1	Yes	Yes	Appropriate signage on the approach to the Hatch Street Lower junction, and in advance of the bus gate at Leeson Lane will be provided which will clearly state the times of operation. This will be	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			provided in the traffic sign design during Detailed Design.	
3.1.2	Yes	Yes	The design has been reviewed in light of the comment and it is considered that the road markings, in combination with the approach signage, will provide necessary information for motorists. At present drivers may turn either left or right from Hatch Street Lower into Leeson Street Lower, but not go straight ahead into Pembroke Street, and there is no change in these movements, only that a left turn is for local access only.	
3.1.3	No	No	The design simply provides for the proposed at-grade cycle lane in the design to be provided to a distance back along Pembroke Street, and does not imply that it ties into an existing cycle lane. It is acknowledged that the tie in can be detailed with a taper approach which shall be included at Detailed Design.	Yes
3.1.4	Yes	Yes	The southbound cycle lane on St Stephens Green East currently sits between two bus lanes, and we are proposing to relocate to the kerb side of the southbound carriageway on St Stephens Green East. This relocation of cycle track will be brought back as far as the current lane is in between two bus lanes.	
3.2.1	Yes	Yes	These have been added for the two-way cycle track on Wilton Terrace.	
3.2.2	Yes	No	This area is noted as a heavy conflict point between cyclists and pedestrians already due to the heavy footfall along Leeson Street and the Canal walkway, the two-way cycle track along the Canal and Wilton Terrace, and the pinch point at the western access to the Canal path. We have introduced a Pedestrian Priority Zone at this point to impress on cyclists that they need to reduce speed and be aware of their interactions here, and to give priority to pedestrians.	Yes
3.2.3	Yes	Yes	Swept path analysis has been carried out on this corner for rigid vehicles up to 12m, which can be accommodated, and a banana kerb has also been installed to protect cyclists against vehicle incursion	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			on this corner. Vehicles larger than a 12m rigid van are not able to make this manoeuvre without crossing the opposing lining.	
3.2.4	Yes	Yes	Right turns are banned for traffic at this junction. We have included jug turns now to cater for cyclists.	
3.2.5	Yes	Yes	Accepting the problem highlighted, implementation of this appropriate road marking will be undertaken as part of the Detailed Design.	
3.2.6	Yes	No	The design team have gone to considerable lengths to meet resident expectations here to retain the trees where possible. To improve the crossing space for accessibility while maintaining the tree the island has been reshaped. There is now a footpath width of 2.3m minimum to one side of the tree, and 2.6m to the other, both of which are greater than the minimum required, though we acknowledge that one side will have to have a signal pole located in it, which will be carefully positioned. Paving and tactile solutions will be addressed at the Detailed Design Stage to ensure enhancements to what is a currently operational crossing.	Yes
3.3.1	Yes	Yes	Ramp is moved to avoid blocking entrance	
3.3.2	Yes	Yes	NO ENTRY sign is now provided in the design to ensure traffic turning from Sussex Road to Leeson Street Upper is only allowed to travel northbound	
3.4.1	Yes	Yes	Swept path analysis has been carried out at all junctions to ensure vehicle movements can be made within the carriageway limits	
3.4.2	Yes	Yes	Directional arrows for cyclists at all junctions are to be provided as part of the Detailed Design road marking design.	
3.4.3	Yes	Yes	Cycle ramp outside No. 9 Wellington Place (approx. Ch. 1260) has been coordinated with a driveway cross over to ensure access is retained	
3.5.1	Yes	Yes	Detailing of the exact ramp location at Detailed Design stage will ensure that the table tops run across the whole desire line. In this location in	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			particular, the ramp down is in line with the wall along the front of the hotel property.	
3.5.2	Yes	Yes	Vehicle cross overs have been provided at all entrances to accommodate accesses between Ch.1350-1800 on the southern side of Morehampton Road.	
3.6.1	Yes	Yes	Yellow box has been included in the design.	
3.6.2	Yes	Yes	Where driveways are present, vehicle crossovers have been provided to ensure access is maintained to all properties	
3.6.3	Yes	Yes	The Parking Assessment Report has concluded that appropriate levels of parking are available on the adjacent side roads. Appropriate lining is to be designed at Detailed Design to discourage parking along this section of road. The cycle track will have a kerb between it and the carriageway, and appropriate messaging will be developed, city wide, to outline the necessary respect for cycle tracks. If the issue is noted post-opening, bollards may be considered appropriate here.	
3.6.4	Yes	Yes	All pedestrian crossings have been checked against the BusConnects Design Guide which stipulates that a direct crossing can be provided for crossings of up to 18m width. Green times have been assessed with crossing widths in mind.	
3.6.5	Yes	Yes	All uncontrolled side road crossings will have all necessary visual and tactile design elements included. These will be completed at the Detailed Design stage to ensure up to date standards are used.	
3.7.1	No	No	We accept that this is a reduced width cycle track at this constrained pinch point. While the cycle track at this location is 1.5m wide, this is in line with the BusConnects Design Guide, informed by the National Cycle Manual. This has undergone a number of design iterations to ensure the optimum layout for all modes of traffic at this pinch point, while keeping cyclist safety as the main priority.	Yes

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	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
3.7.2	Yes	Yes	The yellow box at the Fire Station is now included in the design.	
3.7.3	Yes	No	The right turning pockets are required at this junction, as opposed to dedicated right turn phases, as the junction is already over capacity in one of the peaks so cannot accommodate any other phases. It should be noted the only approx. 8 vehicles an hour turn right at this location into Victoria Ave so this is not considered a major issue by the junction design team.	Yes
3.7.4	Yes	Yes	The design has been revised to provide unimpeded access to this vehicle entrance, taking pedestrians and cyclists into account.	
3.7.5	Yes	Yes	The Accessibility Audit and Pavement Condition Report detail the areas in need of specific remediation, and the Detailed Design of the carriageway, cycle tracks and junctions will ensure that all drainage issues are resolved.	
3.8.1	Yes	No	Due to the nature of the site at this location, and the available footpath landing space on the northern footpath outside the bus depot, the stagger of this crossing is as designed. We cannot provide a straight through crossing as the island width would not allow it to be split into two separate movements safely and if we have it as one long crossing then the junction would be forced well over capacity. The stagger also has to be this way around to fit in the city bound cycle and bus lane otherwise they would have to cut them short and share the lane (it has already been ruled out removing the bus splitter island as this would make it almost impossible to signalise safely). The mitigation is to create a minor stagger so that the two crossings are obvious as separate facilities but at the same time try to reduce the impact of the right/ left stagger. We have also placed all pedestrian heads on the traffic approach side to encourage users to be looking in that direction.	Yes

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
3.8.2	Yes	Yes	A jug turn dwell area for cyclists should be provided on the Anglesea Road arm of the junction in front of the middle (straight ahead) lane. If not incorporated at this stage, this should be included in the Detailed Design road marking designs.	
3.8.3	Yes	Yes	Breaks in the kerbs separating the carriageway and cycle lane have been provided at these accesses, and the cycle lane is at grade along this length to enable easy cross over for vehicles.	
3.9.1	Yes	Yes	The cycle lane in this location is now at grade with the adjacent carriageway in front of the side road junctions with Donnybrook Close and The Court, with ramps from the cycle track level in advance of Donnybrook Close, and after The Court. Breaks are also provided in the separating kerb at the two junction locations.	
3.10.1	Yes	Yes	The parking width available here has been checked against the BusConnects Design Guide, and a sufficient buffer zone has been provided between the parking space and the cycle lane.	
3.10.2	Yes	Yes	The driveways to Nos. 10 &11 are located between the proposed bus stop and coach stop. The shelters for each have been moved as far away as possible in this area, though the necessary ramps for the cycle track at the coach stop is still in an unideal location for the access to No. 10. At Detailed Design a considerable level of attention should be given to these two entrances to maximise the offset from access to cycle track ramp, and the roadside kerbs will be detailed sufficiently to provide adequate access.	
3.10.3	Yes	Yes	The issue with the off road cycle track is noted. This will affect cyclists exiting the Stillorgan Road and entering RTE. Recommendation is for the detail at this junction to be revised during Detailed Design to provide a tie into the two-way element of off-road cycle track within RTE lands.	
3.11.1	Yes	Yes	Ramps now provided in the design to the cycle track at this location for the entrance into Thornfield.	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
3.11.2	Yes	Yes	This has been checked against the topographical survey and the pedestrian crossing does not conflict with the property entrance or gate.	
3.11.3	Yes	Yes	Yield road markings have been included on the cycle track approaches to the junction. The Detailed Design shall further ensure all road markings are provided in line with the up to date standards at the time of design.	
3.11.4	Yes	Yes	This access has been noted. There are two accesses to this property. The one on Nutley Lane outside of the junction footprint is to be maintained, while the one within the junction footprint on to Stillorgan Road is to be closed off as part of the Works.	
3.12.1	Yes	Yes	The bell mouth for Belfield Court has been reduced in size to ensure slower access/egress speeds from the development.	
3.13.1	Yes	Yes	STOP marking now included in the design at this location.	
3.14.1	Yes	Yes	There are no plans in the design to remove this parallel parking section from the side road. Markings outlining these parking spaces shall be added to the road marking plans during Detailed Design.	
3.15.1	Yes	Yes	Accepting the lack of current YIELD road markings to go along with the YIELD traffic sign, this issue will be raised with Dun Laoghaire Rathdown County Council as this is now outside of the scheme's red line boundary.	
3.16.1	Yes	Yes	A left turn arrow has been added to the design at the end of the two-way section of cycle track, indicating to southbound cyclists that they are to cross the Stillorgan Road and continue on the eastern cycle track.	
3.16.2	Yes	Yes	The green time for cyclists is during the same phase as the pedestrian crossings, so there will be sufficient time for cyclists to cross comfortably.	
3.16.3	Yes	Yes	The road markings have been revised here to ensure that there is no stop line to hinder the cyclists joining the eastern two-way cycle track so the	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			potential conflict with buses should now be removed.	
3.17.1	Yes	Yes	The cycle track stub now tapers into the main carriageway with sufficient stacking space if cyclists need to wait for a time to join the N31. A Yield road marking should be added to this cycle lane stub in advance of the merge into the main carriageway as part of the Detailed Design.	
3.17.2	Yes	Yes	Arrows have been added to the road markings on this section of cycle track to denote which lane is for right turning cyclists, and which is for straight ahead cyclists.	
3.18.1	Yes	Yes	This portion of cycle lane is proposed to merge into the existing carriageway as there is no cycle lane on Trees Road Lower and is not planned to have any separating kerb. As such the effective width once the junction is exited covers the width of the carriageway.	
3.18.2	Yes	Yes	Road markings have been revised here to provide two dedicated left turn lanes, and one combined straight and right turn lane.	
3.19.1	Yes	Yes	The Garda platform has been reinstated to the design	
3.19.2	Yes	Yes	The underpass is being retained in the design, and a new pedestrian crossing of the N11 added as well. There will be cycle access to the underpass via the ramps, or cyclists will have the option of crossing at grade at the toucan crossing.	
3.20.1	Yes	Yes	NO ENTRY road markings are now reinstated in the design on the off slip to Stillorgan Grove.	
3.20.2	Yes	Yes	These road markings are included in the design.	
3.20.3	Yes	Yes	These road markings are included in the design.	
3.21.1	Yes	Yes	Road markings have been included in the design to show two dedicated left turn lanes and one combined straight and right turn lane from Brewery Road in to Stillorgan Road.	
3.21.2	Yes	Yes	STOP road marking has been included for exiting traffic from Beachwood Court.	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
3.21.3	No	No	The cycle lane continues eastwards along Farmleigh Avenue, as opposed to tapering out, so no Yield marking considered necessary.	Yes
3.22.1	Yes	No	This junction is signalised so vehicles joining the N11 will only be signaled to do so once mainline car, bus and cycle traffic has been stopped on a red light. Drawings have been updated since the Audit to reflect this.	Yes
3.22.2	Yes	Yes	The bus stop at Ch.8030 has been relocated in the design so no longer blocks visibility to the pedestrian crossing signals.	
3.23.1	Yes	Yes	The pedestrian crossings of the cycle tracks around the Leopardstown Road junction have been designed as Pedestrian Priority Zones, with Stop lines for cyclists on the approach to the crossing point. As such, cyclists are required to give way to any pedestrians in this zone. This will be detailed further in the Landscaping plans at Detailed Design stage.	
3.24.1	Yes	Yes	Arrows have been added to the road markings on this section of cycle track to denote which lane is for right turning cyclists, and which is for straight ahead cyclists.	
3.24.2	Yes	Yes	The junction design has been undertaken with the property access in mind. The pedestrian crossing is now to the north of the property entrance. A separate stop line has been provided to the south of the property entrance to ensure that vehicles exiting while the southbound traffic has a red light will not cross into the junction, with a secondary signal head visible to a vehicle exiting from this property.	
3.24.3	Yes	Yes	This access will be maintained, and the design will have a similar dropped kerb arrangement as currently on place.	
3.25.1	Yes	Yes	These are included in the design.	
3.25.2	Yes	Yes	Gaps have been left in the cycle lane separation kerb here to allow for access and egress to/from the property. We acknowledge the concerns around the	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			cycle interaction for vehicles entering the property under mainline green lights but note that this is an issue in many other locations across the city where cycle lanes cross in front of property entrances.	
3.25.3	Yes	No	Due to the nature of the site at this location, and the property entrances that have to be accommodated alongside the pedestrian crossing and cycle crossings, the stagger of this crossing is as designed. We cannot provide a straight through crossing as the island width would not allow it to be split into two separate movements safely and if we have it as one long crossing then the junction would be forced well over capacity. The mitigation is to create a minor stagger so that the two crossings are obvious as separate facilities but at the same time try to reduce the impact of the right/ left stagger. We have also placed all pedestrian heads on the traffic approach side to encourage users to be looking in that direction.	Yes
3.26.1	Yes	Yes	These are included in the design.	
3.27.1	Yes	Yes	Access to the parking area will still be from Clonkeen Road, through the northernmost gap between the grass verge and the proposed new footpath alongside the cycle lane. There is no planned access from Cabinteely Way.	
3.27.2	Yes	No	While we accept that the stagger layout is not ideal, this is required at this crossing due to the skew of Clonkeen Road.	Yes
3.28.1	Yes	Yes	The section of footpath has been removed from between the cycle track and the carriageway at this location. There is still a grass verge between the carriageway kerb and cycle track.	
3.28.2	Yes	Yes	Lane guidance has been provided for this movement.	
3.29.1	Yes	Yes	Full road marking design will be covered in the Detailed Design stage.	
3.30.1	Yes	Yes	The section of footpath has been removed from between the cycle track and the carriageway at this	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			location. There is still a grass verge between the carriageway kerb and cycle track.	
3.31.1	Yes	Yes	NO ENTRY sign is now provided in the design to ensure traffic do not exit from the southern end of this access road.	
3.32.1	Yes	Yes	NO ENTRY road markings are now provided at all relevant arms of this junction.	
3.32.2	Yes	Yes	The cycle track widths are now consistent across the bridge.	
3.32.3	Yes	No	This localised narrowing is consistent with the approach taken at all island bus stops where the cycle track is narrowed to indicate to cyclists that they are entering an area of potential pedestrian interaction.	Yes
3.32.4	Yes	Yes	The EXCEPT BUSES road marking has now been moved to the near side left turn lane. The middle lane allows for right turning and straight ahead movements, and the off side lane is right turning only. Lane guidance markers should be considered at Detailed Design stage to direct straight ahead traffic to the off side lane of the southbound on slip to avoid conflict with straight ahead bus movements from the near side lane.	
3.33.1	Yes	Yes	NO ENTRY road markings have been added to the parallel side road.	
3.33.2	Yes	Yes	Cherrywood Road is currently an uncontrolled crossing. The design maintains the current traffic lights for cars and will ensure that dropped kerbs are provided either side of Cherrywood Road at Detailed Design for pedestrians to cross as they presently do.	
3.34.1	Yes	Yes	The two-way cycle track has been extended to the overall cycle track termination point beyond the Loughlinstown Roundabout on the Dublin Road.	
3.34.2	Yes	Yes	The road marking design has been updated for the roundabout.	
3.35.1	Yes	Yes	The entrance to Seaview has been reviewed and designed to be of appropriate size and corner radius, and the footpath space either side has been	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
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			maximised. A raised table is now also provided across the entrance for pedestrian crossings, and to reduce access and egress speeds of vehicles.	
3.36.1	Yes	Yes	This junction has been redesigned to cater for revised cycle movements and pedestrian crossings. The skew of Stonebridge Road and the impact this has on junction intervisibility is a constraint to the design.	
3.36.2	Yes	Yes	This junction has been redesigned to cater for revised cycle movements and pedestrian crossings. In doing so the sight lines available to drivers from stop lines on all arms have been checked and optimsed as far as possible taking all junction requirements and users into consideration. The skew of Stonebridge Road and the impact this has on junction intervisibility is a constraint to the design.	
3.36.3	Yes	Yes	The accesses to the three properties on the southwest corner of Stonebridge Road have been considered in detail during the design of the junction. Despite the need for a signal island to allow bus priority at this junction, access to and from each property has been designed, tracked, and checked. Engagement is also underway with the property owners.	
3.36.4	Yes	Yes	The vertical alignment design, and associated footpath and cycleway design in this area has taken consideration of the level constraints here.	
3.37.1	Yes	Yes	These road markings are included in the design.	
3.37.2	Yes	Yes	Following engagement and consultation with the local community, the impact of providing cycle infrastructure through Shankill Village was deemed not acceptable to the community. As such none is provided. Alternative routes for cyclists, that could be provided with signage and no other interventions, have been assessed and are available, though it is for the Client to instruct for these to be progressed.	

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	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
3.37.3	Yes	Yes	This problem is accepted and the inclusion of either a yellow box or Keep Clear markings is to be implemented at the Detailed Design stage in the road marking design.	
3.38.1	Yes	Yes	A yellow box is now provided in the road marking design at the unsignalised junction for Cluain na Greine Court.	
3.38.2	Yes	Yes	We confirm that the parking at this location is not due to be affected by the design so alternative parking is not required.	
3.39.1	Yes	No	These islands, and the associated signals, are no longer in the design, so recommended measures not required.	Yes
3.40.1	Yes	Yes	A taper has been provided to the end point of this cycle lane, along with a Yield marking to ensure cyclists safely merge with the main carriageway.	
3.40.2	Yes	Yes	Crossings have been provided where necessary. Along this stretch of road there are a number of trip attractors, namely Shanganagh Park and Shanganagh Cemetery, which are both part of a wider masterplan improvement. The design is also taking the proposed housing development at Shanganagh Castle into account, and the access required for St. Joseph's Nursing Home. To accommodate all of the above, and to ensure that bus users are able to access these facilities from both sides of the road, and to manage car speeds along this stretch the number of crossings is not considered to be excessive.	
3.41.1	Yes	Yes	This has been discussed with the property owners and the intention is to relocate their entrance on to Woodbrook Downs.	
3.42.1	Yes	Yes	The road marking design has been reviewed and guide lines have been provided to ensure drivers are directed to the correct lane.	
3.42.2	Yes	Yes	The design has since been updated to resolve this issue.	
3.43.1	Yes	No	The design for this junction now includes a full cycle layout so jug turns not necessary.	Yes

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	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
3.44.1	Yes	Yes	A Pedestrian Priority Zone has been provided at the point where the new cycle track joins the existing one, and where they cross over the footpath. Appropriate corduroy paving will be provided during the Detailed Design stage landscaping design.	
3.44.2	Yes	Yes	The junction has been redesigned to remove the left turn slip in to Upper Dargle Road and replace with a standard T junction. This approach will aid against the risk of overturning tall vehicles by removing the slip road bend. The existing and proposed grades from the turn from Dublin road in to Upper Dargle Road have been checked and are no steeper than currently provided.	
3.45.1	Yes	No	The relocation of the pedestrian crossing has been carried out to allow a number of wider scheme objectives to be met and has been considered in some detail. It also moves the crossing closer to the main Dwyer Park approach, and closer to the main Shopping Centre entrance off Castle Street.	Yes
3.46.1	Yes	No	Of the two possible crossing points either side of Stonebridge Lane, this was considered the most appropriate for access to the school and to avoid locating it midway along the layby. It is not possible to reduce the layby provision here as it is required for school drop offs and for utilities maintenance access.	Yes
4.1.1	No	No	Signal arrangement has been set up to manage the two conflicting movements in the northbound direction between the bus lane and the general traffic lane. The nearside secondary is for buses only so if it is obscured by buses the general traffic should not be proceeding anyway. If the nearside signal referred is the one located on pole 12 then this is the nearside primary and has been provided as a legal requirement and to allow two heads to be placed side by side in order to allow motorists to better differentiate between the	Yes

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	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			distinct bus movement and the adjacent general traffic movement, given they are proceeding in the same direction but in conflicting movements. an offside primary signal (on pole 11) and a closely associated offside secondary signal (on pole 10) have been provided to give clear visibility of a signal indication if the legal nearside signal is being masked by a bus. Note, the bus stop line has been set back to further reduce the risk of signal masking and to also provide better visibility of cyclists at the stop line.	
4.2.1	Yes	Yes	Junction layout has been amended and secondary signal positions updated.	
4.2.2	Yes	Yes	Junction layout has been amended and secondary signal positions updated.	
4.3.1	Yes	Yes	This is an operational issue that can be resolved at detailed design.	
4.4.1	Yes	Yes	The offside primary on pole 10 and the bus lane set back have been provided to help mitigate any issue. The vegetation problem will be noted in the reporting to be captured at detailed design.	
4.5.1	No	No	The length of the crossings are provided within the parameters set out by the project and appropriate clearances have been applied in the modelling as per national standards.	Yes
4.5.2	Yes	No	Swan Place was considered within the signal strategy but it was determined that it would be unfeasible to signalise the approach. It is considered a private access as it leads to a few private properties and the flow is expected to be very low. As with a number of private properties in built-up environments it is difficult to cater for their conflicts within a signalised junction, in this case it would not be possible to implement a one-way system or widening to develop an appropriate two-way solution for signalisation. Vehicles exiting the road would be expected to proceed with caution and at low speed based on the physical layout of the approach and tie into the junction. It is also	Yes

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			noted that Swan Place is currently un-signalised within the existing signalised arrangement.	
4.6.1	No	No	An RTS 003 signal is necessary as the designer considers the conflict between the left turn general traffic and adjacent buses in the nearside lane would benefit from a clear left turn signal indication to notify general traffic left turners when it is safe to proceed without conflict. It is considered that a full green aspect without the left turn signal could lead to driver hesitation and greater risk of shunting. The ahead signal indication instead of the full green aspect is simply expected to give motorists greater confidence in which direction they can proceed without conflict.	Yes
4.7.1	No	No	The length of the crossings are provided within the parameters set out by the project and appropriate clearances have been applied in the modelling as per national standards.	Yes
4.7.2	Yes	No	The design team agrees with the audit team's concern regarding the use of left turn flashing ambers for vehicular traffic running concurrently with ahead cyclists, however, this arrangement is intended to be rolled out across Dublin as per the latest version of the BusConnects Design Guide. The design team has taken the approach that, subject to the angle of view between motorists and cyclists being acceptable, and left turn flows being sufficiently low, this arrangement could be operated safely and would provide greater opportunities for cyclists to proceed. Both requirements are considered to be met at this location. It should be noted that cyclists are always given a fully protected movement at some point in the phasing plan to aid less confident cyclists. Note, it is not intended for the cycle movement to be given a flashing amber, this is simply shown in the phasing plan to emphasise the conflict, the cycle signal would be a solid green.	Yes Appropriate Warning signage should be considered at Detailed Design Phase along with Driver/ Cyclist Awareness programmes to reinforce the existing road regulations and ensure road users proceed with caution

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
4.8.1	No	No	Cycle signal movement 8 is not conflicting with cycle signal movement 11 as cyclists from movement 8 may wish to proceed through the stop line associated with movement 11 and would therefore be expected to join a queue. Movement 8 would potentially conflict with cycle signal movement 9 (southbound approach to junction), but movement 9 has a cycle give way marking at the conflict point.	Yes
4.8.2	No	No	The southbound approach has been provided with a mast arm signal as the splitter island separating the bus lane from the left turn movement from the adjacent general traffic lane does not have sufficient width to accommodate the traffic signals and their required clearances. This may be rectified at detailed design to remove the need for the mast arm. Notwithstanding, under the current arrangement the mast arm is required here to provide advance forward visibility of the different movements on the approach, in case the nearside primary is masked by a bus. For the northbound movement, the bus lane and general traffic lanes run together so the double height nearside primary signals coupled with the offside primary and secondary signals is considered to provide appropriate visibility for all traffic lanes associated with the signals. It is considered that visibility of appropriate signals is more critical than consistency (given we have sites where mast arms cannot be applied to both approaches (i.e. at pedestrian overbridges).	Yes
4.8.3	Yes	Yes	This is a minor display error that will be resolved at the Detailed Design stage.	
4.9.1	Yes	No	It is agreed that separating the stages would improve safety but running them together is not considered inherently unsafe. The junction is expected to operate close to capacity under the proposed staging, separating the movements forces	Yes

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			the junction significantly over capacity. Notwithstanding the junction modification, the existing arrangement has the two movements operating together so the vast majority of users would be aware of how the junction operates in this regard.	
4.10.1	Yes	No	The design team agrees with the audit team's concern regarding the use of left turn flashing ambers for vehicular traffic running concurrently with ahead cyclists, however, this arrangement is intended to be rolled out across Dublin as per the latest version of the BusConnects Design Guide. The design team has taken the approach that, subject to the angle of view between motorists and cyclists being acceptable, and left turn flows being sufficiently low, this arrangement could be operated safely and would provide greater opportunities for cyclists to proceed. Both requirements are considered to be met at this location. It should be noted that cyclists are always given a fully protected movement at some point in the phasing plan to aid less confident cyclists. Note, it is not intended for the cycle movement to be given a flashing amber, this is simply shown in the phasing plan to emphasise the conflict, the cycle signal would be a solid green.	Yes Appropriate Warning signage should be considered at Detailed Design Phase along with Driver/ Cyclist Awareness programmes to reinforce the existing road regulations and ensure road users proceed with caution
4.11.1	Yes	Yes	The design team agrees with the audit team's concern regarding the use of left turn flashing ambers for vehicular traffic running concurrently with ahead cyclists, however, this arrangement is intended to be rolled out across Dublin as per the latest version of the BusConnects Design Guide. The design team has taken the approach that, subject to the angle of view between motorists and cyclists being acceptable, and left turn flows being sufficiently low, this arrangement could be operated safely and would provide greater opportunities for cyclists to proceed.	

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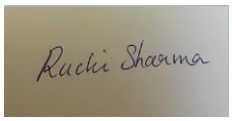
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			Note, it is not intended for the cycle movement to be given a flashing amber, this is simply shown in the phasing plan to emphasise the conflict, the cycle signal would be a solid green. However, following review of this junction and the potential for increased left turn flow due to road closures further upstream, the flashing amber arrangement has been removed.	
4.12.1	Yes	No	The design team agrees with the audit team's concern regarding the use of left turn flashing ambers for vehicular traffic running concurrently with ahead cyclists, however, this arrangement is intended to be rolled out across Dublin as per the latest version of the BusConnects Design Guide. The design team has taken the approach that, subject to the angle of view between motorists and cyclists being acceptable, and left turn flows being sufficiently low, this arrangement could be operated safely and would provide greater opportunities for cyclists to proceed. Both requirements are considered to be met at this location. It should be noted that cyclists are always given a fully protected movement at some point in the phasing plan to aid less confident cyclists. Note, it is not intended for the cycle movement to be given a flashing amber, this is simply shown in the phasing plan to emphasise the conflict, the cycle signal would be a solid green.	Yes Appropriate Warning signage should be considered at Detailed Design Phase along with Driver/ Cyclist Awareness programmes to reinforce the existing road regulations and ensure road users proceed with caution
4.13.1	Yes	No	The design team agrees with the audit team's concern regarding the use of left turn flashing ambers for vehicular traffic running concurrently with ahead cyclists, however, this arrangement is intended to be rolled out across Dublin as per the latest version of the BusConnects Design Guide. The design team has taken the approach that, subject to the angle of view between motorists and	Yes Appropriate Warning signage should be considered at Detailed Design Phase

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			cyclists being acceptable, and left turn flows being sufficiently low, this arrangement could be operated safely and would provide greater opportunities for cyclists to proceed. Both requirements are considered to be met at this location. It should be noted that cyclists are always given a fully protected movement at some point in the phasing plan to aid less confident cyclists. Note, it is not intended for the cycle movement to be given a flashing amber, this is simply shown in the phasing plan to emphasise the conflict, the cycle signal would be a solid green.	along with Driver/ Cyclist Awareness programmes to reinforce the existing road regulations and ensure road users proceed with caution
4.14.1	Yes	Yes	The design has been updated.	
4.142	Yes	Yes	The design and signal phasing has been updated.	
4.15.1	Yes	No	No problems identified in the modelling between the interaction of the midblock crossing at A 14160 and the roundabout, so no changes are recommended at this stage of the design process. Facilities to enable linking can be added at detailed design to allow flexibility in operation as necessary.	
4.15.2	Yes	Yes	This is a minor display error that will be resolved at the Detailed Design stage.	
4.16.1	No	No	No concern from the design team as the right turn movement operates as give way to opposing traffic until the RTIGA is run in Phase B allowing the right turn to proceed without conflict. This is standard practice for signal operation and the designer does not consider the arrangement at this location to preclude this operation on safety grounds. The symbol for the right turn in the staging diagram has minor dashes in Phase A to represent the give way movement, if this is the concern then it can be resolved at the Detailed Design stage.	Yes
4.16.2	No	No	No concern with operation of the junction as per response in item 4.15.1.	Yes

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			A right turn lane was considered by the geometry designer but ruled out based on site constraints and alignment problems. Modelling suggests the short right turn pocket will not be a problem for capacity.	
4.17.1	No	No	While an entrance to the property is located there it is not currently in use, access is taken from Ravenswell Link Road. Existing signal pole to the Educate Together entrance to be brought back in to plans if in use. Further engagement with the landowners will be required to assess the need for a signal or not during the Detailed Design stage.	Yes
4.18.1	Yes	Yes	Agreed, the signal designer had assumed a kerbed section would be provided to physically separate the movements but this has been removed in the latest iteration of the designs. Phasing can be amended at detailed design to remove the bus movement from Phase C, this is not expected to have any significant impact on bus progression due to the close proximity and operation of the adjacent junction at Beaver Row.	
4.18.2	Yes	Yes	The design team agrees with the audit team's concern regarding the use of left turn flashing ambers for vehicular traffic running concurrently with ahead cyclists, however, this arrangement is intended to be rolled out across Dublin as per the latest version of the BusConnects Design Guide. The design team has taken the approach that, subject to the angle of view between motorists and cyclists being acceptable, and left turn flows being sufficiently low, this arrangement could be operated safely and would provide greater opportunities for cyclists to proceed. However, following review of this junction the left turn flow has been deemed too high and the flashing amber has, therefore, been removed.	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
4.19.1	Yes	Yes	It was assumed by the signal team that zebra crossings were being retained and formal signals were to be provided at detailed design as per NTA requirements, however, the road markings and signal arrangements are now inconsistent. This is considered a relatively minor amendment to the design which can be picked up at the Detailed Design stage.	
4.20.1	No	No	The conflict identified is two minor movements with very low vehicle numbers running together, the northbound movement would give way to the opposing southbound movement as per standard priority situations. Separating the movements will lead to capacity problems and significant lost time in the junction operation.	Yes
5.1.1	Yes	Yes	Change Yield to Stop	
5.1.2	Yes	Yes	Arrow and not "except buses" will be added on approach to the shared street	
5.1.3	No	No	The bollards have been requested as a security measure by UCD. We understand that the default position for these will be open, and that they would only be closed during a major event on campus. While we consider the risk of a bus parked in the closest cage blocking visibility to these bollards during these infrequent events to not be a major risk, we can request the bus cage positioning be reviewed further during the Detailed Design stage.	Yes
5.1.4	Yes	Yes	Change Yield to Stop to the road to the north and the road carriage is now a free flow.	
5.1.5	Yes	No	Dashed marking will be used instead of a full solid marking. A review will be carried out during Detailed Design to ensure all road markings are up to the standards current at that time.	
5.2.1	Yes	Yes	STOP marking will be added before the controlled crossing	
5.2.2	Yes	No	Segregation of pedestrian and cyclists within UCD is not considered appropriate, nor in line with the general approach within UCD for internal mobility.	Yes

Signed: 

……..……..……..……..Designer

Signed: 
……..……..……..……..Employer

Signed: ….. 

……..Audit Team Leader

Appendix D. Supplementary Audit: Drawings & Documents Supplied

Dwg No	Rev	Drawing Title
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0008	L04	General Arrangement Plan Sheet 8
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0013	L04	General Arrangement Plan Sheet 13
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0014	L04	General Arrangement Plan Sheet 14
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0041	L04	General Arrangement Plan Sheet 41
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0042	L04	General Arrangement Plan Sheet 42
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0043	L04	General Arrangement Plan Sheet 43
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0045	L04	General Arrangement Plan Sheet 45
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0049	L04	General Arrangement Plan Sheet 49
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0051	L04	General Arrangement Plan Sheet 51
BCIDB-JAC-GEO_GA-0013_XX_00-DR-CR-0052	L04	General Arrangement Plan Sheet 52
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0008	L02	System Design – St Stephen Green South/ Leeson St/ Earlsfort Terrace
BCIDB-JAC-TSM-_SJ-0013_XX_00-DR-TR-0010	L02	System Design – Leeson St Lower / Fitzwilliam Place / Adelaide Rd / Wilton Terrace
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0017	L02	System Design – Leeson St Upper / Wellington Place Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0052	L02	System Design – Donnybrook Rd/ Eglinton Road Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0027	L02	System Design – N11 Stillorgan Rd/ Belfield Pk/ The Rise Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0033	L02	System Design – N11 Stillorgan Rd/ Farmleigh Avenue/ Brewery Rd Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0044	L02	System Design – Dublin Rd/ Stonebridge Road Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0050	L02	System Design – Dublin Rd/ Corke Abbey Avenue/ Old Connaught Avenue
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0052	L02	System Design – Donnybrook Rd/ Eglinton Rd
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0054	L02	System Design – N11 Bray Road / Cherrywood Rd/Silver Tassie
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0056	L02	System Design – Dublin Road / Woodbrook Junction
BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0057	L02	System Design – Dublin Road / Chapel Lane Junction

BCIDB-JAC-TSM_SJ-0013_XX_00-DR-TR-0058	L02	System Design – Dublin Road / Oldcovar Junction
BCIDB-JAC-ENV-LA-13-IN-00-DR LL-0001	L04	UCD BUS INTERCHANGE GENERAL ARRANGEMENT - Sheet 1 of 2
BCIDB-JAC-ENV-LA-13-IN-00-DR LL-0002	L04	UCD BUS INTERCHANGE GENERAL ARRANGEMENT - Sheet 1 of 2

Appendix E. Supplementary Audit - Road Safety Feedback Form

ROAD SAFETY AUDIT FEEDBACK FORM

Scheme: BRAY TO CITY CENTRE BUS CORRIDOR

Audit Stage: Road Safety Audit Stage 1 (Supplementary Audit)

Date Audit Completed: 26th November 2021

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
6.1.1	Yes	Yes	A jug turn will be included for southbound cyclists. This will be incorporated during the Detailed Design.	
6.1.2	Yes	Yes	Four lanes (two right turn, one straight ahead, one left turn) to be shown on the road markings. It is not intended to deviate from the current lane numbers. This will be incorporated during the Detailed Design.	
6.1.3	Yes	Yes	Yellow box markings to be shown on north and southbound carriageways on Donnybrook Road opposite Eglinton Road. This will be incorporated during the Detailed Design.	
6.1.4	Yes	Yes	A break in the kerb will be provided opposite Eglinton Road. The cycle track is already at grade at this location. This will be incorporated during the Detailed Design.	
6.1.5	Yes	Yes	Ramps to come up to footpath level, similar to those on the other side of the road, will be included for northbound cyclists. This will be incorporated during the Detailed Design.	
6.2.1	Yes	Yes	Pedestrian crossings are to be as shown on drawing BCIDB-JAC-ENV_LA 13 IN_00 DR LL 0001. The GAs are to be updated to reflect this. This will be incorporated during the Detailed Design.	
6.2.2	Yes	Yes	The road marking design shall be updated at Detailed Design to ensure all appropriate road markings are provided, including these highlighted STOP markings.	
6.2.3	Yes	Yes	Swept path analysis of the bus interchange has been carried out.	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
6.3.1	Yes	Yes	The Detailed Design for this area will ensure that the pedestrian desire line is carried across the raised tabletop, and not along the ramped section.	
6.4.1	Yes	Yes	The section of the grassed verge alongside the raised tabletop is to be changed to footpath. This will be done during the Detailed Design.	
6.5.1	Yes	Yes	This will be adjusted at Detailed Design to provide a continuous raised tabletop for the crossing cycle track.	
6.6.1	Yes	No	This junction has had considerable attention given to it relating to cyclist movements, particularly how eastbound cyclists will carry on their journey, and where the optimum crossing point should be. At Detailed Design stage the use of detectors will be considered for approaching cyclists to trigger the lights to stop cars and provide a safe carriageway crossing environment. The Designer considers this sufficient to not require a pelican crossing at this location.	Yes
6.7.1	Yes	Yes	The Detailed Design for this area will ensure that the pedestrian desire line is carried across the raised tabletop, and not along the ramped section.	
6.7.2	No	No	This tie in has been designed to tie in to the proposed and approved Wicklow County Council pedestrian and cycle bridge scheme.	Yes
6.8.1	No	No	It replicates the existing signal operation and is used to advise of a merge downstream.	Yes
6.9.1	No	No	It is located on the nearside adjacent to the stop line, as per the existing arrangement. An additional offside secondary could be considered on Pole 13 and/or at Pole 4.	Yes
6.9.2	No	No	This advanced stop line has been specifically added for confident cyclists who wish to use the carriageway rather than the dedicated cycle tracks to make the right turn.	Yes
6.10.1	Yes	Yes	A dropped kerb will be provided to allow cyclists to enter the Toucan Crossing.	
6.11.1	Yes	Yes	Pedestrian crossing places over two-way cycle tracks will have some form of signalisation added to	

Paragraph No. in Report	To Be Completed by the Design Team			To Be Completed by the Audit Team
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
			allow pedestrians to cross without conflict, but this is still to be confirmed project wide. The decision on equipment will be made and updated during detailed design.	
6.11.2	Yes	Yes	It is assumed that cyclists would manage conflicts between themselves as per a give way to opposing cyclists situation, however, if this is found to be a significant concern either at detailed design or implementation on-street then the northbound cycle movement could be removed from phase F.	
6.12.1	No	No	We had difficulty accommodating the bus splitter island if placed the other way. Although not the preferred arrangement it is not a precluded arrangement and NMUs should only cross when it is safe to do so (i.e. during a pedestrian green signal).	Yes
6.12.2	Yes	Yes	Lane guidance road markings will be provided.	
6.13.1	Yes	Yes	Bus lane guidance markings will be provided through the junction to delineate the available lane space.	
6.14.1	Yes	Yes	The small island will be adjusted to avoid swerving or impact issues.	
6.14.2	No	No	During signal phase A it would be on red. It is required for signal phase B to meet appropriate visibility requirements. RTS003 is inappropriate as this would indicate a dedicated movement for the right turn, whereas vehicle must yield to opposing traffic.	Yes
6.14.3	Yes	Yes	Southbound cycle movements will be removed from phase E.	
6.14.4	Yes	Yes	These were kept red to prevent queuing cyclists from hindering pedestrian movements but can be added in if this is not considered a problem. Suggest it is reviewed at detailed design.	
6.15.1	Yes	Yes	The crossing over Eglinton Road can be converted to a Toucan.	
6.16.1	Yes	Yes	Dashed line to be added to phasing diagram	
6.16.2	Yes	Yes	The crossing on the north side can be converted to a Toucan with appropriate lead in ramps added.	

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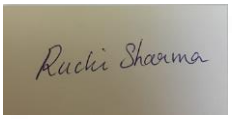
	Problem accepted (yes/no)	Recommended measure accepted (yes/no)		Problem accepted (yes/no)
6.17.1	Yes	Yes	Yellow box markings will be provided.	
6.18.1	No	N/A	This element is outside the scope of the interchange and part of UCD masterplan design. At this location all that the proposed Bray to city centre CBC scheme is carrying out in the improvement of the flexible pavement.	Yes
6.19.1	Yes	Yes	Slatted covers will be specified at these signal heads as part of the Detailed Design Specification	



Signed: …… ……..Designer

Signed: ……..Employer

Signed: ……..Audit Team Leader