

Appendix 30 Stage 1 Road Safety Audit



BETTER SOLUTIONS, INTELLIGENTLY ENGINEERED

TRANSPORT AND INFRASTRUCTURE PLANNING

Roxhill

M1 Junction 15
Northampton Rail Freight Interchange

Stage 1 Road Safety Audit

TRANSPORT AND INFRASTRUCTURE PLANNING

Roxhill

M1 Junction 15 Northampton Rail Freight Interchange Stage 1 Road Safety Audit

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Highways England

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Highways England

1. INTRODUCTION

- 1.1 This report comprises a Stage 1 Road Safety Audit (RSA) that was undertaken on the highway works associated with the alterations proposed on the highway network as a result of the Northampton Strategic Rail Freight Interchange at Junction 15 of the M1.
- 1.2 The Audit Team members are listed in Section 11.0. The audit took place at the Nottingham office of BWB Consulting Limited between 22nd and 29th March 2018.
- 1.3 The Audit comprised an examination of the drawings, documents and information provided by the Design Team, who have prepared the preliminary design drawings for the project. This information is listed in Appendices A and B.
- 1.4 A daylight examination of the site was undertaken by the Audit Team and Greg Allgood of Highways England (HE) on the strategic road network between 1030 and 1230 hours on 23rd March 2018. The site visit continued on the local roads, without the presence of HE, between 1230 and 1430 hours. During the site visit, the weather was fine and dry. Traffic flows at M1 Junctions in particular were heavy, with the remainder of the junctions having moderate traffic flows. There were very few pedestrian or cyclist movements observed during any of the junctions visited throughout the day.
- 1.5 The terms of reference of the audit are as described in HD 19/15. The 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 refer to the highway proposal drawings and the locations have been indicated on Figures 1 to 8.
- 1.6 In summary, the proposals include (but are not limited to) the following:
 - widening of the entry arms and circulatory carriageway at both the A43/M1 Junction 15A southbound and northbound link roundabouts
 - significant alteration to the two roundabouts either side of M1 Junction 15 to accommodate the forecast traffic flows generated by the proposed development
 - the construction of a new roundabout on the A508 to the south of M1 Junction 15 to provide access to the site
 - revisions to the A508/Courteenhall Road junction to restrict vehicle movement to left in/left out, together with the introduction of a right turn harbourage lane into the Courteenhall Estate
 - the introduction of a new bypass around the western side of Roade
 - minor widening of Knock Lane on the bend towards its junction with Blisworth Road, together with widening at said junction

- the straightening of the A508 to the south of its junction with Rookery Lane and Ashton Road, together with the increase in the stagger of said junction and introduction of single lane dualling
- the increasing in size of the right turn harbourage lane at the A508/Pury Road junction
- the introduction of a right turn harbourage lane on the A508 at its junction with Church Lane.

1.7 When reviewing the drawings two key general items were apparent throughout the scheme which need to be reviewed by the Design team and hence are included in this section of the RSA as general problems:

- i) On a number of drawings the proposed kerb lines do not appear to tie in with existing kerb lines.
- ii) The swept path drawings were provided at a scale whereby it was not clear as to whether HGVs in particular, could safely traverse through the scheme. The designs should therefore be checked to ensure that there is no conflict with vehicles. This is especially the case at the M1 junctions.

2. ITEMS RAISED AT THIS STAGE 1 AUDIT – M1 JUNCTION 15A

2.1 Problem

Location: Northwestern corner of the northern A43/M1 southbound roundabout.

Summary: Widening works bring the nearside kerb closer to the watercourse/drain.

The proposed widening on the western side of the A43 brings the carriageway and watercourse/drain closer together. There is currently no VRS present in this location which may be because of the distance between the two features. As a result of the distance being reduced, there is greater potential for vehicles that may exit the carriageway to enter the watercourse.

Recommendation

A RRRAP assessment is undertaken at the appropriate stage to ensure that sufficient distance is provided between the features or that space remains for any VRS that may be required as a result of bringing the carriageway and watercourse closer together.

2.2 Problem

Location: Northeastern corner of the northern A43/M1 southbound roundabout.

Summary: Introduction of an additional circulatory lane at the roundabout creates reverse curvature.

As a result of the proposed widening, an area of reverse curvature would be created. The swept path presented shows a HGV travelling along the revised eastern kerb line of the roundabout. However, this does not appear to be a natural movement due to the kink provided in the circulating carriageway which could result in the driver of the HGV having to swerve sharply to get into the correct lane, potentially losing control, striking the kerb, or side swiping a vehicle as they negotiate the roundabout.

Recommendation

This section of the highway works should be re-examined to create a more natural circulating manoeuvre, removing any reverse curvature.

2.3 Problem

Location: Exit from the southern A43/M1 northbound roundabout onto the M1.

Summary: Two lanes of traffic merging over a short distance.

As presented, it appears that two lanes of traffic exit the southern roundabout towards the M1 northbound. There is however insufficient space available for two vehicles to safely merge at this location, which could result in side swipe collisions.

Recommendation

The merge should either be increased in length, or the off-side lane is hatched out and road markings revised accordingly, so that vehicles are not encouraged to exit the roundabout at this location side by side.

2.4 Problem

Location: Northwestern corner of the southern A43/M1 northbound roundabout

Summary: Lack of guidance markings on the carriageway in front of the stop line may confuse drivers.

There is a large expanse of tarmac in front of the stop line without any guidance markings. Given the unusual lane allocation and layout from the northbound services arm of the southern roundabout, drivers may become confused as to where they can actually travel. In addition, the use of a right turn arrow at the stop line, could confuse drivers further, resulting in them turning the wrong way around the roundabout hitting oncoming vehicles head on.

Recommendation

The road markings should be revised to ensure that it is clear which direction motorists can travel, as well as guiding the through the junction. The right turn arrow should be replaced with a straight ahead arrow on this arm of the junction.

3. ITEMS RAISED AT THIS STAGE 1 AUDIT – M1 JUNCTION 15

3.1 Problem

Location: Existing lay-by on A45 (N) (Figure 2)

Summary: The lay-by is heavily used by HGVs, hence it is unknown what would happen to the displaced demand.

The lay-by, which is proposed to be removed, is heavily used by HGV drivers as witnessed during the site visit. There is no reference to the facility being replaced, hence it is unknown where displaced vehicles would attempt to park. HGV drivers could be tempted to park on Saxon Avenue on the exit from the roundabout and surrounding roads for example, which could create conflict with passing vehicles.

Recommendation

Further information is required with regards to the removal of the lay-by, to determine if any alternative solutions have been considered to prevent any inappropriate HGV parking.

3.2 Problem

Location: Slip roads off the M1 (Figure 3).

Summary: Potential weaving issues.

Early exiting drivers in the nearside lane of the southbound off-slip may want to travel south at Junction 15, towards the site. There is minimum weaving distance on the slip road for lane choice as drivers that were ready to leave the motorway early may not be able to get across to turn right at the junction, which could result in side swipe collisions. This issue is exacerbated by the fact that drivers using the later slip road lane are still able to travel north in the offside lane, which therefore results in vehicles crossing one another's path.

The same issue also arises at the northbound off-slip should drivers in the offside lane want to travel south at Junction 15, towards the site.

Recommendation

Ensure that suitable road markings and associated signage should be introduced to help drivers exit the M1 in the correct lane on the slip roads. It would also help if the two slip road lanes were allocated one direction of travel, for instance on the southbound off-slip the first slip road would provide access to the A45 and the second slip road provide access to Saxon Avenue and the A508. This would result in motorists only having to switch one lane if they found themselves on the wrong slip road.

Road markings and associated signage at the junction will have to be thoroughly examined in further detail as part of the Stage 2 RSA regardless, to ensure that the considerable changes to the junction are as clear as possible to drivers.

4. ITEMS RAISED AT THIS STAGE 1 AUDIT – SITE ACCESS

4.1 Problem

Location: General to the Junction.

Summary: The road markings are not clear.

The road markings as currently proposed are not clear. For example, on the site access the centreline is not central. In addition, directional road markings as well as arrows will be required at the roundabout to make it clear as to what movement is permitted in each of the entry lanes. As a result, this could result in vehicles not taking the correct line of travel if they were guided by the road markings as currently proposed.

Recommendation

Ensure that the road markings and signage strategy at the site access junction is completely clear for all users.

4.2 Problem

Location: Site Access Arm.

Summary: Uncontrolled crossings provided on potentially busy exit from roundabout.

The crossing facility provided over the site access arm is proposed as an uncontrolled crossing. However, the access will potentially be busy during peak times, and the exit from the roundabout is provided with two lanes merging to one within the site. This could make it difficult for pedestrians to cross the carriageway and predict vehicle movements exiting the roundabout. This is exacerbated by the provision of two lanes allowing access to the site around the roundabout.

Recommendation

Assuming pedestrian movements across the site access arm would be low, it could be beneficial to provide a signal controlled facility on the basis that it should not prejudice the capacity of said junction.

4.3 Problem

Location: A508 Northbound bus stop.

Summary: Provision of bus stop close to the roundabout could create confusion.

The proposals include bus stops provided on both the northbound and the southbound A508 approaches to the roundabout. The northbound bus stop in particular is provided close to the roundabout and is also provided in addition to a flare from one lane to

two lanes. This results in a potentially confusing layout, as a bus pulling into the bus stop, could be followed by a car, expecting it to turn into the site, for it to suddenly stop. This could potentially lead to shunt type collisions.

Similarly, the southbound bus stop could restrict visibility to and from pedestrians using the pedestrian crossing.

Recommendation

The bus stops should be located at a suitable distance away from the roundabout to prevent any confusion for motorists at the roundabout.

5. ITEMS RAISED AT THIS STAGE 1 AUDIT – A508/COURTEENHALL ROAD JUNCTION

5.1 Problem

Location: Courteenhall Road, directly to the west of the A508 (Figure 5).

Summary: It is unclear how pedestrians and cyclists would cross Courteenhall Road.

A shared surface pedestrian/cycle route routes along the western side of the A508. A refuge is proposed in the centre of Courteenhall Road to enforce the left-in/left-out arrangement. However, it is unclear at this stage how pedestrians and cyclists would cross Courteenhall Road, because it does not appear that they would be able to make use of the refuge. This could result in such users being put in conflict with vehicles travelling along Courteenhall Road.

Recommendation

It is recommended that pedestrians and cyclists are provided with the opportunity to use the refuge to break their crossing of Courteenhall Road.

5.2 Problem

Location: A508, directly opposite Courteenhall Road (Figure 5).

Summary: Central island could cause conflict.

The junction of the A508/Courteenhall Road is proposed to be revised to a left-in/left-out junction which is forced by the introduction of a narrow central kerbed central island. If the central island was not provided with bollards or signage, it could be inconspicuous to drivers resulting in them colliding with it.

Recommendation

Whilst more of a detailed design issue, it should be ensured that suitable signage, and bollards are provided to make the central island as visible as possible.

6. ITEMS RAISED AT THIS STAGE 1 AUDIT – ROADE BYPASS

6.1 Problem

Location: Blisworth Road, to the southeast of Hyde Farm (Figure 6)

Summary: It is unclear how cyclists would connect onto the off-road cycle facility.

What is understood to be an off-road section of cycleway is proposed on the northeastern side of the Roade Bypass/Blisworth Road roundabout, to provide any cyclists from Blisworth with the opportunity to access the shared surface footway/cycleway on the eastern side of the bypass without travelling around the roundabout on the live carriageway.

However, the facility appears to begin at a newly created farm access. It is therefore unknown at this stage how cyclists would be safely directed onto said facility, avoiding any potential conflict that could be created by the farm access, including any mud on the carriageway which could cause cyclists to come off their bicycles.

Recommendation

Further thought is required as part of the detailed design process, as to how cyclists would safely access the off-road cycle facility. It may be beneficial to provide a separate dropped kerb facility closer to the roundabout, dedicated to cyclists leaving the carriageway to avoid any conflict with the farm access.

7. ITEMS RAISED AT THIS STAGE 1 AUDIT – KNOCK LANE

7.1 No problems were identified at this stage of the process.

8. ITEMS RAISED AT THIS STAGE 1 AUDIT – A508/ASHTON ROAD/ROOKERY LANE JUNCTION

8.1 Problem.

Location: Eastern side of A508 (Figure 7).

Summary: Lack of crossing facility provided between footways.

There is currently a footway provided along the eastern side of the A508 in the vicinity of the cottages, north of the proposed staggered junction. The proposals include a 3.0 metres wide shared facility on the western side of the A508. However, there is no facility provided to the north of the junction to allow pedestrians to cross the carriageway. This could result in pedestrians attempting to cross where there are no provisions or, where motorists are not expecting them to cross, resulting in them being hit by passing vehicles.

Recommendation

Provide an informal crossing facility across the most northern refuge, in the form of dropped kerbs and tactile paving to allow pedestrians to cross the road, outside of the cottages.

9. ITEMS RAISED AT THIS STAGE 1 AUDIT – A508/PURY ROAD JUNCTION

9.1 No problems were identified at this stage of the process.

10. ITEMS RAISED AT THIS STAGE 1 AUDIT – A508/CHURCH LANE JUNCTION

10.1 Problem.

Location: A508 north of Church Lane (Figure 8).

Summary: Refuge could be damaged by agricultural vehicles.

There is a refuge provided on the A508 directly to the north of the Church Lane junction, to allow pedestrian access to the southbound bus stop. During the site visit, a large tractor was witnessed turning right out of Church Lane onto the A508 which used a large amount of carriageway. If the refuge is provided close to the junction this could result in the refuge being run over by these large vehicles, potentially damaging the bollards or the kerbing, which could even leave parts of the kerb in the carriageway leaving a hazard to motorists and motorcyclists.

Recommendation

Ensure that the refuge is provided far enough from the junction to allow agricultural vehicles to enter and exit Church Lane.

11. AUDIT TEAM STATEMENT

11.1 I certify that this audit has been undertaken in accordance with HD19/15.

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Date: 29^h March 2018

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Signed:



Date: 29^h March 2018

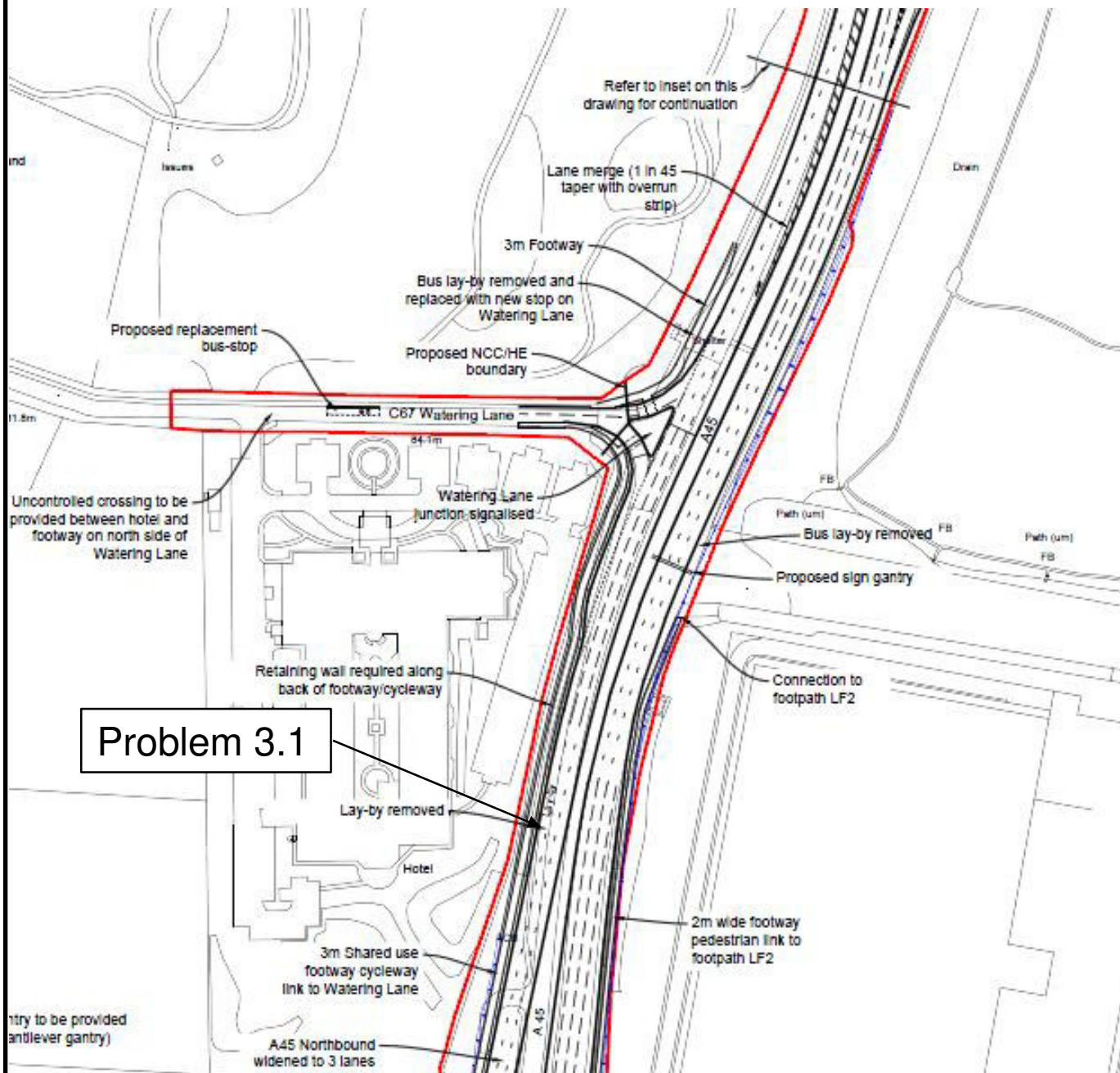
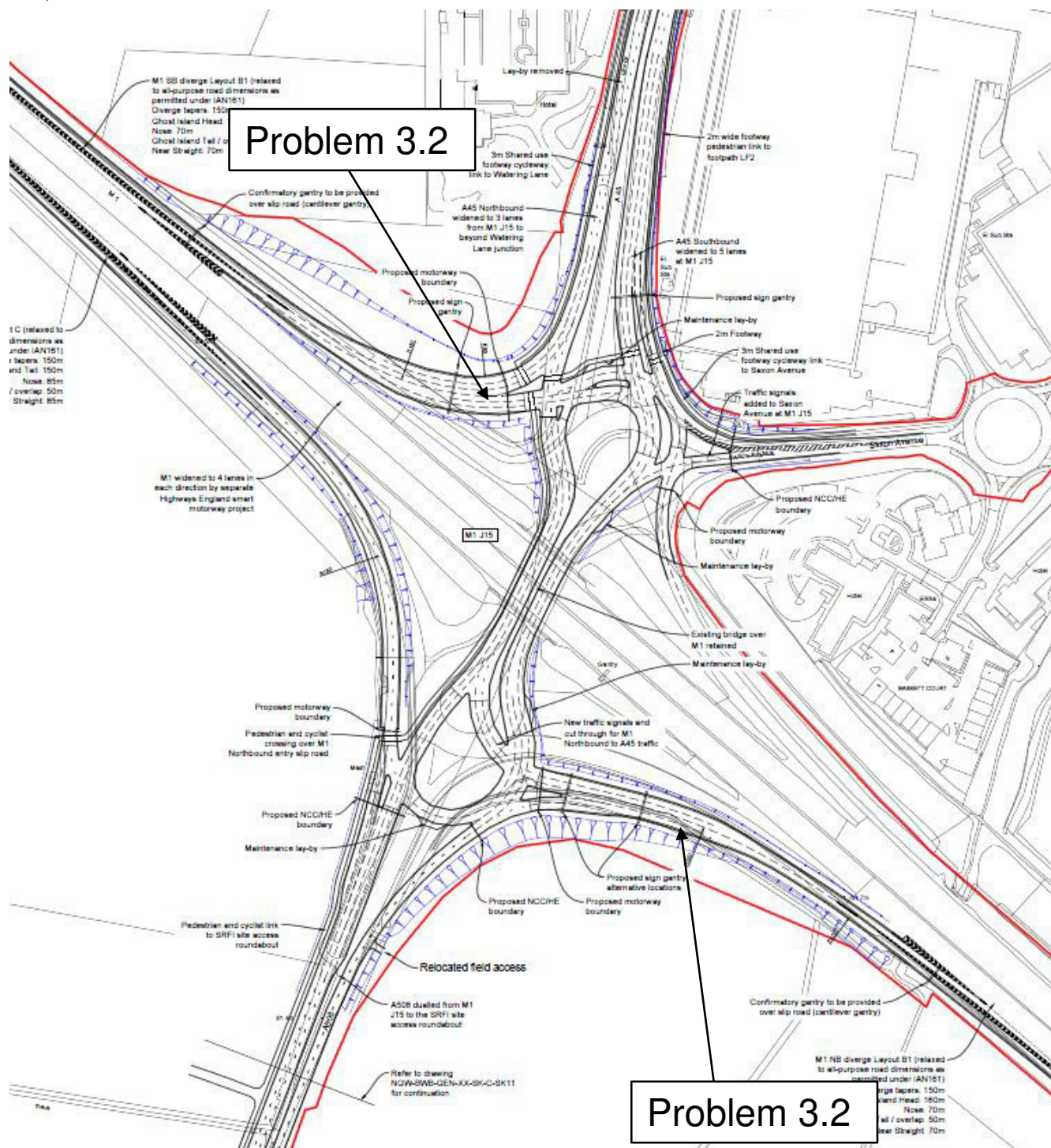
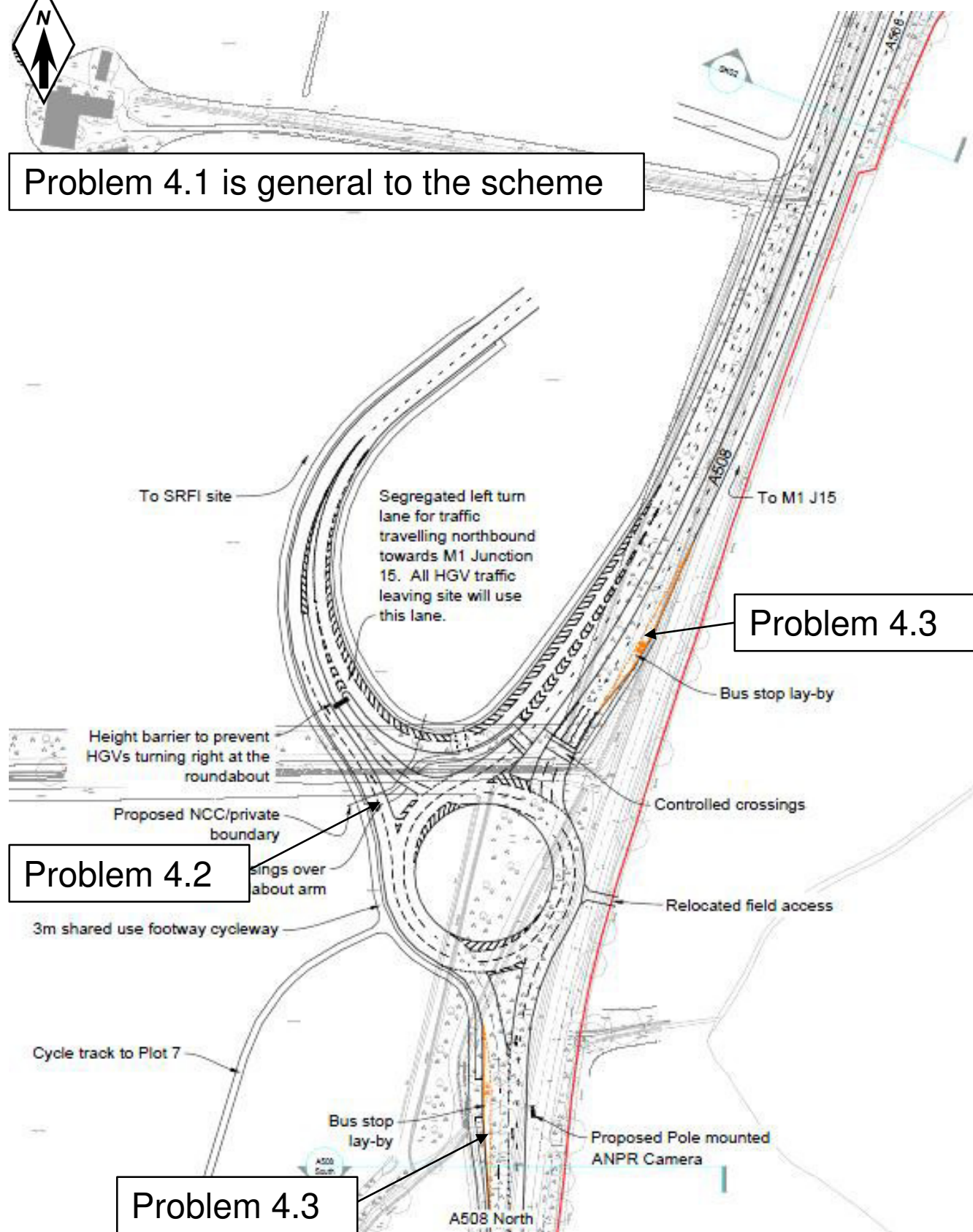


Figure 2 – Location of problems identified within this audit;
A45 north of M1 J15





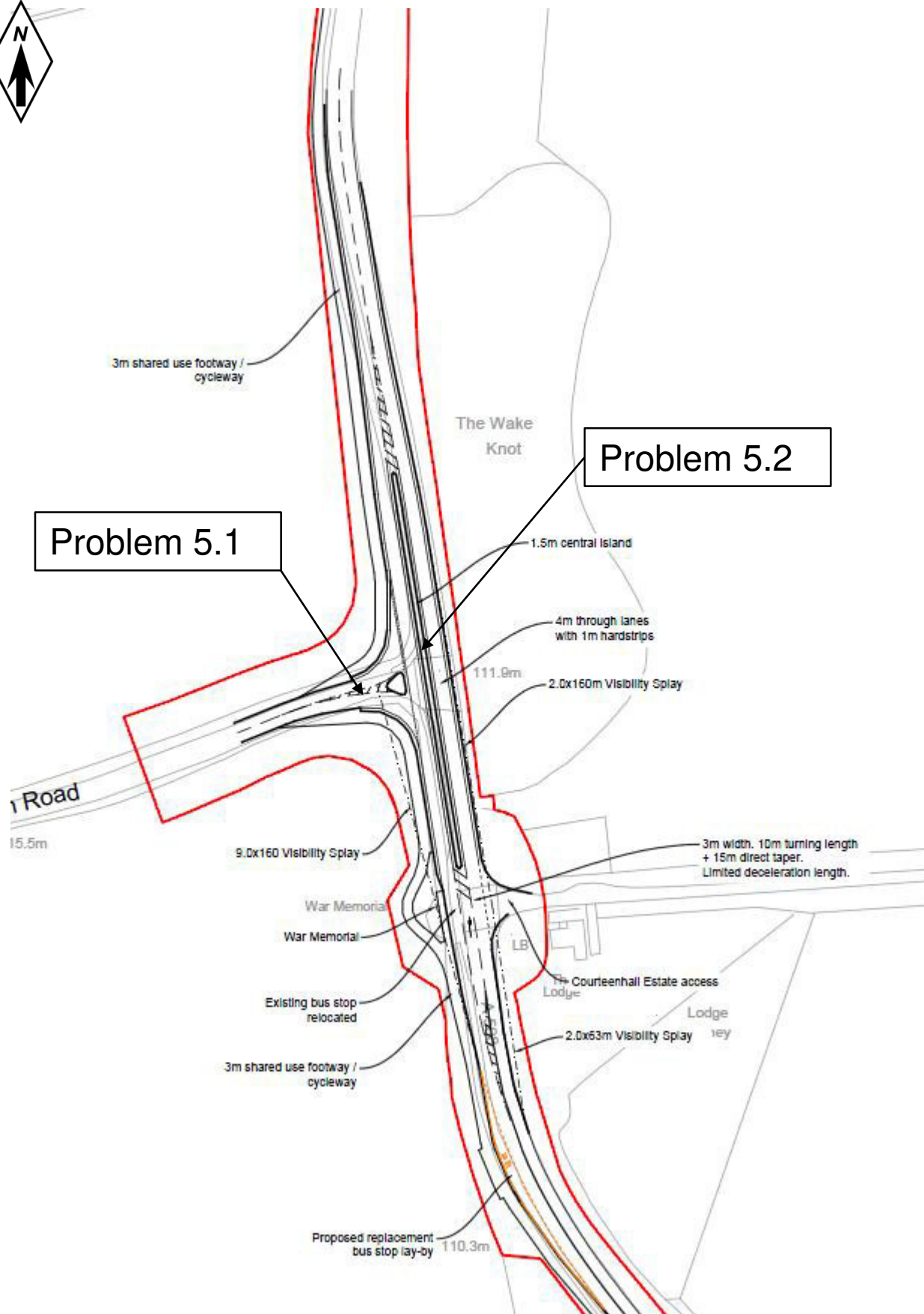
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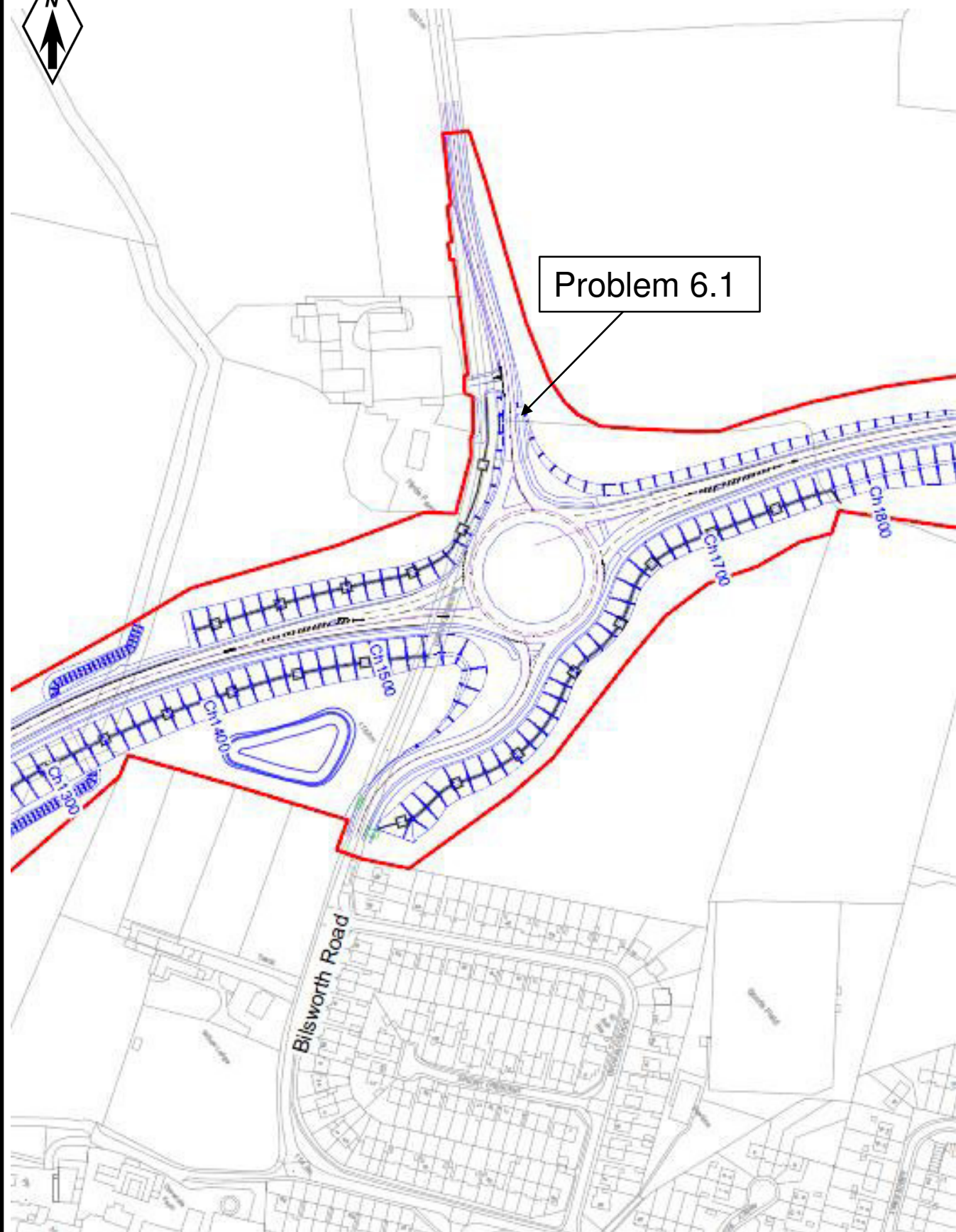


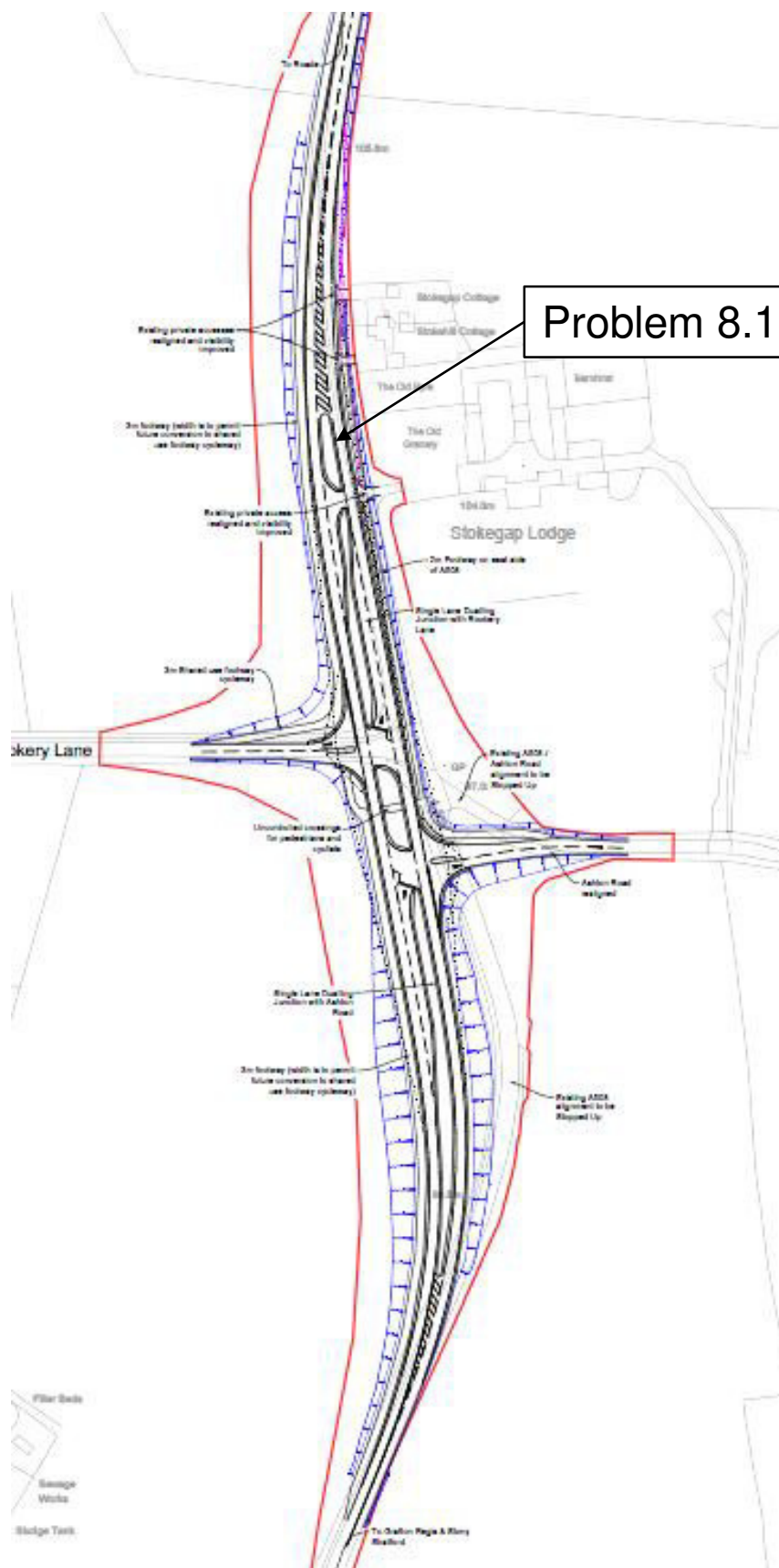
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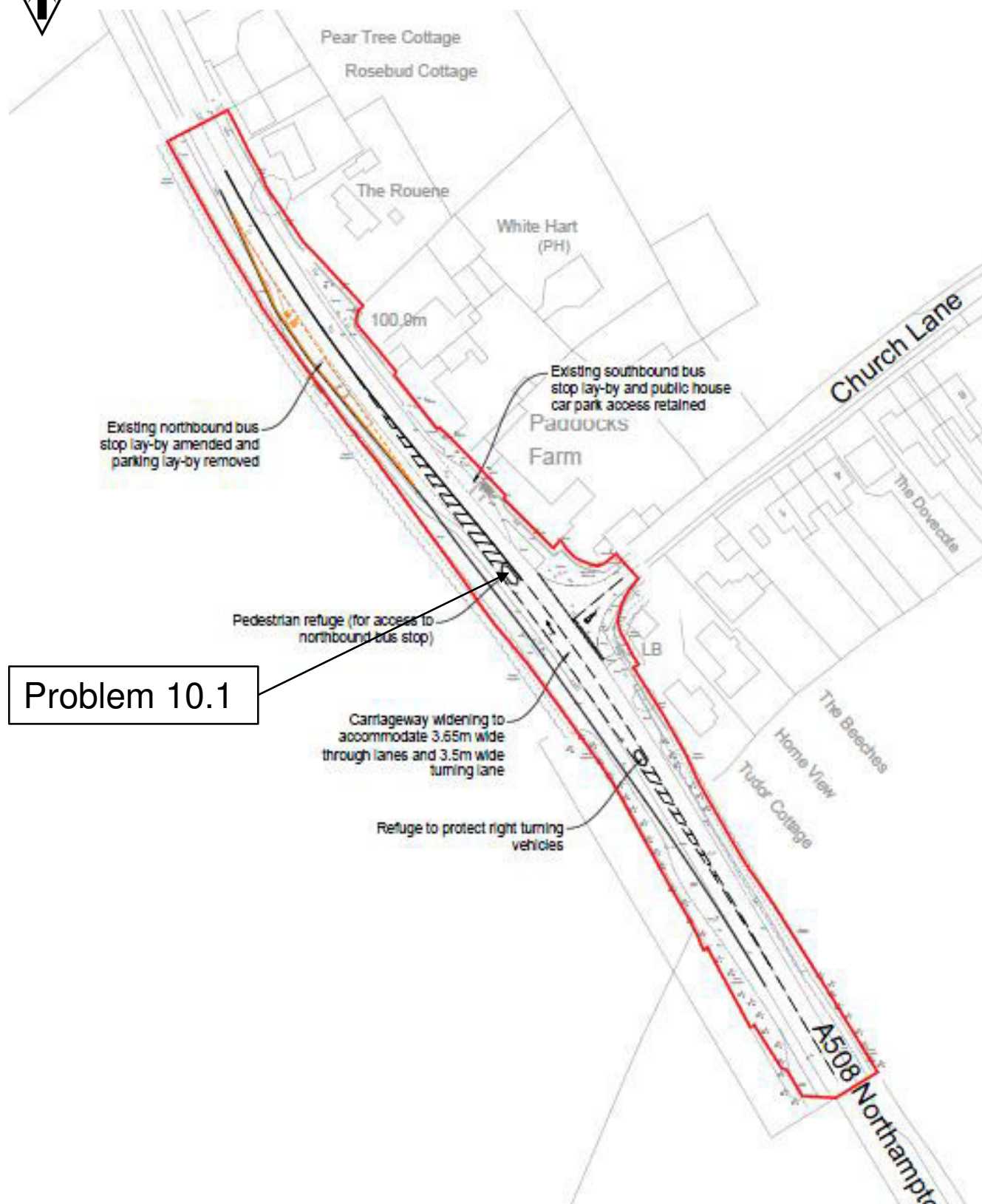
Problem 4.3

Problem 4.3









APPENDICES

APPENDIX 1

Audit brief including a list of documents supplied to the Audit Team – Highways England

1.0 General Details

This Audit Brief is prepared in accordance with HD19/15 "Road Safety Audit" and the Audit shall be undertaken in accordance with this brief and HD19/15.

Project Title	Northampton Gateway
Job Number	NTH2315
Date of Audit Brief	08/03/2018
Road Safety Audit Stage	1
Scheme Overview and Purpose	<p>Northampton Gateway is a proposed Strategic Rail Freight Terminal near M1 J15. There are extensive highway mitigation works comprising:</p> <ul style="list-style-type: none"> • M1 J15 and A45 improvements • M1 J15A improvements • A508 route upgrade which includes: <ul style="list-style-type: none"> ○ Blisworth Road junction improvement ○ Roade Bypass" / "Bypass corridor ○ Rookery Lane / Ashton Road junction improvement ○ Pury Road junction improvement ○ Knock Lane / Blisworth Road improvements" (not on the A508 but linked to the A508 works due to changes in traffic flows) ○ Grafton Regis bus stop crossing / Church Lane junction
Extent / Scope of this Audit	<p>This Audit is for the trunk road works (and associated alterations to side roads), namely:</p> <ul style="list-style-type: none"> • M1 J15 and A45 improvements, which includes alterations to Saxon Avenue and Watering Lane) • M1 J15A improvements
Start of Construction	Spring 2020 (estimate)
Details of WCHAR*	<p>WCHAR Assessment has been undertaken WCHAR Review will be completed prior to RSA</p>
Location of Audit Information	<p>Y:\NTH\NTH2315_M1 J15 SRFI\02. Project Delivery\01. WIP\Reports\RSA\RSA1 M1 J15 A45 J15A\Design Information</p>

*Walking, Cycling & Horse-Riding Assessment and Review

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Audit Team

The following Audit Team is proposed and current CVs and records of ongoing professional development are provided.

Position	Contact name	Qualifications
Audit Team Leader	Paul Wilson	BA (Hons) MCIHT MSoRSA CMILT MInstLM Highway England approved Certificate of Competency
Audit Team Member	Andrew Oakes	MSoRSA Highway England approved Certificate of Competency

Specific points of instruction

The works at M1 Junction 15 and the A45 include works to Saxon Avenue and Watering Lane. If problems are raised with either of these then they must be recorded in a separate chapter in the Audit Report under a heading "Local Roads".

2.0 Scheme Description

Scheme section	A45 mainline	M1 J15 slip roads	M1 J15 roundabout	M1 J15A roundabouts
Design speed (kph)	85	70	n/a	n/a
Speed limit (mph)	50	70	50	70
Existing lighting provision	Yes	In part	Yes	Yes
Proposed lighting provision	Yes	In part, extents to be confirmed	Yes	Yes
AM peak hour flows	See attached summary of flows	See attached summary of flows	See attached summary of flows	See attached LINSIG output extract for OD matrix on page 10
PM peak hour flows	See attached summary of flows	See attached summary of flows	See attached summary of flows	See attached LINSIG output extract for OD matrix on page 13

Scheme section	A45 mainline	M1 J15 slip roads	M1 J15 roundabout	M1 J15A roundabouts
AADT	SB = 34,592 NB = 35,900	SB diverge = 17,347 SB merge = 12,002 NB diverge = 14,649 NB merge = 17,525	A508 SB = 19,782 A508 NB = 19,127 Saxon Ave EB = 1,628 Saxon Ave WB = 1,697 A45 and slips as per other columns	Not yet available. Therefore factor average of peak hour flows.
Queue lengths	n/a	AM Peak M1 NB diverge = 46 pcus M1 SB diverge = 13 pcus PM Peak M1 NB diverge = 16 pcus M1 SB diverge = 11 pcus	AM Peak A45 = 95 pcus Saxon Ave = 2 pcus A508 = 10 pcus PM Peak A45 = 26 pcus Saxon Ave = 5 pcus A508 = 16 pcus	AM Peak Northern Roundabout A5123 = 3pcus A43 EB = 8 pcus Southern Roundabout A43 EB = 16 pcus A43 NB = 11 pcus PM Peak Northern Roundabout A5123 = 2 pcus A43 EB = 6 pcus Southern Roundabout A43 EB = 24 pcus A43 NB = 8 pcus
NMU flows & considerations	Some demand for pedestrians and cyclists	n/a	Various crossing points for pedestrians and cyclists	Footpath crossing of the A43
Environmental constraints	Developed areas	Collingtree AQMA	n/a	n/a
Other constraints	Development on both sides of road	Need to retain existing M1 bridge at Collingtree	Need to retain existing M1 bridge within J15	M1 bridges and highway boundary

3.0 Description of Locality

M1 Junction 15 is where the A45 trunk road and A508 principal road meet the M1. The A45 is the main route from the M1 (South) into Northampton, and connects the M1 and A14. The area around the junction on the east side of the M1 is relatively built up with hotels and warehousing in the immediate vicinity. On the west side of the M1 there are fields, but the land north of the A508

is the location of the proposed SRFI. There are no schools, care homes or hospitals in the immediate vicinity.

M1 Junction 15A is where the A43 trunk road and A5123 principal road meet the M1. It is a relatively unusual junction as it includes the Northampton motorway service area (MSA). There are no schools, care homes or hospitals in the immediate vicinity.

The following factors may affect road safety:

- Pedestrian and cyclist facilities at J15
- Bus stops on Watering Lane
- Public footpath crossing on the A43 south of J15A

4.0 Personal Injury Accident Analysis

Refer to the accident analysis report (see Audit Information below)

5.0 Departures and Relaxations from Standards

A Geometric Design Strategy Record is included with the Audit Information which identifies all proposed geometric departures and relaxations.

6.0 Previous Road safety Audits

Audit Stage and Date	Exception Reports
No previous Audits undertaken	n/a

7.0 Strategic decisions – items outside the scope of this Audit

The M1 is to be upgraded by Highways England to a smart motorway (4 lane all lane running) between J13 and J16 and this is expected to be completed by the time this scheme is completed. The smart motorway works are outside the scope of this Audit.

The following information is provided in addition to this Audit Brief:

CONSULTANCY | ENVIRONMENT | INFRASTRUCTURE | BUILDINGS

APPENDIX 2

Audit brief including a list of documents supplied to the Audit Team – NCC

1.0 General Details

This Audit Brief is prepared in accordance with HD19/15 "Road Safety Audit" and the Audit shall be undertaken in accordance with this brief and HD19/15.

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Job Number	NTH2315
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Location of Audit Information	Y:\NTH\NTH2315_M1 J15 SRFI\02. Project Delivery\01. WIP\Reports\RSA\RSA1 A508 Corridor\Design Information

*Walking, Cycling & Horse-Riding Assessment and Review

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Audit Team Member	Andrew Oakes	MSoRSA Highway England approved Certificate of Competency

2.0 Scheme Description

Scheme section	A508 Dualling	A508 site access to Roade	A508 Roade Bypass	A508 south of Roade	A508 Grafton Regis	Knock Lane
Design speed (kph)	85	85	100	85 (100 south of canal)	60	Rural lane
Speed limit (mph)	50	50	National speed limit	50 (National speed limit south of canal)	30	National speed limit
Existing lighting provision	No	No	No	No	Yes	No
Proposed lighting provision	Yes	At roundabouts	At roundabouts	No	Yes	No
AM peak hour flows	NB= 1619 SB= 2255	NB= 1482 SB= 1552	NB= 1128 SB= 1292	NB= 1112 SB= 1559	NB= 608 SB= 901	WB= 47 EB= 318
PM peak hour flows	NB= 2339 SB= 1995	NB= 1463 SB= 1678	NB= 1112 SB= 1238	NB= 1301 SB= 1373	NB= 894 SB= 786	WB= 105 EB = 151
AADT	42,029	29,851	23,329	25,829	14,926	2,824
NMU flows & considerations	Narrow footpath at present, to be widened to 3m shared footway / cycleway	Narrow footpath at present, to be widened to 3m shared footway / cycleway	Proposals include provision of a new 3m shared footway / cycleway	Improvements proposed at Ashton Road / Rookery Lane junction	NMU improvement	No NMU facilities
Environmental constraints	No major constraints	Existing corridor	Roade village and associated environmental mitigation requirements	Existing corridor	Village environment	
Other constraints	No major constraints	Existing corridor	Various properties, crossing of WCML	Existing corridor	Village environment	Rural lane

3.0 Description of Locality

The A508 is a primary route between M1 Junction 15 and the A5 at Old Stratford. The northern section of the route, between J15 and Grafton Regis, is a historical road and has had very few upgrades except for a section between the canal and Pury Road. The scheme seeks to address significant portions of the route.

The following factors may affect road safety:

- Existing bends and poor geometry
- Substandard junctions
- Various property frontage

The Roade bypass will pass through various fields, crossing the West Coast Main Line on route. There will be a roundabout at the point where it crosses Blisworth Road (Roade).

Knock Lane / Blisworth Road (Roade) is a rural lane where traffic flows will increase and mitigation works are proposed.

4.0 Personal Injury Accident Analysis

Refer to the accident analysis report (see Audit Information below)

5.0 Departures and Relaxations from Standards

A Geometric Design Strategy Record is included with the Audit Information which identifies all proposed geometric departures and relaxations.

6.0 Previous Road safety Audits

Audit Stage and Date	Exception Reports
No previous Audits undertaken	n/a

7.0 Strategic decisions – items outside the scope of this Audit

Nothing to record.

The following information is provided in addition to this Audit Brief:

[illegible]



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