

DBFL Consulting Engineers

# Wellington Lane Cycle Scheme

Stage 1 Road Safety Audit

# DBFL Consulting Engineers

## Wellington Lane Cycle Scheme

### Stage 1 Road Safety Audit

<b>Document Ref:</b>	<b>P22-106-RSA-PD-RP-001</b>
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Rev	Prepared By	Reviewed By	Approved By	Issue Date	Reason for Revision
1.0	MAH	PJM	PJM	15 <sup>th</sup> July 2022	Draft Report

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# 1 Introduction

## 1.1 General

This report results from a Stage 1 Road Safety Audit on the proposed Wellington Lane Cycle Scheme carried out at the request of Ms. Jane Hennaghan of DBFL Consulting Engineers.

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

**Mr. Peter Monahan**

(BE MSc CEng FIEI RSACert)  
Road Safety Audit Team Leader

**Mr. Mazen Al Hosni**

(BEng, MIEI)  
Road Safety Audit Team Member

The Road Safety Audit took place during October 2021 and July 2022 and comprised an examination of the documents provided by the designers (see Appendix B). In addition to examining the documents supplied the Road Safety Audit Team visited the site of the proposed measures on the 13<sup>th</sup> October 2021. Weather conditions during the site visit were dry and the road surface was dry. Traffic volumes during the site visit were moderate, but higher at the school locations. Pedestrian and cyclist volumes moderate and traffic speeds were considered to be generally within the posted speed limit.

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

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

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

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

## 1.2 Items Not Submitted for Auditing

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

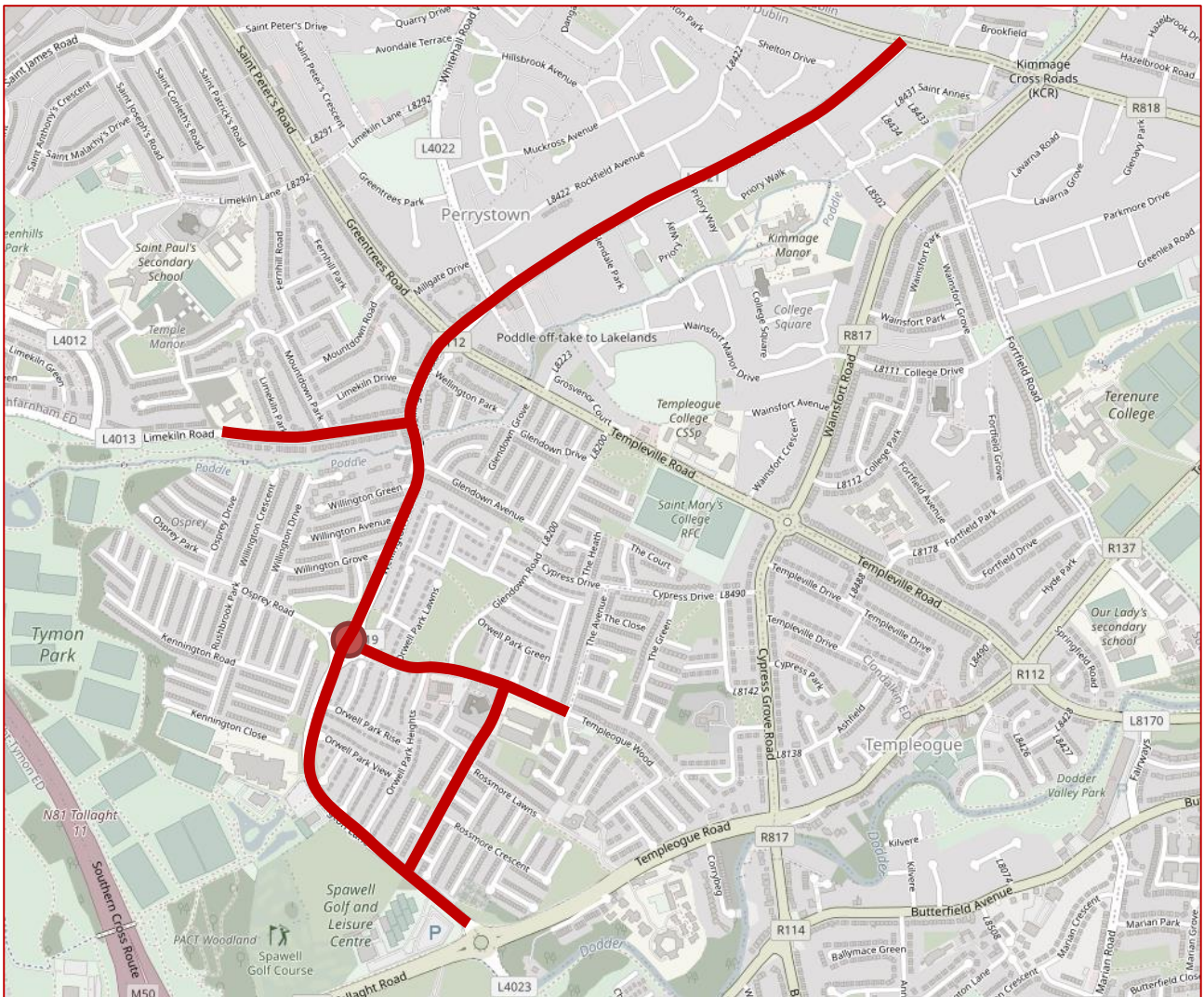
- Vehicle swept paths
- Visibility splays

## 2 Project Description

### 2.1 General

Improved cycle facilities are proposed along Wellington Lane, Wellington Road and Whitehall Road extending from the Spawell Roundabout to the Whitehall Road/Kimmage Road West signalled junction, and along Orwell Road, Rossmore Road and Templeogue Wood.

All of the roads within the proposed Scheme are subject to a 50kph speed limit and consist of two-way single carriageway roads of varying carriageway widths, with footpaths on either side. The route extends through two existing roundabout junctions, at the Orwell Road and at Templeville Road, and one existing signalised junction, at the Whitehall Road West junction.



**FIGURE 2-1: LOCATION PLAN (SOURCE: WWW.OPENSTREETMAP.ORG)**

A number of controlled & uncontrolled pedestrian crossings exist along the route, and the roads within the Scheme serve a number of bus routes, with bus stops located along the route.

The scheme will include the provision of cycle lanes/tracks on both sides of the existing Wellington Lane and Wellington Road over most of the Scheme length. At Whitehall Road, cyclists will share the carriageway with other vehicles for a distance of approximately 150m immediately east of the junction with Whitehall Close. After this a segregated two-way cycle lane is proposed along the northern side of the Whitehall Road until its junction with Kimmage Road.

A cycle track is proposed on both sides of Limekiln Road from its junction with Wellington Lane to its junction with Limekiln Park. A School treatment zone is proposed immediately west of the Limekiln Road/Limekiln Park junction at the Riverview Educate Together National School.



Cycle lanes are also proposed along Rossmore Road, with raised tables proposed at all side roads and the existing crossing in front of Bishop Galvin National School/Parish of St Jude the Apostle is to be retained.

It is also proposed to provide cycle tracks/lanes along a section of Orwell Road between its roundabout junction with Wellington Road and Domville Road.

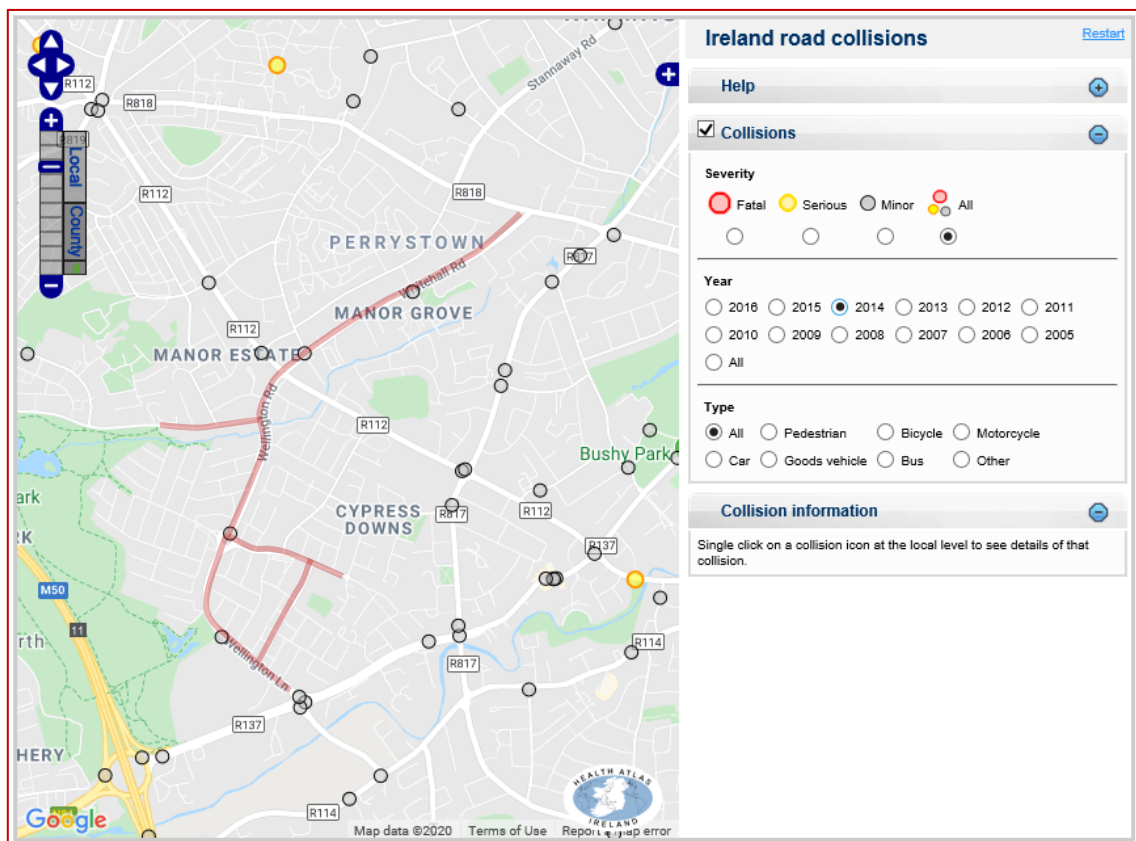
## 2.2 Collision History

The Road Safety Authority website (www.rsa.ie) was consulted to identify historical collisions in the vicinity of the proposed works. The website includes summary information on collision occurrence for the period 2005 to 2016 (see Figure 2-2 to Figure 2-4). Collision occurrence for the period 2014 to 2016 are summarised in Table 2:1 below.

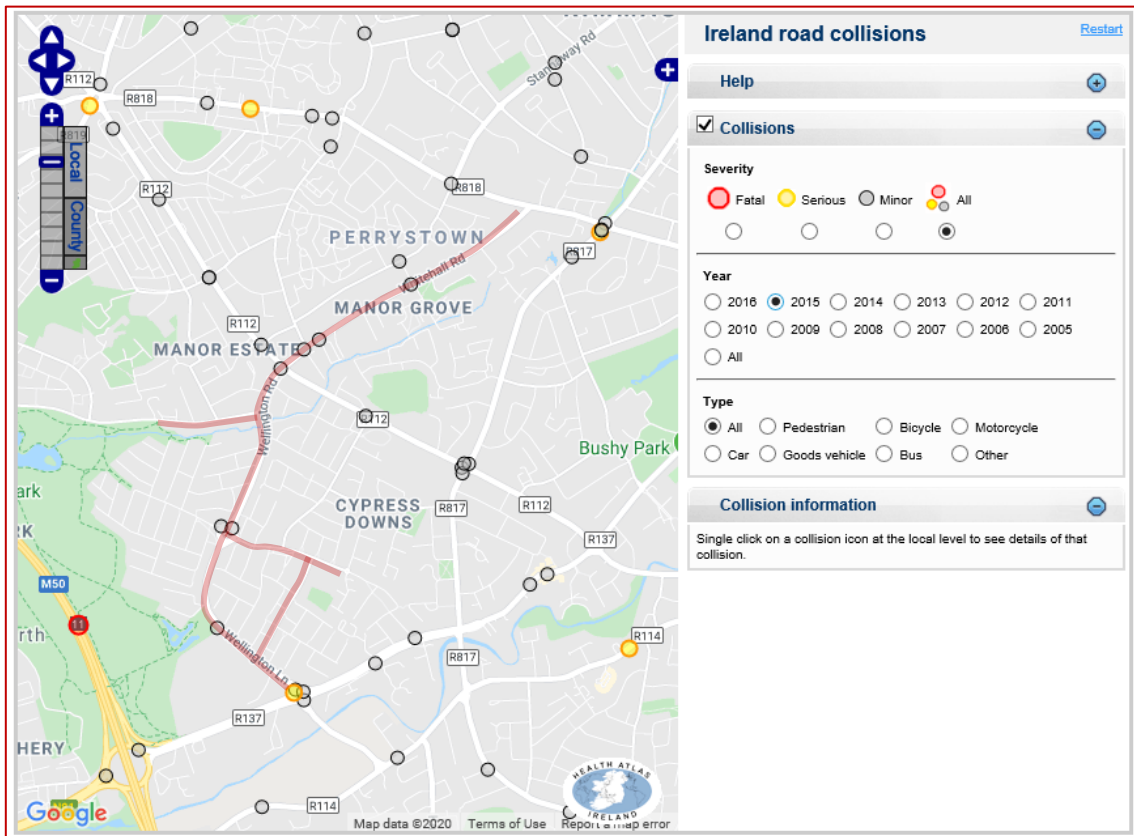
**TABLE 2:1 SUMMARY OF COLLISION OCCURRENCE (2014 TO 2016)**

Time of Day	Car	Motorcycle	Bicycle	Pedestrian	Total	Percentage of Total
7am to 10am	0	0	5	0	5	<b>45%</b>
10am to 4pm	1	0	0	0	1	<b>9%</b>
4pm to 7pm	1	0	0	1	2	<b>18%</b>
7pm to 11pm	2	0	0	0	2	<b>18%</b>
11pm to 3am	0	0	0	1	1	<b>9%</b>
<b>Total</b>	<b>4</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>11</b>	
Percentage of Total	<b>36%</b>	<b>0%</b>	<b>45%</b>	<b>18%</b>		

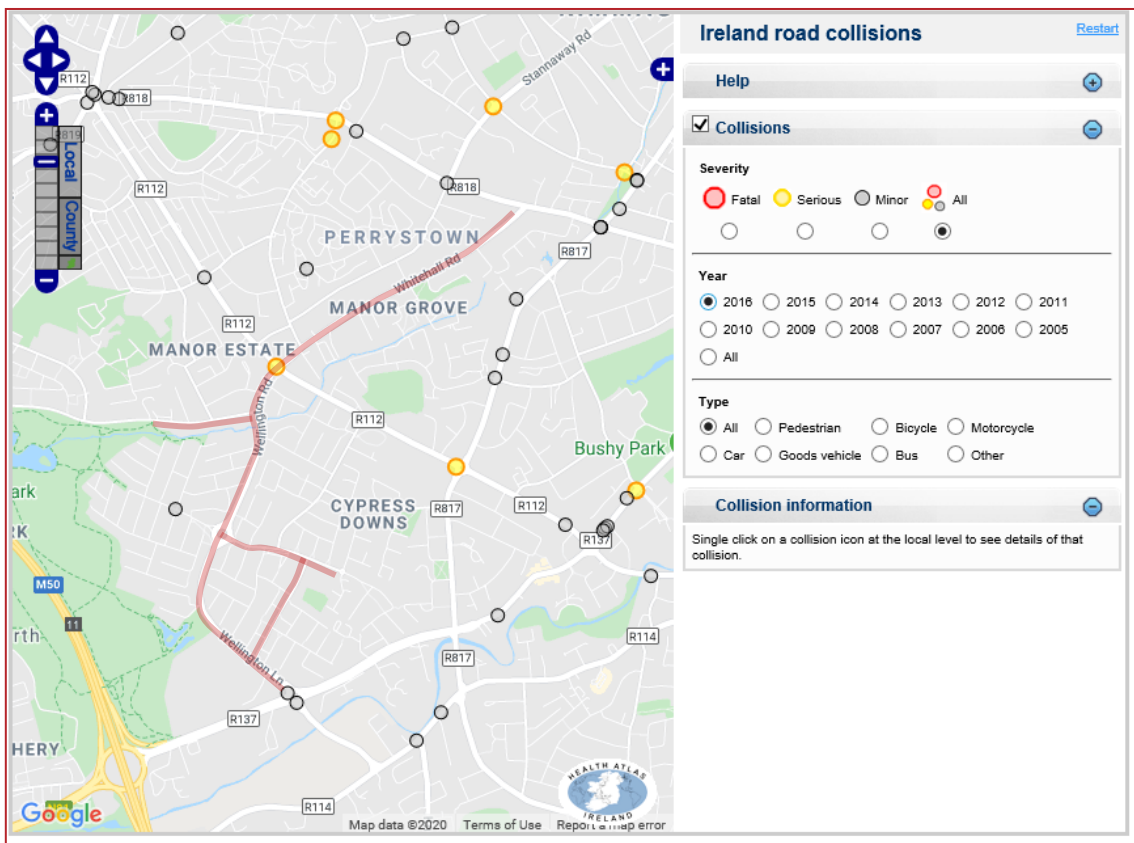
The majority of collisions in the period 2014 to 2016 occurred during the morning (between 7am and 10am), all which involved cyclists. 64% of all collisions in the same period involved Non-motorised Road Users (cyclist & pedestrian).



**FIGURE 2-2: COLLISIONS RECORDED ON THE ROAD SAFETY AUTHORITY'S DATABASE IN THE VICINITY OF THE SCHEME ROADS DURING THE YEAR 2014 (SOURCE: ROAD SAFETY AUTHORITY)**



**FIGURE 2-3: COLLISIONS RECORDED ON THE ROAD SAFETY AUTHORITY'S DATABASE IN THE VICINITY OF THE SCHEME ROADS DURING THE YEAR 2015 (SOURCE: ROAD SAFETY AUTHORITY)**



**FIGURE 2-4: COLLISIONS RECORDED ON THE ROAD SAFETY AUTHORITY'S DATABASE IN THE VICINITY OF THE SCHEME ROADS DURING THE YEAR 2016 (SOURCE: ROAD SAFETY AUTHORITY)**

### 3 Main Report

#### 3.1 Problem

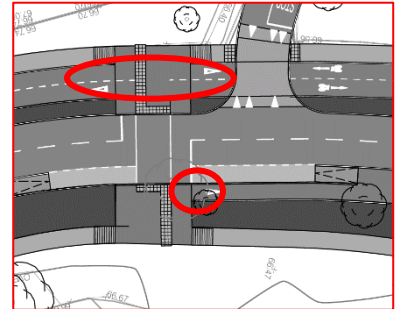
*Location: Drawing 180201-1004 (P0) – Wellington Lane*

*Summary: Visually impaired pedestrians may inadvertently enter cycle lane*

No tramline tactile paving has been shown within the cycle lanes at their interface with the shared surfaces at the proposed toucan crossing. This could result in visually impaired pedestrians inadvertently entering the cycleway, and from there entering the carriageway.

#### Recommendation

Ladder and Tramline tactile paving should be provided at the cycle track ramps at the interface with footpaths, ensuring the correct tactile paving specification (i.e. flat-topped cycle way paving) is used.



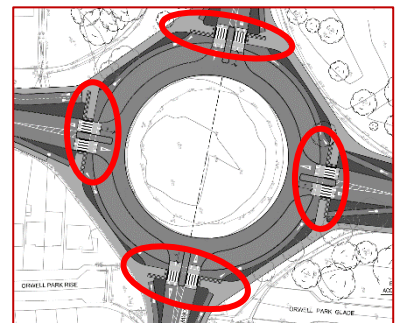
#### 3.2 Problem

*Location: Drawing 180201-1005 (P0) - Orwell Road Roundabout*

*Summary: Visually impaired pedestrians may inadvertently enter cycle lane*

The cycle tracks on the approaches to the Osprey Road, Wellington Lane/Road and Orwell Road roundabout cross footpaths, or run adjacent to the footpath and share the raised-table at the proposed zebra crossings.

No Ladder & Tramline tactile paving has been indicated to warn visually impaired pedestrians of the cycle tracks and it is unclear if vertical separation can be maintained as the footpath and cycle track share the raised-table crossings.



This could result in visually impaired pedestrians inadvertently entering the cycleway, and from there entering the carriageway.

#### Recommendation

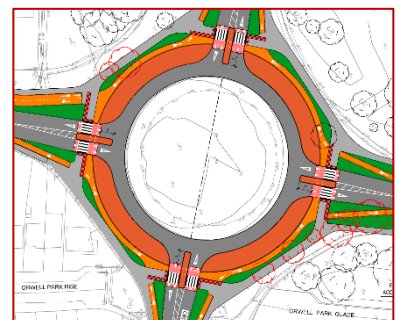
The cycle track and footpath should be segregated vertically and laterally at the roundabout.

#### 3.3 Problem

*Location: Drawing 180201-1005 (P0) - Orwell Road Roundabout*

*Summary: Amendments to roundabout may not achieve sufficient speed reductions if not of an appropriate form.*

It is unclear what form the proposed carriageway width reduction on the roundabout circulating carriageway will take. It is assumed that it will consist of kerbed build-outs.





However, if non-physical means (e.g. road markings) were intended then this arrangement is unlikely to achieve sufficient speed-reduction on the approaches to the exits from the roundabout and the zebra crossings at these locations, possibly resulting in overshoot into the crossings and vehicle/pedestrian collisions.

## Recommendation

The changes to the roundabout circulating carriageway should be of a form which ensures that vehicle speeds are sufficiently reduced to allow drivers to safely come to a halt when required to do so.

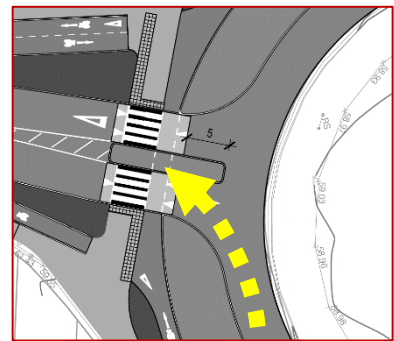
### 3.4 Problem

*Location: Drawing 180201-1005 (P0) - Orwell Road Roundabout*

*Summary: It is unclear if large vehicles will be sufficiently able to enter/exit the roundabout without overhanging the waiting area at the crossings.*

Information regarding the swept path of large vehicles (buses, refuse trucks etc.) has not been provided to the Audit Team. It is therefore unclear if these vehicles will have sufficient space on the entry to & exit from the circulating carriageway within the roundabout without overhanging footpaths.

The lane width & geometry on the entry to & exit from the circulating carriageway is such that it may be overrun, or portions of large vehicles could overhang into the pedestrian refuge island, or on the approach to the crossings, presenting a possible hazard to pedestrians.



## Recommendation

Ensure the entry/exit at the roundabout have sufficient width to allow for the overhang of the larger vehicles, in particular buses.

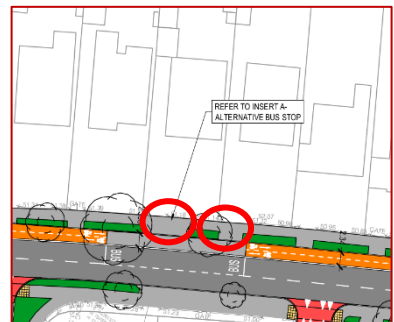
### 3.5 Problem

*Location: Drawing 180201-1010 (P0) – Whitehall Road.*

*Summary: Proposed Bus stop location conflicts with existing vehicular accesses to adjacent properties.*

It is proposed to provide an 'Alternative Bus Stop' layout at the northern bus stop on Whitehall Road. The location of the proposed bus stop in the northbound lane is likely to conflict with existing vehicular accesses to properties on the north-western side of the road.

The indicated Alternative Bus Stop layout includes a kerb height similar in height to the Kassel kerb (160mm), which may lead to difficulties for vehicles entering/exiting the adjacent residential property accesses, or to conflicts between pedestrians waiting at the bus stop and vehicles entering/exiting the adjacent residential property accesses.



## Recommendation

Relocate the bus stop away from vehicular accesses or amend the bus stop extents to remove potential conflicts.

### 3.6 Problem

*Location: Drawing 180201-1010 (P0) – Whitehall Road.*

*Summary: Visually impaired pedestrians may inadvertently enter cycle lane.*

It is proposed to provide an ‘Alternative Bus Stop’ layout at two locations along the northern side of Whitehall Road where the two-way cycle lanes are proposed.

The proposed Alternative Bus Stop layout does not include Ladder & Tramline tactile paving on the entry to the shared pedestrian/cyclist area at the bus stop, possibly resulting in visually impaired pedestrians inadvertently entering the cycle track via the transition to the cycle ramp.



### Recommendation

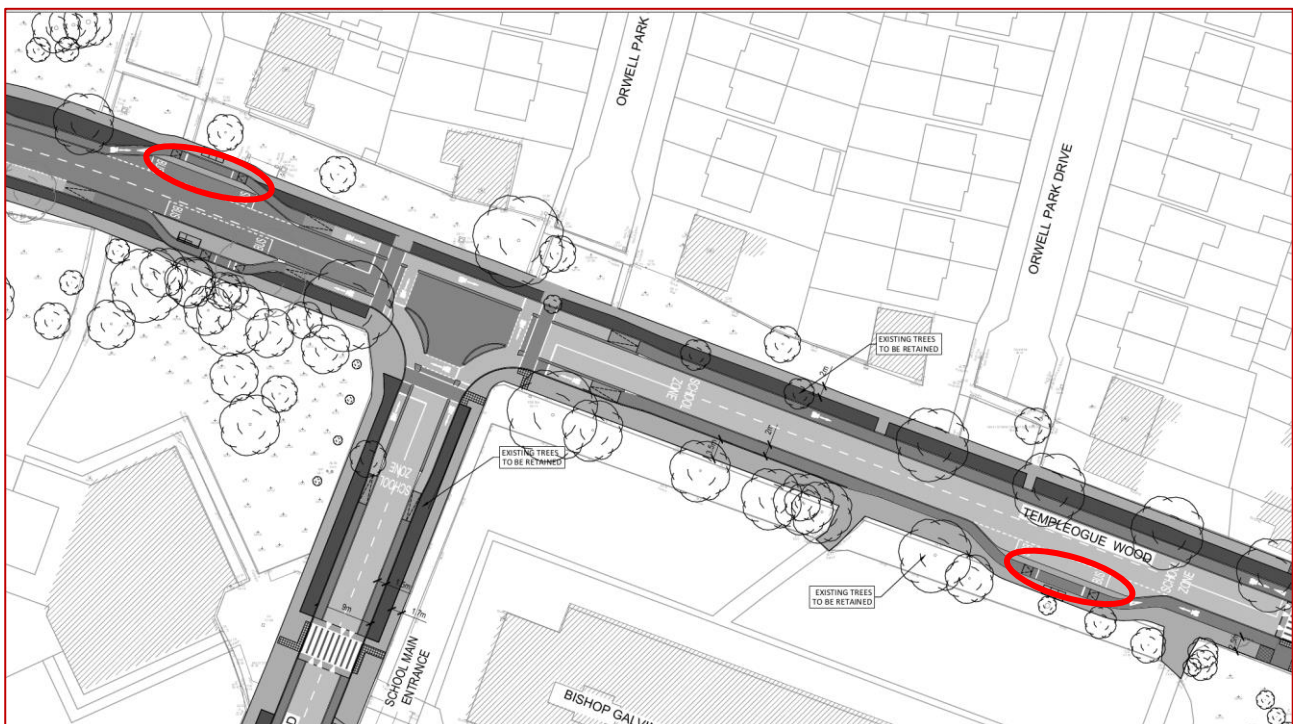
Provide Ladder and Tramline tactile paving at the interface between the shared surface, the footpath and the cycle tracks.

### 3.7 Problem

*Location: Drawing 180201-1051 (-) – Orwell Road and Templeogue Wood*

*Summary: The proposed island bus stops along Orwell Road are narrow.*

It is proposed to provide islands bus stop at the northern side of Orwell Road and on Templeogue Wood. The indicated width of the island is relatively narrow, and it may not accommodate the volumes of pedestrians waiting at the bus stop which may lead to waiting pedestrians encroaching into the cycle track, and blocking the path of a cyclist. In addition, the width of the island may result in difficulties for wheelchair users accessing public transport safely.



### Recommendation

The island should be of adequate width (e.g. the National Cycle Manual recommends a minimum island width of 3m) to accommodate the expected volumes of waiting passengers.

### 3.8 Problem

*Location: Drawing 180201-1051 (-) – Orwell Road and Templeogue Wood*

*Summary: No tactile paving indicated at NMU crossings at the bus stops on Orwell Road and Templeogue Wood.*

It is proposed to provide island bus stops on Orwell Road and Templeogue Wood. No tactile paving has been indicated at the NMU crossings of the cycle tracks to advise visually impaired passengers who disembark at the stop of the cycle lane/track. The absence of tactile paving may result in difficulties for the visually impaired in navigating the proposed bus stop arrangement safely and independently.

### Recommendation

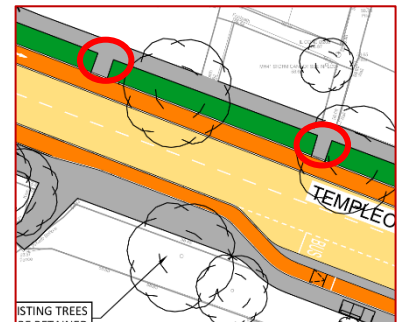
Provide a controlled crossing at the island bus stops. Alternatively, provide a continuous footpath with ramps for cyclists, and Ladder & Tramline tactile paving, with the onus on cyclists to yield to pedestrians.

### 3.9 Problem

*Location: Drawing 180201-1051 (-) – Orwell Road and Templeogue Wood*

*Summary: Retained footpath links at Templeogue Wood may encourage informal crossing and increase risk of pedestrians tripping and falling.*

Footpath links have been indicated from the footpath on the northern side of Templeogue Wood to the kerb at the cycle track. This arrangement is likely to encourage pedestrians to cross at these locations, however with no gaps provided in the protected cycle lane kerbs at these locations there is a risk of pedestrians tripping and falling.



### Recommendation

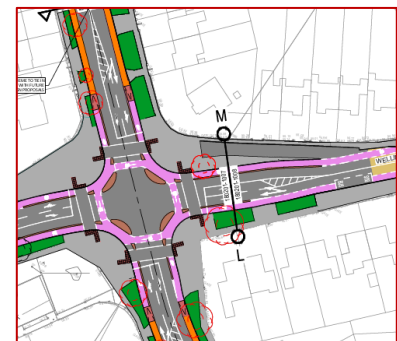
Remove the footpath links to encourage crossing at the proposed controlled crossings.

### 3.10 Problem

*Location: General Problem*

*Summary: Tactile paving stem does not extend to/beyond the walking path line*

At several locations where controlled crossings are proposed at signalised junctions the tactile paving stem does not extend to the back of the footpath. As a result, visually impaired pedestrians may not be able to locate the tactile paving and consequently the crossing point itself.



### Recommendation

Tactile paving should extend to the back of the footpath all controlled crossings, or a sufficient distance so as to be encountered by visually impaired pedestrians on the approaching paths.

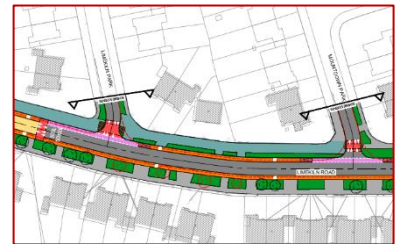
### 3.11 Problem

*Location: Drawing 180201-1041 (-) – Limekiln Road*

*Summary: Ladder and Tramline tactile paving has not been indicated either side of the proposed shared surface.*

It is proposed to provide a shared surface along Limekiln Road in the vicinity of the school. However, Ladder and Tramline tactile paving has not been indicated at the start and end of the shared surface where it meets the existing footpaths on the side roads (e.g. Limekiln Park and Mounddown Park).

This could lead to visually impaired pedestrians approaching the shared surface in the footpath being insufficiently aware that they are entering a shared area where cyclists may also be present which could result in an increased risk of pedestrian-cyclist collisions.



#### Recommendation

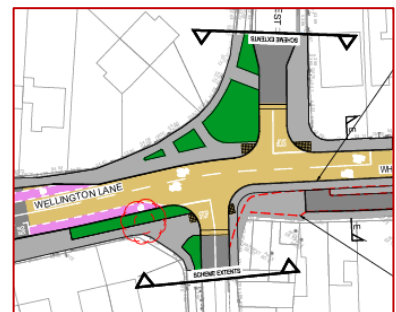
Provide Ladder and Tramline tactile paving at the interfaces between shared and segregated surfaces.

### 3.12 Problem

*Location: Drawing 180201-1008 (P0) - Whitehall Road*

*Summary: Position of dropped kerbs on the corner of the junction could result in inappropriate/unsafe crossings.*

The position of the uncontrolled pedestrian crossing of Whitehall Road West, on the corner of its junction with Whitehall Road, could result in southbound pedestrians travelling along the eastern side of Whitehall Road West mistaking the tactile paving and dropped kerb as indicating a crossing of Whitehall Road at a location where crossings are not intended, and where drivers may not expect a pedestrian to cross, leading to unsafe/inappropriate crossings.



#### Recommendation

The location of the uncontrolled pedestrian crossing should be adjusted so that the direction of the crossing is clear to approaching pedestrians.



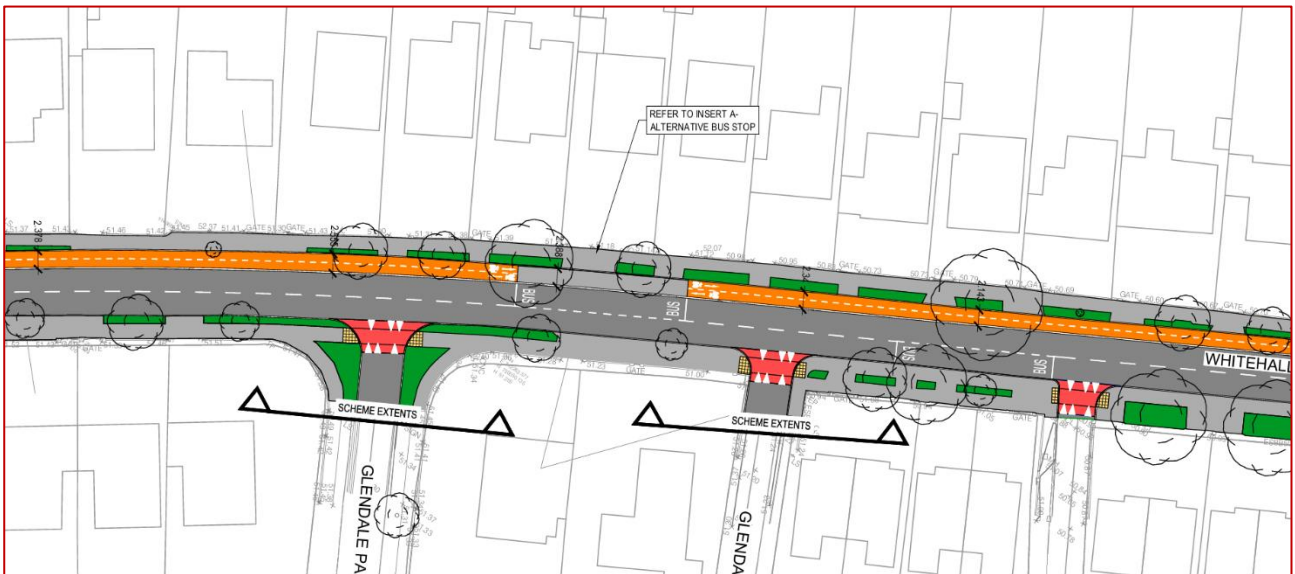
### 3.13 Problem

*Location: Drawing 180201-1009 (P0) - Whitehall Road*

*Summary: Possible pedestrian desire crossing line not catered for within Whitehall Road*

No pedestrian crossing has been indicated in the vicinity of the two bus stops on either side of Whitehall Road. It is likely that public transport users undertaking return journeys would need to cross the road on either their outbound, or inbound, journey.

This could result in unsafe crossing manoeuvres, particularly during peak times, with a consequent risk of vehicular/pedestrian collisions.



### Recommendation

A review of likely pedestrian desire lines at this location should be undertaken, and appropriate & safe measures included to cater for crossing desire lines.



## 4 Observations

4.1 At this early stage in the design development, it is unclear where signals are proposed to be located. Should the signals in the vicinity of the proposed protected junctions be located within the footpath, then they may be less visible to approaching drivers and/or approaching cyclists in the lane furthest from the footpath on the two-way cycle track, resulting in a failure to stop and possible vehicular/ pedestrian or cyclist/ pedestrian collisions.

During the design development ensure that the signal heads are visible to all road users and that minimum effective widths on the footpaths are maintained.

4.2 It is unclear if straight-ahead cyclists at the proposed signalised protected-junctions (e.g. at Wellington Green) are to proceed at the same time as traffic in the same direction of travel.

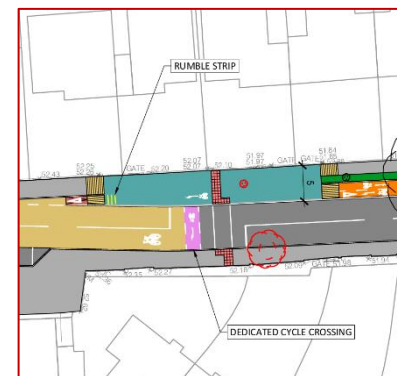
The offset of the cycle lane along the intersecting road, away from the through traffic in the same direction of travel as the cyclists could result in turning drivers believing that cyclists are at a crossing, and should give way to turning traffic.

To avoid potential confusion cyclists should have a separate traffic signal phase to vehicular traffic within these junctions.

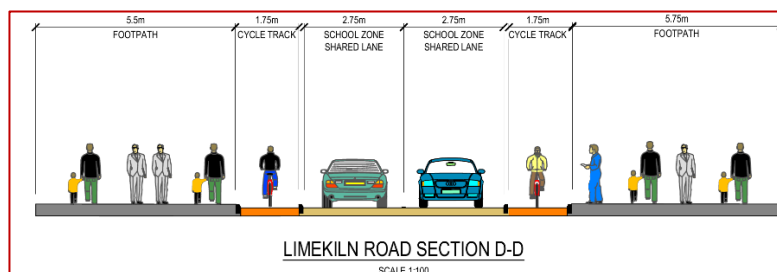


4.3 It is unclear if it is intended to provide a dropped-kerb at the dedicated cycle crossing of Whitehall Road. It is likely that some form of dropped-kerb would be considered necessary to facilitate cyclists use of the crossing. However, a dropped kerb raises the risk of visually-impaired pedestrian inadvertently straying into the carriageway, where they are at risk of being struck by a vehicle. All dropped kerbs should have a minimum upstand of 25 mm, or else tactile paving should be provided.

Alternatively amend the proposed arrangement such that the proposed pedestrian crossing and dedicated cycle crossing combined into a single toucan crossing.



4.4 There is potential for the protected cycle lane kerbs within the "School Zone Shared Lane" to present a trip hazard if the area is intended to be shared with all users. It may be preferable to have a segregated carriageway through this area with School Zone Treatment.



4.5 At a number of controlled and uncontrolled crossing along Orwell Road tactile paving has not been indicated.

This assumed to be CAD error, however the drawings should be amended to reflect the proposed layout.



## 5 Road Safety Audit Team Statement

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

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

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

### ROAD SAFETY AUDIT TEAM LEADER

Peter Monahan Signed: \_\_\_\_\_

Dated: \_\_\_\_\_

### ROAD SAFETY AUDIT TEAM MEMBER

Mazen Al Hosni Signed: \_\_\_\_\_

Dated: \_\_\_\_\_

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

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

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

**Any other information?**

(if 'Yes', describe below)

<input type="checkbox"/>	<input checked="" type="checkbox"/>
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## **Appendix B – Documents Submitted to the Road Safety Audit Team**



DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
Proposed General Arrangement Layout Sheet 1 of 9	180201-1003	P0
Proposed General Arrangement Layout Sheet 2 of 9	180201-1004	P0
Proposed General Arrangement Layout Sheet 3 of 9	180201-1005	P0
Proposed General Arrangement Layout Sheet 4 of 9	180201-1006	P0
Proposed General Arrangement Layout Sheet 5 of 9	180201-1007	P0
Proposed General Arrangement Layout Sheet 6 of 9	180201-1008	P0
Proposed General Arrangement Layout Sheet 7 of 9	180201-1009	P0
Proposed General Arrangement Layout Sheet 8 of 9	180201-1010	P0
Proposed General Arrangement Layout Sheet 9 of 9	180201-1011	P0
Rossmore Road Sheet 1	180201-1051	-
Rossmore Road Sheet 2	180201-1052	-
Limekiln Road	180201-1041	-

## **Appendix C – Feedback Form**

## Road Safety Audit Feedback Form

**Scheme:** Wellington Lane Cycle Scheme

**Route No.:** Wellington Lane

**Audit Stage:** Stage 1      **Date Audit Completed:** 14<sup>th</sup> July 2022

To be Completed by Designer				To be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	Problem Accepted (Yes/No)	Recommended Measure(s) Accepted (Yes/No)	Describe Alternative Measure(s). Give reasons for not accepting recommended measure	Alternative Measures or Reasons Accepted by Auditors (Yes/No)
3.1				
3.2				
3.3				
3.4				
3.5				
3.6				
3.7				
3.8				
3.9				
3.10				
3.11				
3.12				
3.13				

**Signed:** \_\_\_\_\_      Designer      **Date** \_\_\_\_\_

**Signed:** \_\_\_\_\_      Audit Team Leader      **Date** \_\_\_\_\_

**Signed:** \_\_\_\_\_      Employer      **Date** \_\_\_\_\_

## **Appendix D – Problem Locations**

