

CITY CENTRE WEST TO EAST CYCLE LINK


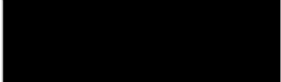





Road Safety Audit Stage 1 Designers Response

City of Edinburgh Council





April 2020

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Quality information

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Authorisation Sheet

Project: CITY CENTRE WEST TO EAST CYCLE LINK

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Table of Contents

| | | |
|----|---|-----|
| 1. | Introduction..... | 6 |
| 2. | Items Outstanding from Previous Audits..... | 7 |
| 3. | Response to Items Resulting from the Stage 1 Road Safety Audit..... | 8 |
| | Appendix A - Problem Location Plans | 110 |

1. Introduction

This report details the Designers Response to a Stage 1 Road Safety Audit carried out on the proposed City Centre West to East Cycle Link, Edinburgh (*report reference RSA115-S1-B CCWEL RSA1 - Rev 0, dated 11 March 2020*). The Audit was carried out at the request of City of Edinburgh Council.

A Stage 1 Road Safety Audit was previously undertaken for the scheme in October 2017, but the scheme has evolved since then such that a new Stage 1 Road Safety Audit is required.

This report indicates each of the problems identified by the Road Safety Audit Team together with recommendations to solve or mitigate the problems. The design team has provided a response to each item raised.

Section 2 of this report includes outstanding issues identified from previous Audit Reports and Section 3 describes the safety issues identified in the Stage 1 Audit together with the designer's response.

The following deviations from Edinburgh Street Design Guide were notified to the Audit Team on the proposals:

1. Provision of cycleway centreline radii below the minimum throughout the scheme due to the presence of existing buildings and infrastructure in the urban environment
2. Provision of Stopping Sight Distance below the minimum throughout the scheme due to the presence of existing buildings and infrastructure in the urban environment
3. Provision of Sight Distance in Motion below the minimum throughout the scheme due to the presence of existing buildings and infrastructure in the urban environment
4. Provision of visibility at some junctions below the minimum due to the presence of parking or recycling bin areas
5. Tactile paving arrangement at controlled crossings throughout the scheme due to proximity of courtesy crossings of adjacent cycleway
6. Single row of tactile paving at uncontrolled crossings throughout the scheme due to decision to comply with DETR document Guidance on the Use of Tactile Paving Surfaces
7. Provision of tactile paving with a diagonal cut throughout the scheme to minimise the extent of tactile paving
8. Provision of a cycleway centreline and a continuous road centreline where the cycleway crosses the continuous footway at junctions throughout the scheme, to highlight the hazards
9. Provision of non-standard toucan crossings throughout the scheme to encourage pedestrians and cyclists to use different sides of the crossings
10. Provision of footway crossfalls greater than the maximum due to the need to tie into existing crossfalls
11. Provision of a reduced number of zig zags on the approach to crossings throughout the scheme due to the presence of parking, and the provision of non-standard cycleway centreline markings to minimise impact to streetscape
12. Replacement of the central zebra crossing at bus stop floating islands throughout the scheme with an uncontrolled crossing
13. Provision of guidance paving at the Haymarket Terrace floating island bus stop to assist the visually impaired
14. Provision of a footway width below the minimum at West Coates due to corridor constraints.

2. Items Outstanding from Previous Audits

As the scheme has changed since the original Stage 1 Road Safety Audit was completed, the previous Road Safety Audit Report has been used for reference only.

3. Response to Items Resulting from the Stage 1 Road Safety Audit

Local Alignment

Problem: 4.1.1

Location(s): Roseburn Terrace

Drawing(s): TDD-636809-1-DR-CH-SK-0036

Summary: Narrow lane width could lead to side-swipe, shunt, loss of control, and / or vehicular-pedestrian collisions



Description:

The nearside eastbound lane on approach to the new crossing of Roseburn Terrace is very narrow at approximately 2 m wide. A motorist in the offside lane following the central zig-zag road markings may veer into the path of an adjacent nearside vehicle, with the potential for side-swipe and / or shunt type collisions to occur. This may also cause a motorist in the nearside lane to hit and / or overrun the kerb. Striking the kerbs could lead to vehicles losing control. Regular overrunning of kerbs could also lead to break up of the footways and kerbs. This could lead to loose material in the carriageway with the potential for loss of control collisions. Any vehicles overrunning the kerbs could also collide with pedestrians behind the kerb.

Recommendation:

It is recommended that the lane widths are adjusted to ensure that vehicles can travel side by side within their lanes.

Designers Response

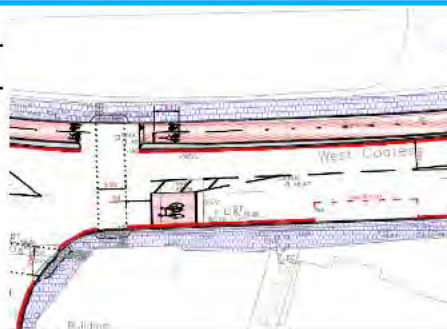
Recommendation accepted.

Lane widths should be 3.2m and 2.9m through this section.

Problem 4.1.2

Location(s) West Coates

Drawing(s) TDD-636809-1.3-DR-CH-00-0003

Summary: Inconsistent lane width could lead to side-swipe collisions

Description:

A loading bay is proposed in the westbound carriageway to the east of the West Coates / Russell Road junction. The road is a single lane on the westbound approach, which widens to accommodate the loading bay, before narrowing to a single lane at the stop line. In the event that the loading bay is empty, and a large vehicle is following the kerb line, a following motorist may see the lane widening and attempt to overtake. This could result in a side-swipe collision as the overtaking motorist attempts to move across prior to the stop line.

Recommendation:

It is recommended that road markings are provided on approach to the loading bay to guide motorists around it when empty.

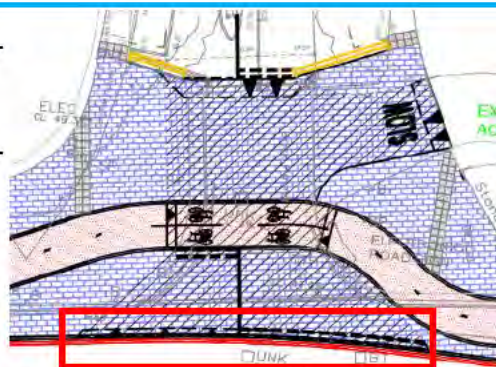
Designers Response

Recommendation rejected.

The widening occurs for a short section over the length of the loading bay with good forward visibility of the approaching stop line and traffic signal equipment. The risk of vehicles attempting to undertake a passing manoeuvre at this location is considered very low; hatching on approach/exiting the loading bay would be scrubbed over time.

Problem 4.1.3

| | |
|--------------------|---|
| Location(s) | Various (see below) |
| Drawing(s) | TDD-636809-1.4-DR-CH-00-0004 TDD-636809-1.5-DR-CH-00-0005 TDD-636809-2.10-DR-CH-00-0010 |
| Summary: | Steep ramp at raised table could lead to loss of control collisions |

**Description:**

The proposed ramps at raised tables at several locations are very short and will therefore be steep. Motorists turning into the side roads may not appreciate the presence of the ramps until they turn in and could lose control whilst turning on a steep ramp. Powered two-wheeler vehicles are particularly at risk of losing control during turning and braking on a steep ramp. This occurs at the following locations:

- Wester Coates Terrace
- Wester Coates Road
- Donaldsons Ingress
- Stafford Street

Recommendation:

It is recommended that the ramp gradients throughout the scheme are suitable for all motorised vehicles to negotiate safely.

Designers Response

Recommendation accepted.

Ramp gradients are provided with a minimum gradient of 1:5 (preferred 1:10) based on the nature of vehicles using the side roads. The gradients are aligned with Edinburgh Streetscape design guidance factsheet G7 which states:

The ramp approach from the major street should be as steep as possible to slow turning vehicles and maintain pedestrian desire lines; typically 1:5 to 1:10 gradient (1:20 on bus routes).

Problem

4.1.4

Location(s)

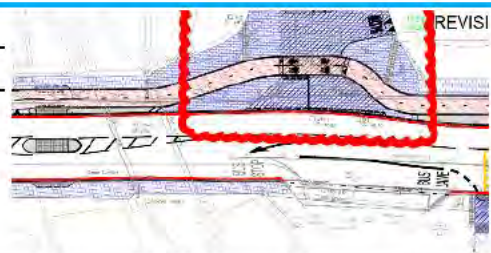
West Coates

Drawing(s)

TDD-636809-1.4-DR-CH-00-0004

Summary:

Short merge length could lead to side-swipe, shunt and / or loss of control collisions



Description:

The westbound approach to Balbirnie Place comprises a Bus Lane and a traffic lane. There is a gap in the Bus Lane across the junction with Balbirnie Place, before the Bus Lane re-commences. However, it only recommences for a short length. Motorists in the offside lane then have a very short distance to merge with the buses in the nearside lane in advance of a proposed central refuge. This short merge length could lead to side-swipe collisions between merging vehicles. It could also lead to shunt type collisions as vehicles brake suddenly if unsuccessful at merging. It could also lead to loss of control collisions should the offside vehicle strike the central refuge.

Recommendation:

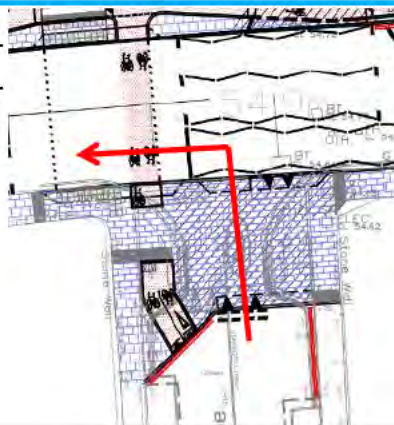
It is recommended that the short length of Bus Lane to the west of Balbirnie Place is removed and the road markings are amended accordingly to provide an appropriate merge taper length.

Designers Response

Recommendation rejected.

The bus lane short section has been retained due to the inset loading located opposite Wester Coates Road. It is considered there is a greater risk associated with vehicles entering and exiting the loading bay into area being used to undertake merging manoeuvres.

The merge length provided westbound is 1:10; there is no guidance for urban merge lengths following the termination of bus lanes however the principles for merging in advance of other obstacles set out in TSM Chapter 3 have been considered as part of the design process. For bus lane commencement the guidance suggests "normally a taper no sharper of 1:10. There may be situations where it is not practicable to provide a taper of 1:10 and a sharper taper is necessary. In such circumstances, care should be taken to ensure that traffic is directed away from the start of the bus lane in a safe manner." Noting the proposed 20mph speed limit and urban environment, and the low risk associated with the merge being between general traffic (offside lane) and buses (nearside lane) as opposed to two general traffic streams, the facility is proposed to be retained to prioritise mitigating the safety risk with the loading bay.

Problem 4.1.5**Location(s)** Stanhope Street**Drawing(s)** TDD-636809-1.5-DR-CH-00-0005**Summary:** Proximity of crossing to junction could lead to vehicular-cyclist and / or head-on collisions**Description:**

There is effectively no radius for motorists to follow when turning left out of Stanhope Street. As a result, they will either have to drive across the cycle waiting area at the crossing in order to complete the turn within the westbound lane on West Coates or swing out into the offside eastbound lane on West Coates, in order to avoid the waiting area. This could result in vehicular-cyclist and / or head-on collisions.

Recommendation:

It is recommended that swept paths are undertaken for all movements at the junction, and the layout is amended to remove the risk of collisions. For example, Stanhope Street could be made one-way, or be closed, or the crossing could be relocated.

Designers Response

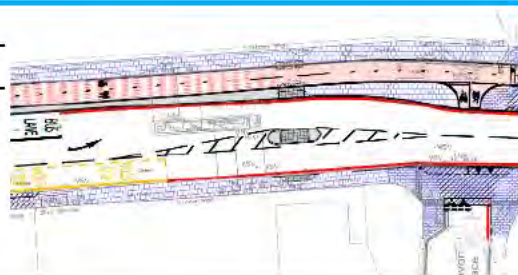
Recommendation accepted.

Subsequent to the Stage 1 RSA Stanhope Street has been amended to be one way southbound.

Problem 4.1.6

Location(s) West Coates

Drawing(s) TDD-636809-1.5-DR-CH-00-0005

Summary: Frequently changing alignment could lead to side-swipe, shunt and / or loss of control collisions

Description:

The eastbound approach to Devon Place comprises a Bus Lane and an offside lane, which then reduce to a single lane. Motorists in the offside lane have a very short distance to merge with the buses in the nearside lane in advance of a proposed central refuge. This short merge length could lead to side-swipe collisions between merging vehicles. It could also lead to shunt type collisions as vehicles brake suddenly if unsuccessful at merging. It could also lead to loss of control collisions should the offside vehicle strike the central refuge. Immediately after the refuge the road alignment curves to the right and then back to the left in quick succession. The combination of short merge taper and back to back short curves could exacerbate the potential for motorists to lose control at this location.

Recommendation:

It is recommended that an appropriate merge taper length is provided, and the eastbound nearside kerb alignment is realigned to improve the travelled path for motorists.

Designers Response

Recommendation rejected.

The auditor's comments on the alignment are noted, however the constraints on this section of the corridor influencing the kerb line include:

- Required uncontrolled crossing adjacent to an access to a significant residential development, which replaces an existing crossing in this location.
- Required cycle access between Devon Place and the two-way cycle track.
- Vehicular Access requirements into Donaldsons development and management of vehicle/cycle conflict.

The carriageway width through the uncontrolled crossing is 4.05m in the eastbound direction; the swept path alignment required is significantly less onerous than the required kerb line.

The merge length provided westbound is 1:7.5 and similar to the response to 4.1.4 this is considered a lower risk location with the proposed 20mph speed limit and urban environment, and the merge being between general traffic (offside lane) and buses/parked cars (nearside lane) as opposed to two general traffic streams.

Problem 4.1.7**Location(s)** Morrison Street**Drawing(s)** TDD-636809-1.7-DR-CH-00-0007**Summary:** Buses travelling across the cycle lane could lead to bus-cyclist collisions**Description:**

It was observed during the audit site visit that buses in the nearside lane were driving within the existing cycle lane. This has the potential for collisions between buses and cyclists.

Recommendation:

It is recommended that the swept paths of vehicles including buses are undertaken along this road, and lane widths adjusted as necessary.

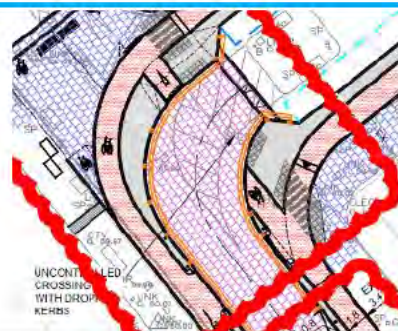
Designers Response

Recommendation accepted.

Swept paths have been undertaken and lane widths adjacent to the cycle track retained as 3.25m minimum to allow for buses and other large vehicles to avoid entering the cycle lane.

Problem 4.1.8

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|--------------------|---|
| <i>Location(s)</i> | Manor Place / Melville Street |
| <i>Drawing(s)</i> | TDD-636809-2.5-DR-CH-00-0005 |
| <i>Summary:</i> | Small radius curve and narrow pavement could lead to side-swipe, head-on and / or vehicular-pedestrian / cyclist collisions |

**Description:**

The road is to be made narrower around the ninety-degree bend between Manor Place and Melville Street. As such, it may be difficult for large vehicles (noting that a bus stop is present on Melville Street) to travel around the bend within their lanes, with the potential for side-swipe and / or head-on collisions to result. This may also result in vehicles overrunning the adjacent footway and cycleway with the potential for vehicular-pedestrian and / or vehicular-cyclist collisions.

Recommendation:

It is recommended that swept paths are undertaken to ensure that vehicles using the route can undertake the movement within their lanes, and without overrunning the adjacent footway / cycleway, and the layout amended if necessary.

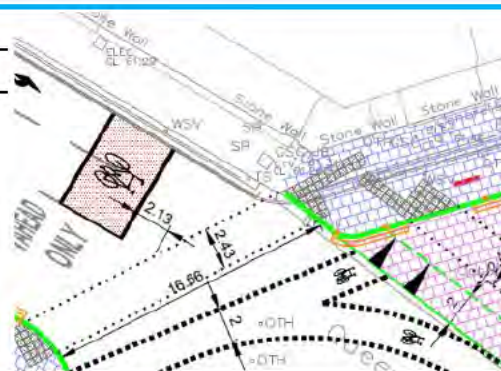
Designers Response

Recommendation accepted in part.

Swept paths have been undertaken for this link. It is recognised that opposing large vehicles will overrun lanes but not the carriageway width, however this has been deliberately designed as a minor road slow speed environment including a raised table environment.

Problem 4.1.9

| | |
|--------------------|---|
| Location(s) | Drumsheugh Place / Randolph Place |
| Drawing(s) | TDD-636809-2-DR-CH-SK-0030 |
| Summary: | Kerb alignment could lead to vehicular-pedestrian and / or loss of control collisions |


Description:

The proposed amendments to the nearside kerb between Drumsheugh Place and Randolph Place do not produce a smooth alignment. As such it is likely that the new corner kerb will be overrun by vehicles turning left into Randolph Place. This could lead to collisions between vehicles and pedestrians waiting to cross. Regular overrunning of kerbs could also lead to break up of the footways and kerbs. This could lead to loose material in the carriageway with the potential for loss of control collisions.

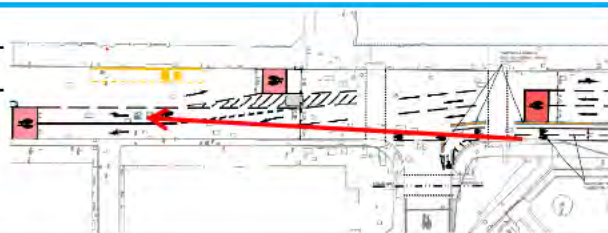
Recommendation:

It is recommended that the kerb ties in smoothly, and its alignment accommodates the swept path of vehicles expected at the junction.

Designers Response

Recommendation accepted.

Kerb line is to be amended to achieve a smoother alignment into Randolph Place. Appropriate swept paths have already been tested.

Problem 4.1.10**Location(s)** South St. David Street**Drawing(s)** TDD-636809-3-DR-CH-SK-0024**Summary:** Layout between junctions could lead to vehicular-cyclist collisions**Description:**

Cyclists travelling south on South St. David Street wishing to turn right at Princes Street must merge with the nearside southbound traffic lane before weaving across the merging offside lane in order to enter the right turn lane. There is the potential for cyclists to be struck by vehicles as they attempt to weave through traffic that may be travelling at a faster speed. Even if cyclists are wishing to turn left at Princes Street, they will have to contend with both nearside and offside vehicles pulling across them, again with the potential for side-swipe and / or shunt type collisions.

Recommendation:

It is recommended that the cyclists have their own signal stage in order to safely progress to the downstream junction.

Designers Response

Recommendation rejected.

Providing an additional traffic signal stage for cyclists will result in a significant delays for all road users in particular southbound cyclists. This may introduce a safety risk of southbound cyclist ignoring traffic signals. The design has evolved to include an early release for southbound cyclists plus additional Diag. 1057 cycle symbols are proposed in the southbound nearside lane.

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| Problem | 4.1.11 |
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| Location(s) | South Charlotte Street / Charlotte Square |
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| Drawing(s) | TDD-636809-4-DR-CH-SK-0007 |
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| Summary: | Lane alignment could lead to side-swipe and / or loss of control collisions |
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| Description: |
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| <p>The northbound lanes are not aligned across the junction (as per the red lines in the image above). Motorists in the offside lane may encroach into the nearside lane with the potential for side-swipe collisions. Also, vehicles in the nearside lane will be guided towards the kerb opposite. This could lead to motorists undertaking a sudden change in direction, with the potential for loss of control and / or side-swipe collisions to occur. Similarly, vehicles in the offside southbound lane may encroach into the nearside lane (as per the green lines in the image above) with the potential for side-swipe collisions.</p> |
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| Recommendation: |
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| <p>It is recommended that the road markings and temporary kerb line are adjusted as necessary to improve the lane alignment through the junction.</p> |
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| Designers Response |
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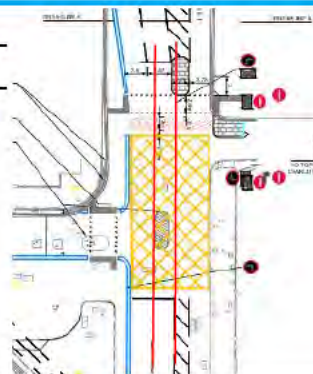
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| <p>Recommendation accepted.</p> |
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| <p>Designer will consider the alignment of northbound and southbound lanes to better align the north and south links at the Rose Street junction.</p> |
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Problem 4.1.12

Location(s) North Charlotte Street / Charlotte Square

Drawing(s) TDD-636809-4-DR-CH-SK-0007

Summary: Lane alignment could lead to side-swipe and / or loss of control collisions

Description:

The northbound lanes are not aligned across the junction (as per the red lines in the image above). Motorists in the nearside lane may encroach into the offside lane with the potential for side-swipe collisions. Also, vehicles in the offside lane will be guided towards the kerb opposite. This could lead to motorists undertaking a sudden change in direction, with the potential for loss of control and / or side-swipe collisions to occur.

Recommendation:

It is recommended that the road markings and kerb lines are adjusted as necessary to improve the lane alignment through the junction.

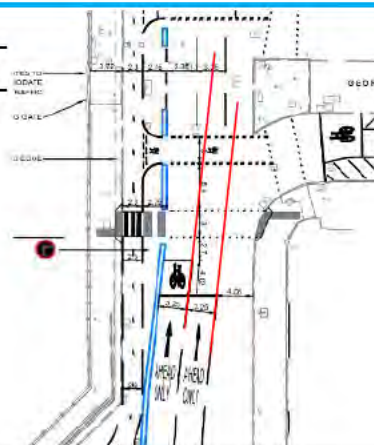
Designers Response

Recommendation accepted.

The alignment northbound through the Charlotte Square/Young Street junction has been updated subsequent to the Stage 1 RSA. The island on the north arm of the junction has been removed and the alignment improved.

Problem 4.1.13

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| Location(s) | Charlotte Square / George Street |
| Drawing(s) | TDD-636809-4-DR-CH-SK-0007 |
| Summary: | Lane alignment could lead to head-on, side-swipe and / or loss of control collisions |


Description:

The northbound lanes are not aligned across the junction (as per the red lines in the image above). Motorists in the offside lane are directed towards the opposing southbound lane, with the potential for head-on collisions. This could lead to motorists undertaking a sudden change in direction, with the potential for loss of control and / or side-swipe collisions to occur.

Recommendation:

It is recommended that the road markings and kerb lines are adjusted as necessary to improve the lane alignment through the junction.

Designers Response

Recommendation accepted.

A straighter alignment for northbound lanes through the George Street junction is not possible within the constraints of the site and the need to provide cyclist and pedestrian facilities on the west side of the junction. However, the alignment will be further highlighted through additional Diag 1004 hazard warning lines between the pedestrian and cycle crossings on the southern arm of the junction.

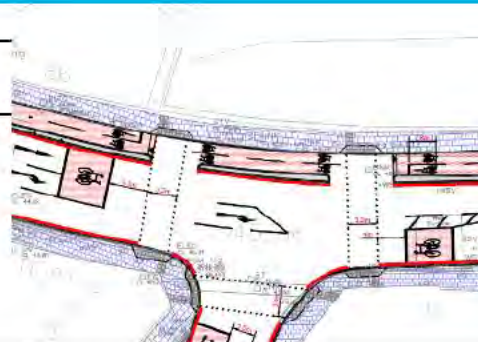
General

Problem: 4.2.1

Location(s): Various (see below)

Drawing(s): TDD-636809-1.3-DR-CH-00-0003
TDD-636809-1.6-DR-CH-00-0006

Summary: Narrow islands could lead to loss of control collisions



Description:

At several locations, the proposed islands may be too narrow to provide a sign / bollard, with a sufficient offset from the kerb, to highlight their presence to motorists. This could lead to them being struck by a vehicle or a cyclist with the potential for loss of control collisions. This occurs at the following locations:

- Roseburn Terrace / Roseburn Street junction
- Haymarket Terrace / Haymarket Yards junction

Recommendation:

It is recommended that the islands are made wide enough for their presence to be highlighted without the risk of vehicles or cyclists striking kerbs or any street furniture.

Designers Response

Recommendation rejected (alternative solution proposed).

It is not possible to provide a wider central island through the junction due to space constraints. As the central island is a continuation of the segregated cycle track (breaking for the pedestrian crossing and car rental access) and not the commencement of a segregated section, a bollard is not proposed. However it is proposed to provide a retroreflective strip around the perimeter of the kerb to highlight its presence.

Problem: 4.2.2**Location(s):** Roseburn Terrace / Russell Street junction**Drawing(s):** TDD-636809-1.3-DR-CH-00-0003**Summary:** Standing water could lead to loss of control collisions and / or slips and falls for pedestrians / cyclists**Description:**

Standing water was observed on the carriageway at the western side of the Roseburn Street pedestrian crossing. Standing water can freeze during wintry conditions, with the potential to cause loss of control collisions for vehicles and slips and falls for pedestrians / cyclists.

Recommendation:

It is recommended that existing drainage is reviewed, and gullies unblocked, and / or additional gullies added as necessary to prevent standing water from occurring.

Designers Response

Recommendation accepted.

The new kerb line proposed at the Roseburn Terrace/Russell Road junction will include suitable drainage profile.

The potential issue relating to maintenance of the existing gullies will be passed to CEC maintenance for consideration.

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| Problem | 4.2.3 |
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| Location(s) | West Coates |
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| Drawing(s) | TDD-636809-1.5-DR-CH-00-0005 |
|------------|------------------------------|

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|----------|---|
| Summary: | Poor pavement condition at crossing could lead to personal injury for pedestrians |
|----------|---|



Description:

The existing pavement is in a poor condition at the location of the proposed uncontrolled crossing to the west of Devon Place. Pedestrians using the crossing may trip and fall leading to personal injury.

Recommendation:

It is recommended that a smooth pavement surface is provided at the crossing point.

Designers Response

Recommendation accepted.

As part of the removal of the existing crossing west of Devon Place, the area west of the existing crossing to east of the new crossing is to be resurfaced.

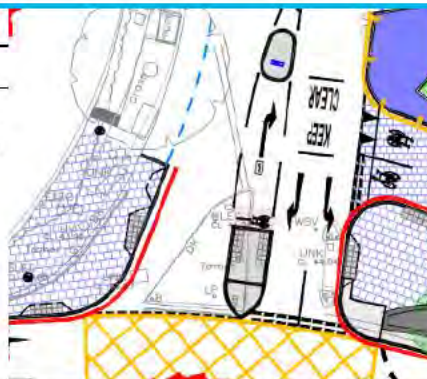
Junctions

Problem: 4.3.1

Location(s): Murrayfield Avenue

Drawing(s): TDD-636809-1.1-DR-CH-00-0001

Summary: Reduced road width could lead to loss of control collisions and / or vehicular-pedestrian / cyclist collisions



Description:

Kerb lines are being realigned in order to widen the footway provision. There is the potential for large vehicles to hit and / or overrun the kerbs at the entry to, and exit from, Murrayfield Avenue, noting the narrow lanes at exit. Striking the kerbs could lead to vehicles losing control. Regular overrunning of kerbs could also lead to break up of the footways and kerbs. This can lead to loose material in the carriageway with the potential for loss of control collisions. Any vehicles overrunning the kerbs could also collide with pedestrians and / or cyclists behind the kerb.

Recommendation:

It is recommended that swept path analyses are undertaken to ensure that large vehicles can undertake all movements without overrunning the adjacent kerbs.

Designers Response

Recommendation accepted.

Swept paths have been completed for this junction for the vehicles expected to require access.

Problem: 4.3.2**Location(s):** Various (see below)**Drawing(s):** TDD-636809-1-DR-CH-SK-0036
TDD-636809-1.4-DR-CH-00-0004**Summary:** Set back of Give Way road markings and restricted visibility could lead to vehicular-cyclist collisions.**Description:**

The Give Way road markings are set back a long way from the main road at several locations where buildings or walls are in close proximity to the side roads. These factors combine to restrict visibility between motorists and cyclists, with the potential for collisions between the two. This occurs at the following locations:

- Roseburn Cliff
- Wester Coates Terrace
- Wester Coates Road

Recommendation:

It is recommended that the Give Way markings are moved closer to Roseburn Terrace / West Coates to maximise visibility between cyclists and approaching vehicles.

Designers Response

Recommendation rejected.

The arrangement proposed is based on the following factors:

- The continuous footway arrangement is proposed for minor road crossings along Roseburn Terrace/West Coates providing priority for pedestrians/cycles, designed in accordance with the Edinburgh Streetscape Design Guidance with give-way markings located prior to the footway to warn motorists they must consider/give-way to footway/cycle track users.
- To relocate the give-way markings forward would remove the continuous footway nature of the access and could encourage higher vehicle speeds. As suggested in the Edinburgh Streetscape Design Guidance "Research carried out for Manual for Streets 2 has found no evidence that reducing visibility at junctions (between vehicles on the major and minor arms) will result in an increased risk of injury or collisions" and "The absence of wide visibility splays will encourage vehicles to emerge cautiously".

Problem: 4.3.3**Location(s):** Roseburn Gardens**Drawing(s):** TDD-636809-1-DR-CH-SK-0036

Summary: Turning movements at junction could lead to vehicular-pedestrian and / or vehicular-cyclist collisions

**Description:**

The crossing of Roseburn Terrace is proposed to be upgraded and relocated. The proposed amendments to the splitter island are such that an eastbound motorist may attempt to turn right into Roseburn Gardens (currently not permitted). This could lead to the potential for collisions between the turning vehicles and pedestrians waiting at the crossing and / or cyclists travelling northbound. Furthermore, as the entry to Roseburn Gardens is on a raised table, there will be dropped kerbs present along the length of the entry. As such, motorists turning left into Roseburn Gardens may turn across the pedestrian waiting area with the potential for vehicular-pedestrian collisions. They may also collide with cyclists waiting at the kerb to the west of the pedestrian crossing, as described in Problem 4.4.3. It is noted that loading bays are proposed on Roseburn Gardens and therefore this issue may be exacerbated by large vehicles undertaking the left turn movement.

Recommendation:

It is recommended that:

- the splitter island is extended to the stop line and

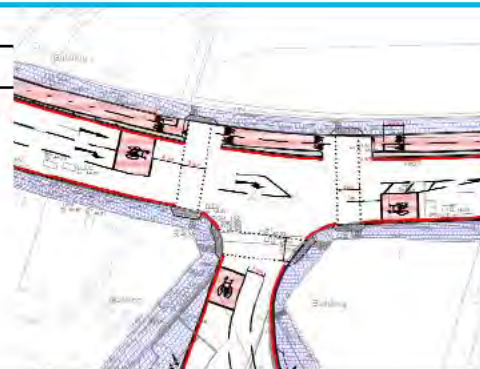
physical measures are provided adjacent to the crossing, in order to prevent the right turn movement, and keep left turning vehicles away from waiting pedestrians.

Designers Response

Recommendation accepted in part.

The splitter island cannot be extended as it is designed to allow for overhang of left turning vehicles from Roseburn Terrace onto Roseburn Gardens if required. However no right turn signs are proposed to confirm the prohibited movement.

- A bell bollard is proposed to the west of the pedestrian crossing to remove the risk of drivers taking a shallow alignment across the pedestrian waiting area. Traffic signal poles are also present immediately to the west of the tactile paving.

Problem: 4.3.4**Location(s):** Roseburn Terrace / Russell Road junction**Drawing(s):** TDD-636809-1.3-DR-CH-00-0003**Summary:** Concurrent green signals could lead to vehicular-cyclist collisions**Description:**

The signal staging diagram for the junction shows that the cycleway will have a green signal whilst Russell Road has a green signal. Any cyclists leaving Russell Road and wishing to join the cycleway will have to wait in the road for a suitable gap in cycleway traffic before joining, which could lead to them being struck by passing vehicles.

Recommendation:

It is recommended that the cycleway does not have a green signal at the same time as Russell Road.

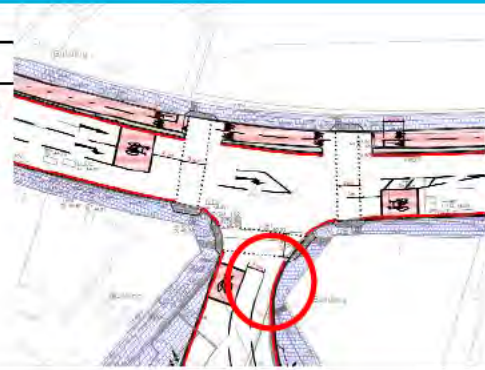
Designers Response

Recommendation rejected.

The auditor's comments are noted and this alternative method of operation has been considered through the design process. There are two reasons the chosen staging has been selected:

1) Anecdotal evidence emerging from cities that have installed segregated cycle facilities is that where cyclists are unnecessarily delayed, for example when non-conflicting side roads are running, there is a tendency for cyclists to ignore red signals. At this location that could result in cyclists from Russell Road joining the cycle track as a cyclist passes through a red signal. This has been weighed against the risk of a cyclist needing to slow and find a gap in cyclists utilising the track. However the operation will be monitored and the configuration can be adjusted if there are observed issues.

2) Russell Road is not being promoted as an access point to the two-way cycle track, primarily due to physical constraints at the junction. Access can be gained for confident cyclists on carriageway however the sign routes are proposed as identified in the response to item 4.3.8.

Problem: 4.3.5**Location(s):** Roseburn Terrace / Russell Road junction**Drawing(s):** TDD-636809-1.3-DR-CH-00-0003**Summary:** Narrow lanes could lead to side-swipe, shunt and / or head-on collisions**Description:**

Two lanes are marked upon entry into Russell Road. However, the lanes are approximately 2.0 m to 2.5 m wide. The traffic signal staging is such that vehicles can turn right into Russell Road at the same time as vehicles turning left into Russell Road. A motorist turning right could see the downstream area marked as two lanes and turn at the same time as a vehicle turning left. The narrow width of the lanes around the corner however, could result in side-swipe or shunt collisions between these two vehicles, and / or head-on collisions with a vehicle waiting at the Russell Road stop line.

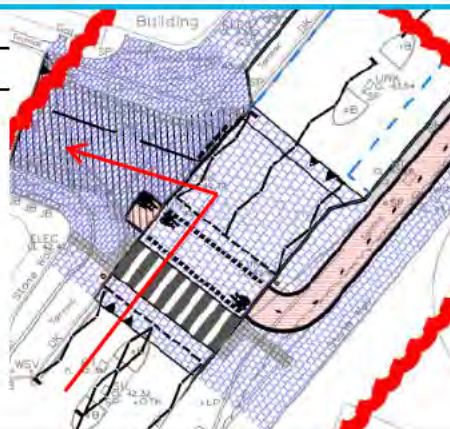
Recommendation:

It is recommended that the entry to Russell Road is marked as a single lane, widening to two lanes where there is sufficient width for two vehicles to travel side by side.

Designers Response

Recommendation accepted.

A single 1004 marking will be removed from the start of the southbound right turn lane.

Problem: 4.3.6**Location(s):** Roseburn Place / Roseburn Street junction**Drawing(s):** TDD-636809-1.3-DR-CH-00-0003**Summary:** Proximity of crossing to side road could lead to vehicular-pedestrian / cyclist collisions, and / or head-on collisions**Description:**

Motorists turning left into Roseburn Place will either have to drive across the pedestrian and cycle waiting areas at the proposed crossing, or across the exit lane from Roseburn Place. This could lead to vehicular-pedestrian / cyclist collisions or head-on collisions.

Recommendation:

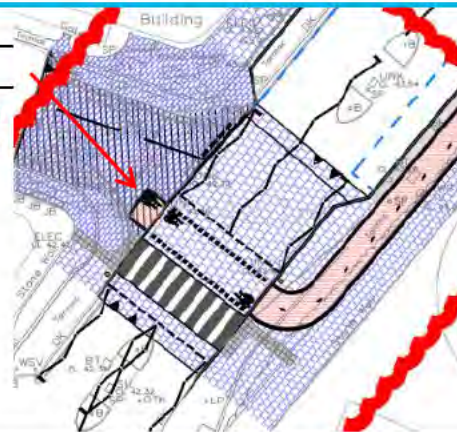
It is recommended that the crossing is relocated such that all turning movements can be performed without risk of overrunning pedestrian / cycle waiting areas or travelling in an opposing traffic lane towards oncoming traffic.

Designers Response

Recommendation rejected (alternative solution proposed).

The crossing is to be retained in its current position to maintain the pedestrian and cycle desire line, though the risk is acknowledged with the current layout. Therefore an alternative solution is proposed to provide a bell bollard to protect the cycle and pedestrian crossing from overrunning whilst allowing the traffic turning movements.

Roseburn Street is a quiet residential street and aligned with the Edinburgh Streetscape Design Guidance tight radii are preferred to slow vehicles, acknowledging large vehicles must wait where crossing into opposing lanes.

Problem: 4.3.7**Location(s):** Roseburn Place / Roseburn Street junction**Drawing(s):** TDD-636809-1.3-DR-CH-00-0003**Summary:** Location of cycleway crossing could lead to head-on and / or side-impact collisions between vehicles and cyclists**Description:**

Cyclists travelling eastbound on Roseburn Place wishing to access the new cycleway are likely to travel diagonally across the continuous footway and therefore diagonally across the westbound traffic lane at the mouth of the junction. This has the potential for head-on and / or side-impact collisions between cyclists and vehicles turning into Roseburn Place from either direction.

Recommendation:

It is recommended that appropriate measures are provided to allow eastbound cyclists to safely access the cycleway crossing.

Designers Response

Recommendation accepted.

It is proposed to 'nudge' cyclists between Roseburn Place and the crossing, mindful of the bin store area located along the south kerb line of Roseburn Street and the quiet residential street nature of this minor junction. Diagram 1057 cycle symbols will be provided in advance of the continuous footway ramp and across the continuous footway to guide cyclists and provide a warning to motorists of the potential presence of cycles.

Problem

4.3.8

Location(s)

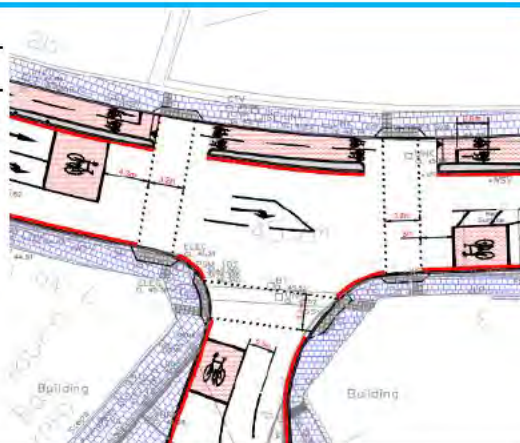
West Coates / Russell Road junction

Drawing(s)

TDD-636809-1.3-DR-CH-00-0003

Summary:

Lack of facilities for cyclists to cross the junction could lead to shunt, side-impact and / or side-swipe collisions with vehicles.



Description:

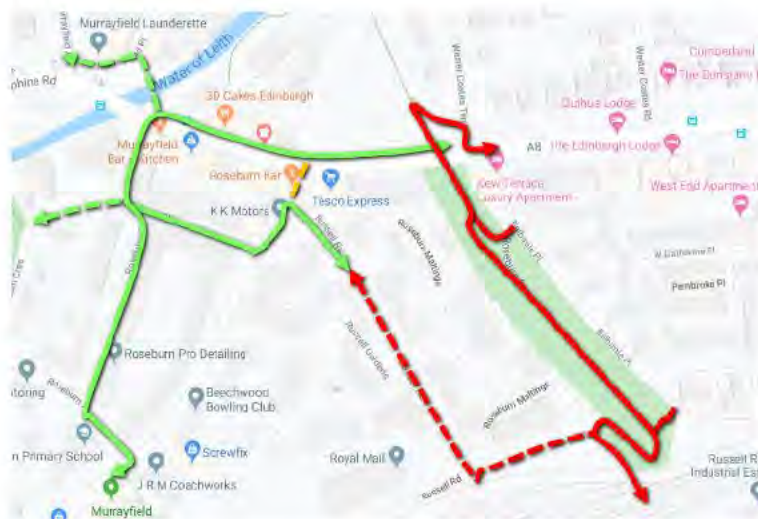
Cyclists on the West Coates cycleway wishing to continue south to Russell Road may believe they can turn at the road junction when they have a green signal. This would create the potential for shunt, side-impact and / or side-swipe type collisions with vehicles travelling through the junction at the same time.

Recommendation:

It is recommended that provision is made for cyclists to safely cross West Coates in order to continue to Russell Road / Roseburn Street.

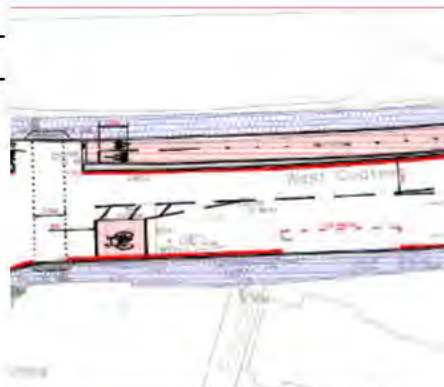
Designers Response

Recommendation accepted: Crossing facilities are provided along Roseburn Terrace and West Coates however these are provided based on desire lines and constraints. There is a wider routing strategy for access to the CCWEL corridor that will be signed accordingly, which offers a more appropriate off-carriageway facility than the exiting on-carriageway via Russell Road.



Problem 4.3.9

| | |
|--------------------|---|
| <i>Location(s)</i> | West Coates / Russell Road junction |
| <i>Drawing(s)</i> | TDD-636809-1.3-DR-CH-00-0003 |
| <i>Summary:</i> | Proximity of loading bay to nearside signal could lead to shunt, side-impact and / or vehicular-pedestrian collisions |


Description:

A loading bay is proposed in the westbound carriageway to the east of the West Coates / Russell Road junction. When a large vehicle occupies the loading bay, it will restrict visibility between westbound motorists and the nearside primary traffic signal at the junction. This could lead to late braking with the potential for shunt collisions, and / or motorists travelling through the junction on a red signal, with the potential for side-impact collisions, or vehicular-pedestrian collisions.

Recommendation:

It is recommended that measures are incorporated to ensure that the traffic signals can be seen should the loading bay be occupied, such as increased height signals, and offside primary signals. If this is not possible then it is recommended that the loading bay is relocated outside of the visibility splay for the signals.

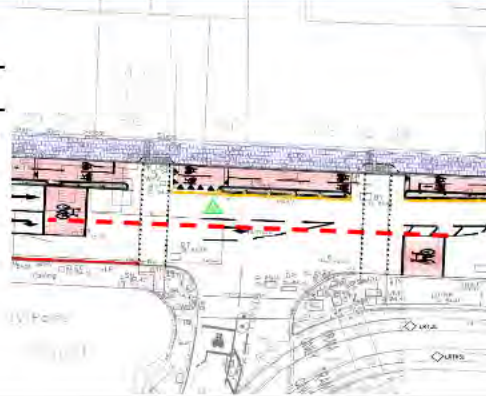
Designers Response

Recommendation accepted.

An offside primary signal head could be confusing in this location to cyclists on the two-way cycle track. A double height pole is proposed to be added to Pole 7 with an additional high level signal head, but will require a side mounted cowl to prevent light spillage towards properties on the south side of Roseburn Terrace.

Problem 4.3.10

| | |
|--------------------|--|
| <i>Location(s)</i> | Haymarket Terrace / Haymarket Yards junction |
| <i>Drawing(s)</i> | TDD-636809-1.6-DR-CH-00-0006 |
| <i>Summary:</i> | Lane alignment through junction could lead to head-on, shunt and / or loss of control collisions |


Description:

The offside of the westbound lane approaching the junction is aligned with the centre of the eastbound right turn lane and right turn pocket opposite (as indicated by the red dashed line in the above image). This could lead to head-on collisions and / or sudden braking / change of direction leading to shunt or loss of control collisions.

Recommendation:

It is recommended that the westbound approach lane is aligned with the westbound departure lane from the junction.

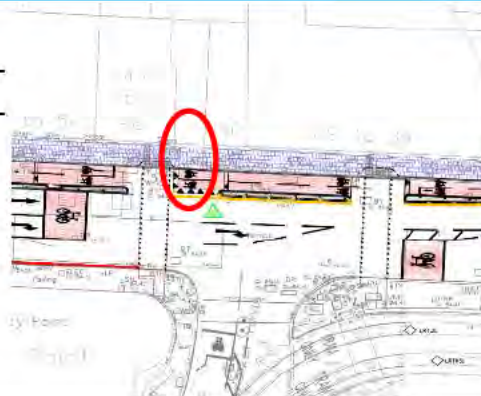
Designers Response

Recommendation accepted.

The alignment of the westbound will be altered slightly, and hatching provided east of the eastbound right turn pocket, to guide westbound vehicles through the junction.

Problem 4.3.11

| | |
|--------------------|---|
| Location(s) | Haymarket Terrace / Haymarket Yards junction |
| Drawing(s) | TDD-636809-1.6-DR-CH-00-0006 |
| Summary: | Swept paths of vehicles could lead to head-on and / or loss of control collisions |


Description:

A Thrifty car and van rental business access is located within the junction. As the northern kerb line is being built out into the road, it is unclear whether vehicles will be able to turn left out of the access without encroaching into the path of westbound vehicles, noting Problem 4.3.11 above. This could lead to head-on collisions. There is also the potential for the vehicles turning left out of the access to overrun the proposed splitter island. Regular overrunning of the kerbs could lead to loose material in the carriageway with the potential for loss of control collisions.

Recommendation:

It is recommended that the lanes and splitter island are aligned such that the swept path of an appropriate vehicle can be accommodated for the left turn without risk of kerb overrun or collision with westbound traffic.

Designers Response

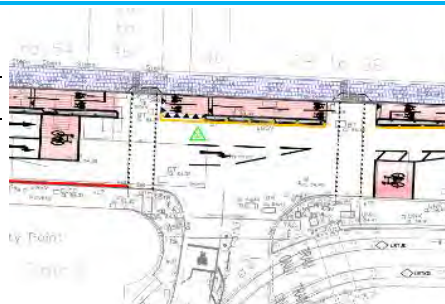
Recommendation accepted.

Swept paths have been undertaken for the vehicles able to pass through the narrow arch to the car rental premises.

Problem

4.3.12

| | |
|--------------------|--|
| Location(s) | Haymarket Terrace / Haymarket Yards junction |
| Drawing(s) | TDD-636809-1.6-DR-CH-00-0006 |
| Summary: | Uncontrolled private access within junction could lead to vehicular-cyclist, head-on, and / or vehicular-pedestrian collisions |

**Description:**

A Thrifty car and van rental business access is located within the junction as per the existing situation. However, the introduction of the cycleway and the proposed signal staging has the potential for the following safety issues to occur:

- Motorists turning left into the access will do so on a green signal and may assume they have priority over all other movements, including the adjacent cycleway. As such, they could collide with an eastbound cyclist in particular.
- Motorists turning right into the access must filter through eastbound traffic first. If they are focussing on a gap in general traffic they will be unlikely to also be focussing on a gap in the cycleway traffic. This could lead to vehicular-cyclist collisions as a motorist enters the cycleway. Alternatively, it could lead to the turning vehicle braking suddenly with the potential for a head-on collision with an eastbound vehicle.
- Motorists exiting the Thrifty access currently have to make a judgement as to when to enter the junction safely. However, in the existing situation they can see the secondary signal head for the eastbound traffic movement, which provides some guidance. In the proposed situation, motorists exiting the access will have to judge not only the traffic within the junction, but also the cycleway, noting that the cycleway continues to operate on green when the general east-west traffic is stopped, and the southern arm has a green signal. Motorists could see the stopped east-west traffic and assume that the cycleway is also on a red signal, with the potential for pulling out into the path of a cyclist.
- Should a motorist exiting the Thrifty access determine that all traffic and cycle movements are stopped they may pull into the junction not realising that the pedestrian movements have a green signal, with the potential for vehicular-pedestrian collisions.

Recommendation:

It is recommended that:

- Ideally, the Thrifty access is relocated outside of the junction
- If relocation is not possible, it is recommended that the Thrifty access is signal controlled and integrated into the staging of the junction. Signal staging should be such that the access does not operate at the same time as the pedestrian crossings.
- If signal control of the access is not possible then it is recommended that the signal staging is amended such that the segregated cycleway only has a green signal when Haymarket Terrace has a green signal, and not when Haymarket Yards has a green signal, and

Traffic signal heads are positioned for the eastbound traffic and cycleway such that they are clearly visible to motorists exiting the Thrifty access.

Designers Response

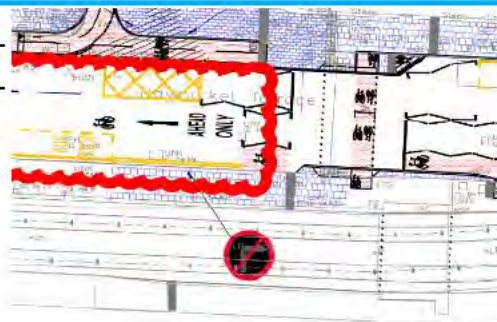
Recommendation accepted in part.

- It is not possible to provide an alternative entrance to the car rental premises or relocate stop lines such that the entrance is outside of the junction. This is a legacy access arrangement within the existing signal controlled junction.
- It is not possible to locate traffic signal infrastructure within the arch (due to width constraints) nor on the footway (due to lack of forward visibility of heads) such that this approach could be operated under signal control.
- It is not proposed to limit the east-west cycle track from being given a green signal unless the pedestrian crossing is called. This will incur additional delay to cyclists where there is no conflict with other signal controlled approaches and is likely to lead to contravention of a red LLCS.
- The conflict point between cyclists and vehicles exiting the car rental premises has been highlighted further through the following measures:
 1. red thermoplastic surfacing to highlight the conflict over the typical red chipped asphalt surfacing proposed for the cycle track.
 2. solar LED studs to be provided across the cycle conflict point.
 3. A 'false' table with ramp triangles is provided, drainage requirements do not permit a physical ramp in this location.

The secondary signal head for Phase A (eastbound) is visible from the exit position from the car rental premises.

Problem 4.3.13**Location(s)** Clifton Terrace**Drawing(s)** TDD-636809-1.6-DR-CH-00-0006

Summary: Short merge length could lead to shunt and / or side-swipe collisions between vehicles and cyclists

**Description:**

At the crossing to the east of Roseberry Crescent, westbound cyclists approach in a segregated cycle lane. To the west of the crossing cyclists have a very short segregated cycle lane before having to merge with traffic to negotiate the bus stops. This could lead to shunt and / or side-swipe collisions between vehicles and cyclists.

Recommendation:

It is recommended that:

- an advanced cycle stop line is provided at the crossing,
- the short length of cycle lane to the west of the crossing is removed, and

road markings are provided to highlight the narrowing of the lane on approach to the bus stops

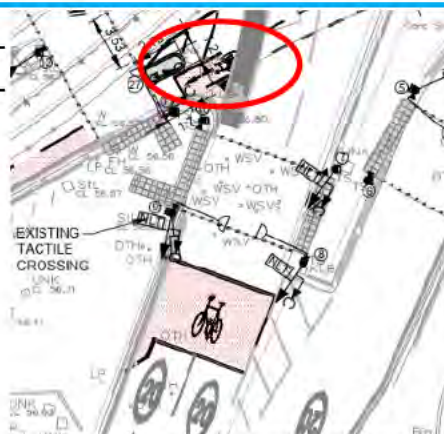
Designers Response

Recommendation accepted.

The layout for this crossing is to be updated to provide fully segregated cycle access to/from Clifton Terrace and the two-way cycle track. This includes removal of the westbound ahead facility audited to be replaced with an ASL with lead-in cycle lane at the crossing. Diag 1057 cycle symbols are proposed on approach to and past the bus stops in either direction to highlight the presence of cyclists.

Problem 4.3.14

| | |
|--------------------|---|
| Location(s) | Haymarket Terrace / Dalry Road junction |
| Drawing(s) | TDD-636809-1.7-DR-CH-00-0007 |
| Summary: | Signal staging and storage length could lead to side-impact, side-swipe and / or shunt collisions |


Description:

When the signal at the Haymarket Terrace west internal cycle stop line, and adjacent traffic stop line, turns red, there may be vehicles and cyclists queueing at this location. There is only a short length within which cyclists and vehicles can store. As such, any queueing vehicles may be at risk of being struck by vehicles and cyclists exiting Dalry Road during the next signal stage. This could lead to side-impact collisions involving vehicles and / or cyclists. Vehicles or cyclists exiting Dalry Road may also move towards the offside lane in order to avoid any queueing vehicles, with the potential for side-swipe and / or shunt collisions to occur.

Recommendation:

It is recommended that sufficient storage is provided to ensure that any vehicles or cyclists at the internal stop line cannot be struck by passing vehicles or cyclists.

Designers Response

Recommendation rejected (alternative solution proposed).

It is proposed to remove the cycle left turn infrastructure from Dalry Road for cyclists (retaining existing prohibition).

Problem 4.3.15

Location(s) Lansdowne Crescent

Drawing(s) TDD-636809-2.2-DR-CH-00-0002

Summary: Restricted visibility on a bend could lead to vehicular-cyclist collisions

Description:

It is proposed to provide an additional parking bay to the east of the junction with Grosvenor Street. This will restrict visibility to the east. Given the curvature of the road, there is a particular risk of motorists exiting the side road not seeing a cyclist in the area outside of the visibility splay i.e. adjacent to the parked vehicles, with the potential for collisions between the two. (In the image above the approximate visibility splay is shown in red, with the hidden cyclist shown as the orange triangle).

Recommendation:

It is recommended that visibility is maximised at the junction. For instance, the parking bays could be removed or build outs could be provided and the Give Way moved to be in-line with the parking bays.

Designers Response

Recommendation rejected.

CEC Factsheet G6 highlights that that "no evidence that reducing visibility at junctions (between vehicles on the major and minor arms) will result in an increased risk of injury or collisions - The absence of wide visibility splays will encourage vehicles to emerge cautiously." The location is characterised by low vehicle flows and low vehicle speeds reducing the likelihood of collision.

Problem 4.3.16

| | |
|--------------------|--|
| Location(s) | William Street |
| Drawing(s) | TDD-636809-2.4-DR-CH-00-0004 |
| Summary: | Restricted visibility could lead to vehicular-cyclist collisions |


Description:

It is proposed to provide additional parking bays to the north of the William Street junction. This will restrict visibility to the north. There is a risk of motorists exiting the side road not seeing a cyclist in the area outside of the visibility splay i.e. adjacent to the parked vehicles, with the potential for collisions between the two. (In the image above the approximate visibility splay is shown in red, with the hidden cyclist shown as the orange triangle).

Recommendation:

It is recommended that visibility is maximised at the junction. For instance, the parking bays could be removed or build outs could be provided and the Give Way moved to be in-line with the parking bays.

Designers Response

Recommendation rejected.

CEC Factsheet G6 highlights that that "no evidence that reducing visibility at junctions (between vehicles on the major and minor arms) will result in an increased risk of injury or collisions - The absence of wide visibility splays will encourage vehicles to emerge cautiously." The location is characterised by low vehicle flows and low vehicle speeds reducing the likelihood of collision.

| | |
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| Problem | 4.3.17 |
|---------|--------|

| | |
|-------------|-------------|
| Location(s) | Manor Place |
|-------------|-------------|

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|------------|------------------------------|
| Drawing(s) | TDD-636809-2.4-DR-CH-00-0004 |
|------------|------------------------------|

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|----------|--|
| Summary: | Wide single lane could lead to side-swipe collisions |
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| Description: |
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The existing southbound approach to Atholl Place comprises a right turn lane and a left turn lane. It is proposed to replace these with a single lane that vehicles can turn in either direction from. The single lane is wide enough that motorists may attempt to queue in two lanes side by side. With the new arrow road markings proposed this could result in vehicles attempting to turn in either direction from either lane with the potential for side-swipe collisions as vehicles turn together.

| |
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| Recommendation: |
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It is recommended that either the two lanes are retained; one for the right turn and one for the left turn, or the single lane is reduced in width beyond the parking bays to reduce the likelihood of it being used as two lanes.

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| Designers Response |
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Recommendation accepted.

The Manor Place southbound approach to the junction with Atholl Place will be retained as existing with two lanes.

Problem 4.3.18

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|--------------------|--|
| <i>Location(s)</i> | Melville Street / Melville Crescent |
| <i>Drawing(s)</i> | TDD-636809-2.6-DR-CH-00-0006 |
| <i>Summary:</i> | Insufficient signs and markings could lead to head-on collisions |


Description:

The junction is being amended with new central islands proposed to separate the traffic streams. However, as each of the four sections of Melville Crescent around the diamond remain wide in order to incorporate parking, it may not be apparent to motorists on Melville Street as to the one-way nature of the sections. As such, motorists may turn into sections travelling the wrong way with the potential for head-on collisions to occur.

Recommendation:

It is recommended that appropriate road signs and road markings are provided such that it is clear as to the direction of travel on each section.

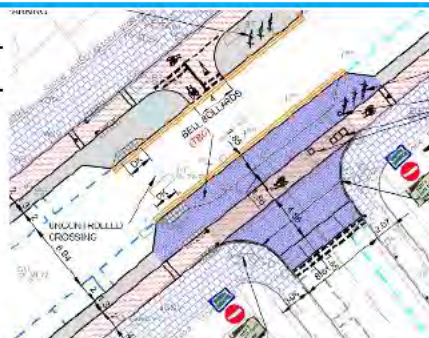
Designers Response

Recommendation accepted.

A road signing strategy has been developed for Melville Street and Melville Crescent and this will be reviewed to ensure that it is clear as to the direction of travel on each section.

Problem 4.3.19

| | |
|--------------------|--|
| Location(s) | Melville Street / Stafford Street |
| Drawing(s) | TDD-636809-2.7-DR-CH-00-0007 |
| Summary: | Junction geometry could lead to vehicular-pedestrian and / or loss of control collisions |


Description:

The geometry of the junction is such that motorists turning left out of Stafford Street may not be able to complete the movement without driving over the pedestrian waiting areas on both sides of Melville Street, with the potential for vehicular-pedestrian collisions. Furthermore, vehicles overrunning the kerbs and footway could lead to the break-up of kerbs and the deposition of loose material on the carriageway, which could lead to loss of control collisions.

Recommendation:

It is recommended that swept paths are undertaken to ensure that vehicles can undertake the left turn without encroaching onto kerbs or pedestrian waiting areas, and the layout amended if required.

Designers Response

Recommendation accepted.

Swept paths have been undertaken and bell bollards have been installed on the left-turn out of Stafford Street to stop vehicles encroaching onto the pedestrian crossing point. Pavement design has been undertaken to ensure the new carriageway make-up is sufficient to withstand the anticipated vehicular loading.

Problem 4.3.20

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|--------------------|--|
| Location(s) | Various (see below) |
| Drawing(s) | TDD-636809-2.7-DR-CH-00-0007 TDD-636809-2.9-DR-CH-00-0009 TDD-636809-2.10-DR-CH-00-0010 TDD-636809-2.11-DR-CH-00-0011 |
| Summary: | Amended one-way route could lead to vehicular-cyclist collisions at junction |


Description:

At several locations, routes are proposed to be amended from one-way to one-way with contraflow cycles. Motorists exiting a side road onto these routes will be accustomed to looking in a singular direction to determine whether vehicles are approaching, before moving onto the adjoining road. Should they continue to do this, without looking in the other direction, then vehicular-cyclist collisions could occur. This occurs at the following locations:

- Alva Street / Stafford Street
- Queensferry Street Lane / Stafford Street
- The access between 23 and 25 Stafford Street / Stafford Street
- Walker Street / Coates Crescent
- Atholl Crescent Lane / Canning Street
- Canning Street Lane / Canning Street

Recommendation:

It is recommended that motorists on the side roads are alerted to the need to look in both directions when exiting onto the adjoining road. This could be through the provision of additional road markings and signs.

Designers Response

Recommendation accepted.

The cycle contraflow and road markings will be reviewed through the detailed design process. It is noted that an objective of the scheme is to reduce sign clutter. Additional signing will only be proposed where one-way streets are being converted for contraflow cycling, movements onto two-way streets will not be included.

Problem 4.3.21

| | |
|--------------------|--|
| Location(s) | Melville Street / Randolph Place |
| Drawing(s) | TDD-636809-2-DR-CH-SK-0030 |
| Summary: | Lane alignment through junction could lead to head-on, side-impact, vehicular-cyclist, vehicular-pedestrian, and / or loss of control collisions |


Description:

The red lines in the image above show the path that vehicles travelling from Melville Street to Randolph Place will take across the junction. The blue lines in the image above show the path that vehicles intending to turn right from Randolph Street will take. There is the potential for head-on and / or side-impact collisions to occur when these two traffic streams have a green signal at the same time.

It is noted that even if there were no right turning vehicles within the junction, the offside lane on Melville Street is aligned such that a vehicle travelling straight ahead into Randolph Place (as shown by the red lines in the image above) will have to suddenly change direction in order to travel past any vehicles approaching the stop line on Randolph Place. The lane width is narrow at the point where the change in direction would occur. This could lead to head-on collisions. Alternatively, it could lead to motorists driving over the kerb in order to avoid oncoming vehicles, which could lead to vehicular-pedestrian collisions. Regular overrunning of kerbs could also lead to break up of the footways and kerbs. This can lead to loose material in the carriageway with the potential for loss of control collisions.

Recommendation:

It is recommended that a swept path analysis is completed for all vehicle movements at the junction, and road markings and / or kerb lines adjusted as necessary.

Designers Response

Recommendation accepted.

The scheme has been developed with the swept path analysis undertaken for appropriate vehicles.

Problem 4.3.22

| | |
|--------------------|---|
| <i>Location(s)</i> | Melville Street / Randolph Place |
| <i>Drawing(s)</i> | TDD-636809-2-DR-CH-SK-0030 |
| <i>Summary:</i> | Concurrent signal phases could lead to cyclist-cyclist and / or cyclist-pedestrian collisions |


Description:

The signal staging for the junction proposes that the cycle crossing from Melville Street (phase L) that leads to Randolph Place and Queensferry Street runs at the same time as the pedestrian and cycle crossings on Queensferry Street (phases K and I). This could lead to cyclist-cyclist and / or cyclist-pedestrian collisions.

Recommendation:

It is recommended that phase L does not run at the same time as phases K and I.

Designers Response

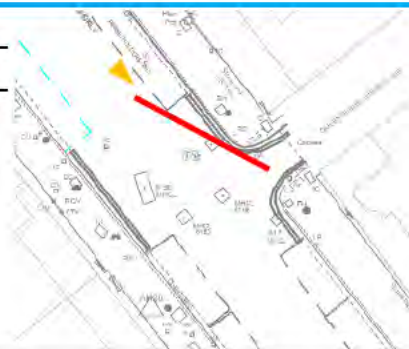
Recommendation accepted.

With the design submitted the intention was to provide an internal stop line for cyclists. This provision has now been removed with right turning cyclists to either turn right from Melville St carriageway or to continue ahead and find alternate routing.

Problem 4.3.23

Location(s) Queensferry Street Lane / Stafford Street

Drawing(s) TDD-636809-2.10-DR-CH-00-0010

Summary: Restricted visibility could lead to vehicular-cyclist collisions

Description:

It is proposed to convert Stafford Street from one-way northbound to one-way northbound with a southbound cycle contraflow. Motorists will now need to be able to see a cyclist approaching from the north. However, existing parking bays limit visibility at this location. There is a risk of motorists exiting the side road not seeing a cyclist in the area outside of the visibility splay i.e. adjacent to the parked vehicles, with the potential for collisions between the two. (In the image above the approximate visibility splay is shown in red, with the hidden cyclist shown as the orange triangle).

Recommendation:

It is recommended that visibility is maximised at the junction. For instance, the parking bays could be removed or build outs could be provided and the Give Way moved to be in-line with the parking bays.

Recommendation:

It is recommended that visibility is maximised at the junction. For instance, the parking bays could be removed or build outs could be provided and the Give Way moved to be in-line with the parking bays.

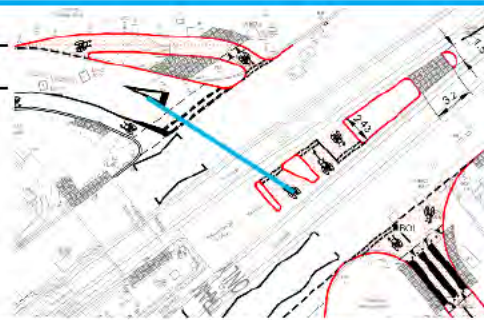
Designers Response

Recommendation rejected.

There are no visibility issues as Queensferry Street Lane is one-way from Stafford Street into Queensferry Street Lane.
Recommendation rejected: There are no visibility issues as Queensferry Street Lane is one-way from Stafford Street into Queensferry Street Lane.

Problem 4.3.24

| | |
|--------------------|---|
| Location(s) | Shandwick Place / Coates Crescent |
| Drawing(s) | TDD-636809-2.10-DR-CH-SK-0031 |
| Summary: | Position of cycle refuge could lead to head-on collisions |


Description:

The proposed cycle refuge islands on Shandwick Place are such that cyclists travelling north are aligned with the exit traffic lane from Coates Crescent, as indicated by the blue line in the image above. To access the cycle lane to the north, cyclists would have to cycle into oncoming traffic on Shandwick Place, with the potential for head-on collisions. Alternatively, they could travel straight across into the general traffic lane, with the potential for head-on collisions.

Recommendation:

It is recommended that a staggered refuge arrangement is provided that aligns with both the approach from the south and the exit to the north.

Designers Response

Recommendation accepted.

The design has been amended to realign the central island

Problem 4.3.25

| | |
|--------------------|--|
| Location(s) | Shandwick Place / Coates Crescent |
| Drawing(s) | TDD-636809-2.10-DR-CH-SK-0031 |
| Summary: | Small cycle refuge islands could lead to tram-cyclist collisions |


Description:

The proposed cycle refuge island is located between the tram lines. If the volume of cyclists using this facility is high there is the potential for multiple cyclists to wait within the refuge at the same time, with the potential for the back of their bikes to overhang the tram lines. This could lead to tram-cyclist collisions. This has the potential to be exacerbated by the issue described in Problem 4.3.27 below if cyclists have to wait for a gap in pedestrians crossing Canning Street.

Recommendation:

It is recommended that the designer confirms that bicycles will not overhang the tram lines, or a controlled crossing solution is provided.

Designers Response

Recommendation accepted.

A range of options have been considered at this location and have been subject to HAZID/HAZOP assessment with Edinburgh Trams. The proposed incorporates sufficient storage space within the central island for cyclists to wait clear of the tram lines. A controlled crossing solution was considered but rejected due to operational and safety implications.

Problem 4.3.26

| | |
|--------------------|--|
| Location(s) | Shandwick Place / Canning Street |
| Drawing(s) | TDD-636809-2.10-DR-CH-SK-0031 |
| Summary: | Proximity of zebra crossing to junction could lead to vehicular-cyclist collisions |


Description:

Canning Street is to be amended such that no motor vehicles are permitted to access it through to Rutland Square. A zebra crossing is proposed near the mouth of the junction for pedestrians to cross. However, there is the risk that, if pedestrian and cycle volumes are high, then cyclists turning into Canning Street from Shandwick Place or Coates Crescent could start to queue back, with the risk of overhanging onto Shandwick Place. This could lead to vehicular-cyclist collisions.

Recommendation:

It is recommended the designer confirms that bicycles will not overhang into Shandwick Place, or the zebra crossing is amended accordingly.

Designers Response

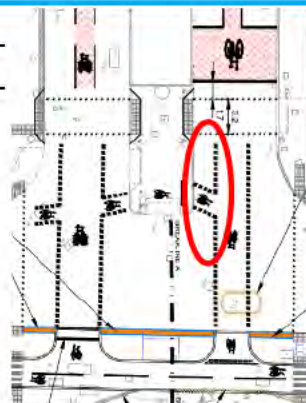
Recommendation accepted.

There is sufficient space in the mouth of the junction for cyclists north of the zebra crossing with a low likelihood of overhanging into Shandwick Place. The location of the zebra crossing on Canning Street best serves pedestrian desire lines.

Problem 4.3.27

Location(s) George Street / St Andrew Square

Drawing(s) TDD-636809-3-DR-CH-SK-0024

Summary: Width of cycle lane and adjacent traffic lane could lead to shunt collisions between vehicles and cyclists

Description:

Road markings are proposed to guide cyclists from the existing central cycle lane on George Street eastbound across St Andrew Square onto the new segregated cycleway. However, the cycle lane is much wider through this section, such that a vehicle in the offside right turn lane will straddle it. If a cyclist exits the junction when there is no offside vehicle adjacent they may seek to utilise the full width of the marked cycle lane. If they do this when they are immediately in front of an offside vehicle, they will move across the front of that vehicle, with the potential for shunt collisions.

Recommendation:

It is recommended that the width of the cycle lane across the junction matches that of the cycle lane on approach.

Designers Response

Recommendation rejected.

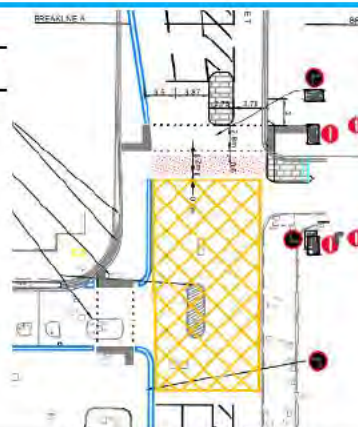
A wide eastbound central cycle lane existing George Street is considered to provide greater conspicuity of the potential presence of cyclists. A narrow central cycle lane may result in motor vehicles in the offside lane attempting to pass cyclists on entry into the junction.

| | |
|---------------------------|--|
| Problem | 4.3.28 |
| Location(s) | St Andrew Square |
| Drawing(s) | TDD-636809-3-DR-CH-SK-0024 |
| Summary: | Proximity of junctions, and reduced number of lanes, could lead to vehicular-cyclist collisions |
| Description: | <p>The drawing illustrates the proposed changes at the St. Andrew Square junction. Key features include the removal of existing traffic signs and the installation of temporary stand signs. A corner lot is noted to have 20m of 150 parked vehicles on the existing pavement. The plan also shows the lapping of new pavement onto the existing surface.</p> |
| Recommendation: | It is recommended that the designer confirms that traffic will not block the George Street junction when the St Andrew Square junction has a red signal, or when a vehicle is turning right into St. Andrew Square. |
| Designers Response | <p>Recommendation accepted.</p> <p>The St. David Street corridor is to operate under a coordinated urban traffic control system to manage queues between adjacent junctions. The traffic volumes predicted to turn right are very low on the account of the movement not serving a through route; the access is for loading and short stay parking only.</p> |

Problem 4.3.29

Location(s) North Charlotte Street / Young Street

Drawing(s) TDD-636809-4-DR-CH-SK-0007

Summary: Lack of stop line road markings could lead to side-impact and / or vehicular-pedestrian collisions

Description:

It is proposed to signalise the North Charlotte Street / Charlotte Square junction. However, there is nothing to inform motorists approaching from North Charlotte Street or Young Street that the junction is signalised. This could lead to side-impact collisions between vehicles on adjacent arms and / or collisions with pedestrians on the crossing.

Recommendation:

It is recommended that stop line road markings are provided on North Charlotte Street and Young Street.

Designers Response

Recommendation accepted.

Subsequent to the Stage 1 RSA the layout of this junction has been updated, such that Young Street is to remain as a priority controlled junction immediately to the north of a new signal controlled junction between Charlotte Street/Charlotte Square (north).

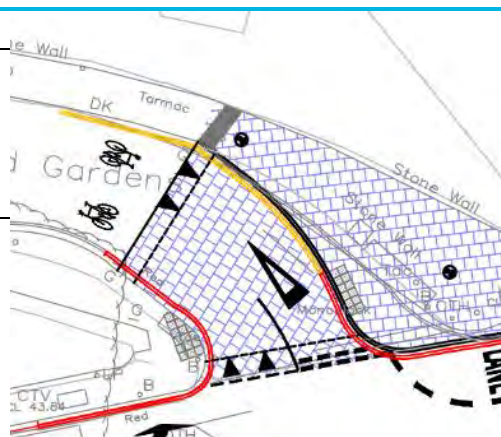
Walking, Cycling and Horse-Riding

Problem: 4.4.1

Location(s): Various (see below)

Drawing(s): TDD-636809-1.1-DR-CH-00-0001
TDD-636809-1.2-DR-CH-00-0002
TDD-636809-2.3-DR-CH-00-0003
TDD-636809-2-DR-CH-SK-0030
TDD-636809-2.10-DR-CH-SK-0031

Summary: Raised tables flush with adjacent footways could result in vehicular-pedestrian collisions for the visually impaired.



Description:

Raised tables are proposed throughout the scheme, but it is unclear whether they will be flush with the adjacent footway. A flush raised table presents a hazard for a visually impaired pedestrian as there is no information to advise them that they are entering the carriageway. Should a visually impaired pedestrian unknowingly enter the carriageway there is the potential for vehicular-pedestrian collisions to occur. This occurs at the following locations:

- Murrayfield Gardens
- Murrayfield Place (2 No.)
- Roseburn Gardens
- Palmerston Place
- Randolph Place
- Charlotte Lane
- Coates Crescent

Recommendation:

It is recommended that the raised tables are provided with a suitable kerb upstand so that the road can be detected by visually impaired pedestrians, with appropriate tactile surfacing and flush pavement at crossing points. An alternative is to have the raised table flush and provide tactile surfacing along the edge of footway where flush. However, this may make it difficult for visually impaired pedestrians to orient themselves when crossing.

Designers Response

Tactile paving is provided where:

- a) A raised table layout is provided i.e. not a continuous footway layout.
- b) A continuous footway layout with side road flows >20vph.

Murrayfield Gardens

Recommendation accepted.

25mm upstand proposed for raised table to delineate from carriageway, with appropriate tactile paving at crossing points.

Murrayfield Place (2 No.)

Recommendation accepted.

25mm upstand proposed for raised table to delineate from carriageway, with appropriate tactile paving at crossing points.

Roseburn Gardens

Recommendation rejected.

This side road access is a continuous footway as opposed to a raised table, and permits entry only from Roseburn Terrace (i.e. no exit permitted). Tactile paving is provided in accordance with Edinburgh Street Design Guidance for continuous footways.

Palmerston Place

Recommendation accepted.

25mm upstand proposed for raised table to delineate from carriageway, with appropriate tactile paving at crossing points. Note that a subsequent design update has shortened the raised table to cover the entrance and crossing on Grosvenor Crescent only.

Randolph Place

Recommendation accepted.

25mm upstand proposed for raised table to delineate from carriageway, with appropriate tactile paving at crossing points.

Charlotte Lane

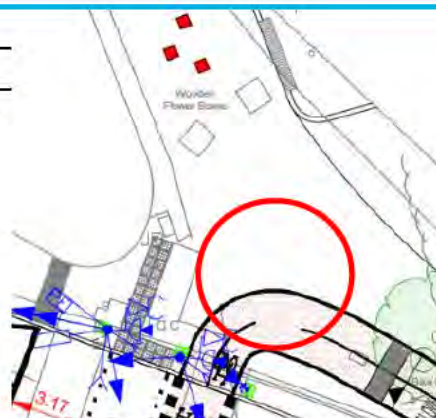
Recommendation rejected.

This side road access is a continuous footway as opposed to a raised table, with give-way markings for vehicles prior to the ramp in accordance with Edinburgh Street Design Guidance for continuous footways.

Coates Crescent

Recommendation accepted.

25mm upstand proposed for raised table to delineate from carriageway, with appropriate tactile paving at crossing points.

Problem: 4.4.2**Location(s):** Roseburn Terrace**Drawing(s):** TDD-636809-1-DR-CH-SK-0036**Summary:** Lack of connecting facilities could lead to cyclist-pedestrian and / or cyclist-cyclist collisions**Description:**

The proposed cycleway leads cyclists into a crossing of Roseburn Terrace. However, there is nothing to guide cyclists who wish to continue their journey to the north, or join the cycleway from the north, which appears to be a shared-use area. As such, cyclists may attempt to join or leave the cycleway at any point over a large distance, potentially at speed, with the potential for cyclist-pedestrian and / or cyclist / cyclist collisions.

Recommendation:

It is recommended that a single point is identified for cyclists to join or leave the cycleway with clear guidance as to who is to give way.

Designers Response

Recommendation accepted.

Revised layout for crossing is proposed that terminates the cycle track in advance of the carriageway crossing. This provides a clearer layout for entry onto the cycle track to either:

- a) Cross Roseburn Terrace or
- b) Travel north towards Murrayfield Gardens

Problem: 4.4.3**Location(s):** Roseburn Gardens**Drawing(s):** TDD-636809-1-DR-CH-SK-0036

Summary: Alignment of cycleway in conjunction with dropped kerbs could lead to inappropriate use of the crossing and cyclist-pedestrian and / or cyclist-cyclist collisions

**Description:**

Cyclists travelling northbound leaving Roseburn Gardens are guided to the cycle crossing across the pedestrian waiting area. However, there will be a continuous drop kerb through here due to the proposed raised table. There is the potential that northbound cyclists wishing to cross Roseburn Terrace could continue straight as indicated by the green arrow in the image above. They may then attempt to cycle across the path of pedestrians and other cyclists using the specified crossing locations, with the potential for cyclist-pedestrian and / or cyclist-cyclist collisions. If they continue straight across they will be met by a full height kerb. If they are unable to readily mount the kerb they may remain in the carriageway temporarily with the potential for being struck by a passing vehicle.

Recommendation:

It is recommended that physical measures such as bollards or pedestrian guardrail are provided to prevent cyclists from travelling straight across Roseburn Terrace.

Designers Response

Recommendation accepted.

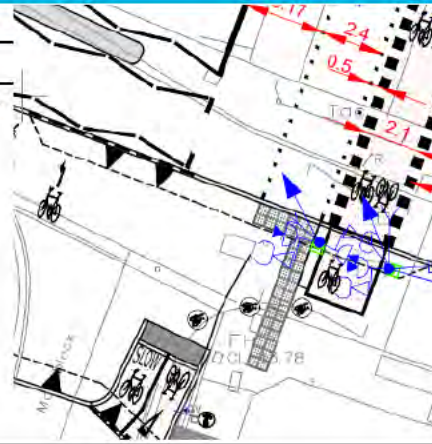
The pedestrian and cycle parts of the crossing over Roseburn Terrace have been reversed so that the access from Roseburn Gardens is better aligned with the crossing. The crossing will also have a traffic signal pole on the west of the crossing and a bell bollard to protect the crossing from vehicles turning left into Roseburn Gardens from Roseburn Terrace.

Problem: 4.4.4

Location(s): Roseburn Gardens / Roseburn Terrace

Drawing(s): TDD-636809-1-DR-CH-SK-0036

Summary: Steep gradient could lead to vehicular-wheelchair collisions



Description:

The pedestrian and cyclist waiting areas on the southern side of the relocated crossing will be positioned on the ramp for the raised table. This will mean that the gradient of the approaches to the crossing will be steep and will make it difficult for wheelchair users in particular to use the crossing. If wheelchair users cannot hold themselves on the steep gradient they may travel into the carriageway with the potential for being struck by a vehicle.

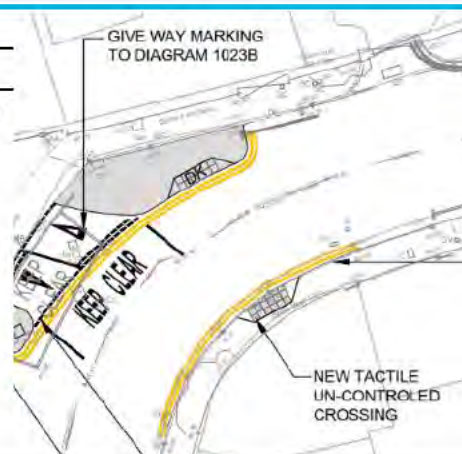
Recommendation:

It is recommended that the footway gradients in the vicinity of the pedestrian crossing are appropriate for wheelchair users.

Designers Response

Recommendation accepted.

A gradient of 1:12 is provided in accordance with DfT guidance on the use of tactile paving.

Problem: 4.4.5**Location(s):** Roseburn Crescent**Drawing(s):** TDD-636809-1.2-DR-CH-00-0002**Summary:** Insufficient visibility to pedestrians at a crossing could lead to vehicular-pedestrian collisions**Description:**

It is proposed to provide a new uncontrolled crossing on Roseburn Crescent. It was observed during the audit site visit that vehicles were parked on both sides of the road in the vicinity of the crossing. Double yellow line road markings are proposed either side of the crossing but, given the curvature of the road, should vehicles park immediately adjacent to the double yellow lines at either end, they will restrict visibility to a pedestrian waiting to cross. This could lead to a pedestrian stepping out into the carriageway and being struck by a vehicle.

Recommendation:

It is recommended that the double yellow line road markings are extended to provide an appropriate visibility splay either side of the crossing.

Designers Response

Recommendation accepted.

The proposed crossing layout is a marked improvement over the current crossing provision on Roseburn Crescent, however to maximise visibility for pedestrians standing on the southern footway of approaching vehicles (and vice versa), the double yellow lines on the south side of Roseburn Crescent will be extended to the east to provide the minimum visibility, as to not promote higher vehicle speeds. The requisite minimum visibility is provided to the west.

Problem: 4.4.6**Location(s):** Roseburn Crescent**Drawing(s):** TDD-636809-1.2-DR-CH-00-0002**Summary:** Lack of tactile guidance could lead to collisions between visually impaired pedestrians and cyclists**Description:**

There is nothing to inform visually impaired pedestrians that they are entering a route where cyclists may be present. This could result in the visually impaired walking into the path of cyclists, with the potential for collisions between the two, noting that forward visibility is also limited in some areas.

Recommendation

It is recommended that appropriate tactile guidance is provided for the visually impaired entering the route so that they are aware that cyclists may be present.

Designers Response

Recommendation accepted.

Tactile paving will be provided on the east side of the cycle access to highlight the shared use environment to visually impaired users.

Problem: 4.4.7**Location(s):** Roseburn Place / Roseburn Street junction**Drawing(s):** TDD-636809-1.3-DR-CH-00-0003**Summary:** Lack of tactile guidance could lead to collisions between visually impaired pedestrians and cyclists**Description:**

There is nothing to inform visually impaired pedestrians that they are entering an area and route where cyclists may be present. This could result in the visually impaired walking into the path of cyclists, with the potential for collisions between the two, noting that forward visibility is also limited in some areas.

Recommendation:

It is recommended that appropriate tactile guidance is provided for the visually impaired entering:

- the shared-use area, and

the start of the cycleway, so that they are aware that cyclists may be present.

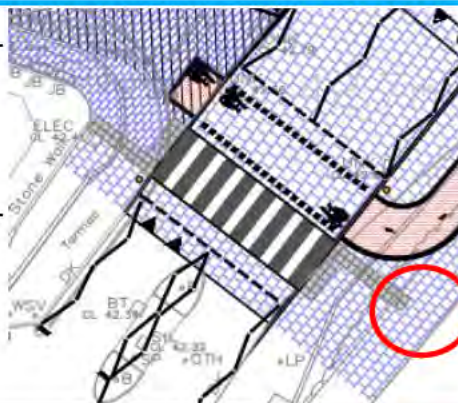
Designers Response

Recommendation accepted.

Tactile paving will be provided on both sides of Roseburn Place to highlight the continuous footway environment to visually impaired users.

Problem 4.4.8

| | |
|--------------------|---|
| Location(s) | Various (see below) |
| Drawing(s) | TDD-636809-1.3-DR-CH-00-0003 TDD-636809-1.5-DR-CH-00-0005 TDD-636809-2-DR-CH-SK-0030 TDD-636809-2.10-DR-CH-SK-0031 TDD-636809-4-DR-CH-SK-0007 |
| Summary: | Insufficient tactile paving could lead to vehicular-pedestrian collisions |

**Description:**

Insufficient tactile paving has been provided at several locations. Visually impaired pedestrians need to be able to detect tactile paving in order to find their way to the crossing point. If they are unable to do this they may attempt to cross at an unsafe location with the potential for vehicular-pedestrian collisions. This occurs at the following locations:

- South-eastern side of the proposed crossing on Roseburn Street
- Northern side of the proposed crossing to the east of Magdala Crescent
- Western side of the proposed crossing on Queensferry Street
- Northern side of the existing crossing on Shandwick Place to the west of Coates Crescent
- Western side of the crossing on Charlotte Square to the south of George Street

Recommendation:

It is recommended that the stems of the tactile paving are extended to the back of the footway.

Designers Response**South-eastern side of the proposed crossing on Roseburn Street:**

Recommendation rejected.

The crossing conforms to the Edinburgh Streetscape Design Guidance in that the maximum of stem length of 4800 is to be used, unless the width of footway is <6m then the tactile paving shall be extended the full footway width.

Northern side of the proposed crossing to the east of Magdala Crescent:

Recommendation rejected.

The crossing conforms to the Edinburgh Streetscape Design Guidance in that the maximum of stem length of 4800 is to be used, unless the width of footway is <6m then the tactile paving shall be extended the full footway width.

Western side of the proposed crossing on Queensferry Street:

Recommendation rejected.

The crossing conforms to the Edinburgh Streetscape Design Guidance in that the maximum of stem length of 4800 is to be used, unless the width of footway is <6m then the tactile paving shall be extended the full footway width.

Northern side of the existing crossing on Shandwick Place to the west of Coates Crescent:

Recommendation accepted.

To ensure visually impaired users are aware of the crossing the stem will be extended across the width of the east-west footway.

Western side of the crossing on Charlotte Square to the south of George Street:

Recommendation accepted.

The tactile paving stem will be extended to the rear of the footway in this location.

Problem

4.4.9

Location(s)

Roseburn Street

Drawing(s)

TDD-636809-1.3-DR-CH-00-0003

Summary:

Long crossing distance combined with restricted visibility could lead to vehicular-pedestrian collisions



Description:

A new uncontrolled crossing is proposed on Roseburn Road where it joins Russell Road. The crossing is wide, and pedestrians using the crossing will need to judge vehicles approaching from three directions before crossing. This will be made more difficult for pedestrians on the southern side of the crossing due to the presence of an existing wall and vegetation, which restrict visibility to the south on Russell Road. As such, pedestrians may enter the carriageway when it is unsafe to do so, with the potential for being struck by a vehicle.

Recommendation:

It is recommended that visibility to the crossing point is maximised, and that a central refuge is provided so that pedestrians can cross in two stages.

Designers Response

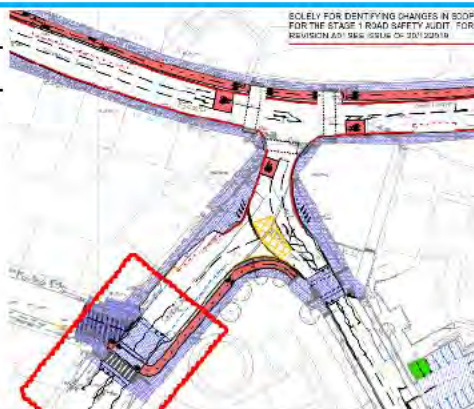
Recommendation accepted in part.

The primary crossing points in this area for visually impaired are the three controlled crossings surrounding this location on Roseburn Street, Russell Road and at the junction of Roseburn Terrace and Russell Road. The uncontrolled crossing has been included acknowledging that some users will cross at this location. Therefore a central refuge will be provided on Roseburn Street. The visibility has been maximised in terms of its location for visibility of Roseburn Street and Russell Road.

Problem

4.4.10

| | |
|-------------|--|
| Location(s) | Russell Road / Roseburn Street |
| Drawing(s) | TDD-636809-1.3-DR-CH-00-0003 |
| Summary: | Lack of connectivity between cycle features could lead to vehicular-cyclist collisions |



Description:

It is unclear how cyclists will travel between the proposed cycleway on West Coates and the proposed off-road facilities on Russell Road and Roseburn Street, which comprise another cycleway, and two areas of cycle parking. If cyclists are required to mount full height kerbs then they may remain temporarily in the carriageway with the potential for being struck by a passing vehicle.

Recommendation:

It is recommended that shared-use areas and / or dropped kerbs are provided to enable full connectivity between the features of the route, incorporating appropriate signage and tactile guidance.

Designers Response

Recommendation accepted.

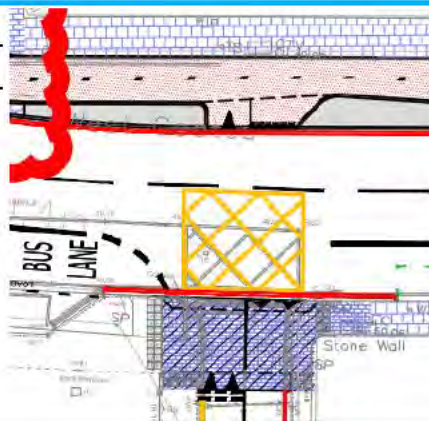
The intention of the Roseburn Street cycle track is only to connect Russell Road to Roseburn Place. The requested connectivity to this area from the A8 West Coates/Roseburn Terrace is achieved via the wider strategy including signed routes at:

- a) Roseburn Gardens via signal controlled crossing onto Roseburn Place
- b) Roseburn Path bridge via Wester Coates Road.

Problem 4.4.11

Location(s) West Coates

Drawing(s) TDD-636809-1.4-DR-CH-00-0004

Summary: Width, and location, of cycle crossing could lead to vehicular-cyclist collisions

Description:

Cyclists are encouraged to cross West Coates between Balbirnie Place and the proposed east-west cycleway via a ramp directly opposite Balbirnie Place. However, West Coates is a wide, busy road, and cyclists would have to judge a gap in three lanes of traffic in order to cross. Furthermore, cyclists travelling southbound across West Coates would also need to judge vehicles turning right out of Balbirnie Place. Cyclists may become frustrated in trying to find a suitable gap and attempt to cross when it is not safe to do so, with the potential for vehicular-cyclist collisions.

Recommendation:

It is recommended that an alternative crossing route is provided for cyclists where they can cross the road in stages or under signal control.

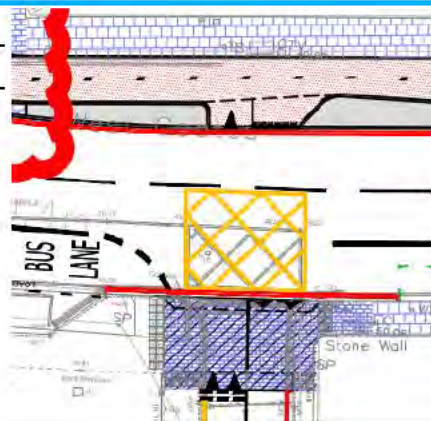
Designers Response

Recommendation rejected.

An alternative crossing route is provided via a (signed) grade separated cross of West Coates between Wester Coates Road and Balbirnie Place. It is acknowledged that some cyclists will want to access the two-way cycle track directly from Balbirnie Place and if this facility is not provided it may encourage inappropriate manoeuvres.

Problem 4.4.12

| | |
|--------------------|--|
| Location(s) | West Coates / Ba birnie Place |
| Drawing(s) | TDD-636809-1.4-DR-CH-00-0004 |
| Summary: | Insufficient storage length for bicycles could lead to loss of control, cyclist-cyclist, vehicular-cyclist and / or head-on collisions |


Description:

A ramp is proposed to provide access for cyclists travelling between Balbirnie Place and the proposed east-west cycleway. However, the ramp appears to be short in length, and it may not be long enough to contain a bicycle. As such, when a southbound cyclist is waiting here, the rear of a bicycle may overhang the cycleway, which may cause a passing cyclist to swerve with the potential for loss of control collisions and / or cyclist-cyclist collisions. Similarly, the rear of a northbound bicycle may overhang the road, with the potential for being struck by a passing vehicle, or causing a passing vehicle to swerve into the adjacent traffic lane which could result in a head-on collision with an oncoming vehicle.

Recommendation:

It is recommended that the access to the cycleway is made sufficiently large enough to store a bicycle between the cycleway and the road.

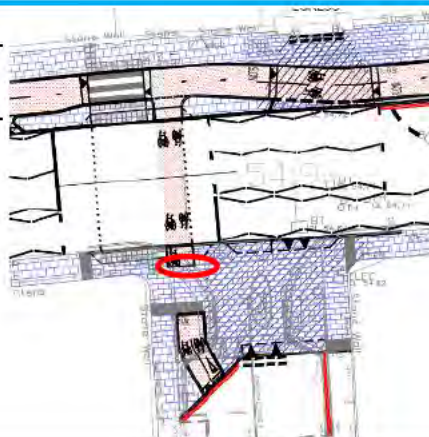
Designers Response

Recommendation accepted.

The storage will be increase to $\geq 1.8\text{m}$ i.e. the length of a bicycle. No additional width can be provided due to the need to retain the existing narrow footway and cycle track cross-section.

Problem 4.4.13

| | |
|--------------------|--|
| Location(s) | Various (see below) |
| Drawing(s) | TDD-636809-1.5-DR-CH-00-0005 TDD-636809-1.6-DR-CH-00-0006 |
| Summary: | Lack of tactile guidance could lead to collisions between visually impaired pedestrians and cyclists |

**Description:**

At several locations there is nothing to inform visually impaired pedestrians that part of the crossing is for cyclists. This could result in the visually impaired walking into the path of cyclists, with the potential for collisions between the two. This occurs at the following locations:

- Stanhope Street – southern side of crossing
- Haymarket Terrace – both sides of the crossing to the east of Roseberry Crescent

Recommendation:

It is recommended that appropriate tactile guidance is provided at the start of each cycleway.

Designers Response**Stanhope Street**

Recommendation rejected.

The shared use environment is defined when entering the continuous footway from Roseburn Terrace or Stanhope Street in accordance with the Edinburgh Street Design Guidance. Within that shared use environment there is a tactile paving arrangement that indicates the location of the pedestrian crossing to visually impaired users, and a clearly demarked cycle waiting area.

Haymarket Terrace

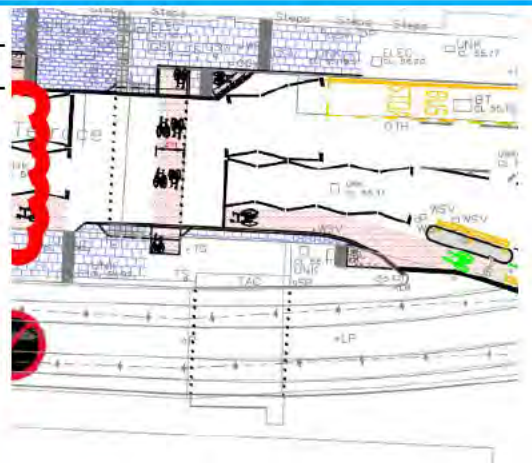
Recommendation accepted (alternative solution proposed).

An alternative layout is proposed for this crossing that segregated pedestrians and cyclists, negating the need for tactile paving within a shared use environment.

Problem 4.4.14

Location(s) Haymarket Terrace

Drawing(s) TDD-636809-1.6-DR-CH-00-0006

Summary: Unclear continuation of cycle route could lead to cyclist-pedestrian collisions

Description:

The proposed crossing leads cyclists southbound onto a central splitter island, but there are no cycle facilities to the south. This could lead to collisions with pedestrians on the splitter island or through the pedestrian crossing to the south.

Recommendation:

It is recommended that Cyclist Dismount signs are provided, or appropriate cycle facilities are provided to continue the route.

Designers Response

Recommendation accepted.

The layout of the crossing is to be updated to provide fully segregated cycle and pedestrian crossings. Cycle dismount signs are required but will be provided on the northern footway.

Problem 4.4.15

| | |
|--------------------|--|
| Location(s) | Various (see below) |
| Drawing(s) | TDD-636809-2.2-DR-CH-00-0002 |
| Summary: | Steep ramps could lead to collisions between vehicles and wheelchair users |


Description:

Raised tables are proposed directly adjacent to accesses into the central gardens at the locations described below:

- Grosvenor Crescent (2 No.)
- Lansdowne Crescent (1 No.)

This requires those wishing to access the central gardens to travel down a steep ramp immediately prior to the garden gates, or up a steep ramp when exiting. It is noted that existing signs on the garden gates say "wheelchair access" on them. If wheelchair users struggle to travel up the ramps they may travel around the base of the raised table and into the road, where they may be struck by a vehicle. They may also become stranded in the carriageway whilst attempting to access the existing footway opposite, with the potential for being struck by a passing vehicle or a vehicle manoeuvring whilst parking.

Recommendation:

It is recommended that a safe means of access is provided at the three gate locations for all types of user.

Designers Response

Recommendation rejected.

Park is not for public access. The ramps are for speed management.

Ramp gradient to garden gates will be 1:14 over a length of 1400mm which is in compliance with BS 8300-2:2018. Design team to review "landing" area immediately outside of the gates to provide minimum 1500mm depth for wheelchair access.

Problem 4.4.16

Location(s) Various (see below)

Drawing(s) TDD-636809-2.2-DR-CH-00-0002

Summary: Insufficient tactile paving could lead to vehicular-pedestrian collisions and / or trips and falls for visually impaired pedestrians

Description:

Insufficient tactile paving has been provided at the following raised tables:

- Grosvenor Crescent (2 No.)
- Lansdowne Crescent (1 No.)

At these locations there is nothing to inform visually impaired pedestrians that they are entering the carriageway. As such, they may unknowingly enter the carriageway with the potential for being struck by a vehicle. Should they enter the carriageway at these locations, they may also be susceptible to trips / falls on the raised table ramps, with the potential for personal injury.

Recommendation:

It is recommended that tactile paving is provided at the entry to the raised tables.

Designers Response

Recommendation rejected.

The park is not for public access (residents only). As such visibility impaired users may misinterpret tactile paving as a crossing opportunity to a permanently accessible footway.

| | |
|---------------------------|--|
| Problem | 4.4.17 |
| Location(s) | Grosvenor Crescent |
| Drawing(s) | TDD-636809-2.3-DR-CH-00-0003 |
| Summary: | Insufficient storage length for bicycles could lead to loss of control and / or cyclist-cyclist collisions, or trips and falls for the visually impaired. |
| Description: | <p>Short lengths of cycleway are present on the east-west routes where they meet the north-south route on Palmerston Place. These areas may not be long enough to contain a bicycle. As such, when a cyclist is waiting here, the rear of a bicycle may overhang the north-south cycleway, which may cause a passing cyclist to swerve with the potential for loss of control collisions and / or cyclist-cyclist collisions. Similarly, the rear of the bicycle may overhang the pedestrian crossing, with the potential for causing an obstruction for the visually impaired, which could lead to trips and falls.</p> |
| Recommendation: | It is recommended that these areas are made sufficiently large to store a bicycle between the cycleway and the pedestrian crossing. |
| Designers Response | <p>Recommendation rejected.</p> <p>There is sufficient space at the courtesy crossing for a cyclist to stop whilst maintaining sufficient space for other cyclists to pass. The crossing has been positioned to meet the pedestrian/cycle desire line whilst providing storage for a single vehicle offline from the junction of Palmerston Place. Relatively low pedestrian flows are expected at this location reducing the chance or likelihood of delay to cyclists.</p> |

Problem

4.4.19

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|-------------|--|
| Location(s) | Between Palmerston Place and Manor Place |
|-------------|--|

| | |
|------------|------------------------------|
| Drawing(s) | TDD-636809-2.4-DR-CH-00-0004 |
|------------|------------------------------|

| | |
|----------|--|
| Summary: | Narrow, unlit road with bollards in close proximity, could lead to head-on and / or loss of control collisions |
|----------|--|



Description:

It is proposed to utilise an existing section of narrow road to connect the cycleways to the south of St Mary's Cathedral. It will be very narrow for a cyclist to pass an oncoming vehicle, with the potential for head-on collisions between the two, particularly during the hours of darkness as this section does not appear to be lit. This will also be exacerbated by the existing bollards that are present behind the northern kerb along part of the route. Whilst attempting to pass an oncoming vehicle, a cyclist may clip the bollards causing them to lose control.

Recommendation:

It is recommended that the route is made safe for a vehicle to pass a cyclist. This may be through widening the road, removing the bollards, and / or providing lighting.

Designers Response

Recommendation rejected.

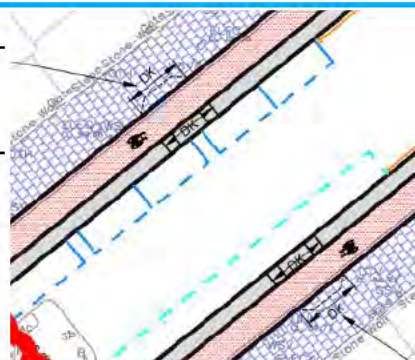
Width of the carriageway section of Bishops Walk typically 3m, beneath 'dilemma zone' typically associated with close passing/overtaking. Current operation of link allows one user to access the link at any time, this operation is unchanged; in the event a vehicle does enter the link there is sufficient space for a vehicle and a cyclist to pass however would be at extremely slow speed. CEC Streetscape Guidance C5 notes 'Very narrow streets down to 3m or less need not be excluded if they have very low traffic volumes'.

Existing Bollards are to be removed and a double height kerb installed over the majority of the footway (on the cathedral side of the carriageway). Additional lining/signage and the proposed (raised) continuous footway at the Manor Place\Bishops Walk junction has been designed to reduce traffic speed along this section of road. Proposed street lighting includes for an additional lighting column approximately 15m from the Manor Place\Bishops Walk junction (refer drawing CM1279/2/4. (extract below) to enhance visibility during low light conditions.

Problem 4.4.20

Location(s) Melville Street

Drawing(s) TDD-636809-2.5-DR-CH-00-0005
TDD-636809-2.6-DR-CH-00-0006
TDD-636809-2.7-DR-CH-00-0007

Summary: Lack of tactile information for the visually impaired could lead to cyclist-pedestrian and / or vehicular-pedestrian collisions

Description:

Dropped kerbs are provided within the footway on both sides of Melville Street, either side of the cycleways. However, there is nothing to inform the visually impaired that, should they follow this route, they will be entering the cycleway, and then the road. This could result in cyclist-pedestrian and / or vehicular-pedestrian collisions.

Recommendation:

It is recommended that tactile paving is provided at the dropped kerbs.

Designers Response

Recommendation rejected: Dropped kerbs have been provided at these locations only for easier access/loading from adjacent parking bays. They are not proposed to be detectable/used by visually impaired users and promoted as crossing points; formal uncontrolled crossings with tactile paving are provided at regular intervals along Melville Street to align with desire lines.

Problem: 4.4.21**Location(s):** Stafford Street**Drawing(s):** TDD-636809-2.7-DR-CH-00-0007**Summary:** Lack of tactile guidance could lead to collisions between visually impaired pedestrians and cyclists**Description:**

There is nothing to inform visually impaired pedestrians that they are entering a route where cyclists may be present. This could result in the visually impaired walking into the path of cyclists, with the potential for collisions between the two, noting that forward visibility is also limited in some areas.

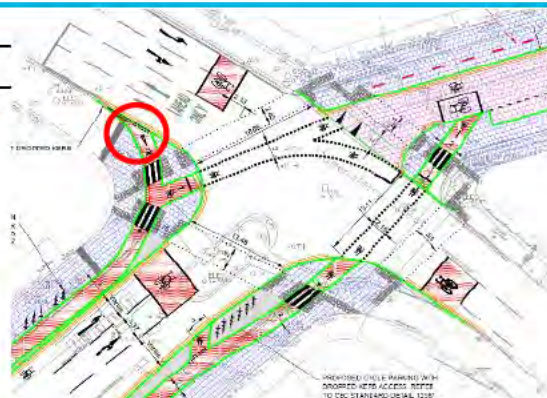
Recommendation:

It is recommended that appropriate tactile guidance is provided for the visually impaired entering the route so that they are aware that cyclists may be present.

Designers Response

Recommendation accepted.

The layout has been updated to provide blister tactile paving to warn pedestrians that they are entering a continuous footway, as per updated Edinburgh Street Design Guidance.

Problem: 4.4.22**Location(s):** Melville Street / Drumshaugh Place**Drawing(s):** TDD-636809-2-DR-CH-SK-0030**Summary:** Low entry angle of cycleway could lead to vehicular-cyclist collisions**Description:**

The eastbound cycleway on Melville Street enters Drumshaugh Place to the north at an acute angle. Cyclists must give-way here and so must be able to assess vehicles approaching from each arm of the junction. The acute entry angle will mean that cyclists will have to look over their shoulder to see vehicles approaching from Queensferry Street, and it will be very difficult for them to see vehicles approaching from Melville Street. As such they may enter when it is unsafe to do so, with the potential for being struck by a vehicle.

Recommendation:

It is recommended that the entry angle is increased to as close to 90 degrees as possible in order to maximise visibility between the cycleway give way and vehicles on the approach arms.

Designers Response

Recommendation accepted.

The entry angle will be revised to improve visibility between the cycleway and vehicles on the NW bound approach recognising a balanced solution to service the cyclist desire line.

Problem: 4.4.23**Location(s):** Coates Crescent / Shandwick Place**Drawing(s):** TDD-636809-2.9-DR-CH-00-0009**Summary:** Lack of cycle provision could lead to vehicular-cyclist collisions**Description:**

Cyclists on Coates Crescent are led to Shandwick Place to continue their journey. However, in order to continue on Shandwick Place, they would have to cross four lanes of traffic, including two tram lanes. Cyclists may find it difficult to find a suitable gap and may enter when it is unsafe to do so, with the potential for being struck by a motor vehicle and / or tram.

Recommendation:

It is recommended that cyclist facilities are provided to connect onto Shandwick Place. This could be through the incorporation of a shared-use cycleway / footway to the crossing point at the Manor Place junction.

Designers Response

Recommendation accepted.

Southbound contraflow cycle lane on Coates Crescent to be removed from scheme.

Problem: 4.4.24**Location(s):** Rutland Square**Drawing(s):** TDD-636809-2.11-DR-CH-00-0011**Summary:** Limited visibility, and speed of cyclists on ramp could lead to vehicular-cyclist collisions**Description:**

It is proposed to provide a ramp for cyclists into the southern corner of Rutland Square. Cyclists will likely travel down this ramp at speed into Rutland Square. The visibility between a vehicle on the south-eastern side of the square and a cyclist exiting from the ramp will be limited due to the buildings on the corner. This could lead to vehicular-cyclist collisions between the two.

Recommendation:

It is recommended that a give way is provided for one of the streams of traffic.

Designers Response

Recommendation rejected.

Proposed Rutland Square ramp has been removed from the scheme. Design now only includes for a new dropped kerb which reduces cycle speed and thereby reducing the likelihood for conflict with vehicles on the south side of Rutland Square.

Problem: 4.4.25**Location(s):** Rutland Street / Lothian Road**Drawing(s):** TDD-636809-2.12-DR-CH-00-0012**Summary:** Lack of continuation of cycle facilities could lead to vehicular-cyclist collisions**Description:**

Cyclists will be permitted to travel eastbound along Rutland Street, which connects into Lothian Road. Whilst there is an advanced cycle stop line for cyclists wishing to continue to the north on Lothian Road, there is no provision for cyclists wishing to continue to the south. To travel south, cyclists would need to cross Lothian Road which is five lanes wide at its junction with Rutland Street. Cyclists may find it difficult to find a suitable gap and may attempt to cross when it is unsafe to do so with the potential for being struck by a vehicle.

Recommendation:

It is recommended that measures are provided to assist cyclists in joining the southbound carriageway safely, for example, through the provision of a central refuge.

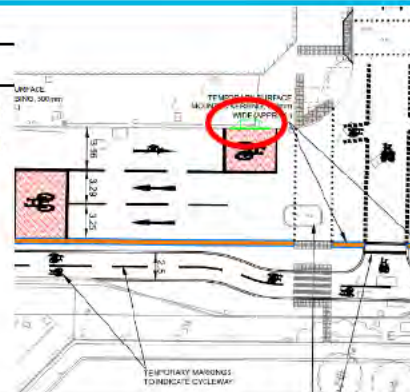
Designers Response

Recommendation rejected.

There is a separate project to review the Rutland St / Lothian Rd for all modes. The CCWEL project will positively sign the left turn only for cyclists emerging from Rutland Street. In the interim and prior to the full scheme right turn cyclists will be routed via Rutland Ct footbridge.

Problem: 4.4.26**Location(s):** South St. David Street**Drawing(s):** TDD-636809-3-DR-CH-SK-0024

Summary: Dropped kerb adjacent to crossing could lead to vehicular-pedestrian collisions and / or pedestrian trips, leading to personal injury.

**Description:**

A dropped kerb is proposed adjacent to the advance cycle stop line, immediately south of the pedestrian crossing. This could be confusing for pedestrians, particularly the visually impaired, who may cross at this location, and become stranded on the carriageway when faced with temporary kerbs opposite, with the potential for being struck by a vehicle. They may also trip and fall at the temporary kerb opposite, leading to personal injury.

Recommendation:

It is recommended that the dropped kerb is removed.

Designers Response

Recommendation accepted.

This dropped kerb has been removed from the current design.

Problem: 4.4.27**Location(s):** Charlotte Square**Drawing(s):** TDD-636809-4-DR-CH-SK-0007**Summary:** Lack of information for visually impaired pedestrians could lead to trips and falls, and / or cyclist-pedestrian collisions**Description:**

Tactile paving is provided at the crossings of Charlotte Square to the west of South Charlotte Street and North Charlotte Street, and then again at the crossing of the cycleway. However, it is considered that a visually impaired pedestrian would find it very difficult to negotiate the route through to the footway. If they were to continue straight after departing the road crossing they would encounter a full height kerb opposite, which could cause them to trip and fall, leading to personal injury. They would be likely to be unaware that they were crossing the cycleway, with the potential for being struck by a cyclist. They would then encounter another trip hazard at the steps, with the potential for injury.

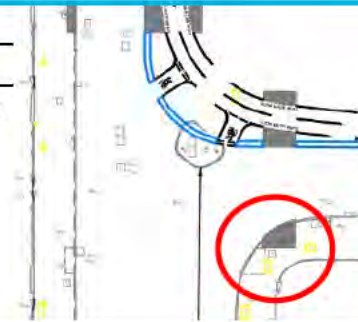
Recommendation:

It is recommended that a tactile surface is provided to lead visually impaired pedestrians between the crossings and to the base of the steps, with appropriate tactile surfacing at the top and bottom of the steps at both the northern and southern sides of the square.

Designers Response

Recommendation accepted.

Subsequent to the Stage 1 RSA it has been decided to provide a temporary ramp for mobility impaired users to utilise the footway to travel north to south, on the east side of Charlotte Square. This will provide a step free route not currently available. To provide guidance to visually impaired users between the controlled crossings, crossings of the cycle track and the ramp hazard tactile paving is to be provided to capture visually impaired users and lead them to the onward crossing.

Problem: 4.4.28**Location(s):** Charlotte Square / Hope Street**Drawing(s):** TDD-636809-4-DR-CH-SK-0007**Summary:** Close proximity of crossings could lead to trips and falls for the visually impaired.**Description:**

A new north-south crossing of Charlotte Square is proposed, with tactile paving. However, it is located immediately adjacent to the existing east-west crossing of Hope Street. This could be confusing for the visually impaired, who may enter the carriageway at an angle that may lead them directly into a full height kerb opposite, with the potential for trips and falls, leading to personal injury.

Recommendation:

It is recommended that the crossing points are moved further apart to remove any ambiguity as to which sets of tactiles are for which road.

Designers Response

Recommendation accepted.

The extent of proposed tactile paving will be reduced and the crossing relocated slightly the east to provide separation from the adjacent crossing.

Problem 4.4.29

Location(s) Charlotte Square

Drawing(s) TDD-636809-4-DR-CH-SK-0007

Summary: Small radii in cycleway could lead to head-on and / or loss of control cyclist collisions

Description:

Several of the radii in the proposed cycleway around Charlotte Square appear to be very small. This could lead to cyclists being unable to stay in their lane, with the potential for colliding with a cyclist travelling in the opposite direction. They could also lead to cyclist losing control as they attempt to follow the radius at speed.

Recommendation:

It is recommended that radii appropriate to the cycling design speed are provided, and mitigation measures such as Slow road markings provided as necessary.

Designers Response

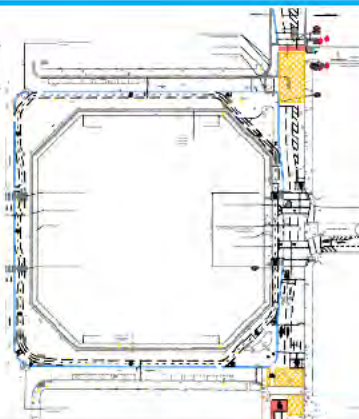
Recommendation accepted.

The alignment of the cycle track for the temporary scheme is influenced by the location of the steps surrounding Charlotte Square, the existing islands and the desire to maximise pedestrian spaces. Following the proposed introduction of temporary ramps noted in item 4.4.27, the cycle track radii have been increased to 5m+ where possible, with a minimum of 4m as advised in LTN 2/08 (for through movements, excludes turning for crossings).

Problem 4.4.30

Location(s) Charlotte Square

Drawing(s) TDD-636809-4-DR-CH-SK-0007

Summary: Unclear route for cyclists could lead to cyclist-pedestrian collisions and / or vehicular-cyclist collisions

Description:

Cyclists travelling northbound on South Charlotte Street are guided to use the proposed cycleway around Charlotte Square. Should these cyclists wish to continue to the north, it is unclear how they are to re-join the carriageway. It appears as though they would have to use the pedestrian crossing of Charlotte Square (northern side), with the potential for collisions with pedestrians, and then cut across the pedestrian crossing of North Charlotte Street, again with the potential for collisions with pedestrians. Similarly, it is unclear how cyclists joining the proposed cycleway from the northern side of the square intending to travel southbound are to re-join the carriageway. They may also have to use pedestrian crossings, with the risk of collisions with pedestrians, or may have to judge a suitable gap to join the South Charlotte Street junction, with the potential for being struck by a vehicle.

Recommendation:

It is recommended that the routes for cyclists are clearly signed, with cycle crossing facilities provided as appropriate, with safe means of access to the carriageway.

Designers Response

Recommendation accepted.

It is noted that the temporary scheme is to be provided primarily to connect Route 1 from Randolph Place to George St for continuation of the CCWEL corridor prior to a permanent scheme being installed.

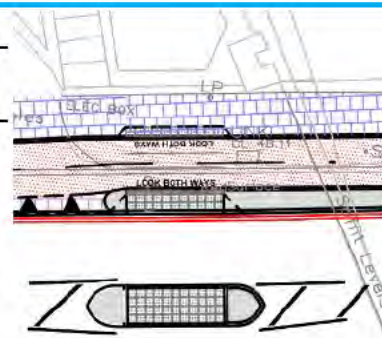
For the temporary scheme wayfinding will be primarily provided via cycle symbols (Diag. 1057) at key decision points and advising on entry/exit points from the temporary link around Charlotte Square.

Flag type signs will be provided to indicate the route to/from NCN1 at the George Street junction and connection to the north of West Register House. A full signing strategy review will be undertaken for the permanent scheme to sign secondary connections.

Problem 4.4.31

Location(s) West Coates

Drawing(s) TDD-636809-1.4-DR-CH-00-0004
TDD-636809-1.5-DR-CH-00-0005

Summary: Narrow pedestrian area could lead to cyclist-pedestrian and / or vehicular-pedestrian collisions

Description:

At several locations a narrow area is provided for pedestrians between the cycleway and the road. Pedestrians will need to wait within this area until it is safe to cross. However, the narrow width of these areas means that there is the potential for pedestrians with prams or wheelchair users to overhang the adjacent cycleway or road, with the potential for cyclist-pedestrian or vehicular-pedestrian collisions to occur respectively.

Recommendation:

It is recommended that the areas provided between the cycleway and the road are sufficiently wide to accommodate all expected user groups.

Designers Response

Recommendation accepted.

All waiting areas at pedestrian crossings are preferred minimum 1.8m, absolute minimum 1.2m where constraints prevent a wider facility, in accordance with Edinburgh Street Design Guidance Factsheet G4.

Problem

4.4.32

Location(s)

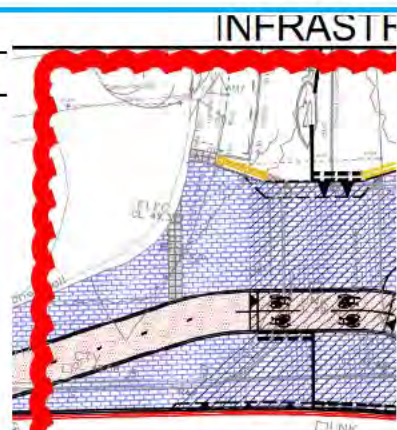
Wester Coates Terrace

Drawing(s)

TDD-636809-1.4-DR-CH-00-0004

Summary:

Lack of provision for cyclists at access to Roseburn Path could lead to cyclist-pedestrian collisions



Description:

There is an existing access to / from the Roseburn Path on Wester Coates Terrace, just to the north of the proposed raised table. However, no measures have been proposed to facilitate access between the path and the proposed cycleway. As such, cyclists would have to either travel along, or cross, the footway, with the potential for collisions with pedestrians.

Recommendation:

It is recommended that a shared-use footway / cycleway is provided between the proposed raised table and the access to the Roseburn Path.

Designers Response

Recommendation rejected (alternative solution proposed).

The access to Roseburn Path immediately adjacent to West Coates is very steep and not suitable for formally designating as a shared use facility. The signed route will be to leave the two-way cycle track onto the carriageway of Wester Coates Terrace and to access Roseburn Path further north.

Traffic Signs, Carriageway Markings and Lighting

Problem: 4.5.1

Location(s): Roseburn Gardens

Drawing(s): TDD-636809-1.1-DR-CH-00-0001 & TDD-636809-1.2-DR-CH-00-0002

Summary: Conflicting road signs and road markings could lead to head-on collisions



Description:

The proposed road signs on Drawing 1.1 indicate that Roseburn Gardens is to be one-way southbound, with contraflow cycles permitted northbound. However, drawing 1.2 indicates that Roseburn Gardens is to be two-way for all vehicles. Motorists entering from Roseburn Terrace heading southbound will not be expecting motorists approaching from the opposite direction. They will be more likely to travel in the centre of the road and may assume that the road markings at Roseburn Place are for a two-lane exit. As such there is the potential for head-on collisions between southbound vehicles and vehicles / cyclists turning left into Roseburn Gardens, noting the restricted visibility on the corner.

Recommendation:

It is recommended that the signs and / or road markings are amended such that it is clear which movements are permitted by which vehicles.

Designers Response

Recommendation accepted.

Road markings and signs will be reviewed and updated to reduce the risk of misinterpretation of the two-way nature of Roseburn Gardens south of the continuous footway crossing.

Problem: 4.5.2**Location(s):** Murrayfield Gardens to Roseburn Gardens**Drawing(s):** TDD-636809-1.1-DR-CH-00-0001
TDD-636809-1-DR-CH-SK-0036**Summary:** Polished roundels could lead to pedestrian / cyclist slips and falls, leading to injury.**Description:**

Roundels set into the footway are proposed between Murrayfield Gardens and Roseburn Gardens. The roundel units and / or the images on them have the potential to become slippery when wet, if they are made from a polished material. This could lead to slips and falls for pedestrians and / or cyclists with the potential for injury.

Recommendation:

It is recommended that the roundels are made of a material such that they will not cause pedestrians or cyclists to slip when wet.

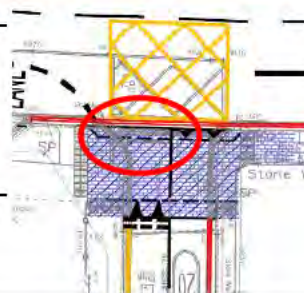
Designers Response

Recommendation accepted: Shared use/cycle roundels to be installed similar to those installed elsewhere within Edinburgh providing an appropriate surface material to reduce the risk of slipping when wet.



Problem 4.5.3

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|-------------|--|
| Location(s) | Various (see below) |
| Drawing(s) | TDD-636809-1.4-DR-CH-00-0004 TDD-636809-1.5-DR-CH-00-0005 TDD-636809-2.1-DR-CH-00-0001 TDD-636809-2.7-DR-CH-00-0007 TDD-636809-2-DR-CH-SK-0030 |
| Summary: | Lack of road markings could lead to side-impact collisions |



Description:

At several locations where raised tables are proposed at junctions, there is nothing to inform motorists or cyclists to give way to traffic on the main road. This could lead to motorists overshooting onto the main road with the potential for side-impact collisions. This occurs at the following locations:

- Ba birnie Place
- Stanhope Street
- Devon Place
- Grosvenor Gardens
- Stafford Street
- Randolph Lane

Recommendation:

It is recommended that Give Way road markings are provided where the side roads join the main road.

Designers Response

Recommendation rejected: It is accepted that vehicles will stop on the raised tables. The layout at these locations is designed in accordance with Edinburgh Streetscape Design Guidance Part G7 layout Option 1. Where a specific hazard has been identified then give way markings have been provided e.g. at Roseburn Cliff junction.

Problem 4.5.4**Location(s)** Magdala Crescent**Drawing(s)** TDD-636809-1.5-DR-CH-00-0005**Summary:** Location of signs could lead to vehicular-cyclist collisions**Description:**

The proposed signs at Magdala Crescent indicate that, to the north of the raised table, the road is one-way northbound with a segregated southbound cycle lane. This does not appear to reflect the proposed layout. It is assumed that only the raised table is to have the cycle contraflow. If the signs are placed as shown then northbound motorists will not be expecting southbound cyclists and vehicular-cyclist collisions could occur.

Recommendation:

It is recommended that:

- the cycle signs are relocated such that it is clear to northbound motorists that southbound cyclists may also be using the raised table
- the cycle signs are amended from showing segregated cycle facilities to showing unsegregated cycle facilities , and

two-way signs are provided to inform northbound motorists departing the raised table.

Designers Response**Location of cycle stands**

Recommendation accepted.

Signs to be relocated to top of entry ramp to table adjacent to cycle stands to improve conspicuity.

Cycle sign layout

Recommendation accepted.

Contraflow (unsegregated) signs to be provided.

Two-way signs

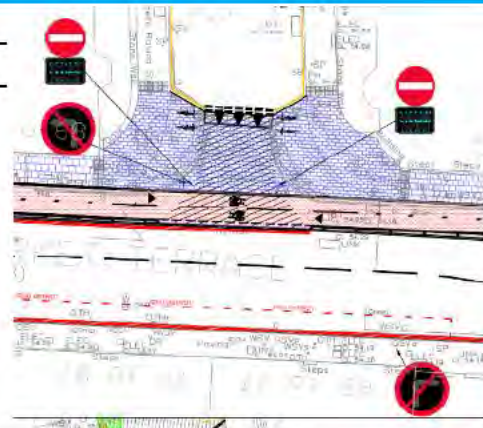
Recommendation accepted.

Two way signs to be provided located back to back with the required 'No Entry (except cycles)'.

Problem 4.5.5

Location(s) Various (see below)

Drawing(s) TDD-636809-1.6-DR-CH-00-0006

Summary: Inconsistent signage could lead to hesitation and shunt vehicular-cyclist collisions

Description:

At several locations the side roads have No Entry Except Cycle signs at their entrance. However, the signs on the main road indicate No Left / Right Turn for all vehicles. This could lead to confusion and hesitation for cyclists. Hesitation could lead to cyclists braking suddenly, with the potential for shunt type collisions with vehicles. This occurs at the following locations:

- Coates Gardens
- Roseberry Crescent

Recommendation:

It is recommended that Except Cycles plates are provided at the No Left / Right Turn signs.

Designers Response

Recommendation accepted.

Supplementary plates as identified will be provided.

| | |
|---------------------------|--|
| Problem | 4.5.6 |
| Location(s) | Haymarket Terrace |
| Drawing(s) | TDD-636809-1.7-DR-CH-00-0007 |
| Summary: | Lack of stop line could lead to tram-cyclist collisions |
| Description: | <p>The westbound traffic lane outside Haymarket station has a stop line road marking at the signals so that vehicles can stop when the trams are running. However, the adjacent cycle lane does not have a stop line. As such, cyclists could continue through the junction and be struck by a tram.</p> |
| Recommendation: | <p>It is recommended that a stop line road marking is provided across the cycle lane and integrated into the signal staging.</p> |
| Designers Response | <p>Recommendation accepted.</p> <p>A stop line with LLCS (mirroring the full height traffic signal head) is proposed at this location.</p> |

Problem 4.5.7

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|--------------------|---|
| Location(s) | Varies (see below) |
| Drawing(s) | TDD-636809-2.1-DR-CH-00-0001 TDD-636809-2.5-DR-CH-00-0005 TDD-636809-2.7-DR-CH-00-0007 TDD-636809-2.10-DR-CH-SK-0031 |
| Summary: | Lack of delineation of raised table could lead to loss of control collisions |


Description:

At several locations raised tables are proposed that are missing delineation of the ramps. Motorists and / or cyclists approaching the raised tables may not be aware of their presence and may enter at too high a speed with the potential for losing control. This could be of particular concern for powered two-wheelers. This occurs at the following locations:

- Grosvenor Gardens / Rosebery Crescent – both sides of the raised table
- Manor Place / Melville Street – northern ramp
- Stafford Street – both sides of the raised table
- Coates Crescent / Shandwick Place – northbound entry for cyclists

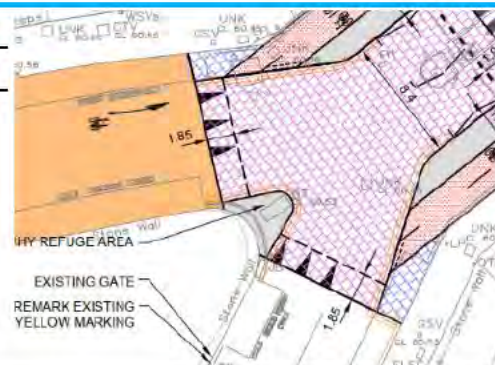
Recommendation:

It is recommended that triangle road markings are provided on the ramps for the raised tables.

Designers Response

Recommendation accepted.

Each location will be reviewed and the road markings drawings amended as appropriate.

Problem 4.5.8**Location(s)** Grosvenor Crescent / Lansdowne Crescent**Drawing(s)** TDD-636809-2.3-DR-CH-00-0003**Summary:** Location of triangle markings on ramps could lead to head-on collisions**Description:**

Triangle road markings are proposed on the two eastbound approaches to the raised table. However, they extend across the offside half of the ramps. This, coupled with the fact that there are no central lane markings on either approach, could lead motorists into thinking that they are on one-way routes. Approaching motorists may enter the ramp centrally within the carriageway, with the potential for head-on collisions with westbound vehicles.

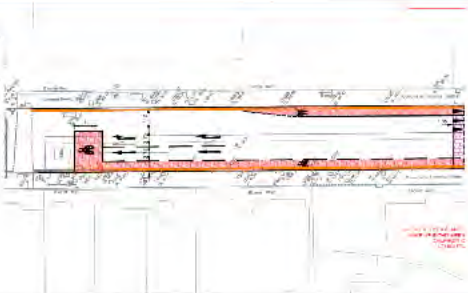
Recommendation:

It is recommended that the triangles are provided to align with the eastbound lanes only on both approaches.

Designers Response

Recommendation accepted.

The number of triangles will need to be reduced to two to achieve this mitigation, and aligned so the easternmost triangle is visible offline from the parking bays.

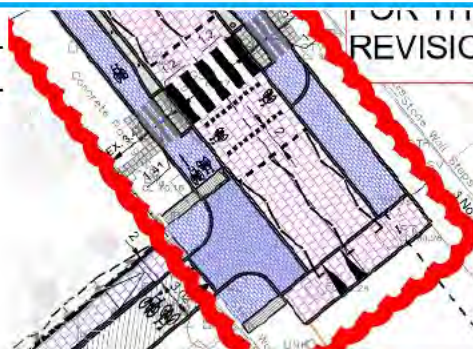
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| Problem | 4.5.9 |
| Location(s) | Palmerston Place |
| Drawing(s) | TDD-636809-2.3-DR-CH-00-0003 |
| Summary: | Lack of road markings could lead to head-on collisions |
| Description: |  |
| Recommendation: | <p>On the northbound approach to Chester Street there is a cycle lane, a straight-ahead lane, and a right turn lane proposed. However, the offside of the right turn lane is not delineated. As such, southbound motorists may drive across the start of the northbound right turn lane in particular as they move across to avoid the southbound cycle lane. This could lead to head-on collisions between southbound vehicles and northbound vehicles entering the right turn lane.</p> |
| Designers Response | <p>It is recommended that road markings are provided to guide northbound and southbound motorists through this area.</p> |
| Recommendation accepted. | Road markings to be updated to define centreline. |

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| Problem | 4.5.10 |
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| Location(s) | Manor Place |
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| Drawing(s) | TDD-636809-2.4-DR-CH-00-0004 |
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| Summary: | Lack of delineation could lead to vehicular-cyclist collisions |
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| Description: |
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A raised table is proposed that will comprise both road and cycleway. The northbound approach ramp is such that vehicles could travel over the nearside portion of the ramp and onto the cycleway, with the potential for vehicular-cyclist collisions.

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| Recommendation: |
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It is recommended that road markings are provided to guide cyclists onto the relevant portion of the ramp, and keep vehicles within their portion of the ramp.

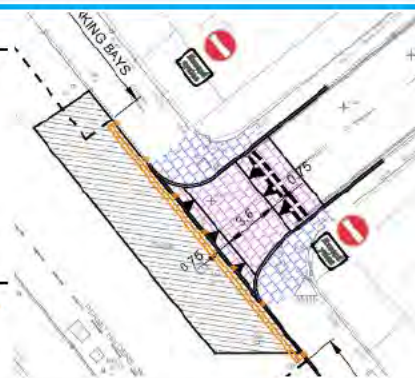
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| Designers Response |
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Recommendation rejected.

The surfacing types are proposed to delineate carriageway from footway rather than additional road markings, as well as the presence of street furniture. Cycle signing is proposed to provide wayfinding information.

Problem 4.5.11

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| Location(s) | Various (see below) |
| Drawing(s) | TDD-636809-1.6-DR-CH-00-0006 TDD-636809-2.4-DR-CH-00-0004 TDD-636809-2.7-DR-CH-00-0007 TDD-636809-2-DR-CH-SK-0030 TDD-636809-2.9-DR-CH-00-0009 TDD-636809-2.11-DR-CH-00-0011 TDD-636809-4-DR-CH-SK-0007 |
| Summary: | Lack of delineation of cycle lane could lead to vehicular-cyclist, and / or cyclist loss of control, collisions |


Description:

At several locations it is proposed to have a cycle contraflow whereby only cyclists will be entering the side road, whilst all vehicles are permitted to exit the side road. Motorists intending to turn right out of the junctions are likely to position themselves within the area that a cyclist turning into the junction would wish to occupy. This could lead to vehicular-cyclist collisions, noting that visibility between motorists and cyclists will be restricted at some locations by parking bays. This occurs at the following locations:

- Coates Gardens
- Rosebery Crescent
- William Street
- Stafford Street
- Charlotte Lane
- Rutland Street

Recommendation:

It is recommended that a section of cycle lane is marked through the raised table section of the junctions to separate cyclists from vehicles.

Designers Response
Coates Gardens

Recommendation rejected.

Appropriate signing will be provided, it is proposed to relocate the contra flow cycle signs adjacent to the ramp to improve conspicuity.

Rosebery Crescent

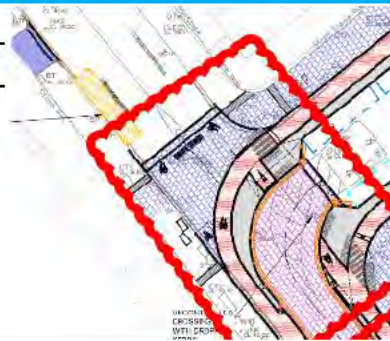
Recommendation rejected.

Cyclists are provided with the adjacent cycle track for access between the two way cycle track and Rosebery Crescent. The proposed signing is deemed suitable to highlight the potential presence of contraflow cyclists who choose not to use the segregated facility.

Problem 4.5.12

Location(s) Manor Place / Melville Street

Drawing(s) TDD-636809-2.5-DR-CH-00-0005

Summary: Unrestricted access could lead to vehicular-pedestrian and / or vehicular-cyclist collisions

Description:

There is nothing to prevent southbound motorists on Manor Place from entering the proposed raised table at Melville Street. If they were to do this, they would have to drive over the pedestrian and cycle waiting areas in order to turn left onto Melville Street, with the potential for vehicular-pedestrian and / or vehicular-cyclist collisions to occur.

Recommendation:

It is recommended that physical measures are provided, together with No Entry / Except Cycles signs and No Through Road signs.

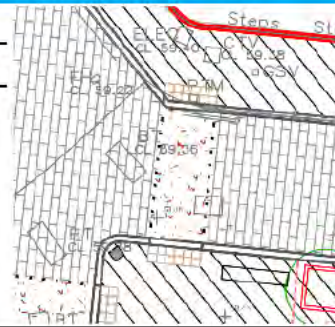
Designers Response

Recommendation accepted.

Benches are shown across Manor Place to prevent access between Manor Place (north) and Melville Street.

Problem 4.5.13

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| <i>Location(s)</i> | Melville Street / Melville Crescent |
| <i>Drawing(s)</i> | TDD-636809-2.6-DR-CH-00-0006 |
| <i>Summary:</i> | Unusual road markings at crossings could lead to vehicular-pedestrian collisions |



Description:

All of the proposed crossings at the junction appear to be uncontrolled crossings as there are no traffic signals shown. However, all of the crossings are bounded by stud markings, which users would normally expect to see at controlled crossings. This may lead pedestrians into thinking they have right of way, whilst the lack of stop lines might lead motorists into thinking that they have right of way, with the potential for vehicular-pedestrian collisions.

Recommendation:

It is recommended that road markings are provided as per the TSRGD.

Designers Response

Recommendation accepted.

Studs to be removed.

Problem 4.5.14

Location(s) Melville Street

Drawing(s) TDD-636809-2.5-DR-CH-00-0005
TDD-636809-2.6-DR-CH-00-0006

Summary: Lack of centreline road markings could lead to head-on collisions

Description:

There are no central road markings on Melville Street to the west of Melville Crescent. Motorists may perceive the section to be one-way, with the potential for head-on collisions.

Recommendation:

It is recommended that central road markings are provided.

Designers Response

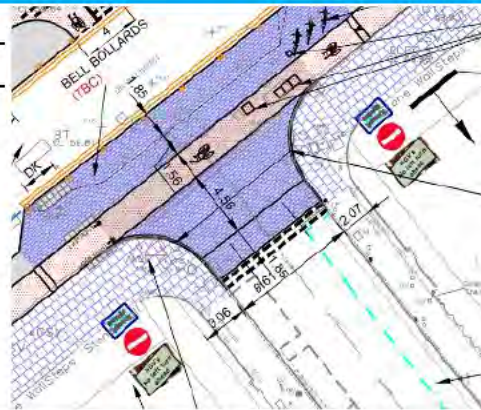
Recommendation rejected.

CEC are promoting no centrelines on Melville Street as per Factsheet G3 (Omitting Centrelines), given the low speed nature and environment of the road.

Problem 4.5.15

Location(s) Stafford Street

Drawing(s) TDD-636809-2.7-DR-CH-00-0007

Summary: Ambiguous road signs could lead to vehicular-pedestrian collisions

Description:

Two "HGV's No Left Turn Ahead" signs are proposed on the approach to Melville Street. These signs are ambiguous as the word "ahead" could be interpreted to be the junction with Melville Street, or at a junction further ahead. Should an HGV driver assume the latter, and attempt to turn left at Melville Street, they would likely drive over the pedestrian waiting areas on both sides of Melville Street, with the potential for vehicular-pedestrian collisions.

Recommendation:

It is recommended that unambiguous road signs are provided.

Designers Response

Recommendation accepted.

Signing will be reviewed alongside the vehicle routing strategy to minimise clutter and provide unambiguous signing.

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| Problem | 4.5.16 |
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| Location(s) | Stafford Street |
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| Drawing(s) | TDD-636809-2.7-DR-CH-00-0007 |
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| Summary: | Contradicting road signs and road markings could lead to vehicular-cyclist collisions |
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| Description: |
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Cycle markings are proposed which suggest that the southbound cycle contraflow on Stafford Street is intended to extend through to Shandwick Place. However, the existing No Entry signs are to be retained to the south of Alva Street. This provides a mixed message to southbound cyclists, which could cause them to hesitate and stop suddenly, with the potential for being struck by a vehicle exiting Alva Street.

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| Recommendation: |
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It is recommended that Except Cycles plates are added beneath the existing No Entry signs.

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| Designers Response |
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Recommendation accepted.

Supplementary plates as identified will be provided.

Problem 4.5.17

Location(s) Randolph Lane

Drawing(s) TDD-636809-2-DR-CH-SK-0030

Summary: Sign orientation could lead to head-on collisions

Description:

It is proposed to provide a cycle contraflow on Randolph Lane. However, the proposed contraflow sign at the southern end of the road is facing the wrong way. Motorists on Queensferry Street would be able to see the one-way sign and could enter Randolph Lane, with the potential for head-on collisions.

Recommendation:

It is recommended that the cycle contraflow sign is oriented correctly for the direction of one-way traffic.

Designers Response

Recommendation accepted.

Sign to be corrected.

Problem 4.5.18

Location(s) Randolph Lane

Drawing(s) TDD-636809-2-DR-CH-SK-0030

Summary: Position of signs could lead to vehicular-cyclist collisions

Description:

Signs are proposed to indicate that motorists travelling southbound must give way to cyclists travelling northbound. However, these signs are placed away from the narrow section at the northern end of the road, which is the most critical point where vehicular-cyclist collisions could occur.

Recommendation:

It is recommended that the Give Way to Oncoming Vehicles sign is located at the start of the narrow section for southbound vehicles, and the Priority Over Oncoming Vehicles sign is located at the start of the narrow section for northbound cyclists.

Designers Response

Recommendation accepted.

Signs to be relocated as appropriate with consideration of where it is practical to locate the signs in the narrow lane without creating a significant obstruction

Problem 4.5.19

Location(s) Randolph Lane

Drawing(s) TDD-636809-2-DR-CH-SK-0030

Summary: Position of signs could lead to vehicular-cyclist collisions

Description:

Signs are proposed to prohibit motor vehicles along the route, except for loading by lorries. However, the signs are placed half way down the road. Should a motorist enter the road from the north they would have to reverse upon seeing the signs, with the potential for collisions with cyclists.

Recommendation:

It is recommended that the Motor Vehicles Prohibited signs are located at the start of the narrow section for southbound motorists.

Designers Response

Recommendation rejected.

The location of the signs is due to the presence of a car park immediately to the north of the signs. If a vehicle does enter the narrow section they will have to carefully reverse back. Due to the low volume of traffic this is not considered to be a significant issue.

Problem 4.5.20

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| <i>Location(s)</i> | Rutland Square |
| <i>Drawing(s)</i> | TDD-636809-2.11-DR-CH-00-0011 |
| <i>Summary:</i> | Incorrect sign could lead to vehicular-cyclist or shunt type collisions |


Description:

Canning Street is to be amended such that no motor vehicles are permitted to access it through to Rutland Square. Currently buses, taxis and cyclists are permitted to turn right from Rutland Square into Canning Street as per the existing sign plate. Should buses or taxis start to turn right from Rutland Square they will be faced with a new splitter island and will have to reverse. This could lead to collisions with cyclists turning right or general vehicles exiting Rutland Square

Recommendation:

It is recommended that the existing sign plate is replaced with an Except Cycles plate.

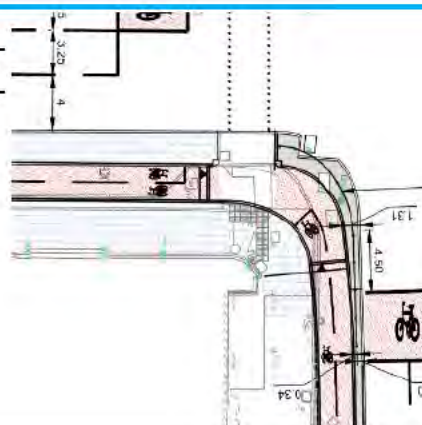
Designers Response

Recommendation accepted.

Sign plate will be replaced.

Problem 4.5.21

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| <i>Location(s)</i> | Queen Street / North St. David Street |
| <i>Drawing(s)</i> | TDD-636809-3-DR-CH-SK-0024 |
| <i>Summary:</i> | Straight alignment on approach to sharp bend and pedestrian crossing could lead to loss of control and / or cyclist-pedestrian collisions |


Description:

The cycleway on Queen Street follows a straight alignment before turning ninety degrees to turn onto North St. David Street. The cycleway also crosses a controlled pedestrian crossing at this location. The approach alignment is such that cyclists will likely be travelling at speed. If they are unaware of the curve ahead, and the potential need to stop at the signals, they could lose control and / or collide with pedestrians on the crossing.

Recommendation:

It is recommended that Slow road markings are provided in the cycleway on approach to the bend.

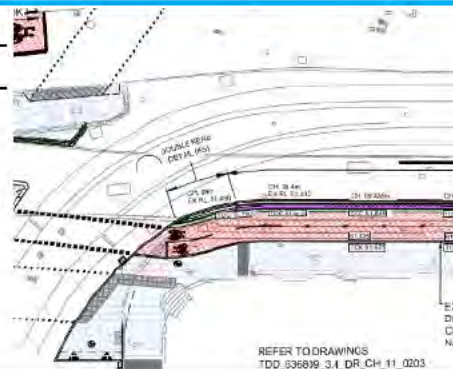
Designers Response

Recommendation accepted.

Slow marking and a 1057 marking will be added to the westbound approach to the crossing (Slow marking already included on northbound direction). In addition there is a ramp to slow cyclists and the movement is traffic signal controlled.

Problem 4.5.22

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| Location(s) | York Place / North St. Andrew Street |
| Drawing(s) | TDD-636809-3.4-DR-CH-11-0201 |
| Summary: | Worn box junction markings could lead to tram-cyclist / vehicle collisions |


Description:

The existing box junction markings at the junction are worn. Should a motorist or cyclist wait within the junction they would be at risk if being struck by a tram.

Recommendation:

It is recommended that the box junction markings are replaced.

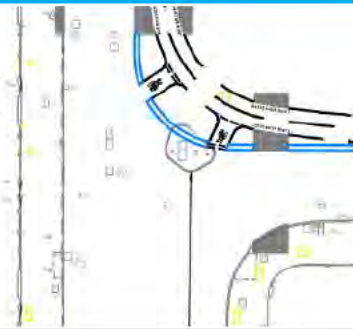
Designers Response

Recommendation accepted.

Current design has the box junctions markings to be refreshed.

Problem 4.5.23

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| <i>Location(s)</i> | Hope Street / Charlotte Square Glenfinlas Street / Charlotte Square |
| <i>Drawing(s)</i> | TDD-636809-4-DR-CH-SK-0007 |
| <i>Summary:</i> | Lack of delineation of junction and one-way route could lead to side-impact and / or head-on collisions |


Description:

The existing inner kerb line on Charlotte Square is being relocated into the carriageway, and Charlotte Square is being made one-way. However, there is nothing to inform motorists approaching the Hope Street / Charlotte Square or Glenfinlas Street / Charlotte Square junctions from either direction as to who has right of way. This could lead to side-impact collisions. It could also lead to head-on collisions in the event that motorists turned right onto Charlotte Square.

Recommendation:

It is recommended that road markings are provided at the junction, and appropriate signage and road markings are provided to convey the one-way route.

Designers Response

Recommendation accepted.

New road markings are proposed for this junction to retain priority control of Hope Street onto Charlotte Square, included on the subsequent refined scheme layout.

Appendix A - Problem Location Plans

Problem Location Plan drawing package available as document RSA115-S1-B CCWEL RSA 1

