

Elephant and Castle Northern Roundabout Improvement Scheme

Stage 2 Road Safety Audit

Ref: 2209/008/A3/TLRN/2015

Prepared for:

Sponsorship, TfL Road Space Management (RSM)

By:

Road Safety Audit, TfL Asset Management Directorate

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Version	Status	Date
A	Audit report issued to Client	02/03/2015

1.0 INTRODUCTION

1.1 Commission

- 1.1.1 This report results from a Stage 2 Road Safety Audit carried out on the Elephant and Castle Northern Roundabout Improvement Scheme proposals.
- 1.1.2 The Audit was undertaken by TfL Road Safety Audit in accordance with the Audit Brief issued by the Client Organisation on 5th February 2015. It took place at the Palestra offices of TfL on 26th February 2015 and comprised an examination of the documents provided as listed in Appendix A, plus a visit to the site of the proposed scheme.
- 1.1.3 The visit to the site of the proposed scheme was made on 26th February 2015. During the site visit the weather was sunny and the existing road surface was dry.

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 2015. 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 proposals; 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 In accordance with TfL Procedure SQA-0170 dated May 2014, this Audit has a maximum shelf life of 2 years. If the scheme does not progress to the next stage in its development within this period, then the scheme should be re-audited.
- 1.2.5 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.
- 1.2.6 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: [REDACTED] – TfL Elephant & Castle Northern Roundabout Project

1.3.2 Design Organisation

Design contact details: [REDACTED] – Ringway Jacobs

1.3.3 Audit Team

Audit Team Leader: [REDACTED] – TfL Road Safety Audit

Audit Team Member: [REDACTED] – TfL Road Safety Audit

Audit Team Observer: None Present

1.3.4 Other Specialist Advisors

Specialist Advisor Details: None Present

1.4 Purpose of the Scheme

- 1.4.1 The scheme proposes significant alterations to the Elephant and Castle Northern Roundabout. This includes closing the circulatory section between New Kent Road and the Elephant and Castle Link to the southern roundabout. This results in a peninsular with two way running. Significant alterations have also been made to the pedestrian and cycling facilities.

1.5 Special Considerations

- 1.5.1 No special considerations to raise.

2.0 ITEMS RAISED IN PREVIOUS ROAD SAFETY AUDITS

The proposals were subject to a Stage 1 Road Safety Audit which was carried by Road Safety Audit, TfL Asset Management Directorate in October 2013 (ref: 1915/008/A3/TLRN/2013). The RSA was revised following significant design alterations in July 2014. Items raised in that report can be summarised as follows:

Problem 3.1.1 Traffic signal layout [London Road j/w Elephant & Castle Peninsular] for cyclists may be ambiguous.

The issues raised were accepted by the designer, agreed by the client and alterations are present in the revised design. Therefore, these issues are now considered to be resolved and will not be raised again in this Audit Report.

Problem 3.1.2 Cycle track [south side of Elephant & Castle link road] may pose a hazard to cyclists and pedestrians.

The Audit Team considers that this problem remains in the revised layout and therefore will be raised again in this Audit Report as Problem 3.6.2.

Problem 3.1.3 Insufficient cycle lane facilities [St Georges Road junction with Elephant & Castle Peninsular] may pose a hazard to cyclists.

An advisory cycle lane with coloured surfacing has been incorporated into the design across St Georges Road which highlights the potential for cyclists to continue ahead across left turning vehicles. Therefore, these issues are now considered to be resolved and will not be raised again in this Audit Report.

Problem 3.1.4 Combined bus and cycle lane [London Road junction with Elephant & Castle Peninsular] may pose a hazard to cyclists.

The Audit Team considers that this problem remains in the revised layout and therefore will be raised again in this Audit Report as Problem 3.1.3.

Problem 3.1.5 Road alignment [Elephant & Castle Peninsular opposite Underground Station] may encourage over-running of the cycle lane.

The issue raised was accepted by the designer, agreed by the client and alterations are present in the revised design. Therefore, the issue is now considered to be resolved and will not be raised again in this Audit Report.

Problem 3.1.6 Internal feeder lane may encourage cyclists to adopt an unsafe position within the carriageway [Elephant & Castle Peninsular j/w London Road] on the approach.

The issue raised was accepted by the designer, agreed by the client and alterations are present in the revised design. Therefore,

the issue is now considered to be resolved and will not be raised again in this Audit Report.

- Problem 3.1.7 Potential for pedestrians [floating bus stop on Newington Causeway] to step into, or stand close to the cycle lane.

The issue raised was part accepted by the designer, agreed by the client and alterations are present in the revised design. Therefore, the issue is now considered to be resolved and will not be raised again in this Audit Report.

- Problem 3.1.8 Change in level [floating bus stop on Newington Causeway] may pose a hazard to visually impaired pedestrians layout.

The issue raised was accepted by the designer, agreed by the client and alterations are present in the revised design. Therefore, the issue is now considered to be resolved and will not be raised again in this Audit Report.

- Problem 3.2.1 Signal timings [London Road junction with Elephant and Castle Peninsular] may be ambiguous to pedestrians.

The issue raised was accepted by the designer, agreed by the client and alterations are present in the revised design. Therefore, the issue is now considered to be resolved and will not be raised again in this Audit Report.

- Problem 3.3.1 Removal of pedestrian guardrail [Link road between Elephant and Castle southern and northern roundabouts] may pose a hazard to pedestrians.

The design no longer proposes removal of pedestrian guardrail and these issues are now considered to be resolved. This problem will not be raised again in this Audit Report.

- Problem 3.3.2 Left turn ban [Newington Causeway j/w Elephant and Castle Peninsular] may encourage unsafe turning manoeuvres.

The Audit Team considers that this problem remains in the revised layout and therefore will be raised again in this Audit Report as Problem 3.2.7.

3.0 ITEMS RAISED AT THIS STAGE 2 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 LONDON ROAD

3.1.1 PROBLEM

Location: A – London Road junction with proposed Peninsular

Summary: Proposed cycle stacking area may result in increased collisions between circulatory traffic and cyclists

The layout for the cycle lane which crosses from the inner to outer sides of the proposed Elephant and Castle peninsular, includes a two way controlled cycle crossing facility. The Audit Team are concerned that the area within the central reservation island may not provide suitable capacity to safely accommodate cyclists held on a red signal. This may lead to collisions as cyclists overhang into the carriageway, potentially into the path of circulatory traffic in either direction. If cyclists feel particularly vulnerable within this area, or do not realise that the crossing operates in two phases, they may be more likely to divert around the facility and/or disobey the red traffic signal with an increased potential for collisions with circulatory vehicles as they attempt to cross three traffic lanes potentially out of phase.

RECOMMENDATION

Ensure that cycle facilities are adequate to accommodate the likely demand and encourage safe usage. This may involve altering the operation of the traffic signals to provide a crossing which can be undertaken in one phase or providing suitable stacking space so that cyclists can take refuge safely until the next phase is called.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue.	
TfL stated that traffic signal modification cannot be considered as it will have a network impact which will impact on the approved and signed off TSSR.	
A design change has now been made to make this cycle route one way northbound effectively doubling capacity for cyclists in the waiting area on the island.	
Client Organisation Comments	
A refinement of the design has been introduced to make the cycle crossing towards London Road one-way only, therefore effectively doubling the capacity for waiting cyclists.	
Although this design could cater for cyclists in both directions in future, the large majority of users would be cyclists in the morning peak hours from New Kent Road travelling towards Cycle Superhighway 6. The signal phasing at this location avoids keeping cyclists waiting in this location, and the signal timings dictate that the next phase allows cyclists who are on the island to move off northwards towards London Road should any stacking back into the carriageway. The junction will be monitored after implementation to ensure it is effectively clearing all cyclists.	
Currently flows of cyclists in the AM Peak westbound are 312 in the peak hour, with a maximum of 90 cyclists in any one 15 minute period. On a cycle time of 120 seconds there should be no more than 12 cyclists in the island area at any one time, or 17 including a projected 40% future uplift. This assumes however that all cyclists	

will want to travel in the same direction, use the facility, and that no cyclists take advantage of the new signage to direct cyclists via a quieter orbital route that avoids the junction.

3.1.2 PROBLEM

Location: B – London Road junction with proposed Peninsular

Summary: Proposed 'buses only' right turn facility is uncontrolled and may result in collisions with cyclists using the controlled cycle crossing facility.

The proposals include an uncontrolled right turn facility to facilitate buses turning right onto London Road within this otherwise signal controlled junction. The Audit Team have concerns that a non-controlled traffic flow within an otherwise controlled junction may increase the risk of collisions as opposing flows are not completely separated. Specifically the Audit Team have concerns that buses turning right from this facility may:-

1. Encounter vehicles approaching from various directions and in multiple lanes. The approaching vehicles are unlikely to be looking out for a vehicle crossing their path as they are given a green signal. This may result in side impact or shunt type collisions if buses fail to give way.
2. The lack of designated stage for buses to complete this manoeuvre combined with the very busy nature of this area may result in buses struggling to find a suitable gap and an increased potential for side impact or shunt type collisions may result. Additionally bus drivers may feel under pressure to clear this area due to the limited stacking space within the right turn facility and the potential to obstruct other users paths whilst waiting to turn right.
3. Obstruct the progression of users entering the anticlockwise section of the peninsular from London Road or Newington Causeway. This may lead to users not completing their manoeuvre within the allocated phase with an increased potential for congestion related conflicts such as pedestrians crossing between waiting vehicles and collisions with opposing vehicles.
4. Collide with cyclists and / or pedestrians, particularly as they attempt to cross in stage 3 as these users are unlikely to anticipate a bus crossing their path as they receive a green signal to cross under phases K, L or F.
5. Collisions with northwest bound cyclists crossing in the second part of phase K are of particular concern as the layout results in cyclists approaching almost parallel along the offside of a bus. These cyclists may not be obvious to buses and collisions may result as both users attempt to enter the same area of carriageway potentially unaware of each other.

This problem may also be exacerbated by the issue raised in 3.1.1 which may mean that cyclists do not adhere to proper use of the cycling crossing.

RECOMMENDATION

Provide measures to reduce the risk of conflict with opposing stages / phases. This could include the introduction of a stop line and associated traffic signal alterations or ensuring that sufficient intergreen / blackout period is provided to ensure that buses can complete this manoeuvre independently.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue.	
TfL stated that traffic signal modification should not be amended as it will have a significant network impact which will impact on the approved and signed off TSSR.	
TI were consulted regarding this issue and they stated that they expect that right-	

turning buses would be able to clear before conflicting phases in other stages begin.

TI confirmed that this will be checked at commissioning and if there does prove to be an issue with buses blocking another phase, then a detector can be added, if required, which will extend the all red period, thus allowing right-turning buses to clear.

Client Organisation Comments

TfL did consider a traffic signal modification however the impact on the network would have been significant and a 'give way' facility was deemed to be the optimum solution.

Considering the monitoring that will take place following installation and the ability to ensure that traffic does clear the 'give way' before the subsequent signal phase, the risk of a collision is considered to be low.

There is also a concern raised by Buses that coaches who are not familiar with the carriageway layout will be permitted to use the right turn into London Road, but may not be aware that they are required to 'Give Way'. This movement behaves in the same way as a right turn into a side, which requires traffic to give way.

This unlikely movement has been partly mitigated by notifying Satellite Navigation providers and Victoria Coach Station that this movement is not permitted. There have been discussions as to whether there is any suitable signage that could be provided to ensure coaches do not turn right, however the operation of this movement will need to be monitored at RSA3. It will be decided following RSA3 whether an RSA4 is required.

3.1.3 PROBLEM

Location: C – London Road junction with proposed Peninsular

Summary: Proposed left turn only nearside Bus and Cycle lane may result in increased risk of collisions with cyclists continuing ahead.

The proposals include a nearside clockwise bus and cycle lane on the approach to London Road. This arrangement may lead to an increased potential for 'left hook' type collisions between cyclists and buses as cyclists attempt to continue ahead across the path of a left turning bus.

RECOMMENDATION

Provide an appropriate facility to safely accommodate the straight ahead movement for cyclists. This may consist of similar measures as found across the St Georges Road junction.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ had meeting with TfL to discuss the concerns regarding the proposed turning movement for the buses into London Road. TfL reiterated response from RSA 1 stating that the bus lane has been designed to a width which makes it almost impossible cyclists & buses to pass each other thereby promoting cyclists to adopt a central dominant position in the lane. Initial VISSIM modelling results have shown only two or three buses make this manoeuvre each cycle. In addition, the problem is further lessened as buses will be familiar with the situation as a daily occurrence and during peak periods large numbers of cyclists will be present and adopt a presence in the bus lane. RJ support this response.	
Client Organisation Comments	
The latest cycle guidance has advised the removal of the cycle marking at the entrance to St George's Road.	
Preventing the overtaking of cyclists with a narrower bus lane is considered to be the lowest risk approach which can be accommodated through this junction. It puts cyclists in the dominant position.	

3.2 NEWINGTON CAUSEWAY

3.2.1 PROBLEM

Location: D – Exit from proposed Peninsular into Newington Causeway.

Summary: Users may attempt to exit in two lanes which may result in increased 'side swipe' type collisions.

The proposed peninsular road markings indicate two ahead lanes clockwise between St Georges Road and London Road. This could be interpreted as both lanes can be used to enter Newington Causeway, which has a single lane exit. This may result in an increased potential for side swipe type collisions as users attempt to enter Newington Causeway two abreast. An increased potential for the advisory cycle lane to be over-run, and for cyclists to become squeezed if users attempt to enter Newington Causeway side by side.

RECOMMENDATION

Provide additional clarification regarding the intended lane designations. This could include providing destination text markings.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>Advanced signing has been proposed notifying motorists of the permitted movements and destinations to assist with motorists advanced lane decision.</p> <p>There are carriageway layout constraints for implementing advanced road marking directional arrows, due to proposed controlled crossing location.</p> <p>RJ to include text destinations to supplement straight ahead arrows for clockwise lanes.</p>	
Client Organisation Comments	
<p>Agree with Designer's response. This will be monitored further at RSA3 to agree any further road markings to reduce lane changes.</p>	

3.2.2 PROBLEM

Location: E – Newington Causeway northeast bound approach to segregated cycle lane.

Summary: Layout on approach to the physical island which segregates the cycle lane and general traffic lane may result in collisions with the feature.

The proposed northeast bound alignment requires general traffic to deviate their path to avoid the physical island which segregates the cycle lane and general traffic lane. The only feature to highlight this island appears to be a bollard and it is therefore anticipated that the feature may not be conspicuous on the approach, particularly if the bollard becomes damaged, demounted or dirty. Vehicles may collide with the island or take evasive manoeuvres to avoid it, which could result in injury to vehicle occupants and / or collisions with other vehicles.

RECOMMENDATION

Increase the conspicuity of the commencement of the physical island. This may include incorporating hatched road markings on the approach and the inclusion of a more conspicuous vertical feature such as an illuminated guide post.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ amended concept design to reduce segregated island length. This was done to mitigate the need for a temporary road closure to address any potential future maintenance works of the front end of the segregation island e.g. replacing a 'Jilson' TSRGD bollard (black & white), which has been proposed by RJ at the entry point of segregated cycle lane. RJ to implement road marking hatch on approach to segregated island, as per recommendation.	
Client Organisation Comments	
Agree with Designer's response.	

3.2.3 PROBLEM

Location: F – Pedestrian crossing facility across Newington Causeway

Summary: Location of pedestrian crossing and cycle by-pass may result in collisions between pedestrian and cyclists.

1. The proposed staggered pedestrian crossing facility across Newington Causeway may result in pedestrians crossing along the anticipated desire line and therefore by-passing the northeast bound section of the crossing. This may result in increased collisions as pedestrians cross behind the stop line and potentially between waiting, accelerating or decelerating vehicles which may not anticipate a pedestrian at this location.
2. Furthermore, the close proximity between the eastern extent of the pedestrian crossing and the facility to enable left turning cyclists to by-pass the stop line may result in increased conflicts as pedestrians either queue back from the crossing facility or cross the path of cyclists which may be approaching at speed.

RECOMMENDATION

Provide a pedestrian crossing facility which encourages safe usage and is suitably segregated from the cycle left turn bypass facility on the eastern corner of this junction. This could include the provision of

1. A pedestrian deterrent to encourage usage of both parts of the crossing facility
2. Alterations to the path of the cycle route to maintain an on carriageway facility, or increase the distance between the interactions of the two facilities off carriageway.

Design Organisation Response	Accepted / Part Accepted / Rejected
1. Design is as per the concept design. Decluttering is a key deliverable of the concept design. Perceived issue noted and recommendation to monitor after scheme implementation and mitigation measure to be considered if conflict issue develops.	
2. Design is as per the concept design. RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue. RJ made surface material changes as part of detailed design but this has now been rejected by TfL following objection from WWM and design has now reverted back to TfL concept design as per TfL's instruction.	

Client Organisation Comments

Note: WWM (Witherford Watson Mann Architects) are the landscaping architects commissioned by Transport for London and the GLA to undertake the urban realm design for the areas within the scope of the project.

The shared surface area for cyclists to use the dropped kerbs mimics similar facilities that are already in place at the southern junction. These are known to existing cyclists and pedestrians who use the area.

Following comments at the highway public consultation, cycling supporters requested that a provision be permitted for cyclists to ensure that cyclists neither cross that section of footway at any location, or turn left at the sharp left turn. This

facility directs cyclists to a specific location where footway signage will make clear to cyclists and pedestrians that both may use this section of footway.

Due to the very low cycle flows making this movement, and that there will be a new signage scheme in place to help cyclists use Rockingham Street to avoid the E&C junctions, the benefit to having a different footway material would be inconsistent with other dropped kerbs and benefit relatively few users.

There will be pedestrian guardrailling on the island to prevent pedestrians crossing other than at the intended crossing location.

Agreed to monitor usage of pedestrian crossing and shared cycle space to ensure it is performing safely at RSA3.

3.2.4 PROBLEM

Location: G – Newington Causeway approach to proposed Peninsular.

Summary: Increased side swipe type collisions may result from poor lane discipline.

The proposed road markings consist of two ahead arrows on the southwest bound approach to the proposed peninsular. Users may interpret both lanes as being suitable for Waterloo or for the A3. This may result in increased weaving / lane changing manoeuvres as they continue onto the anti-clockwise peninsular lanes where the offside lanes are designated for Waterloo and the nearside lanes are for the A3 only. This may be exacerbated by the lack of any lane markings as these users enter the three unmarked lanes within the peninsular which quickly widen to four lanes. This may increase the potential for side swipe type collisions.

RECOMMENDATION

Provide additional clarification regarding the intended lane designations. This may include providing additional lane allocation guidance such as the addition of destination text to the road marking arrows and / or lane designation signing.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ to supplement nearside lane road marking arrow with text 'A3 ONLY'. Additional signage to be considered if possible.	
Client Organisation Comments	
Agree with Designer's response.	

3.2.5 PROBLEM

Location: H – Newington Causeway access south of Rockingham Street.

Summary: Cycle lane layout across the access may result in cycle collisions.

The Audit Team are concerned that southwest bound cyclists may not be anticipated by motorists entering or exiting these premises as the segregated cycle lane is disassociated with the carriageway running lanes. The location of the bus stop in proximity to this access increases the potential for a cyclist in the segregated cycle lane to be obscured from the view of a vehicle turning left into the access whilst the bus stop is occupied which may result in increased risk of collisions.

Furthermore, vehicles exiting this access are likely to obstruct the cycle lane as they wait at the effective edge of carriageway. This issue may also be exacerbated whilst the bus stop is occupied as vehicles are more likely to edge out to gain visibility of southwest bound vehicles. Cyclists may not anticipate vehicles stopping across the cycle lane and an increased potential for collisions may result.

RECOMMENDATION

Relocate the bus stop so that the segregated cycle lane can be provided closer to the carriageway running lanes and not result in potential visibility and obstruction issues.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>Design is as per the concept design with the exception of changes to the road marking layout, which was agreed with TfL via Design Query Register process.</p> <p>Visibility for exiting vehicles not considered an issue. Agreed that visibility for vehicles entering is affected by presence of buses waiting and passengers boarding/alighting. Vehicle entering speeds anticipated to be low.</p> <p>Meetings with TfL also took place to discuss issue and TfL stated that options for relocation of bus stop not possible due proximity of existing bus stop further north and impact on approach lane capacity further south.</p> <p>Instruction from TfL was for no change to floating bus stop layout in concept design.</p> <p>RJ recommend for issue to be monitored after scheme implementation.</p>	
Client Organisation Comments	
<p>Bus stop bypass provides additional safety benefits for cyclists and the vast majority of vehicles using the access into the Metro Central Heights development will be repeat users who are familiar with the layout. Vehicle flows are very low at this location and cyclists have good sight lines approaching the access road.</p> <p>Agreed that performance will be reviewed at RSA 3.</p>	

3.2.6 PROBLEM

Location: I – Newington Causeway, northern extent of northbound segregated cycle lane.

Summary: Cycle lane layout and proximity to bus stop may result in increased cycle / bus collisions as they attempt to cross one another's path.

The indicated route for cyclists from the segregated cycle lane to the Advanced Stop Line effectively guides cyclists to move over to the offside of the nearside lane at a location where buses and left turning vehicles are likely to be entering the nearside lane, from the offside potentially across the path of a cyclist. The proximity of the bus stop combined with the indicated cycle route may result in side swipe type collisions.

RECOMMENDATION

Ensure that the cycle route indicated promotes suitable interactions as cyclists and vehicles merge. This may include, but is not limited to relocating the bus stop and / or increasing the conspicuity of the likely cycle manoeuvres, through provision of more prominent road markings.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue.	
RJ enquired if a similar floating bus stop design as per southbound carriageway had been explored. TfL stated that this design was not possible due to physical constraints, and the removal of significant established trees required.	
RJ enquired if bus stop could be proposed further north on exit side of the controlled crossing. TfL stated that this was not possible, as bus stop needed to be no further than existing location for passenger demand/accessibility.	
RJ to consider additional cycle symbols (Diag. 1057) to further highlight this potential conflict location.	

Client Organisation Comments
The proposed layout has a segregated cycle lane leading into a bus stop and is used elsewhere in London and at another two locations around the Elephant & Castle northern roundabout. Bus drivers and cyclists are familiar with this approach and the inclusion of additional cycle signage is considered appropriate.
It is more common to have an unprotected cycle lane, however, the addition of a segregated cycle lane between the junction and the bus stop is considered a safer solution.

3.2.7 PROBLEM

Location: J – Newington Causeway j/w with Elephant and Castle Peninsular

Summary: Left turn ban may encourage unsafe turning manoeuvres

It is proposed to ban the left turn from Newington Causeway onto New Kent Road. The Audit Team are concerned that vehicles wishing to perform this manoeuvre may continue to do so illegally or seek an alternative place to turn. It is plausible that these vehicles may utilise the former southern roundabout to turn which may over-saturate the available space for performing this manoeuvre, particularly within the internal link road within the junction.

RECOMMENDATION

Provide additional notification to left turning motorists as to the alternative route to perform this manoeuvre.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>As per RSA1 TfL response, advanced signing has been proposed notifying motorists of the permitted movements at the junction to avoid motorists from arriving at the junction and undertaking illegal or u-turn manoeuvres.</p> <p>The perceived issue will be monitored for this new road layout but essentially this is an issue for enforcement.</p>	
Client Organisation Comments	
<p>Vehicle flows for this movement are so low that they cannot be accounted for on the traffic modelling software. There is sufficient space capacity on Great Dover Street which is the direct route.</p> <p>Vehicle counts have also been completed within the Rockingham Estate to enable further monitoring after the works have been completed in case there is an impact from an increase in vehicle traffic.</p>	

3.3 PENINSULAR AREA

3.3.1 PROBLEM

Location: K – Anti-clockwise peninsular lanes between Newington Causeway and London Road.

Summary: Layout may result in side swipe type collisions.

In order to accommodate the provision of the pedestrian and parallel cycle crossing facility, and advisory cycle lanes which cross the peninsular circulatory lanes at this location, the carriageway lane markings are terminated through this section. Whilst no swept path analysis has been provided, it is anticipated that vehicles may weave through this section and a potential for side swipe type collisions may result. This may be exacerbated whilst the right turn for buses only into London Road is accommodated, depending upon the positioning of these vehicles. Furthermore, if vehicles are effectively forced to the nearside an increased potential for collisions with the commencement of the physical island between the cycle crossing and advisory cycle lane may result.

RECOMMENDATION

Undertake swept path analysis and consider the likely impact of the right turn facility being utilised. This should provide an indication as to whether alterations may be required to ensure that vehicles can travel through this section without encroaching into each other's path. Furthermore, additional features may be beneficial to increase the conspicuity of the physical island between the westbound cycle lane and nearside traffic lane.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>Swept path analysis undertaken by RJ, which showed some minor lane encroachment for artics into right turn facility for buses and also lane encroachment for artics as they move anticlockwise. RJ raised issue in Design Query Register, which was issued to TfL for review and response.</p> <p>RJ proposed a kerb realignment of centre island to provide smoother vehicle swept path for vehicles travelling anticlockwise. This would mitigate the potential for vehicle conflict during this turning movement. TfL stated that this proposal would require a traffic signal modification, which should not be amended as it will have a significant network impact which will impact on the approved and signed off TSSR.</p> <p>TfL also stated that their path analysis showed that large vehicles can move anticlockwise without conflict. TfL do accept that there is potential for minor encroachment but consider this to be a low frequency occurrence, so proposal was rejected and instruction was for design to remain as per concept.</p> <p>A 'Jilson' TSRGD bollard (black & white) is proposed for the island in question, so this should increase conspicuity of island.</p>	
Client Organisation Comments	
<p>The proposed layout has a significant impact on journey times through these junctions and a further reduction may require less road space be allocated to cyclists (notably the loss of stacking space on the island raised in item 3.1.1), who are currently subject to a very high rate of collisions.</p> <p>The use of the Jilson bollard is supported and it is considered that on balance this design optimises safety.</p>	

3.3.2 PROBLEM

Location: L – Cycle lane northwest bound between New Kent Road and London Road

Summary: Cycle manoeuvres may lead to conflict with westbound vehicles.

A cycle cut through is proposed south of the north-eastern corner of the peninsular. Cyclists may not appreciate what the cut through is for or choose to avoid the cut through if they are held up by pedestrians within the large path which they are required to cross. If cyclists continue around the nearside segregated cycle lane and attempt to cross the circulatory lanes to head towards London Road an increased potential for conflict may result as they attempt to cross at least three traffic lanes unaided.

Additionally, the anticipated busy nature of the footpath which dissects the cycle cut through may result in increased collisions between cyclists and pedestrians.

RECOMMENDATION

In order to better cater for the likely northwest bound cycle manoeuvres, it may be beneficial to separately signal the cycle stop line. This would provide cyclists with an opportunity to cross the anti-clockwise circulatory lanes unopposed, reduce the potential for pedestrian conflicts and negate the requirement for the cycle cut through.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ raised issue in Design Query Register, which was issued to TfL for review and response.	
TfL stated that traffic signal modification cannot be considered as it will have a network impact which will impact on the approved and signed off TSSR.	
RJ amended peninsular cycle access and egress design, to tie in with temporary path design in the peninsular for pedestrian and cyclist movements after scheme implementation. This proposed a cycle track facility connecting the access and egress points of the peninsular. Meetings with TfL and TfL Cycling Group also took place to discuss this layout issue and instruction from TfL was for design to revert back to the concept design.	
Client Organisation Comments	
A key aim of the peninsula urban realm scheme is to provide additional urban realm space, and the connection of the roundabout to the southern footway is a key element of this. Bisecting it with a cycle track undermines the considerable benefits of this for reduced additional benefit.	
London Underground are expected to hoard much of the peninsular from summer 2017 to enable a construction shaft and work site to be constructed. This would have required the closure of the cycle track for circa 3 years and cause an additional change to cyclists. It was determined that it was clearer for cyclists to mount the footway nearer the pedestrian crossing, and retain clear signage to ensure pedestrians and cyclists are familiar with one another's movements.	
The very low cycle flows on this movement would create enormous disbenefit from having a separately signalled turning movement. Clear signage on the footways will be introduced to ensure that cyclists follow the recommended route and that pedestrians are aware.	

3.3.3 PROBLEM

Location: M – Anti-clockwise peninsular lanes south of London Road.

Summary: Layout may result in side swipe type collisions or collisions with the segregation island.

In order to accommodate access into the nearside anti-clockwise segregated cycle lane from London Road a gap has been provided within the segregation island. The point at which the physical segregation island re-commences coincides with the radius encountered for anticlockwise traffic and as such it may be susceptible to being struck by vehicles in the nearside lane. This may result in injury to occupants of the vehicle or collisions with other vehicles as users swerve to avoid the feature.

RECOMMENDATION

Undertake swept path analysis and if necessary adjust the layout at this location. Furthermore, additional features may be beneficial to increase the conspicuity of the physical island.

Design Organisation Response	Accepted / Part Accepted / Rejected
Swept path analysis undertaken by RJ showed some lane encroachment for larger vehicles like buses and artics, so potential for clipping segregated island if trying to stay in lane.	
RJ to consider inclusion of a 'Jilson' TSRGD bollard (black & white). If minimum clearance not possible, then install road marking (Diag. 1010) to delineate between islands.	
Client Organisation Comments	
Agree with Designer's response.	

3.4 ST GEORGES ROAD

3.4.1 PROBLEM

Location: N – Right turn lanes into St Georges Road from the proposed peninsular

Summary: Reduced southbound visibility for users in the offside right turn lane may result in increased risk of conflict with northbound vehicles.

Two lanes of traffic are permitted to turn right from the peninsular onto St Georges Road. The alignment of the approach lanes to the give way line may result in vehicles in the nearside lane obstructing visibility to the left for drivers in the offside lane of oncoming northbound traffic.

Reduced visibility may result in increased risk of side impact or shunt type collisions as users may not see approaching vehicles and fail to give way.

RECOMMENDATION

Adjust the alignment to maximise inter-visibility between users at the give way line and northbound traffic. It may be necessary to signalise this arm or provide a single lane approach.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>TfL stated that staggered approach was proposed to improve visibility for both lanes of traffic turning into St. Georges Road. RJ amended staggered give way road marking layout in concept design, as it was felt the nearside lane visibility was impacted by proposed sign, and the standard continuous give way line would be a better option with respect to visibility and driver understanding/compliance.</p> <p>TfL TI confirmed signalising of this arm is not feasible, as it will have a network impact which will impact on the approved and signed off TSSR.</p> <p>Similarly, reduction of capacity i.e. single lane approach is not an option, as it will have a network impact which will impact on the approved and signed off TSSR.</p> <p>RJ swept path analysis shows lane encroachment would create conflict for two large vehicles moving side by side turning into St. Georges Road. TfL stated that their path analysis shows no conflict and instructed that two lanes to remain as per concept design.</p>	
Client Organisation Comments	
<p>This junction had originally been proposed as a single right turn lane but the traffic impacts required a redesign. A single right turn made the layout unworkable and the opportunity to improve safety would have been reduced. The revised design staggered the give way to improve visibility between northbound and westbound vehicles. It is considered that on balance this design optimises safety.</p> <p>This solution maximises the inter-visibility between users at the give way line and the northbound traffic.</p>	

3.4.2 PROBLEM

Location: O – Northbound bus and cycle lane from St Georges Road to London Road

Summary: Proposed layout may result in an increased potential for cyclists to be squeezed as buses travel alongside and lane width narrows.

The proposed bus and cycle lane which runs from the north side of St Georges Road, north to the stop line immediately south of London Road appears to allow for buses to travel alongside cyclists at the southern extent but gradually narrows to only accommodate a bus. This may result in widths between 3.2m and 4m which can ambiguously suggest that there may be enough space for a vehicle to pass a cyclist within the lane, when it actually leaves very little lateral clearance. The proposed layout may result in cyclists being squeezed by buses travelling alongside attempting to stay within the designated left turn lane. This may lead to an increased potential for conflicts between buses and cyclists.

RECOMMENDATION

Provide a consistent lane width to allow cyclists to be overtaken safely or to allow cyclists to establish a primary position.

Design Organisation Response	Accepted / Part Accepted / Rejected
Consistent lane width not possible without realignment of islands. This leaves a lane with a pinch point that is not a suitable width to overtake cyclists comfortably but wide enough to encourage vehicles to undertake this manoeuvre.	
RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue.	
A consistent bus lane width is not possible without changes to the proposed kerb alignment across junction with St. Georges Road, which is not feasible as it will have a network impact which will impact on the approved and signed off TSSR.	
However, even with a consistent 4.0m wide bus lane, buses still require the majority of the lane due to the turning movement involved. A 4.0m bus lane width throughout is likely to encourage buses to overtake cyclists in the bus lane, which may result in cyclists being squeezed by buses travelling alongside attempting to stay within the designated left turn lane.	
Removal of the advisory cycle lane marking across the junction of St. Georges Road would help encourage cyclists to establish a primary position on the approach to the bus lane. The narrowing of the bus lane on the approach to London Road combined with cyclists being in a primary position will discourage buses overtaking within the bus lane.	
RJ to revise road marking layout on approach to the bus lane to provide a consistent lane width across the junction of St. Georges Road to assist with encouraging cyclists taking the primary position.	
Client Organisation Comments	
Since the RSA2 was undertaken, the revised cycling design guidance advises that the cycle marking at the entrance to St George's Road is removed. This has the additional advantage that cyclists will be more likely to take a dominant position in the carriageway.	
Buses as a result will expect cyclists to share the lane, rather than be encouraged to	

stay to the left hand side.

The high number of cyclists expected to stay on carriageway through this section during the AM peak in this tidal location will help inform bus drivers behaviour. There is little value for bus journey times in drivers overtaking cyclists only to have to slow down significantly and turn left at London Road.

It will be investigated whether additional communication to advise bus drivers to not overtake cyclists is required.

3.4.3 PROBLEM

Location: P – Cycle crossing south of St Georges Road.

Summary: Layout of cycle crossing may lead to cycle collisions.

The proposed parallel cycle crossing is almost straight across in layout but includes a stop line in the central reservation and different phases. The Audit Team are concerned that conflicts between cyclists and motorists may occur as:

1. Cyclists may not be fully accommodated within the central reservation area if the mass of cyclists exceeds the space provided. This may result in cyclists being clipped by vehicles travelling around the peninsular in either direction.
2. Cyclists may not realise that either side of the crossing is controlled separately. If they do not stop within the central reservation area they may collide with an approaching vehicle.

RECOMMENDATION

Alter the layout to encourage safe usage of the crossing facility. This may include introducing a stagger arrangement to clarify the separate operation of each side of the crossing to encourage cyclists to stop at the proposed stop lines. Alternatively, alter the crossing so that both sides can be crossed in a single phase.

Design Organisation Response	Accepted / Part Accepted / Rejected
Design is as per the concept design.	
RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue and response from TfL stated that there would be no change to the concept design as two phases are required by TfL for pedestrians to cross this distance.	
TfL stated that traffic signal layout modification cannot be considered as it will have a network impact which will impact on the approved and signed off TSSR.	
Client Organisation Comments	
Cycle flows for this movement are low even considering an uplift in future years. There will also be an alternative signage strategy proposed to enable cyclists to use an alternative cycle network and bypass E&C junctions.	
The cycle facility will be monitored after implementation to ensure cyclists can clear the waiting area and the RSA 3 will review the situation.	

3.4.4 PROBLEM

Location: Q – Pedestrian crossing south of St Georges Road

Summary: Proximity of pedestrian crossing to cycle lane may result in cycle and pedestrian collisions.

The western extent of the proposed pedestrian crossing facility at this location is in such close proximity to the off carriageway cycle lane that the tactile paving for the two facilities almost meet. This may result in increased collisions between pedestrians and cyclists within this cycle lane as pedestrians either queue back from the crossing facility or exit the crossing into the path of cyclists.

RECOMMENDATION

Provide better separation between the pedestrian route and the cycle route in order to minimise the potential for conflicts. This may require altering the path of the cycle route to increase the distance between the interactions of the two facilities.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue.	
Altering of the cycle track alignment to address issue is constrained by the existing LCC building line. RJ suggested breaking the cycle track with a shared space element at this end to mitigate conflict. TfL said that the continuous cycle track is a key feature of the scheme and RJ instructed that design was not to be changed. TfL accept the risk of this conflict situation.	
Client Organisation Comments	
The tactile paving design for the pedestrian crossing has been amended to reflect the latest Department for Transport proposals. As a result the tactile paving will be 800mm wide and follow the radius of the kerb. Although this does not give additional footway width, it does help separate the two crossings.	
It is accepted that there is a potential issue, however, the appropriate solution to mitigate this is to use materials to differentiate between the footway and cycle track and therefore give priority to pedestrians.	

3.5 NEW KENT ROAD

3.5.1 PROBLEM

Location: R – Western end of New Kent Road where it joins the eastern end of the proposed peninsular

Summary: Cyclists may be squeezed as the lane width decreases.

The layout proposes two eastbound general traffic lanes and a segregated cycle lane on approach to the proposed crossing at the commencement of New Kent Road. The segregated cycle lane terminates on the western side of the crossing. The Audit Team are concerned that as cyclists continue eastbound they may not be anticipated by eastbound vehicles and as the nearside lane decreases in width cyclists may be squeezed with a potential for destabilisation and / or injuries as they collide or avoid collisions with other eastbound vehicles.

Whilst it is appreciated that this is an existing issue in the current arrangement it may be exacerbated in the proposed layout due to both lanes having to continue to New Kent Road and by the introduction of the segregated cycle lane.

RECOMMENDATION

Increase the conspicuity of the likely / intended cycle manoeuvres to encourage suitable interactions as cyclists and vehicles merge. This may include altering the road markings in order to encourage cyclists to adopt a primary position as they reach the proposed bus stop / start of the narrowed nearside lane.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue.</p> <p>RJ proposed a kerb realignment for a consistent taper as road reaches narrow section by bus stop in eastbound direction. This would encourage cyclists to adopt a primary position sooner.</p> <p>TfL rejected this proposal as concept design allows additional carriageway space for cyclists to pass taxi bay and gives buses longer visibility of merging cyclist.</p> <p>RJ to consider provision of cycle symbols (Diag. 1057) on exit side of controlled crossing.</p>	
Client Organisation Comments	
<p>Agree with Designer's response. It has since been agreed that additional cycle logos will be provided at this location.</p>	

3.6 ELEPHANT & CASTLE LINK ROAD

3.6.1 PROBLEM

Location: S – Elephant and Castle Link, northbound Bus and Cycle lane.

Summary: Effective removal of bus lane may result in increased collisions.

The current layout allows for two buses to pass whilst staying in the bus lane. The proposed bus and cycle lane layout may result in increased merging collisions as buses increasingly have to enter the general traffic lane to avoid waiting buses at these very busy stops.

Furthermore, as the proposed bus and cycle lane width effectively encourages cyclists to pass waiting buses it may increase the potential for side swipe type collisions between buses and cyclists as buses enter or exit the stops potentially across the path of a cyclist.

RECOMMENDATION

Alter the bus lane arrangement to minimise the potential for side swipe type collisions. This may include but is not limited to altering the bus routes to reduce the amount of buses which stop at this location and /or provision of an appropriate merge facility to accommodate the likely merge manoeuvres introduced as part of the altered layout.

Design Organisation Response	Accepted / Part Accepted / Rejected
Design is as per the concept design.	
Although this problem has been identified, it has been mitigated by the introduction of a cycle track to avoid potential collisions with buses. New cycle track in footway anticipated to take significant number of cyclists from Link Road northbound.	
Furthermore, the northbound carriageway design reflects the existing southbound carriageway design, where traffic collision data shows that there is a low risk, with no recorded collisions between cyclists and vehicles in the 36 months data analysed.	
Client Organisation Comments	
The design is similar throughout London with the addition of a segregated cycle track. In addition the proposed design is improved significantly over existing conditions where cyclists are encouraged to cycle alongside buses.	
The existing southbound arrangement is very similar to the proposed northbound arrangement. Collision data for the previous 36 months has shown that there is not a higher risk of cycling related accidents along this stretch of carriageway. However an off-carriageway northbound cycle track was introduced to give cyclists the choice of route and to provide additional capacity for cyclists.	

3.6.2 PROBLEM

Location: T – Cycle lane on south side of Elephant & Castle link road

Summary: Cycle track layout may pose a hazard to cyclists and pedestrians

The Audit Team is concerned that the proposal to provide a cycle track on the western footway may pose a hazard to pedestrians and cyclists. This location has a significant pedestrian and cyclist utilisation. It is likely that the space dedicated for pedestrians may not be sufficient to accommodate the likely volume, leading to pedestrians spilling out into the adjacent cycle track. Pedestrians stepping into the

cycle track are unlikely to anticipate cyclists using the facility, with an exacerbated potential for conflict between these users as a result.

RECOMMENDATION

Modify the cycle track and footway layout to deter encroachment by pedestrians. This may require relocation of the facility away from the footway.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>Design is as per the concept design with the exception of the removal of splayed kerbs delineating the cycle track and replacing with standard straight granite kerb (150mm wide). This change was due to the proposed cycle track level being 50mm below footway level, thus making the splayed kerb an unsuitable delineation option for the track, as the surface course material would be too high.(150mm wide).</p> <p>RJ raised issue in Design Query Register, which was issued to TfL for review and response. Meetings with TfL also took place to discuss issue and response from TfL stated that there would be no change to the concept design.</p> <p>Cycle track is 50mm below footway level to assist blind and partially sighted.</p> <p>Informal crossings at known desire lines are at footway level due to provision of raised table within cycle track, which also acts as calming measure.</p> <p>Approximately 4m of footway will be available for waiting bus passengers and transient pedestrians.</p> <p>Cyclist flow is one way northbound.</p> <p>Scope for modification of cycle track in footway is limited due to physical constraints.</p>	
Client Organisation Comments	
<p>The pedestrian footway width and capacity increases 33% over current provision to 4 metres and the cycle track will be demarcated in the same way as the carriageway, with a 150mm kerb and black asphalt surfacing. Fewer cyclists on carriageway as a result of this new provision should reduce the likelihood and impact of collisions involving cyclists on the carriageway.</p>	

3.7 NEWINGTON BUTTS

3.7.1 PROBLEM

Location: U – Newington Butts junction with Walworth Road

Summary: Proximity of Cycle track to pedestrian crossing may result in collisions between cyclists and pedestrians

The proposed cycle track may be used by cyclists to bypass the northbound stop line. Cyclists travelling at speed may see the facility as a legalised opportunity to bypass a red traffic signal and as the cycle lane crosses close to the rear of the tactile paving at the western side of the pedestrian crossing an increased potential for collisions between cyclists and pedestrians may result.

Furthermore the close proximity of the cycle track to the pedestrian crossing may result in pedestrians waiting to cross, obstructing the cycle lane. This may lead to cyclists diverting around pedestrians potentially into the path of other pedestrians or into the carriageway and potentially into the path of a vehicle.

RECOMMENDATION

Modify the cycle track and footway layout to increase the distance and minimise the potential for conflicts between pedestrians and cyclists. This may require relocation of the facility.

Design Organisation Response	Accepted / Part Accepted / Rejected
<p>TfL concept design for cycle track alignment has been revised at this location to remove conflict with One Elephant Development. Addendum to RSA2 may be required.</p> <p>Revised concept design does not increase the distance between the cycle track and controlled crossing, so issue of potential for conflicts between pedestrians and cyclists still exists. However, scope for increasing distance between cycle track and controlled crossing is minimal and relocation of the facility cannot be considered as it will have a network impact which will impact on the approved and signed off TSSR.</p> <p>Cycle track is one-way northbound, visibility is good and pedestrian crossing points on the cycle track are in a contrasting colour to the cycle track itself, which will help to mitigate potential conflict.</p> <p>RJ recommend for location to be monitored after implementation to assess if conflict develops and whether further mitigation measures are required.</p>	

Client Organisation Comments
<p>This design has been amended since the RSA2 was completed and will be reconsidered as part of RSA 2vB. TfL considers that there is sufficient space for pedestrians to wait within the footway.</p> <p>There are excellent sight lines on the approach for cyclists and the colour differentiation will clearly advise cyclists that they are approaching a pedestrian crossing. This facility will be predominantly used by cyclists who regularly commute to work and should be familiar with the layout.</p>

End of list of problems identified and recommendations offered in this Stage 2 Road Safety Audit

4.0 ISSUES IDENTIFIED DURING THE STAGE 2 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: Various – throughout scheme area.

Reason considered to be outside the Terms of Reference: Design anomaly rather than a defined road safety concern.

The proposals appear to show lighting columns proposed in close proximity on approach to traffic signals. This may result in the traffic signals not being clear or conspicuous which could lead to red light running and / or shunt type collisions.

It is assumed that this is a design anomaly and that the lighting columns will either be relocated or incorporated within the traffic signal poles.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ Street Lighting Design has been amended to include combined signal and lighting columns where possible (9No. in total proposed). Street Lighting Design has received technical approval from TfL.	
Client Organisation Comments	
Agree with Designer's response. Combined lighting and signal columns will be provided where possible.	

4.2 ISSUE

Location: Various – throughout scheme area.

Reason considered to be outside the Terms of Reference: Design anomaly rather than a defined road safety concern.

The Audit team have noted that there may be issues with regards to the proposed visibility and interpretation of signing at various locations. This includes but is not limited to;

- The proposed signing on London Road south bound approach to the Peninsular may be obscured from view by the busy bus stops on the nearside.
- The proposed lane designation sign within the splitter island of the southbound lanes and the right turning lanes into St Georges Road is located beyond the decision point to safely accommodate lane changing.

It is understood that these issues are to be addressed through the continued detailed design of the proposals.

Design Organisation Response	Accepted / Part Accepted / Rejected
RJ to review current proposed locations for all signs in detailed design and determine if any relocations are required to improve visibility. Alternative suitable locations may not be possible for the large directional signs, due to size constraints. Additional carriageway road markings to supplement the directional signs to be considered for inclusion where possible, which will assist motorists with advanced lane decision.	
Client Organisation Comments	
Agree with Designer's response.	

4.3 ISSUE

Location: 1 – Proposed crossing between New Kent Road and Peninsular.

Reason considered to be outside the Terms of Reference: Design anomaly rather than a defined road safety concern.

The proposed crossing is indicated on the traffic signal drawings as a parallel cycle / pedestrian crossing but the rest of the drawings indicate that this is a single / shared crossing facility. It is also noted that the extents of the shared use area on the footways either side of the crossing do not appear to have been indicated.

It is assumed that this is a design anomaly and that these issues will be rectified through the continued detailed design process.

Design Organisation Response	Accepted / Part Accepted / Rejected
TI detailed design provided by TfL. Issue to be reviewed by RJ and TfL to provide amended design for this proposed TI site, if not already provided.	
Client Organisation Comments	
Crossing agreed to be a Toucan to enable cyclists to stay on carriageway and avoid potential collisions with pedestrians on the footway.	

4.4 ISSUE

Location: 2 – Northern footway between London Road and Newington Causeway.

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

The Audit Team understands that the London Underground Station at this location is set to undergo significant changes which may change the pedestrian movements around this area. As these alterations are not yet defined the anticipated impacts cannot be determined.

It is assumed that continued discussions during the development of the station will inform the relevant parties of the restrictions in terms of pedestrian capacity within this area.

Design Organisation Response	Accepted / Part Accepted / Rejected
Noted.	
Client Organisation Comments	
London Underground are in discussions with their Fit for the Future Programme, Bakerloo Line Extension and Skipton House developers. These projects may have an impact on how the space is used at this location.	

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: [REDACTED] MCIHT, MSoRSA Signed: [REDACTED]
Position: Principal Road Safety Auditor Date: 02/03/2015
Organisation: Transport for London, Road Safety Audit
Asset Management Directorate
Address: 8th Floor Palestra, 197 Blackfriars Road, London, SE1 8NJ
Contact: [REDACTED]

AUDIT TEAM MEMBER:

Name: [REDACTED] Signed: [REDACTED]
BSc. (Hons), CMILT, MCIHT MSoRSA
Position: Principal Road Safety Auditor Date: 02/03/2015
Organisation: Transport for London, Road Safety Audit
Asset Management Directorate
Address: 8th Floor Palestra, 197 Blackfriars Road, London, SE1 8NJ
Contact: [REDACTED]

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 2 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: [REDACTED]

Position: SENIOR DESIGN ENGINEER

Organisation: RINGWAY JACOBS

Signed: [REDACTED]

Dated: 13/08/2015

5.3 CLIENT ORGANISATION STATEMENT

I accept these proposals by the Design Organisation.

Name: [REDACTED]

Position: Senior sponsor

Organisation: Transport for London

Signed: [REDACTED]

Dated: 2/11/15

5.4 SECONDARY CLIENT ORGANISATION STATEMENT (where appropriate)

I accept these proposals by the Design Organisation.

Name: [REDACTED]

Position: Senior Programme Sponsor

Organisation: Transport for London

Signed: [REDACTED]

Dated: 27/11/15

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 2 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: [REDACTED]

Position: SENIOR DESIGN ENGINEER

Organisation: RINGWAY JACOBS

Signed:

Dated: 13/08/2015

5.3 CLIENT ORGANISATION STATEMENT

I accept these proposals by the Design Organisation.

Name: [REDACTED]

Position: Senior sponsor

Organisation: Transport for London

Signed:

Dated:

5.4 SECONDARY CLIENT ORGANISATION STATEMENT (where appropriate)

I accept these proposals by the Design Organisation.

Name: [REDACTED]

Position: Senior Programme Sponsor

Organisation: Transport for London

Signed:

Dated:

Elephant and Castle Northern Roundabout Improvement Scheme
Stage 2 Road Safety Audit Report

APPENDIX A

Documents Forming the Audit Brief

DRAWING REGISTER AND DOCUMENT ISSUE

Project Elephant and Castle Improvement Scheme

Discipline Civils



Job number NE2014-0373D

Approved by BH

Date 04/02/2015

Reason for Issue: Road Safety Audit - Stage 2

A B C D E I P S	Approval Billing Construction Comment Contract Information Preliminary Scheme	T X	Tender As Built	Media Format	CD - Compact Disk M - Email W - Aconex Upload	Date of Issue																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Elephant and Castle Northern Roundabout Improvement Scheme

Stage 2 Road Safety Audit Report

A Approval	T Tender	Date of Issue															
B Billing	X As Built																
C Construction																	
D Comment	Media Format																
E Contract																	
I Information	CD - Compact Disk																
P Preliminary	M - Email																
S Scheme	W - Aconex Upload																
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NE2014-373D-1100	KERBS AND FOOTWAYS SHEET 8 OF 8	1															
NE2014-373D-1200	SIGNS SHEET 1 OF 16	1															
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NE2014-373D-1202	ROAD MARK DIMENSIONS SHEET 5 OF 8	0															
NE2014-373D-1202	ROAD MARK DIMENSIONS SHEET 6 OF 8	0															
NE2014-373D-1202	ROAD MARK DIMENSIONS SHEET 7 OF 8	0															
NE2014-373D-1202	ROAD MARK DIMENSIONS SHEET 8 OF 8	0															
NE2014-373D-1203	ROAD MARKS TO BE REMOVED SHEET 1 OF 8	0															
NE2014-373D-1203	ROAD MARKS TO BE REMOVED SHEET 2 OF 8	0															
NE2014-373D-1203	ROAD MARKS TO BE REMOVED SHEET 3 OF 8	0															
NE2014-373D-1203	ROAD MARKS TO BE REMOVED SHEET 4 OF 8	0															
NE2014-373D-1203	ROAD MARKS TO BE REMOVED SHEET 5 OF 8	0															
NE2014-373D-1203	ROAD MARKS TO BE REMOVED SHEET 6 OF 8	0															
NE2014-373D-1203	ROAD MARKS TO BE REMOVED SHEET 7 OF 8	0															
NE2014-373D-1203	ROAD MARKS TO BE REMOVED SHEET 8 OF 8	0															
NE2014-373D-1300	STREET LIGHTING SHEET 1 OF 8	0															
NE2014-373D-1300	STREET LIGHTING SHEET 2 OF 8	0															
NE2014-373D-1300	STREET LIGHTING SHEET 3 OF 8	0															
NE2014-373D-1300	STREET LIGHTING SHEET 4 OF 8	0															
NE2014-373D-1300	STREET LIGHTING SHEET 5 OF 8	0															
NE2014-373D-1300	STREET LIGHTING SHEET 6 OF 8	0															
NE2014-373D-1300	STREET LIGHTING SHEET 7 OF 8	0															
NE2014-373D-1300	STREET LIGHTING SHEET 8 OF 8	0															
NE2014-373D-3000	LANDSCAPING SHEET 1 OF 8	1															
NE2014-373D-3000	LANDSCAPING SHEET 2 OF 8	1															
NE2014-373D-3000	LANDSCAPING SHEET 3 OF 8	1															
NE2014-373D-3000	LANDSCAPING SHEET 4 OF 8	1															
NE2014-373D-3000	LANDSCAPING SHEET 5 OF 8	1															
NE2014-373D-3000	LANDSCAPING SHEET 6 OF 8	1															
NE2014-373D-3000	LANDSCAPING SHEET 7 OF 8	1															

Elephant and Castle Northern Roundabout Improvement Scheme

Stage 2 Road Safety Audit Report

A Approval	T Tender	Date of Issue	
B Billing	X As Built		
C Construction			
D Comment	Media Format		
E Contract			
I Information	CD - Compact Disk		
P Preliminary	M - Email		
S Scheme	W - Aconex Upload		
Reason		D	
Ref. No	Drawing/Document Title		
NE2014-373D-3000	LANDSCAPING SHEET 8 OF 8	1	
NE2014-373D-4000	STREET FURNITURE SHEET 1 OF 8	0	
NE2014-373D-4000	STREET FURNITURE SHEET 2 OF 8	0	
NE2014-373D-4000	STREET FURNITURE SHEET 3 OF 8	0	
NE2014-373D-4000	STREET FURNITURE SHEET 4 OF 8	0	
NE2014-373D-4000	STREET FURNITURE SHEET 5 OF 8	0	
NE2014-373D-4000	STREET FURNITURE SHEET 6 OF 8	0	
NE2014-373D-4000	STREET FURNITURE SHEET 7 OF 8	0	
NE2014-373D-4000	STREET FURNITURE SHEET 8 OF 8	0	
NE2014-373D-GA	GENERAL ARRANGEMENT SHEET 1 OF 8	1	
NE2014-373D-GA	GENERAL ARRANGEMENT SHEET 2 OF 8	1	
NE2014-373D-GA	GENERAL ARRANGEMENT SHEET 3 OF 8	1	
NE2014-373D-GA	GENERAL ARRANGEMENT SHEET 4 OF 8	1	
NE2014-373D-GA	GENERAL ARRANGEMENT SHEET 5 OF 8	1	
NE2014-373D-GA	GENERAL ARRANGEMENT SHEET 6 OF 8	1	
NE2014-373D-GA	GENERAL ARRANGEMENT SHEET 7 OF 8	1	
NE2014-373D-GA	GENERAL ARRANGEMENT SHEET 8 OF 8	1	
STANDARD DETAILS	STANDARD DETAILS	0	
Issue to		Number of Copies	
Contractor:			
Sub-Contractor			
Architect:			
Landscape Architect:			
Structural Engineer			
Planning Supervisor:			
Local Council			
Public Health			
Project Manager			
Client		1	
Record Copy Civils:			

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





