A47 Wansford to Sutton Dualling

Scheme Number: TR010039

Volume 9
9.11 Road Safety Audits

The Infrastructure Planning (Examination Procedure) Rules 2010
Rule 8(1)(c)

Planning Act 2008

February 2022

Deadline 2

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

A47 Wansford to Sutton Development Consent Order 202[x]

9.11 Road Safety Audits

Rule Number:	Rule 8(1)(c)
Planning Inspectorate Scheme Reference	TR010039
Application Document Reference	TR010039/EXAM/9.11
BIM Document Reference	PCF Stage 4
Author:	A47 Wansford to Sutton Project Team, National Highways

Version	Date	Status of Version
Rev 0	February 2022	Deadline 2

A47 WANSFORD TO SUTTON DUALLING

Stage 1 Road Safety Audit

PCF STAGE 3
SUITABLE FOR STAGE APPROVAL | S4
HE551494-GTY-HOS-000-RP-ZS-30001 | P02
13/01/21

Notice

Table of contents

1. Introduction

1.1. Road safety audit report

This report results from a Stage 1 road safety audit carried out on the Scheme proposed by Galliford Try and designed by Sweco UK Ltd at the request of Craig Stirzaker, the Highway Authority Project Manager. The Road Safety Audit was carried out during December 2020 and January 2021.

1.2. Road safety audit team

The road safety audit team membership, approved by Craig Stirzaker from the Overseeing Organisation, was as follows:

Team Leader Martin Magyar BEng CEng MICE, MSoRSA, Certificate of Competency

Team Member Adrian Clothier BEng (Hons), MSoRSA, Certificate of Competency

1.3. Road safety audit brief

The road safety audit team was provided with a road safety audit brief, with document reference HE551494-GTY-HGN-000-RP-CH-30002, revision P03.

The road safety audit brief was accepted by the road safety audit team.

Following issue of the brief, the design team advised the road safety audit team of the following changes to the design:

- The previously proposed segregated left turn lane at the western roundabout of the A47 / A1 junction is removed;
- Upton Drift Road provided with a two-lane carriageway.

New drawings were issued to the audit team covering these design changes, including scheme layout design fix C, and these changes were assessed as part of the audit.

1.4. Road safety audit

The road safety audit comprised an examination of the documents provided, and these are listed in Appendix A.

It is noted that a Stage 1 road safety audit was carried out by the Mott MacDonald / Sweco Joint Venture on a previous design iteration of the scheme (document reference: 264223PU-TPN-ITD-421). The brief states that the design has changed significantly, with a new alignment, since the previous road safety audit.

1.5. Terms of reference

The terms of reference of the road safety audit are as described in GG119 Revision 2. The road safety audit team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.

All comments and recommendations are referenced to the detailed design drawings and the locations have been indicated on plans supplied with the road safety audit brief in Appendix B.

1.6. Scheme description

The proposed scheme, as described in the road safety audit brief, is as follows:

“The A47 Wansford to Sutton scheme starts 12km west of Peterborough where the A47 Peterborough to Lowestoft Trunk Road meets the A1 Edinburgh to London Trunk Road at Wansford. The scheme continues eastwards for 2.5km, tying in with the existing A47 immediately to the east of the to-be-removed existing Nene Way Roundabout.

The existing A47 single-carriageway is to be upgraded to dual-carriageway standard (D2AP). It will be constructed slightly to the north of

the existing A47 from the A1 / A47 junction for approximately 800m, before crossing the existing A47 where it will be constructed further more to the north of the existing alignment until it ties into the existing dual carriageway east of Nene Way.

The scheme objectives are therefore set out as the following:

- *Help enable regional development and growth in Norwich and its surrounding area*
- *Reduce congestion, make journey times more reliable, and provide capacity for future traffic growth*
- *Improve resilience of the road to cope with incidents such as collisions, breakdowns and maintenance*
- *•Improve safety for all road users and for those living in the local area*
- *Protect the environment by minimising any adverse impacts and, where possible, deliver benefits*
- *Ensure the new road layout takes into account local communities and safe access to the A47*
- *Provide a safer route between communities for cyclists, walkers, horse riders and other non-motorist groups*

The proposed scheme was the preferred route identified and agreed at SGAR 2 with Highways England and includes:

- *Dualling of the existing A47 single carriageway section from A1 junction at Wansford to Nene Way Roundabout.*
- *Provision of a new free flow interchange link from A1 WB to A47 EB.*
- *Provision of a new access to A1 council houses rather than direct access from A1.*
- *Closure of A1 SB existing layby.*
- *Closure of A1 SB existing bus stop at A1 SB – A47 EB off slip.*

- *Provision of a new Segregated Left Turn Lane (SLTL) A1 NB – A47 EB at the existing western roundabout.* (See update to design detailed in section 3.1 above)
- *Enlargement of existing roundabout at A1/A47 junction.*
- *Provision of a new access link to Sacrewell.*
- *Provision of two new underpasses – Sacrewell link, as a route for pedestrians, cyclists and equestrians, and the existing dismantled railway, as a route for pedestrians and cyclists.*
- *Provision of a safe route for cyclists and pedestrians along the scheme.*
- *Relocation of the Nene Way roundabout.*
- *Provision of Passing places in Upton Drift Road.* (See update to design detailed in section 3.1 above)
- *Provision of 5 balancing ponds, 2 infiltration basins and 1 wildlife pond. The scheme also counts with a flood storage near the river Nene to compensate for the flood area missing for the new construction.*
- *Provision of maintenance accesses to all the ponds.*
- *Provision of lighting for the modified roundabouts."*

1.7. Site visit

The site was visited by all road safety audit team members as detailed below:

Day/Date	Time from	Time to	Light Conditions	Weather	Surface	Traffic
Thursday, 17 December 2020	12:25pm	3:00pm	Daylight	Fine	Dry	Moderate

A small number of non-motorised users were observed at the western end of the scheme area. This included a cyclist and pedestrians using the subway underneath the A1/A47 western roundabout.

2. Items raised at this Stage 1 road safety audit.

2.1. General

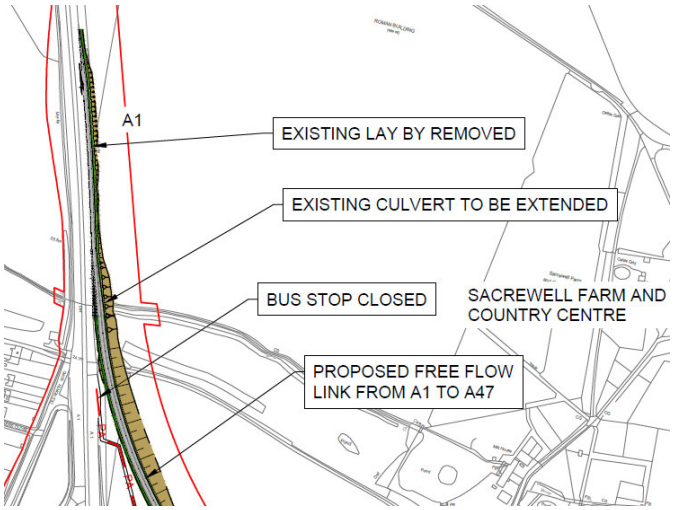
Problem 1

Location: A1 Southbound (drawing: HE551494-GTY-HGN-000-DR-CH-30023)

Summary: Removal of existing lay-by.

Description: An existing parking lay-by on the southbound carriageway of the A1 is to be removed as part of the new scheme. The removal of the lay-by will mean less opportunities for stopping safely on the A1. This may lead to inappropriate parking elsewhere on the road network and collisions between moving and parked vehicles, or drivers driving fatigued

Recommendation: Ensure the A1 southbound still has sufficient stopping facilities if the lay-by is removed.



Plan Extract

Problem 2

Location: A1 / A47 junction, western roundabout. (Drawing: HE551494-GTY-HKF-000-DR-CH-30002).

Summary: Narrow traffic lanes lead to side-swipe collisions.

Description: On the westbound approach to the western roundabout of the A1 / A47 junction there are currently two traffic lanes of narrow width. Larger vehicles were observed straying into the adjacent lane when entering the roundabout, with the risk of side-swipe collisions occurring. This existing situation is to be retained in the new scheme, meaning the potential risk of collisions will remain and potentially will be exacerbated by the dualling and driver 'expectation' to be able to travel side by side on a dual carriageway arrangement.

Recommendation: Re-design the westbound approach to the western roundabout with adequate lane widths.

Plan Extract

Photograph – westbound approach to the western roundabout showing vehicle encroaching into adjacent lane.

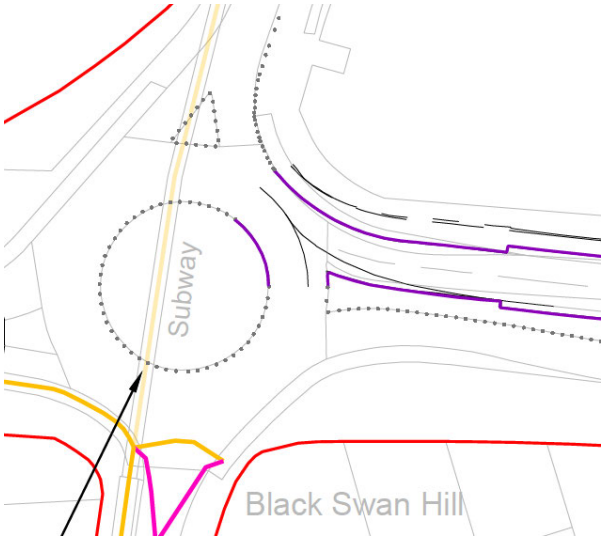
Problem 3

Location: A1 / A47 junction, western roundabout. (Drawing: HE551494-GTY-HKF-000-DR-CH-30002).

Summary: Widened carriageway leads to potential for side-swipe collisions.

Description: The eastbound A47 link between the two roundabouts of the A1/A47 junction will be widened to a full two traffic lanes from the point at which it leaves the western roundabout. This will be achieved by widening the existing carriageway on both sides. By widening the nearside kerb on the exit of what is a constrained roundabout the deflection offered by the circulatory carriageway will be reduced and two arms of the roundabout will be brought closer together. This may encourage some drivers to try to slip from the A1 arm to the A47 eastern arm without properly circulating around the roundabout, leading to side-swipe collisions.

Recommendation: Ensure that the new road layout maintains adequate circulatory carriageway on the western roundabout.



Plan Extract

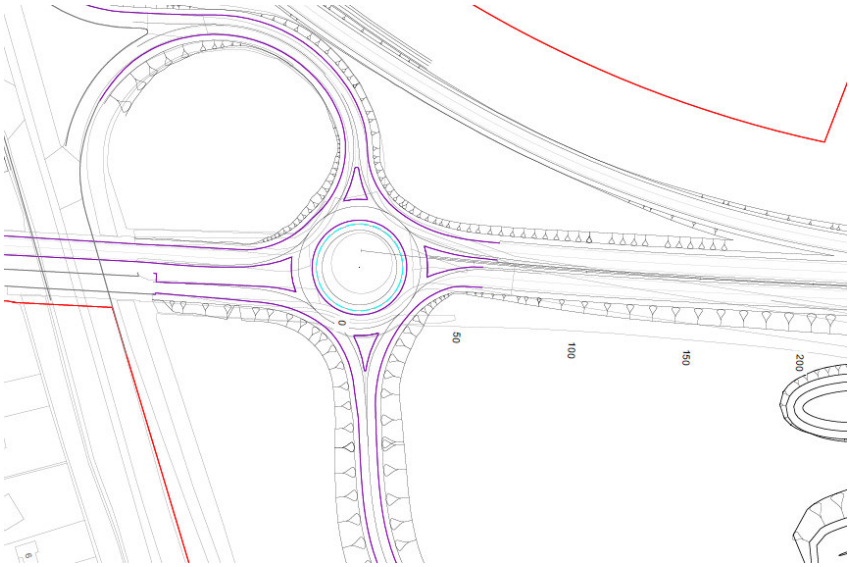
Problem 4

Location: Eastern A1/A47 roundabout (Drawing: HE551494-GTY-HKF-000-DR-CH-30003).

Summary: High vehicular speeds and lack of deflection leads to loss of control collisions.

Description: The re-designed eastern A1/A47 roundabout will be located at the end of a significant section of national speed limit dual carriageway. High vehicle approach speeds are likely on the westbound A47 approach to the roundabout. The road alignment provides virtually no deflection through the roundabout and this could lead to vehicles entering the roundabout at inappropriate speeds and loss of control / overshoot collisions

Recommendation: Design the roundabout and approach alignments such that adequate deflection is introduced that encourages slower speeds through the roundabout. For consistency it is recommended that yellow bar markings be provided on this westbound approach to the roundabout junction.



Plan Extract

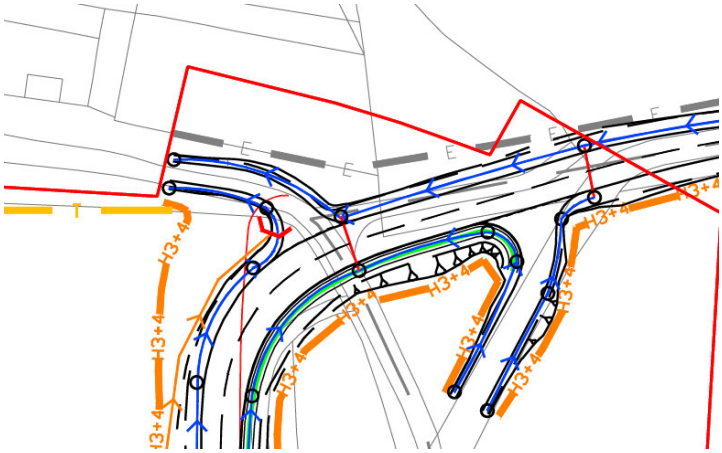
Problem 5

Location: New link to Sacrewell Farm (Drawing: HE551494-GTY-HGN-000-DR-CH-30017).

Summary: Limited intervisibility leading to vehicles turning out of side road colliding with vehicles on the new link road.

Description: Two side roads are proposed on the new link to Sacrewell Farm, immediately adjacent to a sharp bend in the road. Vehicles traversing the new road may strike vehicles turning out of the side roads if they are not expecting them after the bend.

Recommendation: Ensure the road layout provides drivers with full appreciation of upcoming hazards and enough visibility and time to react.



Plan Extract

Problem 6

Location: Petrol filling station on A47 mainline (Drawing: HE551494-GTY-HGN-000-DR-CH-30017).

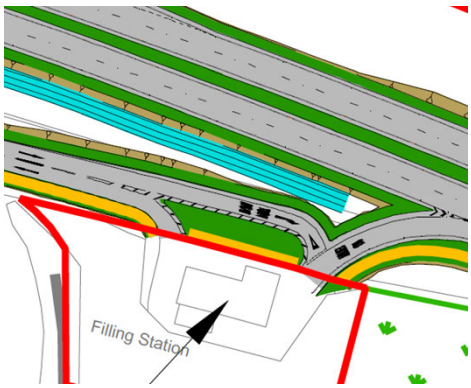
Summary: Vehicle conflicts within the filling station forecourt.

Description: The existing filling station is to be provided with access from the westbound A47 carriageway and a new two-way link road. The eastern end of the new link road is not provided with a turning area, with the filling station forecourt apparently to be used for turning. The existing forecourt was observed to be constrained in space, with little room for vehicles to manoeuvre around vehicles stationed at the filling pumps. It is also noted that there is no route available around the rear of the petrol station building, as it appears the building has been extended to afford more shop/storage space.

The proposed road layout around the filling station could lead to vehicles becoming stuck on the link road, or backing up onto the A47 mainline, if the filling station forecourt is full, with the potential for dangerous manoeuvres and vehicle to vehicle collisions.

Additionally, some drivers travelling westbound on the A47 may try to use the filling station forecourt as a short-cut to the new link road, increasing the risk of conflicts.

Recommendation: Design the road layout such that it is not reliant on the filling station forecourt forming part of the network.



Plan Extract

Photograph – filling station forecourt

Problem 7

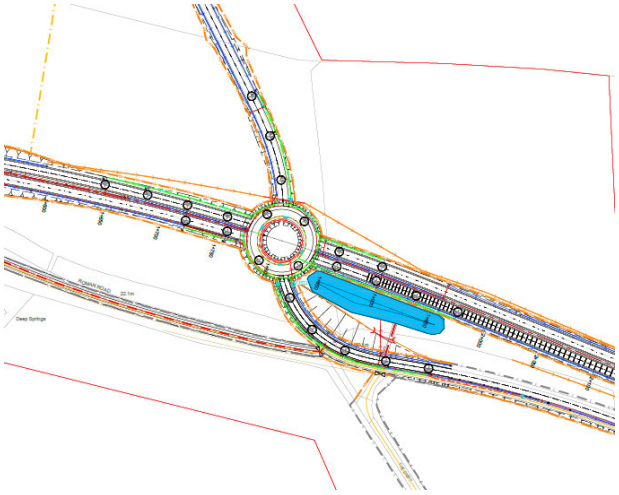
Location: New Nene Way Roundabout (drawing: HE551494-GTY-HGN-000-DR-CH-30020).

Summary: High vehicular speeds and lack of deflection leads to loss of control collisions.

Description: The new Nene Way roundabout will be located on national speed limit dual carriageway, with high vehicle speeds likely on both mainline approaches to it. The road alignment provides virtually no deflection through the roundabout and this could lead to vehicles entering the roundabout at inappropriate speeds and loss of control collisions.

It is appreciated that transverse yellow road markings are proposed on the westbound approach, but this may not be sufficient to reduce westbound approach speeds and does not help eastbound speeds.

Recommendation: Design the roundabout and A47 approach alignments such that adequate deflection is introduced that encourages slower speeds through the roundabout. For consistency, it is recommended that yellow bar markings be provided on the eastbound approach to the roundabout junction also.



Plan Extract

Problem 8

Location: New link road near the River Nene. (Drawing: HE551494-GTY-HGN-000-DR-CH-30017).

Summary: Lack of parking facilities leads to indiscriminate parking and conflicts between vehicles and pedestrians.

Description: There is an existing picnic area, car park and pedestrian link near the River Nene, connecting Wansford with the proposed new link road. This area will be attractive to walkers and picnickers and with the closure of the existing car park, users of these facilities may park their vehicles on the new link road, leading to collisions between moving and parked vehicles.

Recommendation: Ensure users of the leisure area around the River Nene can park without hindering the safe operation of the new road network.

Plan Extract

Photograph – existing parking area near River Nene

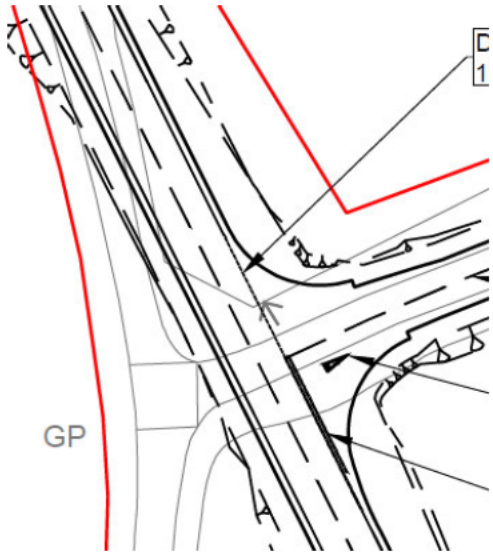
Problem 9

Location: Junction of Sutton Heath Road and Langley Bush Road. (Drawing; HE551494-GTY-HMK-000-DR-CH-30005).

Summary: Large vehicles over run grass verges, leading to loss of control.

Description: The existing Sutton Heath Road / Langley Bush Road junction is to be realigned as a new, simple priority junction. Verge damage was observed at the existing priority junction (see photo below), suggesting that large vehicles struggle to negotiate the junction. This may continue in the future scenario with the risk of loss of control collisions.

Recommendation: Ensure that the realigned priority junction can accommodate all vehicles expected to use it.



Plan Extract

Photograph – existing verge damage

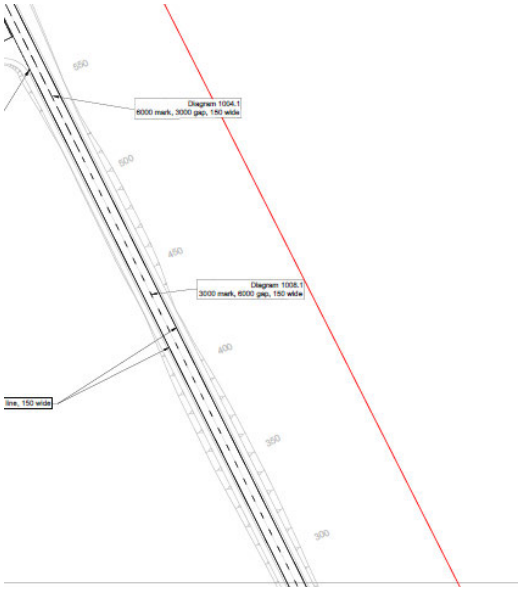
Problem 10

Location: Sutton Heath Road. (Drawing; HE551494-GTY-HMK-000-DR-CH-30005).

Summary: Straight, undulating alignment leads to high vehicle speeds and head-on collisions.

Description: The existing alignment of Sutton Heath Road will be straightened but will remain undulating. The straight alignment will likely encourage high vehicle speeds and the undulation could create limited forward visibility. These factors combined could lead to head-on collisions, particularly if overtaking occurs.

Recommendation: Design the road environment such that opposing vehicles and other hazards ahead can be clearly seen by vehicle drivers.



Plan Extract

2.2. Fences and road restraint systems

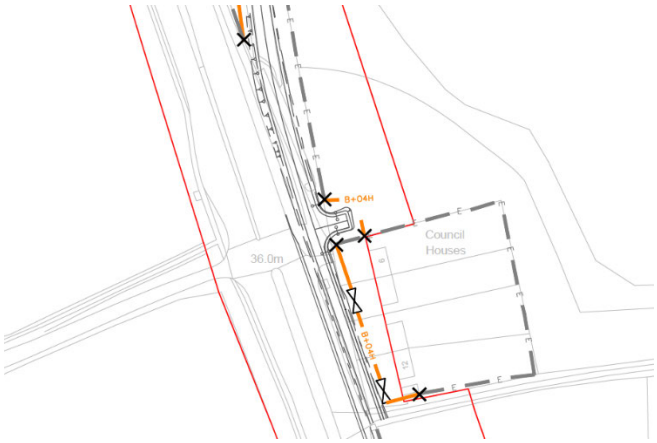
Problem 11

Location: Proposed access to Great North Road houses (Drawing: HE551494-GTY-HFE-000-DR-CH-30001).

Summary: Headlight glare dazzles drivers, leading to loss of control.

Description: A new access road for a row of houses adjacent to the A1 is proposed, to remove the need for the current direct access. The new access road will run parallel, and very close, to the A1 southbound carriageway. It does not appear that any fencing is proposed between the A1 and the new access road. Headlight glare from cars travelling on the access road could dazzle and confuse drivers on the A1, leading to loss of control collisions.

Recommendation: Provide a form of physical barrier between the A1 carriageway and the new access for the Great North Road houses, such that headlight see-through is prevented.



Plan Extract

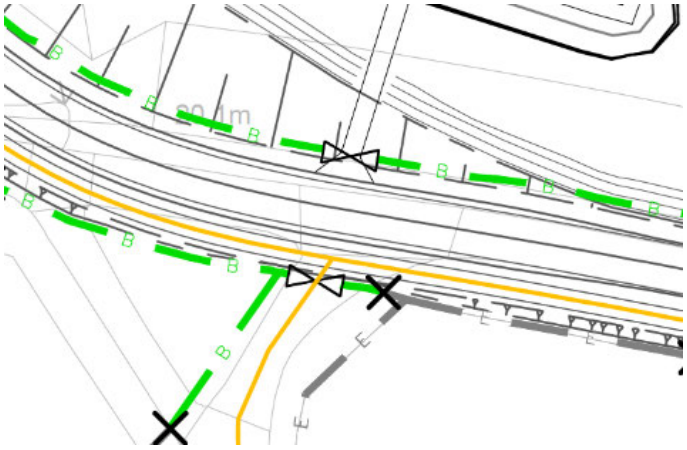
Problem 12

Location: Peterborough Road, near the proposed new roundabout. (Drawing: HE551494-GTY-HFE-000-DR-CH-30006).

Summary: Maintenance vehicles unable to pull off carriageway fully.

Description: A gated, vehicular access is proposed off Peterborough Road for a new attenuation basin. The gate does not appear to be positioned far enough from the carriageway to allow a maintenance vehicle to pull off the carriageway fully whilst the gate is being opened. This may lead to vehicles striking maintenance vehicles waiting to access the basin.

Recommendation: Ensure the gate is positioned such that the largest maintenance vehicles envisaged can pull fully off the carriageway while the gate is being opened.



Plan Extract

2.3. Walking, cycling and horse-riding

Problem 13

Location: A1 / A47 junction. (Drawing: HE551494-GTY-HGN-000-DR-CH-30023).

Summary: Poor cycle facilities leads to vehicle / cyclist conflicts.

Description: Existing provision for cyclists at the A1/A47 junction consists of short sections of off-road cycle track around the circumference of the two roundabouts. These place cyclists back onto the carriageway immediately after the junction, with little protection provided. There are no cycling facilities between the two roundabouts and the subway under the A47 is for pedestrians only, with cyclists presented with 'cyclists dismount' signs. (The subway was observed to be used by cyclists by the audit team, despite the signs). This existing patchwork of facilities, much of which is to be retained, could lead to cyclists colliding with vehicles within the new scheme.

Recommendation: Provide improved facilities for cyclists around the A1 / A47 junction.

Photograph – existing cycle facilities

Photograph – cyclist using existing subway

Problem 14

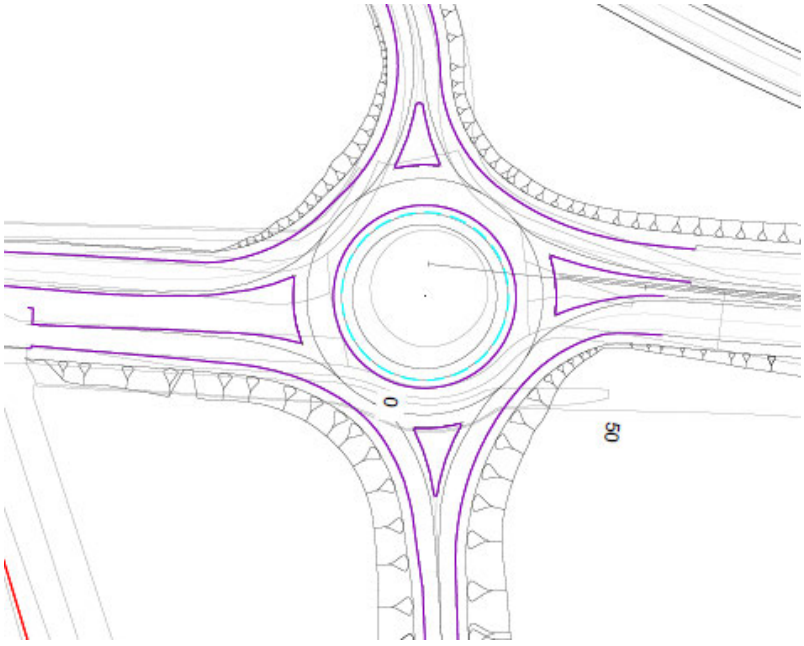
Location: A1 / A47 junction, eastern roundabout.

Summary: Lack of cycle facilities leads to vehicle / cyclist conflicts.

Description: The new scheme will convert the existing three-arm eastern roundabout of the A1 / A47 junction into an enlarged four-arm roundabout. This will potentially create a more hazardous environment for cyclists travelling east-west or west-east along the A47, with the risk of increased vehicular/cyclists collisions.

It is appreciated that an alternative route is being proposed for cyclists, to the south of the A47, however it is still anticipated that some cyclists will choose to use the more direct A47.

Recommendation: Provide suitable cycle infrastructure at the newly enlarged roundabout.



Plan Extract

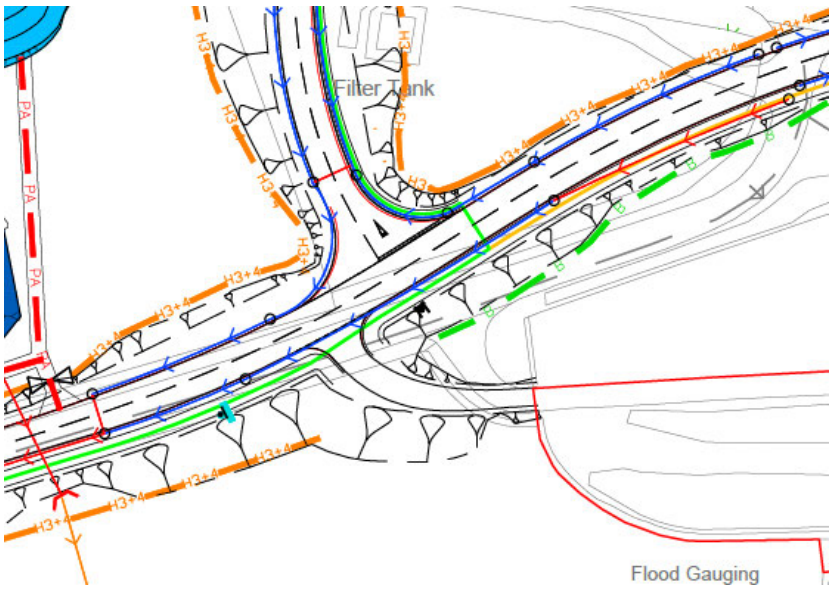
Problem 15

Location: Junction of new link road and new link to Sacrewell Farm. (Drawing: HE551494-GTY-HGN-000-DR-CH-30017).

Summary: Lack of sufficient crossing facilities leads to vehicle / NMU collisions.

Description: The proposed NMU facilities at the junction of the new link road and the new link to Sacrewell Farm will create a need for pedestrians, cyclists and horse-riders to cross the new link road if routing to or from Sacrewell Farm. If the area becomes well used by vehicles and NMUs then this may create the potential for conflicts and collisions if suitable crossing facilities are not provided. An uncontrolled crossing point only is proposed.

Recommendation: Ensure the design allows NMUs to safely cross the new link road to access the new link to Sacrewell Farm.



Plan Extract

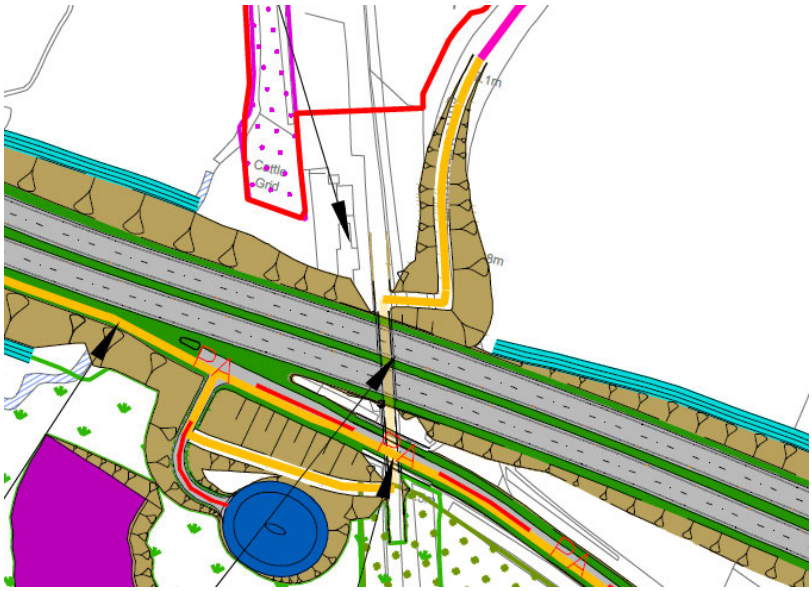
Problem 16

Location: Shared foot / cycleway near Sutton Heath Road. (Drawing: HE551494-GTY-HGN-000-DR-CH-30023).

Summary: Steep gradient and sharp bends lead to cyclists' loss of control or collisions with pedestrians.

Description: A shared cycle / footway is proposed underneath the new A47 alignment, near Sutton Heath Road. There is a significant level difference between the underpass and both Sutton Heath Road and the existing A47, to which the cycle / footway will connect. Sloping paths are proposed on either side of the underpass, with sharp right-angles. Cyclists using these paths could lose control on the bends or collide with pedestrians.

Recommendation: Design the sloping sections of the shared foot/cycleway such that cyclists and pedestrians can safely use the facility.



Plan Extract

Problem 17

Location: Peterborough Road, near Nene Way (Drawing: HE551494-GTY-HMK-000-DR-CH-30007).

Summary: Lack of sufficient crossing facilities leads to vehicle / NMU collisions.

Description: An uncontrolled crossing for pedestrians and cyclists is proposed on the existing Peterborough Road, adjacent to Nene Way, which will connect shared foot / cycleway provision on either side of the carriageway. It is understood the speed limit will be 60mph and as a result there is concern that pedestrians and cyclists may encounter difficulty crossing the carriageway safely, with inherent vehicle / NMU conflict risk.

Recommendation: Ensure the design allows NMUs to safely cross Peterborough Road.

Plan Extract

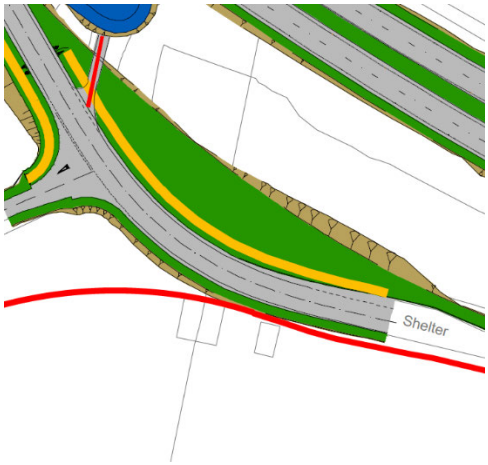
Problem 18

Location: Peterborough Road, at eastern tie-in (Drawing: HE551494-GTY-HGN-000-DR-CH-30023).

Summary: Cyclists re-joining carriageway struck by vehicles.

Description: The proposed shared foot / cycleway on the northern side of Peterborough road ends at an existing layby. It is unclear how cyclists will safely re-join the carriageway on what is a national speed limit road with potentially high vehicle speeds. Cyclists re-joining the carriageway unexpectedly could be struck by vehicles.

Recommendation: Provide a safe means for cyclists to re-join the carriageway.



Plan Extract

Photograph – Peterborough Road at tie-in point.

2.4. Traffic signs and road markings

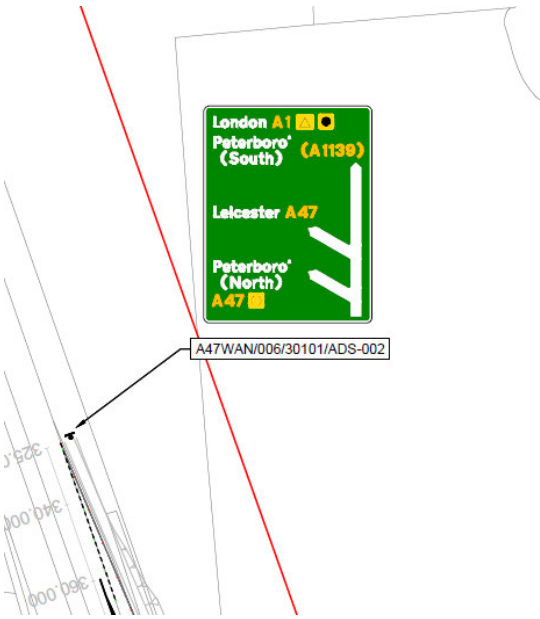
Problem 19

Location: A1 southbound (Drawing: HE551494-GTY-HSN-000-DR-CH-30001 and HE551494-GTY-HSN-000-DR-CH-30002).

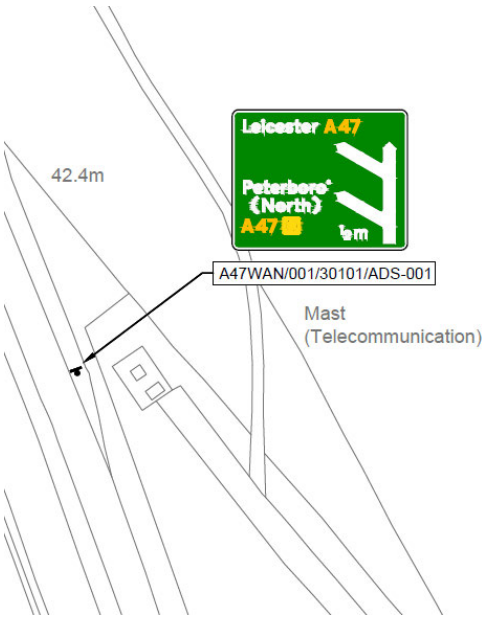
Summary: Traffic signs do not reflect the road layout.

Description: Proposed traffic signs A47WAN/006/30101/ADS-001, 002, and 003 include angled arrows for both exits. This design suggests that both the new freeflow link and the existing exit for Wansford junction have relatively straight slip roads. However, this is not the case with the existing (A47 Leicester) exit, which has quite a severe double turn which drivers may not be expecting based on the sign design.

Recommendation: Provide sign designs that reflect the characteristics of the road layout.



Plan Extract



Plan Extract

3. Audit team statement

We certify that this Road Safety Audit has been carried out in accordance with GG119 Revision 2.

Road safety audit Team Leader

Name	Martin Magyar
Signed	[redacted]
Qualification	BEng, CEng MICE, MSoRSA, Certificate of Competency
Position	Principal Engineer, Sweco
Date:	13/01/2021

Road safety audit Team Member

Name	Adrian Clothier
Signed	[redacted]
Qualification	BEng (Hons), MSoRSA, Certificate of Competency
Position	Engineering Team Manager – Road Safety, Highways England
Date:	13/01/2021

Appendix A. Documents forming the road safety audit Brief

Documents

Ref	Title	Date
264223PU-TPN-ITD-421-A A47 Wansford to Sutton Dualling RSA1.pdf	264223PU-TPN-ITD-421-A A47 Wansford to Sutton Dualling RSA 1 – Design Stage 2.	Sept 2018
HE551494-MMSJV-GEN-000-RP-ZX-00004	Designers Response to RSA 1 – Design Stage 2.	Oct 2018
HE551494-GTY-HGN-000-RP-CH-30002	RSA Brief – Design Stage 3.	Dec 2020
HE551494-GTY-HGN-000-SH-CH-30005	Departure from Standards checklist	
HE551494-GTY-HKF-000-RP-CX-30001-P01.pdf	Walking, cycling and horse-riding assessment - Wansford	Oct 2020
HE551494-GTY-HKF-000-RP-CX-30002-P01.pdf	Walking, cycling and horse-riding review - Wansford	Oct 2020
HE551494-GTY-GHS-000-HS-ZS-30001	PCF Safety Plan	July 2020
HE551494-GTY-GHS-000-HS-ZS-30003	Combined safety and Hazard Log	Nov 2020
HE551494-GTY-GHS-000-HS-ZS-30002	Maintenance and Repair Statement	Dec 2020

Drawings

Ref	Revision	Title
HE551494-GTY-HGN-000-DR-CH-30023	P01.02	Proposed Scheme Layout – design Fix C
HE551494-GTY-HGN-000-DR-CH-30015 to 30021	P01.01	General Arrangement - Sheets 1 to 7
HE551494-GTY-HGN-000-DR-CH-30008	P01.1	Departure summary plan
HE551494-GTY-HGN-000-DR-CH-30008	P01.01	String naming layout
Site clearance:		
HE551494-GTY-HSC-000-DR-CH-30001 to 30007	P01.1	Site clearance layout- Sheets 1 to 7
Fencing:		
HE551494-GTY-HFE-000-DR-CH-30001 to 30007	P01.1	Fencing Layout - Sheets 1 to 7
Road restraint systems:		
HE551494-GTY-HRR-000-DR-CH-30001 to 30007	P01.1	Road Restraint Systems Layout- Sheets 1 to 7
Drainage:		

HE551494-GTY-HDG-000-DR-CD-30001 to 30007	P01.01	Drainage Layout Plan - Sheets 1 to 7
Pavement:		
HE551494-GTY-HPV-000-DR-CH-30001 to 30007	P01.01	Pavement Design - Sheets 1 to 7
Kerbs, footways & paved areas:		
HE551494-GTY-HKF-000-DR-CH-30001 to 30007	P01.1	Kerbs, Footways & Paved Areas Layout Plan - Sheets 1 to 7
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Exploratory Hole Locations:		
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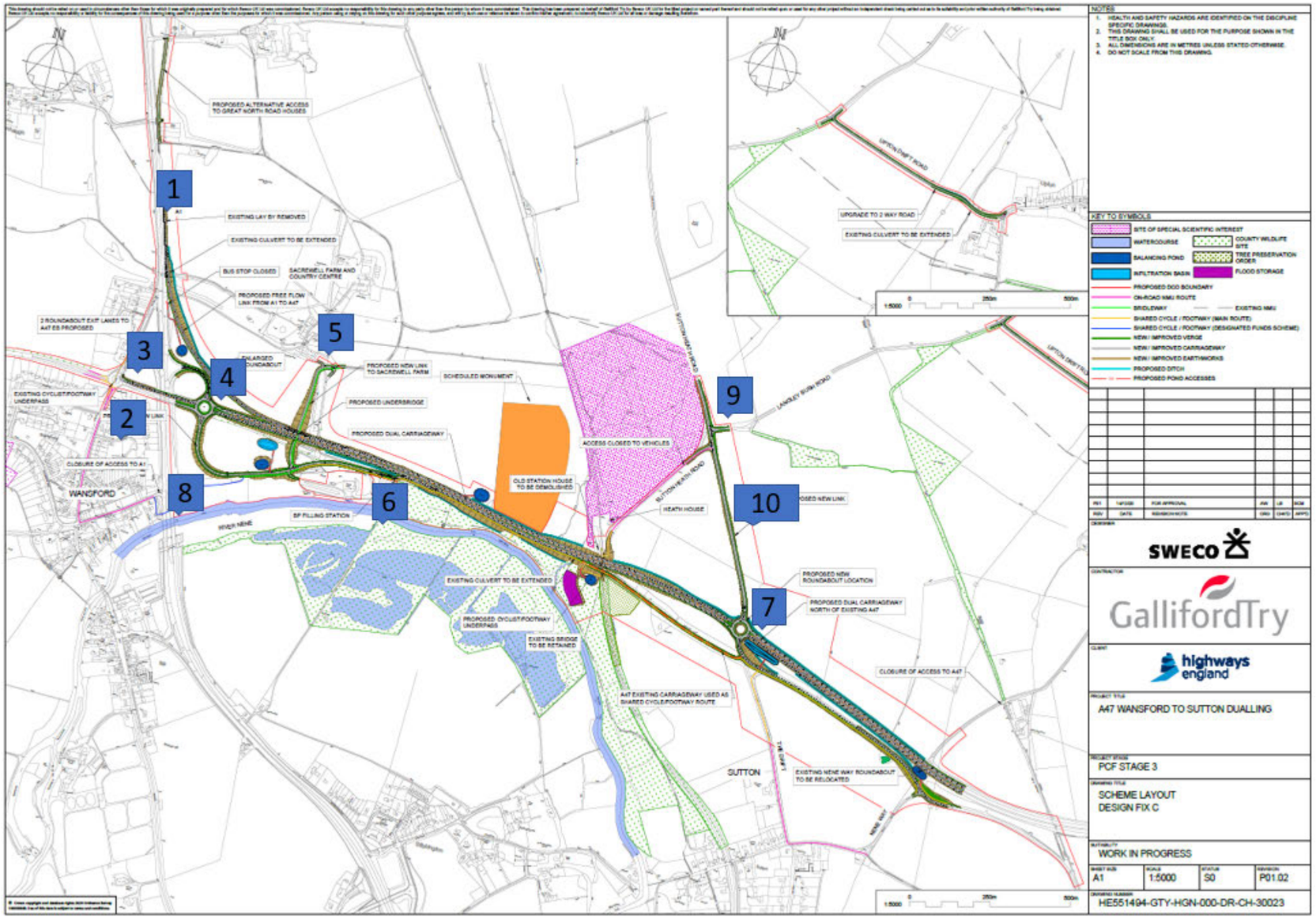
HE551494-GTY-HGT-000-DR-CE-30016 to 30019	P04	Geological Longsections Sideroads – Sheets 1 to 4
Mainline Earthworks:		
HE551494-GTY-HGT-000-DR-CE-30101 to 30107	P02	MAINLINE EARTHWORKS PLAN 7 & PROFILE - Sheets 1 to 7
Sideroads Earthworks:		
HE551494-GTY-HGT-000-DR-CE-30201 to 30207	P02	SIDEROADS EARTHWORKS PLAN 7 & PROFILE - Sheets 1 to 7

Appendix B. Annotated scheme drawing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PROPOSED ALTERNATIVE ACCESS TO GREAT NORTH ROAD HOUSES
EXISTING LAY BY REMOVED
EXISTING CULVERT TO BE EXTENDED
BUS STOP CLOSED
SACREWELL FARM AND COUNTRY CENTRE
PROPOSED FREE FLOW LINK FROM A1 TO A47
2 ROUNDABOUT EXIT LANES TO A47 EB PROPOSED
ENLARGED ROUNDABOUT
PROPOSED NEW LINK TO SACREWELL FARM
SCHEDULED MONUMENT
PROPOSED UNDERBRIDGE
PROPOSED DUAL CARRIAGEWAY
EXISTING CYCLE/FOOTWAY UNDERPASS
CLOSURE OF ACCESS TO A1
WANSFORD
BP FILLING STATION
RIVER NENE
ACCESS CLOSED TO VEHICLES
OLD STATION HOUSE TO BE DEMOLISHED
HEATH HOUSE
SUTTON HEATH ROAD
LANGLEY BURH ROAD
PROPOSED NEW ROUNDABOUT LOCATION
PROPOSED DUAL CARRIAGEWAY NORTH OF EXISTING A47
EXISTING CULVERT TO BE EXTENDED
PROPOSED CYCLE/FOOTWAY UNDERPASS
EXISTING BRIDGE TO BE RETAINED
CLOSURE OF ACCESS TO A47
A47 EXISTING CARRIAGEWAY USED AS SHARED CYCLE/FOOTWAY ROUTE
SUTTON
EXISTING NENE WAY ROUNDABOUT TO BE RELOCATED
UPGRADE TO 2 WAY ROAD
EXISTING CULVERT TO BE EXTENDED
NOTES
1. HEALTH AND SAFETY HAZARDS ARE IDENTIFIED ON THE DISCIPLINE SPECIFIC DRAWINGS.
2. THIS DRAWING SHALL BE USED FOR THE PURPOSE SHOWN IN THE TITLE BOX ONLY.
3. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
4. DO NOT SCALE FROM THIS DRAWING.
KEY TO SYMBOLS
SITE OF SPECIAL SCIENTIFIC INTEREST
WATERCOURSE
COUNTY WILDLIFE SITE
BALANCING POND
TREE PRESERVATION ORDER
INFILTRATION BASIN
FLOOD STORAGE
PROPOSED DCO BOUNDARY
ON-ROAD NMU ROUTE
BRIDLEWAY
EXISTING NMU
SHARED CYCLE / FOOTWAY (MAIN ROUTE)
SHARED CYCLE / FOOTWAY (DESIGNATED FUNDS SCHEME)
NEW / IMPROVED VERGE
NEW / IMPROVED CARRIAGEWAY
NEW / IMPROVED EARTHWORKS
PROPOSED DITCH
PROPOSED POND ACCESSES
FOR APPROVAL
SWECO
GallifordTry
highways england
A47 WANSFORD TO SUTTON DUALLING
PCF STAGE 3
SCHEME LAYOUT
DESIGN FIX C
WORK IN PROGRESS
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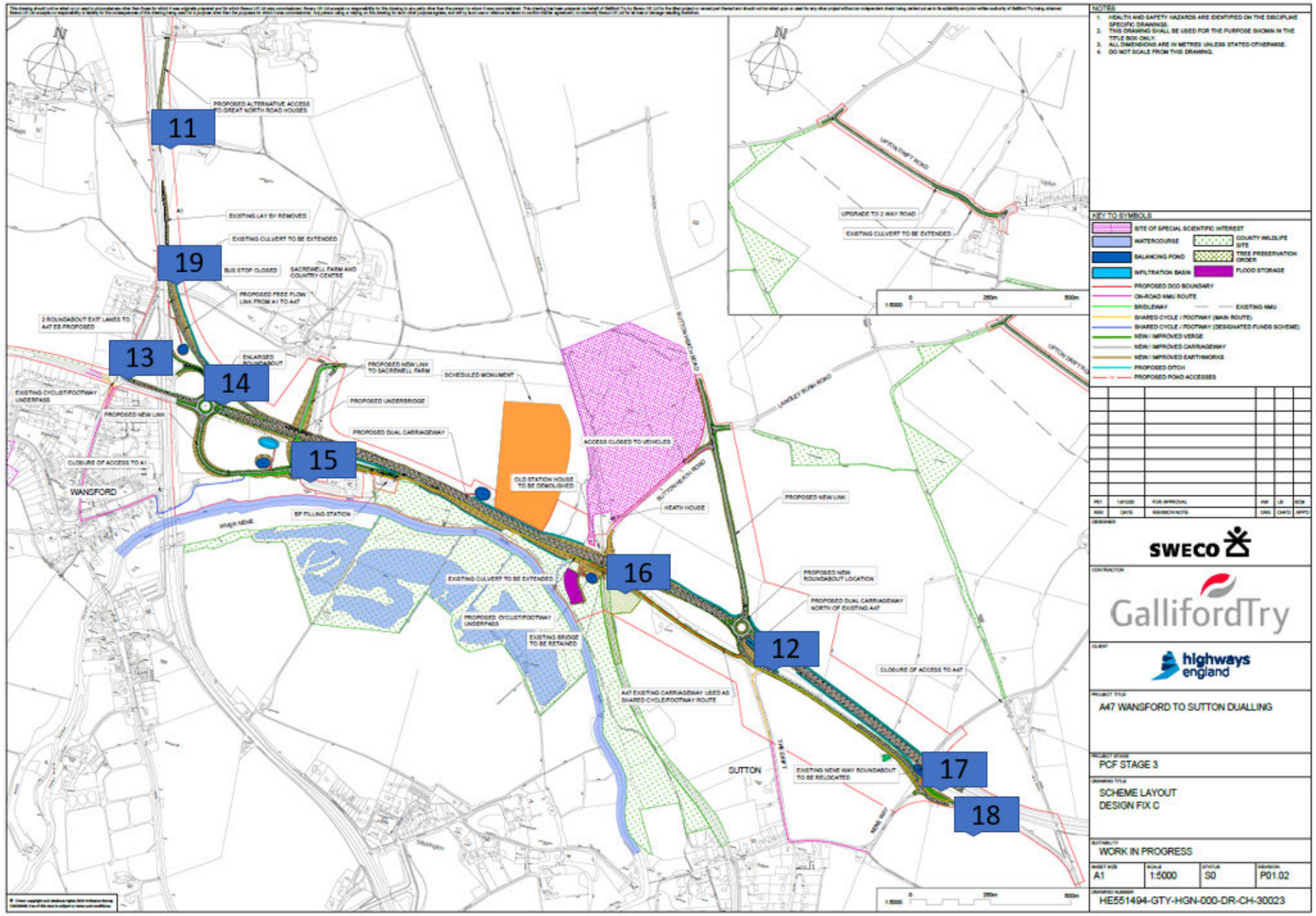
HE551494-GTY-HGN-000-DR-CH-30023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WANSFORD
SUTTON
PROPOSED ALTERNATIVE ACCESS TO GREAT NORTH ROAD HOUSES
EXISTING LAY BY REMOVED
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PROPOSED UNDERBRIDGE
PROPOSED DUAL CARRIAGEWAY
CLOSURE OF ACCESS TO A1
ACCESS CLOSED TO VEHICLES
OLD STATION HOUSE TO BE DEMOLISHED
HEATH HOUSE
PROPOSED NEW LINK
BP FILLING STATION
EXISTING CULVERT TO BE EXTENDED
PROPOSED NEW ROUNDABOUT LOCATION
PROPOSED DUAL CARRIAGEWAY NORTH OF EXISTING A47
PROPOSED CYCLIST/FOOTWAY UNDERPASS
EXISTING BRIDGE TO BE RETAINED
CLOSURE OF ACCESS TO A47
A47 EXISTING CARRIAGEWAY USED AS SHARED CYCLE/FOOTWAY ROUTE
EXISTING NENE WAY ROUNDABOUT TO BE RELOCATED
UPTON DRAFT ROAD
UPGRADE TO 2 WAY ROAD
EXISTING CULVERT TO BE EXTENDED
LAMPLEY BURN ROAD
SUTTON HEATH ROAD
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NEW / IMPROVED VERGE
NEW / IMPROVED CARRIAGEWAY
NEW / IMPROVED EARTHWORKS
PROPOSED DITCH
PROPOSED POND ACCESSES
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REV DATE REVISION NOTE ORIG CHKD APPD
SWECO
GallifordTry
highways england
A47 WANSFORD TO SUTTON DUALLING
PCF STAGE 3
SCHEME LAYOUT
DESIGN FIX C
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A47 WANSFORD TO SUTTON DUALLING

Road Safety Audit Response

PCF STAGE 3
SUITABLE FOR STAGE APPROVAL | S4
HE551494-GTY-HOS-000-RP-CH-30002 | P03
30/04/21

Notice

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2. Introduction

This report is in response to a Stage 1 RSA (Road Safety Audit) carried out on the Scheme proposed by Galliford Try and designed by Sweco UK Ltd at the request of Craig Stirzaker, the Highway Authority Project Manager. The Road Safety Audit was carried out during December 2020 and January 2021.

The proposed scheme, as described in the road safety audit brief, is as follows:

"The A47 Wansford to Sutton scheme starts 12km west of Peterborough where the A47 Peterborough to Lowestoft Trunk Road meets the A1 Edinburgh to London Trunk Road at Wansford. The scheme continues eastwards for 2.5km, tying in with the existing A47 immediately to the east of the to-be-removed existing Nene Way Roundabout.

The existing A47 single-carriageway is to be upgraded to dual-carriageway standard (D2AP). It will be constructed slightly to the north of the existing A47 from the A1 / A47 junction for approximately 800m, before crossing the existing A47 where it will be constructed further more to the north of the existing alignment until it ties into the existing dual carriageway east of Nene Way."

The scheme objectives are therefore set out as the following:

- *Help enable regional development and growth in Norwich and its surrounding area*
- *Reduce congestion, make journey times more reliable, and provide capacity for future traffic growth*
- *Improve resilience of the road to cope with incidents such as collisions, breakdowns and maintenance*
- *•Improve safety for all road users and for those living in the local area*
- *Protect the environment by minimising any adverse impacts and, where possible, deliver benefits*
- *Ensure the new road layout takes into account local communities and safe access to the A47*
- *Provide a safer route between communities for cyclists, walkers, horse riders and other non-motorist groups*

The proposed scheme was the preferred route identified and agreed at SGAR 2 with Highways England and includes:

- *Dualling of the existing A47 single carriageway section from A1 junction at Wansford to Nene Way Roundabout.*
- *Provision of a new free flow interchange link from A1 SB to A47 EB.*

- *Provision of a new access to A1 council houses rather than direct access from A1.*
- *Closure of A1 SB existing layby.*
- *Closure of A1 SB existing bus stop at A1 SB – A47 EB off slip.*
- *A1/A47 Western roundabout upgrade to 2 lanes exit to A47 EB*
- *Enlargement of existing eastern roundabout at A1/A47 junction.*
- *Provision of a new access link to Sacrewell.*
- *Provision of two new underpasses – Sacrewell link, as a route for pedestrians, cyclists and equestrians, and the existing dismantled railway, as a route for pedestrians and cyclists.*
- *Provision of a safe route for cyclists and pedestrians along the scheme.*
- *Relocation of the Nene Way roundabout.*
- *Provision of Passing places in Upton Drift Road.*
- *Provision of 5 balancing ponds, 2 infiltration basins and 1 wildlife pond. The scheme also counts with a flood storage near the river Nene to compensate for the flood area missing for the new construction.*
- *Provision of maintenance accesses to all the ponds.*
- *Provision of lighting for the modified roundabouts."*

The road safety audit response template as set out in GG119 Rev 2 Appendix F has been adopted for this report.

3. Key personnel

Overseeing Organisation	Highways England
Design Organisation	Sweco UK Ltd
RSA team:	
Team Leader	Martin Magyar BEng CEng MICE, MSoRSA, Certificate of Competency
Team Member	Adrian Clothier BEng (Hons), MSoRSA, Certificate of Competency

4. Road safety audit decision log

Reference	RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
4.1. Geometry					
Problem 1	Location: A1 Southbound (drawing: HE551494-GTY-HGN-000-DR-CH-30023) Summary: Removal of existing lay-by. Description: An existing parking lay-by on the southbound carriageway of the A1 is to be removed as part of the new scheme. The removal of the lay-by will mean less opportunities for stopping safely on the A1. This may lead to inappropriate parking elsewhere on the road network and collisions between moving and parked vehicles, or drivers driving fatigued	Ensure the A1 southbound still has sufficient stopping facilities if the lay-by is removed.	**Disagree with problem:** There is a lay-by approximately 1.3km north of the Wansford junction and HGV parking approximately 2km south of the scheme at Stibbington. The inclusion of lay-bys in the vicinity of the junction diverges and merges creates a greater level of risk to road users from weaving movements that than the increased spacing between rest places along the length of the A1 Trunk Road at this location.	Agree with Supplier: Evidence to be provided by supplier at detailed design stage to show removal of layby has no further adverse impacts on safety. Supplier to demonstrate this by providing risk assessment to support position.	Technical note (Appendix B) to be provided to support design position at detailed design phase to show removal of layby has no further adverse impacts on safety.
Problem 2	Location: A1 / A47 junction, western roundabout. (Drawing: HE551494-GTY-HKF-000-DR-CH-30002). Summary: Narrow traffic lanes lead to side-swipe collisions. Description: On the westbound approach to the western roundabout of the A1 / A47 junction there are currently two traffic lanes of narrow width. Larger vehicles were observed straying into the adjacent lane when entering the roundabout, with the risk of side-swipe collisions occurring. This existing situation is to be retained in the new scheme, meaning the potential risk of collisions will remain and potentially will be exacerbated by the dualling and driver 'expectation' to be able to travel side by side on a dual carriageway arrangement.	Re-design the westbound approach to the western roundabout with adequate lane widths.	**Agree with the problem and disagree with recommendation.** Any modification to the to the westbound approach to the western roundabout its outside of the project scope. In the latest design, the only change to the western roundabout is the upgrade to 2 lanes exit into the A47 eastbound in order to improve the traffic flows. This improved configuration will increase the deflection and induce larger vehicles to slow down on the approach to the roundabout and therefore decrease the probability of a sideswipe. The detailed design will show this with greater clarity. See Appendix - A Problem 2.	Agree with Supplier.	Western roundabout exit to A47 eastbound to be upgraded to 2 lanes exit with an increased deflection as shown in latest design. No further changes will be made to the western roundabout, as the western approach, is outside of the scope of the scheme.
Problem 3	Location: A1 / A47 junction, western roundabout. (Drawing: HE551494-GTY-HKF-000-DR-CH-30002). Summary: Widened carriageway leads to potential for side-swipe collisions. Description: The eastbound A47 link between the two roundabouts of the A1/A47 junction will be widened to a full two traffic lanes from the point at which it leaves the western roundabout. This will be achieved by widening the existing carriageway on both sides. By widening the nearside kerb on the exit of what is a constrained roundabout the deflection offered by the circulatory carriageway will be reduced and two arms of the roundabout will be brought closer together. This may encourage some drivers to try to slip from the A1 arm to the A47 eastern arm without properly circulating around the roundabout, leading to side-swipe collisions.	Ensure that the new road layout maintains adequate circulatory carriageway on the western roundabout.	**Agree with problem and recommendation:** Circulatory carriageway is 9m wide which is sufficient for max 2-lane entries. The existing circulatory carriageway is maintained and is not reduced. By providing 2 lanes of exit, we are allowing as smooth an exit path as possible from the roundabout given the physical constraints in the area. The road markings will provide the guidance on deflection to reduce the risk of side swipes occurring. The detailed design will show this with greater clarity.	Agree with Supplier .	Design to show appropriate level of detail at detailed design to show that adequate deflection is present and the issue will be resolved at this stage.
Problem 4	Location: Eastern A1/A47 roundabout (Drawing: HE551494-GTY-HKF-000-DR-CH-30003). Summary: High vehicular speeds and lack of deflection leads to loss of control collisions. Description: The re-designed eastern A1/A47 roundabout will be located at the end of a significant section of national speed limit dual carriageway. High vehicle approach speeds are likely on the westbound A47 approach to the roundabout. The road alignment provides virtually no deflection through the roundabout and this could lead to vehicles entering the roundabout at inappropriate speeds and loss of control / overshoot collisions	Design the roundabout and approach alignments such that adequate deflection is introduced that encourages slower speeds through the roundabout. For consistency it is recommended that yellow bar markings be provided on this westbound approach to the roundabout junction.	**Agree with problem and recommendation of adequate deflections.** **Disagree with recommendation for yellow bar markings.** Deflection: All entries are designed with a 7.5m offset to the centre of the roundabout, such that deflection is increased and vehicles exiting the roundabout have a smooth exit. Entry angles from the north arm clockwise are as follows: 17.0°,30.4°, 30.9°, 30.7°. Therefore, the proposed design has an appropriate deflection. Yellow bar markings: The distance of the dual carriageway is not what would be considered significant at about 2km on a rising gradient towards the Wansford eastern roundabout.	Agree with Supplier - Yellow bar markings not to be incorporated on A1/A47 eastern roundabout westbound approach as per Traffic Signs Manual Chapter 5 para 6.10.3. The distance between the junction will be less than 3km.	Detailed design to show roundabout approach alignments with adequate deflection. Yellow bar markings not to be incorporated on A1/A47 eastern roundabout westbound approach as per Traffic Signs Manual Chapter 5 para 6.10.3. The distance between the junction will be less than 3km.

Reference	RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
			The problem identified is accepted and will be mitigated with advanced warning signs and advanced direction signs that have been designed to give clear and concise information relating to the road layout ahead. The yellow bar markings used on the eastbound approach to the Sutton roundabout are provided as this roundabout is the first at-grade junction whereby A47 dual carriageway users will require to give way for approximately 12km. It is not considered that the short 2km section prior to Wansford is not consistent for use of this marking. Chapter 5 of the Traffic Signs Manual advises that yellow bar markings are not to be used when the distance between junctions is less than 3km. Overuse of the marking may reduce its effectiveness at higher risk locations.		
Problem 5	Location: New link to Sacrewell Farm (Drawing: HE551494-GTY-HGN-000-DR-CH-30017). Summary: Limited intervisibility leading to vehicles turning out of side road colliding with vehicles on the new link road. Description: Two side roads are proposed on the new link to Sacrewell Farm, immediately adjacent to a sharp bend in the road. Vehicles traversing the new road may strike vehicles turning out of the side roads if they are not expecting them after the bend.	Ensure the road layout provides drivers with full appreciation of upcoming hazards and enough visibility and time to react.	**Agree with Problem and Recommendation:** The latest design includes extensive input from consultation with stakeholders representing Sacrewell Farm, who are the beneficiaries of one of the side roads. Signage will be provided to alert road users to the upcoming junctions. The second side road is likely to incur no public use, with only the private landowner needing access, limiting the safety risk. For the vehicles leaving the side roads to join the main road, convex mirror(s) can be provided to increase visibility- any such design details to be provided at SGAR 5.	Agree with Supplier	Convex mirrors to be provided to be to increase visibility and will be incorporated into detailed design ahead of SGAR 5.
Problem 6	Location: Petrol filling station on A47 mainline (Drawing: HE551494-GTY-HGN-000-DR-CH-30017). Summary: Vehicle conflicts within the filling station forecourt. Description: The existing filling station is to be provided with access from the westbound A47 carriageway and a new two-way link road. The eastern end of the new link road is not provided with a turning area, with the filling station forecourt apparently to be used for turning. The existing forecourt was observed to be constrained in space, with little room for vehicles to manoeuvre around vehicles stationed at the filling pumps. It is also noted that there is no route available around the rear of the petrol station building, as it appears the building has been extended to afford more shop/storage space. The proposed road layout around the filling station could lead to vehicles becoming stuck on the link road, or backing up onto the A47 mainline, if the filling station forecourt is full, with the potential for dangerous manoeuvres and vehicle to vehicle collisions. Additionally, some drivers travelling westbound on the A47 may try to use the filling station forecourt as a short-cut to the new link road, increasing the risk of conflicts.	Design the road layout such that it is not reliant on the filling station forecourt forming part of the network.	**Agree with Problem and Recommendation:** The layout at the filling station is being altered to provide a through route past it – roughly on the alignment of the existing A47. The Filling station will be offset as per the current layout with clear signing to prohibit movements onto the A47 against the flow of traffic. In the new design, vehicles travelling EB will be able to turn WB is the filling station is closed. Also, vehicles coming from A47 WB will be able to continue WB through the new link if the petrol station is closed. Please See Appendix - A Problem 6.	Agree with Supplier – the design has been modified to solve the problem.	The design has been altered to solve all the issues raised in this observation.
Problem 7	Location: New Nene Way Roundabout (drawing: HE551494-GTY-HGN-000-DR-CH-30020). Summary: High vehicular speeds and lack of deflection leads to loss of control collisions. Description: The new Nene Way roundabout will be located on national speed limit dual carriageway, with high vehicle speeds likely on both mainline approaches to it. The road alignment provides virtually no deflection through the roundabout and this could lead to vehicles entering the roundabout at inappropriate speeds and loss of control collisions. It is appreciated that transverse yellow road markings are proposed on the westbound approach, but this may not be sufficient to reduce westbound approach speeds and does not help eastbound speeds.	Design the roundabout and A47 approach alignments such that adequate deflection is introduced that encourages slower speeds through the roundabout. For consistency, it is recommended that yellow bar markings be provided on the eastbound approach to the roundabout junction also.	**Agree with the problem and recommendation of adequate deflection.** **Disagree with recommendation for yellow bar markings:** General: The problems identified are accepted and will be mitigated with advanced warning signs and advanced direction signs that have been designed to give clear and concise information relating to the road layout ahead. Deflection: 7.5m offset from centre deflection is provided for all arms, providing ease of exit from roundabout while strongly encouraging entering roundabout to slow down. Design has been updated- was not modelled at the time pending	Agree with Supplier - Yellow bar markings not to be incorporated on A1/A47 eastern roundabout westbound approach as per Traffic Signs Manual Chapter 5 para 6.10.3. The distance between the junction will be less than 3km.	Detailed design to show roundabout approach alignments with adequate deflection. Yellow bar markings not to be incorporated on A1/A47 eastern roundabout westbound approach as per Traffic Signs Manual Chapter 5 para 6.10.3. The distance between the junction will be less than 3km.

Reference	RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
			traffic data from traffic team. Design fix C provides appropriate deflection. Yellow bars: There are proposed yellow bar markings used on the west approach to the Sutton roundabout as this roundabout is the first at-grade junction whereby A47 dual carriageway users will require to give way for approximately 12km. It is not considered to proposed yellow bar making in the east approach to this roundabout as there is only 2km section to the next roundabout prior to Wansford and this is not consistent for use of this marking. Chapter 5 of the Traffic Signs Manual advises that yellow bar markings are not to be used when the distance between junctions is less than 3km. Overuse of the marking may reduce its effectiveness at higher risk locations. See Appendix - A Problem 7.		
Problem 8	Location: New link road near the River Nene. (Drawing: HE551494-GTY-HGN-000-DR-CH-30017). Summary: Lack of parking facilities leads to indiscriminate parking and conflicts between vehicles and pedestrians. Description: There is an existing picnic area, car park and pedestrian link near the River Nene, connecting Wansford with the proposed new link road. This area will be attractive to walkers and picnickers and with the closure of the existing car park, users of these facilities may park their vehicles on the new link road, leading to collisions between moving and parked vehicles.	Ensure users of the leisure area around the River Nene can park without hindering the safe operation of the new road network.	**Agree with Problem and Recommendation:** Picnic area was a known spot for criminal and indecent behaviour and its removal has been included as part of this scheme to resolve this issue. Walking provision will be maintained from existing link underneath A1 to the east along the dualled A47, and north from the Sacrewell Farm Access road. Implementation of a clearway order on the link road is being discussed with stakeholders to deter indiscriminate parking.	Agree with Supplier	Implementation of waiting restrictions to be discussed with stakeholders to deter indiscriminate parking
Problem 9	Location: Junction of Sutton Heath Road and Langley Bush Road. (Drawing; HE551494-GTY-HMK-000-DR-CH-30005). Summary: Large vehicles over run grass verges, leading to loss of control. Description: The existing Sutton Heath Road / Langley Bush Road junction is to be realigned as a new, simple priority junction. Verge damage was observed at the existing priority junction (see photo below), suggesting that large vehicles struggle to negotiate the junction. This may continue in the future scenario with the risk of loss of control collisions. Recommendation: Ensure that the realigned priority junction can accommodate all vehicles expected to use it.	Ensure that the realigned priority junction can accommodate all vehicles expected to use it.	**Agree with Problem and Recommendation:** Junction layout provides tapers and radii appropriate for large vehicles in rural location, as defined in DMRB. Any further increases required to this provision will be checked with vehicle tracking software during SGAR 5.	Agree with Supplier	Junction tapers and radii to be checked again during detailed design to ensure they meet the latest DMRB standard.
Problem 10	Location: Sutton Heath Road. (Drawing; HE551494-GTY-HMK-000-DR-CH-30005). Summary: Straight, undulating alignment leads to high vehicle speeds and head-on collisions. Description: The existing alignment of Sutton Heath Road will be straightened but will remain undulating. The straight alignment will likely encourage high vehicle speeds and the undulation could create limited forward visibility. These factors combined could lead to head-on collisions, particularly if overtaking occurs. Recommendation: Design the road environment such that opposing vehicles and other hazards ahead can be clearly seen by vehicle drivers.	Design the road environment such that opposing vehicles and other hazards ahead can be clearly seen by vehicle drivers.	**Agree with Problem and Recommendation:** We are providing full SSD, though not FOSD (full overtaking sight distance), so the road is intended to be appropriately marked to indicate that overtaking is not permitted. Sutton Heath Road will be closed to vehicles and only used as NMU route. Only the landowners will have vehicular access to that section of the road.	Agree with Supplier	Old Sutton Heath Road to be closed to vehicles and only used for WCHR route and landowner access.
4.2. Fences and Road Restraint Systems					
Problem 11	Location: Proposed access to Great North Road houses (Drawing: HE551494-GTY-HFE-000-DR-CH-30001). Summary: Headlight glare dazzles drivers, leading to loss of control.	Provide a form of physical barrier between the A1 carriageway and the new access for the Great North Road houses, such that	**Agree with Problem and Recommendation:** A safety barrier and an anti-glare fence is proposed between A1 and the new access in the last design iteration.	Agree with Supplier	Safety barrier and anti-glare fence to installed as per latest design iteration

Reference	RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
	Description: A new access road for a row of houses adjacent to the A1 is proposed, to remove the need for the current direct access. The new access road will run parallel, and very close, to the A1 southbound carriageway. It does not appear that any fencing is proposed between the A1 and the new access road. Headlight glare from cars travelling on the access road could dazzle and confuse drivers on the A1, leading to loss of control collisions.	headlight see-through is prevented.			
Problem 12	Location: Peterborough Road, near the proposed new roundabout. (Drawing: HE551494-GTY-HFE-000-DR-CH-30006). Summary: Maintenance vehicles unable to pull off carriageway fully. Description: A gated, vehicular access is proposed off Peterborough Road for a new attenuation basin. The gate does not appear to be positioned far enough from the carriageway to allow a maintenance vehicle to pull off the carriageway fully whilst the gate is being opened. This may lead to vehicles striking maintenance vehicles waiting to access the basin.	Ensure the gate is positioned such that the largest maintenance vehicles envisaged can pull fully off the carriageway while the gate is being opened.	**Agree with Problem and Recommendation:** Fence and gate at pond access are set further back to allow maintenance vehicle to exit Peterborough road in the last design iteration. See Appendix - A Problem 12	Agree with Supplier	Fence and gate at pond access are now set further back to allow maintenance vehicle to exit Peterborough road in the last design iteration.
4.3. Walking, Cycling and Horse-riding					
Problem 13	Location: A1 / A47 junction. (Drawing: HE551494-GTY-HGN-000-DR-CH-30023). Summary: Poor cycle facilities leads to vehicle / cyclist conflicts. Description: Existing provision for cyclists at the A1/A47 junction consists of short sections of off-road cycle track around the circumference of the two roundabouts. These place cyclists back onto the carriageway immediately after the junction, with little protection provided. There are no cycling facilities between the two roundabouts and the subway under the A47 is for pedestrians only, with cyclists presented with 'cyclists dismount' signs. (The subway was observed to be used by cyclists by the audit team, despite the signs). This existing patchwork of facilities, much of which is to be retained, could lead to cyclists colliding with vehicles within the new scheme.	Provide improved facilities for cyclists around the A1 / A47 junction.	**Agree with Problem and Recommendation:** Cyclists will be provided with a crossing on western arm of A47, allowing them to enter southern section of old north road into Wansford. Access to northern part of Old North Road will be maintained using existing underpass. Recommended cycle route will be through the village of Wansford via existing link underneath A1 river Nene bridge. No cyclists are intended to travel east along A47 past the west roundabout.	Agree with Supplier	Cyclists will be provided with a crossing on western arm of A47, allowing them to enter southern section of old north road into Wansford. Access to northern part of Old North Road will be maintained using existing underpass. Recommended cycle route will be through the village of Wansford via existing link underneath A1 river Nene bridge. No cyclists are intended to travel east along A47 past the west roundabout.
Problem 14	Location: A1 / A47 junction, eastern roundabout. Summary: Lack of cycle facilities leads to vehicle / cyclist conflicts. Description: The new scheme will convert the existing three-arm eastern roundabout of the A1 / A47 junction into an enlarged four-arm roundabout. This will potentially create a more hazardous environment for cyclists travelling east-west or west-east along the A47, with the risk of increased vehicular/cyclists collisions. It is appreciated that an alternative route is being proposed for cyclists, to the south of the A47, however it is still anticipated that some cyclists will choose to use the more direct A47.	Provide suitable cycle infrastructure at the newly enlarged roundabout.	**Agree with Problem** **Disagree with recommendation** The design considered cycle movements through the scheme and identified concerns relating to cycle movements through the east roundabout and on the dual carriageway. The proposed solution has been to provide cycle routes that utilise lower speed, lower flow carriageways and off-road routes. Therefore, there is no proposed cycle route through this roundabout- see response to problem 13. Best practice is not to provide multiple route options for varying degrees of cycling, as this would otherwise increase ambiguity for those attempting to utilise intended cycle routes; rather, one designated cycling route should be designated, which is appropriate for users at all confidence levels.	Agree with Supplier - – The WCHR strategy in this area is for us not to encourage cyclists to cross the A1 / A47 junction and therefore there is no route proposed. A full WCHR route is provided linking in to the new DF footpath which then takes cyclists through the village of Wansford before re-joining after the western Wansford roundabout Refer to Problem 13	Agree – The WCHR strategy in this area is for us not to encourage cyclists to cross the A1 / A47 junction and therefore there is no route proposed. A full WCHR route is provided linking in to the new DF footpath which then takes cyclists through the village of Wansford before re-joining after the western Wansford roundabout Refer to Problem 13
Problem 15	Location: Junction of new link road and new link to Sacrewell Farm. (Drawing: HE551494-GTY-HGN-000-DR-CH-30017). Summary: Lack of sufficient crossing facilities leads to vehicle / NMU collisions. Description: The proposed NMU facilities at the junction of the new link road and the new link to Sacrewell Farm will create a need for pedestrians, cyclists and horse-riders to cross the new link road if routing to or from Sacrewell Farm. If the area becomes well used by vehicles and NMUs then this may create the potential	Ensure the design allows NMUs to safely cross the new link road to access the new link to Sacrewell Farm.	**Agree with the problem and recommendation.** The Walking, Cycling and Horse Riding assessment and review identified the requirement for a crossing point at this junction which has been provided within the preliminary design on the east side of the junction, connecting the path on Sacrewell farm road to the link road. The new link road is primarily designed for the filling station access and is therefore not expected to have a significant traffic volume.	Agree with Supplier WCHR route situated to east of Sacrewell access and therefore crossing point would avoid most of the traffic with clear visibility for service stations movements Signage details to be provided as part of detailed design.	WCHR route situated to east of Sacrewell access and therefore crossing point would avoid most of the traffic with clear visibility for service stations movements Signage details to be provided as part of detailed design.

Reference	RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
	for conflicts and collisions if suitable crossing facilities are not provided. An uncontrolled crossing point only is proposed.		The crossing point has been located at a point where it achieves the visibility for the Design Speed and Speed Limit of the link road. In addition to the above, warning signs for pedestrians crossing are provided on both approaches to the crossing. Final solution will be further developed at the detailed design stage.	Signage details to be provided as part of detailed design.	Link to the Petrol station after the Sacrewelll junction only used for Petrol station users. Very low traffic expected in this area. Further analysis will be done in detailed design, Stage 5.
Problem 16	Location: Shared foot / cycleway near Sutton Heath Road. (Drawing: HE551494-GTY-HGN-000-DR-CH-30023). Summary: Steep gradient and sharp bends lead to cyclists' loss of control or collisions with pedestrians. Description: A shared cycle / footway is proposed underneath the new A47 alignment, near Sutton Heath Road. There is a significant level difference between the underpass and both Sutton Heath Road and the existing A47, to which the cycle / footway will connect. Sloping paths are proposed on either side of the underpass, with sharp right-angles. Cyclists using these paths could lose control on the bends or collide with pedestrians.	Design the sloping sections of the shared foot/cycleway such that cyclists and pedestrians can safely use the facility.	**Agree with Problem and Recommendation:** The design follows NMU guidance, landings are provided in design to control speeds. Gradient required in land available informs the right-angle design; landings are considered appropriate for controlling speeds. 3m width anticipated to be sufficient for minimising conflicts for NMUs using the facility. Should this solution require further work, it will be addressed at SGAR 5.	Agree with Supplier	The design follows NMU guidance, landings are provided in design to control speeds. Gradient required in land available informs the right-angle design; landings are considered appropriate for controlling speeds. 3m width anticipated to be sufficient for minimising conflicts for NMUs using the facility. Should this solution require further work, it is to be addressed at SGAR 5.
Problem 17	Location: Peterborough Road, near Nene Way (Drawing: HE551494-GTY-HMK-000-DR-CH-30007). Summary: Lack of sufficient crossing facilities leads to vehicle / NMU collisions. Description: An uncontrolled crossing for pedestrians and cyclists is proposed on the existing Peterborough Road, adjacent to Nene Way, which will connect shared foot / cycleway provision on either side of the carriageway. It is understood the speed limit will be 60mph and as a result there is concern that pedestrians and cyclists may encounter difficulty crossing the carriageway safely, with inherent vehicle / NMU conflict risk.	Ensure the design allows NMUs to safely cross Peterborough Road.	**Disagree with problem:** Crossing facilities with adequate visibility for the Design Speed (70kph) and Speed Limit (40mph) are proposed at this location, which will be supported by cyclists crossing warning signs are provided at each direction on the approach to the crossing point. These will be further developed at the detailed design stage.	Agree with Supplier Supplier to provide signage details as part of detailed design. Supplier to liaise with PCC Highways team regarding 40mph proposal.	Supplier to provide signage details as part of detailed design. Supplier to continue liaison with PCC Highways team regarding 40mph proposal.
Problem 18	Location: Peterborough Road, at eastern tie-in (Drawing: HE551494-GTY-HGN-000-DR-CH-30023). Summary: Cyclists re-joining carriageway struck by vehicles. Description: The proposed shared foot / cycleway on the northern side of Peterborough road ends at an existing layby. It is unclear how cyclists will safely re-join the carriageway on what is a national speed limit road with potentially high vehicle speeds. Cyclists re-joining the carriageway unexpectedly could be struck by vehicles.	Provide a safe means for cyclists to re-join the carriageway.	**Agree with Problem and Recommendation:** The design will be updated for SGAR 5 to provide an extension of the proposed foot/ cycleway to the east past the bus layby for cyclists to enter the carriageway. Traffic signs to Diagram 966 will be provided to advise cyclists to join the carriageway. Warning sign to Diagram 950 will be provided on Peterborough Road eastbound on approach to the location where cyclists are joining the road.	Agree with Supplier	The design is to be updated for SGAR 5 to provide an extension of the proposed foot/ cycleway to the east past the bus layby for cyclists to enter the carriageway. Traffic signs to Diagram 966 will be provided to advise cyclists to join the carriageway. Warning sign to Diagram 950 will be provided on Peterborough Road eastbound on approach to the location where cyclists are joining the road.
4.4. Traffic Signs and Road Markings					
Problem 19	Location: A1 southbound (Drawing: HE551494-GTY-HSN-000-DR-CH-30001 and HE551494-GTY-HSN-000-DR-CH-30002). Summary: Traffic signs do not reflect the road layout. Description: Proposed traffic signs A47WAN/006/30101/ADS-001, 002, and 003 include angled arrows for both exits. This design suggests that both the new freeflow link and the existing exit for Wansford junction have relatively straight slip roads. However, this is not the case with the existing (A47 Leicester) exit, which has quite a severe double turn which drivers may not be expecting based on the sign design.	Provide sign designs that reflect the characteristics of the road layout.	**Disagree with problem.:** The proposed advance direction signage is designed in accordance with Traffic Signs Manual Chapter 7 for grade separated exit slip roads. These signs do not provide a representation of the road alignment but reflect the fact that the junctions are grade separated. To highlight the alignment of the existing A47 (Leicester) exit slip road, 'SLOW' road markings and warning signs will be provided on the approach to the exit. This will be detailed in the SGAR 5 design. Appendix A shows the current and the proposed warning signs.	Agree with Audit that signs could be misleading for A47 Leicester exit. The A47 Leicester slip is for a grade separated junction however the A47 Peterborough dedicated slip is for an at grade exit. Further details to be incorporated as part of detailed design. Supplier to provide risk assessment to support position.	Design to ensure consistent signage as part of detailed design. All signage to show two diverge layout. Technical note (Appendix B) to be provided to provide more detail on decision.

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5. Design organisation and Overseeing Organisation statements

On behalf of the design organisation I certify that: 1 the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation	
Name	Matthew Murrell
Signed	[redacted]
Position	Sweco Project Manager
Organisation	Sweco UK Ltd
Date	02/03/2021

On behalf of the Overseeing Organisation I certify that: 1 the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the design organisation; and 2 the agreed RSA actions will be progressed.	
Name	Craig Stirzaker
Signed	[redacted]
Position	Project Manager
Organisation	Highways England
Date	13/05/2021

Appendix A.

Problem 2

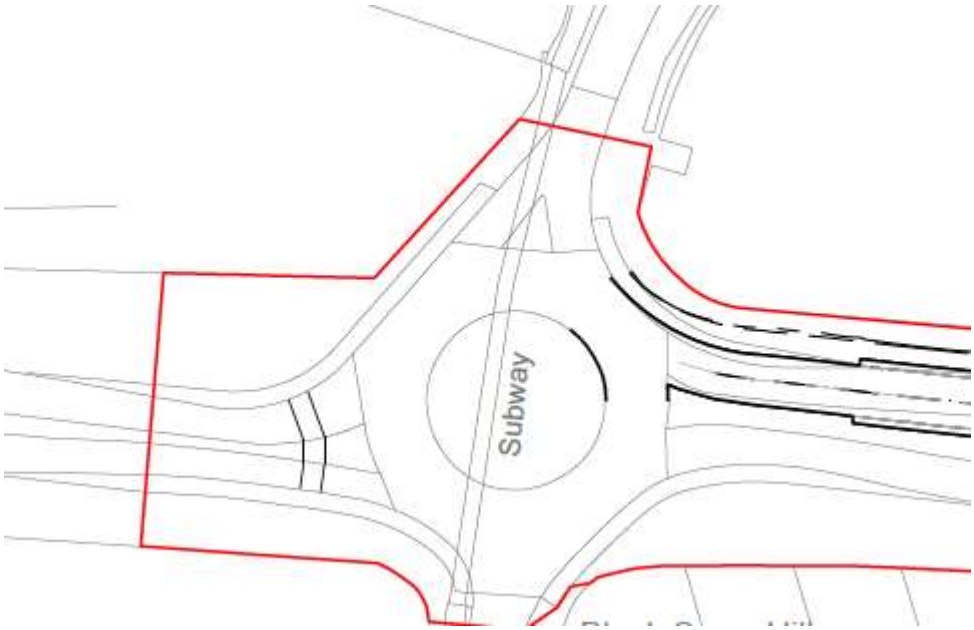

Figure 5-1: A47/A1 wester roundabout

Only works proposed is to upgrade A47 EB to 2 lanes exit.

Problem 6

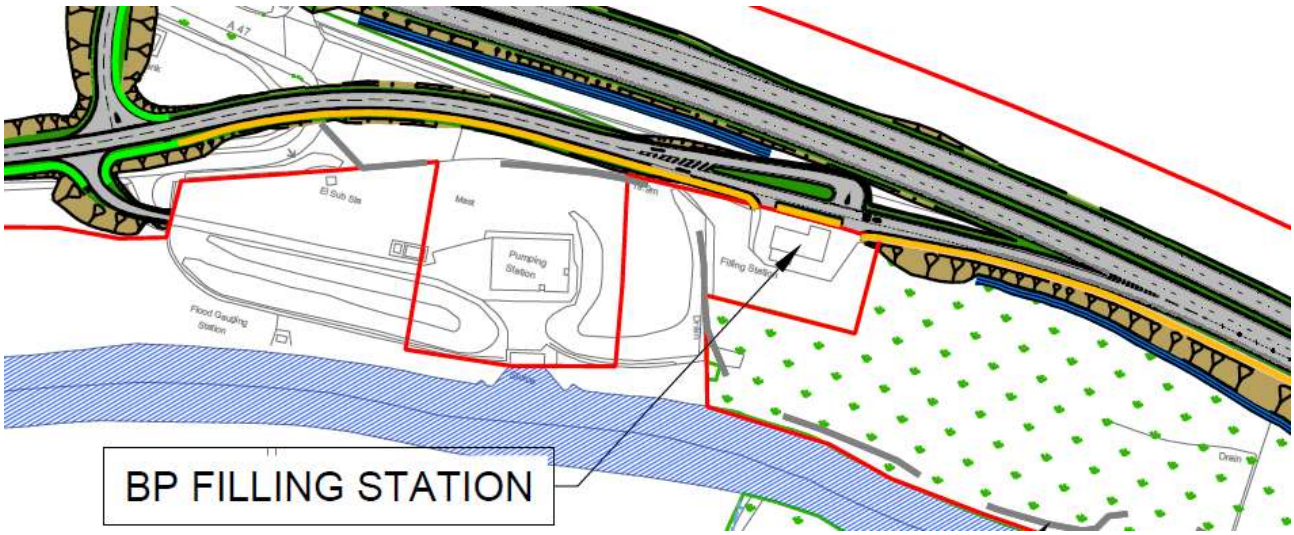

Figure 5-2: Plan extract: Filling station altered design.

Problem 7

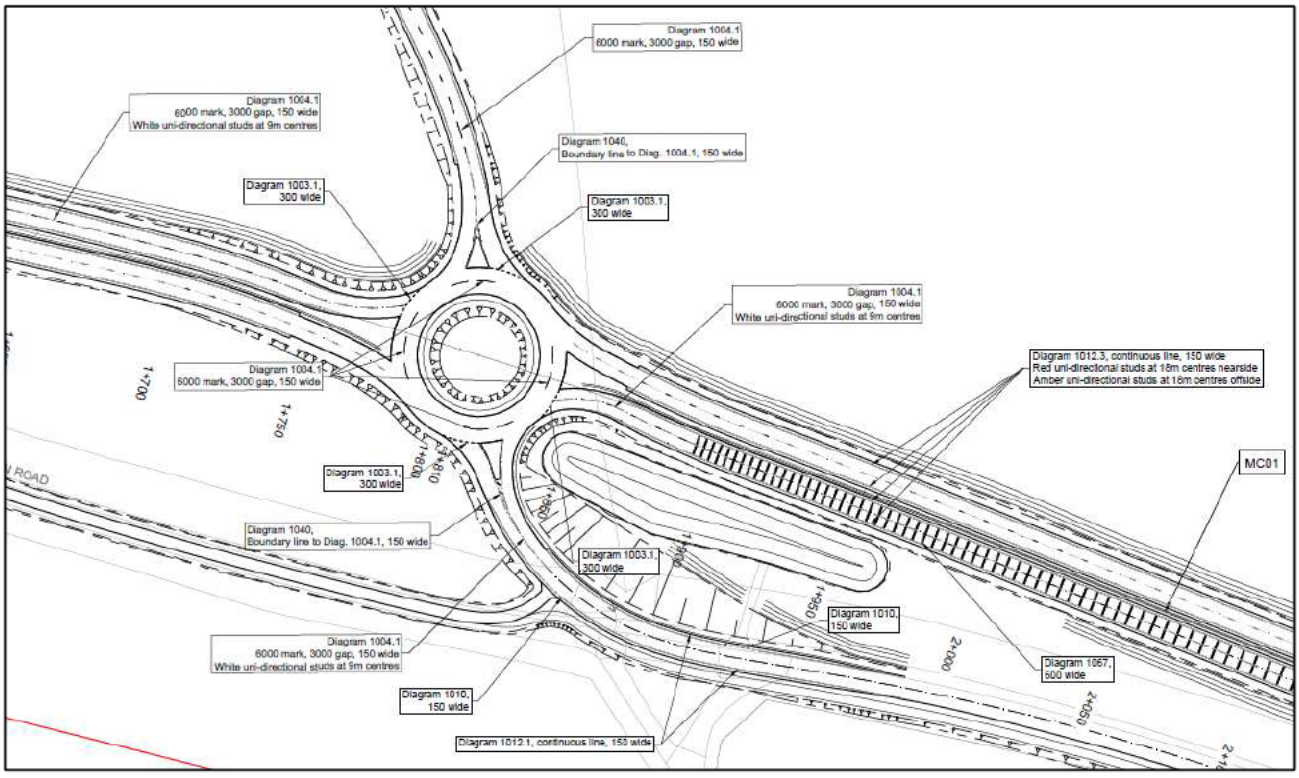

Figure 5-3: Plan extract: new Sutton Heath Roundabout

Updated scheme design fix C.

Problem 12

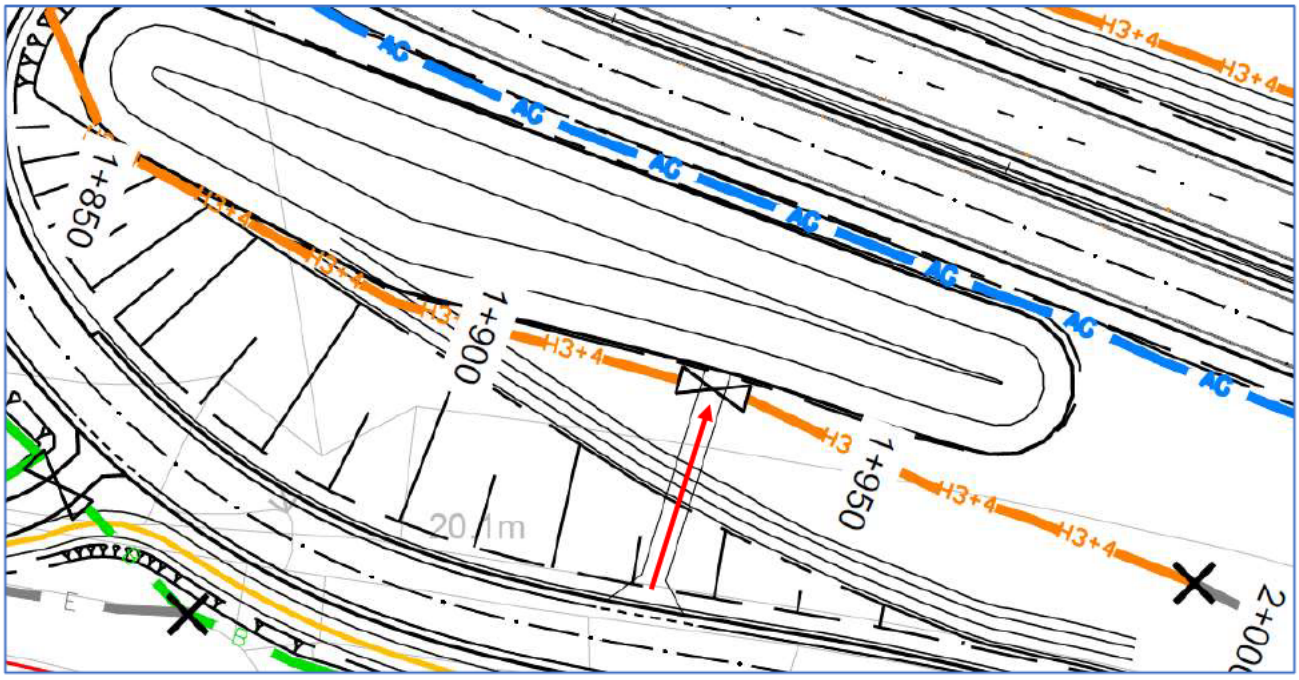

Figure 5-4: Fencing for attenuation basis access moved back from carriageway

Problem 17

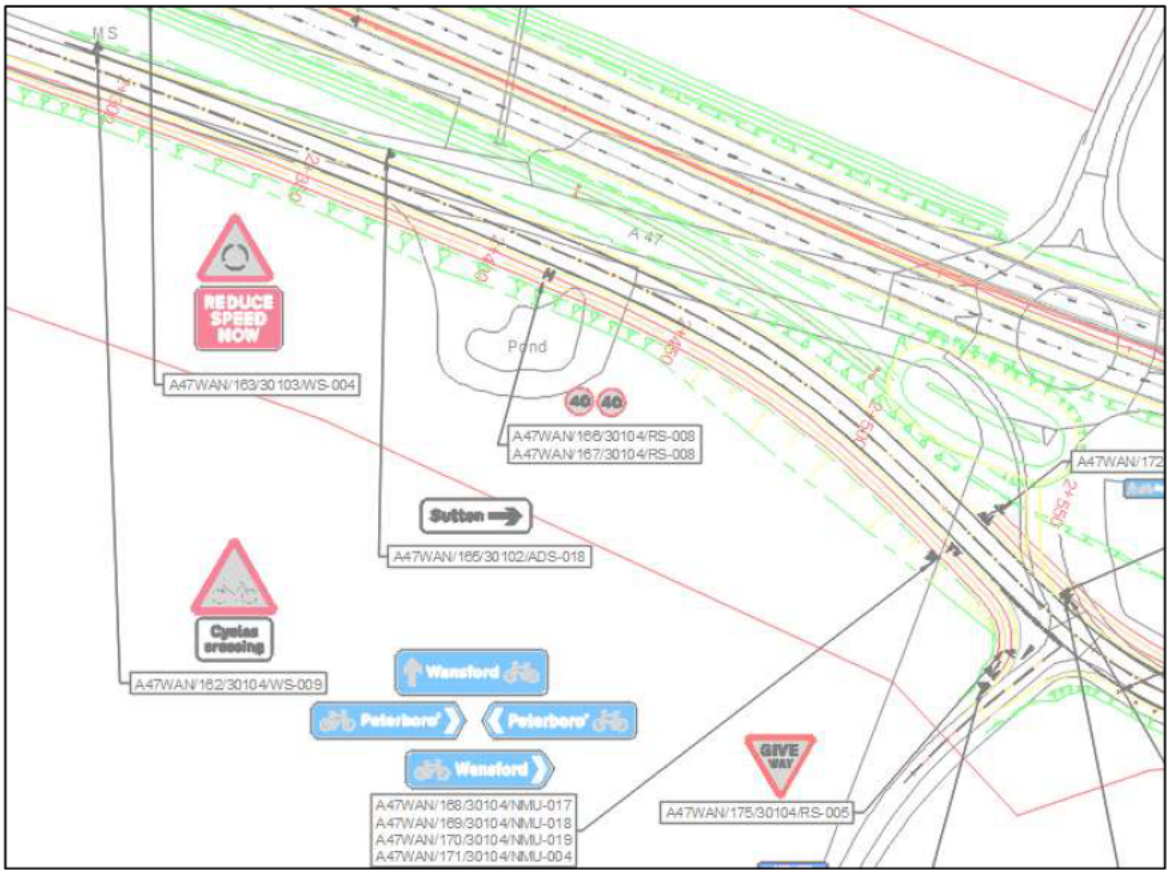

Figure 5-5: Eastbound approach to the proposed Peterborough Road link crossing

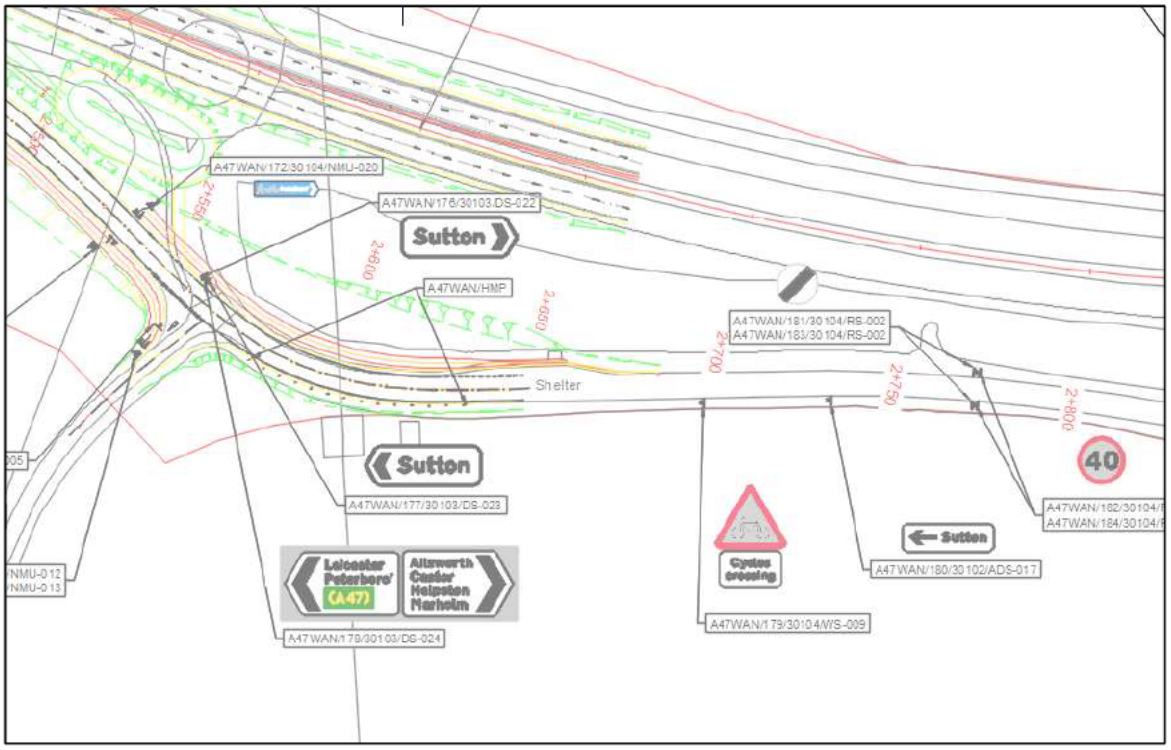

Figure 5-6: Westbound approach to the proposed Peterborough Road link crossing

Problem 19

Figure 5-7: Existing sign in the A1 SB carriageway

Map type ADS showing the Leicester A47 exit slip road.

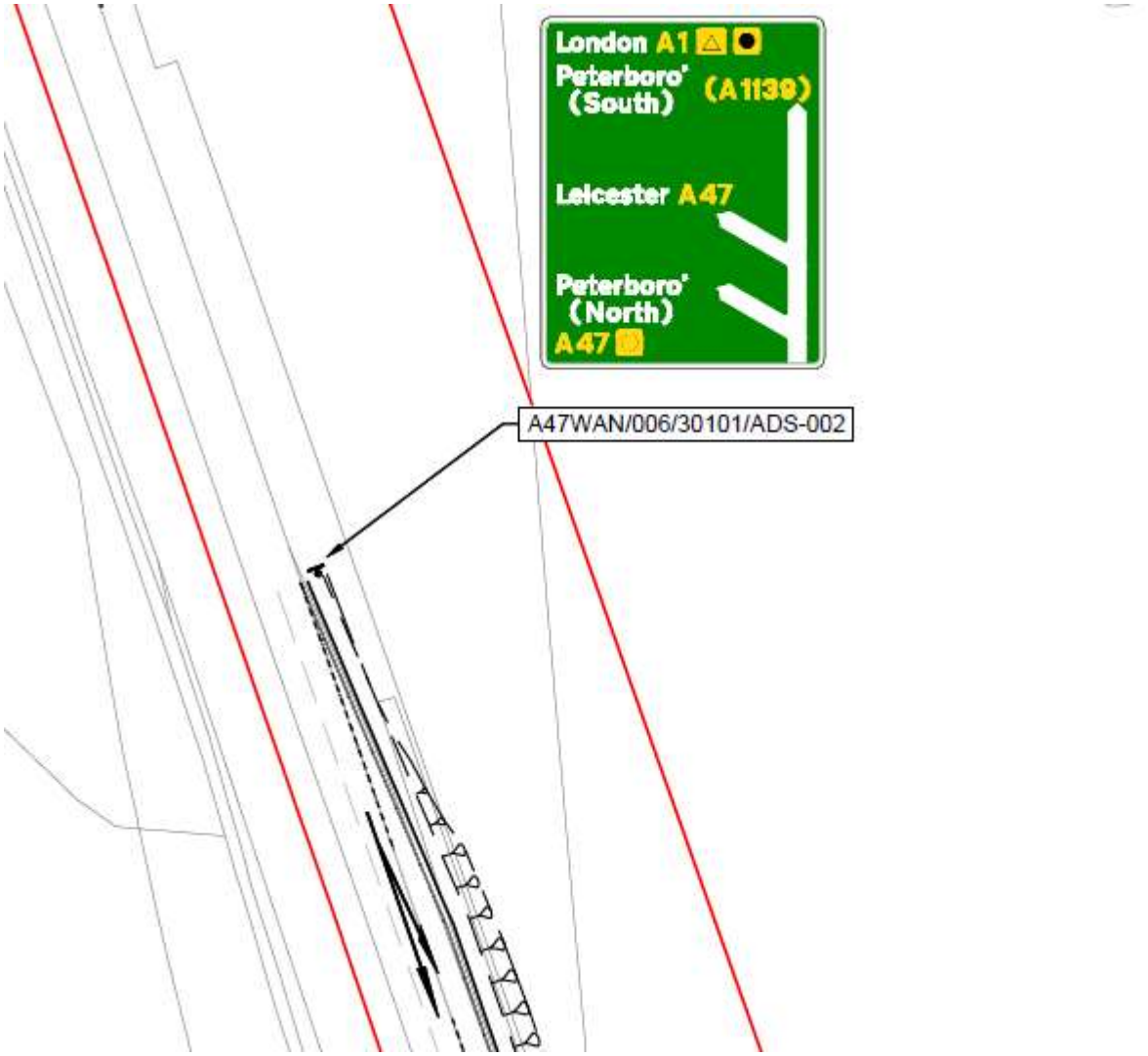

Figure 5-8: Proposed sign at A1 SB carriageway warning of the 2 successive exits.

Appendix B.

Safety Risk Assessment

Safety risk assessments have been carried out in accordance with GG104 "Requirement for safety risk assessment" for the following Problems identified within the road safety audit.

- Problem 1 – Removal of lay-bys
- Problem 19 – Signing of A1 southbound diverges

Planning

Theses safety risk assessments are provided to support the decisions by the designer in relating to the problem identified and recommendation made in the road safety audit as detailed within this report.

Safety risk categorisation

In accordance with GG104 for each activity the safety risk categorisation has been considered to support the level of complexity of the problem and the level of vigour required within the risk assessment process.

The safety risk categorisation is as detailed below:

Problem 1 – Removal of lay-bys

Feature	Type	Justification
Extent of prior experience of activity.	A	There is significant experience and knowledge of the operation of the strategic road network, layout and positioning of lay-bys and rest areas.
Statutory and formal processes and procedures (including standards and legislation).	A	No statutory procedures involved.
Impact on the organisation.	A	There will be very little impact on the organisation.
Activity scale.	A	There will be limited impact of this activity.
Technical.	A	There will be little technical innovation or novelty in the design and operation of the options.
Stakeholder impact and interest.	A	Very few stakeholders are affected.

The overall risk categorisation for Problem 1 is Type A.

Problem 19 – Signing of A1 southbound diverges

Feature	Type	Justification
Extent of prior experience of activity.	A	There is significant experience and knowledge of signing consecutive diverges on the strategic road network..

Statutory and formal processes and procedures (including standards and legislation).	A	No statutory procedures involved.
Impact on the organisation.	A	There will be very little impact on the organisation.
Activity scale.	A	There will be limited impact of this activity.
Technical.	A	There will be little technical innovation or novelty in the design and operation of the options.
Stakeholder impact and interest.	A	Very few stakeholders are affected.

The overall risk categorisation for Problem 19 is Type A.

Identification of affected populations

The populations affected for the activities is identified below:

Problem 1:

- Users
  - Traffic on the A1 mainline

Problem 19

- Users
  - Traffic using the A1 southbound
  - Traffic using the A1 southbound to A47 westbound diverge

Scope

The Scope of the safety risk assessment for each problem is detailed below:

Problem 1

The problem is “An existing parking lay-by on the southbound carriageway of the A1 is to be removed as part of the new scheme. The removal of the lay-by will mean less opportunities for stopping safely on the A1. This may lead to inappropriate parking elsewhere on the road network and collisions between moving and parked vehicles, or drivers driving fatigued“and the recommendation: “Ensure the A1 southbound still has sufficient stopping facilities if the lay-by is removed.”

This safety risk assessment will consider the distances to the adjacent lay-bys and rest areas and consider the risk of the proposed lay-by removal.

Problem 19

The problem is “Proposed traffic signs A47WAN/006/30101/ADS-001, 002, and 003 include angled arrows for both exits. This design suggests that both the new freeflow link and the existing exit for Wansford junction have relatively straight slip roads. However, this is not

the case with the existing (A47 Leicester) exit, which has quite a severe double turn which drivers may not be expecting based on the sign design." And the recommendation is "Provide sign designs that reflect the characteristics of the road layout."

This safety risk assessment will consider the risks associated with the proposed signing solution.

Safety baseline and objectives

Problem 1

Baseline

There is not enough data available to assess fatigue or stationary vehicle collision levels on the A1 to set a base line, however the data from the A47 Norwich bypass which is a similar standard of two lane dual carriageway with grade separate junctions has used due to the level of detail available.

The rate of fatigue collisions over the five-year period 2014-2018 was 0.164 fatigue related collisions per hundred million vehicle kilometres with an FWI (Fatally Weighed Injuries) rate of 0.017 per hundred million vehicle kilometres.

The stationary vehicle collisions (identified as a parked vehicle on a live lane) over the five-year period 2014-2018 was 0.055 fatigue related collisions per hundred million vehicle kilometres with an FWI rate of 0.001 per hundred million vehicle kilometres.

Objective

The distance between roadside parking areas following removal of the lay-bys at Wansford is 3.5 kilometres. This is 1 km more than required within CD169 of the Design Manual for Roads and Bridges

The average annual daily traffic in 2019 on the A1 southbound at Wansford (TMU site 6503/2) was 22,293 vehicles.

- 0.001 FWI per year due to fatigue collisions per km
  - 0.004 FWI per year on a compliant layout - 2.5km spacing
  - 0.005 FWI per year on the proposed layout – 3.5km spacing
- 0.00004 FWI per year due to stationary vehicle collisions per km
  - 0.00011 FWI per year on a compliant layout - 2.5km spacing
  - 0.00016 FWI per year on the proposed layout – 3.5km spacing

The objective would be to be no worse than the baseline fatally weighed injury collisions associated with fatigue and stationary vehicles between lay-bys/rest areas.

Problem 19

Baseline

In the five-year period 2014 to 2018 inclusive there have been 2 serious and 4 slight injury casualties from 4 collisions in the vicinity of the Wansford junction.

The annual FWI is therefore 0.048

Objective

The safety objective would be for the proposed layout to perform better than the baseline.

Safety risk assessment

Hazard identification

Problem 1

The following user hazards have been identified with the removal of the layby:

Hazard	Where	When	Why	How
Collisions resulting from fatigue	Over the additional 1km with no lay-by.	Drivers who are becoming drowsy looking for a place to stop.	The increased distance between lay-bys and rest areas increases the risk of fatigue.	A fatigued driver may lose control of the vehicle or fail to react to slower traffic or other incidents, resulting in a collison.
Collisions with stopped vehicles on the carriageway	Over the additional 1km with no lay-by	In the event of a vehicle breakdown or emergency and not being able to reach a layby.	The increases distance between lay-bys and rest areas increases the risk of a breakdown or stop in the live lane.	A stationary vehicle in a live lane is at risk of being struck by traffic resulting in a collision.

Problem 19

The following users hazards have been identified associated with the junction layout

Hazard	Where	When	Why	How
Late lane changes	On the mainline through the junction	Vehicles intending to leave the A1.	Users are brought into conflict with each other	Vehicles could be involved in side swipes resulting in damage only and possible injury.
Junction overshoot	The A47 Eastbound diverge	Vehicles exiting onto the slip for the A47 (E)	Users overshooting onto the verge colliding with roadside features.	Vehicles colliding with roadside furniture resulting in damage or possible injury.

Hazard analysis

Problem 1

Fatigue incidents are known to occur on long distance trunk roads due to the nature of the traffic. A driver suffering from fatigue is less likely to react to the changing road and traffic conditions, resulting in collisions with roadside features or other road users.

A stationary vehicle due to a breakdown or other emergency presents a risk of being struck by traffic if unable to reach a place of relatively safety such as a lay-by or rest area. However, it should be noted that the slip roads to the A47 will provide a place of relative safety for a broken down vehicle, although this has been discounted within this risk assessment.

Problem 19

The consecutive diverge arrangement presents a risk to users taking the wrong exit and making sudden lane changes to correct their actions. This could result in side swipes or shunts with adjacent and surrounding traffic.

The sharp diverge arrangement of the A47 (E) diverge, (which is the current layout) can lead to drivers failing to negotiate the alignment due to high approach speeds. This generally results in overshoots onto the verges.

Analysis of Safety Risk

Problem 1

A quantitative risk assessment has been carried out for fatigue and stationary vehicle casualty risk from the baseline figures obtained from the A47 Norwich Bypass data from 2015 to 2019 inclusive.

Description	Value
Compliant distance between lay-bys (km)	2.5
Proposed distance between lay-bys (km)	3.5
Annual Average Daily Traffic – Southbound A1 2019 (vehicles)	22293
Annual distance travelled over compliant 2.5km length (Million vehicle kilometres)	0.203
Annual distance travelled over proposed 3.5km length (Million vehicle kilometres)	0.285
Average vehicle occupancy in 2019 (dft car/van occupancy rates)	1.6
Total person journey in 2019 (AADT x 365 days x 1.6 occupancy)	13,019,112

Fatigue collisions	
Fatally weighed injury casualty rate baseline (FWI per million vehicle kilometres)	0.017
Fatally weighed injury casualties per year over compliant 2.5km length (FWI)	0.004
Fatally weighed injury casualties per year over proposed 3.5km length (FWI)	0.005
1 Slight injury casualty (FWI of 0.01) over compliant 2.5km length (1 in ..years)	2.813
1 Slight injury casualty (FWI of 0.01) over proposed 2.5km length (1 in .. years)	2.010
Annual Risk or fatal per person journey over compliant 2.5km length	1 in 3.7 billion[1]
Annual Risk or fatal per person journey over compliant 3.5km length	1 in 2.6 billion
Stationary vehicle collisions	
Fatally weighed injury casualty rate baseline (FWI per million vehicle kilometres)	0.001
Fatally weighed injury casualties per year over compliant 2.5km length (FWI)	0.00011
Fatally weighed injury casualties per year over proposed 3.5km length (FWI)	0.00016
1 Slight injury casualty (FWI of 0.01) over compliant 2.5km length (1 in ..years)	90
1 Slight injury casualty (FWI of 0.01) over proposed 2.5km length (1 in .. years)	64
Annual Risk or fatal per person journey over compliant 2.5km length	1 in 118 billion
Annual Risk or fatal per person journey over compliant 3.5km length	1 in 83 billion

Problem 19

Due to the lack of data associated with driver behaviour relating to sign designs, a qualitive risk assessment has been undertaken.

The proposed design will have consistent clear signing on the approach featuring map signs showing consecutive diverge layouts. This is a standard layout adopted across similar junctions and is likely to reduce the number vehicles taking the wrong exit.

The current layout features a variety of sign types including map and stack type.

The sharp diverge of the A47 (E) exit within the proposed design follows the alignment of the current layout. Following introduction of the A47 (W) diverge, the traffic numbers using this diverge will decrease. The proposed design will also feature improved warning signs at this diverge to advise users of the sharp deviation ahead, and any features within this verge will be passively safe therefore reducing the risk of injury to vehicle occupant.

With consistent clear signing on the approaches to the proposed junction it is likely that the level of risk will be low.

[1] Billion taken as 1,000,000,000

Evaluation of safety risk

This safety risk assessment concludes that the level of risk presented by the proposals are low and therefore deemed to be broadly acceptable.

Document and maintain the safety risk assessment

This safety risk assessment has been developed to address issues raised within the Stage 1 Road Safety Audit carried out as part of the preliminary design (SGAR 3). Should there be a change in the design or circumstances relating to this assessment, the safety risk assessment should be reviewed and updated as appropriate.

A47 WANSFORD TO SUTTON DUALLING

Stage 1 Road Safety Audit Addendum

PCF STAGE 3
HE551494-GTY-HOS-000-RP-CH-30003 | P02
18/06/21

Notice

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Key personnel

Client	Overseeing Organisation
James Stevenson Galliford Try Cowley Business Park Cowley Uxbridge Middlesex UB8 2AL [redacted]	Craig Stirzaker Highways England Woodlands Manton Lane Manton Industrial Estate Bedford MK14 7LW [redacted]
Designer	**Road Safety Audit Team**
Sheila Cano Sweco 5th Floor, Programme All Saints Street Bristol BS1 2LZ [redacted]	Team Leader – Martin Magyar, Sweco Sweco Grove House Mansion Gate Drive Chapel Allerton Leeds LS74DN [redacted] Team Member – Adrian Clothier, Highways England Woodlands Manton Lane Manton Industrial Estate Bedford MK14 7LW

1. Introduction

1.1. Road safety audit addendum report

1.1.1. A Stage 1 road safety audit was carried out on the entire A47 Wansford to Sutton scheme over December 2020 and January 2021. Following on from this initial audit, in May 2021 the audit team was instructed to carry out a second road safety audit, as an addendum to the original audit, to cover specific design elements that changed significantly since the original audit.

1.1.2. This report is an addendum to the Stage 1 road safety audit, document reference HE551494-GTY-HOS-000-RP-CH-30001. It was carried out on the Scheme proposed by Galliford Try and designed by Sweco UK Ltd at the request of Craig Stirzaker, the Highway Authority Project Manager. The Road Safety Audit was carried out during May and June 2021.

1.2. Road safety audit team

1.2.1. The road safety audit team membership, approved by Craig Stirzaker from the Overseeing Organisation, was as follows:

Team Leader	Martin Magyar BEng CEng MICE, MSoRSA, Certificate of Competency
Team Member	Adrian Clothier BEng (Hons), MSoRSA, Certificate of Competency

1.3. Road safety audit brief

1.3.1. The road safety audit team was provided with a road safety audit brief, with document reference HE551494-GTY-HGN-000-RP-CH-30002, revision P04, dated 20 May 2021.

1.4. Road safety audit

1.4.1. The road safety audit comprised an examination of the documents provided, and these are listed in Appendix A.

1.4.2. The road safety audit brief was accepted by the road safety audit team.

1.4.3. Note that this road safety audit report covers the following design changes only, and which are described as follows in the road safety audit brief:

- *The mainline alignment moved slightly north around the Schedule Monument area in order to reduce the volume of the flood compensation area required. With this slightly re-alignment of the mainline, the new design encroaches 9m in the south east corner of the Schedule Monument. This change has been*

incorporated with the agreement of Historic England and with the aim of reducing the impact in the Flood area, and therefore, the mitigation needed

- *The new link to the petrol station was re-designed to allow vehicles to continue their journey if the station is closed for any reason.*
- *Proposed passing places on Upton Drift Road instead of a 2-way road. Due to the project budget and amount of traffic that will use that road, it is considered that a single lane with passing places would be an appropriate design. This design has been reviewed with long vehicles; driving and tracking drawings were produced HE551494-GTY-HSR-000-DR-CH-30021 (P01.1) and HE551494-GTY-HSR-000-DR-CH-30023 (01.1)*

1.4.4. Following issue of the Brief, the audit team requested the following information:

- Traffic flow data for Upton Drift Road
- Swept path analysis for the proposed link to the petrol station.

1.4.5. The traffic flow data was supplied to the audit team, but not the swept path analysis.

1.5. Terms of reference

1.5.1. The terms of reference of the road safety audit are as described in GG119 Revision 2. The road safety audit team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.

1.5.2. All comments and recommendations are referenced to the detailed design drawings and the locations have been indicated on plans supplied with the road safety audit brief in Appendix B

1.6. Scheme description

1.6.1. The proposed scheme, as described in the road safety audit brief, is as follows:

"The A47 Wansford to Sutton scheme starts 12km west of Peterborough where the A47 Peterborough to Lowestoft Trunk Road meets the A1 Edinburgh to London Trunk Road at Wansford. The scheme continues eastwards for 2.5km, tying in with the existing A47 immediately to the east of the to-be-removed existing Nene Way Roundabout.

The existing A47 single-carriageway is to be upgraded to dual-carriageway standard (D2AP). It will be constructed slightly to the north of the existing A47 from the A1 / A47 junction for approximately 800m, before crossing the existing A47 where it will be constructed further more to the north of the existing alignment until it ties into the existing dual carriageway east of Nene Way.

The scheme objectives are therefore set out as the following:

- *Help enable regional development and growth in Norwich and its surrounding area*
- *Reduce congestion, make journey times more reliable, and provide capacity for future traffic growth*
- *Improve resilience of the road to cope with incidents such as collisions, breakdowns and maintenance*
- *•Improve safety for all road users and for those living in the local area*
- *Protect the environment by minimising any adverse impacts and, where possible, deliver benefits*
- *Ensure the new road layout takes into account local communities and safe access to the A47*
- *Provide a safer route between communities for cyclists, walkers, horse riders and other non-motorist groups*

The proposed scheme was the preferred route identified and agreed at SGAR 2 with Highways England and includes:

- *Dualling of the existing A47 single carriageway section from A1 junction at Wansford to Nene Way Roundabout.*
- *Provision of a new free flow interchange link from A1 WB to A47 EB.*
- *Provision of a new access to A1 council houses rather than direct access from A1.*
- *Closure of A1 SB existing layby.*
- *Closure of A1 SB existing bus stop at A1 SB – A47 EB off slip.*
- *Provision of a new Segregated Left Turn Lane (SLTL) A1 NB – A47 EB at the existing western roundabout.* (See update to design detailed in section 3.1 above)
- *Enlargement of existing roundabout at A1/A47 junction.*
- *Provision of a new access link to Sacrewell.*
- *Provision of two new underpasses – Sacrewell link, as a route for pedestrians, cyclists and equestrians, and the existing dismantled railway, as a route for pedestrians and cyclists.*
- *Provision of a safe route for cyclists and pedestrians along the scheme.*
- *Relocation of the Nene Way roundabout.*
- *Provision of Passing places in Upton Drift Road.* (See update to design detailed in section 3.1 above)
- *Provision of 5 balancing ponds, 2 infiltration basins and 1 wildlife pond. The scheme also counts with a flood storage near the river Nene to compensate for the flood area missing for the new construction.*
- *Provision of maintenance accesses to all the ponds.*

- *Provision of lighting for the modified roundabouts."*

1.7. Site visit

1.7.1. The site was visited by all road safety audit team members as detailed below:

Day/Date	Time from	Time to	Light Conditions	Weather	Surface	Traffic
Thursday, 10 June 2021	11:10	12:15	Daylight	Fine	Dry	Moderate

2. Items raised at previous road safety audits

2.1.1. Items raised previously are listed in the main Stage 1 Road Safety Audit report, document reference HE551494-GTY-HOS-000-RP-ZS-30001.

3. Items raised at this Stage 1 road safety audit addendum

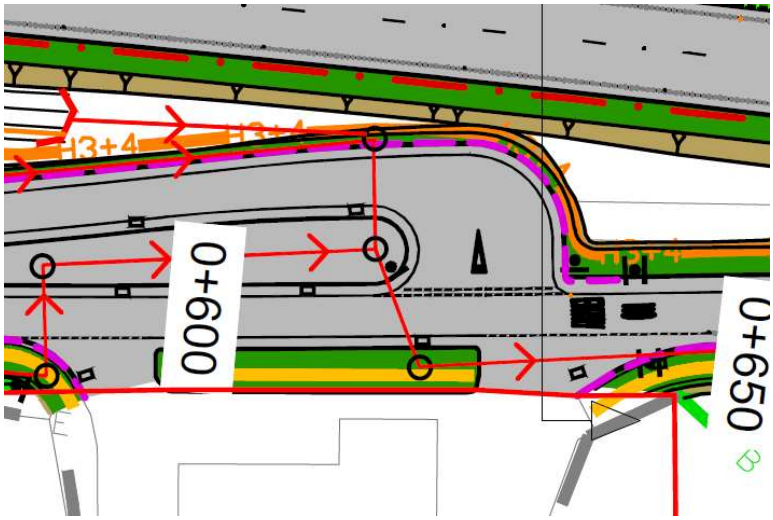
3.1. Problem 1

Location: Link road to petrol station (drawing: HE551494-GTY-HGN-000-DR-CH-36003)

Summary: Alignment of road leads to vehicles striking the kerbed verge.

Description: On the proposed link road to the petrol station, a one-way loop road arrangement is to be provided. Eastbound traffic wishing to enter the petrol station, or carry-out a U-turn, will give-way to vehicles travelling westbound. However, only half of the give-way line aligns with the entry to the petrol station, with the other half aligning with the kerbed verge which separates the petrol station forecourt from the new link road. If vehicles take a tight turn around the loop road, when trying to enter the petrol station from the west, they may strike the kerbed verge.

Recommendation: Provide road markings on the loop road that guide drivers to the section of give-way line that aligns with the petrol station entrance.



Plan Extract

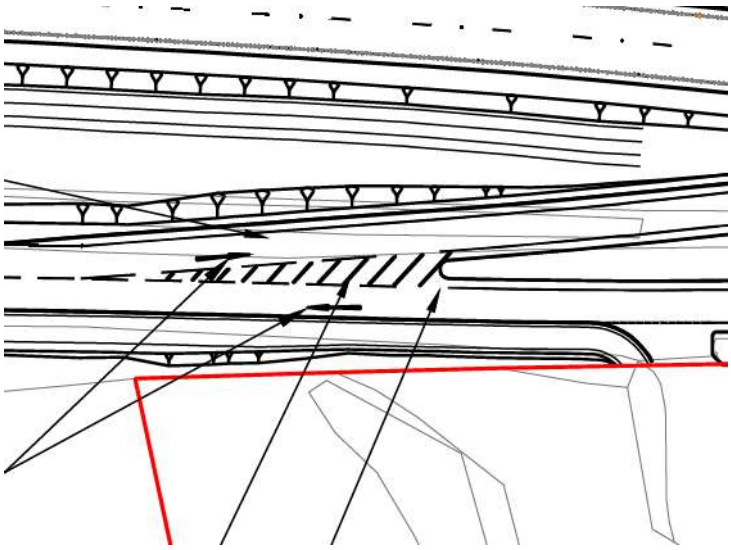
3.2. Problem 2

Location: Link road to petrol station (drawing: HE551494-GTY-HMK-DR-CH-30003 and HE551494-GTY-HSN-000-DR-CH-30003).

Summary: Lack of traffic signing to guide vehicles around the one-way system leads to head-on collisions.

Description: On the proposed link road to the petrol station, a one-way loop road arrangement is to be provided. For eastbound traffic, the two opposing traffic movements are defined through use of arrow road markings and hatching alone that leads to a kerbed central island. No signing is proposed to reinforce the one-way system. If the road markings become less visible to a driver, for example due to poor weather conditions or deterioration of the markings, then drivers may inadvertently drive on the wrong carriageway, leading to head-on collisions.

Recommendation: Provide traffic signing on the central island to advise drivers to proceed left around the one-way loop.



Plan Extract

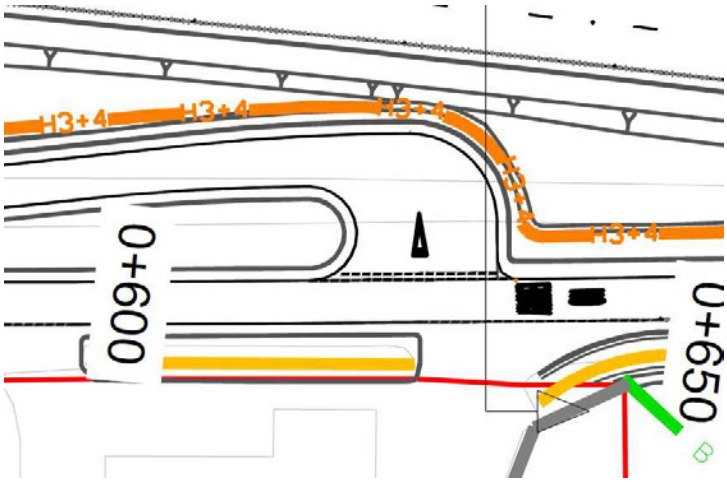
3.3. Problem 3

Location: Link road to petrol station (drawing: HE551494-GTY-HGN-000-DR-CH-36003)

Summary: Proposed fencing blocks inter-visibility between opposing traffic movements.

Description: New wooden post and rail fencing is proposed, which will follow the curvature of the northern side of the new loop road (see plan extract below). This fencing has the potential to restrict inter-visibility between drivers of the opposing movements, leading to side-on collisions between vehicles.

Recommendation: Ensure adequate inter-visibility is maintained between all potentially conflicting vehicular movements.



Plan Extract

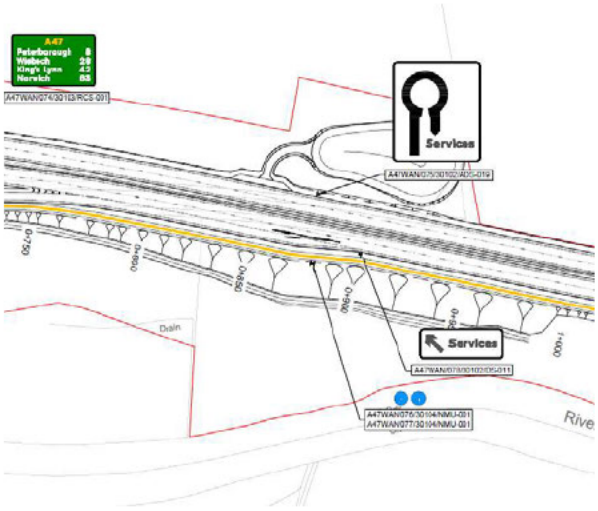
3.4. Problem 4

Location: Existing petrol station and new link road (Drawing: HE551494-GTY-HSN-000-DR-CH-30004).

Summary: Proposed traffic signing for petrol station may lead to large vehicles trying to enter the petrol station and having to reverse back onto the highway.

Description: The existing petrol station is to be retained within the scheme and is to be provided with access from the westbound A47 carriageway and from a new link road, to the south of the mainline. The existing forecourt was observed to be constrained in space and unsuitable for large vehicles. The petrol station is to be signed as 'services' by means of traffic signs located on the east and westbound A47 carriageway. The proposed wording of the traffic signs does not give any indication of the size of the petrol station, or the facilities available and could raise driver expectation that there is a large facility available. This could lead to large vehicles trying to enter the forecourt and potentially having to reverse back onto the link road or stop-start on the link road, leading to shunt-type collisions. This is likely to be exacerbated by the potential high speeds of vehicles entering the slip road that leads to the petrol station.

Recommendation: Provide traffic signing appropriate for the petrol station facility and the vehicle-types it can accommodate.



Plan Extract

Photograph - existing petrol station forecourt

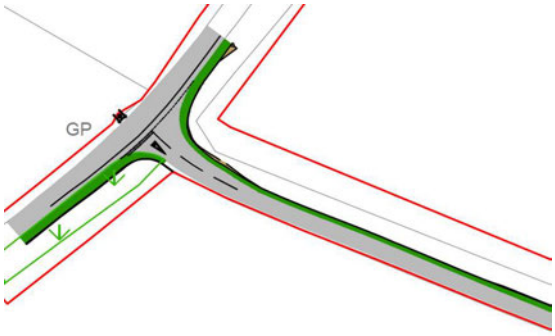
3.5. Problem 5

Location: Upton Drift Road (Drawing: HE551494-GTY-HGN-000-DR-CH-36005)

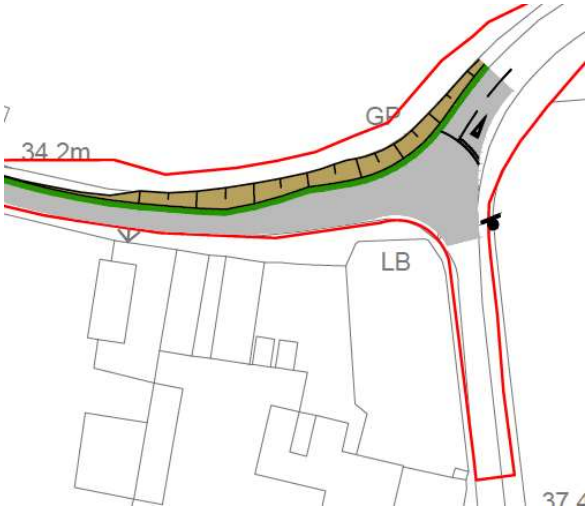
Summary: Lack of passing places leads to head-on collisions.

Description: It is proposed that Upton Drift Road is retained as a single-track road, with new passing bays provided. The proposed passing bays are positioned towards the central section of the road, some distance from the junctions at either end of Upton Drift Road. A vehicle turning into Upton Drift Road, at either end, may face an on-coming vehicle and have no safe place to pull into, to allow passing. This could lead to vehicles reversing or blocking the junctions, with the potential for resultant shunt or side-swipe collisions.

Recommendation: Provide two lanes, of sufficient length for large vehicles to safely pull into, at the junctions at either end of Upton Drift Road.



Plan Extract – Upton Drift Road western end



Plan extract – Upton Drift Road eastern end

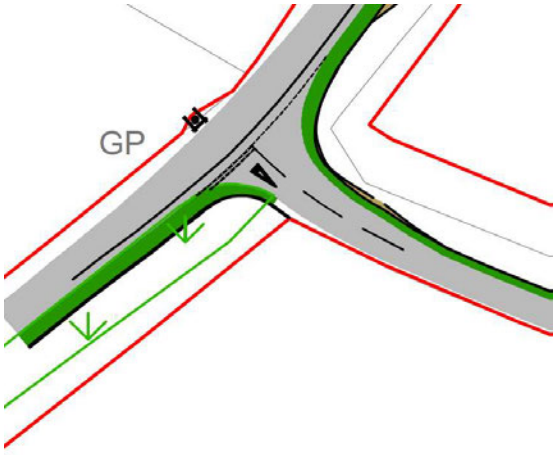
3.6. Problem 6

Location: Upton Drift Road (Drawing: HE551494-GTY-HGN-000-DR-CH-36005).

Summary: Vehicles over-run the verge and lose control.

Description: Site observations indicated evidence of vehicles overrunning the verge on Upton Drift Road, close to the junction with Langley Bush Road. The proposed design for Upton Drift Road appears to maintain the current alignment at this location. With increased traffic using this route in the future, there is increased risk of vehicles over-running the verge and losing control, or spreading soil into the road creating a hazard for other vehicles.

Recommendation: Design the junction of Upton Drift Road / Langley Bush Road such that it can accommodate the swept path of all vehicle types anticipated to use it.



Plan Extract – Upton Drift Road/ Langley Bush Road junction

Photograph – Upton Drift Road / Langley Bush Road junction

3.7. Problem 7

Location: Upton Drift Road (Drawing: HE551494-GTY-HGN-000-DR-CH-36005)

Summary: Lack of forward visibility at S-bend in road leads to head-on collisions.

Description: There is an existing S-bend in the alignment of Upton Drift Road, towards its eastern end, which is to be retained. A passing bay is to be provided on the northern side of the road, at the S-bend. However, an existing hedgerow on the southern side (shown in the image below) obscures forward visibility. This could lead to head-on collisions between vehicles, especially with the anticipated increase in traffic flow on this road.

Recommendation: Ensure suitable forward visibility is maintained along Upton Drift Road such that drivers can see hazards, including oncoming or stationary vehicles, ahead.

Plan Extract – S-bend in Upton Drift Road, with proposed passing bay

Photograph – Upton Drift Road viewed west, with hedgerow obscuring visibility

4. Audit team statement

4.1.1. We certify that this Road Safety Audit has been carried out in accordance with GG119 Revision 2.

Road safety audit Team Leader

Name	Martin Magyar
Signed	[redacted]
Qualification	BEng, CEng MICE, MSoRSA, Certificate of Competency
Position	Principal Engineer, Sweco
Date:	18/06/2021

Road safety audit Team Member

Name	Adrian Clothier
Signed	[redacted]
Qualification	BEng (Hons), MSoRSA, Certificate of Competency
Position	Engineering Team Manager – Road Safety, Highways England
Date:	18/06/2021

Appendix A. Documents forming the road safety audit brief

Documents

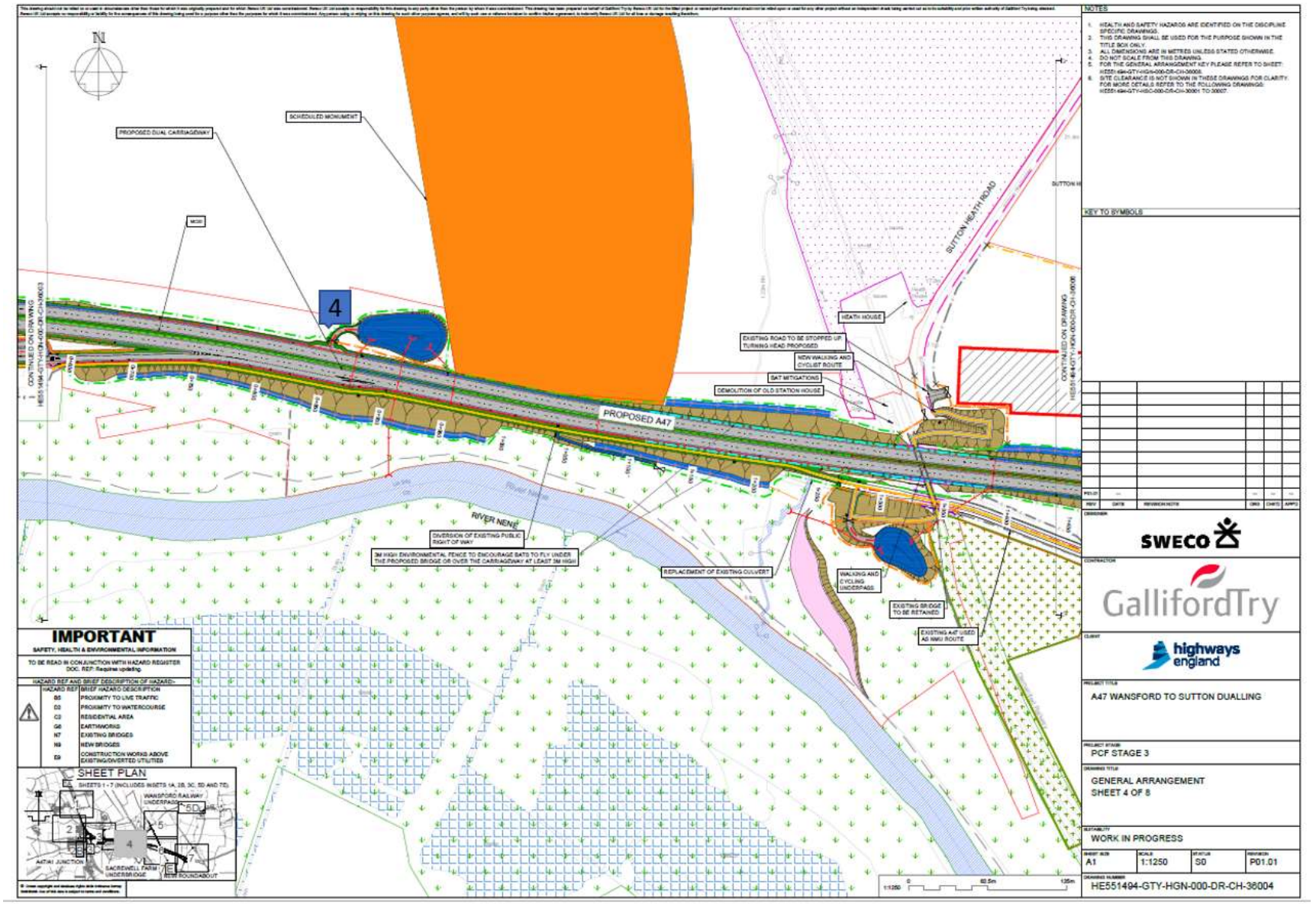
Ref	Title	Date
264223PU-TPN-ITD-421-A A47 Wansford to Sutton Dualling RSA1.pdf	264223PU-TPN-ITD-421-A A47 Wansford to Sutton Dualling RSA 1 – Design Stage 2.	Sept 2018
HE551494-MMSJV-GEN-000-RP-ZX-00004	Designers Response to RSA 1 – Design Stage 2.	Oct 2018
HE551494-GTY-HGN-000-RP-CH-30002	RSA Brief – Design Stage 3.	Dec 2020
HE551494-GTY-HOS-000-RP-ZS-30001	RSA SGAR 3	Jan 2021
HE551494-GTY-HOS-000-RP-CH-30002	RSA Response – SGAR 3	Apr 2021
HE551494-GTY-HGN-000-SH-CH-30005	Departure from Standards checklist	
HE551494-GTY-HKF-000-RP-CX-30001-P01.pdf	Walking, cycling and horse-riding assessment - Wansford	Oct 2020
HE551494-GTY-HKF-000-RP-CX-30002-P01.pdf	Walking, cycling and horse-riding review - Wansford	Oct 2020
HE551494-GTY-GHS-000-HS-ZS-30001	PCF Safety Plan	July 2020
HE551494-GTY-GHS-000-HS-ZS-30003	Combined safety and Hazard Log	Nov 2020
HE551494-GTY-GHS-000-HS-ZS-30002	Maintenance and Repair Statement	Dec 2020
22760 A47 Wansford Site 6 Junction Count	Junction count data	Dec 2019

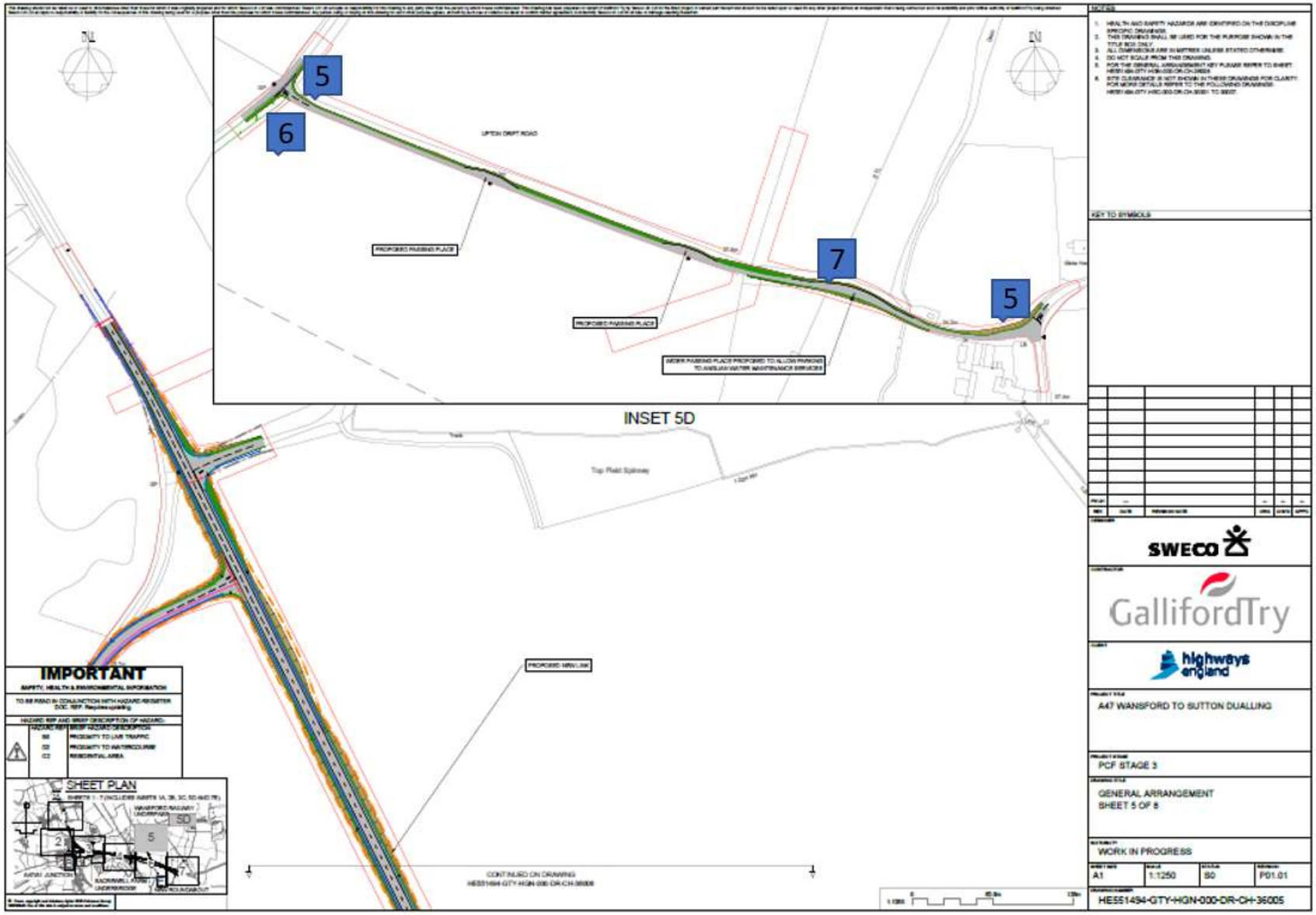
Drawings

Ref	Revision	Title
HE551494-GTY-HGN-000-DR-CH-30023	P01.02	Proposed Scheme Layout – design Fix C
HE551494-GTY-HGN-000-DR-CH-30015 to 30021	P01.01	General Arrangement - Sheets 1 to 7
HE551494-GTY-HGN-000-DR-CH-30008	P01.03	Departure summary plan
HE551494-GTY-HGN-000-DR-CH-30008	P01.01	String naming layout
Site clearance:		
HE551494-GTY-HSC-000-DR-CH-30001 to 30007	P01.01	Site clearance layout- Sheets 1 to 7
Fencing:		
HE551494-GTY-HFE-000-DR-CH-30001 to 30007	P01.1	Fencing Layout - Sheets 1 to 7

Road restraint systems:		
HE551494-GTY-HRR-000-DR-CH-30001 to 30007	P01.1	Road Restraint Systems Layout- Sheets 1 to 7
Drainage:		
HE551494-GTY-HDG-000-DR-CD-30001 to 30007	P01.01	Drainage Layout Plan - Sheets 1 to 7
Pavement:		
HE551494-GTY-HPV-000-DR-CH-30001 to 30007	P01.01	Pavement Design - Sheets 1 to 7
Kerbs, footways & paved areas:		
HE551494-GTY-HKF-000-DR-CH-30001 to 30007	P01.1	Kerbs, Footways & Paved Areas Layout Plan - Sheets 1 to 7
Road lighting:		
HE551494-GTY-HLG-000-DR-EO-30021 to 30027; HE551494-GTY-HLG-000-DR-EO-30030	P01	LIGHTING LAYOUT - SHEETS 1 to 7; KEY NOTES & LEGEND
Road Markings:		
HE551494-GTY-HMK-000-DR-CH-30001 to 30007	P01.01	Road Markings Layout Plan - Sheets 1 to 7
Exploratory Hole Locations:		
HE551494-GTY-HGT-000-DR-CE-30001 to 30006	P02	Exploratory Hole Locations – Sheets 1 to 6
Geological Longsections:		
HE551494-GTY-HGT-000-DR-CE-30010 to 30015	P04	Geological Longsections – Sheets 1 to 6
Geological Longsections Sideroads:		
HE551494-GTY-HGT-000-DR-CE-30016 to 30019	P04	Geological Longsections Sideroads – Sheets 1 to 4
Mainline Earthworks:		
HE551494-GTY-HGT-000-DR-CE-30101 to 30107	P02	MAINLINE EARTHWORKS PLAN 7 & PROFILE - Sheets 1 to 7
Sideroads Earthworks:		
HE551494-GTY-HGT-000-DR-CE-30201 to 30207	P02	SIDEROADS EARTHWORKS PLAN 7 & PROFILE - Sheets 1 to 7

Appendix B. Annotated scheme drawing


N
PROPOSED DUAL CARRIAGEWAY
SCHEDULED MONUMENT
MOH
4
PROPOSED A47
RIVER NENE
SUTTON HEATH ROAD
HEATH HOUSE
EXISTING ROAD TO BE STOPPED UP TURNING HEAD PROPOSED
NEW WALKING AND CYCLIST ROUTE
BAT MITIGATIONS
DEMOLITION OF OLD STATION HOUSE
DIVERSION OF EXISTING PUBLIC RIGHT OF WAY
3M HIGH ENVIRONMENTAL FENCE TO ENCOURAGE BATS TO FLY UNDER THE PROPOSED BRIDGE OR OVER THE CARRIAGEWAY AT LEAST 3M HIGH
REPLACEMENT OF EXISTING CULVERT
WALKING AND CYCLING UNDERPASS
EXISTING BRIDGE TO BE RETAINED
EXISTING A47 USED AS NMU ROUTE
CONTINUED ON DRAWING
IMPORTANT
SAFETY, HEALTH & ENVIRONMENTAL INFORMATION
TO BE READ IN CONJUNCTION WITH HAZARD REGISTER DOC. REF: Requires updating
HAZARD REF AND BRIEF DESCRIPTION OF HAZARD:-
HAZARD REF | BRIEF HAZARD DESCRIPTION
D5 PROXIMITY TO LIVE TRAFFIC
D3 PROXIMITY TO WATERCOURSE
C2 RESIDENTIAL AREA
G6 EARTHWORKS
N7 EXISTING BRIDGES
N9 NEW BRIDGES
E9 CONSTRUCTION WORKS ABOVE EXISTING/DIVERTED UTILITIES
SHEET PLAN
SHEETS 1 - 7 (INCLUDES INSETS 1A, 1B, 3C, 5D AND 7D)
WANSFORD RAILWAY UNDERPASS
A47/A1 JUNCTION
SACREWELL FARM UNDERBRIDGE
NEW ROUNDABOUT
NOTES
1. HEALTH AND SAFETY HAZARDS ARE IDENTIFIED ON THE DISCIPLINE SPECIFIC DRAWINGS.
2. THIS DRAWING SHALL BE USED FOR THE PURPOSE SHOWN IN THE TITLE BOX ONLY.
3. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
4. DO NOT SCALE FROM THIS DRAWING.
5. FOR THE GENERAL ARRANGEMENT KEY PLEASE REFER TO SHEET: HE551494-GTY-HGN-000-DR-CH-36005.
6. SITE CLEARANCE IS NOT SHOWN IN THESE DRAWINGS FOR CLARITY. FOR MORE DETAILS REFER TO THE FOLLOWING DRAWINGS: HE551494-GTY-HSC-000-DR-CH-30001 TO 30007.
KEY TO SYMBOLS
SWECO
GallifordTry
highways england
A47 WANSFORD TO SUTTON DUALLING
PCF STAGE 3
GENERAL ARRANGEMENT
SHEET 4 OF 8
WORK IN PROGRESS
A1 | 1:1250 | S0 | P01.01
HE551494-GTY-HGN-000-DR-CH-36004


5
6
7
5
INSET 5D
PROPOSED PASSING PLACE
PROPOSED PASSING PLACE
IMPORTANT
SHEET PLAN
SWECO
GallifordTry
highways england
A47 WANSFORD TO SUTTON DUALLING
PCF STAGE 3
GENERAL ARRANGEMENT
SHEET 5 OF 8
WORK IN PROGRESS
A1
1:1250
80
P01.01
HE551494-GTY-HGN-000-DR-CH-36005

A47 WANSFORD TO SUTTON DUALLING

Road Safety Audit Addendum Response

PCF STAGE 3
SUITABLE FOR STRAGE APPROVAL | S4
HE551494-GTY-HOS-000-RP-CH-30004 | P01

Notice

Table of contents

Tables

1. Project details

Table 1-1: Project details

Report title:	Road safety audit response
Date:	As per revision history
Document reference and revisions:	As per revision history
Prepared by:	Sweco UK Ltd
On behalf:	Highways England

Table 1-2: Authorisation sheet

Project:	A47 Wansford to Sutton Dualling
Report title	Road Safety Audit Addendum Response
Prepared by:	
Name	Sheila Cano Munoz
Position	Sweco Highways Design Lead
Signed	[redacted]
Organisation	Sweco UK Ltd
Date	21/06/2021
Approved by:	
Name	Matthew Murrell
Position	Sweco Project Manager
On behalf:	
Signed	[redacted]
Organisation	Sweco UK Ltd
Date	21/06/2021

2. Introduction

This report is in response to a Stage 1 RSA (Road Safety Audit) carried out on the Scheme proposed by Galliford Try and designed by Sweco UK Ltd at the request of Craig Stirzaker, the Highway Authority Project Manager. The Road Safety Audit was carried out during December 2020 and January 2021.

The proposed scheme, as described in the road safety audit brief, is as follows:

"The A47 Wansford to Sutton scheme starts 12km west of Peterborough where the A47 Peterborough to Lowestoft Trunk Road meets the A1 Edinburgh to London Trunk Road at Wansford. The scheme continues eastwards for 2.5km, tying in with the existing A47 immediately to the east of the to-be-removed existing Nene Way Roundabout.

The existing A47 single-carriageway is to be upgraded to dual-carriageway standard (D2AP). It will be constructed slightly to the north of the existing A47 from the A1 / A47 junction for approximately 800m, before crossing the existing A47 where it will be constructed further more to the north of the existing alignment until it ties into the existing dual carriageway east of Nene Way."

The scheme objectives are therefore set out as the following:

- *Help enable regional development and growth in Norwich and its surrounding area*
- *Reduce congestion, make journey times more reliable, and provide capacity for future traffic growth*
- *Improve resilience of the road to cope with incidents such as collisions, breakdowns and maintenance*
- *•Improve safety for all road users and for those living in the local area*
- *Protect the environment by minimising any adverse impacts and, where possible, deliver benefits*
- *Ensure the new road layout takes into account local communities and safe access to the A47*
- *Provide a safer route between communities for cyclists, walkers, horse riders and other non-motorist groups*

The proposed scheme was the preferred route identified and agreed at SGAR 2. The current Scheme includes:

- *Dualling of the existing A47 single carriageway section from A1 junction at Wansford to Nene Way Roundabout.*
- *Provision of a new free flow interchange link from A1 SB to A47 EB.*

- *Provision of a new access to A1 council houses rather than direct access from A1.*
- *Closure of A1 SB existing layby.*
- *Closure of A1 SB existing bus stop at A1 SB – A47 EB off slip.*
- *A1/A47 Western roundabout upgrade to 2 lanes exit to A47 EB*
- *Enlargement of existing eastern roundabout at A1/A47 junction.*
- *Provision of a new access link to Sacrewell.*
- *Provision of two new underpasses – Sacrewell link, as a route for pedestrians, cyclists and equestrians, and the existing dismantled railway, as a route for pedestrians and cyclists.*
- *Provision of a safe route for cyclists and pedestrians along the scheme.*
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- *Provision of Passing places in Upton Drift Road.*
- *Provision of 5 balancing ponds, 2 infiltration basins and some wildlife ponds. The scheme also counts with a flood storage near the river Nene to compensate for the flood area missing for the new construction.*
- *Provision of maintenance accesses to all the ponds.*
- *Provision of lighting for the modified roundabouts."*

The road safety audit response template as set out in GG119 Rev 2 Appendix F has been adopted for this report.

3. Key personnel

Overseeing Organisation	Highways England
Design Organisation	Sweco UK Ltd
RSA team:	
Team Leader	Martin Magyar BEng CEng MICE, MSoRSA, Certificate of Competency
Team Member	Adrian Clothier BEng (Hons), MSoRSA, Certificate of Competency

4. Road safety audit decision log

Reference	RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
4.1. Geometry					
Problem 1	Location: Link road to petrol station (drawing: HE551494-GTY-HGN-000-DR-CH-36003) Summary: Alignment of road leads to vehicles striking the kerbed verge. Description: On the proposed link road to the petrol station, a one-way loop road arrangement is to be provided. Eastbound traffic wishing to enter the petrol station, or carry-out a U-turn, will give-way to vehicles travelling westbound. However, only half of the give-way line aligns with the entry to the petrol station, with the other half aligning with the kerbed verge which separates the petrol station forecourt from the new link road. If vehicles take a tight turn around the loop road, when trying to enter the petrol station from the west, they may strike the kerbed verge.	Provide road markings on the loop road that guide drivers to the section of give-way line that aligns with the petrol station entrance.	**Agree with problem and recommendation:** Appropriate road marking will be provided to resolve the problem in Detailed Design.	Agree with Supplier and RSA problem.	Appropriate road marking will be provided to resolve the problem in Detailed Design.
Problem 2	Location: Link road to petrol station (drawing: HE551494-GTY-HMK-DR-CH-30003 and HE551494-GTY-HSN-000-DR-CH-30003). Summary: Lack of traffic signing to guide vehicles around the one-way system leads to head-on collisions. Description: On the proposed link road to the petrol station, a one-way loop road arrangement is to be provided. For eastbound traffic, the two opposing traffic movements are defined through use of arrow road markings and hatching alone that leads to a kerbed central island. No signing is proposed to reinforce the one-way system. If the road markings become less visible to a driver, for example due to poor weather conditions or deterioration of the markings, then drivers may inadvertently drive on the wrong carriageway, leading to head-on collisions.	Provide traffic signing on the central island to advise drivers to proceed left around the one-way loop.	**Agree with problem and recommendation:** Appropriate signing will be provided to resolve the problem in Detailed Design.	Agree with Supplier and RSA problem.	Appropriate signing will be provided to resolve the problem in Detailed Design.
Problem 3	Location: Link road to petrol station (drawing: HE551494-GTY-HGN-000-DR-CH-36003) Summary: Proposed fencing blocks inter-visibility between opposing traffic movements. Description: New wooden post and rail fencing is proposed, which will follow the curvature of the northern side of the new loop road (see plan extract below). This fencing has the potential to restrict inter-visibility between drivers of the opposing movements, leading to side-on collisions between vehicles.	Ensure adequate inter-visibility is maintained between all potentially conflicting vehicular movements.	**Agree with problem and recommendation:** Fencing design to be amended in detailed design to ensure adequate visibility.	Agree with Supplier and RSA problem.	Fencing design to be amended in detailed design to ensure adequate visibility.
Problem 4	Location: Existing petrol station and new link road (Drawing: HE551494-GTY-HSN-000-DR-CH-30004). Summary: Proposed traffic signing for petrol station may lead to large vehicles trying to enter the petrol station and having to reverse back onto the highway. Description: The existing petrol station is to be retained within the scheme and is to be provided with access from the westbound A47 carriageway and from a new link road, to the south of the mainline. The existing forecourt was observed to be constrained in space and unsuitable for large vehicles. The petrol station is to be signed as 'services' by means of traffic signs located on the east and westbound A47 carriageway. The proposed wording of the traffic signs does not give any indication of the size of the petrol station, or the facilities available and could raise driver expectation that there is a large facility available. This could lead to large vehicles trying to enter the forecourt and potentially having to reverse back onto the link road or stop-start on the link road, leading to shunt type collisions. This is likely to be	Provide traffic signing appropriate for the petrol station facility and the vehicle-types it can accommodate.	**Agree with problem and recommendation:** Appropriate signing will be provided to resolve the problem in Detailed Design.	Agree with Supplier and RSA problem.	Appropriate signing will be provided to resolve the problem in Detailed Design.

Reference	RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
	exacerbated by the potential high speeds of vehicles entering the slip road that leads to the petrol station.				
Problem 5	Location: Upton Drift Road (Drawing: HE551494-GTY-HGN-000-DR-CH-36005) Summary: Lack of passing places leads to head-on collisions. Description: It is proposed that Upton Drift Road is retained as a single-track road, with new passing bays provided. The proposed passing bays are positioned towards the central section of the road, some distance from the junctions at either end of Upton Drift Road. A vehicle turning into Upton Drift Road, at either end, may face an on-coming vehicle and have no safe place to pull into, to allow passing. This could lead to vehicles reversing or blocking the junctions, with the potential for resultant shunt or side-swipe collisions.	Provide two lanes, of sufficient length for large vehicles to safely pull into, at the junctions at either end of Upton Drift Road.	**Agree with problem and recommendation:** Sufficient length for large vehicles to safely pass at the junctions at either end of Upton Drift Road will be provided in Detailed Design.	Agree with Supplier and RSA problem.	Sufficient length for large vehicles to safely pass at the junctions at either end of Upton Drift Road will be provided in Detailed Design.
Problem 6	Location: Upton Drift Road (Drawing: HE551494-GTY-HGN-000-DR-CH-36005). Summary: Vehicles over-run the verge and lose control. Description: Site observations indicated evidence of vehicles overrunning the verge on Upton Drift Road, close to the junction with Langley Bush Road. The proposed design for Upton Drift Road appears to maintain the current alignment at this location. With increased traffic using this route in the future, there is increased risk of vehicles overrunning the verge and losing control, or spreading soil into the road creating a hazard for other vehicles.	Design the junction of Upton Drift Road / Langley Bush Road such that it can accommodate the swept path of all vehicle types anticipated to use it.	**Agree with problem and recommendation:** Swept path to analyse and accommodate an appropriate junction at Upton Drift Road / Langley Bush Road junction in detailed design.	Agree with Supplier and RSA problem.	Swept path to analyse and accommodate an appropriate junction at Upton Drift Road / Langley Bush Road junction in Detailed Design.
Problem 7	Location: Upton Drift Road (Drawing: HE551494-GTY-HGN-000-DR-CH-36005) Summary: Lack of forward visibility at S-bend in road leads to head-on collisions. Description: There is an existing S-bend in the alignment of Upton Drift Road, towards its eastern end, which is to be retained. A passing bay is to be provided on the northern side of the road, at the S-bend. However, an existing hedgerow on the southern side (shown in the image below) obscures forward visibility. This could lead to head-on collisions between vehicles, especially with the anticipated increase in traffic flow on this road.	Ensure suitable forward visibility is maintained along Upton Drift Road such that drivers can see hazards, including oncoming or stationary vehicles, ahead.	**Agree with problem and recommendation:** Passing bay in this location will be designed as part of straightening the existing curve and will improve visibility in this location. Design to be reviewed in Detailed Design.	Agree with Supplier and RSA problem.	Passing bay in this location will be designed as part of straightening the existing curve and will improve visibility in this location. Design to be reviewed in Detailed Design.

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5. Design organisation and Overseeing Organisation statements

On behalf of the design organisation I certify that: 1 the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation	
Name	Matthew Murrell
Signed	[redacted]
Position	Sweco Project Manager
Organisation	Sweco UK Ltd
Date	21/06/2021

On behalf of the Overseeing Organisation I certify that: 1 the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the design organisation; and 2 the agreed RSA actions will be progressed.	
Name	Chris Griffin
Signed	[redacted]
Position	Programme Leader
Organisation	Highways England
Date	23/06/2021