



## Elephant & Castle Northern Roundabout Junction Upgrade Proposals

Stage 1 Road Safety Audit

Ref: 1915/008/A3/TLRN/2013

Prepared for:

**TfL Major Projects**

By:

**Road Safety Audit, TfL Asset Management Directorate**

Prepared by: [REDACTED] Audit Team Leader

Checked by: [REDACTED] Audit Team Member

Approved by: [REDACTED]

Version	Status	Date
A	Audit report issued to Client	23/10/2013
B	Audit report updated to reflect revised design	24/07/2014

## **1.0 INTRODUCTION**

### **1.1 Commission**

- 1.1.1 This report results from a Stage 1 Road Safety Audit carried out on the Elephant & Castle Northern Roundabout, junction upgrade proposals.
- 1.1.2 The Audit was undertaken by TfL Safety, Risk and Design Services in accordance with the Audit Brief issued by the Client Organisation on 26<sup>th</sup> September 2013. It took place at the Palestra offices of TfL on 26<sup>th</sup> September 2013 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 26<sup>th</sup> September 2013. During the site visit the weather was raining and the existing road surface was wet.
- 1.1.4 Revised drawings were received on 21<sup>st</sup> July 2014 and this Audit Report has been updated to Revision B to reflect the changes in the design.

### **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 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 designer to complete the designer's response section of this Audit report. Where applicable and necessary it is the responsibility of the Client Officer, in collaboration with the Senior Client Officer (where appropriate), to complete the Client comment section of this Audit report. Signatures from both the Design Team and the Senior Client Officer 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 Officer: [REDACTED] TfL Major Projects  
Senior Client Officer: [REDACTED] TfL Major Projects

#### 1.3.2 Design Organisation

Designer: To be confirmed

#### 1.3.3 Audit Team

Audit Team Leader: [REDACTED] – Asset Management Directorate  
Audit Team Member: [REDACTED] – Asset Management Directorate  
Audit Team Observer: None present

### 1.4 Purpose of the Scheme

- 1.4.1 There is significant local and political interest in this location highlighted by recent campaigns to reduce collisions and improve cycle facilities. The southern peninsula design developed by TDE is the preferred option. This design provides a large area of public space extending from the southern (shopping centre) side and concentrates the majority of traffic movements into a single junction adjacent to the Bakerloo Line Ticket Hall\*.

\*Taken directly from the Audit Brief.



## **2.0 ITEMS RAISED IN PREVIOUS ROAD SAFETY AUDITS**

The Audit Team is not aware of any other Audits having been carried out on the proposals.



### 3.0 ITEMS RAISED AT THIS STAGE 1 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 CYCLE FACILITIES

##### 3.1.1 PROBLEM

**Location:** A – London Road j/w Elephant & Castle Peninsular

**Summary:** Traffic signal layout for cyclists may be ambiguous.

It is proposed to separately signal cycle manoeuvres and vehicle manoeuvres such that left turning cyclists operate at the same time as left turning vehicles. The Audit Team is concerned that this layout may not be clear to all road users and a number of potential conflicts may exist, namely;

- Turning cyclists may fail to appreciate the two manoeuvres are signalled separately, leading to a potential to enter the junction injudiciously,
- Left turning cyclists may attempt to travel ahead from the cycle lane, cyclists attempting this manoeuvre would be in direct conflict with left turning motorists,
- The cycle lane indicates a right turn for cyclists, however, this manoeuvre is not possible. Cyclists would be required to travel ahead and join the cycle lane on the opposing side of the junction. This layout may be ambiguous and lead to a potential for disobedience by cyclists, and;
- Cyclists / motorists may fail to appreciate other vehicles may also be turning as part of the same stage, these users may therefore fail to look out for other road users when turning at the junction.

##### RECOMMENDATION

Modify the junction layout to clarify permissible manoeuvres for cyclists and motorists and ensure those manoeuvres are adequately signalled. This may require modification of the signal timing to allow cyclists and motorists to manoeuvre independently.

Designer's Response	Recommendation Accepted/Part Accepted/Rejected
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The separate traffic signal arrangement for cyclists on London Road has been removed and a 2.0m wide feeder lane will be provided to an ASL instead. As a result the staggered pedestrian crossing across the mouth of London Road has been converted to a straight across crossing.	
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##### Client Officer / Senior Client Officer Comments

Agree with Designer's Response.

### 3.1.2 PROBLEM

**Location:** B – 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.

Designer's Response	Recommendation Accepted/Part Accepted/Rejected
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Off carriageway cycle track will be located at rear of footway when running alongside the bus stops. Due to desire lines pedestrians will be expected to cross the cycle track but these will be at locations where visibility between both modes will be good. Approximately 4m of footway will be available for waiting bus passengers and transient pedestrians.	
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#### Client Officer / Senior Client Officer Comments

The Urban Realm design will ensure there is clear delineation between the areas.
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### 3.1.3 PROBLEM

**Location:** C – St Georges Road junction with Elephant and Castle Peninsular

**Summary:** Insufficient cycle lane facilities may pose a hazard to cyclists

It is proposed to provide a cycle lane on the western side of the footway on the approach to St Georges Road. This facility is unlikely to be used by confident cyclists who may prefer to utilise the bus lane and cycle lane on the carriageway instead. Cyclists using the bus lane and cycle lane are required to transition across left turning buses to continue ahead. Cyclists may therefore be exposed to the 'left hook' type conflict with buses. A potential for conflict between these modes may exist as a result.

#### RECOMMENDATION

Provide additional cycle infrastructure to guide cyclists through the junction without the need to cross left turning buses.

Designer's Response	Recommendation Accepted/Part Accepted/Rejected
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The on carriageway provision is intended for cyclists who don't wish to use the off carriageway provision so the number of cyclists using this facility will be significantly lower than existing. It is accepted ahead cyclists are at risk of 'left hook' type conflict but this is similar to today's situation. Cycle safety should improve at this location as motorists are currently partially focussed on cyclists whilst waiting for an opportunity to access the roundabout to make the left turn exit into St. George's Road, whereas in the proposed scheme motorists will be controlled via traffic signals and can focus on their surrounding environment.	
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#### Client Officer / Senior Client Officer Comments

Agree with Designer's Response. 20 mph speed limit is proposed to be introduced which will further reduce the probably and impact of collisions involving cyclists.

### 3.1.4 PROBLEM

**Location:** D – London Road junction with Elephant and Castle Peninsular

**Summary:** Combined bus and cycle lane may pose a hazard to cyclists

It is proposed to provide a cycle lane leading into a left turn only lane for cycles and buses. The Audit Team is concerned that this layout may pose a hazard to cyclists as buses are required to merge into the lane over a short distance at a location where the presence of cyclists is not likely to be anticipated.

Furthermore, cyclists wishing to travel ahead from the facility would be required to cross left turning buses. Cyclists may therefore be exposed to the 'left hook' type conflict with buses. A potential for conflict between these modes may exist as a result.

#### RECOMMENDATION

Provide additional cycle infrastructure to guide cyclists through the junction without the need to merge with buses and / or cross left turning buses.

Designer's Response	Recommendation Accepted/Part Accepted/Rejected
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The segregated cycle lane leading into a left turn lane for cycles and buses has been replaced with a bus lane. The bus lane has been designed to a width which makes it almost impossible for 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.	
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#### Client Officer / Senior Client Officer Comments

Agree with Designer's Response, a 3 metre width prevents the bus and cyclist being side by side. 20 mph speed limit is proposed to be introduced which will further reduce the probably and impact of collisions involving cyclists.

### 3.1.5 PROBLEM

**Location:** E – Elephant and Castle Peninsular opposite Underground Station

**Summary:** Road alignment may encourage over-running of the cycle lane

This Audit Problem has been removed following changes to the design and subsequent up-issue of the Road Safety Audit report.

### 3.1.6 PROBLEM

**Location:** F – Elephant and Castle Peninsular j/w London Road

**Summary:** Internal feeder lane may encourage cyclists to adopt an unsafe position within the carriageway on the approach.

This Audit Problem has been removed following changes to the design and subsequent up-issue of the Road Safety Audit report.

### 3.1.7 PROBLEM

**Location:** G – Floating bus stop on Newington Causeway

**Summary:** Potential for pedestrians to step into, or stand close to the cycle lane.

The Audit Team is concerned that the cycle lane is likely to be used by pedestrians when waiting for a bus at the adjacent bus stop. There is a concern that pedestrians will cross the cycle lane indiscriminately when transitioning between the footway and the bus stop, thereby at a potential conflict with cyclists within the cycle lane.

Furthermore, cyclists within the cycle lane, potentially at speed, will be constrained to the cycle lane due to the vertical separation to the adjacent footway. Should a pedestrian stray into the lane, or stand close to the cycle lane, cyclists may not be able to modify their route to avoid a collision. A further potential for conflict with pedestrians may exist as a result.

#### RECOMMENDATION

Remove the potential for conflict between cyclists and pedestrians. This may include relocating the cycle lane away from the bus facilities, and / or deterring pedestrians from walking in the cycle lane and encouraging them to use the crossing facility provided. It may also be beneficial to ensure the crossing point is located as close as possible to pedestrian desire lines.

Designer's Response	Recommendation Accepted/Part Accepted/Rejected
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<p>The floating bus stop arrangement will be maintained as it removes the conflict between cyclists and buses. A difference in levels and materials will be used to highlight the cycle and pedestrian areas. Horizontal and vertical deflection will be used to control cycle speeds. This bus stop is not considered a high usage stop and therefore conflict between cyclists and pedestrians is not expected to be an issue although pedestrians and cyclist will have to exercise some caution when using the facility. While it is accepted that the ability of cyclists to change direction to avoid conflict, should a pedestrian step into the cycle lane, is limited by the kerbing, visibility is generally good on the approaches to the bus stops and pedestrians should be able to see each other in good time to avoid conflict. In addition, the cycle lane has been designed to encourage lower cycle speeds to reduce the potential for conflict. These include narrowing the cycle lane to 1.5m, adding a raised table for pedestrian access and alignment changes as the lane passes to the rear of the bus stop.</p>	
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Client Officer / Senior Client Officer Comments
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<p>Agree with Designer's Response.</p>
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### 3.1.8 PROBLEM

**Location:** H – Floating bus stop on Newington Causeway

**Summary:** Change in level may pose a hazard to visually impaired pedestrians.

The Audit Team is concerned that the difference in levels between the floating bus stop and cycle lane may pose a hazard to visually impaired pedestrians. Pedestrians, particularly those with visual impairments, may exit the bus believing they are on the





footway. These users are unlikely to anticipate the change in level to the cycle lane, leading to an increased potential for trips and falls into the cycle lane.

**RECOMMENDATION**

Provide measures to identify to visually impaired pedestrians the presence of the cycle lane. It may be beneficial to provide guidance to the crossing point provided and ensure this is on the desire line.

**Designer's Response**

Recommendation Accepted/Part Accepted/Rejected

The crossing point will be provided on the desire line to ensure visually impaired passengers cross the cycle lane at the intended location which will be at the same level as the footway. Tactile paving will also be used as guidance at the crossing point.

**Client Officer / Senior Client Officer Comments**

Agree with Designer's Response.



## 3.2 PEDESTRIAN FACILITIES

### 3.2.1 PROBLEM

**Location:** I – London Road junction with Elephant and Castle Peninsular

**Summary:** Signal timings may be ambiguous to pedestrians

It is proposed to separately signal the left and right turning manoeuvres for vehicles and cyclists to exit London Road onto the peninsular. Pedestrians may observe vehicles stationary at the stop-line, assuming this applied to all traffic lanes at this location. Pedestrians may therefore step into the carriageway 'out of phase' presuming the route to be clear, with an exacerbated potential for conflict with turning vehicles and cyclists as a result.

#### RECOMMENDATION

Convey to pedestrians the potential vehicle manoeuvres at this location and when it is safe to cross. This may require the removal of ambiguous traffic stages.

Designer's Response	Recommendation Accepted/Part Accepted/Rejected
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The separate traffic signal arrangement for cyclists on London Road has been removed and a 2m wide feeder lane will be provided to an ASL instead. As a result the staggered pedestrian crossing has been converted to a straight across crossing. The change in design will remove any ambiguity for pedestrians.	
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#### Client Officer / Senior Client Officer Comments

Agree with Designer's Response.
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### 3.3 GENERAL

#### 3.3.1 PROBLEM

**Location:** J – Link Road between southern and northern roundabouts

**Summary:** Removal of pedestrian guardrail may pose a hazard to pedestrians

The Audit Team is concerned that the removal of the pedestrian guardrail within the central reserve area may expose a restricted desire line for pedestrians and encourage them to cross at this location. Pedestrians crossing at this location are required to cross three lanes in either direction, and may not be anticipated by motorists. A potential for conflict between pedestrians and motorists may exist as a result.

#### RECOMMENDATION

Provide measures to deter pedestrians from crossing at this location. This may require the retention of the pedestrian guardrail or another similar measure.

<b>Designer's Response</b>	Recommendation Accepted/Part Accepted/Rejected
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The guard rail is not being removed under the proposals.

#### Client Officer / Senior Client Officer Comments

Agree with Designer's Response. At grade crossings will improve wayfinding which should also reduce the levels of informal crossing.

#### 3.3.2 PROBLEM

**Location:** K – 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.

<b>Designer's Response</b>	Recommendation Accepted/Part Accepted/Rejected
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Advanced signing will be provided notifying motorists of the permitted movements at the junction to avoid motorists from arriving at the junction and undertaking illegal or u-turn manoeuvres.

#### Client Officer / Senior Client Officer Comments

Agree with Designer's Response.

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End of list of problems identified and recommendations offered in this Stage 1 Road Safety Audit

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#### 4.0 ISSUES IDENTIFIED DURING THE STAGE 1 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 warrant that a full review of the highway environment has been undertaken beyond that necessary to undertake the Audit as commissioned.

##### 4.1 ISSUE

**Location:** 1 - Peninsular junction with Newington Causeway.

**Reason considered to be outside the Terms of Reference:** Item for consideration

The proposals will drastically alter pedestrian movements in the area and therefore it is difficult to ascertain whether a pedestrian desire-line will be created immediately east of Newington Causeway. It may be beneficial to consider a crossing point at this location as part of the detailed design process.

Designer's Response	Recommendation Accepted/Part Accepted/Rejected
Providing a crossing here will require a staggered crossing due to the crossing distance. Due to the staging arrangement pedestrians will only be able to cross one half of the crossing per cycle as traffic exits Newington Causeway resulting in significant wait times. In addition, the provision of a crossing will have an impact on the w/b stop line and increase intergreen/clearance times and potentially result in unacceptable delays to the network. Design of the public realm (which has yet to be done) will also impact on pedestrian movements in the area.	
Client Officer / Senior Client Officer Comments	
Agree with Designer's Response.	

##### 4.2 ISSUE

**Location:** General to scheme, multiple locations

**Reason considered to be outside the Terms of Reference:** Item for consideration

The Audit Team notes the omission of lane allocation markings throughout the scheme. The presence of lane allocation markings, particularly around the Newington Causeway junction, may assist in clarifying lane usage and is recommended as part of the detailed design proposals.

Designer's Response	Recommendation Accepted/Part Accepted/Rejected
Recommendation Accepted	
Client Officer / Senior Client Officer Comments	
Agree with Designer's Response. 20 mph speed limit is proposed to be introduced which will further reduce the probably and impact of collisions.	



#### 4.3 ISSUE

**Location:** 2 – Elephant and Castle southern roundabout

**Reason considered to be outside the Terms of Reference:** Item for consideration

The Audit Team notes the removal of the nearside bus lane for northbound vehicles within the roundabout. This is regarded as a design error and the bus lane will be retained at this location.

<b>Designer's Response</b>	Recommendation Accepted/Part Accepted/Rejected
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Bus lane will retained.

<b>Client Officer / Senior Client Officer Comments</b>
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Agree with Designer's Response.



## 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 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] Signed: [REDACTED]  
BEng (Hons), CMILT, MCIHT MSoRSA  
Position: Principal Road Safety Auditor Date: 24/07/2014  
Organisation: Transport for London, Road Safety Audit  
Asset Management Directorate  
Address: 4<sup>th</sup> Floor Palestra,  
197 Blackfriars Road,  
London, SE1 8NJ

#### AUDIT TEAM MEMBER:

Name: [REDACTED] MCIHT, MSoRSA Signed: [REDACTED]  
Position: Principal Road Safety Auditor Date: 24/07/2014  
Organisation: Transport for London, Road Safety Audit  
Asset Management Directorate  
Address: 4<sup>th</sup> Floor Palestra,  
197 Blackfriars Road,  
London, SE1 8NJ



## 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 1 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 Officer / Senior Client Officer's endorsement of my proposals.

Name: [REDACTED]

Position: ODE Designer

Organisation: Transport for London

Signed: [REDACTED] Dated: 8<sup>th</sup> Feb 2015

## 5.3 CLIENT OFFICER STATEMENT (where appropriate)

I accept these proposals by the Design Team.

Name: [REDACTED]

Position: Project Sponsor

Organisation: Transport for London

Signed: [REDACTED] Dated: 8/2/15

## 5.4 SENIOR CLIENT OFFICER STATEMENT

I accept these proposals by the Design Team.

Name: [REDACTED]

Position: Senior Programme Manager

Organisation: Transport for London

Signed: [REDACTED] Dated: 9/2/15



## APPENDIX A

### Documents Forming the Audit Brief

#### DRAWING NUMBER

TDE-TX-000-3004476-051-IN-03

#### DRAWING TITLE

Preliminary Design (Option 3V)

#### DOCUMENTS

- ☒ Safety Audit Brief
- ☐ Previous Road Safety Audits
- ☐ Previous Designer Responses
- ☐ Departures from Standards
- ☐ Traffic signal details
- ☐ Collision data
- ☐ Traffic count data
- ☐ Speed survey data
- ☐ Other documents

#### DETAILS (where appropriate)

## APPENDIX B

### Problem Locations

