

Cycle Superhighway North-South Route Completed Scheme in Southwark

Stage 3 Road Safety Audit

Ref: 2291.F2/008/A201/TLRN/2016

Prepared for:

**Cycle Superhighways
TfL Projects and Programmes Directorate (PPD)**

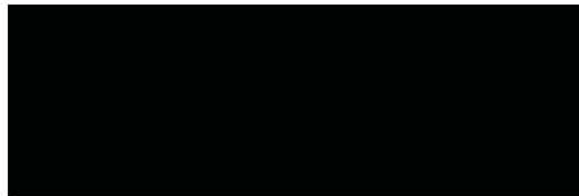
By:

Road Safety Audit, TfL Asset Management Directorate

Prepared by:

Checked by:

Approved by:



Version	Status	Date
A	Draft Audit report issued to Client	18/07/2016



1.0 INTRODUCTION

1.1 Commission

- 1.1.1 This report results from a Stage 3 Road Safety Audit carried out on the Cycle Superhighway North-South route, completed scheme in Southwark.
- 1.1.2 The Audit was undertaken by TfL Road Safety Audit in accordance with the Audit Brief issued by the Client Organisation on 1st June 2016. It took place at the Palestra offices of TfL during June and July 2016 and comprised an examination of the documents provided as listed in Appendix A, plus a visit to the site of the scheme.
- 1.1.3 The visit to the site of the scheme was made on 9th June 2016 and 8th July 2016. During both site visits the weather was overcast and the existing road surface was dry.
- 1.1.4 Catherine Linney of the Metropolitan Police attended the day-time site visit on the 9th June 2016.

1.2 Terms of Reference

- 1.2.1 The Terms of Reference of this Audit are as described in TfL Procedure SQA-0170 dated May 2014. The Audit Team has examined and reported only on the road safety implications of the scheme as presented and how it impacts on all road users and has not examined or verified the compliance of the designs to any other criteria. However, to clearly explain a safety problem or the recommendation to resolve a problem the Audit Team may, on occasion, have referred to a design standard without touching on technical audit. An absence of comment relating to specific road users / modes in Section 3 of this report does not imply that they have not been considered; instead the Audit Team feels they are not adversely affected by the proposed changes.
- 1.2.2 This Safety Audit is not intended to identify pre-existing hazards which remain unchanged due to the scheme; hence they will not be raised in Section 3 of this report as they fall outside the remit of Road Safety Audit in general as specified in the procedure SQA-0170 dated May 2014. Safety issues identified during the Audit and site visit that are considered to be outside the Terms of Reference, but which the Audit Team wishes to draw to the attention of the Client Organisation, are set out in Section 4 of this report.
- 1.2.3 Nothing in this Audit should be regarded as a direct instruction to include or remove a measure from within the scheme. Responsibility for designing the scheme lies with the designer and as such the Audit Team accepts no design responsibility for any changes made to the scheme as a result of this Audit.
- 1.2.4 Unless general to the scheme, all comments and recommendations are referenced to the detailed design drawings and the locations have been indicated on the plan located in Appendix B.
- 1.2.5 It is the responsibility of the Design Organisation to complete the Designer's response section of this Audit report. Where applicable and necessary it is the responsibility of the Client Organisation to complete the Client comment section of this Audit report. Signatures from both the Design Organisation and Client Organisation must be added within Section 5 of this Audit report. A copy of which must be returned to the Audit Team.

1.3 Main Parties to the Audit

1.3.1 Client Organisation

Client contact details:



1.3.2 Design Organisation

Design contact details:



1.3.3 Audit Team

Audit Team Leader:

Audit Team Member:

Audit Team Observer:



1.3.4 Metropolitan Police

Police Contact:



1.3.5 Other Specialist Advisors

Specialist Advisor Details:



1.4 Purpose of the Scheme

1.4.1 The purpose of the scheme was to provide a segregated cycle facility linking Elephant and Castle in the south to Stonecutter Street in the north.

1.5 Comments received from the Metropolitan Police

1.5.1 [Redacted] from the Metropolitan Police had no comments to add to this Audit.

1.6 Special Considerations

1.6.1 The Audit Team has no special considerations to raise.

2.0 ITEMS RAISED IN PREVIOUS ROAD SAFETY AUDITS

The proposals were subject to a number of Stage 1, Stage 1/2 and Stage 2 Road Safety Audits carried out during 2014, 2015 and 2016 by TfL Road Safety Audit, Asset Management Directorate. These Road Safety Audits can be summarised as follows:

1953	Stage 1	Entire Route
1953.01	Stage 1	Split Track option
1953.02	Stage 1	Stonecutter Street Alterations
1953.03	Stage 1	Webber Street Quietway Tie In
1953.04	Stage 1	Blackfriars Bridge Alterations
1953.05	Stage 1	Farringdon Road Modifications
2119.01	Stage 2	Package A Proposals
2119.02	Stage 2	Package B Proposals
2119.03	Stage 2	Package C Proposals
2119.04	Stage 2	Package D Proposals
2119.05	Stage 1/2	One Blackfriars Temporary Works
2119.06	Stage 2	Package E Proposals
2119.07	Stage 2	Package F Proposals
2119.08	Stage 2	Package G Proposals
2119.09	Stage 1	Temple Area Parking
2460.01	Stage 1/2	St Georges Circus Alterations
2460.02	Stage 1/2	The Cut junction road markings
2460.03	Stage 1/2	Tudor Street Area Egress Options

Due to the large number of problems covered by the Audits, a detailed summary replicating this information would be cumbersome. It is recommended that reference be made to these Audit Reports to identify problems raised prior to implementation.

All outstanding problems raised in the above Road Safety Audit reports have been replicated as part of this Stage 3 Audit where appropriate.

3.0 ITEMS RAISED AT THIS STAGE 3 ROAD SAFETY AUDIT

This section should be read in conjunction with Paragraphs 1.2.1, 1.2.2 and 1.2.3 of this report.

3.1 PEDESTRIANS

3.1.1 PROBLEM

Location: General to scheme, multiple locations

Summary: Design of raised separator strip within the pedestrian islands may pose a trip hazard to pedestrians

A number of staggered pedestrian islands are provided with a raised delineator strip around the edge of the island, designed to act as a tapping rail for visually impaired pedestrians. Whilst the layout of these islands has been implemented elsewhere without detriment, the features implemented as part of this scheme appear to have led to pedestrians tripping over the delineator strip, presumably due to the lack of visual contrast with the island paving material. Pedestrians that trip on the delineator strip are at an exacerbated potential for personal injury.

RECOMMENDATION

It seems disproportionate to recommend the removal and reconstruction of the island (and possibly kerb-lines) to provide an alternative island arrangement. It is therefore recommended that measures to differentiate the delineator strip from the island paving material are provided. This may require the provision of a contrasting colour or the provision of an alternative method for defining the edge of the traffic islands.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>It is noted that the design and construction of the staggered crossings is in accordance with TfL's Streetscape Guidance.</p> <p>Any amendments to this arrangement should be made in accordance to recommendations of the TfL Streetscape Team. It is understood that TfL's PPD Team will be consulting the Streetscape Team on this issue.</p>	
Client Organisation Comments	
<p>Staggered crossings are used on a large number of projects throughout TfL's programme, and have been installed using this design on a number of new projects including CS routes. They have been designed in accordance with TfL's Streetscape Design Guidance.</p> <p>The staggered crossings on North-South conform to the Streetscape Guidance standards however, given localised reports of pedestrian trip hazards we will keep this issue under review through the RSA 4A and 4B process after 12 and 36 months respectively. TfL is also conducting a wider review into the staggered crossing design and any lessons learned will be considered for specific sites on North-South.</p>	

3.1.2 PROBLEM

Location: General to scheme, multiple locations

Summary: Absence of a pedestrian deterrent may expose a potentially unsafe desire line

The Audit Team is concerned that a number of reverse staggered pedestrian islands are provided without the provision of a pedestrian deterrent to discourage pedestrians from 'straight lining' the crossings. The 'non-preferred' arrangement at these staggered pedestrian crossings guides pedestrians to 'walk away' from approaching traffic. The absence of a pedestrian deterrent may invite pedestrians to ignore the stagger and cross in a straight ahead movement. Any pedestrian performing this manoeuvre may do so behind the stop-line, and therefore potentially between stationary, accelerating or decelerating vehicles thereby increasing the potential for conflict.

RECOMMENDATION

It seems disproportionate to recommend the removal and reconstruction of the island (and possibly kerb-lines) to provide a pedestrian deterrent. It is therefore recommended that the facilities are monitored and should pedestrians be observed to ignore the stagger and cross in a straight ahead movement, then mitigation measures are introduced to reduce a potential for conflict.

Design Organisation Response	Accepted / Part-Accepted / Rejected
<p>It is noted that the design of the staggered crossings is in accordance with TfL's Streetscape Guidance. It is TfL's current policy to reduce street furniture clutter and in particular minimise the use of pedestrian guardrails.</p> <p>The Design Organisation agrees with the Auditor's recommendation that the facilities are monitored and should pedestrians be observed to ignore the stagger and cross in a straight ahead movement, then mitigation measures should be introduced to reduce a potential for conflict.</p> <p>It is understood that the Client Organisation will be undertaking appropriate monitoring of these facilities.</p>	
Client Organisation Comments	
<p>Agree with designer.</p> <p>It is acknowledged that reverse staggered crossings are not the preferred method and where possible along the Cycle Superhighway route straight ahead crossings or conventional staggered crossings have been provided. However, in some locations reverse staggered crossings have been the most suitable way of providing a safe crossing point. They have been staggered to prevent long cycle times which would increase pedestrian wait times and create delays for traffic and cyclists. Long cycle times within the signals may encourage pedestrians not to wait at crossings which in turn creates a safety risk. PGR has not been provided throughout the scheme in accordance with TfL's current Streetscape guidance.</p> <p>TfL will keep the issue under review through the RSA 4A and 4B process after 12 and 36 months respectively.</p>	

3.1.3 PROBLEM

Location: General to scheme, multiple locations

Summary: Traffic island width may not be sufficient to accommodate pedestrians

The Audit Team is concerned that a number of traffic islands are installed at a width of around 2.5m. These islands, particularly around the traffic signal equipment, may

not be sufficient to accommodate the volume of pedestrians likely to use them, particularly when pedestrian footfall is high. Pedestrians may be forced to bypass the islands, or walk within the carriageway to cross. Pedestrians performing these manoeuvres are at an exacerbated potential for conflict with passing vehicles. This is of particular concern for the mobility impaired and those with wheelchairs or children's buggies.

RECOMMENDATION

It seems disproportionate to recommend the removal and reconstruction of the islands (and possibly kerb-lines) to increase the islands width post construction. It is therefore recommended that the facilities are monitored and should pedestrians be observed to be forced into the carriageway due to inadequate island widths, then mitigation measures are introduced to reduce a potential for conflict.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>It is noted that the design of the traffic islands is in accordance with TfL's Streetscape Guidance.</p> <p>Islands have been designed taking account of anticipated pedestrian flows and providing appropriate (and at least minimum required island widths) within the constraints of the available carriageway.</p>	
Client Organisation Comments	
<p>Agree with designer.</p> <p>Constraints of the road width have meant that road space has needed to be balanced leading to the current design being implemented. Designs of staggered crossings islands across the North-South CS6 route took into account pedestrian demand along the route and TfL Streetscape Guidance ensuring minimum widths are met for accessibility therefore they are adequate and fit for purpose.</p>	

3.1.4 PROBLEM

Location: A – Webber Street junction with Blackfriars Road

Summary: Lack of physical definition of the footway may pose a hazard to pedestrians

The Audit Team is concerned that the footway on Webber Street (particularly the east side) has been constructed without a detectable upstand to the adjacent carriageway. Site observations show pedestrian adherence with the footway appears good, however, a pedestrian who is blind or visually impaired may fail to detect the edge of the footway and enter the carriageway injudiciously. Pedestrians who enter the carriageway injudiciously are at an increased potential for conflict with other road users.

RECOMMENDATION

It is recommended that measures to define the edge of the footway are provided. This may require the provision of a detectable kerb upstand or other similar feature.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>The design and construction of the improvements to Webber Street was undertaken by the LB Southwark and is outside of the scope of the Audit. This issue should be highlighted to the Borough Council for their review and consideration.</p>	

Client Organisation Comments

Agree with the designer's response.

The improvement works undertaken at this particular location at the junction of Webber Street were constructed by the London Borough of Southwark's contractor and are therefore not in the scope of this project. The issue raised by the auditor has been passed onto the Borough Council for them to review and action should they deem it necessary.

3.1.5 PROBLEM

Location: B – Blackfriars Bridge, entire length

Summary: Lack of physical definition of the cycle facility may pose a hazard to cyclists and pedestrians

The cycle track has been provided across Blackfriars Bridge at the same level as the adjacent footway without physical definition to separate the two facilities. Site observations show pedestrian adherence with the footway appears good, however, a pedestrian who is blind or visually impaired may fail to identify the cycle facility and enter the track injudiciously. Pedestrians who enter the track injudiciously are at an exacerbated potential for conflict with cyclists.

RECOMMENDATION

It is recommended that measures to define the edge of the footway are provided. It does not appear feasible for the Audit Team to recommend the provision of vertical separation between the cycle track and the footway, given the feature is over a bridge deck and this may limit construction options. It is therefore recommended that a stick-down 'Camden kerb' or other similar feature is provided to offer delineation of the cycle facility.

Design Organisation Response	Accepted / Part Accepted / Rejected
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The Design Organisation accepts the Auditor's recommendation to provide a feature to offer delineation of the cycle facility from the footway.

It is noted that the detailed design included for a channel kerb between the footway and the new cycleway. No positive drainage system exists across Blackfriars Bridge and the design provided for the most efficient way to channel surface water runoff to the ends of the bridge. Careful consideration will need to be given when choosing a delineation strip to minimise the impact on flow paths and flow widths along the bridge. Use of a more distinct drainage channel which is able to be detected by the visually impaired should be considered as an alternative to a raised feature.

Client Organisation Comments

The detailed design included a channel kerb between the footway and the new cycle track; this channel was designed to be detectable to the visually impaired pedestrians crossing Blackfriars Bridge. However, when constructed on site no delineation of cycle track and footway was present resulting in one needing to be retrofitted. The client organisation has consulted internally with the Streetscape Team and met with disability groups on site to assess the most appropriate measure to resolve the issue. It has been recommended that a raised delineation strip be used similar to the ones used at bus stop bypasses along the route. Careful consideration will given to ensure the

feature provided is safe and fit for purpose for use on the bridge.

3.2 JUNCTIONS

3.2.1 PROBLEM

Location: C - St Georges Roundabout junction with Blackfriars Road

Summary: Vehicles exiting Blackfriars Road (southbound) may not to give-way to cyclists on the gyratory

The Audit Team is concerned that drivers exiting Blackfriars Road (southbound) are not giving way to cyclists on St Georges Roundabout circulatory. A number of near-misses have been observed between these users historically when the site became operational, which appear to be due to drivers failing to appreciate the necessity to give-way at this location.

It is noted that it is only cyclists that this concerns as they originate from the bus lane where general traffic is prohibited, and no buses make this manoeuvre.

RECOMMENDATION

It is appreciated that the layout has recently been modified to clarify priority at this location, and the conflicts weren't observed at the time of the site visit, however a residual risk remains.

It may be beneficial to continue to monitor behaviour at the junction to ensure vehicles comply with the requirement to give way to right turning cyclists. If vehicles are observed to fail to comply it may be beneficial to modify the signal timings at the junction.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>The design of the traffic signals was undertaken by TfL's TI Team and they have provided the following responses to this issue:</p> <p>The priority at the junction has been changed with the removal of the southbound give-way line and introduction of a northbound right-turn pocket and signal timings have been adjusted. The historical conflict has not been observed since this change.</p>	
Client Organisation Comments	
<p>Agree with the designer.</p> <p>Following construction, issues observed at this location led to a change in the design to include a new right turn pocket for traffic turning right into Borough Road. The changes made at the junction mean that Blackfriars Road southbound traffic has priority over traffic on the circulatory and does not need to give way (no give way line is in place).</p> <p>The traffic signal timings at the junction were also changed to allow the southbound traffic to start ahead of right-turning traffic on the circulatory to establish the flow of traffic. Therefore, the right-turning traffic must give way to southbound traffic at the right-turn pocket.</p> <p>TfL are not aware of any outstanding problems persisting since this change was made. However, monitoring through collision analysis will be undertaken and RSA 4A and 4B process after 12 and 36 months respectively.</p>	

3.2.2 PROBLEM

Location: D - St Georges Roundabout junction with Blackfriars Road

Summary: Vehicles exiting Borough Road may block back through the early release facility and pose a hazard to cyclists travelling ahead

The Audit Team is concerned that drivers exiting Borough Road are being caught within the early start facility, presumably as a result of vehicles queuing from the pedestrian crossing across London Road. Cyclists, particularly those wishing to turn right via the bus lane, are at risk of becoming trapped and forced to cross left turning vehicles that progress from the secondary stop-line concurrently. Drivers turning left at this location are less likely to anticipate a cyclist approaching from their nearside and across their path. An exacerbated potential for 'left hook' type conflicts may exist as a result.

In addition to the above, it is understood that the geometry of the junction has led to drivers turning left and over-running the footway on both the nearside and offside.

RECOMMENDATION

It is recommended that measures are provided to deter vehicles from stopping within the early start facility, and/or measures are provided to facilitate cyclist to turn right unimpeded by left turning vehicles. This may include the modification to traffic signal timings to prevent vehicles blocking back, or the provision of a dedicated cycle only facility that isn't impeded by left turning vehicles. If this cannot be achieved it may be beneficial to provide a feature to allow cyclists to exit the early start in advance of any trapped vehicles, similar to an early release facility.

It may also be beneficial to review the kerb-line arrangement and swept-path of vehicles exiting Borough Road to ensure the footways are not over-run by turning vehicles.

Design Organisation Response	Accepted / Part Accepted / Rejected
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The design of the traffic signals was undertaken by TfL's TI Team and it is understood that they are proposing to introduce an additional low level cycle signal.

The Design Organisation also agrees with the Auditor's recommendation to review the kerb-line arrangement and swept-path of vehicles exiting Borough Road to ensure the footways are not over-run by turning vehicles. Swept path analysis and site observation shows that the turn can be made by both rigid and articulated HGVs without overrun.

Client Organisation Comments

Vehicles trapped in the early start

Following observations on site and a review of options, three changes have been implemented to address this issue.

1. An early release at the front stop line to enable cyclists to proceed ahead of traffic when the lights turn green even if a vehicle is in the early start
2. a secondary low level cycle signal at the front stop line to enhance the visibility of the early release
3. a call cancel on the pedestrian crossing on the exit arm to reduce the frequency with which vehicles queue back to Borough Road which exasperates the likelihood for a vehicle to become trapped in the early start

The LLCS and call cancel were installed on 18 October 2016. Prior to installation monitoring was undertaken by the traffic operations team which recorded the number of vehicles trapped in the reservoir per signal cycle and also the number of times the pedestrian crossing was called. This monitoring was undertaken again once the LLCS and call cancel technology had been installed. This monitoring showed a reduction in the number of times vehicles were trapped in the reservoir (1 compared to 3 from the previous monitoring) and also a reduction in the number of times the pedestrian crossing was called down (a reduction of 20% in the AM and PM peaks).

This shows that the introduction of the LLCS and the call cancel technology are already having a positive impact on the junction.

Tyre marks on the footway

Initial observations at the junction upon completion of construction showed tyre marks across the footpath which indicated that the kerb line was being over run by large HGVs and articulated lorries. Further site observations show that while the tyre marks are still existent, the number and visibility has not increased since initial site observations, suggesting that vehicles are now successfully making the turn out of Borough Road.

Both Concept and Detailed design show through swept path analysis that HGVs and articulated vehicles can successfully make the turn. The turn has been designed such that vehicles are forced to slow down on approach to the pedestrian crossing.

The kerb line is not in a pedestrian desire line and therefore pedestrians are not placed in a vulnerable position, it would appear that the issue with the kerbs was an early issue and this problem has since passed.

The client organisation expects it to take time for people to become accustomed to new layouts such as this and the further monitoring undertaken supports that road users have become accustomed and are successfully navigating the left turn. The client organisation will continue to monitor the junction through the RSA 4a and 4b process 12 and 36 months respectively and will pass the issue raised by the auditor onto the maintenance department for them to monitor and highlight any significant concerns back to the client for them to action appropriately

3.2.3 PROBLEM

Location: E - Blackfriars Road junction with The Cut

Summary: Northbound vehicles may overtake the queue of vehicles when turning right or filtering

The Audit Team is concerned that drivers travelling northbound are overtaking the queue of vehicles on the offside to reach the right turn facility into Union Street. The Audit Team are aware of a collision involving a powered two wheeler who filtered on the offside of the queue, then sat in front of a large goods vehicle who failed to see the rider and progressed, resulting in serious injury.

RECOMMENDATION

It is recommended that the junction is modified to discourage filtering on the offside, this may require the provision of a physical island or other similar measure.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>The Design Organisation accepts the Auditor's recommendation to modify the junction to discourage filtering on the offside. Due to site constraints, a physical island cannot be provided. Consideration will be given to the provision of road markings such as central hatching/ghost island and/or southbound lane arrows.</p>	
Client Organisation Comments	
<p>Agree with designer's response.</p> <p>Monitoring of the junction was undertaken on several occasions after opening the route and this showed that some vehicles overtake northbound queuing traffic on the offside. Since completion of construction and allowing for a period of 'bedding in' the monitoring shows that this issue has not improved and is still observed on site.</p> <p>TfL considered various options for mitigating this issue with input from other stakeholders including the Metropolitan Police due to the incident with the motorcyclist.</p> <p>As a result of this review TfL will be installing southbound lane arrows to highlight to northbound traffic they are entering the incorrect side of the road. Following installation, the junction will be monitored again with counts to determine the number of road users complying with the layout and review the effectiveness of this measure. Should the issue remain on site further mitigation measures will be considered.</p>	

3.2.4 PROBLEM

Location: F – Blackfriars Road junction with Stamford Street

Summary: Queue along Blackfriars Road results in vehicles waiting over the cycle crossing, potentially leading to collisions relating to cyclists crossing between slow moving or queuing traffic

At the site visit, a queue of vehicles was observed along Blackfriars Road which began to clear when the cycle crossing facility across Stamford Street became operational. Cyclists were observed to cross between slow moving or stationary vehicles, who were unaware the cycle facility was operational. This could lead to an increased risk of collisions involving cyclists, particularly with powered two wheelers who may be filtering.

RECOMMENDATION

Provide measures to ensure the crossing is kept clear of queuing vehicles. This could require modifications to signal timings or the provision of a 'keep clear' type feature to prevent vehicles stopping across the cycle crossing when it is operational.

Design Organisation Response	Accepted / Part-Accepted / Rejected
The Design Organisation accepts the Auditor's recommendation to ensure the crossing is kept clear of queuing vehicles. It is understood that the Client Organisation is proposing to provide a 'Yellow Box Junction' at this location.	
Client Organisation Comments	
Agree with the designer's response Along the North-South route, visual clutter such as road markings were kept to a minimum to simplify layouts and improve urban realm. However, following a review of the operation of the junctions since opening, TfL will be implementing a Yellow Box Junction over the junction (including the cycle track) to help alleviate the issue.	

3.2.5 PROBLEM

Location: G - Blackfriars Road junction with Stamford Street

Summary: Cycle segregation island may force larger vehicles to over-run the cycle two-stage right turn

The Audit Team is concerned that the cycle segregation island on the south side of Blackfriars Road at the junction with Stamford Street may hinder the swept path for larger left turning vehicles. Large articulated vehicles were observed to take an elongated manoeuvre around the cycle track segregation island, and as a result travel in very close proximity to the two-stage right turn facility for cyclists. A potential for conflict with cyclists using the facility may exist as a result.

RECOMMENDATION

Whilst it is unlikely that a conflict with cyclists would occur, it may be beneficial to investigate cutting back the cycle segregation island to permit left turning vehicles to make a less severe manoeuvre. This would also assist with reducing the potential for the segregation island to be over-run and damaged.

Design Organisation Response	Accepted / Part-Accepted / Rejected
<p>The Design Organisation has carried out a swept path analysis and has determined that reducing this island would not alter the path of turning vehicles. Additionally there is no evidence of the island being overrun.</p> <p>It should be noted that this is an interim layout pending the completion of the One Blackfriars development, resulting in a reduced width of Stamford Street.</p>	
Client Organisation Comments	
<p>Agree with the designer's response.</p> <p>On site observations show that there is no evidence that the island is being overrun. Swept path analysis has been conducted and confirms that reducing the island would not alter the path the vehicles make.</p> <p>Agree with the designer that the layout currently in place on Stamford Street is a temporary layout which is narrower than the final carriageway permanent layout due to be installed upon completion of the One Blackfriars development in 2018.</p>	

3.3 CYCLE FACILITIES

3.3.1 PROBLEM

Location: H - Blackfriars Road junction with Stamford Street

Summary: Close proximity of stop-line may pose a hazard to pedestrians

The Audit Team is concerned that the stop line to catch left turning cyclists into Stamford Street may be located too close to the junction. Cyclists turning left into Stamford Street may fail to appreciate the necessity to stop at this location with a potential for conflict with pedestrians on the conflicting pedestrian stage as a result.

RECOMMENDATION

It is recommended that the level of non-compliance by cyclists is determined to ascertain the likelihood that cyclists will cross at the same time as pedestrians. If it observed, it may be beneficial to provide measures to encourage compliance with the traffic signals.

Design Organisation Response	Accepted / Part-Accepted / Rejected
<p>The Design Organisation accepts the Auditor's recommendation to monitor the operation of the facility to determine the level of non-compliance by cyclists at the stop line. If a problem is observed it is suggested that a low-level cycle signal head could be provided to improve the conspicuity of the traffic signals and encourage compliance by cyclists.</p>	
Client Organisation Comments	
<p>Agree with designer</p> <p>The internal stop line at the Blackfriars Road Stamford Street Junction is a new arrangement across London and other Cycle Superhighway routes.</p> <p>At this junction, the signalisation of the pedestrian crossing and internal stop line was designed to accommodate a low number of cyclists making the left turn into Stamford Street while providing benefits to pedestrians and not increasing cycle time at the junction. Monitoring at the junction found that few cyclists make the left turn into Stamford Street and as such the risk of cycle to pedestrian conflict is low. Due to the seethrough visibility at the junction the installation of a further low level signal for cyclists would not be possible as it would not comply with TI standards.</p> <p>Red light compliance is an enforcement matter. Information has been passed onto TfL's enforcement team, who undertake regular cycle patrols on all Cycle Superhighway routes as part of business as usual enforcement activity. Furthermore, TfL has Operation Safeway, which is a high visibility roadside enforcement operation and involves hundreds of officers from the Roads and Transport Policing Command (RTPC) mobilised at key times in an effort to reduce risk to all road users by enforcing the rules of the road and engaging with these users on how to use the road safely.</p> <p>The client organisation will continue to monitor the junction through the RSA 4A & 4B process after 12 and 36 month respectively.</p>	

3.4 GENERAL

3.4.1 PROBLEM

Location: General to scheme, multiple locations

Summary: Absence of illumination may pose a hazard to road users

The Audit Team noted the absence or inoperability of a number of lighting units or lamp columns throughout the route. These can be summarised as follows:

- A number of lamp columns are provided, but are not operational leading to areas of relative darkness in both the cycle track and adjacent carriageway. Darkness may reduce the conspicuousness of other road users, particularly pedestrians and cyclists, leading to an exacerbated potential for conflict with these user groups.
- A number of traffic signs are provided without, or with inoperable lighting units. During the hours of darkness, road users may fail to appreciate the traffic signs, and the message contained upon them, leading to a potential for injudicious manoeuvres. Drivers who perform injudicious manoeuvres are at an exacerbated potential for conflict with other road users.

An exacerbated potential for conflict may exist as a result.

RECOMMENDATION

It is recommended that the lamp columns are made operational and the traffic sign lighting units are implemented as appropriate and are working.

Design Organisation Response	Accepted / Part Accepted / Rejected
The Design Organisation accepts the Auditor's recommendation that the identified lamp columns are made operational and the traffic sign lighting units are implemented in accordance with the detailed design.	
Client Organisation Comments	
Agree with designer's response	
All lighting of lamp columns and traffic signs will be assessed as part of the project lighting and snagging works. Any signs required to be lit in the detailed design will be included in the snagging programme of works.	

3.4.2 PROBLEM

Location: General to scheme, multiple locations

Summary: Ponding of surface water may pose a hazard to road users

Throughout the scheme there are areas of standing water which do not dissipate rapidly following periods of inclement weather. The presence of standing water may pose a slip hazard for all road users, particularly pedestrians and riders of two wheeled vehicles. This is of particular concern during the winter months when surface water may freeze to form ice. This was noted most prominently as:

- Within the pedestrian crossing island close to the junction with Elliots Row.
- Within the cycle track on St Georges Road in proximity to Hayles Street.
- Throughout the northwest corner of the St Georges Road junction with Lambeth Road.
- Throughout the southern side of Lambeth Road in proximity to the bus stand.
- Lambeth Road (both sides) prior to the cycle link to St Georges Roundabout.
- Blackfriars Road (west side) north of the junction with Webber Street.
- Blackfriars Road (west side) north of the junction with Valentine Place.
- Blackfriars Road (west side) at the junction with Ufford Street.
- Blackfriars Road (west side) outside Southwark Tube Station.
- Blackfriars Road (west side) under the rail over-bridge by Southwark Tube Station.
- Blackfriars Road (west side) outside the Ibis Hotel.
- Blackfriars Road (west side) opposite Prince William Henry Public House.
- Blackfriars Road (west side) south of the junction with Colombo Street.
- Blackfriars Road (west side) in the footway south of the junction with Stamford Street.

An exacerbated potential for conflict may exist as a result.

RECOMMENDATION

It is recommended that the surface water drainage is modified to adequately dissipate surface water from both the footway and carriageway / cycle track.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>The Design Organisation accepts the Auditor's recommendation that the surface water drainage should be modified to adequately dissipate water from both the footway, carriageway and cycle track. This will have to be considered on a case-by-case basis to establish the most appropriate solution.</p> <p>It is understood that level surveys will be undertaken at each identified site and the problem will be rectified where reasonably practicable.</p>	
Client Organisation Comments	
<p>Agree with designer's response</p> <p>Level surveys have been commissioned for each area impacted by ponding. The results of the level survey will determine the appropriate action taken and each</p>	

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problem area will be rectified where it is reasonably practicable.

3.5 TRAFFIC SIGNS AND ROAD MARKINGS

3.5.1 PROBLEM

Location: General to scheme, multiple locations

Summary: Traffic islands may not be adequately visible to approaching road users leading to an increased potential for conflict with the feature

The Audit Team are concerned that a number of traffic islands are implemented without a vertical feature to highlight the islands presence during the hours of darkness. The absence of a vertical illuminated feature may lead to a potential for the islands to be hit, particularly at night. An exacerbated potential for personal injury may therefore exist as a result. This was most notably identified at the following locations:

- The Cut (facing westbound) at the junction with Blackfriars Road.
- Blackfriars Road (facing southbound) at the junction with The Cut.

RECOMMENDATION

It is recommended that the visibility of these islands is increased, particularly during the hours of darkness. This may require the provision of a vertical illuminated feature, such as a keep left bollard or other similar feature.

Design Organisation Response	Accepted / Part Accepted / Rejected
The Design Organisation accepts the Auditor's concern and it is proposed that at the location on Blackfriars Road, a lit, steel-hoop, keep-left bollard be installed.	
At the location on The Cut, the presence of a traffic signal facing oncoming traffic is deemed to be a sufficient vertical feature.	
Client Organisation Comments	
Agree with designer's response	
The Cut (facing westbound) at the junction with Blackfriars Road has the presence of a traffic signal facing oncoming traffic, this is a sufficient vertical feature for road users to see the island.	
Blackfriars Road (facing southbound) an illuminated keep left bollard is to be installed to highlight the presence of the island.	

3.5.2 PROBLEM

Location: General to scheme, multiple locations

Summary: Traffic sign may pose a hazard to pedestrians due to an inadequate mounting height

The Audit Team are concerned that a number of traffic signs are implemented at an inadequate height and may pose a hazard to pedestrians. The low mounting height may increase the potential for pedestrians to collide with the leading edge of the traffic signs, with an exacerbated potential for personal injury as a result. This was most notably identified at the following locations:

- St George's Road opposite Elliots Row, northern footway.
- Colnbrook Street, both sides at the junction with St Georges Road.

RECOMMENDATION

It is recommended that the mounting height of the traffic signs is increased.

Design Organisation Response	Accepted / Part Accepted / Rejected
The Design Organisation accepts the Auditor's recommendation to adjust the height of the identified signs to provide adequate headroom clearance for pedestrians.	
Client Organisation Comments	
Agree with designer's response	
Any traffic signs not installed at the adequate height with appropriate headroom clearance for pedestrians will be picked up and rectified as part of the ongoing snagging works.	

3.6 TRAFFIC SIGNALS

3.6.1 PROBLEM

Location: H - Blackfriars Road junction with Stamford Street

Summary: Traffic signal and road marking non-compliance may pose a hazard to other road users

The Audit Team is concerned that vehicles and cyclists were observed to travel ahead from the nearside left turn only lane at the junction with Stamford Street. Drivers who perform this manoeuvre are less likely to be anticipated by other road users. An exacerbated potential for lane change and side swipe type conflicts may exist as a result.

Furthermore, drivers wishing to turn left were observed to follow the traffic signals for the ahead manoeuvre, rather than wait correctly for the left turn filter stage. Drivers who perform this manoeuvre are at an exacerbated potential for conflict with cyclists within the cycle track which operates at the same time as the ahead general traffic lane.

RECOMMENDATION

It is recommended that measures to encourage compliance with the traffic signals are provided; this may require additional road markings, the provision of additional traffic signals or alterations to the traffic signal staging.

Design Organisation Response	Accepted / Part Accepted / Rejected
The Design Organisation accepts the Auditor's concern and recommendation to provide measures to encourage compliance with the traffic signals.	
The Detailed Design included for three sets of lane designation arrows on the Blackfriars Road northbound approach to the Stamford Street Junction. It is understood that a decision was taken on site between CVU and TfL to only provide two sets of arrows.	
The Design Organisation recommends that the operation of the junction is monitored by the Client Organisation and if a problem is seen to persist then additional measures to encourage compliance should be considered.	
TfL's TI Team has confirmed that the staging is fixed by the filters and it is not possible to change this.	
Client Organisation Comments	

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Agree with designer's response

Two sets of lane designation markings have been installed at the junction approach. The junction has been monitored during the AM peak to determine the number of road users disobeying the signals. It was found during the monitoring that no road users disobeyed the signal. The staging is fixed at this junction and therefore cannot be changed. Monitoring of the junction through RSA 4A and 4B process after 12 and 36 months respectively will be undertaken to ascertain if the concern raised occurs.

End of list of problems identified and recommendations offered in this Stage 3 Road Safety Audit

4.0 ISSUES IDENTIFIED DURING THE STAGE 3 ROAD SAFETY AUDIT THAT ARE OUTSIDE THE TERMS OF REFERENCE

Safety issues identified during the audit and site inspection that are considered to be outside the Terms of Reference, but which the Audit Team wishes to draw to the attention of the Client Organisation, are set out in this section. It is to be understood that, in raising these issues, the Audit Team in no way warrants that a full review of the highway environment has been undertaken beyond that necessary to undertake the Audit as commissioned.

4.1 ISSUE

Location: General to scheme, multiple locations

Reason considered to be outside the Terms of Reference: Illegal manoeuvre rather than a deficiency with the implemented scheme layout.

The Audit Team noted a number of cyclists disobeying the red cycle signals and continuing illegally through the junctions and crossings. In some instances cyclists were observed to cycle around a static queue and proceed through the red signal, indicating this may be a deliberate action rather than a deficiency in the layout of the scheme. It may be beneficial to encourage the Police to undertake enforcement of the traffic signals to improve compliance.

Design Organisation Response	Accepted / Part Accepted / Rejected
The Design Organisation agrees with the Auditor's recommendation to encourage the Police to undertake enforcement of the signals to improve compliance.	
Client Organisation Comments	
Agree with Designer's comments. Cyclist signal compliance to be kept under review through operational enforcement activities undertaken by TfL and partners.	
TfL has Operation Safeway, which is a high visibility roadside enforcement operation, involves hundreds of officers from the RTPC mobilised at key times in an effort to reduce risk to all road users by enforcing the rules of the road and engaging with these users on how to use the road safely. TfL will pass on the information to the enforcement team to highlight to them the contraventions that are taking place.	

4.2 ISSUE

Location: General to scheme, multiple locations

Reason considered to be outside the Terms of Reference: Incomplete or incorrect items that do not appear to pose a road safety concern.

The Audit Team noted the following items have not been implemented or implemented incorrectly but may be beneficial to implement or resolve:

- **Item 1** - The give-way road markings for the private access at the tie-in to the Elephant and Castle scheme have not been provided.
- **Item 2** - Cycle signs to denote the cycle track is for cyclists only have not been provided opposite the junction with Elliots Row.
- **Item 3** - The cycle sign on the bollard opposite Geraldine Street is facing the wrong direction.
- **Item 4** - At the junction of Lambeth Road and St George's Roundabout the nearside cycle restriction sign is particularly small. This sign is unlikely to be appreciated by road users at a realistic distance hence it may be beneficial to increase the size of the restriction sign at this location.
- **Item 5** - The cycles only Regulatory sign mounted on the bollard on Blackfriars Road near the St George's roundabout junction is facing the wrong way. A similar sign mounted high on a post at the same location appears redundant.
- **Item 6** - The bollards within the footway between Valentine Place and Boundary Row are provided without a reflective strip to increase their prominence during the hours of darkness for pedestrians.
- **Item 7** - The cycle cut-through opposite Nelson Square is provided without Regulatory signing to indicate the cut-through is for cyclists only.
- **Item 8** - The kerb for the cycle facility opposite Scoresby Street has not been splayed completely.
- **Item 9** - The two-stage right turn sign south of the junction with Stamford Street is situated in front of the dropped kerb for the property access.
- **Item 10** - A lamp column is situated within the tactile paving arrangement (northwest corner) across both Stamford Street and Blackfriars Road at the junction with Southwark Street.

It is recommended that these items are investigated and resolved expeditiously.

Design Organisation Response	Accepted / Part-Accepted / Rejected
The above items are considered to be construction/snagging related issues. The status of these issues is understood to be as follows:	
Item 1 – Completed.	
Item 2 – Completed.	
Item 3 – Completed.	
Item 4 – The sign provided is considered to be adequate and the provision of the adjacent 'No Entry' signs prevents any ambiguity.	

Item 5 – Completed.

Item 6 – The provision of these bollards was not part of the scheme design. It is understood that TfL's Maintenance Team will be advised of this issue and asked to action.

Item 7 – A bollard mounted regulatory sign is to be provided.

Item 8 – Completed.

Item 9 – It is understood that the access is redundant and will be removed.

Item 10 – It is understood that this issue is to be resolved by the Road Contractor for the One Blackfriars development.

The Design Organisation accepts the Auditor's recommendation that the above items should be investigated and resolved expeditiously.

Client Organisation Comments

Agree with Designer's response

Item 6 – within the AMD Highways handover document they will be informed of the bollards and asked to action

Item 7 – will be installed as part of the ongoing snagging works

Item 9 – the access will become redundant at a later stage once the development has been completed which the access currently serves

Item 10 – client organisation will inform One Blackfriars Development for them to resolve

4.3 ISSUE

Location: General to scheme, multiple locations

Reason considered to be outside the Terms of Reference: Maintenance issues or items not working which are not considered to pose a road safety concern.

The Audit Team noted the following items that require maintenance or have been installed but are not working:

- **Item 1** - The wait lamps within the pedestrian push buttons throughout the Blackfriars junction are not operational. The pedestrian stage at this location appears to be called, and the rotating tactile cones are working, hence it may just be the wait lamps that are inoperable.
- **Item 2** - The footway in proximity to Ufford Street is broken and loose and may benefit from being repaired,

It is recommended that these items are investigated and resolved expeditiously.

Design Organisation Response	Accepted / Part-Accepted / Rejected
The above items are considered to be maintenance related issues. The status of these issues is understood to be as follows:	
Item 1 – TfL’s TI Team are to be requested to investigate and rectify this issue as determined necessary.	
Item 2 – This problem is associated with an ongoing adjacent development and should be rectified by the Developer.	
Client Organisation Comments	
Agree with the designer’s response	
TfL has rectified the issues with the wait lamp push buttons and has also rectified the issue with the broken paving.	

4.4 ISSUE

Location: General to scheme, multiple locations

Reason considered to be outside the Terms of Reference: Item for consideration rather than a defined road safety concern.

The Audit Team noted that the direction and information signs for cyclists appear small and may not be appreciated by approaching cyclists. It may be beneficial to consider increasing the size of the signs to make them more visible to cyclists.

Design Organisation Response	Accepted / Part-Accepted / Rejected
The design of the direction and information signs for cyclists was undertaken by the Client. This issue should be highlighted to the Client’s Design Team for their review and consideration.	
Client Organisation Comments	
All cycle directional signs have been designed with an x-height of 25mm in accordance with TfL’s Cycle Superhighway (CS) Design Guidance and the London Cycling Design Standards (LCDS – 6.3.6). Similar sized signs have been	

implemented on previous CS routes within London with no known reported adverse impact. Use of a 25mm x-height also ensures consistency across the network. The DfT have also authorised the general use of a 25mm x-height on cycle direction signs in the updated 2016 TSRGD.

4.5 ISSUE

Location: General to scheme, multiple locations

Reason considered to be outside the Terms of Reference: Item for consideration rather than a defined road safety concern.

The Audit Team noted the intermittent use of 'look both ways' road markings and traffic signs (both permanent and temporary) along the route. The Audit Team makes the following observations:

- Item 1 - There is an inconsistent application of the use of 'look both ways' road markings and traffic signs throughout the route. It may be beneficial to take a consistent approach in the use of these signs and markings to offer a uniform message along the route.
- Item 2 - A number of 'look both ways' traffic signs within the floating bus stops are situated facing those alighting from the bus. Due to the narrow width of the traffic islands, and the height of the signs, they may not be immediately visible. It may be preferable to relocate the traffic signs to the opposite footway to make the traffic signs more visible.
- Item 3 - A number of 'look both ways' traffic signs are provided temporarily in addition to permanent signs mounted on the sign posts. It may be preferable to remove or relocate the temporary signs.

Design Organisation Response	Accepted / Part-Accepted / Rejected
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The status of these issues is understood to be as follows:

Item 1 – In accordance with Streetscape Guidance no 'look both ways' road markings have been provided except at the crossings outside of Southwark Underground Station which was identified necessary following Stakeholder Consultation.

Item 2 – All 'look both ways' traffic signs have been installed where possible in accordance with the detailed design. It is proposed that the orientation of these signs should be reviewed to ensure that they are clearly visible and understood by pedestrians.

Item 3 – It is understood that all temporary signs have now been removed.

Client Organisation Comments

Agree with designer's response

TfL will ensure that all temporary 'look both ways' signs have been removed from the route. TfL will ensure also that 'look both ways' signs at bus stop bypasses have been installed to the correct orientation to assist pedestrians leaving buses and crossing onto the footway. 'Look both way' road markings were put in specific locations to support road users becoming accustomed to the new road layout. TfL took the decision to only use these road markings in certain locations where they felt it was necessary to highlight the presence of traffic coming from both directions. On discussing with the safety auditors, the road markings do not present a safety concern and therefore will be retained.

4.6 ISSUE

Location: 1 – St Georges Road junction with Lambeth Road

Reason considered to be outside the Terms of Reference: Item raised previously, interventions implemented and not observed on the site visit.

The Audit Team noted that when implemented, drivers at this location were observed to follow the low level cycle signals rather than the high level aspects. As a result drivers were progressing into the junction at the same time as cyclists, removing the benefits of the early release. It is understood that the signal timings have been optimised, and this problem was not observed at the latest site visit, hence it is not raised as a problem in Section 3 of this Road Safety Audit report. It may be beneficial to continue to monitor the situation and provide mitigation measures to discourage incorrect usage of the facility if this situation reoccurs.

Design Organisation Response	Accepted / Part Accepted / Rejected
The design of the traffic signals was undertaken by TfL's TI Team. It is request that the status of this issue be clarified with the traffic signals design team.	
Client Organisation Comments	
Agree with the designer's response	
The issue the auditor has described has not been observed to be a problem since it was initially raised. The junction will be monitored through collision analysis and RSA 4A and 4B process after 12 and 36 months respectively, any issues identified through the monitoring appropriate action will be taken.	

4.7 ISSUE

Location: 2 – St Georges Road junction with Lambeth Road

Reason considered to be outside the Terms of Reference: Not safety related

The Audit Team noted the provision of a single Regulatory 'buses and cycles only' traffic sign. It would appear that this restriction is being widely ignored by a variety of users. It is the opinion of the Audit Team that the single sign, located on a steel hoop, may not be immediately appreciated by all drivers, compounding the potential for disobedience. It may be preferable to provide a more usual high level traffic sign or supplement the single sign with an additional provision on the central island.

Design Organisation Response	Accepted / Part Accepted / Rejected
The Design Organisation accepts the Auditor's recommendation to improve the signing at this location.	
It should be noted that the steel hoop has been replaced with a traditional sign post.	
Client Organisation Comments	
Agree with the designer's response	
The signing at this location has been picked up as part of the snagging works ongoing for the project and an additional sign has been implemented to highlight the restriction.	

5.0 SIGNATURES AND SIGN-OFF

5.1 AUDIT TEAM STATEMENT

We certify that we have examined the drawings and documents listed in Appendix A. to this Safety Audit report. The Road Safety Audit has been carried out in accordance with TfL Procedure SQA-0170 dated May 2014, with the sole purpose of identifying any feature that could be removed or modified in order to improve the safety of the measures. The problems identified have been noted in this report together with associated suggestions for safety improvements that we recommend should be studied for implementation.

No one on the Audit Team has been involved with the design of the measures.

AUDIT TEAM LEADER:

Name:

Position:

Organisation:

Address:

Contact:

AUDIT TEAM MEMBER:

Name:

Position:

Organisation:

Address:

Contact:

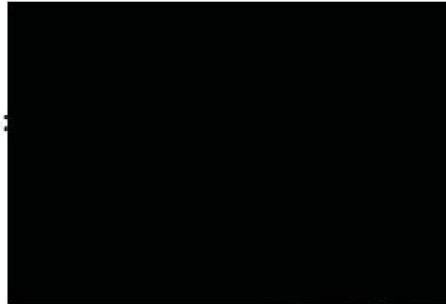
5.2 DESIGN TEAM STATEMENT

In accordance with SQA-0170 dated May 2014, I certify that I have reviewed the items raised in this Stage 3 Safety Audit report. I have given due consideration to each issue raised and have stated my proposed course of action for each in this report. I seek the Client Organisation's endorsement of my proposals.

Name:

Position:

Organisation:



Signed:

Dated:

08 September 2016

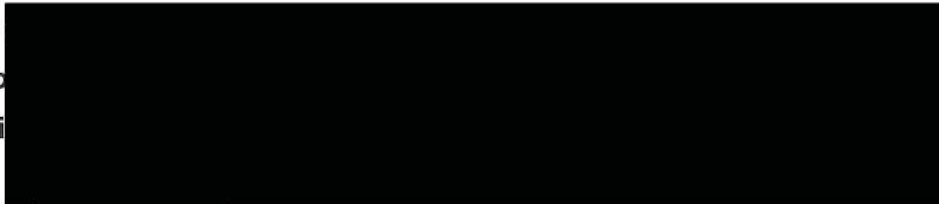
5.3 CLIENT ORGANISATION STATEMENT

I accept these proposals by the Design Organisation.

Name:

Position:

Organisation:



Signed:

Dated: 13/12/2016

5.4 SECONDARY CLIENT ORGANISATION STATEMENT (where appropriate)

I accept these proposals by the Design Organisation.

Name:

Position:

Organisation:



Signed:

Dated:

APPENDIX A

Documents Forming the Audit Brief

DRAWING NUMBER	DRAWING TITLE
CSNS-URS-XX—00-DR-RE-00131	General Arrangement Sheet 1 of 24
CSNS-URS-XX—00-DR-RE-00132	General Arrangement Sheet 2 of 24
CSNS-URS-XX—00-DR-RE-00133	General Arrangement Sheet 3 of 24
CSNS-URS-XX—00-DR-RE-00134	General Arrangement Sheet 4 of 24
CSNS-URS-XX—00-DR-RE-00135	General Arrangement Sheet 5 of 24
CSNS-URS-XX—00-DR-RE-00136	General Arrangement Sheet 6 of 24
CSNS-URS-XX—00-DR-RE-00138	General Arrangement Sheet 7 of 24
CSNS-URS-XX—00-DR-RE-00137	General Arrangement Sheet 8 of 24
CSNS-URS-XX—00-DR-RE-00138b	General Arrangement Sheet 8b of 24
CSNS-URS-XX—00-DR-RE-00139	General Arrangement Sheet 9 of 24
CSNS-URS-XX—00-DR-RE-00140	General Arrangement Sheet 10 of 24
CSNS-URS-XX—00-DR-RE-00141	General Arrangement Sheet 11 of 24
CSNS-URS-XX—00-DR-RE-00142	General Arrangement Sheet 12 of 24
CSNS-URS-XX—00-DR-RE-00143	General Arrangement Sheet 13 of 24
CSNS-URS-XX—00-DR-RE-00144	General Arrangement Sheet 14 of 24
CSNS-URS-XX—00-DR-RE-00145	General Arrangement Sheet 15 of 24
CSNS-URS-XX—00-DR-RE-00146	General Arrangement Sheet 16 of 24

DOCUMENTS

- Safety Audit Brief
- Site Location Plan
- Traffic signal details
- TfL signal safety checklist
- Departures from standard
- Previous Road Safety Audits
- Previous Designer Responses
- Collision data
- Collision plot
- Traffic flow / modelling data
- Pedestrian flow / modelling data
- Speed survey data
- Other documents

DETAILS (where appropriate)

APPENDIX B

Problem Locations

