Appendix M
Road Safety Audit

Lucan to City Centre

Core Bus Corridor Scheme

Stage 1 Road Safety Audit Report

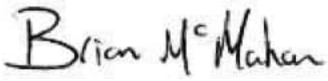
Client – National Transport Authority

Project number: Project Number

BCIDA – ACM - STY_SP – 0006_XX_00 – RP – XX – 0002

Date September 2022

Quality information

Prepared by	Checked by	Approved by
		
Rowan Lyons Principal Engineer	Brian McMahon Associate Director	Rowan Lyons Principal Engineer

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	22.06.2022	Draft	RL	Rowan Lyons	Principal Engineer
1	20.09.2022	Final	RL	Rowan Lyons	Principal Engineer

Distribution List

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Prepared for:

National Transport Authority

Prepared by:

AECOM Ireland Limited in association with Mott MacDonald

24 Lower Hatch Street

Dublin 2 D02 TY88

Ireland

Prepared in association with:

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1 Introduction

AECOM were commissioned to undertake an updated Stage 1 Road Safety Audit on the proposed Core Bus Corridor (CBC) scheme running from Lucan to Dublin City Centre (Proposed Scheme Route 6). The Audit was carried out at the request of Client Name.

The Safety Audit Report indicates each of the problems identified, provides outline recommendations for solving the problems, presents the Audit Team Statement, and describes a schedule of documents reviewed.

The Road Safety Audit team membership, was as follows:

Team Leader: R Lyons BEng CEng MIEI MCIHT MSoRSA

Principal Engineer, AECOM

(Certificate of Competency in Road Safety Audit)

Team Member: B McMahon BE MSc CEng MIEI

Associate Director, AECOM

(Certificate of Competence in Road Safety Audit)

This Safety Audit represents the response of an independent Audit Team to various aspects of the scheme. The recommendations contained therein are the opinions of the Audit Team and are intended as a guide to the designers on how the scheme as designed can be improved to address issues of road safety.

The terms of reference of the Road Safety Audit are as described in TII GE-STY-01024. The Road Safety Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.

The scheme has not been examined or verified for compliance with any other standards. However, in order to clearly explain a safety problem or the recommendation to resolve a problem, the Audit Team may on occasion have referred to a design standard for information only. Any Audit comments should not be construed as implying that a technical audit has been undertaken in any respect.

2 Scheme Description

2.1 Received Information

A summary of the drawings and documentation information received to carry out the audit is included in Appendix A.

A formal Stage 1 Audit Brief including all associated documents and information was not provided. Only details as provided have been considered as part of this Stage 1 Audit.

2.2 Traffic Flow Information

The NTA has provided individual traffic surveys of various sections of the corridor. However, future forecasts of pedestrian, cyclists, frequency of the buses, Dublin Bus or otherwise have not been provided.

2.3 Collision Information

A review of the collision data between the years 2005 and 2016 has been undertaken for the length of the Lucan to City Centre Proposed Scheme.

2.4 Departures from Standard

4 no. departures from standards have been notified to the Audit Team on the scheme. Two of these departures relate to non-standard merge layouts at the N4 Junction 3 eastbound merge slip road and the N4 Junction 2 eastbound diverge slip road, while the other two departures relate to reduced visibility to gantry signage on the N4 eastbound, westbound of Junction 1 and forward visibility inbound on the R148 Chapelizod Bypass.

2.5 Scheme Details

The Core Bus Corridor project proposes the provision of 230 kilometres of dedicated bus lanes on twelve of the busiest bus corridors and 200 kilometres of cycle lanes and tracks.

The intention is to develop these bus corridors so that each will have continuous bus priority - in other words, a continuous bus lane in each direction as well as maintaining two general traffic lanes. In addition, it is proposed to provide safe cycling facilities, segregated where possible from other vehicular traffic. This will remove the delays currently experienced which will grow worse as congestion increases.

The Lucan to City Centre Core Bus Corridor (Proposed Scheme) commences at Junction 3 on the N4 and it is routed via the N4 as far as Junction 1 (M50), and via the R148 along the Palmerstown Bypass, Chapelizod Bypass, Con Colbert Road, St John’s Road West and Frank Sherwin Bridge, where it will join the prevailing traffic management regime on Victoria Quay. The Proposed Scheme is approximately 9.6km in length and will reduce bus journey times significantly and improve reliability.

The scheme includes redistribution of road space, provision of new Proposed Scheme facilities as well as pedestrian and cycle facility upgrades.

It is intended that Proposed Scheme Route 6 will provide a high-quality transport system where priority for buses will be provided along the entire route, consisting primarily of dedicated bus lanes in both directions, with alternative measures proposed at particularly constrained locations. Dedicated cycle facilities will also be provided alongside the Proposed Scheme route.

The site is within existing 30-80km/h speed limit zone throughout.

Error! Reference source not found. provides a summary of the scheme location and context while the l ocation of the CBC Route 6 is shown on the scheme drawings.

Table 2.1 Summary of Scheme Location

Location	Junction 3 on the N4 to Frank Sherwin Bridge (Victoria Quay)
Classification	National, Regional & Local Roads
Speed Limit	30 - 80 km/h
Local Authority Area	South Dublin County Council & Dublin City Council
Type of Roads	Dual Carriageway Roads, Urban Environment

2.6 Site Inspection

The Audit Team visited the site on the 07 and 08 March 2022 between the hours of daylight 09.00 and 17.00. Traffic flows were moderate and free flowing during the inspection. The weather conditions during the site visit were generally clear. The carriageway and footway surfaces were dry.

Photographs were taken, and notes were written in order to document impressions of the scheme prior to the writing of this report.

The report indicates each of the problems identified together with recommendations to resolve or mitigate the problems, the Audit Team Statement and a schedule of documents reviewed as listed in Appendix A

All comments and recommendations are referenced to the design drawings and where applicable, the locations of problems are shown in conjunction with the scheme proposals in Appendix B where the reference numbers relate to the problems identified in this report.

Any recommendations included within this report should not be regarded as being prescriptive design solutions to the problems raised. They are intended only to indicate a proportionate and viable means of eliminating or mitigating the identified problem, in accordance with GG119, and in no way imply that a formal design process has been undertaken. There may be alternative methods of addressing a problem which would be equally acceptable in achieving the desired elimination or mitigation and these should be considered when responding to this report.

Where applicable, the locations of problems are shown in conjunction with the scheme proposals in Appendix B where the reference numbers relate to the problems identified in this report.

2.7 Site Observations

These observations are discussed below under a number of key headings.

Road Geometry

- The study area extends from Junction 3 on the N4 in Lucan to Victoria Quay in Dublin City. The Proposed Scheme is routed via the N4 as far as Junction 1 (M50), and via the R148 along the Palmerstown Bypass, Chapelizod Bypass, Con Colbert Road, St John's Road West and Frank Sherwin Bridge, where it will join the prevailing traffic management regime on Victoria Quay.
- With the exception of the Frank Sherwin Bridge, which is one-way (south-to-north), the length of the 9.6km route is a combination of single 2-lane carriageway, dual 2-lane carriageway and dual 3-lane carriageway.

- The Proposed Scheme is routed along the N4 between Junction 3 at Lucan and the M50 Junction 7 intersection. This section of the corridor has a three-lane plus bus lane cross-section.
- The Proposed Scheme continues along the R148 as far as the Frank Sherwin Bridge adjacent to Heuston Railway Station. The R148 (Palmerstown Bypass, Chapelizod By-pass and Con Colbert Road) between the M50 Interchange and the South Circular Road junction at Kilmainham is a two-lane plus bus lane dual carriageway.
- The eastbound carriageway of St. John's Road West consists of two lanes; one being a bus lane. There is a taxi rank and taxi queuing lane (approximately 550m in length) along the northern side of the carriageway adjacent to Heuston Railway Station. The westbound carriageway of St. John's Road West consists of two lanes from the Frank Sherwin Bridge as far as the entrance to HSQ. From here, the carriageway increases to three lanes with the commencement of a bus lane.
- The Proposed Scheme crosses the LUAS Red Line adjacent to Heuston Railway Station.
- At the Frank Sherwin Bridge, traffic approaching from St. Johns Road West can either continue straight across the bridge or turn left into Heuston Station and the station carpark. Right-turns onto Victoria Quay are prohibited.
- Buses are only permitted to enter the drop-off area fronting Heuston Station. There is a shared bus/Luas stop at this location.
- In addition to the Proposed Scheme facilities proposed, the existing bus stop facilities are to be improved along the route.

Vehicular Traffic

- Traffic flows during the site visit appeared to be normal for each particular road for the time of day.
- The speed limit on the road network within the study area is 30 to 80 km/h, with traffic generally appearing to stay within this limit.

Pedestrians & Cyclists

- A footpath is provided adjacent to the bus corridor from the start of the scheme at Lucan through to the N4 Junction 2 off-slip, where it diverts and continues off-line along the Old Lucan Road and footbridge over the M50, re-joining the Old Lucan Road. The pedestrian route continues off-line until a footpath connection on the Con Colbert Road, at the War Memorial Gardens. The footpath continues on-line adjacent to the bus corridor on to Victoria Quay.
- There is no on-line footpath adjacent to the bus corridor from the of N4 Junction 2 off-slip through the N4/M50 Interchange and along the Palmerstown and Chapelizod By-passes.
- There is a variety of existing cycle facilities along the route, from on-road, shared with bus, cycle tracks, etc.
- Pedestrian and cyclist activity were busiest in the vicinity of Heuston Station.

Street Lighting

- Public lighting is provided throughout the entire scheme extents. The site visit was carried out during daylight hours; lighting levels at the site during darkness hours were therefore not observed.

3 Items Raised at Previous Road Safety Audits

An earlier Stage 1 Road Safety Audit undertaken for this scheme in May 2020 was issued to the Audit Team for information.

A previous Lucan to City Centre Stage 1 Road Safety Audit was carried out by AECOM in May 2020. The current RSA team determined that the following 16 no. previously noted problems are still relevant to the current Lucan to City Centre Core Bus Corridor (Proposed Scheme) scheme from the Stage 1 Road Safety Audit, Report reference: BCIDA-ACM-STY_SP-0006_XX_00-RP-ZZ-0001.

For ease of reference to this 2020 audit, the problem numbers are retained in the list below.

4.2.1 Problem	
Location:	Throughout the Scheme
Summary:	No tactile paving at pedestrian crossings
Description:	
No tactile paving has been provided at any of the pedestrian crossings proposed throughout the scheme. This may result in visually impaired pedestrians to either trip and fall while crossing the road carriageway or entering the carriageway at an unsafe location. The following are examples of locations where tactile paving has not been provided: • Sheet 1 of 32: Toucan crossings at the R835 Old Lucan Road/R136 junction. • Sheet 13 of 32: Toucan crossing across the R148 at the junction with Kennelsfort Road Lower. • Sheet 15 of 32: Crossing across the R148 at the junction with Old Lucan Road • Sheet 26 of 32: Crossings at the Con Colbert Road/Memorial Road junction • Sheet 28 of 32: All crossing at the Con Colbert Road/South Circular Road junction. • Sheet 29 of 32: Crossings at the St. John's Road West/Military Road junction. • Sheet 31 of 32: Crossings at Heuston Station and at the St. John's Road West/Frank Sherwin Bridge junction.	
Recommendation:	
Appropriate tactile paving should be installed at all pedestrian crossings proposed throughout the scheme.	

4.2.2 Problem	
Location:	Throughout the Scheme
Summary:	No yield road marking provided for cyclists at a number of pedestrian crossing points
Description:	
No yield road markings have been provided on the cycle tracks in advance of pedestrian crossings through the scheme. It is important that yield road markings are provided to ensure that cyclists slow down and yield to crossing pedestrians on shared space. Failure to provide Yield road markings may result in cyclists failing to stop at the pedestrian crossings and collisions.	
Recommendation:	
Yield markings should be provided at all crossings throughout the scheme.	

4.2.3 Problem	
Location:	Throughout the Scheme
Summary:	Auto Tracking has not been provided
Description:	
Tracking for buses has not been provided for any of the junctions throughout the scheme. If there is insufficient space within the carriageway for all vehicle types to safely complete a turning manoeuvre there is a risk of vehicles over-running, or striking, the kerb or entering the footpath/cycle lane where there is the potential for collisions with vulnerable road users.	
Recommendation:	
The swept path of all vehicles should be accommodated within the extents of the traffic lanes at all junctions within the Scheme. Where larger vehicles (e.g. buses and HGVs) may over-run adjacent traffic lanes when turning ensure stop lines are sufficiently set back from the junction and that mirrored turning manoeuvres are on separate signal phases.	

4.2.8 Problem	
Location:	Throughout the Scheme
Summary:	Removal of left-slip lanes
Description:	
The removal of left slip lanes at a number of junctions through the scheme may result in reduced capacity at these junctions. This may result in increased congestion at the junctions. The operation of the junction should be assessed to ensure that removing the left-slip lanes does not reduce junction capacity. The following are examples where left slip lanes have been removed: • Sheet 1 of 32: R835 Old Lucan Road/R136 junction – removal of left-slip from the R136 arm. • Sheet 25 of 32: R148 Chapelizod Bypass/R833 Con Colbert Road junction – removal of left-slip from the R833 arm. • Sheet 28 of 32: Con Colbert Road/South Circular Road junction – removal of left-slip from St/ John's Road West onto South Circular Road	
Recommendation:	
The junctions should be assessed to ensure that removing the slip-lanes does not reduce their capacity.	

4.3.7 Problem

Location:	Westbound Bus Stop to the west of Ballyowen Lane
Drawing:	Sheet 03 of 32
Summary:	Bus stop is too short

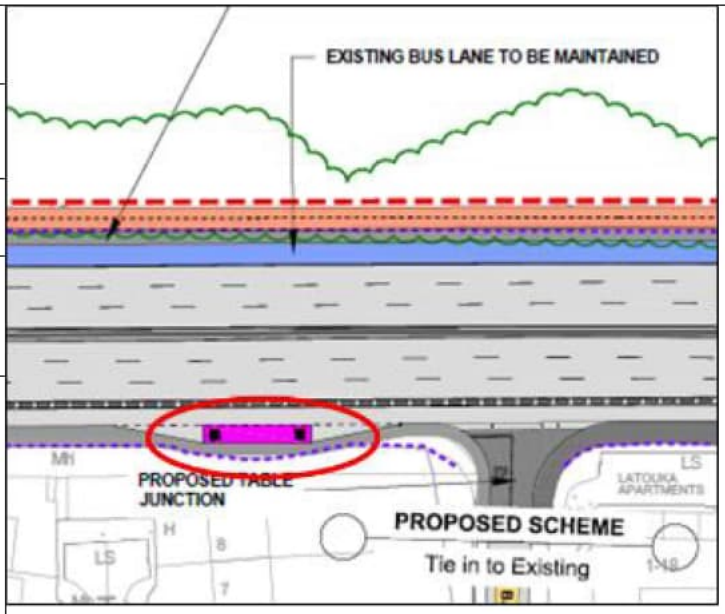


Figure 3.1 Westbound bus stop too short

Description:

The westbound bus stop located to the west of Ballyowen Lane is too short in length. The bus stop does not have sufficient capacity to accommodate more than a single bus. This results in buses having to stop on the carriageway when there is already a bus occupying the bus stop. This will increase the risk of rear end shunt collisions with buses required to stop on the carriageway while waiting for another bus to depart the bus stop.

Recommendation:

Provide a bus stop longer in length so it can accommodate more than a single bus.

4.3.12 Problem

Location:	R113 roundabout to north of N4 at Junction 2
Drawing:	Sheet 06 of 32
Summary:	Vehicle encroach on island

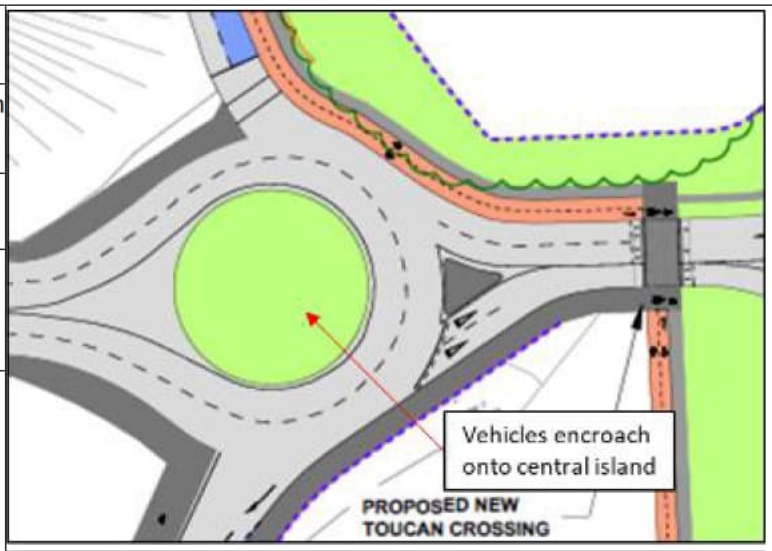


Figure 3.2 R113 roundabout located north of N4 (Junction 2)

Description:

It appears that larger vehicles occasionally encroach on the central island of the roundabout. This may result in loss of control and collisions.

Recommendation:

An overrun area should be provided so that large vehicles can negotiate the roundabout without having to mount the central island kerbing.

4.3.16 Problem

Location:	Old Lucan Road between R113 and The King's Hospital
Drawing:	Sheets 06, 07 & 08 of 32
Summary:	On-street parking along both sides of Old Lucan Road

Figure 3.3 On-street parking on Lucan Road between R113 and King's Hospital

Description:

On-street parking along Old Lucan Road was observed during the site visit. It is anticipated that motorists will want to continue to park at this location. Without parking restrictions or enforcement, motorists may park on the proposed two-way cycle track. Vehicles parked on the cycle track will likely result in cyclists having to use the carriageway thus increasing the risk of collisions with motorists.

Recommendation:

Parking enforcement measures should be provided on Old Lucan Road between the R113 and The King's Hospital.

4.3.18 Problem	
Location:	Merge onto the N4 west bound carriageway to the west of Junction 1
Drawing:	Sheets 08 & 09 of 32
Summary:	Bollards separating merge lane and main carriageway

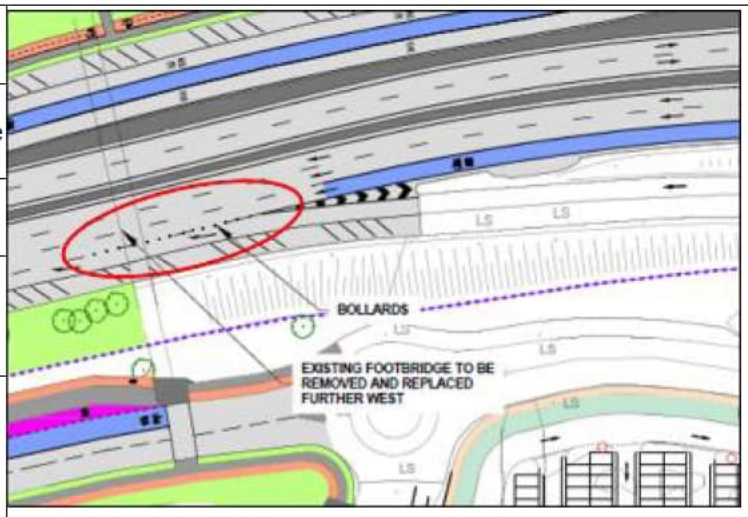


Figure 3.4 Bollards separating merge lane (from M50 north bound carriageway) and N4 westbound

Description:

It is proposed to install bollards between the merge lane and inside lane (bus lane) of the N4 westbound carriageway. The presence of bollards on a high-speed carriageway would pose a hazard. There is a risk that vehicles merging from the on-slip from the M50 northbound carriageway will strike these bollards.

Recommendation:

The bollards should be omitted from the scheme and replaced with a solid white line.

4.3.19 Problem

Location:	N4 to the west of Junction 1 – both carriageways
Drawing:	Sheets 08 & 09 of 32
Summary:	High speeds observed at this location

Figure 3.5 Speed limit on eastbound approach to M50 interchange

Description:

During the site visit it was observed that vehicles appeared to be travelling in excess of the posted speed limit. The provision of an additional bus lane, particularly on the eastbound approach, increases the complexity of the road layout. The existing speed limit on the approach may be unsuitable for the proposed layout and result in an increase in collisions.

Recommendation:

An assessment of the existing speed limits should be undertaken by the designers. If the speed limit is deemed unsuitable, discussions with TII should be undertaken with regard to reducing the speed limit at this location.

4.3.20 Problem

Location:	Cycle track to the north of the N4
Drawing:	Sheet 08 of 32
Summary:	Proposed cycle track cut through embankment

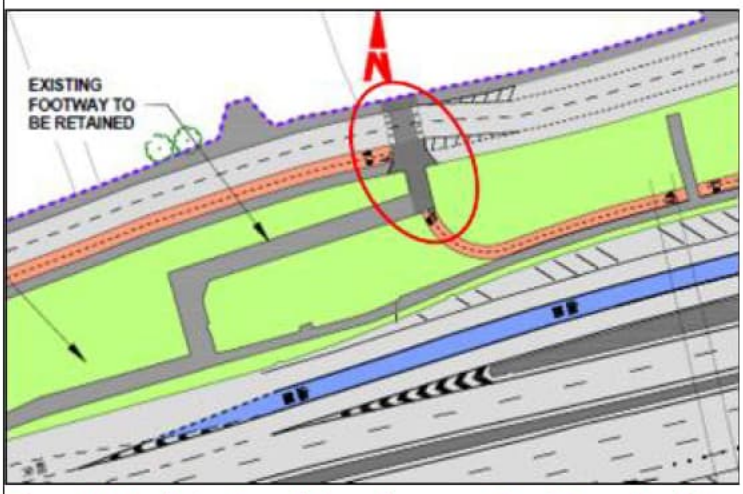


Figure 3.6 Cycle track and shared space will cut through existing embankment

Description:

The proposed two-way cycle track along Old Lucan Road will cut through a steep embankment and link up with the two-way cycle track adjacent to the N4. Should the cycle track be constructed with a steep gradient at this location, this may result in collisions with cyclists losing control or unable to stop as they approach Old Lucan Road.

Recommendation:

The cycle way should be constructed so that the long fall gradient does not exceed 5% in accordance with the National Cycle Manual.

4.3.30 Problem	
Location:	South Circular Road junction
Drawing:	Sheet 28 of 32
Summary:	The length of the pedestrian crossing is excessive

Figure 3.7 Length of crossing is too long

Description:

The length of the crossing across the westbound carriageway of Con Colbert Road is excessive. The crossing traverses a cycle track and five lanes of traffic approximately 20m in length. If appropriate green times are not provided to pedestrians, this could result in vehicle/pedestrian collisions.

Recommendation:

Appropriate green times should be provided to ensure pedestrians can cross in time.

4.3.33 Problem	
Location:	South Circular Road junction
Drawing:	Sheet 28 of 32
Summary:	Auto tracking for left-turning vehicles

Figure 3.8 Can large HGVs negotiate left-turn between St. John's Road West and South Circular Road?

Description:

The left-turn slip between St. John's Road West and South Circular Road (R111) has been removed. It is not clear whether vehicles, particularly larger vehicles, can negotiate the left turn without encroaching onto other lanes. This may result in left-turning vehicles encroaching into the straight-ahead bus lane, on the adjacent shared space or collisions with northbound vehicles on South Circular Road stopped at the junction.

Recommendation:

Autotrack analysis should be undertaken to demonstrate that this manoeuvre can be undertaken in a safe manner.

4.3.35 Problem

Location:	Heuston Station pick-up/drop-off
Drawing:	Sheet 31 of 32
Summary:	Pick-up/drop-off has been removed

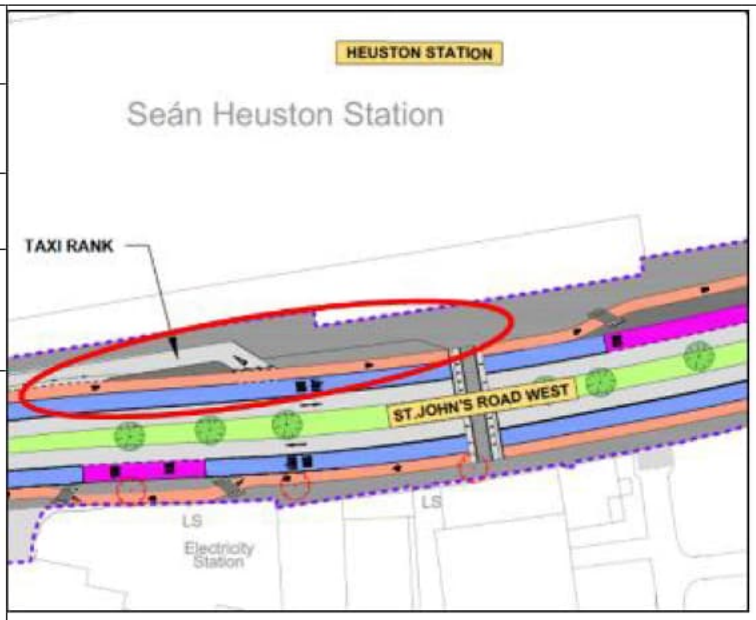


Figure 3.9 Drop-off/Pick-up area outside Heuston Station had been removed

Description:

It appears that the existing drop-off/pick-up area will be omitted to accommodate the proposed scheme. It is likely that private vehicles will use either the bus stop or taxi rank to drop-off/pick-up passengers. This is likely to result in delays and conflicts between private vehicles and buses and/or taxis, which could result in collisions.

Recommendation:

The existing drop-off/pick up area adjacent to the south elevation of Heuston Station should either be retained or an alternative drop-off/pick up area should be provided elsewhere for private motorists.

4.3.36 Problem	
Location:	Heuston Station drop-off
Drawing:	Sheet 31 of 32
Summary:	Width of peed ramp is too short

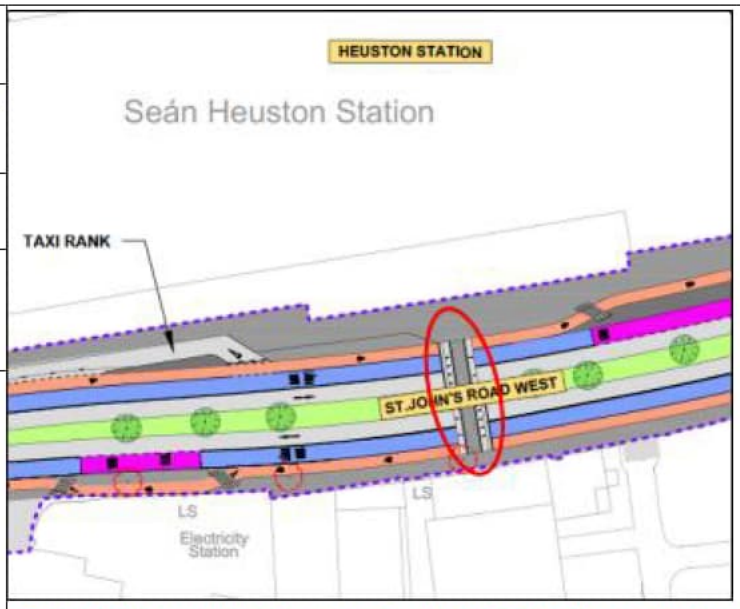


Figure 3.10 Speed bump across St. John's Road West is too narrow

Description:

The speed ramp proposed on St. John's Road West adjacent to Heuston Station is too narrow for buses. This could result in ground of buses as they negotiate the ramp and possibly collisions. Increasing the length of the flat-top ramp is favoured by buses as they perceive it to reduce the discomfort for drivers and passengers together with maintenance and repair costs for their vehicles.

Recommendation:

A minimum flat-top length of 6m on bus routes, a height of 75mm together with ramp slopes of 1 in 15 should be installed as this represents a good balance between effective speed reduction and the potential drawbacks. This is in line in line with the requirements of the Traffic Management Guidelines.

4.3.37 Problem	
Location:	St. John's Road West/Frank Sherwin Bridge/Victoria Quay junction
Drawing:	Sheet 31 of 32
Summary:	Refuge areas are too small for pedestrians and cyclists crossing the junction

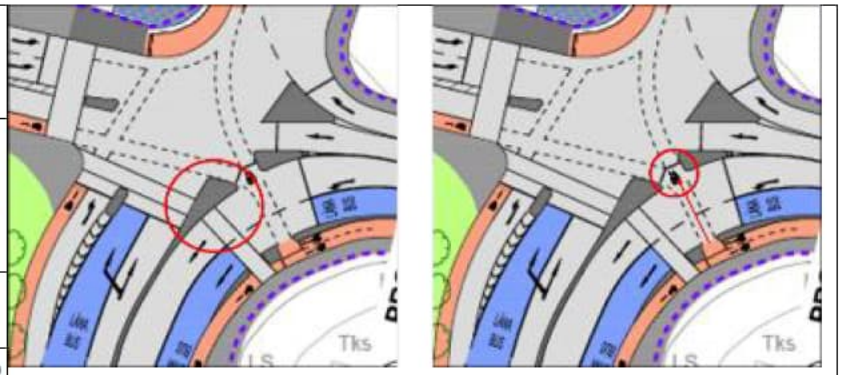


Figure 3.11 Narrow pedestrian refuges

Description:

The refuge island at the pedestrian crossings at the St. John's Road West/Frank Sherwin Bridge/Victoria Quay junction is too narrow to accommodate the large volumes of pedestrians that are present at this location on a daily basis. The insufficient width is likely to result in pedestrians encroaching on the adjacent carriageway with the risk of being struck by vehicles.

In addition, cyclists crossing the junction from Victoria Quay towards Frank Sherwin Bridge have a very restricted waiting area. Again, when there are large volumes of cyclists crossing at the same time, there is a risk that a cyclist will encroach on the carriageway while waiting to cross the junction towards Frank Sherwin Bridge, with the risk of collisions.

Recommendation:

The size of the pedestrian refuge islands should be increased at this location. The waiting area of cyclists should also be extended.

4.3.39 Problem	
Location:	St. John's Road West/Frank Sherwin Bridge/Victoria Quay junction
Drawing:	Sheet 31 of 32
Summary:	No Autotrack analysis done

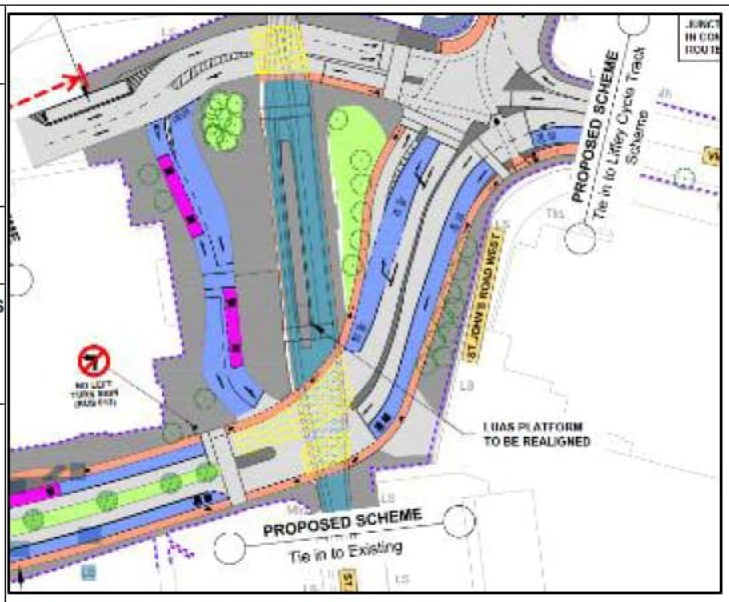


Figure 3.12 Narrow pedestrian refuges

Description:

No AutoTrack analysis has been undertaken at this stage of the project. AutoTrack analysis will demonstrate whether all types of vehicles can manoeuvre safely through the junction without encroaching onto pedestrian and shared spaces, cycle track or onto other lanes.

Recommendation:

Autotrack analysis should be undertaken to ensure that the junction can be negotiated by all vehicle types in a safe manner.

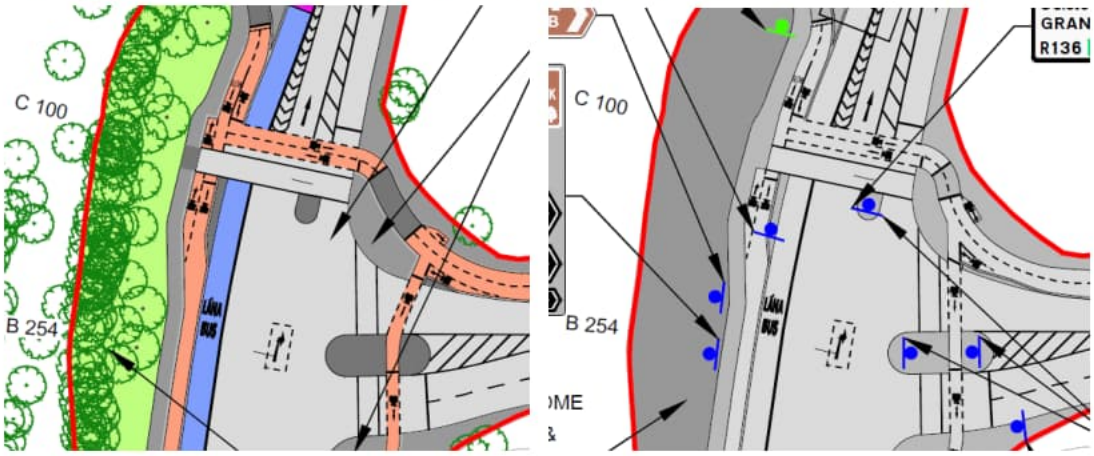
All other problems raised in the May 2020 Stage 1 RSA have been addressed

4 Items Raised at this Stage 1 Road Safety Audit

4.1 General

Problem: **4.1.1**

Location(s):	Scheme wide
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-9001 General Arrangement BCIDA-ACM-TSM_GA-0006_XX_00-DR-CR-9001 Traffic Signs & Markings
Summary:	Differences in drawing series can lead to incorrection provisions.



Description:

It is noted that there are several inconsistencies of the cycle layouts between the separate drawing series.

For example, as shown above at the R835 Lucan Road / R136 Ballyowen Road junction, when comparing the General Arrangement drawing to the Traffic Signs & Road Marking drawing, the alignment of the cycle crossings are different on the R136 Ballyowen Road for each drawing.

The radii of the cycle tracks on the north-eastern side of the junction area different. Also, the location of the western cycle right turn waiting area northbound on the Lucan Road is located at different positions either side of the Lucan Road pedestrian crossing.

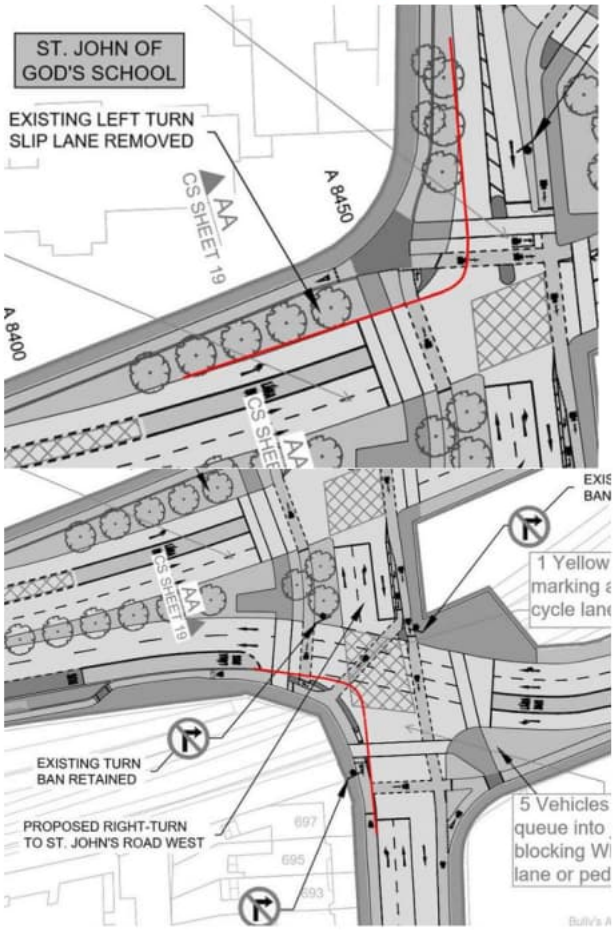
Inconsistencies in layout arrangement on construction drawings can lead to unsafe layouts and road markings which can result in pedestrian and cyclist collisions and injuries.

Recommendation:

Ensure the proposed layout is consistent across all proposed drawing series.

Problem: 4.1.2

Location(s):	Scheme wide
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-9001 General Arrangement
Summary:	Large junction radii can lead to high turning speeds.



Description:

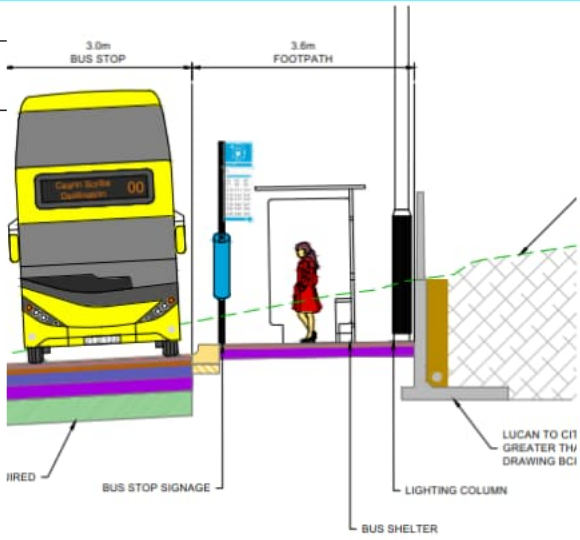
It is noted that there are several locations where the proposed junction radii are quite large, and in some locations larger than the current condition. Large turning radii can reduce the footpath space available and also encourage higher turner speeds which could lead to vehicles travelling too fast for the conditions and may result in vehicular collisions.

Recommendation:

Review all junctions to ensure that junction radii are minimised so as to reduce turning speeds and are also able to accommodate the expected turning manoeuvres.

Problem: **4.1.3**

Location(s):	Scheme Extents
Drawing(s):	BCIDA-ACM-GEO_CS-0006_XX_00-DR-CR-0009 of 23
Summary:	Lack of adequate width on footpath at bus stops can lead to pedestrian/vehicle conflicts.



Description:

Proposed bus shelters shown on drawing no. BCIDA-ACM-GEO_CS-0006_XX_00-DR-CR-0009, show that the bus shelters are offset from the rear of the footpath. Therefore, at the bus shelters, the clear width of available footpath to the rear and front of the bus shelter is reduced and restricted for footpath users. Without the appropriate width of pavement, there may be a lack of manoeuvrability and passing space between the bus shelter and edge of footpath. This can lead to pedestrians stepping into the carriageway to avoid other NMUs and coming into conflict with vehicles which could result in pedestrian collisions.

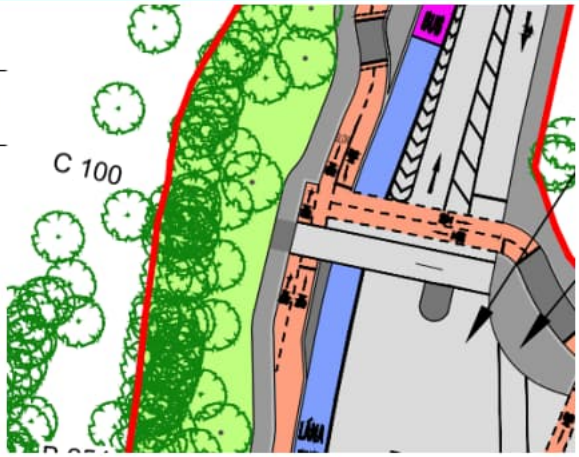
Recommendation:

Ensure that there is adequate width on all footpaths at bus stops to facilitate adequate space for passing NMUs on the footpaths.

4.2 Specific Locations

Problem: **4.2.1**

Location(s):	Lucan Road / Ballyowen Road junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0001 of 31
Summary:	Lack of cycle push-button facilities can lead to cyclist/pedestrian collisions.



Description:

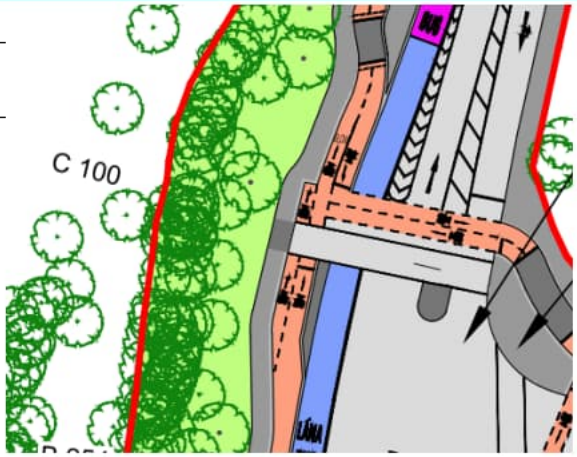
The cycleway traverses the signalised pedestrian crossing on the Lucan Road. Stop lines are provided within the cycleway in both directions in advance of the pedestrian crossing. When the pedestrian phase is called, the traffic signals will turn red. These signal aspects will be visible to all eastbound traffic. As no low level cycle signals are provided in an advance of the pedestrian crossing, eastbound cyclists may not be aware that the pedestrian phase is activated, which can lead to cyclists colliding with pedestrians resulting in pedestrian and cyclist falls.

Recommendation:

Provide low level cycle signals in both directions at all signalised pedestrian crossings to allow cyclists to identify when it is safe to proceed through the pedestrian crossing.

Problem: **4.2.2**

Location(s):	Lucan Road / Ballyowen Road junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0001 of 31
Summary:	Lack of tactiles and signage can lead to cyclist/pedestrian collisions.



Description:

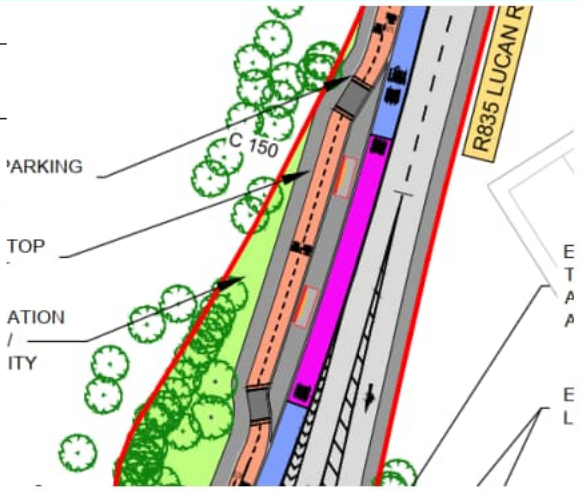
Dropped kerbs and tactile paving assist Non-Motorised Users (NMUs) to identify and safely negotiate crossing points. At all of the crossing points, it is unclear the extent and nature of tactile paving arrangement at the footpath/cycle track crossing points. The location of pedestrian routes crossing the cycle track has been identified within the drawings, although the tactile paving type and dropped kerbing are not shown.

Recommendation:

Ensure that dropped kerbs and appropriate tactile tramline paving, with visual contrast, are provided on the cycle track and at NMU crossing locations and in accordance with the Traffic Management Guidelines, particularly at the bus stops and in areas where the footpath crosses the cycle track. Also provide appropriate tramline tactile paving on the cycle track in advance of all pedestrian crossing locations.

Problem: **4.2.3**

Location(s):	Scheme Route
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0001 of 31
Summary:	Risk of pedestrians sustaining personal injuries when attempting to transition between footway and bus boarding area due to lack of crossing across cycleway.



Description:

A floating bus stop / bus stop bypass is proposed on the R835 Lucan Road opposite the Lucan Retail Park and at locations along the R148 Con Colbert Road and St John's Road West. It is unclear if a street level or a raised crossing is provided across the bi-directional cycleway between the footway and the bus stop island.

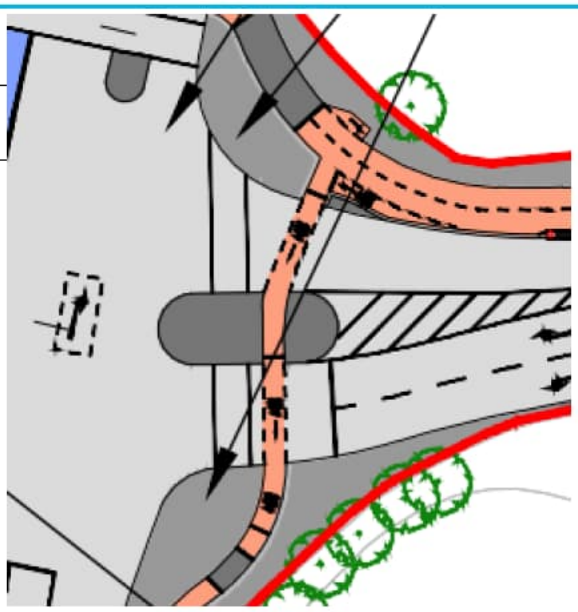
If a raised crossing across the cycle track is not provided, cyclists may understand that they have priority at this crossing location and there is a risk that bus users with mobility or visual impairments could collide with cyclists and sustain personal injuries whilst attempting to transition from the footway to the bus stop island.

Recommendation:

It is recommended that appropriate infrastructure such as a raised island is provided to enable all footpath users to transition safely between the footway and bus stop island.

Problem: **4.2.4**

Location(s):	Lucan Road / Ballyowen Road junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0001 of 31
Summary:	Insufficient cycle storage on splitter island could lead to pedestrian/vehicle or cycle/vehicle collisions.



Description:

The Audit Team have concerns that the width of the island may be insufficient for the volume of pedestrians and cyclists crossing. The signal phasing diagrams indicate that there is a 2-stage crossing of the R136 Ballyowen Road for pedestrians and cyclists. Therefore, pedestrians and cyclists will be held on the splitter island to wait for the next

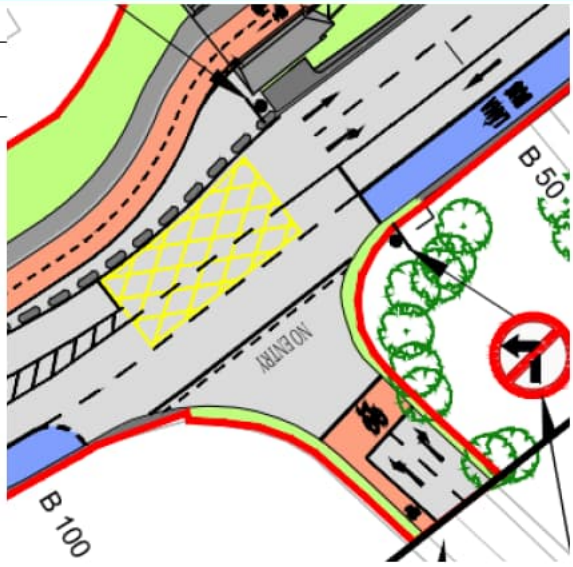
signal stage. There appears to be 2 no. consecutive green phases for crossing the southbound arm of the R136 before a single green stage to cross the northbound arm. Without the appropriate width of pavement on the splitter island, there may be a lack of storage space for pedestrians and cyclists on the splitter island. This could lead to pedestrians or cyclists spilling onto the carriageway, which could result in them being struck and injured by passing vehicles.

Recommendation:

Ensure that there is adequate waiting storage space on all splitter islands with a 2-stage crossing, to facilitate expected volume of cyclists to safely wait off the carriageway.

Problem: **4.2.5**

Location(s):	N4 Off-Slip / Ballyowen Road junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0001 of 31
Summary:	Restricted access to the cycle track can lead to cycle/vehicle collisions.



Description:

There is an existing cycle track on the nearside of the N4 Junction 3 off-slip road with a cycle storage area in advance of the vehicle stop line at the junction with the R136 Ballyowen Road. The existing uni-directional northbound cycle track on the western side of the R136 Ballyowen Road is proposed to be replaced by a bi-directional cycle track located on the eastern side of the R138, behind the existing safety barrier. There does not appear to be an opening proposed within this safety barrier.

Therefore, cyclists travelling from the N4 off-slip road onto the R138 will not be able to access the bi-directional cycle track on the R138 directly. This will result in cyclists having to travel on the R138 carriageway and may undertake unsafe manoeuvres to access the proposed cycle track, which may lead to cycle/vehicle collisions resulting in cyclist injuries.

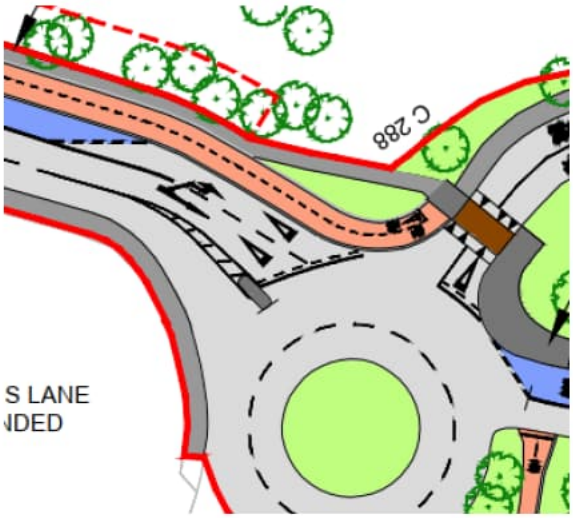
Recommendation:

Provide clear directional signage and access arrangements for cyclists from the N4 off-slip road to safely access the proposed cycle tracks on the R138 Ballyowen Road.

Problem: **4.2.6**

Location(s):	Lucan Road roundabout at the entrance to Lucan Retail Park
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0002 of 31

Summary: The road marking arrows are misleading and could lead to side swipe collisions.



Description:

The roundabout at the eastern end of Lucan Road has road markings for 2 no. circulatory lanes. The offside lane of the Lucan Road approach to the roundabout junction has a straight ahead arrow and the nearside lane has a left turn only arrow. If the left turn arrow is obscured, vehicles may enter this lane and proceed to access the N4 On-slip from this lane. This may cause side swipe collisions with vehicles in the outer offside lane also going straight ahead onto the N4 on-slip lane leading to vehicular collisions.

Recommendation:

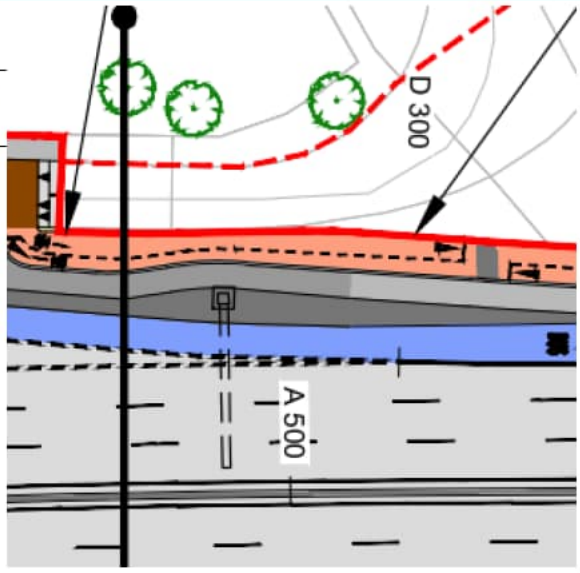
Ensure road marking and advanced signage is provided and is clearly visible, and also appropriate to the expected vehicle manoeuvres. On the approach to the roundabout, provide a straight ahead and left turn arrow on the inner nearside approach lane, and a right-turn only arrow on the outer offside approach lane.

Problem: **4.2.7**

Location(s): N4 eastbound outside the Hermitage Golf Club

Drawing(s): BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0003 of 31

Summary: Narrow bus lane could result in vehicle side swipe collisions.



Description:

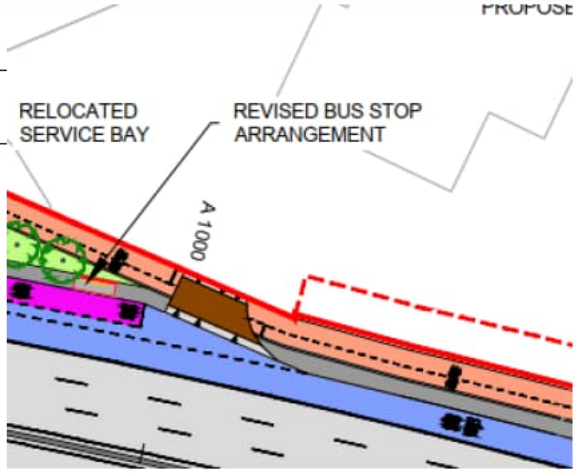
The proposed bus lane connects with the existing bus lane at the existing gantry for the Junction 2 advanced directional signage. The proposed bus lane is aligned at a shallow angle of approach to the existing bus lane. The proposal appears to have a narrow width of bus lane at this location at about chainage A500. There is a risk that buses approaching this section may overhang the edge of the bus lane at this location, into Lane 1 of the N4 eastbound carriageway. This could lead to side swipe collisions with buses in the bus lane and vehicles travelling in Lane 1 on the N4.

Recommendation:

Provide sufficient width on the proposed bus lane at tie-in locations to ensure that buses do not overhang into the adjacent traffic lane.

Problem: **4.2.8**

Location(s):	East of existing Foot and Cycle bridge outside Sureweld Ltd site on the N4 EB
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0004 of 31
Summary:	Risk of visually impaired or wheelchair users crossing on a slope could lead to falls.



Description:

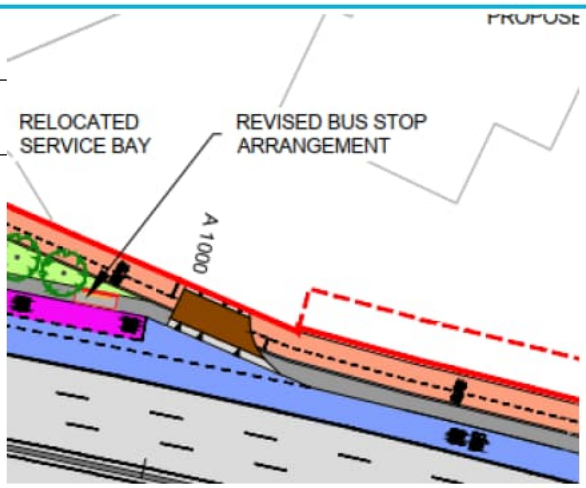
The proposals include the provision of a raised table across the access to the Sureweld site. The raised table extends across most of the width of the segregated cycle track and part of the footpath. The ramp to the raised table extends to the front edge of the footpath. The sloped ramp of the raised table appears to extend across the majority of the width of the footpath and across part of the cycle track. As a result, wheelchair users would have to travel along the crossfall of the ramp to cross the access, or the visually impaired may step off the footpath onto the ramped section, not expecting a sloped surface, which may result in visually impaired, or wheelchair users falls. Also, eastbound cyclists may suddenly swerve to avoid the sloped ramp and collide with oncoming cyclists or pedestrians.

Recommendation:

Provide a flush finish across the entire width of all footpath crossings and cycle tracks on raised tables or at a minimum, provide a flush finish across the extent of the tactile paving at the footpath crossing.

Problem: **4.2.9**

Location(s):	East of existing Foot and Cycle bridge outside Sureweld Ltd site on the N4 EB
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0004 of 31
Summary:	Risk of visually impaired pedestrians misinterpreting crossing.



Description:

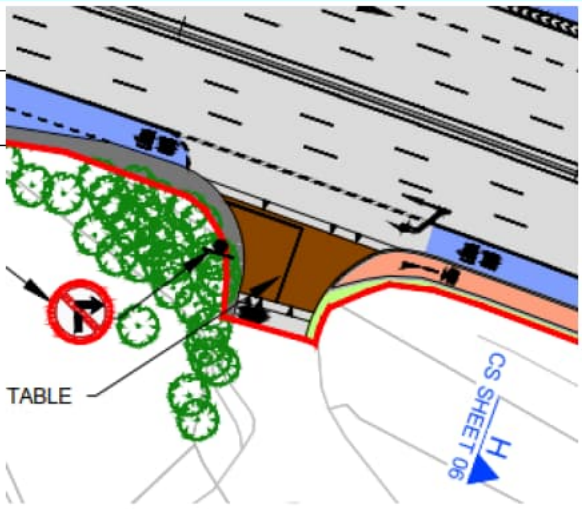
The proposals include the provision of a raised table across the access to the Sureweld site. The raised table extends across the segregated cycle track and part of the footpath. It is unclear whether the raised table is to be flush with the adjacent cycle track and footway along the entire interface between the footway and raised table or whether a drop with tactile paving is to be provided.

Recommendation:

Ensure that appropriate warning paving is provided to inform visually impaired pedestrians of the interface of the footway and cycleway.

Problem: **4.2.10**

Location(s):	Access off the N4 WB into St Loman's Hospital
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0004 of 31
Summary:	Cycle route terminates without onward direction.



Description:

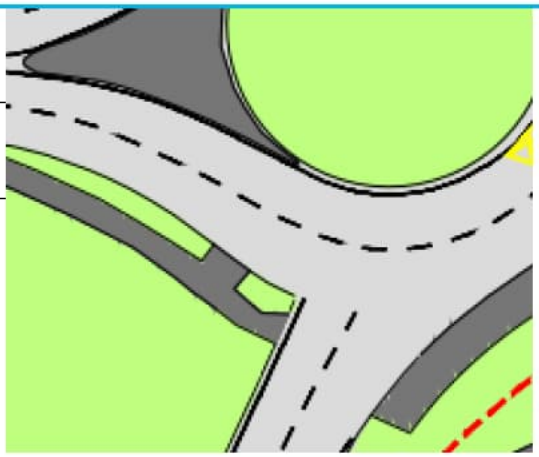
The westbound shared footpath to the east of the access off the N4 into St Loman's Hospital, terminates as a cycle route at the eastern side of this junction. There is a footpath on the western side of this junction to accommodate pedestrians, but there is no provision on the western side to accommodate cyclists. This can lead to cyclists continuing their westbound journey on the footpath or entering onto the Bus Lane on the N4. Pedestrians may not be expecting cyclists on the footpath which could lead to pedestrian/cyclist collisions, or buses travelling westbound on the N4 may not expect cyclists to merge into this lane and may lead to cyclist/bus collisions resulting in cyclist injury.

Recommendation:

Provide clear direction to enable cyclists to continue their journey in a safe environment to minimise conflict with vehicles and pedestrians.

Problem: **4.2.11**

Location(s):	Fonthill Road northern dumbbell roundabout
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0006 of 31
Summary:	Proposed footpath link directs NMUs into the carriageway.



Description:

On the grassed verge to the southeastern side of the northern Fonthill Road roundabout, a short footpath link is proposed onto the Foothill Road. This short footpath link is directed towards the northern Fonthill Road roundabout. There is no destination provision for footpath users from this footpath link section. Pedestrians may attempt to cross

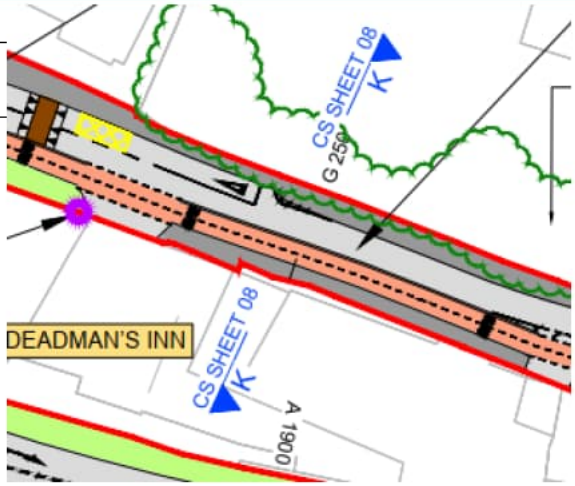
the Fonthill Road at this location where it is not safe to do so, which could lead to pedestrian/vehicular collisions resulting in pedestrian injuries.

Recommendation:

Remove this footpath link and provide adequate facilities at pedestrian crossing points.

Problem: **4.2.12**

Location(s):	Old Lucan Road
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0007 of 31
Summary:	No pedestrian crossing facility is provided across the Old Lucan Road.



Description:

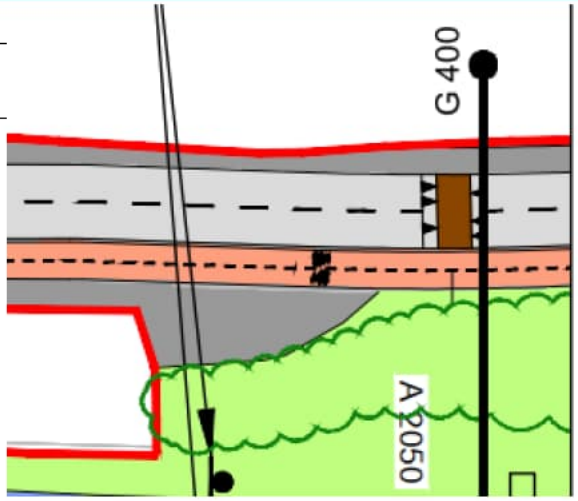
The footpath is located on the northern side of the Old Lucan Road, while a bi-directional cycle track is located on the southern side of the Old Lucan Road. A footpath is also provided on the southern side of the Old Lucan Road from the carpark to the west of The Deadmans Inn to the end of the commercial yard to the east. Raised tables are proposed across the carriageway of the Old Lucan Road. These raised tables are not proposed to extend across the adjacent bi-directional cycle track. No crossing facilities are proposed for pedestrians on the northern footpath to cross to the commercial properties on the southern side of the road. This can lead to pedestrians crossing at locations which are unsafe to do so and may result in pedestrian conflicts with vehicles or cycles travelling on the Old Lucan Road.

Recommendation:

Ensure that pedestrian crossings suitable for all NMUs, with dropped kerbs and appropriate tactile paving, are provided across the Old Lucan Road.

Problem: **4.2.13**

Location(s):	Old Lucan Road
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0007 & 0008 of 31
Summary:	Cars may park on the cycle track on the Old Lucan Road.



Description:

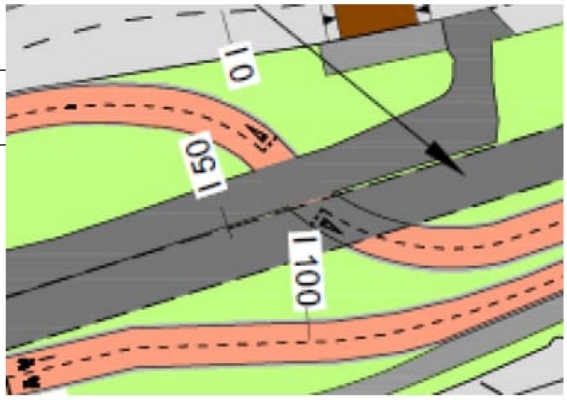
There is currently uncontrolled on-street car parking along the southern side of the Old Lucan Road. As there is a bus stop a short distance away, this section of the Old Lucan Road may be used as a parking area for city bound bus users. If alternative sufficient parking facilities are not provided to replace the current on-street parking, this can lead to cars parking in the cycle track. This will result in cyclists having to veer into and out of the Old Lucan Road carriageway, which could result in a cyclist/vehicular collision.

Recommendation:

Provide sufficient off-street parking to accommodate existing parking usage or provide adequate cycle track segregation and protection so that vehicles would not be able to enter the cycle track.

Problem: **4.2.14**

Location(s):	Old Lucan Road / Foot/cycle bridge junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0008 of 31
Summary:	A steep gradient on the proposed cycle track may cause cyclists to lose control



Description:

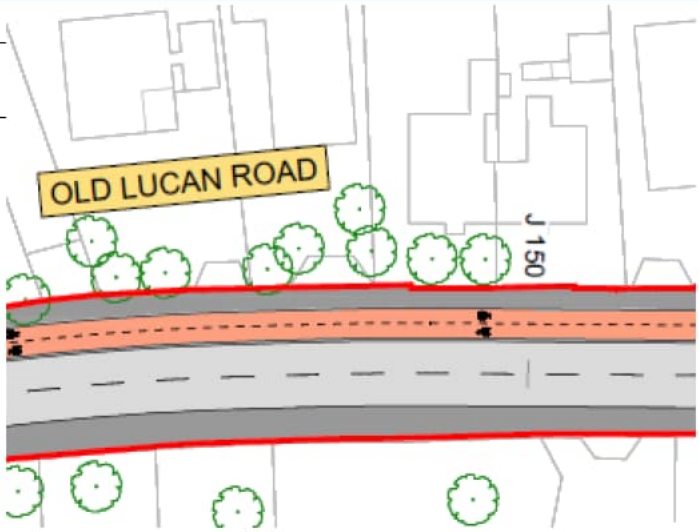
There is currently a level difference either side of the existing pedestrian/cycle path. The proposed cycle track crosses this path on a high angle. Therefore, this section of the proposed cycle track between the Old Lucan Road and the existing overbridge may have a steep gradient. For eastbound cyclists this can lead to cyclists losing control in this area which may lead to cyclist collisions.

Recommendation:

Provide appropriate gradient on the cycle track.

Problem: **4.2.15**

Location(s):	Old Lucan Road
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0011 & 0012 of 31
Summary:	Vehicles may park on the cycle track on the Old Lucan Road.



Description:

There is uncontrolled on-street parking along the northern side of the Old Lucan Road. If alternative sufficient parking facilities are not provided to replace the current on-street parking, this can lead to cars parking in the cycle track. This will result in cyclists having to veer into and out of the Old Lucan Road carriageway, which could result in a cyclist/vehicular collision.

Recommendation:

Provide adequate cycle track segregation and protection so that vehicles would not be able to enter the cycle track.

Problem: **4.2.16**

Location(s):	Old Lucan Road
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0012 of 31
Summary:	Relocation of Bus stops may restrict non-motorised user journeys causing conflict with vehicles.

Description:

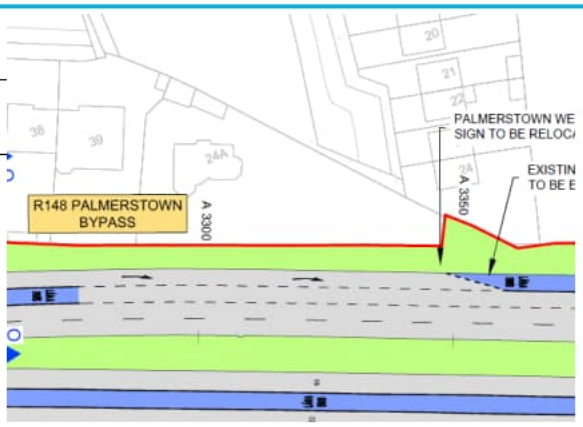
Existing bus stops are being removed from the Old Lucan Road. It is unclear if these bus stops are being permanently removed or being relocated along the Old Lucan Road. If these are to be relocated along the road, they may restrict movements within the footpath or cycle track which could lead to pedestrian/cycle/vehicular collisions.

Recommendation:

Relocate bus stops to locations where there is clear visibility and priority given to NMUs.

Problem: **4.2.17**

Location(s):	R148 Palmerstown Bypass / M50 SB On-slip
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0012 of 31
Summary:	Short merge length for opposing crossover manoeuvres may lead to side swipe collisions.



Description:

The proposed bus lane on the R148 terminates in advance of the eastbound diverge lane from the M50 onto the R148 Palmerstown Road. This is to allow merging traffic from the M50 to access onto the R148. A 'new extended' bus lane begins approximately 80m further east on the nearside lane of the R148 Palmerstown Bypass, resulting in a short merge distance. Buses within the existing bus lane have to move left crossing the merge lane to access the 'new' bus lane. Traffic merging from the M50 have to cross to the right from the merge lane into Lane 2 to join onto the R148 Palmerstown Bypass. Vehicles merging onto the R148 may not be aware of the designated bus lane in the nearside lane ahead and that buses on the R148 are moving into the nearside lane while merge traffic are moving

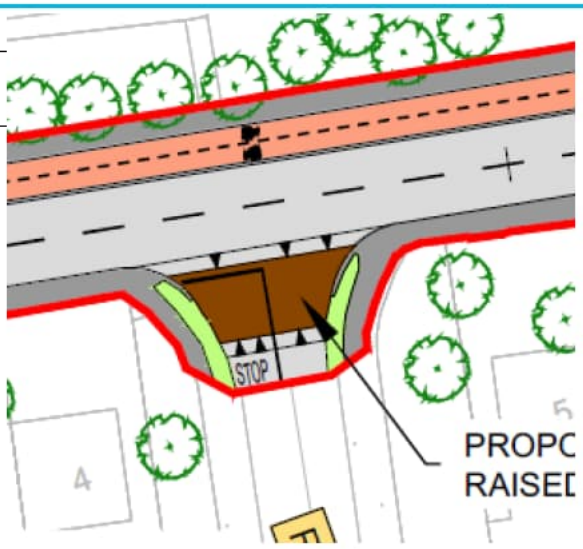
right into an offside lane. This has the potential for weaving lane change type side swipe collisions involving buses with merging traffic or shunt collisions between merging traffic.

Recommendation:

Provide appropriate advanced warning signage of the R148 lane allocations on the M50 diverge lane in advance of the merge.

Problem: **4.2.18**

Location(s):	Old Lucan Road
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0012, 0013 & 0014 of 31
Summary:	Risk of visually impaired pedestrians misinterpreting level difference or wheelchair users crossing on a steep crossfall.



Description:

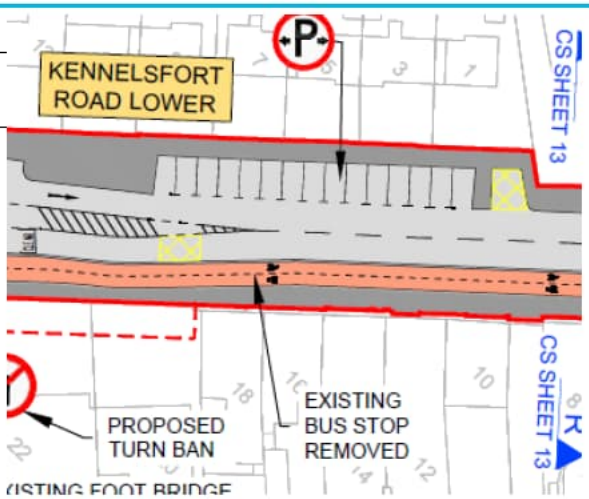
The proposals include the provision of a raised table across the side roads on the Old Lucan Road (East). The raised tables do not extend across the full width of the footpaths. Where footpaths are narrow or there is landscaping adjacent to the minor road crossing, the sloped ramp of the raised table extends across part of the width of the footpath. As a result, wheelchair users would have to travel along the crossfall of the ramp to cross the side road, or the visually impaired may step off the footpath onto the ramped section, not expecting a sloped surface, which may result in visually impaired falls or wheelchair users losing control.

Recommendation:

Provide a flush finish across the entire width of all footpath crossings on raised tables or provide a flush finish across the extent of the tactile paving at the NMU crossing location.

Problem: **4.2.19**

Location(s):	Kennelsfort Road Lower
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0014 of 31
Summary:	Relocation of Bus stops may restrict non-motorised user journeys causing conflict with vehicles.



Description:

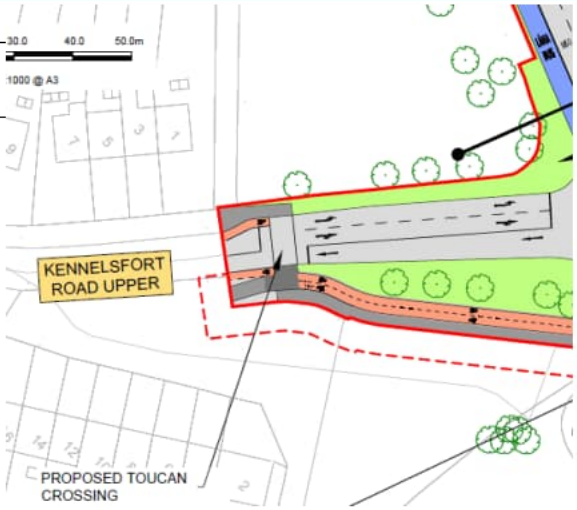
Existing bus stops are being removed from the Kennelsfort Road Lower. It is unclear if these bus stops are being permanently removed or being relocated along the Kennelsfort Road Lower. If these bus stops are to be relocated along the road, they may restrict movements within the footpath or cycle track which could lead to pedestrian/cycle/vehicular collisions.

Recommendation:

Relocate bus stops to locations where there is clear visibility for vehicles and NMUs and ensure that priority given to NMUs.

Problem: **4.2.20**

Location(s):	Kennelsfort Road Upper
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0014 of 31
Summary:	Risk of left turning vehicles striking and injuring cyclists.



Description:

At the signalised pedestrian crossing on the Kennelsfort Road Upper a cycle track is indicated on the northbound approach to the crossing. This cycle track is located on the nearside of the single northbound lane. It is unclear as to the intention of cycle continuation route at this location as there are no directional road markings in this cycle track. Beyond this crossing, the Kennelsfort Road Upper changes to 2 northbound lanes, a dedicated left turn and a combined straight ahead and right turn lane. As the cycle track is located on the nearside, cyclists stopped at the crossing proposing to go straight ahead have to cross northbound traffic to access the offside northbound lane. Vehicles turning left at this junction may not be expecting this manoeuvre by cyclists and could result in cycle/vehicle conflicts which can lead to cyclist injury.

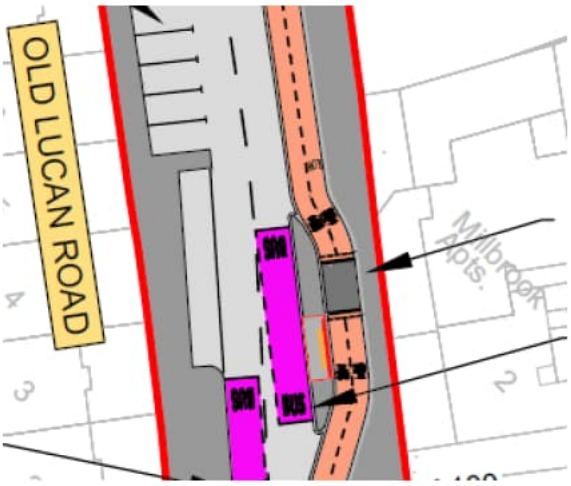
Recommendation:

Provide clear cycle route road marking and directional signage at this junction. Also, if it is the intention to direct cyclists straight ahead, provide a cycle storage area in advance of the northbound vehicular stop line on Kennelsfort Road Upper to allow cyclists to select their destination lane without having to manoeuvre across following traffic.

Problem: **4.2.21**

Location(s):	Old Lucan Road
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0014 of 31

Summary: Risk of pedestrians sustaining personal injuries when attempting to transition between footway and bus boarding area due to lack of crossing across cycleway.



Description:

A floating bus stop / bus stop bypass is proposed on Old Lucan Road at the bus stop at Millbrook apartments. It is unclear if a street level or a raised crossing is provided across the bi-directional cycleway between the footway and the bus stop island.

If a raised crossing across the cycle track is not provided, cyclists may understand that they have priority at this crossing location and there is a risk that users with mobility or visual impairments could collide with cyclists and sustain personal injuries whilst attempting to transition from the footway to the bus stop island.

Recommendation:

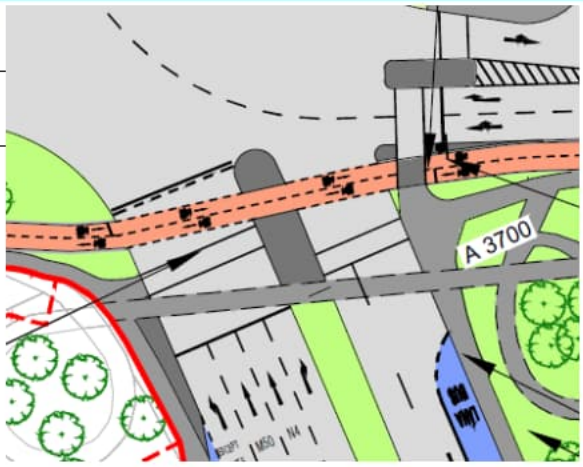
It is recommended that appropriate infrastructure is provided to enable all footpath users to transition between the footway and bus stop island.

Problem: **4.2.22**

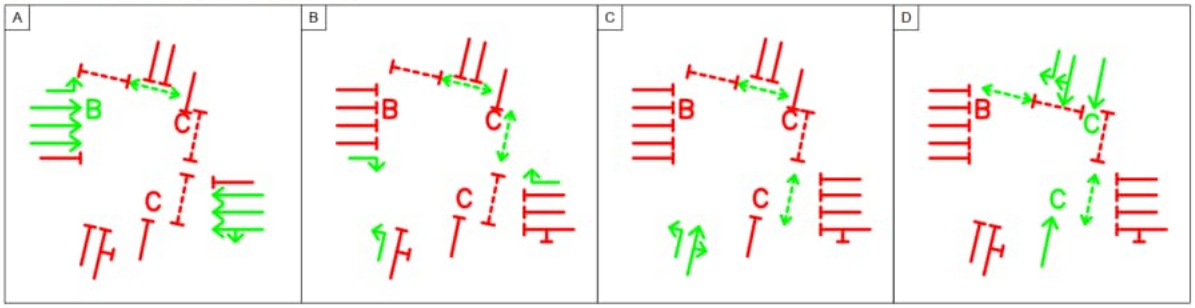
Location(s): R148 Palmerstown Bypass/ Kennelsfort Road junction

Drawing(s): BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0014 of 31

Summary: Risk of pedestrians crossing the R148 carriageway when it is not safe to do so and being struck and injured by vehicles.



INDICATIVE METHOD OF CONTROL



Description:

The signal staging diagram for the R148 Palmerstown Bypass/Kennelsfort Road is illustrated in the image above. It shows the 4 no. stages of the traffic signals at this junction, with the pedestrian movement across the R148 eastbound indicated in Stage B. Pedestrians crossing the R148 Palmerstown Bypass from the Kennelsfort Road Upper on the first pedestrian crossing signal stage 'C' are held on the central splitter island for 2 no. signal stages before they can cross the R148 eastbound carriageway to Kennelsfort Rd Lower at stage 'B'. Signal stage 'D' facilitates the green stage for cyclists to cross to and from the Kennelsfort Road Upper and Lower. There is a Red aspect on the pedestrian signals crossing the eastbound carriageway on this stage.

As traffic is stopped on the eastbound carriageway, pedestrians may risk crossing the eastbound carriageway during this red phase. This could result in pedestrians having insufficient time to cross this carriageway which could lead to pedestrian/vehicular conflict resulting in pedestrians being struck by vehicle.

Recommendation:

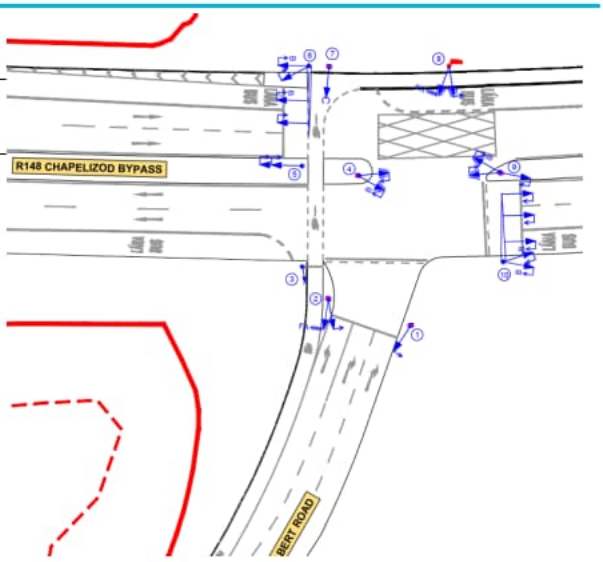
Provide appropriate signal phasing to minimise pedestrian waiting times on all central splitter islands. If it is safe to do so, give northbound pedestrians a green light to cross the R148 eastbound during signal stage D.

Problem: 4.2.23

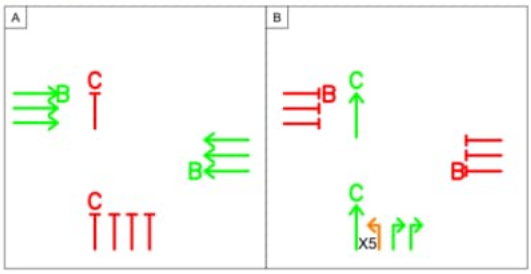
Location(s): R148 Signalised junctions at Con Colbert Road, HSQ and Heuston Station

Drawing(s): BCIDA-ACM-TSM_SJ-0006_XX_00-DR-TR-0009, 0013 & 0016 of 16

Summary: Risk of left turning vehicles striking and injuring cyclists.



INDICATIVE METHOD OF CONTROL



X5 denotes Advance 5 seconds Start for Cyclists and Buses

Description:

There are signalised junctions on the R148 with the Con Colbert Road, HSQ and Heuston Station with left turn traffic manoeuvres conflicting with straight ahead cycle track movements. The traffic signals staging diagram is shown on drawing no. BCIDA-ACM-TSM_SJ-0006_XX_00-DR-TR-0009,0013 & 0016 respectively. These indicate 2 no. signal phases, A and B. The left turn manoeuvre from Con Colbert Road, R148 westbound into HSQ and into Heuston Station, are indicated as 'X5 which denotes an Advance 5 seconds Start for Cyclists and Buses'.

As there is no dedicated bus lane on these arms, this provision is unclear to the audit team. It is also unclear if the northbound cycle filter will indicate a 'Red' phase after 5 seconds. Confusion or inappropriate stage timings could lead to vehicle collisions with cyclists crossing the R148 Chapelizod Road which may result in injury to cyclist.

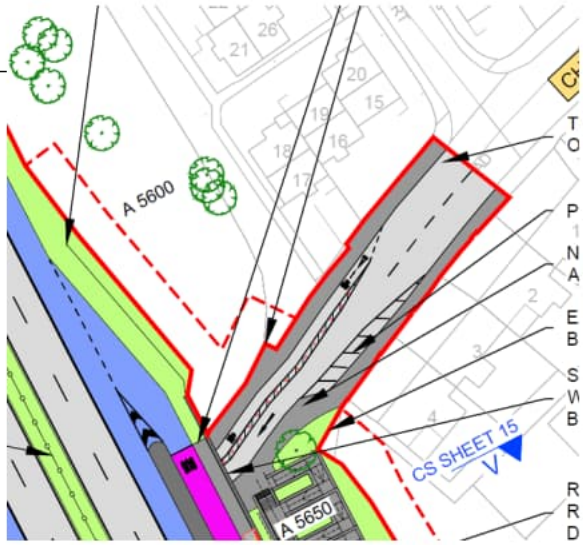
Recommendation:

Provide appropriate traffic signal stages and timings to accommodate all traffic and NMU improvements at these junctions.

Problem: 4.2.24

Location(s): Chapelizod Hill Road

Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0020 of 31
Summary:	Risk of opposing cyclists collisions in uni-directional cycle track.



Description:

Under the R148 Chapelizod Bypass, the Chapelizod Hill Road is one-way northbound. This road is quite steep, falling from south to north. below the R148 Chapelizod Bypass overbridge. A uni-directional cycle track is proposed on the western side of the Chapelizod Hill Road to accommodate northbound cyclists. This is in the downhill direction. Bollards are proposed to separate this northbound cycle track from the southbound vehicles on the Chapel Hill Road. There is no separate provision for southbound (uphill) cyclists using this section of the Chapel Hill Road nor is there any directional signage proposed for southbound cyclists.

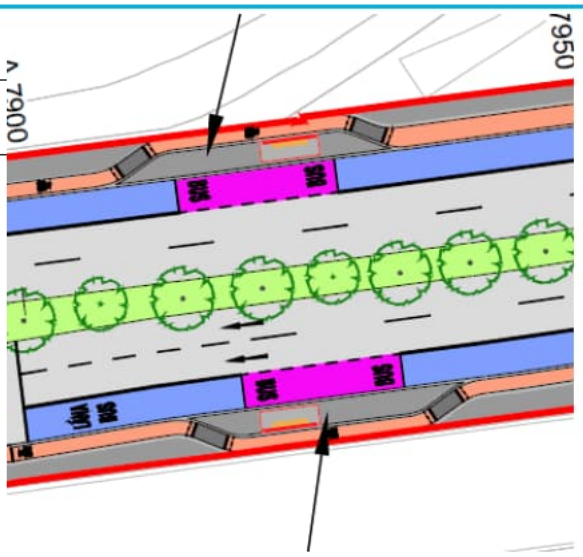
There is a risk that southbound cyclists may enter into the northbound cycle track to avoid travelling slowly on the one-way southbound carriageway. This can lead to southbound (uphill) cyclists coming into conflict with fast moving northbound cyclists, resulting in injuries to cyclists.

Recommendation:

Provide appropriate cycle road markings and direction signage for all cyclists in both directions.

Problem: **4.2.25**

Location(s):	R148 east of Memorial Road & west of South Circular Road
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0026 & 0028 of 31
Summary:	Risk of cyclists losing control due to geometry of cycleway, leading to falls.



Description:

There are several points along the route where the geometry of the radii of the uni-directional cycle route appears tight. This could cause issues for users on longer bicycles, such as recumbent, cargo or tandem bicycles. The locations include:

East of the R148/R839 Memorial Road junction, at the bus bypasses on each side of Con Colbert Road; and

West of the R148/R111 South Circular Road junction, at the bus bypasses on each side of Con Colbert Road.

At these points tight radii appear to be proposed when the cycle track diverts to bypass the proposed bus stops. This could lead to cyclists losing control, particularly in wet conditions, which could lead to cyclist falls, resulting in cyclist injuries.

Recommendation:

It is recommended that swept path analysis is undertaken on the proposed layouts using different types of bicycle and that the design is appropriately amended, if required.

Problem: **4.2.26**

Location(s):	R148 Con Colbert Road / South Circular Road Junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0028 of 31
Summary:	Yellow box road markings may lead to cyclist slips.

Description:

A cycle track is proposed diagonally across the intersection of the R111 South Circular Road and the R148 St Johns Road West westbound, for cyclists progressing westwards onto the Con Colbert Road cycle track. There are yellow box markings shown over this section of the cycle track. Therefore, cyclists will be travelling over these road markings. When wet or damp the yellow box marking may be slippery to cyclists. This can result in cycle slips across this intersection, which may lead to cycle falls which can result in fall injuries or could also lead to cycle/vehicle collisions if motorists are not expecting a fallen cyclist on the carriageway.

Recommendation:

Remove the yellow box road marking across the cycle track or provide non-slip yellow box marking across the cycle track.

Problem: **4.2.27**

Location(s):	R148 Con Colbert Road / South Circular Road Junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0028 of 31
Summary:	Right Turn Pocket for Cyclists (RTPC) may lead to collisions with vehicles.

Description:

The proposed Right Turn Pocket for Cyclists (RTPC) located beyond the stop line of the southbound lane on the northern side of the junction at the R111 South Circular Road. This RTPC is located in front of waiting southbound traffic beyond the pedestrian crossing. The RTPC directs the cyclists to stop directly ahead on the R111 South Circular Road carriageway, instead of directing the cyclists into the cycle track. This may lead to confusion for right turning cyclists unfamiliar of this junction, as to the correct location to stop to turn right.

It is also unclear as to the proposed number of cyclists expected to turn right at this junction. The extent of space available for right turning cyclists to wait is quite restricted. If there is insufficient storage area for cyclists turning right in the southbound direction to wait, it can lead to cyclists backing up into the northbound lane. Failure to provide adequate cyclist storage in this area may lead to collisions between southbound cyclists and vehicles travelling on the R111 straight through this junction.

Recommendation:

Demarcate the Right Turn Pocket for Cyclists (RTPC) with the same road surfacing colour as the cycle track to identify it as an area for cyclists only and, ensure that there is sufficient waiting storage space to facilitate expected volume of southbound cyclists.

Problem: **4.2.28**

Location(s):	R148 Con Colbert Road / South Circular Road Junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0028 of 31
Summary:	Risk of side swipe and rear end shunt collisions between signalised junctions.

Description:

On the eastbound approach of the R148 Con Colbert Road to the R111 South Circular Road there are 4 lanes of carriageway. The nearside Lane 1 is a designated left turn lane, Lane 2 is signed as a straight ahead Bus Lane, and Lanes 3 and 4 are also signed as straight ahead lanes. At this stop line, lane designation road marking signage identifies Lane 4 ahead as straight ahead. Immediately beyond this initial junction, the road marking arrow identifies Lane 4 as a designated right turn only lane.

When the traffic signals are green for the eastbound traffic on the R148 Con Colbert Road, vehicles in Lane 4 travelling at speed will not be aware of the change of lane designation until they are at the junction. This may lead to vehicles in Lane 4 making sharp manoeuvres to move into Lane 3 or braking hard to move into Lane 3, which can result in side swipe or rear end shunt collisions leading to vehicle occupant injuries.

Recommendation:

Provide sufficient advanced directional and warning signage, for the expected approach speeds, to provide eastbound vehicles with sufficient time for drivers to safely change lanes during the free flow movement of traffic.

Problem: **4.2.29**

Location(s):	R148 Con Colbert Road / South Circular Road Junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0028 of 31

Summary: Vehicles blocking the junction may result in vehicle and/or pedestrian collisions.

Description:

A new right tun lane is proposed for South Circular Road northbound vehicles to access the R148 eastbound. The storage length of this right turn facility is quite short in length and will not accommodate many vehicles. A high number of right turning vehicles may block this junction leading to following vehicles undertaking erratic unsafe manoeuvres or vehicles left waiting on/in the yellow box, on the pedestrian crossing or on the cycle lane across South Circular Road (south). This could lead to vehicle collisions with traffic westbound on the R148, or pedestrian/cycle collisions with vehicles on the South Circular Road.

Recommendation:

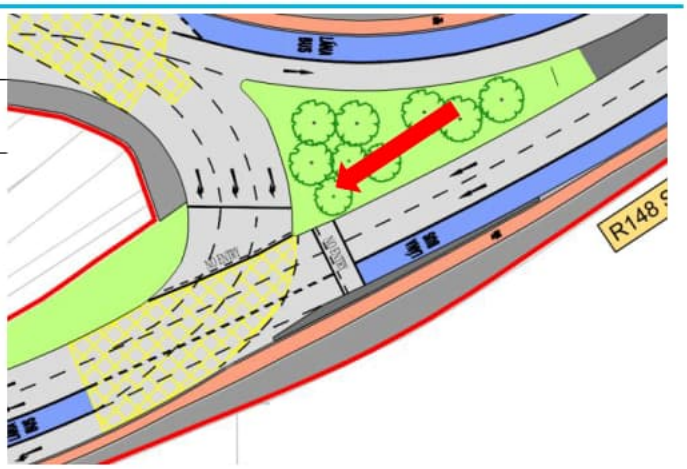
Extend the Yellow Box markings on the R148 westbound lane further south to meet the pedestrian crossing on South Circular Road.

Problem: **4.2.30**

Location(s): R148 St John's Road West, east of R111 South Circular Road

Drawing(s): BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0028 of 31

Summary: Vegetation blocking traffic signals can lead to vehicle collisions



Description:

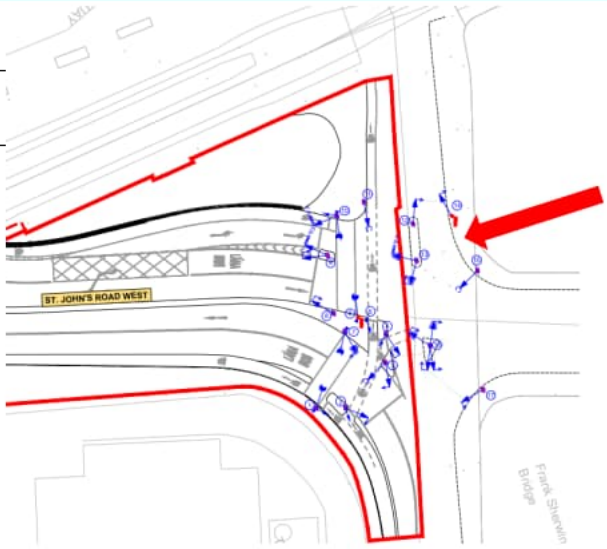
On the westbound approach of the R148 St. John's Road west to the southbound circulatory of the South Circular Road junction, existing vegetation is blocking the offside primary traffic signals. Mature trees within the central reservation, between the eastbound and westbound R148, restrict the visibility of approaching westbound drivers to the offside primary traffic signals. If drivers are unable to see the traffic signals clearly this may lead to vehicles braking hard to, which can result in side impact or rear end shunt collisions leading to vehicle occupant injuries.

Recommendation:

Ensure that all current and future vegetation is set back and/or maintained so as not to obstruct westbound drivers' visibility to traffic signals.

Problem: **4.2.31**

Location(s):	St John's Road West / Heuston Station access
Drawing(s):	BCIDA-ACM-TSM_SJ-0006_XX_00-DR-TR-0016 of 16
Summary:	Lack of a pedestrian phase can lead to pedestrian collisions with vehicles.



Description:

There is a footpath along the eastern side of the Frank Sherwin Bridge. Currently there are dropped kerbs on this footpath located on the access road to Heuston Station. These dropped kerbs direct footpath users across the Heuston Station access road, via a splitter island to dropped kerbs on the opposite footpath. Although this pedestrian route crosses a 2-lane carriageway and uni-directional on-street cycle tracks, there is no existing pedestrian crossing signal facilities at this location.

The proposed traffic signals staging diagram is shown on drawing no. BCIDA-ACM-TSM_SJ-0006_XX_00-DR-TR-0016. No pedestrian crossing phase is shown on the proposed signal staging diagrams. It is unclear what pedestrian crossing facilities will be provided for footpath users crossing the Heuston Station access road to/from the Frank Sherwin Bridge to/from Heuston Station. There is a risk that pedestrians may cross the Heuston Station access road at a location where it is unsafe to do so which may result in pedestrian collisions with vehicles or cyclists.

Recommendation:

Provide pedestrian facilities for footpath users to safely cross the Heuston Station access road to/from the Frank Sherwin Bridge.

Problem: **4.2.32**

Location(s):	Lucan Road / Ballyowen Road junction
Drawing(s):	BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0001 of 31
Summary:	Insufficient protection to the bus lane could lead to bus/vehicle side swipe collisions.

Description:

The bus lane on the Lucan road is provided through the junction with the R136 Ballyowen Road. There is currently a segregated island between the bus lane and the Lucan Road. No similar physical segregation is proposed between the bus lane and the Lucan Road in the proposed junction layout. As shown in the staging phasing diagram, vehicles can turn right from the R136 Ballyowen Road in the same phase as buses travelling straight through the junction in the bus lane.

There is a concern that without adequate physical segregation that large HGVs turning right may overrun the carriageway into the bus lane, which could result in near side or side swipe collisions between vehicles and buses.

Recommendation:

Undertake a swept path analysis to ensure that there is adequate turning space within the junction to facilitate large vehicles turning right without overriding into the bus lane.

End of problems / recommendations raised in this Stage 1 Road Safety Audit

5 Audit Team Statement

We certify that this Road Safety Audit has been carried out in the accordance with TII Road Safety Audit Guidelines GE-STY-01027-01 and Standard GE-STY-01024-07.

The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme.

No one on the audit team has been involved with scheme design.

Road Safety Audit Team LEADER:

Rowan Lyons — Signed 

BEng (Hons) CEng, MIEI MSoRSA (Certificate of Competency)

Principal Engineer

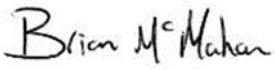
AECOM — Date 22 June 2022

9th Floor, 2 Clarence Street West

Belfast

BT2 7GP

Road Safety Audit Team Member:

Brian McMahon — Signed 

BE MSc CEng MIEI

Associate Director, AECOM — Date 22 June 2022

4th Floor, Adelphi Plaza

Georges Street Upper

Dun Laoghaire

Co. Dublin

A96 T927

Appendix A Schedule of Documents Used

The following documents were submitted as part of the Road Safety Audit:

Document Number	Rev	Description	Date
BCIDA-ACM-PMG_PD-0006_XX_00-RP-ZZ-0001		Preferred Route Option report	Feb 2022
BCIDA-ACM-PMG_PD-0006_XX_00-RP-ZZ-0002	L01	Prelim Design Report	Feb 2022
BCIDA-ACM-STY_SP-0006_XX_00-RP-ZZ-0001	1	Stage 1 RSA	21/05/2020
BCIDA-ACM-GEO_ZZ-0006_XX_00-RG-CR-0001		Departures from Standard	

Drawings			
Series Reference no.	Rev	Title	Date
BCIDA-ACM-SPW_ZZ-0006_XX_00-DR-CR-9001		Site Location Maps	
BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-9001		General Arrangement	
BCIDA-ACM-GEO_HV-0006_ML_00-DR-CR-9001		Mainline Plan & profile	
BCIDA-ACM-TSM_GA-0006_XX_00-DR-CR-9001		Traffic Signs & Markings	
BCIDA-ACM-TSM_SJ-0006_XX_00-DR-TR-9001		Junction Signals	
BCIDA-ACM-DNG_RD-0006_XX_00-DR-CD-9001		Surface Water	
BCIDA-ACM-ENV_LA-0006_XX_00-DR-LL-9001		Landscaping	
BCIDA-ACM-GEO_CS-0006_XX_00-DR-CR-9001		Cross Sections	
BCIDA-ACM-LHT_RL-0006_XX_00-DR-EO-9001		Street Lighting	
BCIDA-ACM-PAV_PV-0006_XX_00-DR-CR-9001		Pavement Treatment	
BCIDA-ACM-SPW_BW-0006_XX_00-DR-CR-9001		Fencing	
BCIDA-ACM-STR_GA-0006_XX_00-DR-CB-9001		Structures	

Appendix B Location of Problem Plan

LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

PROBLEM 4.1.0
GENERAL SITEWIDE

CAR PARK

LUCAN RETAIL PARK

R835 LUCAN ROAD

R136 BALLYOWEN ROAD

N4 JUNCTION 3

N4

WOODVILLE AVENUE

WOODVILLE CLOSE

WOODVILLE GROVE

WILLSBROOK PLACE

HERMITAGE VALLEY

HERMITAGE ROAD

WILLSBROOK

ALMON

Dublin
Baile Átha
Cliath

SHEET 2
SHEET 1

B
CS SHEET 01

A
CS SHEET 01

INSET A
SHEET 1

SHEET 2
INSET A

C 200

C 150

C 100

C 50

C 0

B 254

B 200

B 150

B 100

B 50

B 0

A 100

A 50

A 0

N 350

N 368

B1 100

B1 150

B1 200

RW06 PROPOSED PILED BOUNDARY WALL

ST03 BALLYDOWD PEDESTRIAN AND CYCLE BRIDGE. REFER TO STRUCTURES DRAWING: BCIDA-ACM-STR_GA-0006_BR_01-DR-CB-0101

EXISTING TURN BAN RETAINED

EXISTING LEFT TURN SLIP LANE REMOVED

EXISTING TURN BAN RETAINED

TIE IN TO EXISTING CYCLE TRACK ON SLIP ROAD

EXISTING TURN BAN RETAINED

PROPOSED SAFETY BARRIER

EXISTING TURN BAN RETAINED

EXISTING TURN BAN RETAINED

TIE IN TO EXISTING CYCLE LANE

PROBLEM 4.2.3

EXISTING BIKE PARKING RELOCATED

REVISED BUS STOP ARRANGEMENT

PROPOSED LOCATION FOR BIKE RACK / STORAGE FACILITY

EXISTING JUNCTION LAYOUT TO BE MODIFIED TO ACCOMMODATE BUS LANE AND CYCLE FACILITIES

PROBLEM 4.2.1

EXISTING LEFT TURN SLIP LANES REMOVED

PROPOSED BOLLARDS

PROBLEM 4.2.2

PROBLEM 4.2.32

PROBLEM 4.2.5

PROBLEM 4.2.4

EXISTING WELCOME TO LUCAN SIGN & PLANTING AREA TO BE RELOCATED AND ENHANCED

EXISTING PEDESTRIAN ENTRANCE RETAINED

TRANSITION TO EXISTING CARRIAGEWAY ON LUCAN ROAD

EXISTING BIKE LOCKERS TO BE RELOCATED

EXISTING BUS STOP RETAINED

PROPOSED SCHEME
Tie in to Existing

PROPOSED SCHEME
Tie in to Existing

INSET A

QUIET STREET CYCLE TREATMENT VIA HERMITAGE ROAD

TIE IN TO EXISTING CYCLE LANE

PROPOSED BOLLARDS

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

NOTES:

1. ADDITIONAL PROPOSED SCHEME INFORMATION IS AVAILABLE ON THE DRAWING SERIES PROVIDED WITHIN VOLUME III OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR).
2. WHERE PROPERTY LINE ADJUSTMENTS ARE PROPOSED, NEW BOUNDARY WALLS ARE PROPOSED TO MATCH EXISTING UNLESS OTHERWISE DETERMINED IN CONSULTATION WITH THE LANDOWNER.

Project Ireland 2040
Building Ireland's Future

Rev	Date	Drn	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
L03	24/06/21	GM	JS	JS	ISSUE FOR APPROVAL
L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair / National Transport Authority

Engineering Designer: AECOM; MOTT MACDONALD

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code
BCIDA	ACM	

Programme Title: **BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS**

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Drawing File Name	Sheet Number	Status	Rev
BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0001	01 of 31	A	L04

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RW06 PROPOSED PILED BOUNDARY WALL

PROPOSED TIE-IN TO N4 CYCLE TRACK

EXISTING TURN BAN RETAINED

QUIET STREET CYCLE TREATMENT VIA GOLF CLUB ACCESS ROAD

PROBLEM 4.2.6

R835 LUCAN ROAD

SHEET 2 SHEET 1

EXISTING BUS LANE TO BE EXTENDED

EXISTING N4 CYCLE TRACK

N4

CS SHEET 02 D

CS SHEET 03 E

TRANSITION TO PROPOSED BUS LANE/ CYCLE LANE ON N4

SHEET 3 SHEET 2

CAR PARK

SPLITTER ISLAND DIVERTED FROM THIS POINT

BOLLARDS

HERMITAGE GARDENS

CS SHEET 02 C

ROAD WIDENING REQUIRED IN TO EXISTING EMBANKMENT

QUIET STREET CYCLE TREATMENT VIA HERMITAGE ROAD

HERMITAGE ROAD

PROPOSED LOW BLOCK GRAVITY RETAINING WALL FOR ROAD WIDENING

PROPOSED BUS STOP

EXISTING BUS STOP REMOVED

HERMITAGE VALLEY

SHEET 2 SHEET 1

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

NOTES:

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2. WHERE PROPERTY LINE ADJUSTMENTS ARE PROPOSED, NEW BOUNDARY WALLS ARE PROPOSED TO MATCH EXISTING UNLESS OTHERWISE DETERMINED IN CONSULTATION WITH THE LANDOWNER.

Project Ireland 2040 Building Ireland's Future

Rev	Date	Drn	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
L03	24/06/21	GM	JS	JS	ISSUE FOR APPROVAL
L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM / MOTT MACDONALD

Programme Title: **BUSCONNECTS DUBLIN**
CORE BUS CORRIDORS INFRASTRUCTURE WORKS

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code	Drawing File Name	Sheet Number	Status	Rev
BCIDA	ACM		BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0002	02 of 31	A	L04

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LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

TREE REMOVAL REQUIRED TO PROVIDE PROPOSED CYCLE TRACK

Hermitage Golf Club

HERMITAGE GOLF COURSE

PROPOSED 15m HIGH GOLF NETTING

EXISTING BUS LANE TO BE MAINTAINED

RW01 PROPOSED RETAINING WALL GREATER THAN 1.5m RETAINED HEIGHT. REFER TO STRUCTURES DETAIL DRAWING BCIDA-ACM-STR_GA-0006_RW_01-DR-CB-0101

EXISTING BOUNDARY WALL RELOCATED

PROPOSED STONE WALL TO MATCH EXISTING SLOPED AT END FOR VISIBILITY

PROPOSED 2-WAY CYCLEWAY & FOOTWAY

D 300 A 500 A 550 A 600 A 650 A 700 A 750 A 800 A 850

CS SHEET 04

N4

PROBLEM 4.2.7

BOLLARDS IN THE EXISTING FOOTWAY TO BE RETAINED

PETROL STATION

SHEET 2 SHEET 3

REVISED BUS STOP ARRANGEMENT

EXISTING TURN BAN RETAINED

HERMITAGE WAY

QUIET STREET CYCLE TREATMENT VIA BALLYOWEN LANE

BALLYOWEN LANE

PROPOSED RAISED TABLE

WESTBOUND SERVICE ROAD

Latouka Apts.

SHEET 4 SHEET 3

QUIET STREET CYCLE TREATMENT VIA HERMITAGE ROAD

ENTRANCE TO BE WIDENED

KISSING GATE REMOVED. ENTRANCE TO BE WIDENED

HERMITAGE ROAD

SHEET 3 SHEET 2

HERMITAGE PARK

PROPOSED PEDESTRIAN PRIORITY QUIET CYCLEWAY LINK

LIMIT OF PROPOSED QUIET STREET CYCLE TREATMENT

50 km/h 30 km/h

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

NOTES:

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2. WHERE PROPERTY LINE ADJUSTMENTS ARE PROPOSED, NEW BOUNDARY WALLS ARE PROPOSED TO MATCH EXISTING UNLESS OTHERWISE DETERMINED IN CONSULTATION WITH THE LANDOWNER.

Project Ireland 2040 Building Ireland's Future

Rev	Date	Drn	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
L03	24/06/21	GM	JS	JS	ISSUE FOR APPROVAL
L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM MOTT MACDONALD

Programme Title: BUSCONNECTS DUBLIN
CORE BUS CORRIDORS INFRASTRUCTURE WORKS

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME
GENERAL ARRANGEMENT

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code	Drawing File Name	Sheet Number	Status	Rev
BCIDA	ACM		BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0003	03 of 31	A	L04

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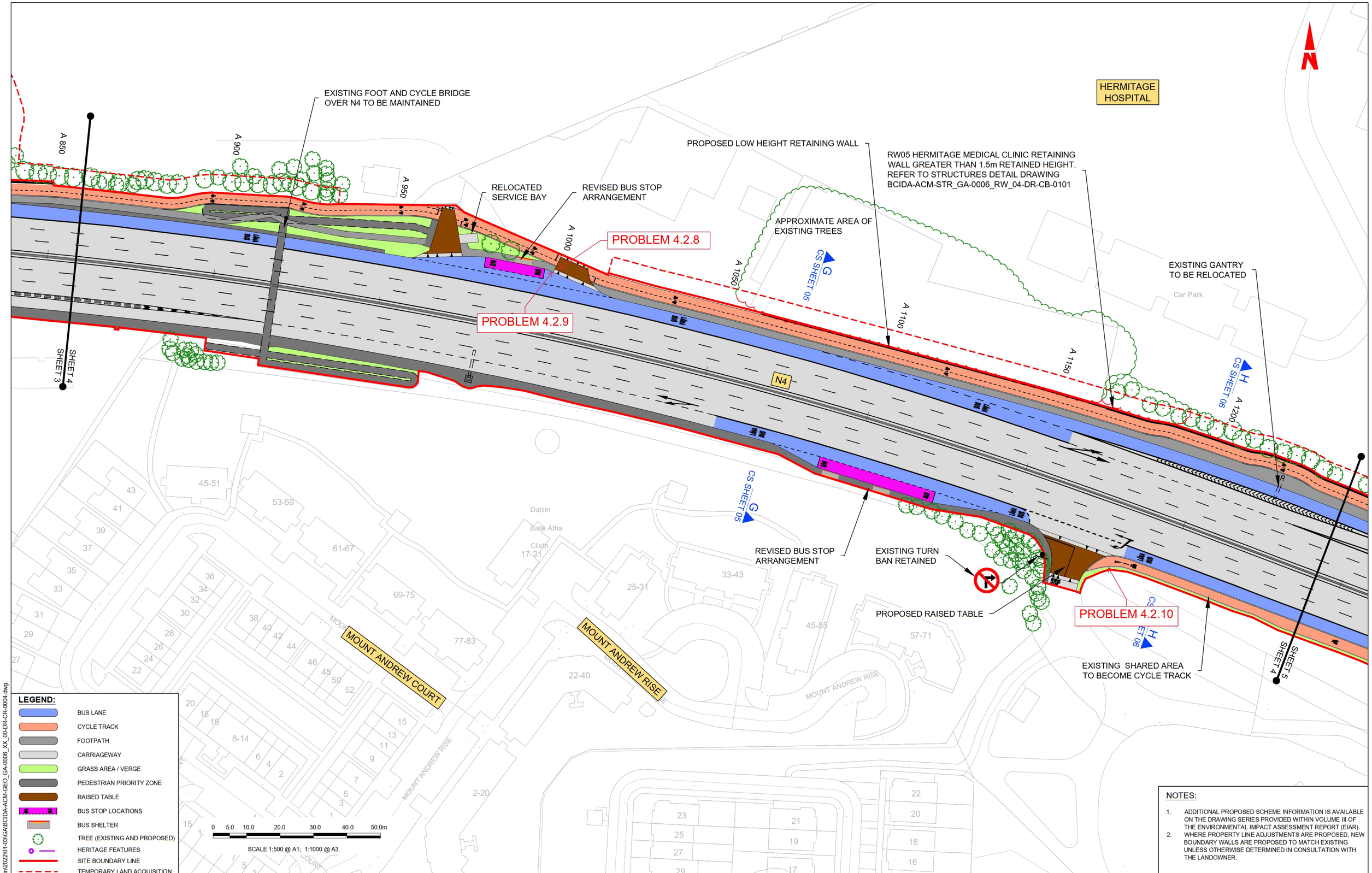

LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

NOTES:

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Project Ireland 2040 Building Ireland's Future

Rev	Date	Dm	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
L03	24/06/21	GM	JS	JS	ISSUE FOR APPROVAL
L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM / MOTT MACDONALD

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1, 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code
BCIDA	ACM	

Programme Title: **BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS**

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Drawing File Name	Sheet Number	Status	Rev
BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0004	04 of 31	A	L04

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LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

N

A 1550
A 1600
A 1650
A 1700
A 1750
E 250
E 300
E 305
F 0
F 50
F 100
F 149
G 0
G 50
G 100
SHEET 5
SHEET 6
SHEET 6
SHEET 7
R113 FONTHILL ROAD
N4 JUNCTION 2
N4
PROPOSED TOUCAN CROSSING
PROBLEM 4.2.11
EXISTING SHARED AREA REMOVED ACROSS BRIDGE
EXISTING TURN BAN RETAINED
EXISTING TURN BAN RETAINED
EXISTING SHARED FACILITY CONVERTED TO FOOTPATH
POTENTIAL TEMPORARY SITE COMPOUND
PROPOSED UNCONTROLLED CROSSING
ROAD TO BE REALIGNED AND 30KPH TO BE INSTIGATED
GANTRY SIGNAGE REPLACED
CS SHEET 08 J
CS SHEET 08 J
OLD LUCAN ROAD
PROPOSED RAISED TABLE
CLAYTON HOTEL LIFFEY VALLEY
FONTHILL ROAD
LUCAN RD
50 km/h
30 km/h
50 km/h
30 km/h
Lána Bus BUS LANE
Ó Thuaidh NORTHBOUND M50
An Lár CITY CENTRE
Baile Phástúr PALMERSTOWN R148
Ó Dheas SOUTHBOUND M50

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

NOTES:

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Project Ireland 2040 Building Ireland's Future

Rev	Date	Drn	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
L03	24/06/21	GM	JS	JS	ISSUE FOR APPROVAL
L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM / MOTT MACDONALD

Date: 20/01/22 | Scale: 1:500 @ A1, 1:1000 @ A3 | Drawn: S.A | Checked: A.T.DALE | Approved: C.ACTON

Project Code: BCIDA | Originator Code: ACM | QMS Code:

Programme Title: **BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS**

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Drawing File Name: BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0006 | Sheet Number: 06 of 31 | Status: A | Rev: L04

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POTENTIAL TEMPORARY SITE COMPOUND

F 149

G 50

G 100

SHEET 6
SHEET 7

R113 FONTHILL ROAD

A 1650

EXISTING BUS STOP REMOVED

A 1700

A 1750

G 150

G 200

ROAD TO BE REALIGNED AND 30KPH TO BE INSTIGATED

PROPOSED 61.5m CHICANE

CAREFUL REMOVAL OF TREES TO LIMIT IMPACT ON RETAINED TREES.
NO DIG SURFACE TO BE INSTALLED OVER RETAINED ROOT ZONE.

CS SHEET 08
K

G 250

EXISTING BUS LANE TO BE MAINTAINED.
PROPOSED REVISED SPEED LIMIT FOR BUS LANE

PROBLEM 4.2.13

MILESTONE TO BE RETAINED

A 1800

A 1850

THE DEADMAN'S INN

CS SHEET 08
K

G 300

OLD LUCAN ROAD

G 350

G 400

PROBLEM 4.2.12

A 1950

A 2000

A 2050

N4

REVISED BUS STOP ARRANGEMENT

SHEET 6
SHEET 7

SHEET 8
SHEET 7

TOYOTA
LIFFEY VALLEY

Open Well

LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

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3. HERITAGE FEATURES TO BE RETAINED OR RELOCATED WHERE REQUIRED.

Project Ireland 2040
Building Ireland's Future

Rev	Date	Dm	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
L03	24/06/21	GM	JS	JS	ISSUE FOR APPROVAL
L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM / MOTT MACDONALD

Programme Title: **BUSCONNECTS DUBLIN**
CORE BUS CORRIDORS INFRASTRUCTURE WORKS

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code	Drawing File Name	Sheet Number	Status	Rev
BCIDA	ACM		BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0007	07 of 31	A	L04

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LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

ST01 PROPOSED N4 PEDESTRIAN BRIDGE. REFER TO STRUCTURES DRAWING BCIDA-ACM-STR_GA-0006_BR_03-DR-CB-0101

PROPOSED HEDGE ADJACENT TO CYCLE TRACK AND NATIVE PLANTING BEHIND

EXISTING FOOT/CYCLE BRIDGE RETAINED

PROPOSED UNCONTROLLED PEDESTRIAN CROSSING

EXISTING BRIDGE & RAMP TO BE RETAINED

GANTRY SIGNAGE REPLACED

PROPOSED GROUP 6 PORTAL GANTRY WITH ATTACHED SIGNAGE

EXISTING BUS STOP REMOVED

OLD LUCAN ROAD

PROBLEM 4.2.13

PROBLEM 4.2.14

STONE WALL TO MATCH EXISTING

EXISTING STONE WALL RETAINED

PROPOSED BIKE RACK

EXISTING TREES TO BE KEPT

PROPOSED BUS STOP

N4

CS SHEET 09

SHEET 7

SHEET 8

SHEET 9

FONTHILL ROAD

PROPOSED SCHEME

Tie in to Liffey Valley Shopping Center Redevelopment Phase 1. Ref. No. SD19A/0320

RW02 PROPOSED RETAINING WALL GREATER THAN 1.5m RETAINED HEIGHT. REFER TO STRUCTURES DETAIL DRAWING BCIDA-ACM-STR_GA-0006_RW_03-DR-CB-0101

EXISTING BUS STOP 2213 RELOCATED

M50-N4 Junction 7-1 EXISTING RAMP REMOVED

Liffey Valley Shopping Centre

CAR PARK

EXISTING BUS LANE TO BE MAINTAINED. PROPOSED REVISED SPEED LIMIT FOR BUS LANE

LIFFEY VALLEY SHOPPING CENTRE

Car Park

NOTES:

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Project Ireland 2040 Building Ireland's Future

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L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM / MOTT MACDONALD

Programme Title: BUSCONNECTS DUBLIN
CORE BUS CORRIDORS INFRASTRUCTURE WORKS

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1, 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code
BCIDA	ACM	

Drawing File Name: BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0008

Sheet Number: 08 of 31 | Status: A | Rev: L04

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LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

I 800
I 750
I 700
I 650
I 600
I 550
I 850
I 883
J 0
J 50
J 100
J 150
J 200
J 250
EXISTING CYCLE PEDESTRIAN BRIDGE RETAINED
M50
OLD LUCAN ROAD
PROBLEM 4.1.15
N
CS SHEET 10
SHEET 11
J 200
SHEET 12
PROPOSED UNCONTROLLED CROSSING
EXISTING BUS STOP REMOVED
SHEET 11
SHEET 10
R148
A 2950
A 2850
A 2900
A 2800
A 3000
A 3050
A 3100
A 3150
ROAD WIDENING IN TO MEDIAN
SHEET 10
SHEET 12
R148 PALMERSTOWN BYPASS
N4
M50
Dublin

NOTES:

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N4/M50 INTERCHANGE (JUNCTION 7)

Project Ireland 2040 Building Ireland's Future

Rev	Date	Drn	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
L03	24/06/21	GM	JS	JS	ISSUE FOR APPROVAL
L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM / MOTT MACDONALD

Programme Title: BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code	Drawing File Name	Sheet Number	Status	Rev
BCIDA	ACM		BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0011	11 of 31	A	L04

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NOTES:

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3. HERITAGE FEATURES TO BE RETAINED OR RELOCATED WHERE REQUIRED.

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

PROBLEM 4.2.16

EXISTING BUS STOP REMOVED

PROBLEM 4.2.15

PROBLEM 4.2.18

PROPOSED UNCONTROLLED CROSSING

PROPOSED RAISED TABLE

PROPOSED RAISED TABLE

PROPOSED RAISED TABLE

PROPOSED RAISED TABLE

HERITAGE POST BOX TO BE RETAINED AND RELOCATED WHERE REQUIRED

PROBLEM 4.2.17

PALMERSTOWN WELCOME SIGN TO BE RELOCATED

EXISTING BUS LANE TO BE EXTENDED

GANTRY SIGNAGE REPLACED

SAINT PHILOMENA'S CHURCH

ST. THOMAS INDIAN ORTHODOX CHURCH

PALMERSTOWN VETERINARY HOSPITAL

SUPERMARKET

RIVERSDALE AVENUE

OLD LUCAN ROAD

HOLLYVILLE LAWN

RIVERSIDE DRIVE

R148 PALMERSTOWN BYPASS

J 200 J 250 J 300 J 350 J 400 J 450 J 500 J 550 A 3050 A 3100 A 3150 A 3200 A 3250 A 3300 A 3350 A 3400

SHEET 11 SHEET 12 SHEET 10 SHEET 13

CS SHEET 11

Project Ireland 2040 Building Ireland's Future

Rev	Date	Drn	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
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L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM MOTT MACDONALD

Date: 20/01/22 | Scale: 1:500 @ A1, 1:1000 @ A3 | Drawn: S.A | Checked: A.T.DALE | Approved: C.ACTON

Project Code: BCIDA | Originator Code: ACM | QMS Code:

Programme Title: BUSCONNECTS DUBLIN
CORE BUS CORRIDORS INFRASTRUCTURE WORKS

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME
GENERAL ARRANGEMENT

Drawing File Name: BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0012 | Sheet Number: 12 of 31 | Status: A | Rev: L04

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RIVERSDALE AVENUE

SAINT PHILOMENA'S CHURCH

HERITAGE POST BOX TO BE RETAINED AND RELOCATED WHERE REQUIRED

J 500

J 550

J 600

J 650

J 700

J 750

J 800

J 850

EXISTING BUS STOP REMOVED

P CS SHEET 12

ROBIN VILLAS

WATERSTOWN AVENUE

PROPOSED RAISED TABLE

ADDITIONAL BIKE RACKS

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PROPOSED RAISED TABLE

ST. THOMAS INDIAN ORTHODOX CHURCH

PALMERSTOWN VETERINARY HOSPITAL

SHEET 12

SHEET 13

PROPOSED UNCONTROLLED CROSSING

EXISTING BUS STOP REMOVED

P CS SHEET 12

OLD LUCAN ROAD

PROBLEM 4.2.18

ROSE VIEW

PROPOSED RAISED TABLE

PROPOSED RAISED TABLE

PROPOSED RAISED TABLE

EXISTING PARKING RETAINED

SHEET 14

SHEET 13

PROBLEM 4.2.16

LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

SUPERMARKET

PETROL STATION

A 3350

A 3400

A 3450

A 3500

A 3550

R148 PALMERSTOWN BYPASS

A 3600

A 3650

A 3700

Q CS SHEET 12

SHEET 13

SHEET 14

Q CS SHEET 12

KENNELSFORT ROAD LOWER

EXISTING BUS LANE TO BE EXTENDED

EXISTING DENSE PLANTING

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

SHEET 12

SHEET 13

Project Ireland 2040 Building Ireland's Future

Rev	Date	Drn	Chk'd	App'd	Description
L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
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L02	22/04/21	MG	CA	JS	ISSUED FOR PEER REVIEW
L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM / MOTT MACDONALD

Programme Title: BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1, 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code	Drawing File Name	Sheet Number	Status	Rev
BCIDA	ACM		BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0013	13 of 31	A	L04

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LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
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- TREE (EXISTING AND PROPOSED)
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NOTES:

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3. HERITAGE FEATURES TO BE RETAINED OR RELOCATED WHERE REQUIRED.

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L04	20/01/22	SA	AD	CA	ISSUE FOR PHASE 3: PRELIMINARY DESIGN
L03	24/06/21	GM	JS	JS	ISSUE FOR APPROVAL
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L01	23/10/20	SS	AD	JS	STAGE A – PEER REVIEW

W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM / MOTT MACDONALD

Programme Title: **BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS**

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME GENERAL ARRANGEMENT

Date	Scale	Drawn	Checked	Approved
20/01/22	1:500 @ A1 1:1000 @ A3	S.A	A.T.DALE	C.ACTON

Project Code	Originator Code	QMS Code	Drawing File Name	Sheet Number	Status	Rev
BCIDA	ACM		BCIDA-ACM-GEO_GA-0006_XX_00-DR-CR-0014	14 of 31	A	L04

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

ROSSMORE DRIVE

SHEET 19
SHEET 20

A 5550

R148 CHAPELIZOD BYPASS

PROPOSED BUS STOP

EXISTING NOISE WALLS REPLACED WHERE NECESSARY

PROPOSED BUS STOP

EXISTING BOUNDARY WALL TO BE REPLACED

CHAPELIZOD HILL ROAD

PROBLEM 4.2.24

CHAPELIZOD ROAD

RIVER LIFFEY

TRANSITION TO EXISTING CARRIAGEWAY ON CHAPELIZOD HILL ROAD

PROPOSED BIKE RACK

NO THROUGH ROAD FOR VANS AND LORRIES SIGN RETAINED

EXISTING BOUNDARY WALL TO BE REPLACED

ST02 CHAPELIZOD HILL ROAD BRIDGE WIDENING. FOR DETAILS REFER TO DRAWING BCIDA-ACM-STR_GA-0006_BR_06-DR-CB-0101

SAINT LAURENCE ROAD

A 5600

U CS SHEET 23

PROPOSED BUS STOP

U CS SHEET 23

PEDESTRIAN BARRIERS ADDED TO CENTRAL MEDIAN

LIGHTING TO BE UPGRADED BENEATH BRIDGE

RW04 PROPOSED RETAINING WALL GREATER THAN 1.5m RETAINED HEIGHT. REFER TO DRAWING BCIDA-ACM-STR_GA-0006_RW_06-DR-CB-0111

CS SHEET 15 V

A 5650

RW03 PROPOSED RETAINING WALL GREATER THAN 1.5m RETAINED HEIGHT. REFER TO STRUCTURES DETAIL DRAWING BCIDA-ACM-STR_GA-0006_RW_06-DR-CB-0101

CDETB BALLYFERMOT TRAINING CENTRE

CS SHEET 15 V

EXISTING TREES AND PLANTING ON ROAD EMBANKMENT REMOVED UNDER EXTENTS OF RAMPS AND STEPS

EXISTING TREES AND PLANTING ON ROAD EMBANKMENT REMOVED UNDER EXTENTS OF RAMPS AND STEPS

A 5700

EXISTING INTERMITTENT PLANTING ON SLOPING MEDIAN

TRANSITION TO EXISTING CARRIAGEWAY ON CHAPELIZOD HILL ROAD

BOLLARDS

60 km/h 80 km/h

EXISTING BUS LANE TO BE MAINTAINED. PROPOSED REVISED SPEED LIMIT FOR BUS LANE

60 km/h 80 km/h

EXISTING BUS LANE TO BE MAINTAINED. PROPOSED REVISED SPEED LIMIT FOR BUS LANE

CHAPELIZOD HILL ROAD

EXISTING NO ENTRY RETAINED

A 5750

SHEET 20
SHEET 21

A 5800

Mast
Car Park
Further Education
College
Knockmaree Apartments
ES
CHAPELIZOD COURT
ST LAURENCE RD
Area Under

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W.I.P.

Client: NTA Údarás Náisiúnta Iompair National Transport Authority

Engineering Designer: AECOM MOTT MACDONALD

Programme Title: BUSCONNECTS DUBLIN
CORE BUS CORRIDORS INFRASTRUCTURE WORKS

Drawing Title: LUCAN TO CITY CENTRE CORE BUS CORRIDOR SCHEME
GENERAL ARRANGEMENT

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EXISTING BUS LANE
TO BE MAINTAINED.
PROPOSED REVISED SPEED
LIMIT FOR BUS LANE

EXISTING FOOTBRIDGE
OVER R148
TO BE MAINTAINED

SHEET 24
SHEET 25

R148 CHAPELIZOD
BYPASS

EXISTING BUS LANE
TO BE MAINTAINED.
PROPOSED REVISED SPEED
LIMIT FOR BUS LANE

A 7250
A 7300
A 7350
A 7400
A 7450
A 7500
A 7550
A 7600

EXISTING TURN
BAN RETAINED

CS SHEET 16
W

REQUEST BUTTON
FOR CYCLE SIGNAL

EXISTING STUB WALL AND
RAILING TO BE RETAINED

EXISTING LEFT TURN
SLIP LANE REMOVED

PROBLEM 4.2.23

POTENTIAL TEMPORARY
SITE COMPOUND

CS SHEET 16
X

CS SHEET 16
W

CS SHEET 16
X

CON COLBERT ROAD

PROPOSED SCHEME
Tie in to Existing

SHEET 25
SHEET 26

EXISTING TURN
BAN RETAINED

POTENTIAL TEMPORARY
SITE COMPOUND

PROPOSED SCHEME
Tie in to Proposed Liffy
Valley Scheme

CON COLBERT ROAD WITH LIFFEY VALLEY TO CITY
CENTRE CORE BUS CORRIDOR SCHEME

LEGEND:

- BUS LANE
- CYCLE TRACK
- FOOTPATH
- CARRIAGEWAY
- GRASS AREA / VERGE
- PEDESTRIAN PRIORITY ZONE
- RAISED TABLE
- BUS STOP LOCATIONS
- BUS SHELTER
- TREE (EXISTING AND PROPOSED)
- HERITAGE FEATURES
- SITE BOUNDARY LINE
- TEMPORARY LAND ACQUISITION

0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

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LEGEND:

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0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

IRISH WAR MEMORIAL GARDENS

Burial Place (Site of)

R148 CON COLBERT ROAD

A 7600 A 7650 A 7700 A 7750 A 7800 A 7850 A 7900 A 7950

CS SHEET 17

PROBLEM 4.2.25

PROPOSED BUS STOP

PROPOSED TOUCAN CROSSINGS

PROPOSED SCHEME

Tie in to Existing

PROBLEM 4.2.25

PROPOSED BUS STOP

EXISTING TURN BAN RETAINED

SHEET 27

SHEET 26

R839 MEMORIAL ROAD

R833 CON COLBERT ROAD

RAILWAY TRACK

SHEET 25

SHEET 26

Chy

MEMORIAL ROAD

THE BELFRY

INCHICORE RD

INCHICORE ROAD

INCHICORE ROAD

PROPOSED RIGHT-HAND TURN TO MEMORIAL ROAD

EXISTING MEDIAN TO BE NARROWED AND REALIGNED TO CREATE RIGHT-HAND TURN POCKET

PROPOSED TOUCAN CROSSINGS

R148 CON COLBERT ROAD

PROPOSED SCHEME

Tie in to Proposed Liffy Valley Scheme

R839 MEMORIAL ROAD

RAILWAY TRACK

CON COLBERT ROAD WITH LIFFEY VALLEY TO CITY CENTRE CORE BUS CORRIDOR SCHEME

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0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

N

R111 SOUTH CIRCULAR ROAD

TIE IN TO EXISTING CYCLE LANE

EXISTING TURN BAN RETAINED

EXISTING JUNCTION LAYOUT TO BE MODIFIED TO ACCOMMODATE ADDITIONAL BUS LANE AND CYCLETRACK

RAILWAY TRACK

A 8700

A 8650

A 8600

A 8550

SHEET 29
SHEET 28

PROBLEM 4.2.27

ST. JOHN OF GOD'S SCHOOL

EXISTING LEFT TURN SLIP LANE REMOVED

A 8450

AA
CS SHEET 19

PROBLEM 4.2.28

A 8400

EXISTING TURN BAN RETAINED

R148 ST. JOHN'S ROAD WEST

PROBLEM 4.2.25

A 8350

A 8300

AA
CS SHEET 19

PROBLEM 4.2.26

PROBLEM 4.2.30

CON COLBERT ROAD

EXISTING TURN BAN RETAINED

PROBLEM 4.2.29

PROPOSED BUS STOP

PROPOSED RIGHT-TURN TO ST. JOHN'S ROAD WEST

SHEET 28
SHEET 27

EXISTING JUNCTION LAYOUT TO BE MODIFIED TO ACCOMMODATE ADDITIONAL BUS LANE AND CYCLETRACK

EXISTING LEFT TURN SLIP LANE REMOVED

EXISTING TURN BAN RETAINED

R111 SOUTH CIRCULAR ROAD

Recreational Complex

Saint John of God Special School

Saint John Of God's School

Saint John Of God Special School

Tks

Bully's Acre

Bully's Acre

Royal Hospital Kilmainham

Burial Ground

697
695
693
691
689
687
685

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0 5.0 10.0 20.0 30.0 40.0 50.0m

SCALE 1:500 @ A1; 1:1000 @ A3

PROBLEM 4.2.31

RIVER LIFFEY

SEÁN HEUSTON BRIDGE

FRANK SHERWIN BRIDGE

WOLFE TONE QUAY

TEMPLE STREET WEST

CIVIL DEFENCE DEPOT

INTERFACE WITH LIFFEY CYCLE SCHEME TBC

VICTORIA QUAY

LUAS STOP HEUSTON STATION

HEUSTON STATION

ST. JOHN'S ROAD WEST

ST. JAMES'S GATE BREWERY

DR. STEEVENS' HOSPITAL

STEEVEN'S LANE

EXISTING LEFT TURN SLIP LANE REMOVED

EXISTING CYCLE PARKING RETAINED

A 9694 Tie in to Liffey Cycle Route Scheme

PROPOSED SCHEME

TIE IN TO LIFFEY CYCLE ROUTE SCHEME

PROPOSED STUB RETAINING WALL

EXISTING NO ENTRY RETAINED

EXISTING TURN BAN RETAINED

HERITAGE LAMP POST TO BE RETAINED AND RELOCATED WHERE REQUIRED

HERITAGE POST BOX TO BE RETAINED AND RELOCATED WHERE REQUIRED

HERITAGE LAMP POST TO BE RETAINED

REVISED BUS STOP ARRANGEMENT

HERITAGE LAMP POST TO BE RETAINED AND RELOCATED WHERE REQUIRED

TAXI RANK

HERITAGE LAMP POST TO BE RETAINED

EXISTING BIKE RACKS RECONFIGURED

PROPOSED TOUCAN CROSSING

EXISTING MEDIAN TO BE REALIGNED

REDUCING HEIGHT OF LUAS PLATFORM WALL

EXISTING NO ENTRY RETAINED

EXISTING TURN BAN RETAINED

PROPOSED TOUCAN CROSSING

HERITAGE LAMP POST TO BE RELOCATED

EXISTING TURN BAN RETAINED

EXISTING MEDIAN TO BE REALIGNED

PROPOSED BUS STOP

EXISTING BUS STOP REMOVED

HERITAGE LAMP POST TO BE RELOCATED

PROPOSED BUS STOP

EXISTING CAR CHARGING POINTS TO BE RELOCATED

EXISTING MEDIAN TO BE REALIGNED

HERITAGE LAMP POST TO BE RETAINED

PROPOSED PEDESTRIAN CROSSING

Och Amháin Tramanna EXCEPT TRAMS

A 9650

A 9600

A 9500

A 9450

CS SHEET 22 AD

CS SHEET 22 AD

SHEET 30

SHEET 31

Parkgate Place

Croppies Memorial Park

Civil Defence

Frank Sherwin Bridge

Sean Heuston Bridge

Heuston

Area Under Construction

Car Park

Local Government/Bu

Tks

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Appendix C Road Safety Audit Feedback Form

	Scheme: Core Bus Corridor Scheme, Lucan to City Centre Audit Stage: Stage 1 Date Audit Completed; June 2022				
Paragraph No. in Safety Audit Report	To be Completed by Designer				To be completed by Audit Team Leader
	Problem Accepted (Yes / No)	Recommended Measure Accepted (Yes / No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Designer Comments	Alternative Measures or reasons accepted by auditors (Yes / No)
Items Raised at Previous Road Safety Audit					
4.2.1	Yes	Yes		Tactile Paving is required and will be proposed at detailed design stage, in accordance with the Traffic Management Guidelines.	
4.2.2	Yes	Yes		Yield markings have been omitted from the drawings at the stage for clarity, however will be proposed on cycle tracks at pedestrian crossings at detailed design stage.	
4.2.3	Yes	Yes		Swept path analysis has been carried out through all junctions, and corner radii, stop line positions and lane widths have been designed to allow turning manoeuvres for suitable vehicle types.	
4.2.8	Yes	Yes		"Junction capacity analysis has been undertaken to ensure appropriate capacity following removal of the left- hand slip-lanes"	
4.3.7	Yes	Yes		The length of bus stop is appropriate for the forecast patronage	
4.3.12	Yes	Yes		The kerb line of the central island has been amended to allow larger vehicles to negotiate the roundabout without the need to mount the kerb.	
4.3.16	Yes	Yes		Double yellow road markings are proposed along Old Lucan Road south in order to prevent vehicles parking on the two-way cycle track.	
4.3.18	Yes	Yes		Delineators are common in chevron areas on the M50. The extent of the delineators will be reviewed as part of the detailed design	
4.3.19	No	No	The proposed design does not increase the complexity of the road layout	"The proposed design does not increase the complexity of the road layout and provides increased weaving length and provision of lane designation signage. Speed enforcement is a matter for TII"	Yes
4.3.20	Yes	Yes		The long fall gradient at the link between the two-way cycle track at	

				the end of (old) Lucan Road is to be designed at detailed design stage & will not exceed 5%.	
4.3.30	Yes	Yes		The length of the pedestrian crossing has been reduced, and adequate green time is provided to ensure pedestrians can cross.	
4.3.33	Yes	Yes		Swept path analysis has been carried out through the junction, and the lane configuration has been amended to allow left turning movements to be carried out with no encroachment into adjacent lanes.	
4.3.35	No	No	There is already an alternative drop off/ pick ups	The existing drop-off/pick facility on Heuston Station Road to the north of Heuston Station will be retained and is considered adequate	Yes
4.3.36	Yes	Yes		Ramp widths at this location have been increased to 4.5m to accommodate both pedestrians and cyclists.	
4.3.37	Yes	Yes		Traffic island widths have been amended to provide sufficient capacity for cyclists travelling through the junction.	
4.3.39	Yes	Yes		Swept path analysis has been carried out through all junctions, and corner radii, stop line positions and lane widths have been designed to allow turning manoeuvres for suitable vehicle types.	
Items Raised at this Stage 1 Road Safety Audit					
4.1.1	Yes	Yes		Preliminary Design drawings to be fully aligned with General Arrangement plans.	
4.1.2	Yes	Yes		Corner radii for urban junctions have been generally designed in accordance with DMURS section 4.3.3 and assessed/adjusted following vehicle swept path tracking assessments. DMURS states 6m is an appropriate general radius to allow larger rigid vehicles to turn without overrunning whilst keeping car speeds low.	
4.1.3	Yes	Yes		Bus shelters and footpath widths have been set out in accordance with the BCPDGB. Minimum footpath widths in accordance with DMURS & Building for Everyone: A Universal Design Approach (see figure 1.6). Where widths are restricted, cantilever bus shelters will be provided to maintain suitable footpath widths at bus stops.	
4.2.1	Yes	Yes		Provision of low level cycle signals to be shown in the Systems Design drawings.	
4.2.2	Yes	Yes		Tactile Paving is required and will be proposed at detailed design stage, in accordance with the Traffic Management Guidelines.	

4.2.3	Yes	Yes		Pedestrians are to be given priority at the crossing points across the cycle tracks at the bus stops. Further detail in accordance with the BCPDGB & the NCM to be shown at detailed design stage.	
4.2.4	No	Yes		Cycle storage has been considered and noted that cycle phases have been set out to be consecutive to mitigate the risk for excessive queue impacts on the island.	
4.2.5	Yes	Yes		"A continuous barrier is required at this location to mitigate against errant vehicles at the embankment/N4. An ASL has been provided to give additional priority for cyclists. Additional signage to be provided in the detailed design considerations.	
4.2.6	No	No	"Volume of left turning traffic in to golf course access road is low; making all straight ahead traffic use the left lane unnecessarily impacts the bus lane priority and increases interaction between buses and other traffic.	The road marking layout has been amended to more clearly direct motorists to travel through the junction using the appropriate lane. Provision of ADS on the junction approach to be considered at detailed design stage.	Yes
4.2.7	Yes	Yes		Design updated in accordance with TII Publication (DN-GEO-03087) - Hard Shoulder Bus Priority Measures on Motorways and Type 1 Dual Carriageways to include a bus gate at this location	
4.2.8	Yes	Yes		Provision of flush crossings and associated footway approach alignments to be revisited at detailed design stage.	
4.2.9	Yes	Yes		Tactile Paving is required and will be proposed at detailed design stage, in accordance with the Traffic Management Guidelines.	
4.2.10	Yes	Yes		Cycle signage not shown for clarity - to be added at detailed design stage.	
4.2.11	Yes	Yes		The existing spur is to be removed.	
4.2.12	Yes	Yes		A pedestrian crossing is being provided adjacent to the Deadman's Inn	
4.2.13	Yes	Yes		"Double yellow road markings are proposed along Old Lucan Road south in order to prevent vehicles parking on the two-way cycle track. Parking enforcement measures are to be considered at detailed design stage. In addition, as part of the wider BusConnects scheme there are proposed Park and ride facilities to be provided in certain areas to facilitate the increase in commuter numbers, reducing the need for on street parking. Double yellow lines to be provided"	

4.2.14	Yes	Yes		The long fall gradient at the link between the two-way cycle track at the end of (old) Lucan Road is to be designed at detailed design stage & will not exceed 5%.	
4.2.15	Yes	Yes		"Double yellow road markings are proposed along Old Lucan Road north in order to prevent vehicles parking on the two-way cycle track. Parking enforcement measures are to be considered at detailed design stage. In addition, as part of the wider BusConnects scheme there are proposed Park and ride facilities to be provided in certain areas to facilitate the increase in commuter numbers, reducing the need for on street parking. Double yellow lines to be provided"	
4.2.16	No	Yes	The bus service has changed. Bus stops serving this catchment have been located elsewhere	It is not proposed to relocate the bus stop at the noted location. Proposed bus stop locations are shown on the drawings.	Yes
4.2.17	Yes	Yes		Proposed layout complies with Figure 4 DN-GEO-03087	
4.2.18	Yes	Yes		Provision of flush crossings and associated footway approach alignments have been amended and will be fully detailed at detailed design stage.	
4.2.19	No	Yes	The bus service has changed. Bus stops serving this catchment have been located elsewhere	These bus stops are relocated elsewhere. Proposed bus stops on Old Lucan Road and Revised bus stop on R148 Palmerstown Bypass	Yes
4.2.20	Yes	Yes		"There is no destination left & cyclist should cross at the Toucan provided to access the two-way facility via the new crossing on the R148. Directional signage for cyclists is not shown for clarity and is to be added at detailed design stage."	
4.2.21	Yes	Yes		Pedestrians are to be given priority at the crossing points across the cycle tracks at the bus stops. Details to be shown at detailed design stage.	
4.2.22	Yes	Yes		There is a potential for cyclist and pedestrian conflict if we were to run both in Phase D. Signalling will be revisited and agreed with SDCC at detailed design stage	
4.2.23	Yes	Yes		Cyclists will get a 5 second (X5) head start ahead of buses. System design updated to make this clear.	
4.2.24	Yes	Yes		Cycle signage not shown for clarity - to be added at detailed design stage	
4.2.25	Yes	Yes		Cycle lane geometry around bus stops is generally in accordance with BusConnects Design Guide.	

				Design has been amended to provide shared landing bus stops.	
4.2.26	Yes	Yes		Yellow box road markings to be removed across the cycle lanes at detailed design stage.	
4.2.27	Yes	Yes		Demarcation / relocation of cycle right turn pocket to be considered at detailed design stage.	
4.2.28	Yes	Yes		"ADS map signage is provided on the approach. Signage strategy to be revisited at detailed design stage to consider if further measures are required."	
4.2.29	Yes	Yes		Yellow box markings to be extended as far as pedestrian crossing on South Circular Road.	
4.2.30	Yes	Yes		Existing & proposed landscaping to be checked at detailed design stage to ensure visibility to signals for approaching drivers	
4.2.31	Yes	Yes		Pedestrian crossing facilities are proposed in the Liffey Cycle Route Scheme. Co-ordination between schemes ongoing.	
4.2.32	Yes	Yes		Swept paths for all turning vehicles to be run, with detailed design amended to cater for appropriate vehicle types.	

Signed **Designer** Anthony Dale **Date** 05/10/22

Signed **Audit Team Leader** Rowan Lyons **Date** 20/09/2022

Signed colm griffin **Employer** **Date**