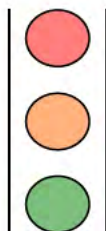


STAGE 3 ROAD SAFETY AUDIT REPORT FOR EDINBURGH TRAM NETWORK



Traffic Consultant
5 Sentry Knowe
Selkirk
TD7 4BE



In association with:

WYLLIE LODGE
INDEPENDENT ROAD SAFETY AUDITORS

Report Reference:-
Airport – York Place Final Stage3.

Date 06.04.2014

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1. INTRODUCTION.

1.1 The objective of a Road Safety Audit is to identify any aspects of a road design or construction scheme that gives rise to road safety concerns and, where possible, to suggest modifications that would improve the road safety of the resultant scheme. This report results from a Stage 3 Road Safety Audit carried out on the introduction of trams to Edinburgh. The Audit was requested by Bilfinger Construction UK Limited on behalf of City of Edinburgh Council and was carried out by [REDACTED] Traffic Consultant and Wyllie Lodge Limited, Independent Road Safety Auditors.

1.2 The Road Safety Audit Team members were;

[REDACTED] C.Eng, MICE Dip TE	Team Leader
[REDACTED], I.Eng, MCIHT, MSoRSA, HA. Cert Comp.	Team Member
[REDACTED] BSc, MSc, MCIHT, CMILT, HA. Cert Comp.	Team Member

2. SCHEME DETAILS.

- 2.1 The scheme includes the construction of 14km of tram track and 15 tram stops between the centre of Edinburgh and the airport to the west of the city. Between York Place and Haymarket the trams run along surface streets shared with other road users, thereafter the tram route has been constructed along a traffic free corridor to the airport. The tram route crosses several public roads and paths between Haymarket and the airport. A pedestrian and cyclist path runs parallel to the route between Balgreen Tram Stop and Edinburgh Park Station.



- 2.2 All areas within the scheme that were subject to the road safety audit process were those areas where the tram route interacted with the existing road network. The route has been divided into the following sections;
- 1C York Place to Princes St Tram Stop (west end of stop)
 - 1D Princes St Tram Stop to Haymarket Tram Stop (east end of stop)
 - 2A Haymarket Tram Stop to Russell Road
 - 5A Russell Road to Balgreen Tram Stop (east end)
 - 5B Balgreen Tram Stop to Edinburgh Park Central Tram Stop (west end)
 - 5C Edinburgh Park Central Tram Stop to Gogarburn Tram Stop (west end)
 - 6 Depot
 - 7A Gogarburn Tram Stop to Airport Tram Stop

- 2.3 The problems identified in this road safety audit report are listed by the above sections. With the exceptions of Sections 5C (from Gogarburn tram stop to Gogar Castle access crossing), Section 6 and Sections 7A (excluding Eastfield Avenue) which were covered by other auditors prior to this audit, at the direction of City of Edinburgh Council.

3. PROCEDURE.

- 3.1 The audit was carried out in accordance with procedures set out in HD 19/03 of the Design Manual for Roads and Bridges (DMRB). The Road Safety Audit procedure is not an examination or verification of compliance to a design standard. The audit team has been informed of departures from design standards, these are referred to within this report. The recommendations in this report are considered by the audit team to be appropriate and proportionate to the concerns and problems identified.
- 3.2 This report should be read in conjunction with interim RSA reports dated 20th Nov 2012, 8th Feb, 8th May, 5th June and 31st October 2013 (see Appendix iv) and the designer's responses (see Appendix v), issued on 21st February 2014.
- 3.3 This final road safety audit was carried out on 12th February 2014 between 10:00 and 21:00 hours. During the site visit the Audit Team were accompanied by;
- ██████████, City of Edinburgh Council - Tram Engineering Manager
██████████, Deputy Project Director, Bilfinger Construction UK
██████████, Engineer, Siemens.
██████████, Police Scotland.
- 3.4 On 12th February members of the Audit Team walked, cycled and rode on a tram along the route. The weather during this visit was cold and damp.
- 3.5 The team has examined and reported only on the road, cycle and pedestrian safety implications of the layout and not on its design.
- 3.6 All the relevant drawings were made available to the Audit Team. These are listed in Appendix i.
- 3.7 A draft version of this report was issued to the deputy project director on 7th March and a designer's response (see appendix vi) to this draft issued by him to the audit team on 21st March. This final road safety audit report considers this latest designers response.

4. PREVIOUS ROAD SAFETY AUDITS.

- 4.1 The safety aspects of the scheme were the subject of Stage 2 Road Safety Audit Reports. These are listed in Appendix ii. Items which this Audit Team consider to remain a problem are referred to again in this report.
- 4.2 Items referred to in the interim Stage 3 Road Safety Audit Reports, (see 3.2), which this Audit Team consider to remain a problem are referred to again in this report.

5. IDENTIFIED PROBLEMS.

SECTION 1C. York Place to Princes St Tram Stop

GENERAL ISSUES

5.1C.1 PROBLEM.

LOCATION. Section 1C.

SUMMARY. Departures from Standard.

The audit team has been advised of the following approved departures from standards.

Departure No	Location	Departure Type
1C - D1	MacDonald Road to Princes Street West	Footway width
1C - D2	MacDonald Road to Princes Street West	Footway crossfall
1C - D3	MacDonald Road to Princes Street West	Carriageway crossfall
1C - D4	MacDonald Road to Princes Street West	Junction visibility
1C - D5	MacDonald Road to Princes Street West	Junction intervisibility zone
1C - D6	MacDonald Road to Princes Street West	Length of crossing
1C - D7	MacDonald Road to Princes Street West	Vertical alignment
1C - D8	Picardy Place	Flow width for gullies
1C - D9	Dublin Street crossing of York Place	Foot / cycleway width
1C - D10	Picardy Place Tram stop & Princes Street Tram stop	Clearance between OLE and kerb
1C - D11	Dublin Street	Ramp gradient
1C - D12	Dublin Street	Cycleway gradient

RECOMMENDATION.

The audit team considers the essential compensatory measures identified in the departure report, Ref ULE90130-01-REP-00155-V5 to be appropriate and proportionate to the problems identified. It is recommended these measures are implemented.

5.1C.2 PROBLEM.

LOCATION. Section 1C. York Place at Tram Buffer

SUMMARY. Risk of vehicle impact with tram buffer.

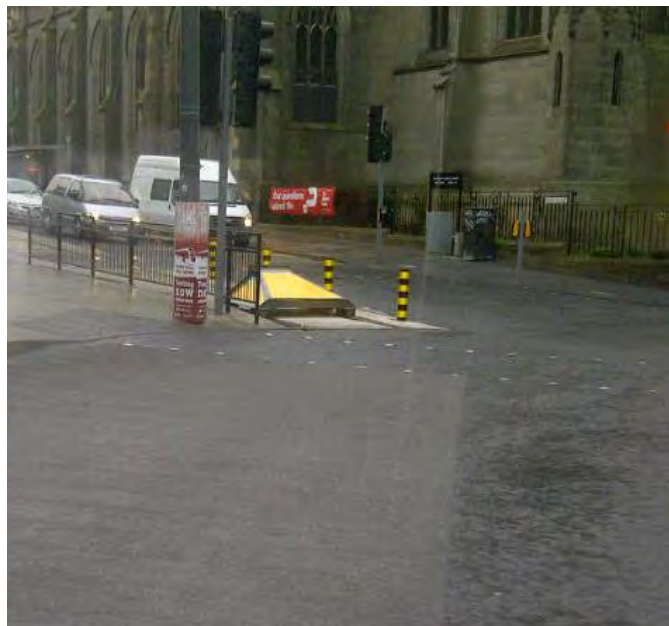
The works at the Tram Buffer were incomplete at the time of the site visit on 12th February. The area around the buffer was protected by temporary traffic management. Eastbound vehicles in the nearside lane turning right from York Place towards the Picardy Place roundabout, were observed encroaching into the offside lane forcing cars in this lane towards the temporary barriers around the proposed buffer location. Poor lane discipline here is likely to force some cars towards the buffer, risking a collision and slight or serious injury to vehicle occupants.

RECOMMENDATION.

The buffer and the deflection area behind the buffer should be protected by a series of passively safe reflective bollards that if hit can be quickly replaced. The audit team have been advised that “Visiflex” bollards in “NAL” sockets are to be provided around the area of the buffer along with retro-reflective markings on the buffer.

POST SITE VISIT WORKS.

Since the site visit on 12th February bollards have been provided around the buffer and the buffer has been made more conspicuous with the application of reflective markings. The Audit team consider these measures to meet the above recommendation.



5.1C.3 PROBLEM.

LOCATION. Section 1C. York Place Westbound bus stop.

SUMMARY. Risk of Pedestrians being hit on Pelican crossing.

The westbound bus stop on York Place is immediately in front of a Pelican crossing. The Pelican crossing was not commissioned at the time of the Stage 3 RSA site visit. There are only two zig-zag markings between the bus stop bay and the Pelican stop line. Buses stopped at the front of the bus bay will completely obstruct a driver's sight of the nearside primary signal aspect and any waiting pedestrians. Likewise pedestrians waiting to cross will not be able to see approaching traffic in the outside lane. Inadequate safe sighting distances are provided here and there is a high risk these factors will contribute to a pedestrian injury collision.

RECOMMENDATION.

Relocate the bus stop westwards to beyond the Pelican crossing or increase the sightlines to the crossing by moving the bus stop eastwards to be further away for the Pelican crossing.

DESIGNERS RESPONSE

City of Edinburgh Council to monitor the problem

SIGNING, ROAD MARKING AND STREET LIGHTING ISSUES

5.1C.4 PROBLEM.

LOCATION. Along route from York Place to Haymarket

SUMMARY. Risk of tram collision with pedestrians.

At the time of the night time visit there were still a number of lights not illuminated. This may reduce the visibility of pedestrians by tram drivers resulting in collisions with pedestrians

RECOMMENDATION.

Ensure all lighting is operational prior to operation of regular service.

DESIGNERS RESPONSE

Agree with recommendation.

5.1C.5 PROBLEM.

LOCATION. Section 1C. North St Andrews Lane / North St Andrew's Street junction.

SUMMARY. Risk of vehicle impact with trams.

It was reported to the audit team that taxi drivers were in the habit of exiting North St Andrew's Lane onto North St Andrew's Street and only looking left, as previously vehicles were only travelled from the left on St Andrew's Street. The trams however travel in both directions. There is therefore a risk that a Taxi could pull out into the path of a passing tram if the drivers are not reminded to look both ways at the stop sign.

RECOMMENDATION.

Provide left and right pointing direction arrows to the Tram route at junction ahead sign, which is mounted below the Stop sign.

DESIGNERS RESPONSE

City of Edinburgh Council to monitor the problem

5.1C.6 PROBLEM.

LOCATION. Section 1C. South St Andrews Street.

SUMMARY. Risk of pedestrian / vehicle impact due to vehicles turning and travelling against a one-way Order.

South St Andrew's Street between its junction with West Register Street and Meuse Lane is a one-way street. Access is restricted to taxis and deliveries. Vehicles leaving South St Andrew's Street should do so via Meuse Lane. South St Andrew's Street is wide enough to allow vehicles to carry out U-turn manoeuvres and some drivers have been seen to carry out U-turns and drive against this short length of one-way operation.

RECOMMENDATION.

Provide One-Way traffic signs (TSRGD Diag 652) on South St Andrews' Street.

DESIGNERS RESPONSE

Agree with recommendation.

SECTION 1D. Princes St Tram Stop to Haymarket Tram Stop.

GENERAL ISSUES.

5.1D.1 PROBLEM.

LOCATION. Section 1C/1D

SUMMARY. Departures from Standard.

The audit team have been advised of the following approved departures from standard.

Section 1C and 1D – Carriageway marking to diagram 1066 spacing – swept path markers at 1.2m rather than 1.5m

Section 1D – Reduced footway clearances at Haymarket Terrace – max. footway clearance of 1.2m; Drawing Ref ULE90130-01-DRG-00794; OLE Ref: 131+149B

RECOMMENDATION.

None.

DESIGNERS RESPONSE

Agree with recommendation.

5.1D.2 PROBLEM.

LOCATION. Section 1D.

SUMMARY. Departures from Standard.

The audit team has been advised of the following approved departures from standards.

Departure No	Location	Departure Type
1D - D1	Princes Street West to Haymarket	Width of footway
1D - D2	Princes Street West to Haymarket	Crossfall of footway
1D - D3	Princes Street West to Haymarket	Cross fall of carriageway
1D - D4	Princes Street West to Haymarket	Width of footway
1D - D5	Princes Street West to Haymarket	Signal Controlled Junction intervisibility zone
1D - D6	Princes Street West to Haymarket	Widths of traffic lanes
1D - D7	Princes Street West to Haymarket	Length of pedestrian crossings
1D - D8	Princes Street West to Haymarket	Junction Intervisibility

RECOMMENDATION.

The audit team considers the essential compensatory measures identified in the departure report, Ref ULE90130-01-REP-00156 V2 to be appropriate and proportionate to the problems identified. It is recommended these measures are implemented.

DESIGNERS RESPONSE

Agree with recommendation.

NON MOTORISED ROAD USER ISSUES

5.1D.3 COMMENT.

LOCATION. Section 1D. Approach to Haymarket Station.

SUMMARY. Risk of cyclists falling in front of trams.

During the site visit on the 12th February the old Haymarket Station was closed for refurbishment and taxis have been relocated to the northwest side of Haymarket Terrace. Cyclists are encouraged to use the short “jug handle” design cycle lane within the Haymarket Station junction in order to cross the tram lines at a safer angle. A member of the audit team cycled through this area during the site visit and found it to be safe provided the marked alignment was taken.



RECOMMENDATION.

City of Edinburgh Council continue to promote good cycling practice and publicize to cyclist the recommended methods of crossing tram lines.

DESIGNERS RESPONSE

City of Edinburgh Council to monitor the problem

SIGNING, ROAD MARKING AND STREET LIGHTING ISSUES.

5.1D.4 PROBLEM.

LOCATION. Section 1D. Princes Street at its junction with Lothian Road

SUMMARY. Risk of pedestrian /vehicle conflict at signalised junction.

The audit team were informed of drivers ignoring the straight ahead only signal aspect and turning right from Princes Street into Lothian Road. This potentially dangerous manoeuvre could confuse pedestrians crossing Lothian Road, who could step onto the road whilst not expecting traffic to turn right from Princes Street into Lothian Road.

RECOMMENDATION.

Replace the straight ahead arrows with No Right Turn aspects on the signal heads.

DESIGNERS RESPONSE

City of Edinburgh Council to action.

5.1D.5 PROBLEM.

LOCATION. Section 1C & 1D. Princes Street / Hanover / The Mound junction and Old Haymarket Station.

SUMMARY. Risk of inconspicuous pedestrians being struck by trams.

During the site visit there were a number of street lamps and sign lamps not illuminated. This had been identified in the previous interim audit (21/10/13), but had not been fully addressed.

The street lighting along Princes Street is mounted on a pole that also carries the overhead line equipment (OLE) for the trams. The power supply to the trams has to be switched off in order to replace a defective street lamp.

Outside the old Haymarket Station a street lamp cover was hanging by its hinges.

The audit team note that the designer response issued on 21/2/14 states that "Infracore to complete lighting works prior to final handover. Further assessment in final Stage 3 RSA in Feb 14".

RECOMMENDATION.

Repair the defective street lamps.

DESIGNERS RESPONSE

Problem now closed.

PROBLEM.

5.1D.6

LOCATION. Section 1D. Atholl Place

SUMMARY. Risk of cyclist riding within the tram lanes.

Westbound cyclist on Atholl Place are required to turn left and go via Torphichen Street and Morrison Street to reach Haymarket. Many cyclist will ride straight ahead along West Maitland Street, as they have been permitted to share tram lanes elsewhere in the city.

RECOMMENDATION.

Provide signage to instruct cyclists to turn left onto Torphichen Street.

DESIGNERS RESPONSE

City of Edinburgh Council to action

SECTION 2A Haymarket Tram Stop to Russell Road

5.2A.1 PROBLEM.

LOCATION. Section 2A

SUMMARY. Departures from Standard.

The audit team has been advised of the following approved departures from standards.

Departure No	Location	Departure Type
2A - D1	Haymarket Yards	Width of footway
2A - D2	Haymarket Yards	Crossfall of footway
2A - D3	Haymarket Yards – General Access Road	Wheel path segregation
2A - D4	South of Verity House	Horizontal Radius
2A - D5	Haymarket Terrace / Haymarket Yards Junction	Horizontal Radius
2A - D6	Haymarket Yards	Stopping Sight Distance, on approach to traffic signals
2A - D7	Haymarket Yards	Advanced cyclists waiting area, non-standard entry taper
2A - D8	Haymarket Yards – General Access Road	Signal Controlled Junction intervisibility zone
2A - D9	Haymarket Yards / New access into Haymarket Station car park	Signal Controlled Junction intervisibility zone
2A - D10	Haymarket Yards / New access into Haymarket Station car park	width of carriageway

RECOMMENDATION.

The audit team considers the essential compensatory measures identified in the departure report, Ref ULE90130-02-REP-00033 V3 to be appropriate and proportionate to the problems identified. It is recommended these measures are implemented.

DESIGNERS RESPONSE

Agree with recommendation.

SECTION 5A Russell Road to Balgreen Tram Stop.

GENERAL ISSUES.

5.5A.1 PROBLEM.

LOCATION. Section 5A

SUMMARY. Departures from Standard.

The audit team have been advised of the following approved departures from standard

Murrayfield Tram Stop footway width – width of 1.5m accepted rather than 2.0m as shown on design.

RECOMMENDATION.

None.

DESIGNERS RESPONSE

Agree with recommendation.

5.5A.2 PROBLEM.

LOCATION. Section 5A

SUMMARY. Departures from Standard.

The audit team has been advised of the following approved departures from standards.

Departure No	Location	Departure Type
5A - D1	Haymarket Depot entrance from Russell Road	Vertical geometry.
5A - D2	Roseburn Street	Carriageway cross fall.
5A - D3	Roseburn Street	Junction radii.
5A - D4	Roseburn Street	Sub-standard junction Y-dimension visibility.
5A - D5	Roseburn Street	Sub-standard sight distance

RECOMMENDATION.

The audit team considers the essential compensatory measures identified in the departure report, Ref ULE90130-05-REP-00283 V1 to be appropriate and proportionate to the problems identified. It is recommended these measures are implemented.

DESIGNERS RESPONSE

Agree with recommendation.

NON MOTORISED ROAD USER ISSUES.

5.5A.3 PROBLEM.

LOCATION. Section 5A. Balgreen Road

SUMMARY. Risk of vehicle impact with cyclists

A Pelican crossing is present at the Balgreen Tram stop. This crossing forms part of the cycle route and will therefore be used by cyclists. It should therefore be a Toucan crossing.

RECOMMENDATION.

Change crossing from a Pelican crossing to a Toucan crossing.

DESIGNERS RESPONSE

City of Edinburgh Council to action.

SIGNING, ROAD MARKING AND STREET LIGHTING ISSUES.

5.5A.4 PROBLEM.

LOCATION. Section 5A. Balgreen Road

SUMMARY. Risk of vehicle impact with pedestrians.

The zigzag markings on the northbound approach to the Pelican crossing are only two lines in length. This may not give sufficient warning to drivers of the presence of the crossing and may encourage vehicles to stop to drop off tram users. This may result in a risk of collision of vehicles with pedestrians or cyclists using the crossing.

RECOMMENDATION.

Provide the full number of zig zag markings.

DESIGNERS RESPONSE

City of Edinburgh Council and Infracore to agree suitable marking to be installed.

5.5A.5 PROBLEM.

LOCATION. Section 5A. Balgreen Road

SUMMARY. Risk of cyclists colliding with vehicles on Balgreen Road

Cyclists heading down the vehicle ramp from Balgreen Tram Stop may cycle straight onto Balgreen Road risking collision with vehicles. The signalised crossing cannot be viewed directly from the ramp.

RECOMMENDATION.

Provide cycle route signing for cyclists using the ramp to direct them to the crossing point. Remove the "End of Cycle Route" sign.

DESIGNERS RESPONSE

City of Edinburgh Council to monitor meantime and change signs when toucan is installed

SECTION 5B Balgreen Tram Stop to Edinburgh Park Central Tram Stop.

GENERAL ISSUES.

5.5B.1 PROBLEM.

LOCATION. Section 5B

SUMMARY. Departures from Standard.

The audit team have been advised of the following approved departures from standard

Section 5B - Carrick Knowe Bridge – reduced clearance at the lighting column – reduced clearance footway width of 1.5m

Section 5B – South Gyle Access – width of central island = 1.13m.

Section 5B – Saughton Tram Stop – east footway max longfall of 7.9%; (west footway max longfall of 6.5%)

RECOMMENDATION.

None.

DESIGNERS RESPONSE

Agreed

5.5B.2 PROBLEM.

LOCATION. Section 5B

SUMMARY. Departures from Standard.

The audit team has been advised of the following approved departures from standards.

Departure No	Location	Departure Type
5B - D1	Edinburgh Park Station	Vertical Geometry & Sight Stopping Distance
5B - D2	Edinburgh Park Station	Reduction in combined footway/cycleway width
5B - D3	Carrick Knowe Existing Foot-bridge	Gradient of combined footway/cycleway
5B - D4	Edinburgh Park Station	Gradient of segregated footway/cycleway
5B - D5	Bankhead Drive / South Gyle Access Junction	Signal Controlled Junction intervisibility zone
5B - D6	Bankhead Drive eastbound nearside at the junction with South Gyle Access	Gradient
5B - D7	Carrick Knowe Bridge	Width of shared path

RECOMMENDATION.

The audit team considers the essential compensatory measures identified in the departure report, Ref ULE90130-05-REP-00282 V2 to be appropriate and proportionate to the problems identified. It is recommended these measures are implemented.

DESIGNERS RESPONSE

Agreed

5.5B.3 PROBLEM.

LOCATION. Section 5B. Bankhead Dr / South Gyle access

SUMMARY. Risk of pedestrians being struck by cyclists.

The bollard at the end of this section of cycle pedestrian segregated route is the wrong way round and indicates to pedestrians to use the cycle lane and vice versa. This will bring pedestrians and cyclists into conflict.

RECOMMENDATION.

Rotate the bollard to correctly indicate the cycle and pedestrians sections of this route.

DESIGNERS RESPONSE

Agreed

5.5B.4 PROBLEM.

LOCATION. Section 5B. Bankhead Drive approach to South Gyle Access.

SUMMARY. Risk of Cyclist colliding with street furniture.

Cyclist are forced to deviate around street furniture and will come into conflict with pedestrians and other cyclists. There was evidence of cyclists passing the street furniture on the left, between the cabinets and the retaining wall.



RECOMMENDATION.

Provide some road markings between the tactile slabs and the controllers to guide cyclists away from the controllers.

DESIGNERS RESPONSE

City of Edinburgh Council and Infracore to agree suitable marking to be installed.

SECTION 5C Edinburgh Park Central Tram Stop to Gogarburn Tram Stop.

5.5C.1 PROBLEM.

LOCATION. Section 5C

SUMMARY. Departures from Standard.

The audit team have been advised of the following approved departures from standard

Section 5C – Ramp opposite “Puregym” being too steep – max longfall of 6.3% (1 in 16)

Section 5C – Gyle Tram Stop Steps and Ramp – ramp max longfall of 5.2% (1 in 18.9)

Section 5C – Ramp from Gyle to A8 (existing ramp) - max longfall of 7.1% (1 in 14)

Section 5C – Tram Pedestrian Crossing at South Gyle Broadway. Crossing not in line with standard due to design not considering OLE backstay – hence crossing “squeezed” into available space. CEC will accept departure due to limited usage of this crossing.

Section 5C – Gogarburn Tramstop – west approach too steep - max longfall of 12% (outwith the scope of this Audit)

RECOMMENDATION.

None.

DESIGNERS RESPONSE

Agreed

SECTION 7A Eastfield Avenue

5.7A.1 PROBLEM.

LOCATION. Section 7A

SUMMARY. Departures from Standard.

The audit team has been advised of the following approved departure from standards.

Departure No	Location	Departure Type
7A - D1	Eastfield Avenue	Ramp Gradient

COMMENT.

The audit team has reviewed the departure report, Ref ULE90130-05-REP-00283 V1 and has no comment to make on this departure.

DESIGNERS RESPONSE

Agreed

6. AUDIT STATEMENT.

EDINBURGH TRAMS PROJECT Various locations;

- 1C York Place to Princes St Tram Stop (west end of stop)
- 1D Princes St Tram Stop to Haymarket Tram Stop (east end of stop)
- 2A Haymarket Tram Stop to Russell Road
- 5A Russell Road to Balgreen Tram Stop (east end)
- 5B Balgreen Tram Stop to Edinburgh Park Central Tram Stop (west end)
- 5C Edinburgh Park Central Tram Stop to A8 only
- 7A Gogarburn Tram Stop to Airport Tram Stop (Eastfield Ave only)

ROAD SAFETY AUDIT STAGE 3

I certify that the Audit Team has examined the works listed in this report and visited the site. The examination has been carried out with the sole purpose of identifying any features of design or construction that can be modified in order to improve the safety of the scheme. The problems identified have been noted in this report together with recommendations, which should be studied for implementation. The audit has been carried out in general accordance with HD 19/03.

No-one in the audit team has been involved in the scheme design



Signed.....

Date

APPENDICES

APPENDIX i Drawing Register

APPENDIX ii Stage 2 RSA Reports

APPENDIX iii Departure Reports

APPENDIX iv Interim Stage 3 Road Safety Audit Reports

APPENDIX v Designers Response to Interim Road Safety Audits.

APPENDIX vi Designers Response to Final Road Safety Audits.

APPENDIX i Drawing Register

DRAWINGS – Transmittal 8019

HRL GENERAL OVERVIEW DRAWINGS

ULE90130-01-HRL-00017 Rev 17
ULE90130-01-HRL-00018 Rev 17
ULE90130-01-HRL-00019 Rev 15
ULE90130-01-HRL-00020 Rev 10
ULE90130-01-HRL-00021 Rev 12
ULE90130-01-HRL-00022 Rev 13
ULE90130-01-HRL-00023 Rev 12
ULE90130-01-HRL-00024 Rev 16

ULE90130-02-HRL-00001 Rev 14
ULE90130-02-HRL-00002 Rev 5
ULE90130-02-HRL-00003 Rev 9

ULE90130-05-HRL-00001 Rev 9
ULE90130-05-HRL-00002 Rev 7
ULE90130-05-HRL-00003 Rev 6
ULE90130-05-HRL-00004 Rev 5
ULE90130-05-HRL-00005 Rev 8
ULE90130-05-HRL-00006 Rev 8
ULE90130-05-HRL-00007 Rev 6
ULE90130-05-HRL-00008 Rev 6
ULE90130-05-HRL-00009 Rev 13
ULE90130-05-HRL-00010 Rev 10
ULE90130-05-HRL-00011 Rev 6
ULE90130-05-HRL-00012 Rev 5
ULE90130-05-HRL-00013 Rev 5
ULE90130-05-HRL-00014 Rev 6
ULE90130-05-HRL-00015 Rev 7
ULE90130-05-HRL-00016 Rev 5
ULE90130-05-HRL-00017 Rev 8
ULE90130-05-HRL-00018 Rev11
ULE90130-05-HRL-00019 Rev 6
ULE90130-05-HRL-00020 Rev 5
ULE90130-05-HRL-00021 Rev 5
ULE90130-05-HRL-00022 Rev 6
ULE90130-05-HRL-00023 Rev 8
ULE90130-05-HRL-00024 Rev 5
ULE90130-05-HRL-00025 Rev 5
ULE90130-05-HRL-00026 Rev 12

ULE90130-07-HRL-00001 Rev 7
ULE90130-07-HRL-00002 Rev 6

ULE90130-07-HRL-00003 Rev 10
ULE90130-07-HRL-00004 Rev 6
ULE90130-07-HRL-00005 Rev 6
ULE90130-07-HRL-00006 Rev 7
ULE90130-07-HRL-00007 Rev 7
ULE90130-07-HRL-00008 Rev 10
ULE90130-07-HRL-00009 Rev 6
ULE90130-07-HRL-00010 Rev 4

SECTION 1C and 1D – York Place to Haymarket

ULE90130-01-HRL-00086 Rev 3
ULE90130-01-HRL-01142 Rev 2
ULE90130-01-HRL-00109 Rev 2
ULE90130-01-HRL-00108 Rev 2
ULE90130-01-HRL-00090 Rev 3
ULE90130-01-HRL-00088 Rev 3
ULE90130-01-HRL-00087 Rev 3
ULE90130-01-HRL-00085 Rev 3
ULE90130-01-HRL-00084 Rev 3
ULE90130-01-HRL-00082 Rev 4
ULE90130-01-HRL-01136 Rev 3
ULE90130-01-HRL-01250 Rev 5
ULE90130-01-HRL-01281 Rev 5
ULE90130-01-HRL-01280 Rev 6
ULE90130-01-HRL-01220 Rev 5
ULE90130-01-HRL-01131 Rev 13
ULE90130-01-HRL-01120 Rev 5
ULE90130-01-HRL-00081 Rev 5
ULE90130-01-HRL-01135 Rev 3
ULE90130-01-HRL-00049 Rev 4
ULE90130-01-HRL-00083 Rev 5
ULE90130-01-HRL-00719 Rev 4
ULE90130-01-HRL-00524 Rev 4
ULE90130-01-HRL-00220 Rev 4
ULE90130-01-HRL-00219 Rev 4
ULE90130-01-HRL-01141 Rev 4
ULE90130-01-HRL-01133 Rev 8
ULE90130-01-HRL-01130 Rev 10
ULE90130-01-HRL-00079 Rev 4
ULE90130-01-HRL-00078 Rev 3
ULE90130-01-HRL-01134 Rev 14
ULE90130-01-HRL-01137 Rev 3
ULE90130-01-HRL-00420 Rev 6
ULE90130-01-HRL-00020 Rev 10
ULE90130-01-HRL-00217 Rev 10
ULE90130-01-HRL-01116 Rev 8
ULE90130-01-HRL-00016 Rev13
ULE90130-01-HRL-01282 Rev7
ULE90130-01-HRL-01252 Rev9

ULE90130-01-HRL-01222 Rev10
ULE90130-01-HRL-01122 Rev8
ULE90130-01-HRL-00722 Rev5
ULE90130-01-HRL-00422 Rev10
ULE90130-01-HRL-00222 Rev7
ULE90130-01-HRL-00022 Rev1
ULE90130-01-HRL-01138 Rev8
ULE90130-01-HRL-00801 Rev6
ULE90130-01-HRL-00536 Rev7
ULE90130-01-HRL-00065 Rev5
ULE90130-01-HRL-00064 Rev6
ULE90130-01-HRL-00062 Rev7
ULE90130-01-HRL-00537 Rev8
ULE90130-01-HRL-00535 Rev10
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ULE90130-01-HRL-01276 Rev8
ULE90130-01-HRL-00716 Rev7
ULE90130-01-HRL-00416 Rev7
ULE90130-01-HRL-01121 Rev6
ULE90130-01-HRL-00216 Rev6
ULE90130-01-HRL-00224 Rev10
ULE90130-01-HRL-01251 Rev8
ULE90130-01-HRL-01221 Rev9
ULE90130-01-HRL-00721 Rev6
ULE90130-01-HRL-00421 Rev8
ULE90130-01-HRL-00021 Rev12
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ULE90130-01-HRL-00019 Rev15
ULE90130-01-HRL-00221 Rev7
ULE90130-01-HRL-01279 Rev10
ULE90130-01-HRL-01249 Rev9
ULE90130-01-HRL-01219 Rev9
ULE90130-01-HRL-00419 Rev10
ULE90130-01-HRL-01119 Rev6
ULE90130-01-HRL-01314 Rev5
ULE90130-01-HRL-01278 Rev11
ULE90130-01-HRL-01248 Rev12
ULE90130-01-HRL-01218 Rev12
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ULE90130-01-HRL-01118 Rev12
ULE90130-01-HRL-00718 Rev12
ULE90130-01-HRL-00418 Rev13
ULE90130-01-HRL-00218 Rev11
ULE90130-01-HRL-00018 Rev17
ULE90130-01-HRL-01284 Rev10
ULE90130-01-HRL-01254 Rev11
ULE90130-01-HRL-01224 Rev12
ULE90130-01-HRL-00724 Rev10

ULE90130-01-HRL-00424 Rev10
ULE90130-01-HRL-00024 Rev16
ULE90130-01-HRL-01124 Rev12
ULE90130-01-HRL-01283 Rev8
ULE90130-01-HRL-01253 Rev8
ULE90130-01-HRL-01223 Rev9
ULE90130-01-HRL-01123 Rev8
ULE90130-01-HRL-00723 Rev7
ULE90130-01-HRL-00423 Rev8
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ULE90130-01-HRL-01247 Rev13
ULE90130-01-HRL-01217 Rev12
ULE90130-01-HRL-00417 Rev13
ULE90130-01-HRL-00017 Rev17
ULE90130-01-HRL-01126 Rev 8
ULE90130-01-HRL-01117 Rev13
ULE90130-01-HRL-00717 Rev11

SECTION 2A – Haymarket to Roseburn Delta

ULE90130-02-HRL-00801 Rev11
ULE90130-02-HRL-00800 Rev9
ULE90130-02-HRL-00101 Rev11
ULE90130-02-HRL-00100 Rev9
ULE90130-02-HRL-00901 Rev12
ULE90130-02-HRL-00001 Rev14
ULE90130-02-HRL-00903 Rev8
ULE90130-02-HRL-00553 Rev3
ULE90130-02-HRL-00503 Rev6
ULE90130-02-HRL-00003 Rev9
ULE90130-02-HRL-00902 Rev5
ULE90130-02-HRL-00551 Rev5
ULE90130-02-HRL-00501 Rev8
ULE90130-02-HRL-00404 Rev4
ULE90130-02-HRL-00401 Rev6
ULE90130-02-HRL-00403 Rev5
ULE90130-02-HRL-00552 Rev2
ULE90130-02-HRL-00502 Rev5

SECTION 5 – Roseburn Delta to RBS Gogarburn (works to exclude Depot Access Road, A8 and Gogar Castle Access Road)

ULE90130-05-HRL-00539 Rev6
ULE90130-05-HRL-00414 Rev4

ULE90130-05-HRL-00236 Rev5
ULE90130-05-HRL-00234 Rev5
ULE90130-05-HRL-00233 Rev5
ULE90130-05-HRL-00232 Rev6
ULE90130-05-HRL-00231 Rev6
ULE90130-05-HRL-00230 Rev7
ULE90130-05-HRL-00133 Rev6
ULE90130-05-HRL-00131 Rev7
ULE90130-05-HRL-00020 Rev5
ULE90130-05-HRL-00016 Rev5
ULE90130-05-HRL-00014 Rev6
ULE90130-05-HRL-00013 Rev5
ULE90130-05-HRL-00012 Rev5
ULE90130-05-HRL-00008 Rev6
ULE90130-05-HRL-00007 Rev6
ULE90130-05-HRL-00968 Rev4
ULE90130-05-HRL-00967 Rev4
ULE90130-05-HRL-00962 Rev6
ULE90130-05-HRL-00562 Rev6
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ULE90130-05-HRL-00261 Rev6
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ULE90130-05-HRL-00942 Rev7
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ULE90130-05-HRL-00540 Rev10
ULE90130-05-HRL-00536 Rev7
ULE90130-05-HRL-00531 Rev8
ULE90130-05-HRL-00418 Rev6
ULE90130-05-HRL-00417 Rev6
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ULE90130-05-HRL-00961 Rev5
ULE90130-05-HRL-00561 Rev5
ULE90130-05-HRL-00021 Rev5
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ULE90130-05-HRL-00415 Rev5
ULE90130-05-HRL-00015 Rev7
ULE90130-05-HRL-00011 Rev6
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ULE90130-05-HRL-00931 Rev6
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ULE90130-05-HRL-00504 Rev3
ULE90130-05-HRL-00404 Rev3
ULE90130-05-HRL-00204 Rev3
ULE90130-05-HRL-00004 Rev5
ULE90130-05-HRL-00425 Rev3
ULE90130-05-HRL-00424 Rev3
ULE90130-05-HRL-00262 Rev4
ULE90130-05-HRL-00260 Rev4
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ULE90130-05-HRL-00800 Rev7
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ULE90130-05-HRL-00401 Rev6
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ULE90130-05-HRL-00902 Rev7
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ULE90130-05-HRL-00503 Rev4
ULE90130-05-HRL-00502 Rev7
ULE90130-05-HRL-00405 Rev5
ULE90130-05-HRL-00402 Rev6
ULE90130-05-HRL-00205 Rev4
ULE90130-05-HRL-00005 Rev8
ULE90130-05-HRL-00003 Rev6
ULE90130-05-HRL-00002 Rev7

SECTION 7A – RBS Gogarburn to Airport

ULE90130-07-HRL-00508 Rev9
ULE90130-07-HRL-01301 Rev2
ULE90130-07-HRL-01302 Rev1
ULE90130-07-HRL-00010 Rev4
ULE90130-07-HRL-00800 Rev8
ULE90130-07-HRL-00100 Rev8
ULE90130-07-HRL-00908 Rev7
ULE90130-07-HRL-00008 Rev10
ULE90130-07-HRL-00201 Rev9
ULE90130-07-HRL-00003 Rev10
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ULE90130-07-HRL-00907 Rev6
ULE90130-07-HRL-00507 Rev6
ULE90130-07-HRL-00407 Rev5
ULE90130-07-HRL-00009 Rev6
ULE90130-07-HRL-00005 Rev6
ULE90130-07-HRL-00004 Rev6
ULE90130-07-HRL-00002 Rev6

APPENDIX ii Stage 2 RSA Reports

ROAD SAFETY REPORTS

ULE90130-01-REP-00110 Rev10
ULE90130-07-REP-00043 Rev3
TMUSDSrsa2 S1C-02 Rev8
ULE90130-02-REP-00017 Rev3
ULE90130-05-REP-00216 Rev7
ULE90130-05-REP-00214 Rev5
ULE90130-01-REP-00111 Rev8
TMUSDSrsa2 S5C-01 rev4
TMUSDSrsa2 S5A-01 rev2
TMUSDSrsa2 S2A-01 rev2
TMUSDSrsa2 S1D-01 rev5
TMUSDS-rsa2-S5B-01 Rev2
ULE90130-05-REP-00215 Rev4
TMUSDS-rsa2-S7A Rev3
ULE90130-05-REP-00226 Rev2
ULE90130-01-REP-00096 Rev3
ULE90130-01-REP-00093 Rev3
ULE90130-05-REP-00262 May 2007
ULE90130-07-REP-00044 Rev1
ULE90130-01-REP-00126 Rev0
ULE90130-01-REP-00125 Rev1

APPENDIX iii List of Departure Reports

Section	Departure Report Reference
1C	Ref ULE90130-01-REP-00155-V5
1D	ULE90130-01-REP-00156 V2
2A	ULE90130-02-REP-00033 V3
5A	Ref ULE90130-05-REP-00283 V1
5B	ULE90130-05-REP-00282 V2
7A	ULE90130-07-REP-00050 V2
Road and Track departure Report System wide	ULE90130-SW-REP-00872 V1

APPENDIX iv Interim Road Safety Audit Reports.

INTERIM STAGE 3 ROAD SAFETY AUDIT REPORT FOR EDINBURGH TRAMS NETWORK

Princes Street
(Waverley Bridge to South St. Andrew Street)



Traffic Consultant
5 Sentry Road
Selkirk
TD7 4BE



In association with:

WYLLIE LODGE
INDEPENDENT ROAD SAFETY AUDITORS

Report Reference:-
Princes St. "Plug" Interim RSA3.

Date 10.12.12

Stage 3 Road Safety Audit
Princes Street (Waverley Bridge to South St.Andrew Street)

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Stage 3 Road Safety Audit
Princes Street (Waverley Bridge to South St.Andrew Street)

1. INTRODUCTION

1.1 This is a report of an independent pre-Stage 3 Road Safety Audit carried out on Sections 1C and 1D of the Edinburgh Tram Project.

1.2 The Audit Team members were :-

██████████ C.Eng, MICE Dip TE – Road Safety Audit Team Leader

██████████, City of Edinburgh Council - Tram Engineering Manager

██████████, Bilfinger Construction UK

1.3 The team visited the site on 20 November 2012 between 10 am and 11 am when the weather was fair, the roads were dry and the traffic – both pedestrian and vehicular – was very busy.

1.4 The following drawings were made available to the team :-

- ULE 90130-01-HRL-00017 – Road Scheme Layout
- -00018 – Road Scheme Layout
- -00083 – Typical Cross-sections
- -00086 – Typical Cross-sections
- -00108 – Typical Cross-sections
- -00109 – Typical Cross-sections
- -01118 – Kerbs, Footways & Paved Areas

1.5 The team has examined and reported only on the road safety implications of the layout and not on its design.

Stage 3 Road Safety Audit
Princes Street (Waverley Bridge to South St. Andrew Street)

C2 MATTERS ARISING FROM THE AUDIT

C2.1 It was reported that the following work will not be done before the planned re-opening of the road on Friday 23 November :-

- The new street lighting at the junction of Waverley Bridge and South St. Andrew St. (the columns are up but there are no lanterns attached)
- The road signs will be up but not lit
- A traffic signal head on Pole No. 17 will not be in place as yet.

C2.2 The following work should be done before the road is re-opened :-

- The road surfacing including the High Friction surfacing
- The paving of the footways
- The paving of the pedestrian crossing place at the foot of South St. Andrew St.
- All ironwork to be reinstated
- The ACO drain to be cleaned out
- The traffic signals to be ready to be switched on
- All temporary traffic management barriers and signs to be removed
- The narrow footway at the Applestore development to be widened

C2.3 None of these works outstanding, whether completed or not by the re-opening date of 23 November, poses any significant road safety hazards, and it is the auditor's view that it is safe to re-open the section of road known as the Princes Street Plug.

C2.4 PROBLEM - Non-Motorised Users

It is inevitable that the interface between non-motorised users – particularly cyclists and pedestrians – and the trams and their tracks will pose road safety problems.

Stage 3 Road Safety Audit
Princes Street (Waverley Bridge to South St. Andrew Street)

In addition, users of mobility scooters may experience difficulties.

There is a likelihood that inattentive or impaired pedestrians or cyclists may be struck by trams. There is also the possibility of cyclists and users of mobility scooters being unseated while crossing the tram tracks, particularly at an acute angle. Both of these mishaps could have serious road safety consequences.

This project includes excellent provision of pedestrian crossing facilities. There should be no need for pedestrians to cross outwith these areas in conflict with the trams. As the trams are highly visible there is no need for numerous warning signs. It is anticipated that the trams will impose a road user discipline which will be safe for all road users.

One problem remaining is the crossing of the tracks by cyclists and users of mobility scooters particularly if they cross at an acute angle.

RECOMMENDATION

As part of their tram scheme, Transport for Greater Manchester has produced a safety leaflet about cycling on roads on which trams operate.

It is recommended that the City of Edinburgh Council produce and distribute widely a similar leaflet.

Stage 3 Road Safety Audit
Princes Street (Waverley Bridge to South St. Andrew Street)

3. AUDIT TEAM STATEMENT

Princes Street (Waverley Bridge to South St. Andrew St.)

INTERIM ROAD SAFETY AUDIT STAGE 3

I certify that the audit team have examined the works listed in this report and visited the site. The examination has been carried out with the sole purpose of identifying any features of design or construction that can be modified in order to improve the safety of the scheme. The problems identified have been noted in this report together with recommendations, which should be studied for implementation. The audit has been carried out in general accordance with HD 19/03.

No-one in the audit team has been involved in the scheme design

 Signed.....

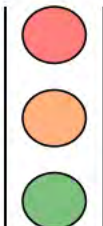
Date

INTERIM STAGE 3 ROAD SAFETY AUDIT REPORT FOR EDINBURGH TRAMS NETWORK

Ingilston P&R Stop,
Edinburgh International Estate Crossing,
Gogarburn Stop,
Gogar Castle Access Crossing.



Traffic Consultant
5 Sentry Road
Selkirk
TD7 4BE



In association with:

WYLLIE LODGE
INDEPENDENT ROAD SAFETY AUDITORS

Report Reference:-
Ingilston P&R – Gogar Castle RSA3.

Date 08.2.13

Stage 3 Road Safety Audit
Ingilston P&R Stop to Gogar Castle Access

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Stage 3 Road Safety Audit
Ingilston P&R Stop to Gogar Castle Access

1. INTRODUCTION

1.1 This is a report of an independent Stage 3 Road Safety Audit carried out on the following elements of the Edinburgh Tram Project.

- i) Ingilston P&R Stop,
- ii) Edinburgh International Estate Crossing,
- iii) Gogarburn Stop,
- iv) Gogar Castle Access

1.2 The Audit Team members were :-

██████████ C.Eng, MICE Dip TE – Road Safety Audit Team Leader
██████████, BSc, MSc, CMILT, MCIHT. - Road Safety Audit Team Member
██████████ I.Eng, MCIHT, MSoRSA - Road Safety Audit Team Member

Also in attendance were;

██████████, City of Edinburgh Council - Tram Engineering Manager
██████████, Bilfinger Construction UK

Apologies were given by ██████████ from Lothian & Borders Police.

1.3 The team visited the site on 8th February 2013 between 6:45 am and 9.00 am when the weather was dry and very cold, the roads and footways were slippery with frost.

1.4 The following drawings were made available to the team :-

- ***List to be completed here***

1.5 The team has examined and reported only on the road safety implications of the layout and not on its design.

Stage 3 Road Safety Audit
Ingilston P&R Stop to Gogar Castle Access

C2 MATTERS ARISING FROM THE AUDIT.

C2.1 Ingilston P&R Tram Stop and Gogerburn Tram Stop.

Note.

During the night time audit the platform lighting and shelter lighting was not switched on. Only the public street lighting system on the approach paths to the stops was energized.

C2.2 Ingilston P&R Tram Stop

There is a risk that wheel chair users will get the small front wheels of their chair stuck in the drainage gully covers that are located at the end of the yellow hatched area beside the disabled parking bays.



Recommendation. Provide a gully cover with openings that run parallel to the adjacent kerb.

Stage 3 Road Safety Audit
Ingilston P&R Stop to Gogar Castle Access

C2.3 Ingilston P&R Tram Stop.

The level of some of the access covers on the platform has been set to low whilst the infill slabs to the covers have been set to the correct level. This has resulted on a tripping point between the cover and the slab fitted to the cover.



Recommendation. Reset the covers and slabs to the correct level to remove the tripping point.

C2.4 Ingilston P&R Tram Stop.

The ramp from the disabled bays to the platform appear steep and there is evidence of water ponding at the bottom of the ramp. The steepness of the ramp maybe too much for wheelchair users to cope with.

Recommendation. Check that the gradient of the ramp is within acceptable standards for wheelchair users and re-grade if necessary. Rectify the drainage / ponding defect.

Stage 3 Road Safety Audit
Ingilston P&R Stop to Gogar Castle Access

C2.5 Ingilston P&R Tram Stop.

There is already evidence of pedestrians walking from the platform directly through the landscaping to the cycle stands. Whilst there is little risk to the safety of those pedestrians who walk across the soft landscaping consideration should be given to providing a surfaced path from the cycle stand to the platform.



C2.6 Gogar Castle Access, Gogarburn Tram Stop and Edinburgh International Estates Crossing.
No problems were identified at these locations identified.

C2.7

As part of their tram scheme, Transport for Greater Manchester has produced a safety leaflet about cycling on roads on which trams operate. It is recommended that the City of Edinburgh Council produce and distribute widely a similar leaflet.

Stage 3 Road Safety Audit
Ingilston P&R Stop to Gogar Castle Access

3. AUDIT TEAM STATEMENT

Ingilston P&R Stop,
Edinburgh International Estate Crossing,
Gogarburn Stop,
Gogar Castle Access

INTERIM ROAD SAFETY AUDIT STAGE 3

I certify that the audit team have examined the works listed in this report and visited the site. The examination has been carried out with the sole purpose of identifying any features of design or construction that can be modified in order to improve the safety of the scheme. The problems identified have been noted in this report together with recommendations, which should be studied for implementation. The audit has been carried out in general accordance with HD 19/03.

No-one in the audit team has been involved in the scheme design

 Signed.....

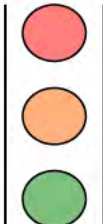
Date

STAGE 3 ROAD SAFETY AUDIT REPORT FOR EDINBURGH TRAMS NETWORK

Various locations between
Edinburgh Airport and
North St Andrews Street



Traffic Consultant
5 Sentry Knowe
Selkirk
TD7 4BE



In association with:

WYLLIE LODGE
INDEPENDENT ROAD SAFETY AUDITORS

Report Reference:-
Airport to St Andrew's SquareRSA3.

Date 08.5.13

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

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Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

1. INTRODUCTION

1.1 This is a report of an independent Stage 3 Road Safety Audit carried out on the following sections of the Edinburgh Tram Project.

- i) Eastfield Avenue Edinburgh Airport,
- ii) Gogar Roundabout,
- iii) A8 Underpass,
- iv) Gyle Tram Stop
- v) South Gyle Broadway Crossing
- vi) Lochside Avenue junction
- vii) Pedestrian Crossing at Ritz Bar and Energise Gym
- viii) Princes Street and Waverley Bridge
- ix) North St Andrews Street
- x) Haymarket Yard.
- xi) Russell Road Bridge
- xii) Murrayfield Stadium

1.2 The Audit Team members were :-

██████████ C.Eng, MICE Dip TE – Road Safety Audit Team Leader

██████████, I.Eng, MCIHT, MSoRSA - Road Safety Audit Team Member

Also in attendance were;

██████████, City of Edinburgh Council - Tram Engineering Manager

██████████, Design Manager, Bilfinger Construction UK

██████████, Police Scotland.

1.3 The team visited the site on 8th May 2013 between 2:00pm and 7.00pm when the weather was showery. A night time site visit is to be carried out once all the associated street lighting is complete.

1.4 Audit Team Member, ██████████, also cycled along the following sections between 10:00am and 1pm on the 8th May.

- i) Princes Street and Waverley Bridge.
- ii) North St Andrews Street.
- iii) Haymarket Yard.
- iv) Russell Road Bridge.
- v) Murrayfield Stadium Station.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

- 1.4 All the relevant drawings were made available to the audit team.
- 1.5 The team has examined and reported only on the road safety implications of the layout and not on its design.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2 MATTERS ARISING FROM THE AUDIT.

C2.1 Eastfield Avenue Edinburgh Airport.

A tree branch in front of the “Trams – Look Both Ways” sign will grow and obstruct sightlines to the sign.



Recommendation. Cut the branch from the tree.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.2 Gogar Roundabout.

Two trees have been planted in front of the new Advance Direction sign. These will grow and obstruct drivers' view of the sign.



Recommendation. Replant the trees behind the sign.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.3 A8 Gogar roundabout eastbound approach.

The vehicle crash barrier (VCB) alignment moves away from the rear of the footway towards the top of the embankment above Gogar Tram Depot. This leaves the lighting column at the rear of the footway unprotected from impact by any errant vehicles.

This VCB is provided to prevent errant vehicles from entering the Tram Depot. If it has been assessed that vehicles will leave the carriageway at this point then there is a risk that they will impact with the lighting columns and signs. The Audit team has considered the safety implications of this. The columns are approximately 4m from the kerb and within a 40 mph speed limit.



Recommendation. Provide a VCB at the rear of the footway in front of the last 2 lighting columns and the advance direction sign or provide passively safe street furniture at this location.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.4 A8 Underpass.

The approach parapet rails provide an opportunity for people to climb on and through to gain access to the 7m high embankment. Young children in particular are likely to climb on these rails in order to see the passing trams.



Recommendation. Provide a mesh to the rails, similar to that provided on the parapet rails on the nearby A8 Gogar roundabout approach retaining walls.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.5 A8 Eastbound exit from Gogar Roundabout.

The lighting columns between the Gogar roundabout eastbound exit and the A8 Tram underpass are placed in front of the vehicle crash barrier (VCB). The merging of the two lane roundabout exit into one lane could lead to swipe type collisions and impact with the VCB and lighting columns.



Recommendation. Relocate the lighting columns to behind the VCB. Similar to the detail used along the Gogar Tram Depot access road.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.6 Gogar Roundabout to A8 underpass, eastbound.

There is no continuous fence or barrier between the A8 and the 7m landscaped embankment above the tram tracks. Any errant vehicles which leave the carriageway at the eastbound A8 exit at Gogar roundabout risk rolling down the embankment and onto the tram lines. This is likely to result in serious injury to vehicle occupants.

Recommendation. Extend the VCB from the Gogar roundabout to the A8 underpass.

C2.7 Gyle Tram Stop.

Sightlines for small children crossing the tram tracks towards the Morrison store are restricted by the adjacent steps. Young children do not have the skills to judge speeds and distances and are known to be impulsive.



Recommendation. Provide signage for approach tram drivers to highlight the possibility of children stepping out from behind the steps.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.8. South Gyle Broadway Crossing.

At several locations within the junction the pedestrian crossing push button facility is too far from the tactile slabs. This may result in visually impaired pedestrians not being able to locate the push button.



Recommendations.

- a) Reposition signal poles so that the push button can be reached from the tactile slab area.
- b) Provide protective covers to the anchor bolts to the adjacent overhead cable column to protect pedestrians from impact with the bolts.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.9. Pedestrian exit from South Gyle Stop to South Gyle Broadway.

There is a risk that pedestrians leaving the tram stop may run along the footway from the tram stop and onto the carriageway of South Gyle Broadway.

Recommendation. Provide a section of pedestrian guardrail along South Gyle Broadway to prevent pedestrians running from the tram stop onto the carriageway.

C2.10. Footway from tram crossing to access road to Ritz Bar and Grill.

Drop kerbs need to be provided to match the existing drop kerbs on the opposite side of the carriageway.



Recommendation. Provide drop kerbs and tactile slabs.

C2.11. Waverley Bridge and Princes Street.

Signage, lighting and tram signal works are incomplete. The area is considered safe for its current use, however, a further audit is required before trams start running on this section.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.12. North St Andrews Street at its junction with St Andrew's Square.

The shared use pedestrian and cyclist sign at the north east side of St Andrew Square is poorly positioned. It is low in height which is a hazard to both pedestrians and cyclists. Its position central within the footway provides a hazard to cyclist turning and visually impaired pedestrians.

Recommendation. Relocate the sign to the rear of the footway.

C2. 13. Haymarket Yards.

The narrowness and stepped alignment of the pedestrian and cyclist route from Balbirnie Place as it joins Haymarket Yards has the following hazards for cyclists;

- a) The sign to the Chartered Accountants is too close to the edge of the path and there is a risk, especially for eastbound cyclist that their handlebars will hit this sign.
- b) The tram tracks are close and at a lower level than the pedestrian and cyclist path.



Recommendations.

- a) Move the sign further away (3m approx) from where cyclist join the path.
- b) Widen the path by surfacing the grass divide, where the sign is currently positioned.
- c) Provide a short section of pedestrian / cyclist barrier rail between the path and the tram tracks.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

C2.14. Murrayfield Stadium Station.

Pedestrian deterrent surfacing has been provided on Roseburn Street to discourage pedestrians walking towards the railway bridge as there is no footway under the eastside of the bridge. The chosen deterrent slab is not very effective. The Audit Team feel that pedestrians will still walk on the surface and end up nearer the bridge where the footway width tapers out and poor sightlines make crossing Roseburn Street hazardous.



Recommendation. Provide a pedestrian refuge island within the hatched area of Roseburn Street.

Stage 3 Road Safety Audit
Various locations, Edinburgh Airport to North St Andrews Street.

3. AUDIT TEAM STATEMENT.

Various locations Edinburgh Airport to North St Andrew's Street.

INTERIM ROAD SAFETY AUDIT STAGE 3

I certify that the audit team have examined the works listed in this report and visited the site. The examination has been carried out with the sole purpose of identifying any features of design or construction that can be modified in order to improve the safety of the scheme. The problems identified have been noted in this report together with recommendations, which should be studied for implementation. The audit has been carried out in general accordance with HD 19/03.

No-one in the audit team has been involved in the scheme design

 Signed.....

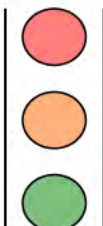
Date 06 April 2014

INTERIM STAGE 3 ROAD SAFETY AUDIT REPORT FOR EDINBURGH TRAMS NETWORK

Various locations between
Hermiston Gait and Haymarket



Traffic Consultant
5 Sentry Knowe
Selkirk
TD7 4BE



In association with:

WYLLIE LODGE
INDEPENDENT ROAD SAFETY AUDITORS

Report Reference:-
Hermiston Gait to Haymarket RSA3.

Date 17.6.13

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

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Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

1. INTRODUCTION

1.1 This is a report of an independent Stage 3 Road Safety Audit carried out on the following sections of the Edinburgh Tram Project.

- i) Hermiston Gait Stop.
- ii) South Gyle Junction.
- iii) Carrick Knowe Guided Busway Junction.
- iv) Saughton Stop.
- v) Murrayfield Stadium Stop.
- vi) Haymarket Station.

1.2 The Audit Team members were :-

██████████ C.Eng, MICE Dip TE – Road Safety Audit Team Leader
██████████, I.Eng, MCIHT, MSoRSA - Road Safety Audit Team Member
██████████, BSc, MSc, MCIHT, CMILT – Road Safety Audit Team Member

Also in attendance were;

██████████, City of Edinburgh Council - Tram Engineering Manager
██████████, Design Manager, Bilfinger Construction UK
██████████, Police Scotland.

1.3 The team visited the site on Wednesday 5th June 2013 between 10:00am and 4.00pm when the weather was warm and sunny. No night-time site visit was carried out at this time.

1.4 All the relevant drawings were made available to the Audit Team.

1.5 The team has examined and reported only on the road, cycle and pedestrian safety implications of the layout and not on its design.

1.6 The Audit Team have not commented on the Stage 2 audit at this time and intend to do this prior to completion of the final stage 3 report.

1.7 It should be noted that many areas of the scheme were incomplete and were not ready for this Stage 3 Audit to be carried out. These sites will require to be revisited.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C2 MATTERS ARISING FROM THE AUDIT.

C 2.1. Hermiston Gait.

The flexible bollards installed to differentiate the cycle and pedestrian sections of the footway / cycleway are hazardous to both cyclists and pedestrians. Their width reduces the available width and in windy conditions they may sway sufficiently to strike pedestrians and cyclists.



Recommendation. Replace these bollards with ones similar to those installed near Edinburgh Airport.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.2. Hermiston Gait.

The cycle route direction signs erected at this location may be confusing to cyclists who see the route provided adjacent to the carriageway.



Recommendation. Provide cycle signing showing destinations.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.3. Toucan crossing between Hermiston Gait tram stop and Hermiston Gait Retail Park.

The toucan crossing at this location only has high friction surfacing on one approach and only two zig-zag markings on one approach. Lack of high friction surfacing may result in vehicles skidding onto the crossing risking collision with pedestrians crossing.



Recommendation	Provide the full complement of line markings and high friction surfacing on both approaches.
----------------	--

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.4. East of Edinburgh Park Station

Two separate footway / cycleways merge before the route heads into the underpass below the tramline. Lack of priority markings may result in cycle to cycle or cycle to pedestrian collisions resulting in personal injury.



Recommendation	Provide priority markings to allow safe movement onto the merged footway / cycleway.
----------------	--

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.5. Hermiston Gait stop and all other tram stops.

The 'Look Both Ways' tram signing located adjacent to the crossing point is unlikely to be seen by pedestrians about to cross the tram tracks.



Recommendation. In order to provide sufficient warning of the presence of trams to pedestrians provide back to back signing on both sides of the track.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.6. Hermiston Gait.

The stays for the overhead cables are anchored within the area of the stop which is accessible to pedestrians. At night or in inclement weather it is possible that pedestrians may trip over these stay or walk into them.



Recommendation. Provide conspicuous covers around the stays

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.7. Hermiston Gait.

Cyclists have been using an informal short cut between the cycle route and Hermiston Gait to avoid the ramp provided. This is likely to continue after the works are complete and may result in cyclists falling in wet or freezing conditions.



Recommendation. Formalise this short cut in bituminous material and with a Give Way marking for cyclists.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.8. Hermiston Gait.

The "No Waiting" sign at this location is below the recommended height and facing the wrong way. This may cause injury to passing pedestrians.



Recommendation. Ensure that all signing at this location is above the recommended 2.25m mounting height.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.9. South Gyle Junction.

The temporary pedestrian crossing at this location is unsuitable for mobility impaired pedestrians and wheelchair users.



Recommendations. Provide dropped kerb crossing points at this location and reinstate to full height kerbs once the works are complete.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.10. Carrick Knowe Guided Busway Junction and other sites.

The tactile paving provided at both crossing points extends beyond the crossing width. Visually impaired pedestrians may fall onto the tram tracks if they use the ends of the tactile paving as a guide



Recommendation. Reduce tactile paving width to match the width of the crossing point.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.11. Carrick Knowe Guided busway Junction

Stairs and perpendicular ramps have been provided to give access between the tramline and the Stenhouse Drive footway. The sides of the ramps have been formed in concrete and are unprotected. This may result in pedestrians falling down the slopes and sustaining personal injury.



Recommendation	Provide handrails at the edge of the ramps to aid safe negotiation and minimize the risk of pedestrians falling down the slope.
----------------	---

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C2.12. Stairs between Carrick Knowe Junction and Stenhouse Drive

It was obvious from the site visit that cyclist have been leaving the surfaced footway / cycleway and riding down the slope adjacent to the stairs to access Stenhouse Drive. In wet weather they risk falling off and sustaining personal injury. A ramped access is provided nearby.



Recommendation Install a section of fence to prevent cyclists riding down the slope and to encourage them to use the dedicated cycle route to access Stenhouse Drive.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.13. Access Road to the north of the track at the Carrick Knowe junction.

The access road and cycle route are at the same level and are separated by a line of kerbs. At night or in inclement weather it may be difficult to see the kerb edging and this may result in injury to cyclists or damage to vehicles



Recommendation. Replace kerblines with a series of bollards to provide easier access for cyclists and pedestrians and highlight the end of the access road for vehicles.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C2.14. Pedestrian crossing point at Carrick Knowe junction.

The concrete surface at the crossing point is approximately 20 to 30mm below the level of the rubberized insert next to the track. This is likely to be a tripping hazard particularly to elderly or mobility impaired pedestrians.



Recommendation	Bring the level of concrete crossing point up to the level of the rubberized track insert.
----------------	--

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.15. Bridge over mainline at Carrick Knowe junction.

The bases for the lighting columns situated on the cycleway / footway sit above the level of the adjacent surface and have protruding fixing bolts. These would be hazardous to pedestrians and cyclists.



Recommendation. Remove the portion of the bolts protruding above the nuts and bring the footway / cycleway surfacing up to a level to eliminate the possibility of tripping over, or running into, the base plate.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C 2.16. Balgreen Road

The northbound approach to the proposed Toucan crossing has restricted sightlines due to the adjacent bridge abutments. Lack of forward visibility may result in vehicle / pedestrian conflict as vehicles attempt to stop at the crossing.



Recommendation	Relocate the Toucan crossing further along Balgreen Road to provide suitable forward visibility to the crossing.
----------------	--

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C2. 17. Saughton Stop

The large electric junction box at the west end of the platform creates a hazard for small children as they try to cross the track as they will not be able to see oncoming trams and tram drivers will not be able to see them.



Recommendation Relocate junction box to the north side of the platform.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C2.18. Murrayfield Stadium Stop.

The coping on the walls adjacent to the steps is flat and could be used by children and skateboarders etc. If they were to fall off this coping they are likely to suffer injury.



Recommendation	Replace flat coping with peaked coping as used on the walls at the adjacent stairs and platform walls.
----------------	--

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C2.19. Murrayfield Stadium Stop

Walls have been constructed at the west end of the platform, presumably to deter pedestrians from walking along the track. These are however too high for children to see oncoming trams before attempting to cross the track.



Recommendation. Reduce a section of wall by three courses Over the first metre to permit intervisibility between children and tram drivers.

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

C2.20. Haymarket – entry barrier at CoSLA building

The entry barrier is situated very close to Haymarket Yards and as such vehicles will require to wait partly in the carriageway and on the tram tracks until they gain access. This may bring them into conflict with trams and result in tram to vehicle collisions.

Recommendation	Relocate entry barrier further within the site to allow awaiting vehicle to leave Haymarket Yards.
----------------	--

Interim Stage 3 Road Safety Audit
Various locations, Hermiston Gait to Haymarket.

3. AUDIT TEAM STATEMENT.

Various locations Hermiston Gait to Haymarket.

INTERIM ROAD SAFETY AUDIT STAGE 3

I certify that the audit team have examined the works listed in this report and visited the site. The examination has been carried out with the sole purpose of identifying any features of design or construction that can be modified in order to improve the safety of the scheme. The problems identified have been noted in this report together with recommendations, which should be studied for implementation. The audit has been carried out in general accordance with HD 19/03.

No-one in the audit team has been involved in the scheme design



Signed.....

Date

INTERIM STAGE 3 ROAD SAFETY AUDIT REPORT FOR EDINBURGH TRAMS NETWORK

SECTION 1C and 1D – York Place to Haymarket.
SECTION 2A – Haymarket to Roseburn Delta.
SECTION 5 – Roseburn Delta to RBS Gogarburn
SECTION 7A – RBS Gogarburn to Airport.



Traffic Consultant
5 Sentry Knowe
Selkirk
TD7 4BE



In association with:

WYLLIE LODGE
INDEPENDENT ROAD SAFETY AUDITORS

Report Reference:-
Airport – York Place Interim Stge3.

Date 03.11.13

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1. INTRODUCTION.

- 1.1 This is a report of an interim independent Stage 3 Road Safety Audit carried out on the following sections of the Edinburgh Tram Project.

Section 1C. York Place to Princes Street

Section 1D. Princes Street to Haymarket Terrace

Section 2A. Haymarket Yards to Roseburn Delta Junction

Section 5A. Russell Road to Network Rail Access Road Balgreen

Section 5B. Balgreen Road to Edinburgh Park Central Tram Stop.

Section 5C. Lochside Avenue to Gogarburn Tram Stop

Section 7A. Gogar Access Road to Airport Tram Stop

- 1.2 The Audit Team members were :-

██████████ C.Eng, MICE Dip TE – Road Safety Audit Team Leader

██████████, I.Eng, MCIHT, MSoRSA - Road Safety Audit Team Member

██████████, BSc, MSc, MCIHT, CMILT – Road Safety Audit Team Member

Also in attendance were;

██████████, City of Edinburgh Council - Tram Engineering Manager

██████████, Design Manager, Bilfinger Construction UK

██████████, Engineer, Siemens.

██████████, Police Scotland.

- 1.3 The team visited the site on Monday 21st October 2013 between 2:00pm and 11:00pm. The weather was wet and cold.
- 1.4 All the relevant drawings were made available to the audit team.
- 1.5 The team has examined and reported only on the road, cycle and pedestrian safety implications of the layout and not on its design.
- 1.6 It should be noted that many sections of the scheme were incomplete and were not ready for this stage 3 audit to be carried out. This audit report is of an interim stage 3 audit site visit.
- 1.7 This report should be read in conjunction with interim RSA reports dates 8th Feb, 8th May and 5th June 2013. All items within these interim reports are still relevant.

2 MATTERS ARISING FROM THE AUDIT.

SECTION 1C. York Place to Princes Street.

Sec 1C.1 North St Andrews Street at junction with Queen Street / York Place.

A sign pole carrying a small direction sign for the national cycle route is positioned near to tactile slabs and in the middle of a busy footway. It presents an unnecessary hazard for pedestrians, in particular visually impaired pedestrians who are at most risk of walking into it.



Recommendation. Remove the pole and relocate the sign onto an existing piece of street furniture.

Sec 1C.2 Proposed Buffer in York Place.

The audit team visited the location of the proposed tram buffer on York Place. The design drawings of the buffer were also reviewed. Eastbound vehicles in the nearside lane turning right from York Place towards Picardy Place roundabout, were observed encroaching into the offside lane forcing cars in this lane towards the temporary barriers around the proposed buffer location. Poor lane discipline here is likely to force some cars towards the buffer, risking a collision and slight or serious injury to vehicle occupants.

Recommendation. The buffer and the deflection area behind the buffer should be protected by a series of passively safe reflective bollards that if hit can be quickly replaced.

Sec 1C.3 Street lighting.

Many of the street lamps and traffic sign lamps throughout the scheme were either not energised or missing. The night time audit could not therefore be completed. This applied to the following sections of road;

North St Andrew's Street - unlit No Entry signs at North St Andrew's Street Lane, St Andrew's Square – 6 unlit lanterns alongside the Square and all lanterns at the tram stop were unlit,

South St Andrews Street – numerous No Entry and regulatory signs were unlit, Princes Street, Shandwick Place, West Maitland Street, and Haymarket Terrace – several lanterns above the tram cables were unlit, as were many regulatory signs.

Recommendation. Carry out a night time site visit once the all the lighting systems are activated.

Sec1C.4 York Place, Bus Stop at Pelican crossing.

The westbound bus stop on York Place is immediately in front of the Pelican crossing. There are only two zig-zag markings between the bus stop bay and the Pelican stop line. Buses stopped at the front of the bus bay will completely obstruct driver's sight of the nearside primary signal aspect and any waiting pedestrians. Likewise pedestrians waiting to cross will not be able to see approaching traffic in the outside lane. Inadequate safe sighting distances are provided here and there is a high risk these factors will contribute to a pedestrian injury collision.



Recommendation. Relocate the bus stop to beyond the Pelican crossing.

SECTION 1D. Princes Street to Haymarket Terrace

Sec 1D.1 Haymarket Terrace – Taxi Rank.

The queue of taxis regularly extends beyond the end of the taxi rank and into the westbound lane of Haymarket Terrace. This queue obstructs traffic in the nearside lane which is used by trams, buses and cyclists.

This extended queue forces cyclists to cross the tram tracks at a very shallow angle. This presents a high risk that a bicycle wheel will get caught in the tram track causing the rider to fall and land between the tram lines, resulting in a slight or serious injury to the rider. Further and more serious injury will be caused if any following vehicle is unable to stop before reaching the fallen rider.

Where cyclists are required to cross the tram tracks it is recommended they do so at angles close to 90 degrees.

Whilst cars and buses can deviate around the extended taxi queue, trams will not be able to do so. Their progress will be halted by taxis' queuing in their lane. It is less likely the queue will extend into the tram tracks after the trams start to use this section of track.



Recommendations.

1. Continue to enforce the breach of the existing waiting restrictions by the taxi drivers.
2. Temporarily plug the tram tracks at this location until the trams start operating here.
3. Provide an alternative nearby feeder rank that taxis can use when this existing rank is full. This feeder rank should be equipped with a monitor to show taxi drivers when there is space available at the Haymarket Station taxi rank.
4. Monitor taxi driver and cyclist behaviour by CCTV and take appropriate enforcement action if required.

Sec 1D.2 Haymarket Terrace – Cycle Lane in Taxi Stance.

Cyclists heading west past Haymarket Station have to cross the tram tracks in order to cycle past the Haymarket Tram Stop. The cyclist's desire line and the tram tracks cross at a very shallow angle. Taking a shallow alignment across the tracks risks the bicycle wheel getting caught in the tram track causing the rider to fall and land between the tram lines, resulting in a slight or serious injury to the rider. Further and more serious injury will be caused if any following vehicle is unable to stop before reaching the fallen rider.

The cycle lane through the taxi stance outside Haymarket Station provides cyclists with an alternative route. By using this cyclists will cross the tram tracks at a near 90 degree angle. This however is not within the desire line of cyclists and brings them into conflict with taxis and their passengers using the taxi stance.

In addition cyclists exiting the stance are on the right of the stop line and will need to cross in front of taxis in order to get to the left side of the their chosen lane. Taxis were also observed carrying out right turns and U-turns out of the Taxi stance. This is contrary to traffic regulations and again this results in taxis and cyclists crossing paths. Vehicle speeds within the taxi stance are lower than those on Haymarket Terrace.

Both routes provide a risk to cyclists, however, the route through the taxi stance presents a lower risk of cyclist falling in front of a fast moving vehicle.

Recommendation.

1. Promote the use of the cycle lane through the taxi stance.
2. Enforce the right turn / U turn prohibition out of the taxi stance.

Sec 1D.3 Haymarket Terrace - Memorial Island.

The push button is located too far from the tactile paving and cannot be reached adequately by visually impaired pedestrians standing on the paving.



Recommendation. Relocate signal pole adjacent to tactile paving.

Sec 1D.4 West Maitland Street.

West Maitland Street has changed from a one way road to a two way road. The west bound lanes being restricted to trams and buses only. The shops on West Maitland Street require servicing and there is a “no waiting and no loading” restriction and a tram only lane along the frontage the shops on the south side of the road. Refuge collection and other servicing (taxis and deliveries) will be in conflict with the waiting /loading and trams only restrictions. The collection of refuse by vehicles is likely to delay trams and, if suitable access arrangements are not provided for the collection of refuse it will be piled along the kerbside which will obstruct pedestrians and present an unnecessary hazard for the visually impaired.



Recommendation. Agree with the businesses and their suppliers' suitable access times for servicing to be carried out. If the refuse is to be collected during the night then suitably conspicuous containers should be provided to help prevent pedestrians tripping over low level black bags at the kerbside.

Sec 1D.5 Atholl Place, near its junction with Palmerston Place.

The gradient of the tactile slabs at the crossing point on the north side of Atholl Place are steep and may cause wheel chair users and those pushing prams to lose control and roll onto the carriageway, or struggle to get from the carriageway onto the footway.



Recommendation. Re-grade the ramped tactile slabs on the footway.

Sec 1D.6 Canning Street.

During the site visit cars were noticed driving along Canning Street and turning left onto the tram and bus lane along Shandwick Place. Cars are not permitted in the tram and bus lane. The “no entry except taxis” signs on Canning Place were incomplete.

Recommendation. Complete the signing and lining works on Canning Place and audit the junction again.

Sec 1D.7 Shandwick Place / Queensferry Street.

Temporary barriers are provided on the pedestrian refuge island between Shandwick Place and Queensferry Street. This is to prevent pedestrians crossing both directions of traffic in the one manoeuvre.

Recommendation. Replace the temporary barriers with permanent barriers.

Sec 1D.8 Shandwick Place to Lothian Road.

There was evidence of drivers not complying with the “No right turn” restriction. This causes confusion and leads to conflict between vehicles. Potentially resulting in a slight injury collision.

Recommendation. Replace the white on blue straight ahead arrow sign on the signal heads with a no right turn signal sign.

Sec 1D.9 Princes Street

Along Princes Street there were a number of traffic signs that were erected too low a height and present a danger for pedestrians. Serious head injuries can be caused by walking into the sharp edge of a traffic sign. These signs are at;

Princes Street / Fredrick Street junction – Cyclist, Caution tram tracks sign.

Princes Street / The Mound – No right turn sign.

Princes Street / Hanover Street – No right turn sign.

Recommendation. Increase the height of the signs.

Sec 1D.10 Princes Street.

There were a number of No Entry signs missing or facing away from traffic, at various location between the Mound and South St Andrew’s Street.

Recommendation. Provide the correct No Entry signing.

Sec 1D.11 Princes Street / South St David Street junction.

There is a temporary metal plate in the carriageway along with a number of metal covers which are all in the direct line of a cyclist heading west along Princes Street. The covers present a slippery hazards for cyclists who are likely to weave between them.



Recommendation. Reinstate the carriageway and remove the temporary plate.

Sec 1D.12 Princes Street

The street lamps on Princes Street are located above the overhead power cables for the trams. This provides an additional hazard for electricians tasked with repairing the lamps. The audit team were advised that the power to the trams would have to be switched off to repair or replace defective lamps. There remains a risk that someone may attempt to work on the lanterns without the power being switched off or that the overhead wires are damaged by a hydraulic platform used to access the lanterns.



Recommendation. Put in place controls to ensure all lighting maintenance operatives are fully aware of the approved safe working practices and approved method statements for carrying out any work on the lanterns.

Sec 1D.13 Shandwick Place / Lothian Road.

Most of the traffic signal pedestrian aspects along the route from Haymarket to Shandwick Place are nearside indicators. From the Lothian Road junction and along Princes Street the more traditional far side pedestrian aspect indicators remain. This mixture of equipment standard may confuse some pedestrians. With a high number of foreign pedestrians in this area who may be unfamiliar with UK traffic conditions this may further complicate their judgement.

Recommendation. Establish a programme to upgrade the signals to provide a consistent series of nearside indicators along the route.

Sec 1D.14 West Maitland Street.

West Maitland Street has changed from a 4 lane one way street to a 2 lane two way street. During the night time site visit some drivers were still using the street as a 4 way one way street. They were not noticing the signs and were following either a previously established pattern or their out of date Sat-Nav systems. In addition to the risk of a head on collision with a tram or bus this can be very dangerous for pedestrians who may step onto the carriageway whilst not expecting a car to drive the wrong way along the road. This could result in a serious injury collision.

Recommendation.

For a period up until the trams start running on West Maitland Street, provide a series of temporary traffic cylinders along the centre of the road to better separate the two traffic flows.

Advise providers of Sat-Nav data of the changes to the traffic systems in the city.

Sec 1D.15 Central reserve at Waverley Bridge pedestrian crossing

A 'No Entry' sign and restriction plates are attached to the signal pole / lighting column. They are located at a height where pedestrians may strike the edge of the signs causing injury. At the time of the site visit pedestrians were observed walking between the bollard and lighting column.



Recommendation. Relocate the signing to a suitable height.

Sec 1C.16

Haymarket Tram Stop.

At the east end of the Tram platform there is a level difference between the tram tracks and the adjacent footway area. This provides a tripping hazard for pedestrians.



Recommendation. Reset the footway level to remove the tripping point.

SECTION 2A – Haymarket to Roseburn Delta.

The audit team walked from Section 2A at Haymarket depot to Section 5B at Edinburgh Park Station during darkness. The street lighting along this section was illuminated and no safety issues were identified in terms of street lighting.

SECTION 5A Network Rail Access Road Balgreen

Sec 5A.1 Foot / cycleway from Balgreen Tram stop to Balgreen Road Toucan Crossing.

The foot / cycleway descends toward the Toucan crossing, however the crossing is not within the line of sight of approaching cyclists, who could be freewheeling at unsafe speeds for a shared use path.



Recommendation. Provide advance signage to inform cyclists of the direction of the cycle route.

Sec 5A.2

Balgreen Tram Stop.

There is no barrier between the rear of the tram platform and the steep embankment down towards the foot /cycleway. Visually impaired pedestrians who have crossed the tram tracks from south to north could easily walk off the platform and fall down the embankment, causing serious injury to themselves and others.



Recommendation. Provide a barrier along the rear of the platform and complete the construction of the steps as shown on the design drawing (Sec 5B Drg No ULE9013-05-HRL-00403, Rev 3).

Sec 5A.3 Balgreen Tram Stop – vehicular track crossing to access railway line.

An area of ponding is evident on the crossing point to access the Network rail yard. During sub-zero temperatures this is likely to freeze risking skidding and loss of control of crossing vehicles



Recommendation. Re-profile crossing point to remove ponding area.

Sec 5A.4 Balgreen Tram Stop.

There is an open area next to the gates at the crossing point which could be used by vehicles accessing the Network Rail yard. This may bring vehicles into conflict with pedestrians and the trams.



Recommendation. Erect bollards across the open area to prevent vehicle access.

SECTION 5B Balgreen Road.

Sec 5B.1 Balgreen Road Toucan Crossing.

The Toucan crossing was not installed at the time of this site visit. No poles were in place yet a stop line was provided. The stop line without the accompanying signals will be confusing for some motorists and may result in sudden braking and consequently slight injury rear end shunt collisions.

Recommendation. Black out the stop line until the Toucan is fully operational.

Sec 5B.2 Baird Drive / Balgreen Road junction.

The Baird Drive junction is very close to the Balgreen Road Toucan crossing. The primary signal aspect may be awkward for drivers exiting Baird Road to see from the Give Way line. The secondary aspect will be within a comfortable line of sight and the zig-zag markings will be across the Give Way lines.

Recommendation. Ensure the secondary aspect signal head is aligned to be within the line of sight of drivers exiting Baird Drive.

Sec 5B.3 Foot / cycleway from Edinburgh Park tram stop towards Novotel Hotel.

The level of illumination along the path, to the north side of tram tracks appeared poor in comparison to other areas and the spacing of some lighting columns appeared to be wide.

Recommendation. Check that the correct number of lanterns have been provided and their illumination levels are adequate.

SECTION 5C – Gogar Interchange.

The audit team walked from Edinburgh Park Tram Stop which was fully lit to Lochside Avenue and South Gyle Broadway during darkness. In general the level of illumination was good and no safety issues were identified in terms of street lighting.

The audit team visited the A8 Gogar Interchange and were shown the additional vehicle crash barrier, recommended in item C2.6 of the interim RSA report dated 8th May 2013.

SECTION 7A – Eastfield Avenue

The audit team also visited Eastfield Avenue within Edinburgh Airport and noted that the recommendations in the interim report dated 8th May 2013 have not yet been implemented.

3. AUDIT TEAM STATEMENT.

Various locations;

Section 1C. York Place to Princes Street

Section 1D. Princes Street to Haymarket Terrace

Section 2A. Haymarket Yards to Roseburn Delta Junction

Section 5A. Russell Road to Network Rail Access Road Balgreen

Section 5B. Balgreen Road to Edinburgh Park Central Tram Stop.

Section 5C. Lochside Avenue to Gogarburn Tram Stop

Section 7A. Gogar Access Road to Airport Tram Stop

INTERIM ROAD SAFETY AUDIT STAGE 3

I certify that the audit team have examined the works listed in this report and visited the site. The examination has been carried out with the sole purpose of identifying any features of design or construction that can be modified in order to improve the safety of the scheme. The problems identified have been noted in this report together with recommendations, which should be studied for implementation. The audit has been carried out in general accordance with HD 19/03.

No-one in the audit team has been involved in the scheme design



Signed.....

Date 06 April 2014

APPENDIX v Designers Response to Interim Road Safety Audits.

Designers Response to Interim Road Safety Audit dated 8th May 2013

Refer to Stage 3 Road Safety Audit Report Reference : - Airport to St Andrew's Square RSA3 dated 08.05.13						
Area	Audit Report Ref.	Audit Report Recommendation (direct from Audit Report)	Designers Responses	Infraco's response	CEC's Response	Final / Current Status
Eastfield Avenue Edinburgh Airport	C2.1	Cut the branch from the tree	Agree - maintenance issue	CEC to discuss with EAL to cut or remove branch.	Agree with both. CEC will write to EAL to request branches are cut back.	Tree now removed by CEC. RSA comment addressed.
Gogar Roundabout	C2.2	Replant the trees behind the sign	Agree - construction issue. Tree should be planted in an appropriate location	Infraco to relocate the trees	Agree with both.	Infraco has removed trees. RSA comment addressed.
A8 Gogar roundabout Eastbound approach	C2.3	Provide a VCB at the rear of the footway in front of the last 2 lighting columns and the advance direction sign or provide passively safe street furniture at this location	VCB is as designed and at the preference of CEC during design. Discussion was held regarding the position of the lighting columns. CEC have confirmed that the lighting columns will be repositioned as part of CEC renewals programme	CEC to issue tNC/tCO should they require Infraco to carry out the Auditor's recommendation.	Agree with both. CEC will relocate the columns (write to SfC).	CEC to action as part of routine cyclic maintenance.
A8 Underpass	C2.4	Provide a mesh to the rails, similar to that provided on the parapet rails on the nearby A8 Gogar roundabout approach retaining walls	Revised SDS Response Disagree: This area is not populated by young children due to its location by the A8, the bypass and the large Gogar roundabout. The auditor at RSA1 and RSA2 did not raise any issue with this area of the design. SDS do not consider this an issue.	CEC to issue tNC/tCO should they require Infraco to carry out the Auditor's recommendation.	CEC agree with Auditor. Designer's response not sufficient and no further response provided despite request. CEC will monitor and install mesh later if required.	CEC to monitor.

A8 Eastbound Exit from Gogar Roundabout	C2.5	Relocate the lighting columns to behind the VCB. Similar to the detail used along the Gogar Tram Depot Access Road	Disagree - VCB is as designed and at the preference of CEC during design. Discussion was held regarding the position of the lighting columns. CEC have confirmed that the lighting columns will be repositioned as part of CEC renewals programme	CEC to issue tNC/tCO should they require Infracore to carry out the Auditor's recommendation.	Agree with both. CEC will relocate the columns (write to SfC).	CEC to action as part of routine cyclic maintenance.
Gogar Roundabout to A8 Underpass, Eastbound	C2.6	Extend the VCB from the Gogar roundabout to the A8 underpass	Partially Agree with Auditor - whilst TD19 does not require the gap to be infilled between the barriers detailed on Section 6 drawings that protect the embankment in the vicinity of the roundabout and the structure protection of the A8 underpass. The risk of traffic leaving the carriageway toward the gateway embankment does not warrant a continuous barrier at this location, due to traffic speed, carriageway alignment and proximity of embankment to the carriageway kerb lines. Further Designer's Response: Designer's Risk Assessment provided to CEC on 08 Aug 13 stating that additional 7.0m of barrier required.	Infracore to carry out additional barrier works as per designer's response. CEC has issued tNC/tCO to extend the barrier further albeit not to the extent that the gap is closed.	Agree with both and note CEC instructed an additional length of guardrail.	Additional barrier length installed to address RSA comment.

Gyle Tram Stop	C2.7	Provide signage for approach tram drivers to highlight the possibility of children stepping out behind the steps.	Disagree:- There is no requirement to provide signage for Tram Drivers at tramstops. All trams will be stopping at all tramstops and all drivers are driving in line of sight. Further Designer's Response: To overcome the perceived issue of a blind spot on behind the stair access at Gyle tramstop, SDS propose a max 10mph limit outbound at the exit of the road crossing. This will not impact the operational running of the tram as in normal service the tram will be approaching the tramstop. SDS see this as perceived issued as they do not agree that there is a blind spot.	CEC to issue tNC/tCO should they require Infraco to carry out the Auditor's recommendation. Reviewed with ICP. ICP suggests monitoring once trams running to see if there is an issue.	CEC agree with Auditor. Signage may be required. Designer's response not sufficient and no further response provided despite request. CEC will monitor and install mesh later if required.	CEC to monitor during shadow running. Signage may be required.
South Gyle Broadway Crossing	C2.8	a) Reposition signal poles so that the push button can be reached from the tactile slab area.	a) Infraco to check offset dimension from the edge of tactile to push button. To be less than 500mm	Infraco has reviewed with CEC. Agreed that Departure will be submitted and signed off for crossing on east side of South Gyle Broadway. Infraco/CEC to review and agree if push button shown on photo (west of South Gyle Broadway is to be relocated).	CEC has reviewed with Infraco and agreed that as crossing used infrequently a departure would be signed off and crossing monitored for crossing on east side of South Gyle Broadway. Other push buttons should be as per standard.	Infraco/SDS to submit departure. CEC to sign off for crossing on east side of South Gyle Broadway. Infraco/CEC to review and agree if push button shown on photo is to be relocated.

South Gyle Broadway Crossing	C2.8	b) Provide protective covers to the anchor bolts to the adjacent overhead cable column to protect pedestrians from impact with the bolts	b) Construction issue	b) bolts sticking out of footway to be covered by Infraco.	The Council agrees with the auditor that the bolts are covered.	Infraco has installed caps over the OLE bolts. Further measure of cowl to be discussed between CEC and Infraco.

pedestrian exit from South Gyle Tram Stop to South Gyle Broadway	C2.9	Provide Section of pedestrian guardrail along South Gyle Broadway to prevent pedestrians running from the Tram Stop onto the carriageway.	Disagree - SDS do not perceive this to be a risk that would require barriers. This issue was not raised by previous audits. SDS do not consider there is a requirement for additional guardrail in this area. Further Designers Response: Any pedestrian will have climbed the stairs from the platform, turned 90 degrees right to exit onto the footpath. At this location the footpath is some 4m wide and so the kerb onto the roadway is not adjacent to the entry/ exit point. SDS do not accept that a further pedestrian guardrail is required at this location	CEC to issue tNC/tCO should they require Infracore to carry out the Auditor's recommendation.	Agree with designer.	CEC agree with designer - no guardrail required.
Edinburgh Park	C2.10	Footway from tram crossing to access road to Ritz bar and Grill - Provide drop kerbs and tactile slabs	Disagree:- This is outside the LOD and out with the scope of SDS design	Please note this is also outside the adopted land of CEC and is privately owned. Infracore reinstated as per existing. CEC to issue tNC/tCO should they require Infracore to carry out the Auditor's recommendation.	Agree with designer. CEC can raise this with Edinburgh Park.	CEC will raise this issue with Edinburgh Park.

Waverley Bridge and Princes Street	C2.11	Signage, Lighting and Tram Signal works incomplete	No comment	to be reviewed as part of final audit following completion of remaining works.	Agreed.	To be reviewed as part of final Audit.
North St Andrews Street at its junction with St Andrew's Square	C2.12	Relocate the sign to the near of the footway	Disagree - if constructed as per design, SDS do not agree. The design position is to split the cycle lane and walking lane	Sign to be raised to 2.2m.	Agree with the designer, however the Infracore response is incorrect - the spec is 2.3m	Infracore has actioned as per specification.
Haymarket Yards	C2.13	a) Move the sign further away (3m approx.) from where cyclist join the path	a) Disagree - the sign is on private land and therefore is not within SDS power to amend as built position	CEC to issue tNC/tCO should they require Infracore to carry out these works.	Agree with the designer and CEC will contact land owner to seek consent for change.	CEC to action. Will enter into negotiations with landowner on changes.
		b) Widen the path by surfacing the grass divide, where sign is currently positioned	b) Disagree - The footpath cannot be widened due to the limit of the LOD	CEC to issue tNC/tCO should they require Infracore to carry out these works.	Agree with the designer and CEC will contact land owner to seek consent for change.	CEC to action. Will enter into negotiations with landowner on changes.

		c) Provide a short section or pedestrian / cyclist barrier rail between the path and the tram tracks	c) Disagree - The recommendation is not in line with the concept of the Tram Design Manual. Further Designers Response: This footpath is constrained at both ends and the perceived issue here is replicated further along this footpath. It is relevant that the LOD constrains its width, as the boundary of the private property to the north of the path limits the site. The tramway is an un-barriered network and the introduction of a barrier at this location will further restrict the width of the path. SDS consider this solution to be the best available given the constraints	CEC to issue tNC/tCO should they require Infracore to carry out these works. Reviewed by ICP and he is of the opinion that no barrier should be installed. Width is no worse than in other sections of the same cycle path further west.	Agree with Designer, and CEC will monitor the layout during testing and commissioning. If required, CEC will install barrier.	CEC to monitor and action prior to Revenue Service, if required.
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Murrayfield Stadium Station	C2.14	Provide a pedestrian refuse island within the hatched area of Roseburn Street	Disagree - Deterrent paving indicates that this is not a pedestrian area and therefore no further works are required to comply with standards. The IFC design fulfils the requirements of the ERs in complying with Roads Standards and has been reviewed and approved by CEC Roads Authority. There is no requirement to identify that the footpath beyond the crossing is for the sole use of access into the NWR yard, however if CEC consider an additional crossing to be beneficial SDS would not object to its addition.	CEC to issue tNC/tCO should they require Infracore to carry out modifications to the as installed IFC design.	CEC agree with the auditor and will require a pedestrian refuge to be installed. Designer's Response is inadequate and does not state why they disagree.	CEC to action prior to Revenue Service.
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Designers Response to Interim Road Safety Audit dated 17th June 2013

Refer to Stage 3 Road Safety Audit Report Reference : - Various locations between Hermiston Gait and Haymarket RSA3 dated 17.06.13						
Area	Audit Report Ref.	Audit Report Recommendation (direct from Audit Report)	Designers Response	Infraco's response	CEC's Response	Final / Current Status
Hermiston Gait	C2.1	Replace these bollards with the ones similar to those installed near Edinburgh Airport	Agree - construction issue IFC drawing shows bollard type - ULE90130-05-HRL-00543	Bollard installed as per CEC detail provided by R Goodwin to B&S.	Agree with SDS.	Infraco has replaced bollards.
Hermiston Gait	C2.2	Provide cycle signing showing destinations	Disagree - SDS are of the opinion that the current cycle sign does not cause confusion. Any amendments to be addressed by CEC as this element of work is outwith the scope of SDS.	CEC to issue tNC/tCO should they require Infraco to carry out the Auditor's recommendation.	CEC to monitor.	CEC to monitor.
Toucan crossing between Hermiston Gait Tram Stop and Hermiston Gait Retail Park	C2.3	Provide the full complement of line markings and high friction surfacing on both approaches.	Works now installed as per IFC	Works complete and installed as per IFC.	Agreed.	Works complete.
East of Edinburgh Park Station	C2.4	Provide priority markings to allow safe movement onto the merged footway / cycleway	Existing footway junction - any improvement to CEC	CEC to issue tNC/tCO should they require Infraco to carry out the Auditor's recommendation.	Agree with both. CEC to undertake works directly.	CEC to action as part of cyclic maintenance.

Hermiston Gait Stop and all other tram stops	C2.5	In order to provide sufficient warning of the presence of trams to pedestrians provide back to back signing on both sides of track.	Disagree. IFC drawings prepared and considered at length by CEC. SDS stand by design.	Infraco has issued tram signage document and agreed additional and realigned signage with CEC to address the Auditor's comment.	CEC do not agree with SDS response. Signs cannot be seen in all instances - design generic and not site specific. Revised SDS response required.	Works complete to address Auditor's comment.
Hermiston Gait	C2.6	Provide Conspicuous covers around the stays	Disagree - not a pedestrian area - no protection required. No - this is not a requirement of RSPG2. This is not a footpath or a pedestrian area.	Infraco suggest black and yellow tape around cable stays to highlight the potential trip hazard should pedestrians/public use this as a short cut.	Agree with auditor and Infraco.	Infraco to action: Infraco to install black and yellow tape around the cable stays prior to Revenue Service.
Hermiston Gait	C2.7	Formalise this short cut in bituminous material and with a Give Way Marking for cyclists	Disagree not in IFC - Any ' short cut' will not comply with standards and leave CEC open to legal challenge. CEC to monitor	CEC to issue tNC/tCO should they require Infraco to carry out the Auditor's recommendation.	Agree with the auditor. CEC will monitor during testing and commissioning to take any appropriate action required.	CEC to monitor.
Hermiston Gait	C2.8	Ensure that all signing at this location is above the recommended 2.25m mounting height	Construction Issue	Infraco to fix signage	Agree with both.	Infraco to action prior to Revenue Service.
South Gyle Junction	C2.9	Provide dropped kerb crossing points at this location and reinstate to full height kerbs once the works are complete	Disagree - temporary crossing now removed	Temporary crossing - works to be completed shortly. Propose no action until final Audit when junction complete.	Agree with auditor. Temporary provision is insufficient, but it is acknowledged that it will shortly be removed.	To be reviewed as part of final RSA Audit.

Carrick Knowe Guided Busway Junction and other sites	C2.10	Reduce tactile paving width of the crossing point	SDS Agree with auditor. One tactile to be re-laid and surface.	Infraco to review design and amend if not as per IFC.	Agree with both.	Infraco to action prior to Revenue Service.
Carrick Knowe Guided Busway Junction	C2.11	Provide handrails at the edge of the ramps to aid safe negotiation and minimize the risk of pedestrians falling down the slope.	Disagree - Built as IFC. Ramp is DDA compliant. The graded footway at this locations is not a ramp, therefore does not need handrails. If CEC wish to install SDS have no objection.	CEC has issued tNC/tCO should they require Infraco to carry out the Auditor's recommendation.	Slope will be used by pedestrians. CEC agree with auditor and have issued a project change accordingly.	Handrails installed to close out Auditor's comment.
Stairs between Carrick Knowe Junction and Stenhouse Drive	C2.12	Install a section of fence to prevent cyclists riding down the slope to encourage them to use the dedicated cycle route to access Stenhouse Drive	Disagree - Not required. Further Designer's Response: There is no design code requirements for a return fence at the head of these stairs.	CEC to issue tNC/tCO should they require Infraco to carry out the Auditor's recommendation.	Agree with the designer. CEC will monitor this situation and install barrier if required.	CEC to monitor.
Access Road to the North of the Track at the Carrick Knowe Junction	C2.13	Replace kerbline with a series of bollards to provide easier access for cyclist and pedestrians and highlight the end of the access road for vehicles	This is as an historic kerbline lying outwith the LOD and is subsequently outwith SDS scope.	CEC to issue tNC/tCO should they require Infraco to carry out the Auditor's recommendation.	Agree with both. CEC to undertake works directly.	CEC to action as part of cyclic maintenance.
Pedestrian Crossing Point at Carrick Knowe Junction	C2.14	Bring the level of concrete crossing point up to the level of the rubberized track insert	Agree - not as IFC - Construction Issue	Infraco to amend	Agree with both.	Infraco to action prior to Revenue Service.

Bridge over mainline at Carrick Knowe Junction	C2.15	Remove the portion of the bolts protruding above the nuts and bring the footway / cycleway surfacing up to a level to eliminate the possibility of tripping over or running into, the base plate	Agree - not as IFC.	Infraco to action as per tNC once issued.	Agree with both, but note that we have agreed to reduce the width instead by installing a barrier. Departure from standard will be required (which CEC will approve).	Infraco to action as per tNC prior to Revenue Service. Departure will be issued by SDS.
Balgreen Road	C2.16	Relocate the Toucan crossing further along Balgreen Road to provide suitable forward visibility to the crossing	Disagree - arrangement as per design was agreed with CEC. The conflicts of the geometry of the Baird Drive junction, the Jenners Depository access and the Balgreen Underbridge were considered in depth with representatives from CEC when the initial IFC design was found to be unworkable. At that time it was agreed to place the toucan crossing as per the revised IFC design and as initially constructed. SDS has no objection to moving the crossing point. SDS advise that it is no less safe to move the crossing to the new location (CEC design); however, cognisance should be taken of the proximity of Baird Drive.	Junction to be audited when works complete - solution is as requested by CEC. Propose no action until final Audit when junction complete. CEC has issued tNC to relocate the junction and works on-going. Will be audited in Oct when works complete.	CEC agree with Auditor. SDS response does not address why it wouldn't be safer to move it north.	Infraco has completed works in line with tNC. Review at next Audit.

Saughton Stop	C2.17	Relocate junction box to the north side of platform	Disagree. Trams stopping at the stop will be approaching at a speed that will allow sufficient stopping distance should a person hiding behind the TEC panel choose to step toward the track at the same time as the tram is approaching. An additional restriction on "through running" trams should dictate that the maximum speed for inbound trams is 10mph at this location. Speed Signage and/or Operator briefing required.	CEC to issue tNC/tCO should they require Infracore to carry out the Auditor's recommendation.	CEC agree that speed signage will address issue; although CEC do not agree in full with Designer's response. Suggest a speed restriction may be appropriate.	CEC to discuss with operator, and signage to be installed prior to Revenue Service.
Murrayfield Stadium Stop	C2.18	Replace flat coping as used on the walls at the adjacent stairs and platform walls	Disagree - all approved by CEC, planning. No Issue. Established Planting will deter access to this area. Further Designer's Response: SDS notes mature landscaping has been planted.	CEC to issue tNC/tCO should they require Infracore to carry out the Auditor's recommendation.	Agree with Designer and note that mature planting has now been installed. CEC will monitor this issue going forward.	CEC to monitor.

Murrayfield Stadium Stop	C2.19	Reduce a section of wall by three courses over the first metre to permit indivisibility between children and tram drivers.	Disagree - Trams will be arriving at stop and travelling at low speeds. SDS has no objection to removal of part of the wall to improve sightlines.	tNC issued. Infraco to action tNC.	SDS design creates blind spot for wheelchair users and small children. SDS to check forward visibility/ stopping distances etc. CEC agree with the auditor.	Wall height reduced to improve sight lines. This addresses Auditor's comment.
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Haymarket - entry barrier at CoSLA building	C2.20	Relocate entry barrier further within the site to allow awaiting vehicle to leave Haymarket Yards	Disagree: The barrier position and roadway operation is no different to pre-tram. SDS agree that moving the barrier would improve this situation; however, the current situation is not unsafe - tram operates by line of sight as per other vehicles that have used Haymarket Yards with this arrangement. SDS suggest CEC review accident records to determine if this has been an issue previously. Tram Drivers to be made aware of potential blockage at this location due to barrier position. The barrier is outwith the LOD and the remit of SDS. CEC to discuss with building owner. This is actually Rosebery House rather than COSLA building entrance. Note that should be Rosebery House rather than CoSLA building in reference.	CEC to issue tNC/tCO should they require Infracore to carry out the Auditor's recommendation.	CEC do not agree with SDS response and requested a more detailed response. This was not forthcoming. CEC to monitor.	CEC to monitor.
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Designers Response to Interim Road Safety Audit dated 21st October 2013

Refer to Stage 3 Road Safety Audit Report Reference : - Airport to York Place dated 21.10.13						
Area	Audit Report Ref.	Audit Report Recommendation (direct from Audit Report)	Designers Response	Infraco's response	CEC's Response	Final / Current Status
SAS/YPL	1C.1	National Cycle Route Signage pole - relocate sign onto another column and remove pole.	The IFC Design as approved by CEC is adequate; however, SDS has no objection to the proposed amendment.	CEC to action if relocation of signage deemed necessary	Agree with both. CEC to monitor and make changes, if required.	CEC to monitor.

YPL Buffer	1C.2	Buffer and deflection area should be protected by series of passively safe reflective bollards that if hit can be quickly replaced.	During the design process, SDS were persuaded not to install guardrails in the York Place re-work to accommodate the terminus at York Place by CEC. SDS similarly do not have control over the requests from CEC Planning to make the buffer “blend in” and the cowlings/ colour of the unit is not within SDS’s gift to change. If driver education is to be promoted by the Council and to address the concerns from the RSA team, SDS would propose the use of knock down bollards as per the attached sketch. Whilst SDS remain content with the adequacy of the IFC design, they have advised that the inclusion of the bollards (as per their sketch) would improve the design and as such they would recommend the inclusion of the bollards in the final scheme.	CEC to action if bollards deemed necessary	Agree with both. Bollards to be installed -	CEC to install bollards parallel to Buffer prior to traffic management barriers being removed and before Revenue Service. Photos of completed works to be provided to Auditors.
Street Lighting	1C.3	Further night time audit required once all lighting systems are activated.	Construction issue.	Agree with Auditor. Address in final Stage 3 RSA in Jan 14	Agree with both.	Infracore to complete lighting works prior to final handover. Further Assessment in final Stage 3 RSA

						in Feb 14
YPL bus stop	1C.4	Relocate bus stop beyond Pelican crossing	SDS are satisfied with current IFC design as the layout was also accepted by CEC due to constrictions of the existing street layout and the desire by CEC to have a tram stop at this location.	Issue for CEC to address	Agree with designer and CEC will monitor and make any changes, if required.	CEC to monitor.
Haymarket Terrace Taxi Rank	1D.1 (1)	Continue to enforce the breach of the existing waiting restrictions by the taxi drivers	Operational issue.	Issue for CEC to address	Agree with both. CEC are currently making changes to taxi stances to remove rank in front of station and create a drop off/loading area. CEC will also monitor its effectiveness and take any further remedial action required.	CEC to action prior to Revenue Service.
Haymarket Terrace Taxi Rank	1D.1 (2)	Temporarily plug the tram tracks at this location until tram start operating	This is not feasible as T&C programme underway so trams running. Furthermore, this would be a temporary measure that would not assist in the long run as plugs would be removed - cyclists need to familiarise themselves with the tram route - plugging then unplugging the rails would merely confuse.	Issue for CEC to address	Agree with both. CEC are currently making changes to taxi stances to remove rank in front of station and create a drop off/loading area. CEC will also monitor its effectiveness and take any further remedial action required.	CEC to action prior to Revenue Service.

Haymarket Terrace Taxi Rank	1D.1 (3)	Provide an alternative nearby feeder rank	Operational issue - CEC to advise.	Issue for CEC to address	Agree with both. CEC are currently making changes to taxi stances to remove rank in front of station and create a drop off/loading area. CEC will also monitor its effectiveness and take any further remedial action required.	CEC to action prior to Revenue Service.
Haymarket Terrace Taxi Rank	1D.1 (4)	Monitor taxi driver and cyclist behaviour and take appropriate enforcement action if required	Operational issue - CEC to advise.	Issue for CEC to address	Agree with both. CEC are currently making changes to taxi stances to remove rank in front of station and create a drop off/loading area. CEC will also monitor its effectiveness and take any further remedial action required.	CEC to action prior to Revenue Service.
Haymarket Terrace Taxi Rank	1D.2 (1)	Promote use of the cycle lane through the taxi stance	SDS has no objection to additional signage. SDS satisfied with existing design.	Issue for CEC to address	Agree with both. CEC have installed additional local signage.	CEC have installed additional signage.
Haymarket Terrace Taxi Rank	1D.2 (2)	Enforce the right turn/U turn prohibition out of the taxi stance	Operational issue.	Issue for CEC to address	Agree with both. CEC to promote TRO in due course.	CEC to action prior to Revenue Service.
Haymarket Terrace memorial Island	1D.3	Relocate signage pole adjacent to tactile paving	Construction issue	This was placed as is due to utilities not being diverted by CEC. CEC to review and move if necessary.	Agree with auditor. No utilities in that area, but CEC will monitor and if it becomes an issue, CEC will address the issue.	CEC to monitor.

West Maitland Street	1D.4	Suitable access times for servicing to be agreed with businesses	Operational issue.	Issue for CEC to address	Agree with both. CEC to monitor and make changes, if required.	CEC to monitor.
Atholl Place	1D.5	Re-grade the ramped tactile slabs on footway	Re-grading of tactile paving is outwith the scope of SDS design remit.	There are a number of reasons for gradient of tactiles including basements, utilities etc. Any re-grading to be completed by CEC.	Agree with both.	CEC to monitor.
Canning Street	1D.6	Complete the signing and lining works and audit the junction again	Construction issue.	Agree with Auditor.	Agree with both.	Infraco has completed works. Further Assessment in final Stage 3 RSA in Feb 14
Shandwick Place/Q'sferry St	1D.7	Replace temp barriers with permanent barriers	Construction issue.	Agree with Auditor. Works now complete.	Agree with both.	Works now complete.
Shandwick Place to Lothian Road	1D.8	Replace the white on blue straight ahead arrow sign on signal heads with no right turn sign.	SDS satisfied with IFC design. This is an operational issue.	Issue for CEC to address	Agree with auditor. Drivers are not aware there is a banned turn. CEC to change box signs on traffic signals.	CEC to action prior to Revenue Service.
Princes St	1D.9	Traffic signs too low. Sign heights to be increased at: 1. Princes St/Frederick Street junction - cyclist, Caution tram tracks sign. 2. Princes St/The Mound - No right turn sign 3. Princes St/Hanover	Construction issue.	Sign heights to be increased in early Jan 14	Agree with both.	Infraco to amend signage heights prior to Revenue Service. Further Assessment in final Stage 3 RSA in Feb 14.

		Street - No right turn sign				
Princes St	1D.10	Provide the correct No Entry signing	Construction issue.	Signage works in line with IFC design to be completed in early Jan 14. Any further signage deemed necessary by CEC to be installed by CEC.	Agree with both.	Infraco to amend signage heights prior to Revenue Service. Further Assessment in final Stage 3 RSA in Feb 14.
Princes St / South St David St junction	1D.11	Reinstate the carriageway and remove temporary plate.	Construction issue.	Issue for CEC to address	Agree with both.	CEC to action prior to Revenue Service.
Princes St	1D.12	Put in place controls to ensure all lighting maintenance operatives are fully aware of approved safe working practices	Agree.	Appropriate "Permit to work" procedures in place	Agree with both.	CEC to action prior to Revenue Service.
Shandwick Place/Lothian Road	1D.13	Establish Programme to upgrade signals to provide consistent series of nearside indicators along the route.	Not a design issue - outwith SDS scope.	Issue for CEC to address	Agree with both. CEC to monitor and make changes, if required.	CEC to monitor.
West Maitland Street	1D.14	1. Provide series of temporary traffic cylinders to separate traffic flows prior to tram running.	Not a design issue.	Issue for CEC to address	Agree with both. CEC to monitor and make changes, if required.	CEC to monitor.

		2. Advise Sat-Nav providers of changes				
Waverley Bridge	1D.15	Relocate sign to suitable height	The signage is located in a non-pedestrian zone. No change proposed.	Signage has been installed as per IFC.	Agree with auditor. Signage not as per IFC and is too low. Infraco to change mounting heights.	This is under review between Infraco and CEC to see if signage can be altered.
Haymarket Tram Stop	1D.16	Reset the footway level to remove the tripping point	Construction issue.	Under Review by Infraco. Site review with CEC proposed.	Awaiting Infraco response.	This is under review between Infraco and CEC to determine extent of remedial action required.
Network Rail Access Road Balgreen	5A.1	Provide advance signage to inform cyclists of direction of cycle route	SDS do not accept that additional signage is required.	Issue for CEC to address	Agree with both. CEC to address.	CEC to action prior to Revenue Service.
Balgreen Tram Stop	5A.2	Provide barrier and complete steps	SDS do not accept that additional barriers are required.	Steps to be installed. CEC to consider and install barrier if CEC deem necessary	Agree with designer. Steps will be sufficient.	Infraco to complete steps as per IFC design by end Feb 14.
Balgreen Tram Stop	5A.3	Re-profile crossing point to remove ponding area	Construction issue.	Re-profiling not required due to limited traffic use. Suggest CEC monitor.	Agree with auditor. Ponding will lead to ice in the winter and could cause maintenance staff to fall.	Infraco to alter crossing to remove ponding. Works to be complete before Revenue Service.
Balgreen Tram Stop	5A.4	Erect bollards across open area to prevent vehicle access	SDS do not accept that additional barriers are required.	No required. Bollards at bottom of access road. Only vehicles are Network Rail / Tram	Agree with designer. CEC will monitor area and make changes, if required.	CEC to monitor.

				maintenance vehicles.		
Balgreen Road Toucan Crossing	5B.1	Black out stop line until full operational	Construction issue.	Crossing to be completed Jan 14.	Agree with both.	Infraco to complete works. Further Assessment in final Stage 3 RSA in Feb 14
Baird Drive/Balgreen Road junction	5B.2	Ensure secondary aspect signal head is aligned to be within line of sight of drivers exiting Baird Drive.	This is a CEC design and CEC should provide designer's response. Any slight tweak of the design, whilst not an SDS design, would be deemed reasonable to SDS.	Infraco to review following CEC response. Proposed that Siemens TLC can address as part of finalisation of the junction works.	Agree with auditor. Siemens to address when commissioning signals.	Works now complete and side road visibility has been achieved.
Edinburgh Park	5B.3	Check that correct number of lanterns have been provided and illumination levels are adequate	Designer suggests inclusion of additional column midway between F12/PN and F13/PN.	Infraco propose to install "missing" lighting column following CEC Approval of SDS proposal	Agree with both. Infraco to provide drawing for approval.	Infraco to action and provide as-built drawing.

APPENDIX vi Designers Response to Final Road Safety Audit

Refer to Stage 3 Road Safety Audit Report Reference : - Airport to York Place dated 12.02.14						
Area	Audit Report Ref.	Audit Report Recommendation (direct from Audit Report)	Designers Response	Infraco's response	CEC's Response	Final / Current Status
Sect 1C	5.1C.1	Departures as identified in ULE90130-01-REP-00155 are appropriate and proportionate to the problems identified.	no comment.	no comment.	Departures accepted by CEC as Roads Authority	Agreed
Sect 1C - York Place at Tram Buffer	5.1C.2	The buffer and the deflection area behind the buffer should be protected by a series of passively safe reflective bollards that if hit can be quickly replaced.	During the design process, SDS were persuaded not to install guardrails in the York Place re-work to accommodate the terminus at York Place by CEC. SDS similarly do not have control over the requests from CEC Planning to make the buffer "blend in" and the cowling/ colour of the unit is not within SDS's gift to change. If driver education is to be promoted by the Council and to address the concerns from the RSA team, SDS would propose the use of knock down bollards. Whilst SDS remain content with the adequacy of the	Infraco has installed in line with the IFC design as approved by CEC. CEC are installing bollards along the side of the buffer and have added yellow strips to the buffer to make it more visible to road users. No bollards installed behind the buffer.	Agree with the auditor. Knock down reflective bollards have now been installed and additional road markings instructed which will further highlight the buffer to drivers.	CEC to monitor

			IFC design, they have advised that the inclusion of the bollards (as per their sketch) would improve the design and as such they would recommend the inclusion of the bollards in the final scheme.			
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York Place Westbound Bus Stop	5.1C.3	Westbound bus stop on York Place is immediately in front of Pelican Crossing. Relocate bus stop westwards to beyond the Pelican crossing or increase sightlines.	SDS are satisfied with current IFC design as the layout was also accepted by CEC due to constrictions of the existing street layout and the desire by CEC to have a tram stop at this location.	As part of the traffic signal commissioning the signal heads have been altered to improve visibility. Any further works required would be for CEC to address.	Agree with the designer. Moving the bus stop westward may also cause forward visibility issues with the traffic signals at Elder Street. It should be noted that buses stop at the bus stop pole, rather than the end of the bus stop box. It is considered that there is sufficient forward visibility for westbound drivers even when buses are stopped at the bus stop. Infracore have also since altered the traffic signal head positions to improve visibility. CEC will however monitor the situation and take any measures necessary.	CEC to monitor
York Place to Haymarket	5.1C.4	Ensure all lighting is operational prior to operation of regular service.	Construction issue.	All lighting will be complete and handed over to CEC prior to revenue service	Agreed	Agreed
N St Andrew Lane/ N St Andrew St junction	5.1C.5	Provide left and right pointing direction arrows to the Tram route at junction ahead sign, which is mounted below the stop sign.	SDS to do not agree with the auditor. No change to the IFC design required.	Infracore constructed the IFC design. Any further changes with CEC to manage/implement as necessary.	Agree with the auditor. Edinburgh Trams have informed CEC that they have had two near misses with taxis at this location. This will be monitored during shadow running and if this issue contin-	CEC to monitor

					ues, additional signing will be added.	
S St Andrew St	5.1C.6	Provide one-way traffic signs on S St Andrew St.	SDS to do not agree with the auditor. No change to the IFC design required.	Infraco constructed the IFC design. Any further changes with CEC to manage/implement as necessary.	Agree with auditor. CEC are in the process of implementing new signs (which require special authorisation from Transport Scotland because of trams running in two directions).	CEC to install signs
Sect 1D	5.1D.1	Departures accepted by Auditor	no comment.	no comment	Departures accepted by CEC as Roads Authority	Agreed
Sect 1D	5.1D.2	Departures as identified in ULE90130-01-REP-00156 are appropriate and proportionate to the problems identified.	no comment.	no comment	Departures accepted by CEC as Roads Authority	Agreed

Approach to Hay-market Station	5.1D.3	Once the old station access is reopened and the trams and taxis operating in intended a further audit is carried out to assess if road users interact with the road infrastructure as the design intended.	SDS stand by the IFC design as approved by CEC. Any modifications by CEC or by Network Rail due to Hay-market Station development are outwith the scope of the SDS ETN design.	Infraco constructed the IFC design. Any further changes with CEC to manage/implement as necessary. Infraco note that CEC will undertake Stage 4 Audit approx. 1 year after tram operations commence.	CEC have already installed minor improvements to the IFC that clarify the cycle route across the rails. CEC will continue to monitor the area and are already in consultation with cycle user groups on how to undertake further improvements.	CEC to monitor
Princes St/Lothian Road junction	5.1D.4	Replace straight ahead arrows with NRT aspects on signal heads.	SDS do not agree with the auditor. SDS IFC Design as approved by CEC complies with TRO and signage manual.	Infraco constructed the IFC design. Any further changes with CEC to manage/implement as necessary.	Agree with the auditor. CEC will alter the box signs.	CEC to action.
Sect 1D	5.1D.5	Repair defective street lamps.	Construction issue.	All lighting will be complete and handed over to CEC prior to revenue service. CEC responsible for maintenance of lighting after handover.	Agree with all parties. Defective lamp now repaired.	Closed.
Atholl Place	5.1D.6	Provide signage to instruct cyclists to turn left onto Torphichen Street.	SDS to do not agree with the auditor. No change to the IFC design required.	Infraco constructed the IFC design. Any further changes with CEC to manage/implement as necessary.	Agree with the auditor. CEC will liaise with the cycle groups to develop a suitable solution to be implemented.	CEC to action.

Sect 2A	5.2A.1	Departures as identified in ULE90130-02-REP-00033 are appropriate and proportionate to the problems identified.	no comment.	no comment.	Departures accepted by CEC as Roads Authority	Agreed
Sect 5A	5.5A.1	Departures accepted by Auditor	no comment.	no comment.	Departures accepted by CEC as Roads Authority	Agreed
Sect 5A	5.5A.2	Departures as identified in ULE90130-05-REP-00283 are appropriate and proportionate to the problems identified.	no comment.	no comment.	Departures accepted by CEC as Roads Authority	Agreed
Balgreen Road	5.5A.3	Change crossing from a Pelican crossing to a Toucan Crossing.	This is a CEC design. SDS has no comment.	Infraco installed to the CEC design as instructed. Any changes now required are for CEC to implement. The installed crossing is a Puffin, in accordance with Drg ULE90130-05-HRL-00101 Rev 7. It is not a Pelican. Refer to CEC(ARe) email to BSu 30 October 2013 16:32, in which it indicates that a redetermination order will be required and that CEC will change it to a Toucan at a later date. Any further action with CEC.	Agree with all parties. CEC will change this to a toucan crossing (once a redetermination order has been processed). This work will fall outwith the tram project.	CEC to action.

Balgreen Road	5.5A.4	Provide the full number of zig zag markers.	Balgreen Road junction design amended by CEC. SDS has no comment on CEC design.	Infraco constructed the IFC design with design amendments as instructed by CEC.	Agree with the auditor. Markings to be extended.	CEC and Infraco to agree suitable marking to be installed.
Balgreen Road	5.5A.5	Provide cycle route signing for cyclist using the ramp to direct them to the crossing point. Remove "End of Cycle Route" sign.	SDS to do not agree with the auditor. No change to the IFC design required.	Infraco constructed the IFC design. Any further changes with CEC to manage/implement as necessary.	Agree with the principle of the auditors comments, but until the crossing is changed to a toucan then the current layout is suitable.	CEC to monitor meantime and change signs when toucan is installed.
Sect 5B	5.5B.1	Departures accepted by Auditor.	no comment.	no comment.	Departures accepted by CEC as Roads Authority	Agreed
Sect 5B	5.5B.2	Departures as identified in ULE90130-05-REP-0282 are appropriate and proportionate to the problems identified.	no comment.	no comment.	Departures accepted by CEC as Roads Authority	Agreed
Bankhead Drive/South Gyle Access	5.5B.3	Rotate the bollard correctly to indicate the cycle and pedestrian sections of this route.	Construction issue.	Bollard has been rotated.	Agree with all parties.	Closed.
Bankhead Drive approach to South Gyle Access	5.5B.4	Provide some road markings between the tactile slabs and the controllers to guide cyclists away from the controllers.	Construction issue.	Infraco constructed to the IFC design except where constrained by utilities. It should be noted that some cabinets (and positions) are outwith Infraco scope of works.	Agree with the auditor. CEC and Infraco to agree suitable markings to be installed.	CEC and Infraco to agree suitable marking to be installed.

Sect 5C	5.5C.1	Departures accepted by Auditor.	no comment.	no comment.	Departures accepted by CEC as Roads Authority	Agreed
Sect 7A	5.7A.1	No comment on the Departures.	no comment.	no comment.	Departures accepted by CEC as Roads Authority	Agreed