Stage 1 Road Safety Audit

South Circular Rd to Bishops Quay Cycle Lane, Limerick City

On behalf of Limerick City & County Council

Prepared By:

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September 2022

Civil
Structural
Traffic

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Document History

Revision	R0	R1	R1	R2	R2				
Purpose of Issue: P=Preliminary PG=Progress C=Comment I=Information PL=Planning T=Tender CN=Construction	C	C	I	C	PL				
Date:	18 06 21	22 06 21	13 10 21	15 08 22	02 09 22				
Originator:	SS	SS	SS	SS	SS				
Checked By:	PJG	PJG	PJG	PJG	PJG				
Approved By:	SS	SS	SS	SS	SS				

1. INTRODUCTION

1.1. This report describes a Stage 1 Road Safety Audit carried out on behalf of Limerick City & County Council on proposals to introduce a cycle network between the Crescent Shopping Centre off South Circular Road and Bishops Quay, Limerick.

1.2. The audit was carried out between 28th July – 15th August 2022

1.3. The audit team were as follows:

Team Leader:

Stuart Summerfield, HNC (Civil) FCIHT FSoRSA
Certificate of Competency in Road Safety Audits (SoRSA, 2015)
TII Auditor Ref. SS73290

Team Member:

PJ Gallagher. BEng M.Inst.A.E.A
TII Auditor Ref. PG3425716

1.4. The audit comprised an examination of the drawings relating to the scheme supplied by the design office. A site visit was carried out by both Audit Team members together on 2nd August 2022 between the hours of 11:00 and 15:00. Weather conditions during the inspection were generally fine with occasional light drizzle and the road surface was dry. Photographs were taken during the inspection.

1.5. This Stage 1 audit has been carried out in accordance with the relevant sections of the Transport Infrastructure Ireland (TII) Publication (Standard) GE-STY-01024 (Dec 2017) 'Road Safety Audit'. The audit team has examined only those issues within the design relating to the road safety implications of the scheme and has therefore not examined or verified the compliance of the design to any other criteria.

1.6. Appendix A describes the documents examined by the Audit Team.

1.7. All of the problems described in this report are considered by the audit team to require action in order to improve the safety of the scheme and minimise accident occurrence.

2. ITEMS RESULTING FROM PREVIOUS STAGE 1 AUDIT

A previous Stage 1 RSA was undertaken in October 2021. The scheme has been substantially redesigned since this previous Stage 1 RSA was undertaken and therefore it has been deemed by the client that a new audit is required. Reference to the previous audit findings and agreed outcomes are included in Section 3. Where the findings from the previous audit remain relevant, and the problem remains in the revised design, the problem and recommendation have been carried forward to Section 4 of this report.

3. ITEMS RESULTING FROM THE PREVIOUS STAGE 1 AUDIT

3.1 General Problems / Problems at Multiple Locations

3.1.1 Two-way Cycle Facility

Problem: The scheme incorporates a two-way cycle facility to one side of the carriageway with numerous junctions and accesses across the facility.

Hazard: Users emerging from side roads and private driveways may not expect to encounter contra-flow cyclists. The user may proceed from the junction into the path of the contra-flow cyclist.

Recommendation: Amend the design such that cyclists travel in the same direction and the same side as the main carriageway user.

Stage 1 Feedback Form:
The recommendations were rejected by the design team as the options assessment process undertaken had identified the two-way provision as the preferred option.
This has been agreed by the audit team.

3.1.2 Two-way Cycle Facility - Access

Problem: The scheme generally incorporates a two-way cycle facility to one side of the carriageway. It is not clear how southbound cyclists are intended to access/egress the facility at all of the junctions on the route.

Hazard: Cyclists may cut across the path of motorised traffic in order to access. Impact with the motorised user may result.

Recommendation: Amend the design such that cyclists travel in the same direction and the same side as the main carriageway user.

Stage 1 Feedback Form:
The recommendations were rejected by the design team as the options assessment process undertaken had identified the two-way provision as the preferred option.
This has been agreed by the audit team.

3.1.3 Contra-flow Cyclists

Problem: The contra-flow cyclist on two way cycle facility is shown travelling in between the opposing motorist and cyclists. This is NOT in compliance with the National Cycle Manual approach and may be confusing to regular cyclists familiar with contra-flow systems elsewhere. Furthermore, the risk of head-on collisions with motorised traffic is increased due to the closer proximity of the opposing motorist.

Hazard: Head-on collisions with other cyclists and/or motorised traffic.

Recommendation: Ensure the contra-flow cyclist is position**ed** furthest from the motorist.
(This would have the cyclist cycling on the right side of the cycle lane which would be contrary to the norm with cycling on the left of the roadway; this might create confusion – See Problem 3.2.2).

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.1.4 Cycle Facility Width

Problem: The cycle lanes are generally narrow, with the two-way facility indicated as 2.0m in some areas. Cyclists generally require far greater width to account for wobble, overtaking other cyclists and clearance to opposing traffic.

Hazard: Impact with opposing cyclists may result.

Recommendation: Provide greater width for cyclists in both directions.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.1.5 South Circular Road – Car Parking

Problem: The proposals involve removal of the majority of existing car parking from South Circular Road. There is no alternative parking indicated on the drawings.

Hazard: Cars parked by house occupants may continue to park in the general area of their residence. This may be on the reduced width carriageway or footpath. The cyclists may be required to enter the opposing traffic lane to pass the parked vehicle. Impact with opposing traffic may result.

Recommendation: Adequate car parking should be provided in close proximity to the existing parking demand.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2 Problems at Specific Locations

3.2.1 St Nessan's Road / Ballinacurragh Road

Problem: The existing southbound cycle lane to the east of Ballinacurragh Road is not shown on the drawings. It is likely the majority of southbound cyclists will make use of this lane and not the proposed lane to the west of the road. Northbound cyclists are likely to become complacent and make use of the full cycle facility to the west of the road.

Hazard: Occasional southbound cyclists who decide to make use of the facility on the western side of the road are at risk of impact from opposing cyclists.

Recommendation: Omit the southbound facility to the west of the road.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.2 St. Nessans Road – Start of Cycle Facility

Problem: The cycle facility is shown starting at the existing bus stop (it is not clear how cyclists are intended to get to this point) with cyclists passing in-between the bus shelter and the bus bay.

Hazard: Passengers alighting the bus are at risk of impact from passing cyclists.

Recommendation: Commence the cycle facility to the north of the bus stop.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.3 Ballinacurragh Road

Problem: Northbound cyclists are required to ride up a steep hill. Some users will achieve higher speeds than others here and attempt to overtake slower moving users. Insufficient width seems to be available for safe overtaking.

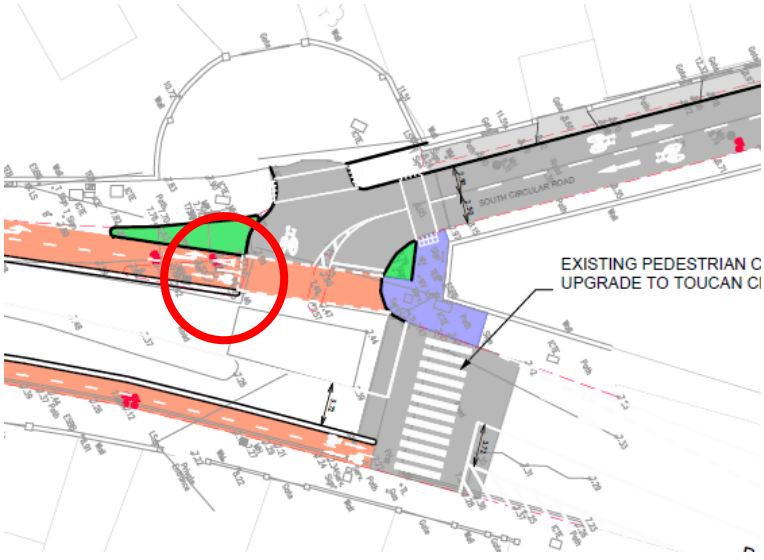
Hazard: Users may enter the opposing cycle lane in order to overtake. Impact with opposing cyclists may result.

Recommendation: Ensure adequate width is provided.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.4 Ballinacurragh Road / South Circular Road Junction

Problem: Northbound cyclists are advised to yield at the junction. It is unclear who these cyclists are meant to yield to.



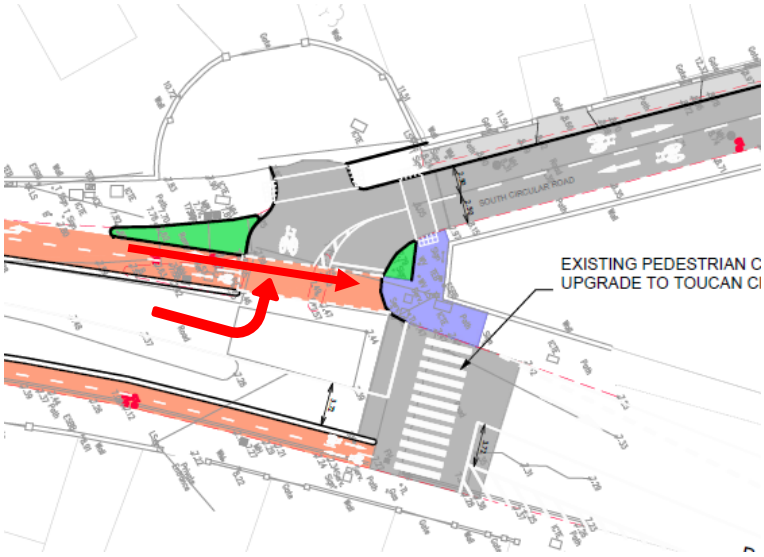
Hazard: Some cyclists may slow/stop at the yield symbol and be subject to rear end collisions from other cyclists.

Recommendation: Omit the yield markings. See also 3.3.5 below.

Stage 1 Feedback Form : The recommendation has been agreed by the design team.

3.2.5 Ballinacurragh Road / South Circular Road Junction – Left Turning Motorists

Problem: There is a 'yield' symbol shown to northbound cyclists arriving at the junction. However the cyclist may proceed straight through the junction at the same time as Ballinacurragh motorists turn left into South Circular Road.



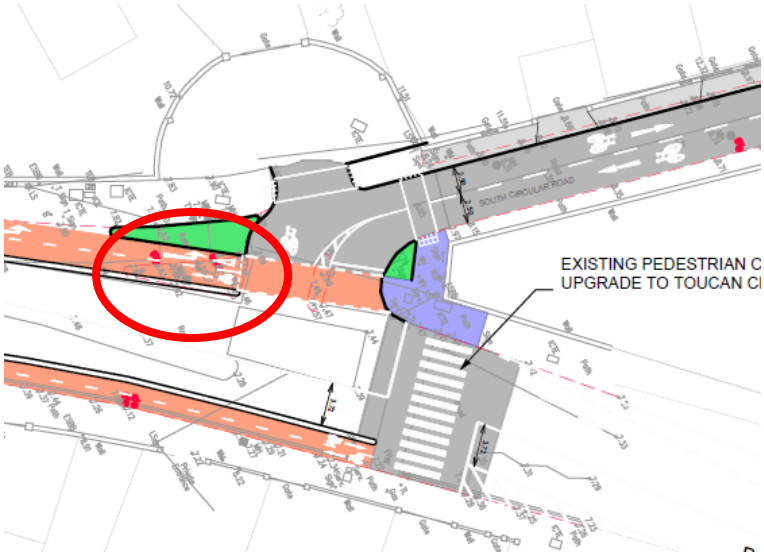
Hazard: Cyclists / motorist impacts may result.

Recommendation: Adjust the road layout such that cyclists are introduced into the Ballinacurragh main carriageway in advance of the junction, whereby it is obvious to the motorist that the cyclists may proceed though the junction.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.6 Ballinacurragh Road / South Circular Road Junction

Problem: It is not clear how southbound cyclists are meant to access the cycle lane to the west of Ballinacurragh Road.



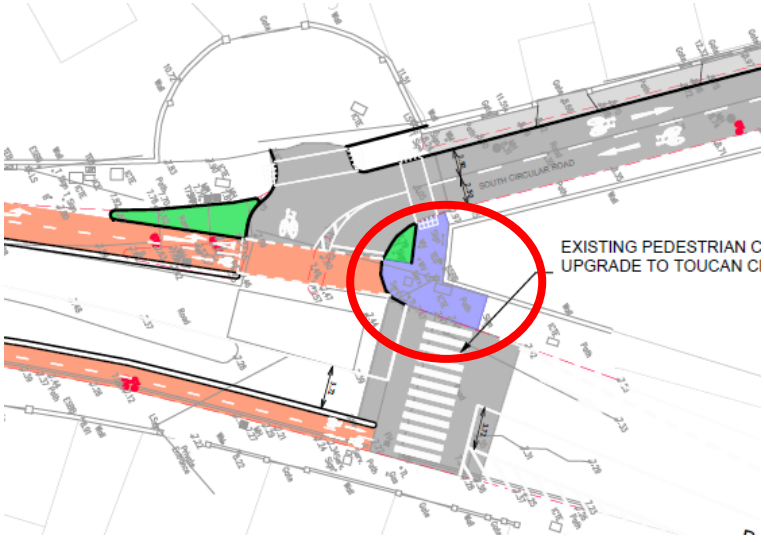
Hazard: There is risk that cyclists on Ballinacurragh Road or South Circular Road will cut across and in front of motorised traffic in order to access the cycle lane.

Recommendation: Omit the southbound cycle lane to the western side of the road.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.7 Ballinacurragh Road / South Circular Road Junction

Problem: Cyclists are directed onto a shard surface / footpath at the junction. Cyclists wishing to continue north-west on Ballinacurragh Road are directed onto the existing footpath.



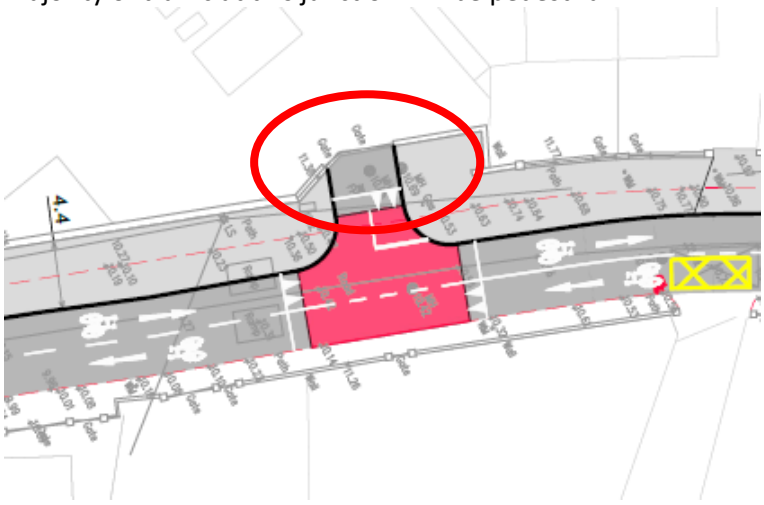
Hazard: Impact with pedestrians may result.

Recommendation: Terminate the cycle facility short of the existing footpath and cater for cyclists within junction. North-west bound cyclists should be directed onto the main carriageway, not the footpath.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.8 South Circular Road – Gated Access

Problem: The gated access to the north of Greenpark Close is shown with a raised table type junction. Motorists exiting this access are offered priority over pedestrians passing the access. It is likely the majority of traffic at this junction will be pedestrian.



Hazard: Motorists exiting the development may not take adequate care as they have priority. Impact with crossing pedestrians may result.

Recommendation: Omit the vehicular priority and treat as a simple footpath crossover.

3.2.9 Parking Bays to north-west of Lifford Park

Problem: The proposed parking bay**s** cross multiple private driveways.

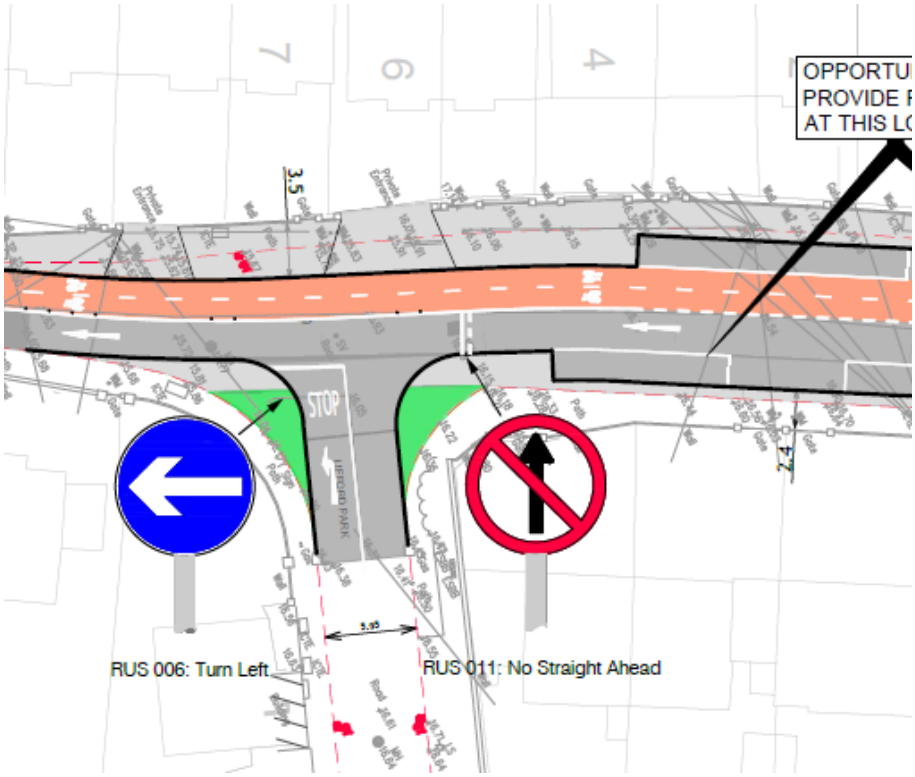
Hazard: Occupiers may get their car blocked in by vehicles parked in the bay. The dwelling occupant may decide not to park in their driveway on future occasions due to this risk of blocking. This may result in additional demand for on street parking / congestion / risks to cyclists passing on street parked vehicles.

Recommendation: Provide yellow box markings for all active driveways.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.10 South Circular Road One Way Option – Fennessy's Roundabout to Lifford Ave.

Problem: The carriageway width is indicated as 2.5m. There is no restriction to traffic type on this road. There is a road junction with Lifford Park and some of the houses have private driveways accessed perpendicular to the carriageway.



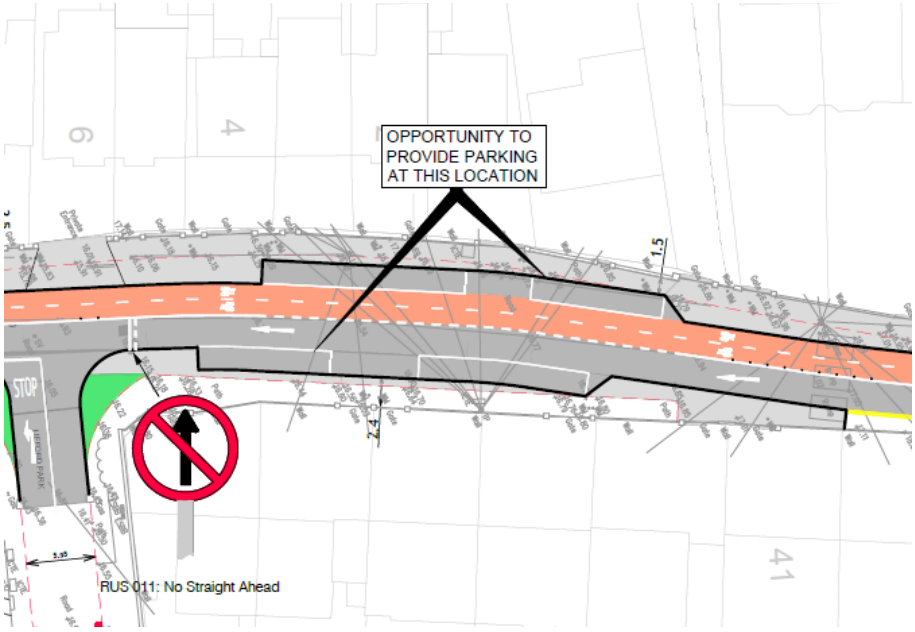
Hazard: Wide and/or long vehicles may have difficulty in navigating such a narrow road. Users may have difficulty in turning left out of Lifford Park. Cars may experience difficulty in exiting their driveways. In all scenarios the user may bump up the segregation strip and enter the cycle facility.

Recommendation: Ensure adequate carriageway width is maintained. The alternative option offered on drawing 402 does not have such problems.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.11 South Circular Road One Way Option – Fennessy's Roundabout to Lifford Ave.

Problem: The cycle facility abuts the car parking bays to the north of Lifford Ave.



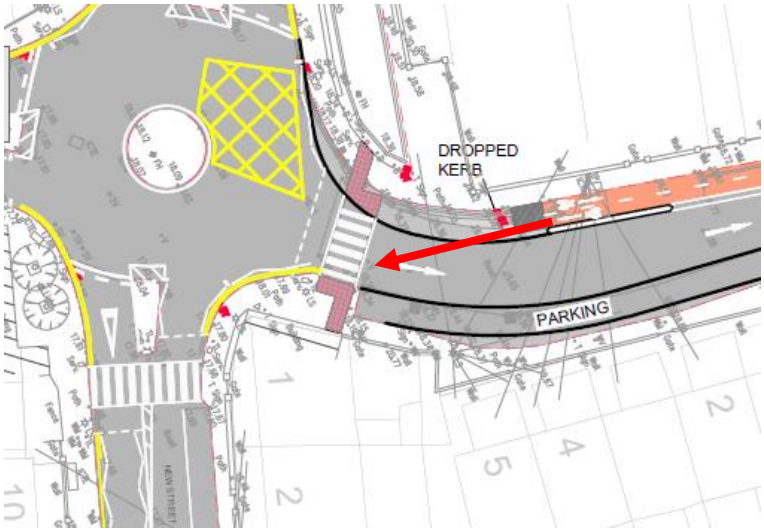
Hazard: Car passengers may open their door into the path of oncoming cyclists.

Recommendation: Provide a buffer strip so cyclists are guided away from the potential opening door. This may require using some of the footpath space for the car parking bay.
This issue pertains to both options shown on drawing 402 and 406.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.12 Ashbourne Avenue Roundabout Junction.

Problem: Southbound cyclists arriving at Ashbourne Avenue roundabout are not provided with any guidance or facilities to access the roundabout safely.



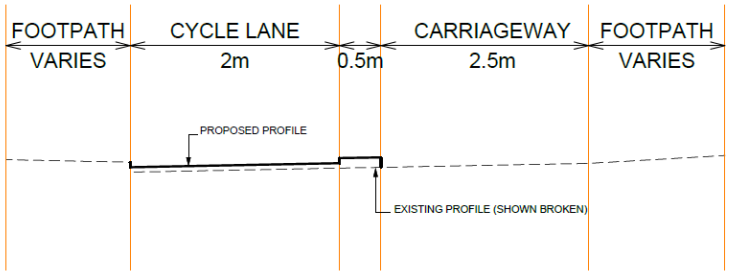
Hazard: The cyclist may depart the cycle lane into the path of opposing motorised traffic.

Recommendation: Terminate the southbound cycle lane at / near the pedestrian / toucan crossing at the school and provide a southbound cycle facility to the eastern side of South Circular Road as far as the roundabout.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.13 South Circular Road between Summerville Ave to Laurel Hill Ave

Problem: The carriageway width is indicated as 2.5m. There is no restriction to traffic type on this road. Some of the houses have private driveways accessed perpendicular to the carriageway.



Section 6

Scale H: 1/50, V: 1/50

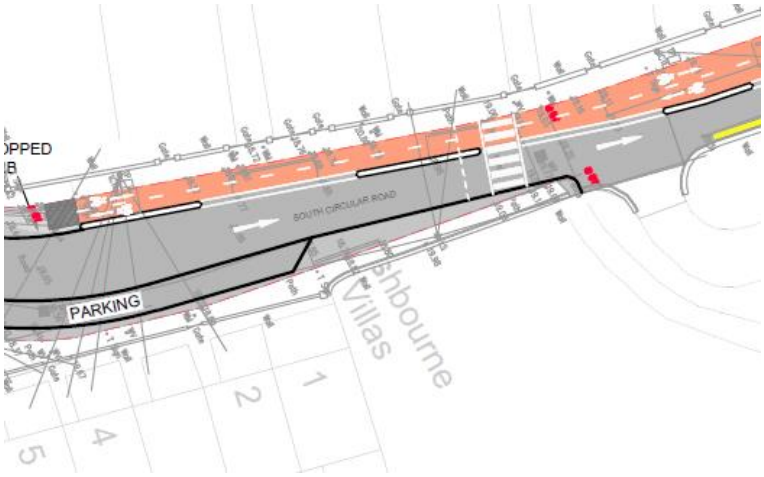
Hazard: Wide and/or long vehicles may have difficulty in navigating such a narrow road. Cars may experience difficulty in exiting their driveways. In both scenarios the user may bump up the segregation strip and enter the cycle facility.

Recommendation: Ensure adequate carriageway width is maintained.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.14 Scoil Mháthair Dé – Collection / Drop off

Problem: The proposals will reduce carriageway width near the entrance to Scoil Mháthair Dé. It is not known if this area is used for temporary set down for school collections / drop off.



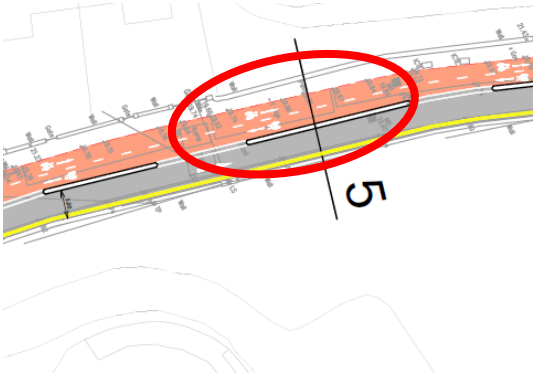
Hazard: The reduced carriageway width may result in congestion in the area and traffic backing up on the roundabout junction. Rear end shunts may result.

Recommendation: Ensure adequate provision is made for school collections / drop offs.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.15 Bus Stop opposite Scoil Mháthair Dé

Problem: There is an existing bus stop opposite Scoil Mháthair Dé. This stop is not shown on the proposal's drawings. The carriageway in this area is to be reduced in width such that passing a stationary bus will not be possible.



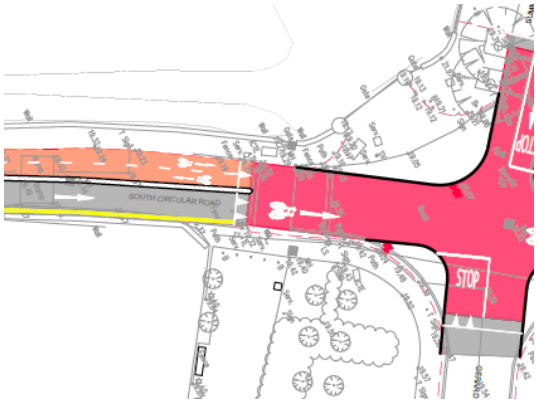
Hazard: Traffic may back up onto the roundabout. Rear end shunts may result.

Recommendation: Ensure delays from any stationary bus are acceptable and do not result in excessive queuing.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.16 Existing Zebra Crossing – Mary Immaculate College

Problem: The existing zebra crossing of South Circular Road at Mary Immaculate College is being removed by the proposed works. It is likely this pedestrian crossing is well used during term times.



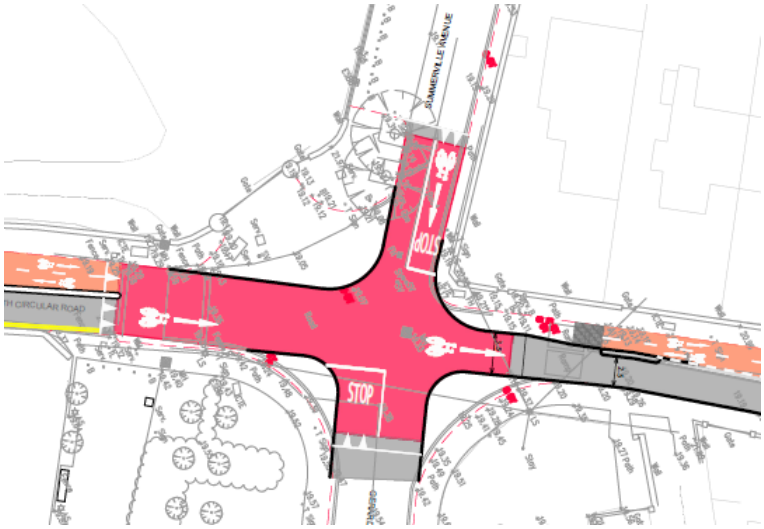
Hazard: Crossing pedestrians are at increased risk of impact from South Circular Road traffic.

Recommendation: Maintain the zebra crossing.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.17 Mary Immaculate College - Vehicle Movements

Problem: The kerb lines at the Summerville Ave junction are to be reduced in radius by the works. Users exiting the college turning left into Summerville Ave are unlikely to be able to undertake the turn without entry to the opposing traffic lane.



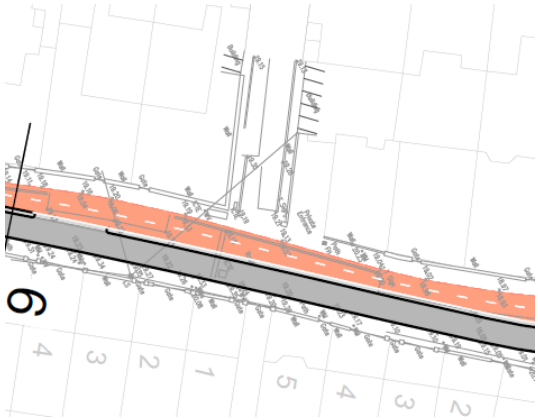
Hazard: Head-on impact with Summerville Ave traffic may result.

Recommendation: Undertake swept path Autotracks and amend the design as deemed appropriate.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.18 Access Lane to north-west of Summerville Ave

Problem: There is an existing vehicular access lane to the north-west of Summerville Ave that serves access to dwelling houses. This access is shown as being blocked off by a raised strip on the proposals drawing.



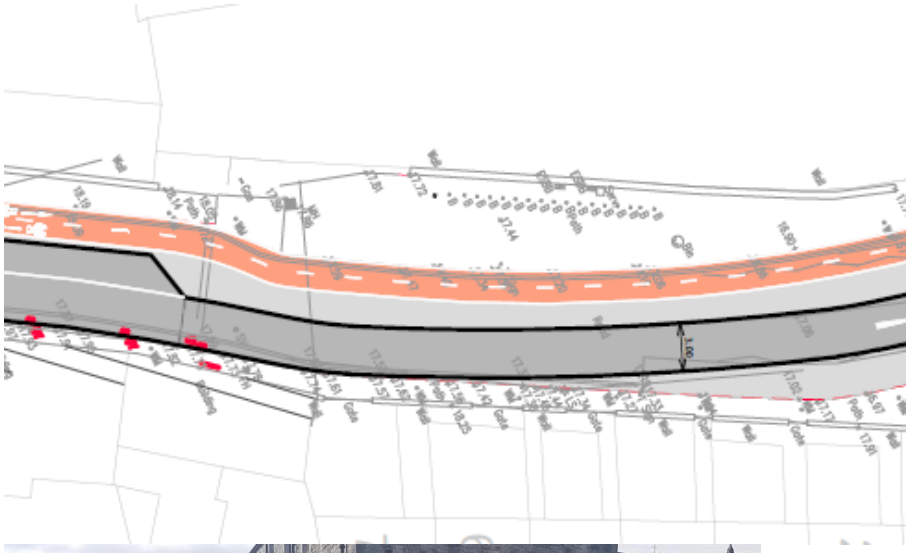
Hazard: Motorists may make use of the opening to the south and drive along the cycle facility in order to access the lane. Impact with cyclists may result.

Recommendation: Provide direct access to the lane.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.19 Mount St. Alphonsus Church – Vehicle Movements

Problem: Mount St. Alphonsus church has substantial car parking provision and is likely to generate large traffic movements. No access/egress arrangement is shown on the proposal's drawings.



Hazard: Lack of guidance to / from the church car park may result in impact with other church traffic and/or cyclists/pedestrians.

Recommendation: Provide a clear access/egress arrangement for church traffic to access the carriageway.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.20 Zebra Crossing at Mount St. Alphonsus Church

Problem: It is not clear how the existing zebra crossing at Mount St. Alphonsus Church is incorporated into the proposals. The cycle facility is segregated from the main carriageway here. Some pedestrians may attempt to undertake the crossing i**n** 2 halves and wait between the carriageway and cycle facility, whereas others may attempt to undertake the crossing in a single manoeuvre.

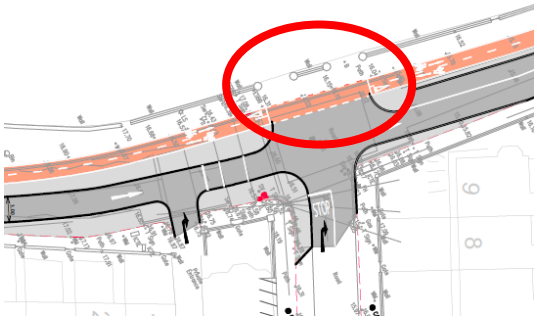
Hazard: Pedestrian confusion may encourage cyclists to continue over the crossing. The cyclist may impact with other crossing pedestrians.

Recommendation: Provide a new crossing with a central refuge and appropriate tactile paving, so the crossing can be undertaken in two halves. Ensure the cyclist is informed to yield to pedestrians.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.21 Vehicular access to Mount St. Alphonsus Church

Problem: The drawings show a very wide junction leading to Mount St. Alphonsus Church. Only the southern gate to the church is in use. A permanent bollard blocks the northern gate.

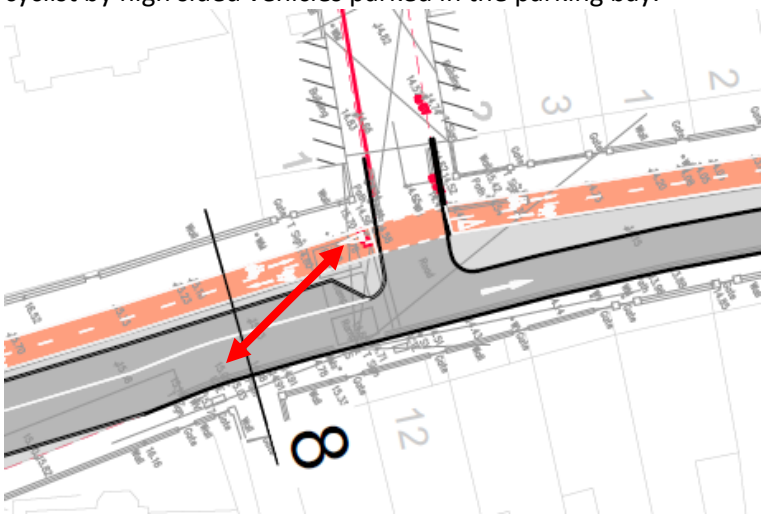


Hazard: Motorists may errantly arrive at the fixed bollard believing it is automated and will lower. This motorist will be required to reverse back into South Circular Road and may impact with approaching vehicles while doing so.

Recommendation: Amend the junction bell mouth to guide users to the open gate only.
Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.22 Left Turning into St Alphonsus St.

Problem: Motorists turning left into St Alphonsus St. may be shielded from view of north-east bound cyclist by high sided vehicles parked in the parking bay.



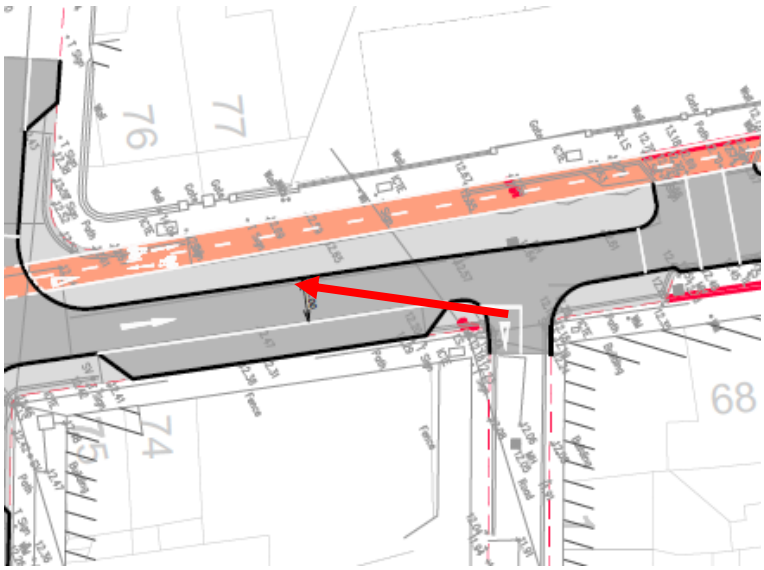
Hazard: The cyclists may commence the crossing of St Alphonsus St. at the same time as the motorist arrives at the junction. Impact with cyclists or rear end shunts may result.

Recommendation: Omit sufficient parking bay to achieve adequate inter-visibility.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.23 Naughton's Place

Problem: Northbound Henry Street traffic are pushed west and closer to the junction of Naughton's place. The parking bay to the left of users exiting the junction may restrict visibility to oncoming traffic for users exiting the junction.



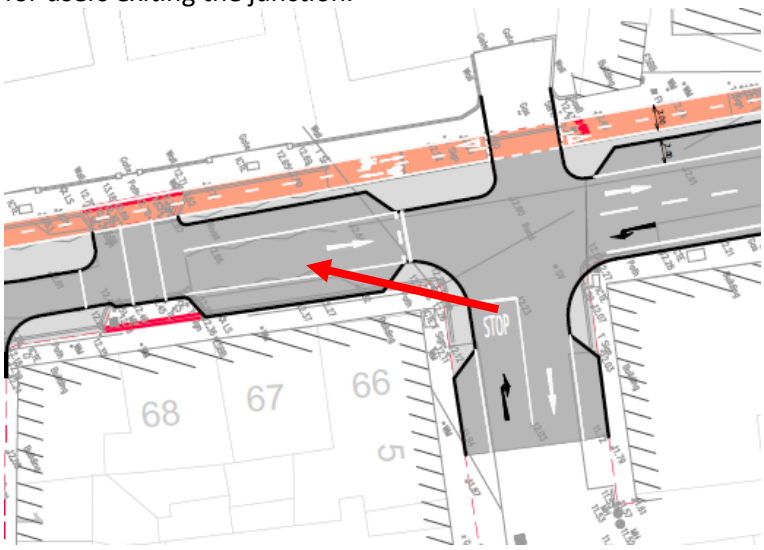
Hazard: Users may errantly exit the junction into the path of oncoming traffic.

Recommendation: Omit sufficient parking to the left of the junction to ensure adequate junction visibility is achieved.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.24 Clontarf Place

Problem: Northbound Henry Street traffic are pushed west and closer to the junction of Clontarf Place. The parking bay to the left of users exiting the junction may restrict visibility to oncoming traffic for users exiting the junction.



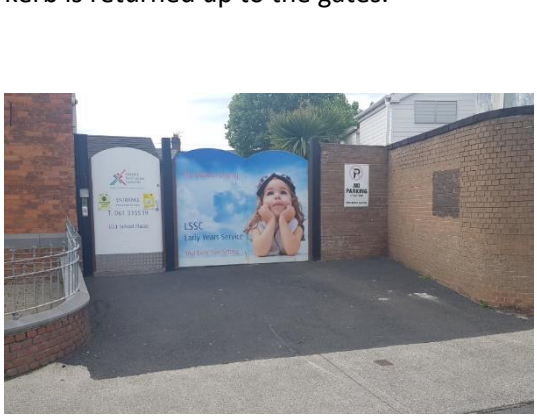
Hazard: Users may errantly exit the junction into the path of oncoming traffic.

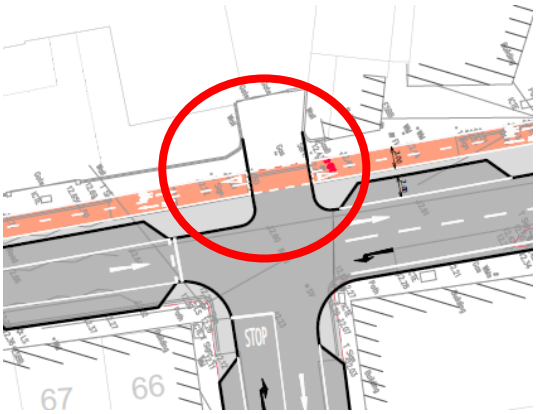
Recommendation: Omit sufficient parking to the left of the junction to ensure adequate junction visibility is achieved.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.25 Little Henry Street

Problem: Little Henry Street is a private and gated access. The proposals indicate the carriageway kerb is returned up to the gates.





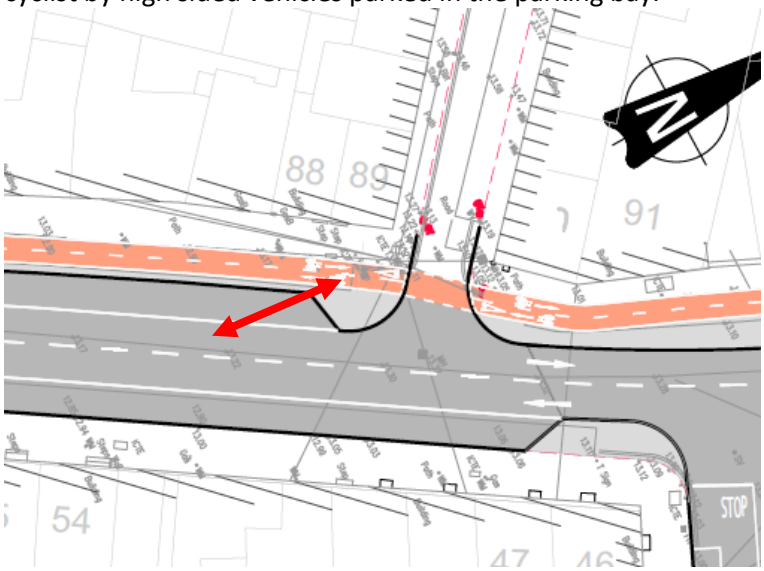
Hazard: Confusion may arise between pedestrians/cyclists and motorised users to who has priority here. Impact between these users may result.

Recommendation: Omit the kerb returns and treat **as** a standard footpath crossover.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.26 Left Turning into Windmill Street

Problem: Motorists turning left into Windmill Street may be shielded from view of north-east bound cyclist by high sided vehicles parked in the parking bay.



Hazard: The cyclists may commence the crossing of Windmill Street at the same time as the motorist arrives at the junction. Impact with cyclists or rear end shunts may result.

Recommendation: Omit sufficient parking bay to achieve adequate inter-visibility.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.27 Access to Oriental Supermarket

Problem: There are a number of car parking spaces to the front of the oriental supermarket. These users were observed driving forwards into the spaces and reversing back onto Henry Street. The provision of the cycle facility will result in the user reversing back over the cycle facility.

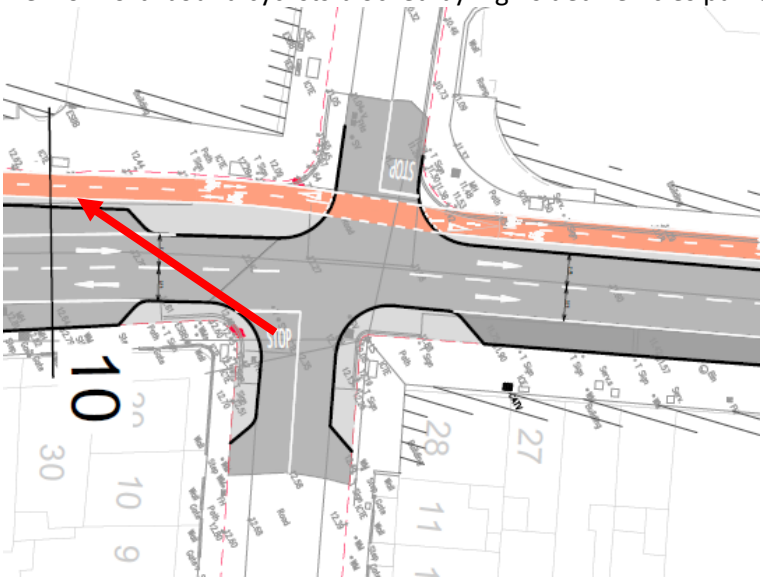
Hazard: Impact with cyclists may result.

Recommendation: Omit the perpendicular parking bays.

Stage 1 Feedback Form :
The recommendation has been rejected by the design team.

3.2.28 Lower Hartstonoge Street

Problem: Drivers exiting Lower Hartstonge Street and entering Mount Kenneth Place may have their view of northbound cyclists blocked by high sided vehicles parked in the Henry Street parking bay.



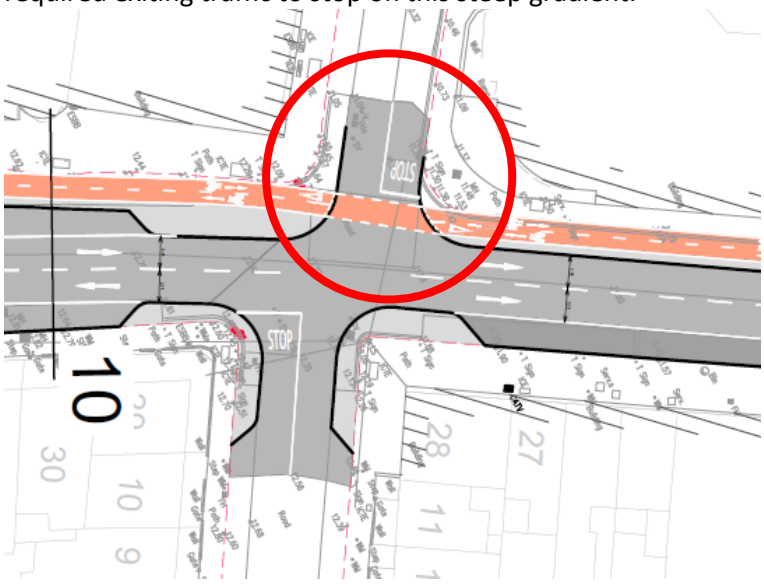
Hazard: Impact with cyclists crossing Mount Kenneth Place may result.

Recommendation: Omit some of the problematic parking bay on Henry Street.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.29 Mount Kenneth Place - Gradient

Problem: Mount Kenneth Place has a steep gradient to the Shannon. The relocation of the stop line required exiting traffic to stop on this steep gradient.



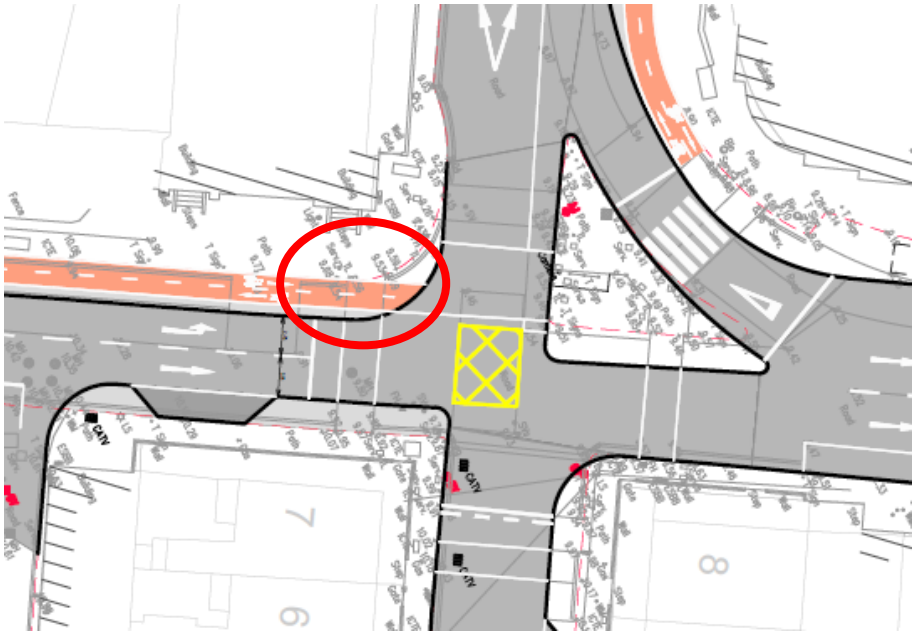
Hazard: The driver may roll backwards or stall upon attempting to exit the junction.

Recommendation: Amend the junction arrangement to provide a dwell area for traffic exiting Mount Kenneth Place.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.30 Henry Street – Push Button Crossing at Junction of Lower Mallow Street

Problem: The cycle facility crosses through the pedestrian crossing. Pedestrians are likely to stand in the cycle lane while waiting for the green man signal.



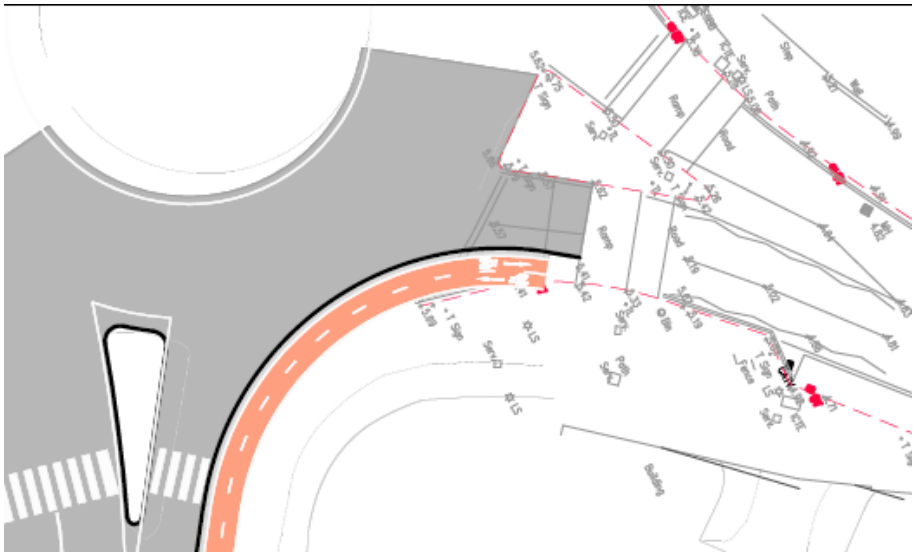
Hazard: Pedestrian / cyclist impacts may result.

Recommendation: Terminate the dedicated cycle facility short of the pedestrian crossing(s) at the junction.

Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

3.2.31 End of Cycle Facility – Bishops Quay

Problem: The cycle facility abruptly ends near the pedestrian crossing on Bishops Quay. No guidance is given to the cyclist on how to continue their journey in any direction.



Hazard: The cyclist may make sudden and unexpected directional choices. Impact with pedestrians or motorised vehicles may result.

Recommendation: Provide suitable design(s) for permitting cyclists to continue their journey to all roads at this junction.

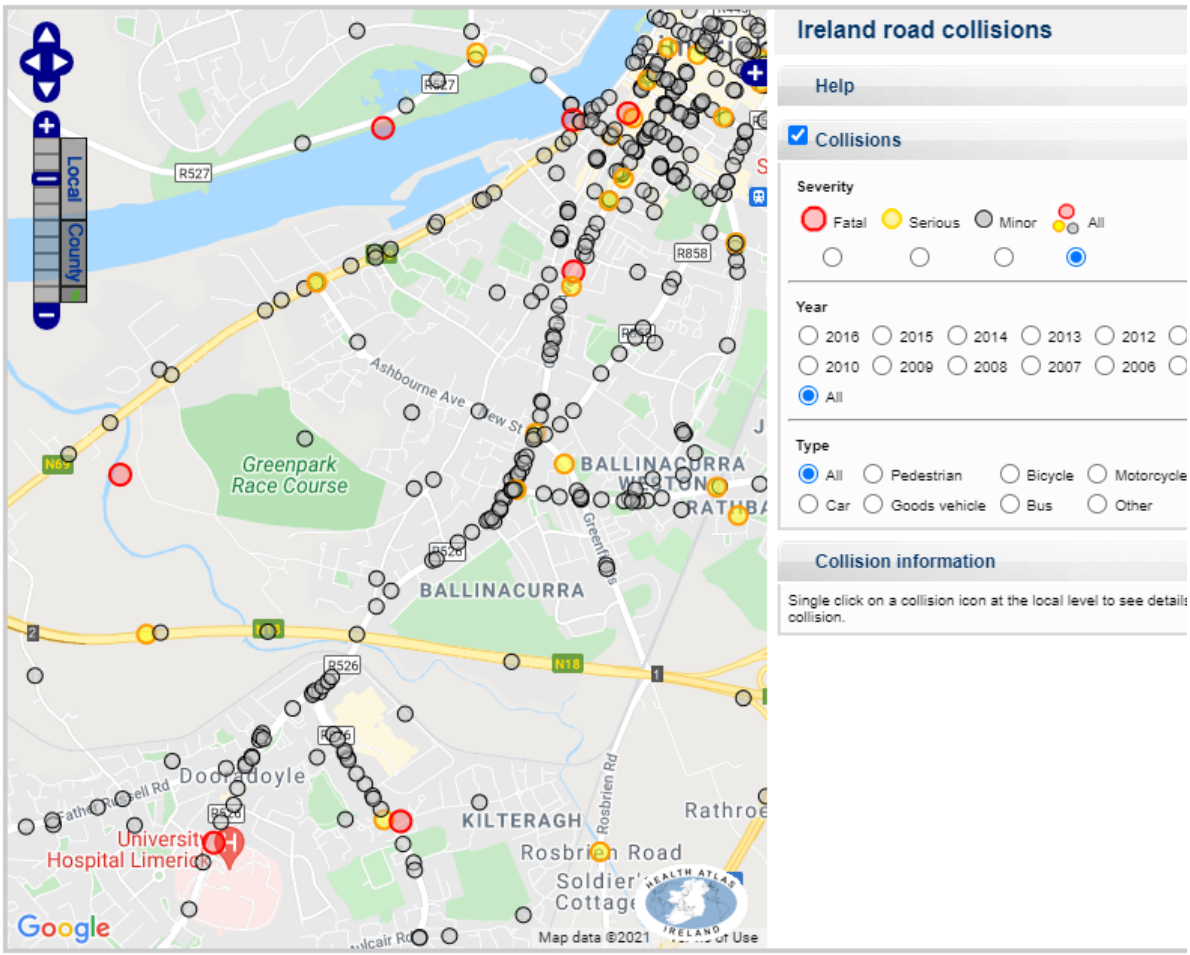
Stage 1 Feedback Form :
The recommendation has been agreed by the design team.

4. ITEMS RESULTING FROM THIS STAGE 1 AUDIT

4.1 Collision Data

Collision data has not been supplied with this scheme.

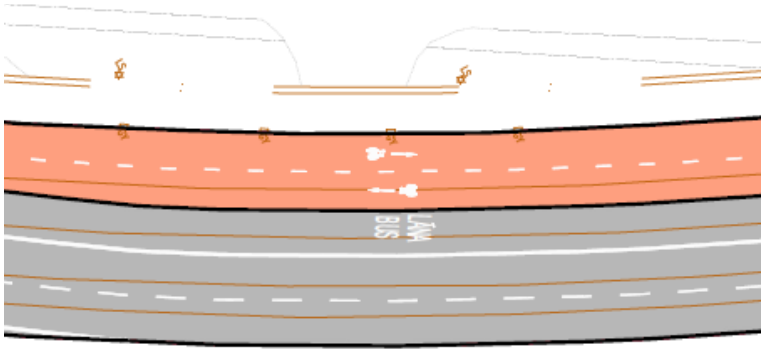
Road Collision Data available on the Road Safety Authority Database, within the period 2005 to 2016, recorded 72 collisions in the immediate vicinity of the proposed site. 7 of these are recorded as serious injury and 1 fatal collision. The fatality is listed as a pedestrian. 4 of the 7 serious injury collisions involve pedestrians.



4.2 General Problems / Problems at Multiple Locations

4.2.1 Cyclists direction

Problem: The proposal generally indicates the cyclists nearest the carriageway is travelling in the opposite direction to the adjacent motorists.



Hazard: Errant cyclists who may enter the carriageway are at risk of head-on collisions with motorised vehicles.

Recommendation: Amend the design such that the cyclist adjacent to the carriageway is travelling in the same direction as the adjacent motorist.

4.2.2 Road Markings and Signage

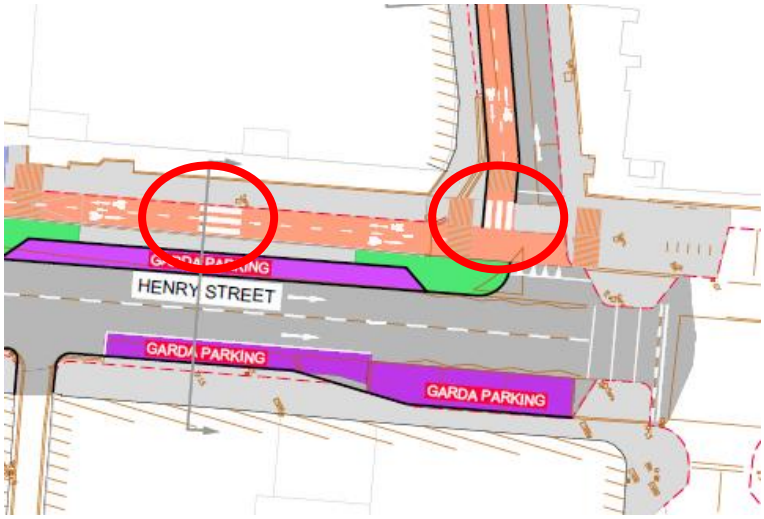
Problem: Although the drawings indicate the signage references numbers, the signage and road markings shown on the drawings do not appear to be complete.

Hazard: Insufficient or misleading signage may result in user confusion and potential impact between user groups.

Recommendation: Undertake a full review of the signage and road markings in advance of undertaking the Stage 2 Road Safety Audit.

4.2.3 Zebra Crossings across the Cycle Path

Problem: There are a number of zebra type crossings indicated across the cycle path. However the crossing does not require cyclists to yield to the pedestrian.

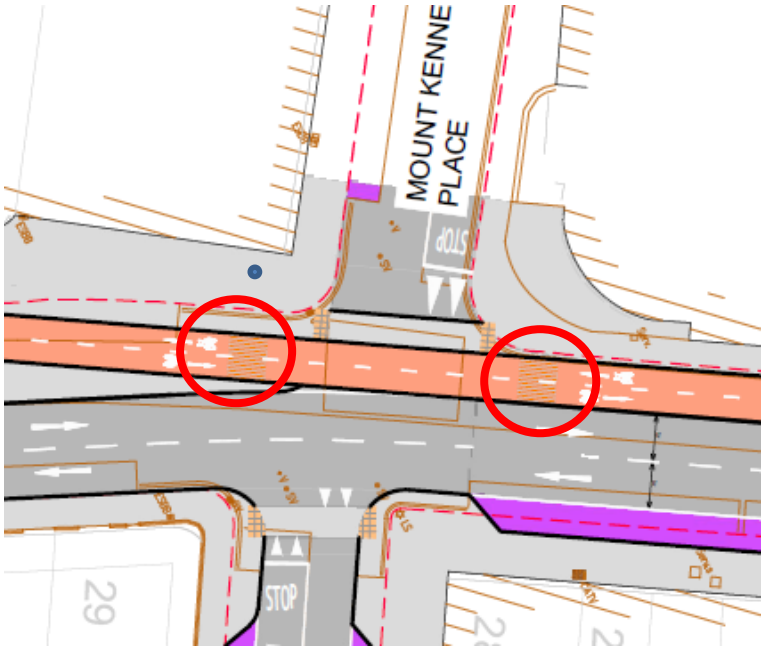


Hazard: Both users may believe they have priority and impact between users may result.

Recommendation: Ensure a full suite of markings and signals / beacons are provided to offer guidance to the user.

4.2.4 Ladder Paving / Road crossings

Problem: The arrangement of ladder paving being confined to the cycle path is non-standard and may be confusing. Ladder paving is normally provided along the route of the cycle path and across the adjacent footpath at the termination of the cycle path.

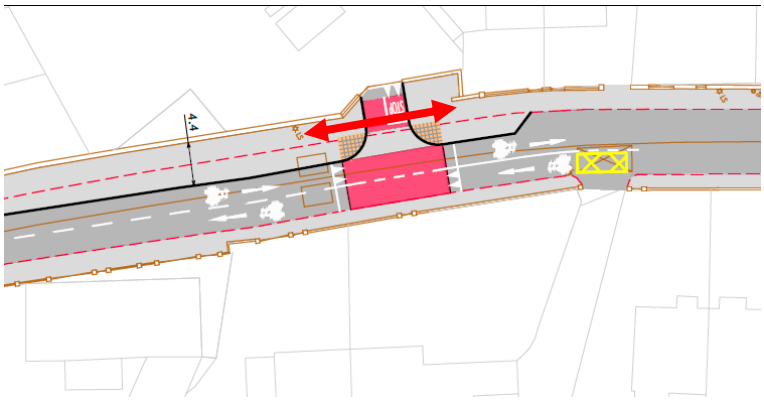


Hazard: Sight impaired users may errantly enter the cycle path in the area of the junction, in between the ladder paving units. The user may be stuck by cyclists.

Recommendation: Maintain a level change between the cycle path and footpath throughout and omit the ladder paving.

4.2.5 Blister tactile paving layout.

Problem: Sight impaired users often use the rear edge of the footpath / boundary walls to assist in their travel. the proposed blister paving at the junctions does not extend to the probable desire line for sight impaired users.

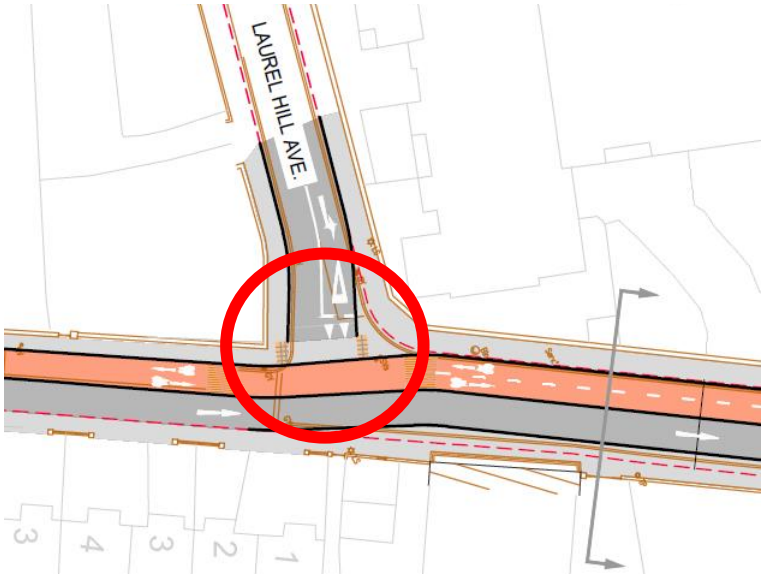


Hazard: Sight impaired users may errantly step into the carriageway into the path of oncoming traffic.

Recommendation: Amend the tactile layout to provide suitable tactile for the intended users and amend the associated road markings to suit.

4.2.6 Junction priority

Problem: There are a number of junctions where the footpath surfacing material is carried through the junction and the minor road markings are set back, thereby indicating priority is given to the pedestrian. However tactile paving is also provided on the footpath.



Hazard: Sight impaired users encountering the blister paving are likely to believe they are required to wait for motorists to clear the junction prior to proceeding to cross the road. Confusion between motorists and pedestrians may result in collisions between the users.

Recommendation: Omit the tactile paving, ensure no kerb face is provided on the route of the pedestrian and ensure signage / road markings adequately inform the motorist that pedestrians have priority.

4.2.7 Zebra Crossings

Problem: There are proposed zebra crossings within the scheme that are indicated as two separate crossings, one for the cycle path and a separate crossing for the carriageway, with a small refuge in between.

Hazard: Sight impaired users may experience difficulty in understanding the crossings. Additionally large volume of pedestrians may overspill the central refuge and be subject to vehicle strikes.

Recommendation: Provide a single stage crossings of both the carriageway and cycle path.

4.2.8 St Nessan's Road / Ballinacurragh Road

Problem: The existing southbound cycle lane to the east of Ballinacurragh Road is not shown on the drawings. It is likely the majority of southbound cyclists will make use of this lane and not the proposed lane to the west of the road. Northbound cyclists are likely to become complacent and make use of the full cycle facility to the west of the road.

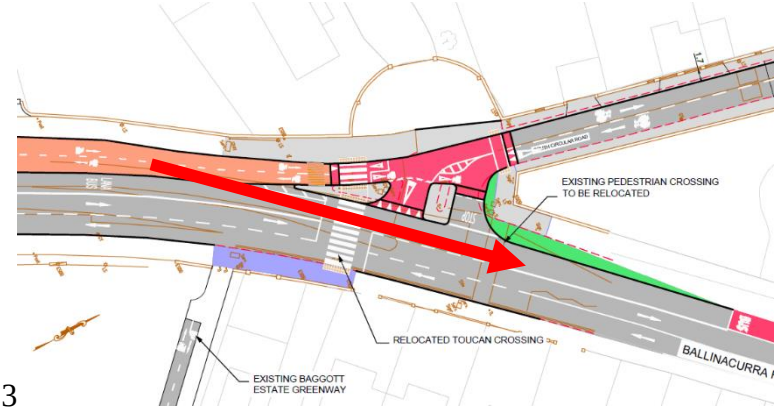
Hazard: Occasional southbound cyclists who decide to make use of the facility on the western side of the road are at risk of impact from opposing cyclists.

Recommendation: Omit the southbound facility to the west of the road and make provision for cycles exiting South Circular Road to access the existing cycle lane.

4.3 Problems at Specific Locations

4.3.1 Ballinacurragh Road cyclists

Problem: Cyclists travelling south to north on Ballinacurragh road are not given opportunity to egress the cycle facility to continue their journey on the main carriageway.



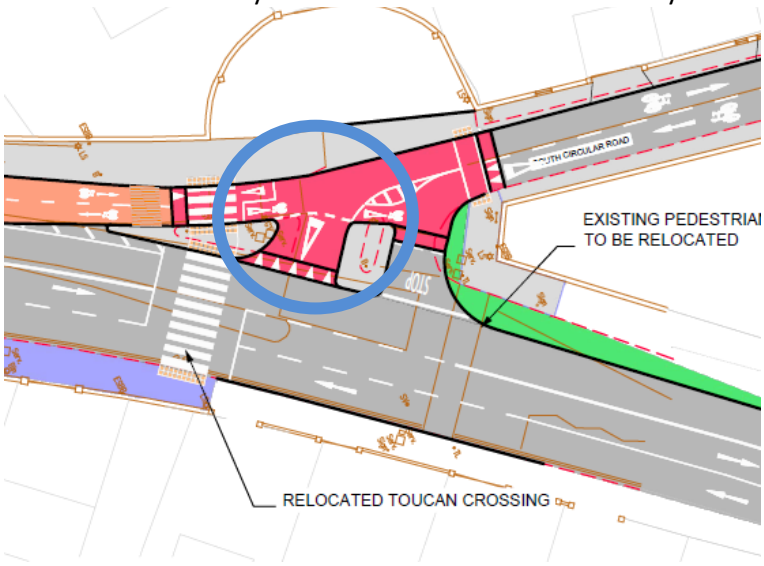
3

Hazard: Cyclists are likely to jump down the full face kerb and enter the bus lane immediately prior to the South Circular Road junction. Cycle loss of control / impact with a passing bus may result.

Recommendation: Provide a suitable method for cyclists to safely rejoint the Ballinacurragh carriageway

4.3.2 South Circular Road / Ballinacurragh Road Junction

Problem: Both the cyclists and motorist are advised to yield to each other at this junction.

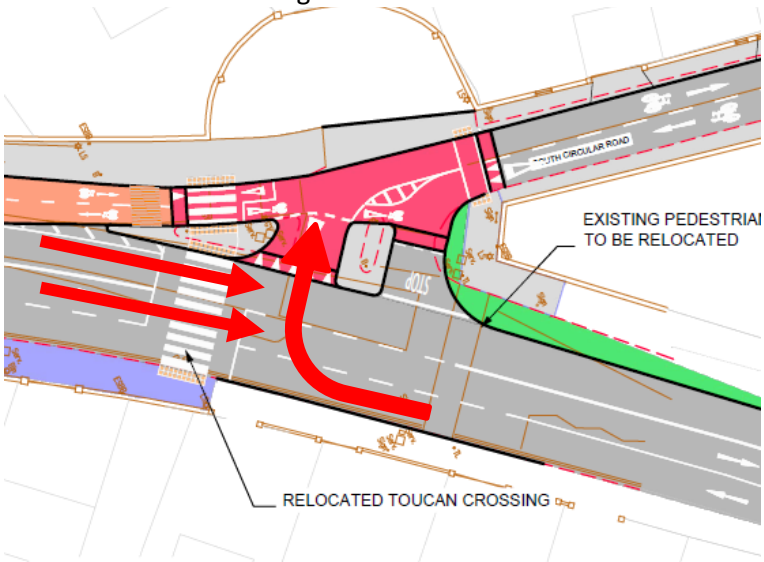


Hazard: Motorists who yield to the cyclists are at risk of creating a tail back onto the Ballinacurragh road with the resultant risk of rear end shunts.

Recommendation: Omit the road marking for the motorist and offer this user priority to continue through the junction.

4.3.3 Ballinacurragh Road motorists turning right into South Circular Road

Problem: Motorists wishing to turn right into South Circular road are required to cross two lanes of northbound Ballinacurragh Road traffic.

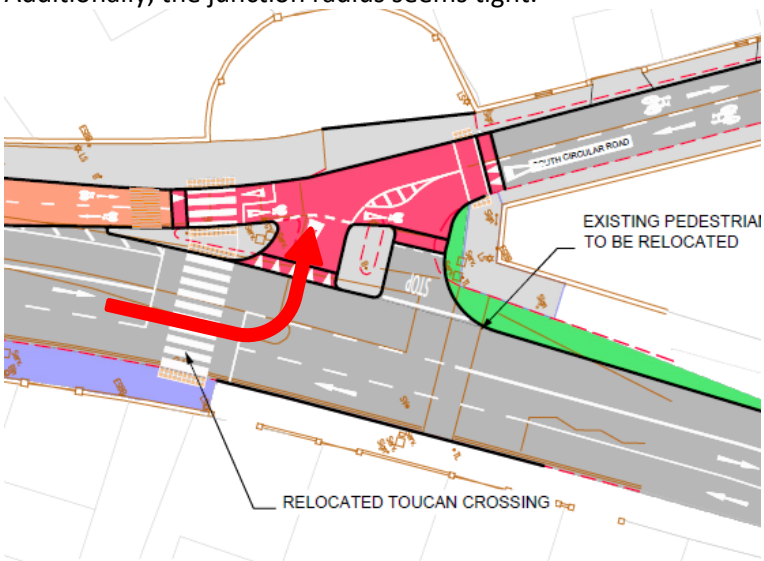


Hazard: Queuing high sided vehicles in the offside lane may shield smaller and faster moving smaller vehicles in the nearside lane. The right turner may commence their turn and impact with vehicles in the bus lane.

Recommendation: Ensure adequate visibility between all road users is provided.

4.3.4 Ballinacurragh Road motorists turning left into South Circular Road

Problem: Motorists wishing to turn left into South Circular Road are required to cross the bus lane. Additionally, the junction radius seems tight.

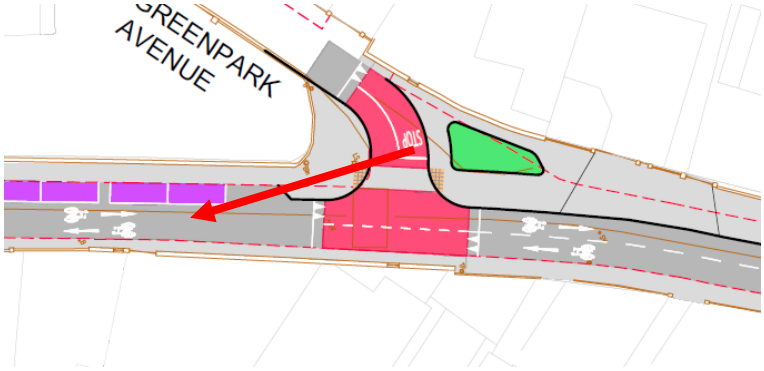


Hazard: The left turning motorists may be stuck by an approaching vehicle in the bus lane. Additionally, the user may strike the kerb.

Recommendation: Amend the road markings to enable left turning traffic to occupy the nearside lane. Undertake swept path analysis to ensure the junction radii is adequate.

4.3.5 Greenpark Avenue Junction

Problem: Cars parked in the parking bays to the west of the junction may park outside of the indicated bays and closer to the junction.

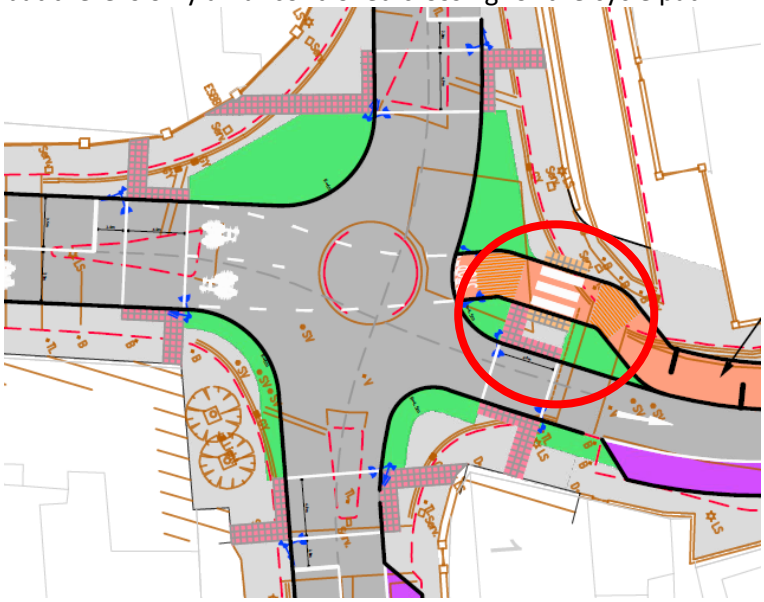


Hazard: High sided parked vehicles may restrict junction visibility for users exiting Greenpark Avenue

Recommendation: Assess the junction visibility and amend the kerb alignment to ensure parking closer to the junction is not physically possible.

4.3.6 Ashbourne Av. / South Circular Road junction - Pedestrians

Problem: Signalised crossing points are offered to the pedestrian for crossing the main carriageway, but there is only an uncontrolled crossing for the cycle path.

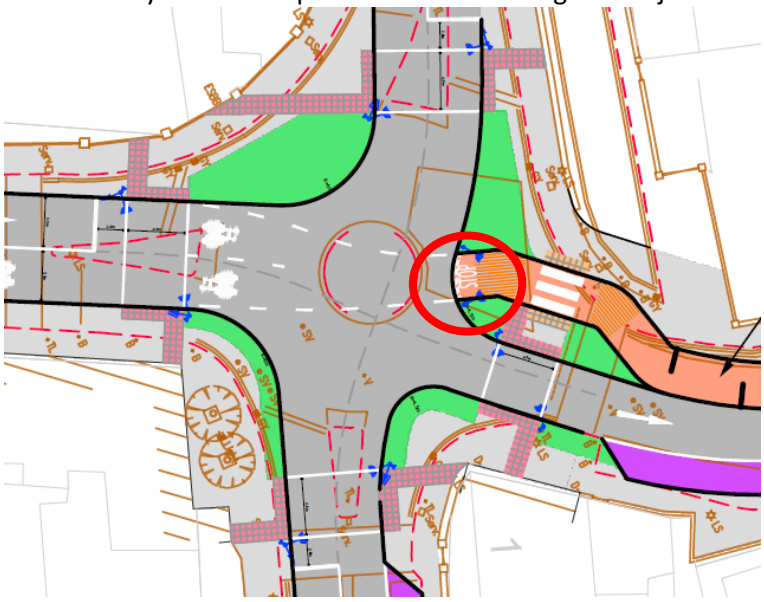


Hazard: Sight impaired users may experience difficulty in crossing the cycle path. Errant entry into the path may result in impact with cyclists.

Recommendation: Incorporate the cycle path crossing into the signalised pedestrian crossing.

4.3.7 Ashbourne Ave / South Circular Road junction – Cyclists

Problem: Cyclists are expected to enter the signalised junction without sight of the signals.

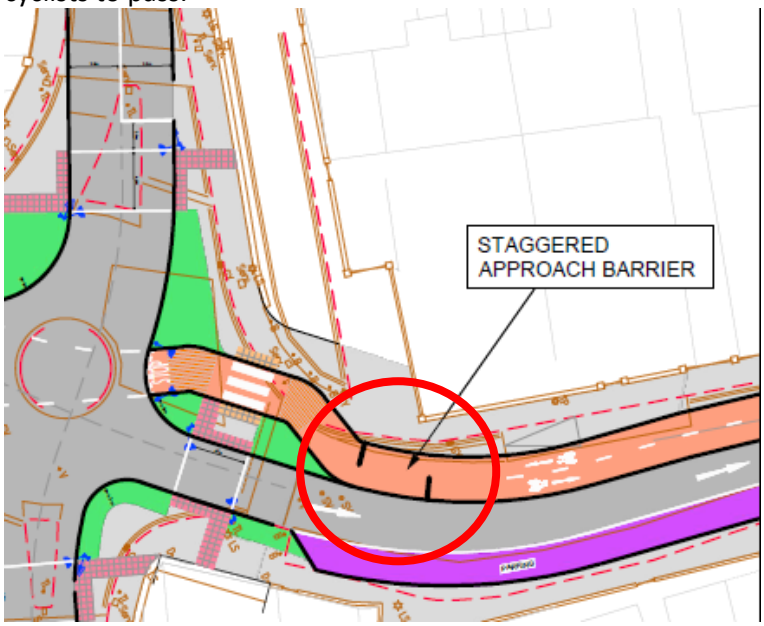


Hazard: Cyclists may errantly look at the wrong traffic stream and note no oncoming vehicles, just at the same time as one of the other streams of traffic are offered a green light. Impact with motorists may result.

Recommendation: Provide a dedicated signal stage for the cyclist.

4.3.8 South Circular Road – Staggered barrier

Problem: The provision of the staggered barrier results in inadequate cycle path width for opposing cyclists to pass.

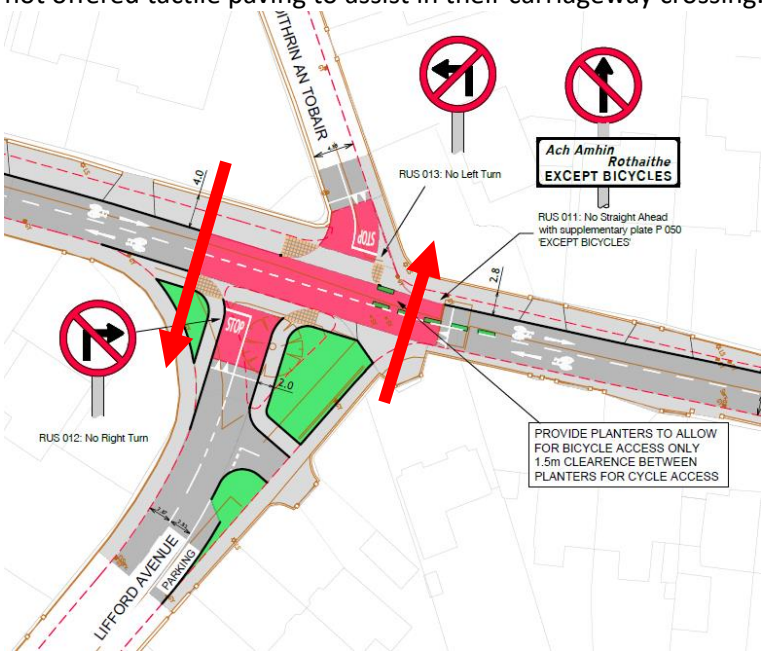


Hazard: Opposing cyclists may fail to discretionary yield, resulting in head-on impacts.

Recommendation: Provide road markings / signage giving priority to the northbound cyclist.

4.3.9 South Circular Road / Lifford Park junction

Problem: Sight impaired pedestrians who wish to cross from Boithrin An Tobair to Lifford Avenue are not offered tactile paving to assist in their carriageway crossing.

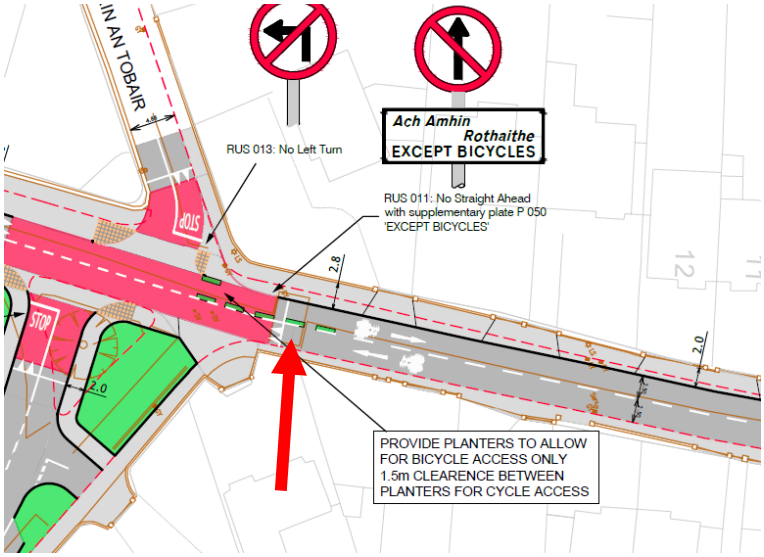


Hazard: Users may errantly enter the carriageway or may trip/stumble on high kerbs.

Recommendation: Provide suitable blister paving and dropped kerbs at a suitable carriageway crossing location.

4.3.10 South Circular Road width to north of Lifford Park junction

Problem: The proposed planters appear to be located in the middle of the road. No remaining lane width for southbound vehicles is indicated on the drawings.



Hazard: Large southbound vehicles may strike the planter and push this into the path of oncoming cyclists.

Recommendation: Ensure adequate lane width is maintained for southbound vehicles.

4.3.11 Scoil Mháthair Dé – Collection / Drop off

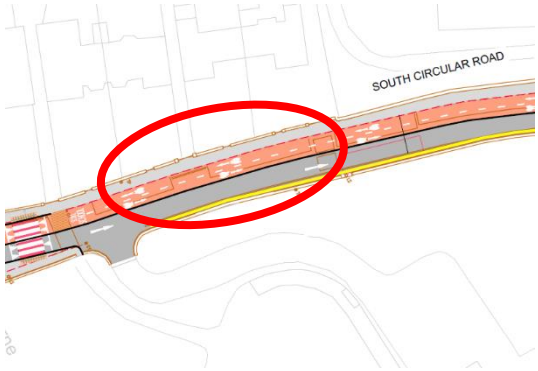
Problem: The proposals will reduce carriageway width near the entrance to Scoil Mháthair Dé. It is not known if this area is used for temporary set down for school collections / drop off.

Hazard: The reduced carriageway width may result in congestion in the area and traffic backing up on the roundabout junction. Rear end shunts may result.

Recommendation: Ensure adequate provision is made for school collections / drop offs.

4.3.12 Bus Stop opposite Scoil Mháthair Dé

Problem: There is an existing bus stop opposite Scoil Mháthair Dé. This stop is not shown on the proposal's drawings. The carriageway in this area is to be reduced in width such that passing a stationary bus will not be possible.

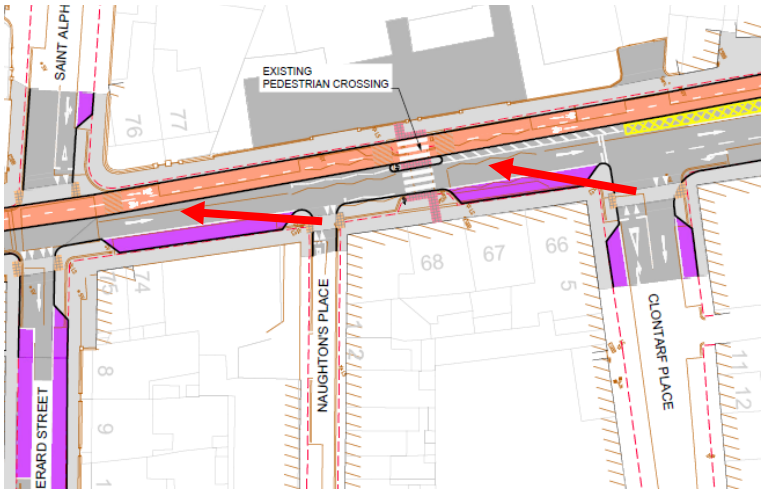


Hazard: Traffic may back up onto the roundabout. Rear end shunts may result.

Recommendation: Ensure delays from any stationary bus are acceptable and do not result in excessive queuing.

4.3.13 Car Parking Bays to south of Naughton's Place and Clontarf Place

Problem: The car parking bays on Henry Street are close to the minor roads to the south.

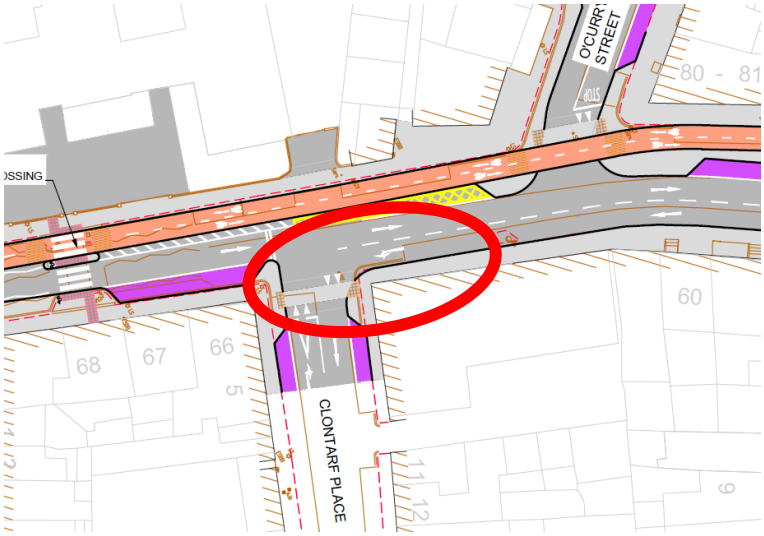


Hazard: High sided vehicles parked in the bays may restrict visibility to oncoming traffic for users attempting to exit the minor roads.

Recommendation: Ensure adequate junction visibility is achieved. Shorten the parking bays if necessary.

4.3.14 Vehicles turning left into Clontarf Place

Problem: The footpath material carries through the side road junction, thereby implying the pedestrian has priority here, but there is no road markings requiring the motorist to yield to this pedestrian.

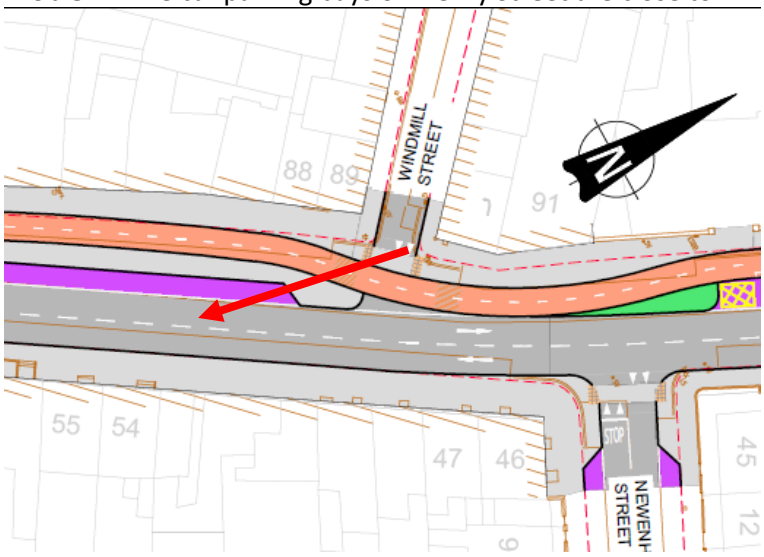


Hazard: Impact between motorists and pedestrians may result.

Recommendation: Provide suitable signage and road markings so the motorists is fully aware of their need to yield to pedestrians.

4.3.15 Car Parking Bays to west of Windmill Close

Problem: The car parking bays on Henry Street are close to Windmill Close

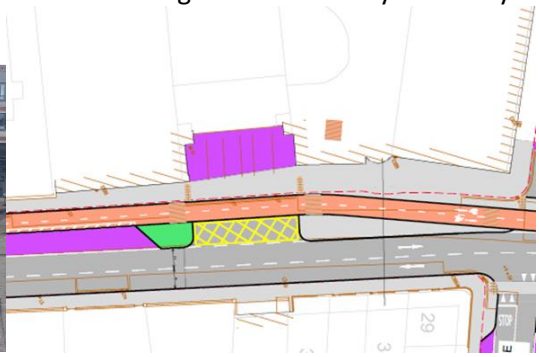


Hazard: High sided vehicles parked in the bays may restrict visibility to oncoming traffic for users attempting to exit the minor road.

Recommendation: Ensure adequate junction visibility is achieved. Shorten the parking bays if necessary.

4.3.16 Access to Oriental Supermarket

Problem: There are a number of car parking spaces to the front of the oriental supermarket. These users were observed driving forwards into the spaces and reversing back onto Henry Street. The provision of the cycle facility may result in the user reversing back over the cycle facility.

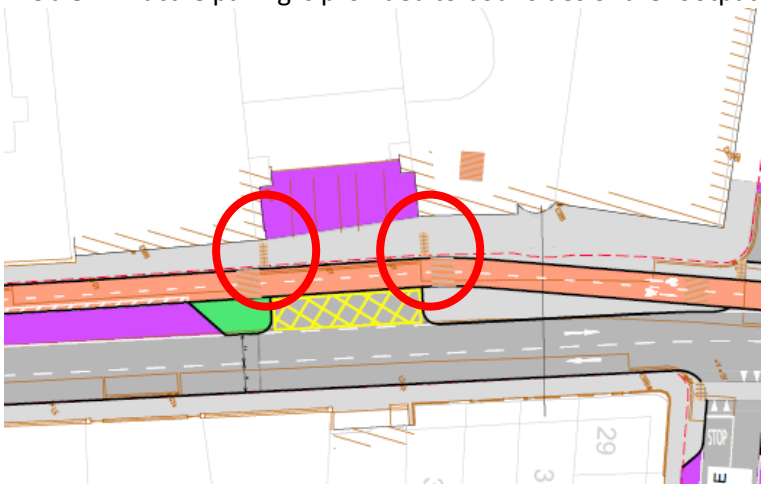


Hazard: Impact with cyclists may result.

Recommendation: Provide signage to encourage reversing into the parking spaces.

4.3.17 Footpath in front of Oriental Supermarket

Problem: Tactile paving is provided to both sides of the footpath in front of the Oriental Supermarket



Hazard: Pedestrians are unlikely to acknowledge the tactile paving and fail to yield to entering motorists. Motorists may believe they have the right of way and fail to yield to the pedestrian. Impact between users may result.

Recommendation: Omit the tactile paving in this location and inform motorists to yield to the pedestrian.

4.3.18 Lower Mallow Street – Shared Surface

Problem: Substantial volumes of pedestrians were observed during the site visit in the area of Henry street / Mallow Street junction. The proposals indicate this area is to become a shared space for use both by cyclists and pedestrians.

Hazard: Cyclists are likely to depart the segregated cycle path at speed and enter the shared space. Impact with pedestrians may result.

Recommendation: Provide a means for cyclist to enter the main carriageway safely and incorporate cycle facilities within the signalised junction. Amend the layout to provide a footpath only over the area currently shown as a shared surface. Terminate the cycle facility at the commencement of the pedestrian area.

4.3.19 Lower Mallow Street - Tactile

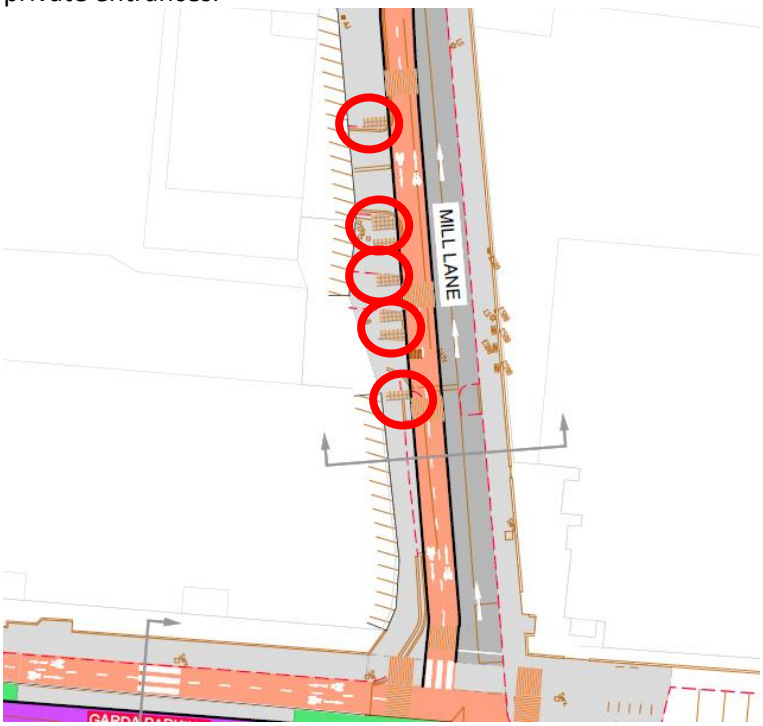
Problem: There is no tactile paving indicated at the revised Lower Mallow Street junction.

Hazard: Sight impaired users may experience difficulty in locating the push button and may errantly enter the carriageway into the path of oncoming motorists.

Recommendation: Provide suitable tactile paving.

4.3.20 Mill Lane – Vehicle Cross Overs

Problem: There are a number of tactile paving sets shown along the footpath of Mill lane at the private entrances.

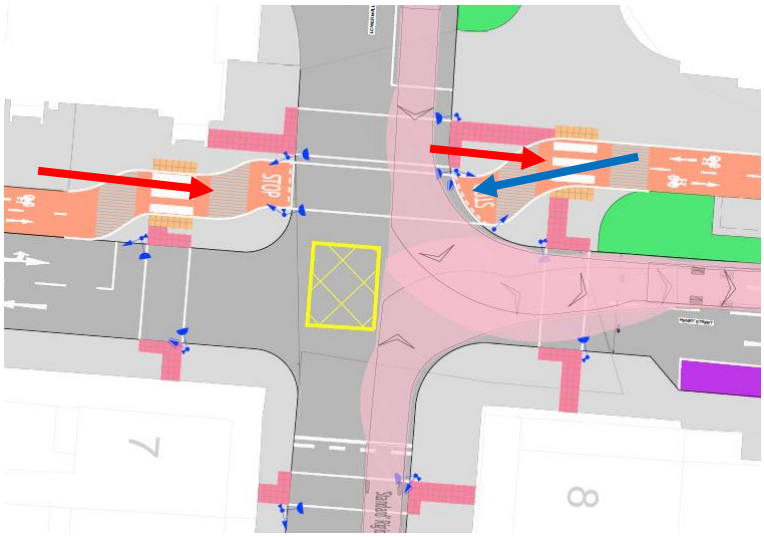


Hazard: It is unlikely sight impaired users will be able to understand if they are on a "safe" section of footpath or within a section with vehicle priority. Impact between users may result.

Recommendation: Omit the tactile paving and offer priority to the pedestrian. Inform the motorists they are required to yield to the pedestrian.

4.3.21 Lower Mallow / Henry Street Junction Option 2

Problem: The cycle path incorporates a number of sharp changes in direction

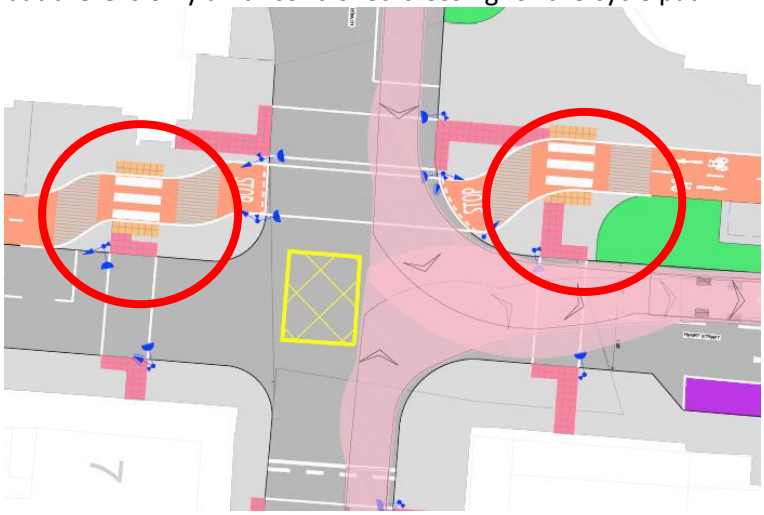


Hazard: Pedestrians are at risk of errantly entering the cycle path (red arrows). Additionally cyclists (blue arrows) are likely to take the "racing line" through the switchback bends, with the possibility of impact with opposing cyclists

Recommendation: Provide a uniform and straighter alignment that is more self-regulating and not in the direct line of pedestrians.

4.3.22 Lower Mallow Street / Henry Street - Pedestrians

Problem: Signalised crossing points are offered to the pedestrian for crossing the main carriageway, but there is only an uncontrolled crossing for the cycle path.



Hazard: Sight impaired users may experience difficulty in crossing the cycle path. Errant entry into the path may result in impact with cyclists.

Recommendation: Relocate the cycle path closer to the carriageway and incorporate the cycle path into the signalised pedestrian crossing.

5. Audit Team Statement

We certify that we have examined the drawings and other information listed in Appendix A. This examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified to improve the safety of the scheme. The problems that we have identified have been noted in the report, together with suggestions for improvement which we recommend should be studied for implementation. No one in the audit team has been involved with the scheme design as shown in Appendix A.

Signed .....
Stuart Summerfield
Audit Team Leader

Date 15th August 2022

Signed .....
PJ Gallagher
Audit Team Member

Date 15th August 2022

Appendix A List of Documents Examined

DOCUMENT REF.	RECEIVED FROM:	DATE:
211101-PUNCH-02-XX-DR-C-0401 P05	PUNCH Consulting Engineers	28/07/2022
211101-PUNCH-02-XX-DR-C-0402 P05		
211101-PUNCH-02-XX-DR-C-0403 P05		
211101-PUNCH-02-XX-DR-C-0404 P05		
211101-PUNCH-02-XX-DR-C-0405 P05		
211101-PUNCH-02-XX-DR-C-0405 P01.01		

Appendix B RSA Feedback Form

ROAD SAFETY AUDIT FEEDBACK FORM

CST Group Chartered Consulting Engineers
1, O'Connell Street, Sligo, F91 W7YV, Ireland

Scheme: South Circular Rd to Bishops Quay Cycle Lane, Limerick City

Audit Stage: 1 **Date Audit Completed:** 15/08/2022 **Route No.** **Our Ref :**121123|R2

TO BE COMPLETED BY DESIGNER				TO BE COMPLETED BY AUDIT TEAM LEADER
Paragraph No. in Safety Audit Report	**Problem accepted (Yes/No)**	**Recommended measure accepted (Yes/No)**	**Describe alternative measure(s). Give reasons for not accepting recommended measure. Only complete if recommended measure is not accepted.**	**Alternative measures or reasons accepted by Auditors (Yes/No)**
4.2.1	Yes	No	This is only the case on Section 1 (between Ballykeefe Roundabout and SCR) and has been approved by NTA due to the improved set up for the cyclist at the Ballinacurra/SCR junction.	Yes
4.2.2	Yes	Yes		
4.2.3	Yes	No	Zebra markings removed and only tactile and drop kerbs to be provided as uncontrolled crossings.	Yes
4.2.4	Yes	Yes		
4.2.5	Yes	No	Tactile removed as footpath continuous.	Yes
4.2.6	Yes	Yes		
4.2.7	Yes	Yes		
4.2.8	No	No	The existing cycle lane will be removed prior to implementation of the Active Travel Scheme.	Yes
4.3.1	Yes	Yes		
4.3.2	Yes	Yes		
4.3.3	Yes	No	Do not allow right turn movements as this is in keeping with the concept of reducing traffic numbers on SCR. Traffic survey numbers of this movement were very low.	Yes
4.3.4	Yes	Yes		
4.3.5	Yes	Yes		
4.3.6	Yes	Yes		
4.3.7	Yes	Yes		
4.3.8	Yes	No	Remove staggered barriers.	Yes
4.3.9	Yes	Yes		

ROAD SAFETY AUDIT FEEDBACK FORM

CST Group Chartered Consulting Engineers
1, O'Connell Street, Sligo, F91 W7YV, Ireland

TO BE COMPLETED BY DESIGNER				TO BE COMPLETED BY AUDIT TEAM LEADER
Paragraph No. in Safety Audit Report	**Problem accepted (Yes/No)**	**Recommended measure accepted (Yes/No)**	**Describe alternative measure(s). Give reasons for not accepting recommended measure. Only complete if recommended measure is not accepted.**	**Alternative measures or reasons accepted by Auditors (Yes/No)**
4.3.10	Yes	Yes		
4.3.11	Yes	Yes		
4.3.12	Yes	Yes		
4.3.13	Yes	Yes		
4.3.14	Yes	Yes		
4.3.15	Yes	Yes		
4.3.16	Yes	Yes		
4.3.17	Yes	Yes		
4.3.18	Yes	Yes		
4.3.19	Yes	Yes		
4.3.20	Yes	Yes		
4.3.21	Yes	Yes		
4.3.22	Yes	Yes		

Signed: _____ Designer Date: 16-08-2022
Julie Tiernan
PUNCH Consulting Engineers

Signed: _____ Audit Team Leader Date: 17/08/2022
Stuart Summerfield
CST Group Chartered Consulting Engineers

Signed: _____ Employer Date: 2/9/2022
For Limerick City & County Council