

**O & H Properties Ltd,
Malborough Development Ltd.
& Barratt Strategic**

Great Haddon - Highway Access

**Designer's Response to Stage 1
Safety Audit**

Revision A

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Great Haddon - Highway Access
Designer's Response to Stage 1 Safety Audit – Exception Report

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A	August 09	Amendments to document title and responses to problems raised in Stage 1 Road Safety Audit	Chris Tompkins		Ron Henry

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Great Haddon - Highway Access
Designer's Response to Stage 1 Safety Audit – Exception Report

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Appendices

Appendix A - Information Utilised in the Stage 1 Safety Audit

List of Information Supplied To the Audit Team

15188/100B/015C rev A	Indicative Junction Layout, Great North Road/A1(M)
15188/100B/017C	Indicative Junction Layout, Yaxley By-pass – A15 London Road
15188/100B/018	Great Haddon A15 Site Access Indicative Layout
15188/100B/020C	Indicative Junction Layout, Great North Road, Junction 1
15188/100B/021C	Indicative Junction Layout, Great North Road, Junction 2 – Roundabout Option
15188/100B/022C	Indicative Junction Layout, Great North Road, Junction 2 – T Junction Option
15188/100B/023C	Indicative Junction Layout, Great North Road, Junction 3
15188/100B/024C	Indicative Junction Layout, Great North Road, Junction 4
15188/100B/025C	Indicative Junction Layout, Great North Road, Junction 5

Appendix B –

Drawings

Great Haddon - Highway Access
Designer's Response to Stage 1 Safety Audit – Exception Report

1 Introduction

- 1.1 A Stage 1 Safety Audit was carried out in April 2009 by an independent team of the proposed highway works associated with the proposed Great Haddon development affecting the existing A15 in the vicinity of A1M junction 16 (Norman Cross) and Yaxley, and also "New Road", the minor road parallel A1M north of Norman Cross.
- 1.2 The scheme proposals at the time of audit were for:
- Signalising the existing T junction on the A15 with New Road at Norman Cross
 - Junction 1 – a simple priority junction on New Road
 - Junction 2 – options for a ghost-island junction and a 3-arm mini roundabout on New Road
 - Junction 3 – a simple priority junction on New Road
 - Junction 4 – a 3-arm mini roundabout on New Road
 - Junction 5 – a 3-arm mini roundabout on New Road
 - A new signalised 3-arm junction on A15 between Norman Cross and Yaxley
 - A new signalised junction on the A15 south of Yaxley facilitating the diversion of the A15 to bypass Yaxley
 - change in traffic usage of existing signalised junction of London Road and B1091 Broadway
 - A new signalised junction on the A15 north of Yaxley facilitating the diversion of the A15 to bypass Yaxley and creation of a bus-only link into Yaxley
- 1.3 A15 London road is a busy single carriageway. South of Yaxley the road is national speed limit, through Yaxley there is a 40mph speed limit and the road is lit, and north of Yaxley there is a 50mph speed limit. Great North Road is a minor rural road, the carriageway is approximately 7m wide, it runs on a straight alignment parallel to the A1 M1 and it is de-restricted.
- 1.4 This Designer's response to Stage 1 Road Safety Audit details the response of the Design Team to the problems raised by the Audit Team in the Safety Audit.
- 1.5 For ease of reference, the Safety Audit comments are repeated in italics, with the Designer's Response in bold.

2 Issues Raised at the Stage 1 Safety Audit and the Designer's Response

2.1 A15/New Road signalised junction

2.1.1 Problem

Location - A15 northbound exit roundabout

Summary - Visibility to junction may be restricted across inside of bend

Visibility for drivers exiting from the A1(M) junction towards the traffic signals may be restricted by existing vegetation in the verge.

Recommendation

Adequate visibility to the traffic signals should be provided (SSD to at least one primary traffic signal). The likely extent of any traffic queuing from the stop line should also be examined.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the comments raised by the Audit Team that the existing vegetation on the nearside verge may impact on the forward visibility to the proposed traffic signals and to the rear of any queuing traffic at the proposed signalised junction at the A15 and Great North Road.

It is proposed that the existing vegetation will be cut back to provide a forward visibility envelope to facilitate the minimum required Stopping Site Distance to the signal heads, this is indicated within drawing 15188/200/01, contained within Appendix B for reference.

It should be noted that it is envisaged that all visibility envelopes will be bought forward for adoption by the local highway authority. On this basis the requirement for maintenance of this visibility splay will pass to them.

2.1.2 Problem

Location - A15 northbound exit roundabout

Summary - Carriageway too narrow

The A15 northbound is to be widened to provide 2 lanes from the exit of the A1 (M) roundabout to the traffic signals. The proposed carriageway width may not be sufficient to allow for the swept paths of large vehicles on the curved alignment of the roundabout exit without vehicles encroaching into the adjacent lane or over-running verges.

Recommendation

The geometry of the carriageway should be reviewed and revised as necessary to accommodate the swept paths of large vehicles such they would not be forced to encroach into an adjacent lane.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the comments raised by the Audit Team with regards to swept paths of HGVs at the A15 northbound exit from A1(m) Junction 15 roundabout.

A swept path analysis for the maximum legal articulated vehicle (16m long by 3m wide) has been undertaken to inform the alignment of the channel line and lane widths through the A15 northbound exit to ensure that HGVs will not encroach into other running lanes, the revised carriageway alignment is indicated in drawing number 15188/200/01, contained within Appendix B for reference.

2.1.3 Problem

Location - A15 northbound merging taper

Summary - Sub-standard geometry of taper

The lane reduction merge for northbound traffic, north of the junction may not be sufficiently long or gradually tapered to allow and encourage the safe and orderly merging of traffic. Also, at the northern end of the hatched section, there is an abrupt deflection in the alignment.

Recommendation

The geometry of the merge should be revised. It would appear that a more gradual taper of the offside lane may be required and the channel should tie-in to the existing more smoothly.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the taper lengths provided to the north of the proposed signalised junction, and the alignment of the channel line and road markings at the tie in with existing carriageway.

The proposed taper has been increased in length to 100m, the taper distance recommended in TD50/04- The Geometric Layout of Signal Controlled Junctions, Para. 2.31 and Fig. 2/11. The alignment of the channel line and road markings has also been amended to ensure a smooth tie in with the existing carriageway. These amendments are indicated in drawing 15188/200/01, contained within Appendix B for reference.

2.1.4 Problem

Location - A15 northbound bus stop

Summary - Existing bus stop not catered for in scheme proposals

The drawing does not indicate how the existing bus stop (A15 northbound) north of the junction will be treated.

Recommendation

The Audit Team assume that that the provision of bus services and routes will be affected by the proposed development and therefore the future requirement for a bus stop in this location should be examined. Ideally the bus stop could be relocated to a safe and convenient location away from the A15. However, if the bus stop is still required a replacement facility needs to be incorporated into the design.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the potential impact on the bus stop indicated in the proposals.

As noted in Section 2.1.3 the proposed channel line and road markings have been amended to provide a smooth tie in with the existing carriageway. The revised proposed alignment, as indicated in drawing 15188/200/01, contained within Appendix B for reference, will not impact upon the existing bus stop provision.

2.1.5 Problem

Location - A15 Central islands

Summary - Islands may be too narrow

The width of the central island on the A15 through the junction appears narrow, and it may not be wide enough to accommodate the required traffic signal heads, allowing for a safe lateral clearance. Also the islands north and south of the junction do not align smoothly.

Recommendation

The central islands should be wide enough to accommodate all necessary street furniture, eg. traffic signal heads. The geometry of the island should be revised such that there is a smooth alignment for traffic travelling straight ahead through the junction.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the central reserve width being insufficient to accommodate signals and other street furniture, along with the alignment of the central reserve islands themselves.

It should be noted that the signalised junction proposals have been revised to include for a signal controlled crossing to provide connectivity between the footways on the north and south of London Road.

The width of the central reserve has been increased to a sufficient width to accommodate all proposed traffic signals and street furniture. The requirements for all street furniture, traffic signal locations, crossings and therefore the widths of the proposed central reserve, will be reviewed further in accordance with 'The Design of Pedestrian Crossing- Local Transport Note 2/95' and confirmed at the detailed design stage once non-motorised user routes and flows are confirmed in detail.

The alignment of the proposed central reserve islands has also been amended to ensure a smooth radius between the respective channel lines. This and the amendments noted above are indicated in drawing 15188/200/01, contained within Appendix B for reference.

2.1.6 Problem

Location - A15

Summary - No provision for pedestrians and cyclists

There is no indication of any pedestrian or cycle facilities at the traffic signals. It would appear that pedestrians and cyclist travelling north south could use the existing paths parallel to the A15. However the proposed development could change some travel patterns and desire lines and increase the number of pedestrians and cyclists wishing to cross the A15 in the vicinity of the junction. For example, there is a bus stop (southbound) on the eastern side of the A15. Pedestrians going to and from this bus stop may be travelling to/from the great Haddon development and require to cross the A15.

Recommendation

Pedestrian and cycle desire lines should be reviewed to assess the likely demand for pedestrians and cyclists to cross the A15 in the vicinity of the junction. Depending on the outcome of the assessment, pedestrian and cycle crossing facilities may need to be provided. As a minimum, the Audit Team consider that a safe and convenient route, via a refuge island with dropped kerbs should be provided to/from the existing bus stop on A15 southbound. A "non-motorised-user audit" should be carried out as part of the design process.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to reviewing desire lines and non-motorised user facilities at London Road (A15).

As previously noted Section 2.1.5 above the proposals for the signalised junction at London Road and Great North Road will include for signal controlled crossings to provide connectivity between the northern and southern sides of London Road, indicated in drawing 15188/200/01, contained within Appendix B for reference.

A review of desire lines, pedestrian/ cycle flows and non-motorised user requirements, based on the principles of HD42/05- Non-Motorised User Audits and TA91/05- Provision for Non-Motorised Users will be undertaken as part of the detailed design stage. London Road is not currently designated as a trunk road, on this basis it is not anticipated that a full audit will be required. It is anticipated that the type of signal controlled crossings required will be confirmed following this review.

2.2 New Road General

2.2.1 Problem

Location - New Road

Summary

It is noted that it is proposed that New Road will be subject to a 30mph speed limit. Due to the width and straight alignment of the existing carriageway, it is not clear that a 30mph limit would be well observed. Currently the road is very lightly trafficked. It is difficult for the Audit Team to assess how its character may change as a result of the development.

Recommendation

Additional traffic calming measures should be provided in order to encourage drivers to comply with the proposed 30mph speed limit. Alternatively, the proposed speed limit could be reviewed taking into account the likely frontage development and activity along the road. However, should an increased speed limit be appropriate, this requires correspondingly increased standards for the design of the proposed junctions. Also, mini roundabouts, as currently proposed for some options would not be appropriate where the speed limit exceeds 30mph or where the 85th percentile dry weather speed is 35mph and above.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to potential post development vehicle speeds on Great North Road (referred to by the Auditor as New Road, above).

It is envisaged that a number of improvements to Great North Road will be made to change the character of Great North Road from a rural derestricted carriageway to an urban 30mph limit carriageway as part of the development. These will be reviewed further and confirmed as part of the detailed design stage, but could potentially include the following:

- **It is anticipated that the geometry of the proposed major/minor priority type junctions to access the proposed development and existing dwellings on Great North Road (indicated in drawings 1518/200/04-07, contained within Appendix B for reference) will be provided on an urban scale as to ensure turning vehicles make turning manoeuvres at appropriate speeds.**
- **Following review of desire lines, pedestrian/ cycle flows and non-motorised user requirements, an appropriate footway or combined footway/ cycletrack may be provided at Great North Road.**
- **A review of the potential requirement for vehicle calming measures between other road features which would reduce vehicle speeds, e.g. pedestrian crossings, junctions, etc, where the distance between features is too great to adequately control vehicle speeds.**

2.2.2 Problem

Location

Summary

Further to 2.2.1 above, options for a mini roundabout have been proposed for Junction 2, Junction 4 and Junction 5. Mini roundabouts may only be used where the speed limit is 30mph or less and vehicles speeds in the vicinity of the junction are relatively low (35mph 85th percentile dry weather speed). Mini roundabouts depend on the interaction of drivers assessing the actions of vehicles on the other arms in deciding whether to enter the junction and therefore it is necessary for vehicles to be travelling slowly in order to operate safely.

It should also be noted that Highways Agency Standards (TD54/07) do not permit mini roundabouts to be used at new junctions, nor where the predicted flow on any arm is less than 500 vehicles per day.

Recommendation

Despite TD54/07 (which is the standard for Motorways and Trunk Roads) stating that mini roundabouts must not be used at new junctions, the Audit Team does not consider that they will create a road safety problem at New Road, provided the other requirements of TD54/07 are adhered to. In particular, the proposed scheme incorporating mini roundabouts should also have sufficient traffic calming features to ensure low speeds on the approaches to the mini roundabouts.

The design team should be satisfied that the proposed use of mini roundabouts is appropriate and agreed with the local highway authority. It is noted that 3-arm mini roundabouts have a similar accident rate to priority T junctions and that the accident severity tends to be less.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the provision of mini roundabouts at new junctions, and appropriate traffic flows.

The proposals for junctions 2 and 4 on Great North Road have been revised to major/minor priority type junctions as indicated in drawings 15188/200/05 and 06, contained within Appendix B for reference.

The proposed mini roundabout at junction 5 has been amended to a compact type roundabout. The geometry of which has been provided in accordance with TD 16/07 – Geometric Design of Roundabouts, as indicated in drawing 15188/200/08, contained within Appendix B, for reference.

It should be noted that the geometry for the above junctions has been provided on the basis that the Speed limit on Great North Road will be reduced from the national speed limit to 30mph as previous noted in Section 2.2.1 above.

2.3 Junction 1

2.3.1 Problem

Location - New Road, Junction 1

Summary - Form of junction should be appropriate to predicted traffic flows

Junction 1 is indicated as a simple priority junction. No details of the predicted traffic has been provided.

Recommendation

It is recommended that traffic forecasts are reviewed to ensure that the form of junction is appropriate for the volume of future traffic and turning flows.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to review of junction capacities and appropriate junction forms.

The geometry and junction of the amended junction proposals, indicated within drawings 15188/0200/01-09, contained within Appendix B for reference, has been informed by junction capacity analysis. The results of the junction capacity analysis is contained with the Great Haddon Transport Assessment, dated July 2009, Appendix A.

The junction capacity assessments and appropriate junction type and geometry will be reviewed further as part of the detailed design stage once development proposals are confirmed in detail.

2.3.2 Problem

Location - *New Road, Junction 1*

Summary - *Road geometry appears tight – possible difficulties for large vehicles manoeuvring*

No details of the junction geometry, eg. carriageway widths and radii have been provided. By inspection the radii of the bell mouth appear tight and the width of the side road narrow. It is not clear that the junction could accommodate large vehicles turning without over-running the verges and /or conflicting with opposing traffic. (The Audit Team would consider that for a residential development where large vehicles may be infrequent, a turning manoeuvre which encroaches into the opposing traffic lane may be acceptable).

Recommendation

It is recommended that, through the detailed design, the junction will be designed to have suitable geometry to accommodate large vehicles turning at the junction. The design team should take into account the anticipated future use of the junction in determining to what extent an occasional large vehicle may have to encroach into an opposing traffic lane. Refer also to 2.2.1 concerning the character of New Road.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the swept path of HGVs using the proposed junction 1.

As previously noted in Section 2.2.1, it is intended that the speed limit on Great North Road will be reduced from the National Speed Limit to 30mph and the character of the road will be changed from a rural to a urban road to encourage vehicles to travel at appropriate speeds.

It should be noted that a large percentage of HGV traffic will not be anticipated on Great North Road following the completion of the development and subject to confirmation of bus route proposals. Likely HGV traffic may include refuse vehicles and pantechnicons.

Given the proposed urban nature of the access the geometry of junction 1 has been provided with small radii reduce vehicle turning speeds and encourage non-motorised user crossing movements. A swept path analysis has been undertaken to confirm that the proposed alignment is appropriate for occasional HGV use, however it should be noted that there may be limited impact upon other running lanes. The Design Team concurs with the comment of the Audit Team that it can be acceptable for infrequent turning manoeuvres to encroach upon opposing traffic lanes, as an experienced HGV driver will wait for an appropriate gap in traffic.

Junction geometry and appropriate design vehicles will be reviewed further as part of the detailed design phased once development proposals are confirmed in detail.

2.3.3 Problem

Location - New Road Junction 1

Summary - Vegetation may restrict visibility

It is noted that New Road will be realigned such that the eastern channel will be approximately on the alignment of the existing layby in the vicinity of the proposed junction. Therefore the visibility to/from the junction may be restricted by the existing hedge line.

Recommendation

Visibility splays, appropriate to the design speed should be safeguarded. Potentially a length of the existing hedge may have to be removed in order to achieve the visibility splay.

DESIGNER'S RESPONSE

The Design Team notes the comment of the Audit Team with respect to forward visibility envelopes on the approach to and visibility splays at the proposed junctions.

As previously noted in Section 2.2.1, it is intended that the speed limit on Great North Road will be reduced from the National Speed Limit to 30mph, therefore a design Speed of 60kph and minimum Stopping Sight Distance of 90m is considered appropriate. Given the proposed urban nature of the junctions an x distance of 4.5m is deemed appropriate for junction visibility splays (as indicated on drawing 15188/200/04 contained within Appendix B, for reference). The topographical survey for Great North Road indicates that the existing hedgerow is set back approximately 8m from Great North Road. The design team do not consider that the hedge will impact upon the visibility requirements for the proposed junctions.

Forward visibility envelopes and visibility splays will be confirmed as part of the detailed design stage once development proposals are confirmed in detail.

2.4 Junction 2

Ghost-island right turn option

2.4.1 Problem

Location - *New Road Junction 2*

Summary - *Form of junction should be appropriate to predicted traffic flows*

Junction 2 is indicated as a ghost-island priority junction. No details of the predicted traffic has been provided.

Recommendation

It is recommended that traffic forecasts are reviewed to ensure that the form of junction is appropriate for the volume of future traffic and turning flows.

DESIGNER'S RESPONSE

See Designer's Response to Section 2.3.1.

2.4.2 Problem

Location - *New Road Junction 2*

Summary - *Road geometry appears tight – possible difficulties for large vehicles manoeuvring*

No details of the junction geometry, eg. carriageway widths and radii have been provided. It is not clear that the junction could accommodate large vehicles turning.

Recommendation

It is recommended that, through the detailed design, the junction will be designed to have suitable geometry to accommodate large vehicles turning at the junction. The Audit Team consider that if the junction is based on a ghost-island arrangement, then the nature of the junction is such that large vehicles should be able to manoeuvre without having to encroach into opposing traffic lanes. Refer also to 2.2.1 concerning the character of New Road.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the swept path of HGVs using the proposed junction 2.

As previously noted in Section 2.2.1, it is intended that the speed limit on Great North Road will be reduced from the National Speed Limit to 30mph and the character of the road will be changed from a rural to an urban road to encourage vehicles to travel at appropriate speeds.

As previously noted in Section 2.3.2, it should be noted that a large percentage of HGV traffic will not be anticipated on Great North Road following the completion of the development and subject to confirmation of bus route proposals. Likely HGV traffic may include refuse vehicles and pantechincons.

Given the proposed urban nature of the access the geometry of junction 2 has been provided with reduced radii reduce vehicle turning speeds and encourage non-motorised user crossing movements. A swept path analysis has been undertaken to confirm that the proposed alignment is appropriate for occasional HGV use and is not anticipated that HGV turning manoeuvres will encroach into opposing traffic lanes.

Junction geometry and appropriate design vehicles will be reviewed further as part of the detailed design phased once development proposals are confirmed in detail.

2.4.3 Problem

Location - New Road Junction 2

Summary - Vegetation may restrict visibility

It is noted that New Road will be realigned such that the eastern channel will be near to the existing hedge line. Therefore the visibility to/from the junction may be restricted by the existing hedge line.

Recommendation

Visibility splays, appropriate to the design speed should be safeguarded. Potentially a length of the existing hedge may have to be removed in order to achieve the visibility splay.

DESIGNER'S RESPONSE

Please see the Designer's Response for Section 2.3.3.

Mini Roundabout option

2.4.4 Problem

Location - New Road Junction 2

Summary - Form of junction should be appropriate to predicted traffic speeds and flows

Junction 2 is indicated as a mini roundabout. No details of the predicted traffic has been provided. No indication of traffic calming measures on New Road have been provided.

Recommendation

It is recommended that additional traffic calming measures are provided on New Road. It is recommended that traffic forecasts are reviewed to ensure that the form of junction is appropriate for the volume of future traffic and turning flows. Low entry flows on any of the arms can lead to drivers not anticipating approaching traffic and failing to give way.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments however, as previously noted in Section 2.2.2 the roundabout option for Junction 2 has been removed.

Junction geometry and appropriate design vehicles will be reviewed further as part of the detailed design phased once development proposals are confirmed in detail.

2.4.5 Problem

Location - New Road Junction 2

Summary - Road geometry

No details of the junction geometry, eg. carriageway widths and radii have been provided. By inspection it would appear that the entry arm from the proposed development is aligned such that left turners may not be encouraged to slow sufficiently and also that right turners may tend to over-run the central island.

Recommendation

It is recommended that, through the detailed design, the junction and its approaches be designed to have suitable geometry to encourage vehicles to proceed through the junction at slow speed and also circulate around the central island.

DESIGNER'S RESPONSE

Please see the Designer's response to Section 2.4.4.

2.5 Junction 3

2.5.1 Problem

Location - New Road Junction 3

Summary - Form of junction should be appropriate to predicted traffic flows

Junction 3 is indicated as a simple priority junction. No details of the predicted traffic has been provided.

Recommendation

It is recommended that traffic forecasts are reviewed to ensure that the form of junction is appropriate for the volume of future traffic and turning flows

DESIGNER'S RESPONSE

Please see the Designer's Response to Section 2.3.1.

2.5.2 Problem

Location - New Road Junction 3

Summary - Road geometry appears tight – possible difficulties for large vehicles manoeuvring

No details of the junction geometry, eg. carriageway widths and radii have been provided. By inspection the radii of the bell mouth appear tight and the width of the side road narrow. It is not clear that the junction could accommodate large vehicles turning without over-running the verges and /or conflicting with opposing traffic. (The Audit Team would consider that for a residential development where large vehicles may be infrequent, a turning manoeuvre which encroaches into the opposing traffic lane may be acceptable).

Recommendation

It is recommended that, through the detailed design, the junction will be designed to have suitable geometry to accommodate large vehicles turning at the junction. The design team should take into account the anticipated future use of the junction in determining to what extent an occasional large vehicle may have to encroach into an opposing traffic lane. Refer also to 2.2.1 concerning the character of New Road.

DESIGNER'S RESPONSE

Please see the Designer's Response for Section 2.3.2.

2.5.3 Problem

Location - New Road Junction 3

Summary - Vegetation may restrict visibility

It is noted that New Road will be realigned such that the eastern channel will be nearer to the existing hedge line. Therefore the visibility to/from the junction may be restricted by the existing hedge line.

Recommendation

Visibility splays, appropriate to the design speed should be safeguarded. Potentially a length of the existing hedge may have to be removed in order to achieve the visibility splay.

DESIGNER'S RESPONSE

Please see the Designer's Response for Section 2.3.3.

2.6 Junction 4

2.6.1 Problem

Location - *New Road Junction 4*

Summary - *Form of junction should be appropriate to predicted traffic speeds and flows*

Junction 4 is indicated as a mini roundabout. No details of the predicted traffic has been provided. No indication of traffic calming measures on New Road have been provided.

Recommendation

It is recommended that additional traffic calming measures are provided on New Road. It is recommended that traffic forecasts are reviewed to ensure that the form of junction is appropriate for the volume of future traffic and turning flows. Low entry flows on any of the arms can lead to drivers not anticipating approaching traffic and failing to give way.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments however, as previously noted in Section 2.2.2 the roundabout option for Junction 2 has been removed.

Junction geometry and appropriate design vehicles for swept path analysis will be reviewed further as part of the detailed design phased once development proposals are confirmed in detail.

2.6.2 Problem

Location - *New Road Junction 4*

Summary - *Details of geometry not provided*

No details of the junction geometry, eg. carriageway widths and radii have been provided. By inspection it would appear that the layout does not comply with TD54/07, although a compliant layout would appear to be feasible.

Recommendation

It is recommended that, through the detailed design, the junction and its approaches be designed to have suitable geometry to encourage vehicles to proceed through the junction at slow speed and also circulate around the central island.

DESIGNER'S RESPONSE

Please see the Designer's Response for Section 2.6.1.

2.7 Junction 5

2.7.1 Problem

Location - *New Road Junction 5*

Summary - *Form of junction should be appropriate to predicted traffic flows*

Junction 5 is indicated as a mini roundabout. No details of the predicted traffic has been provided.

Recommendation

It is recommended that traffic forecasts are reviewed to ensure that the form of junction is appropriate for the volume of future traffic and turning flows.

DESIGNER'S RESPONSE

Please see the Designer's Response to Section 2.3.1.

2.7.2 Problem

Location - *New Road Junction 5*

Summary - *Details of geometry not provided*

No details of the junction geometry, eg. carriageway widths and radii have been provided. By inspection it would appear that the layout may be feasible.

Recommendation

It is also recommended that, through the detailed design, the junction will be designed to have suitable geometry in accordance with TD 54/07 to accommodate large vehicles turning at the junction.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to proposals for a mini roundabout and junction capacity.

As previously noted in Section 2.3.3, the proposed mini roundabout at junction 5 has been amended to a compact type roundabout. The geometry of which has been provided in accordance with TD 16/07 –Geometric Design of Roundabouts, as indicated in drawing 15188/200/08, contained within Appendix B, for reference.

2.8 A15 Site Access

2.8.1 Problem

Location - A15 Northbound

Summary - Stop lines poorly located

No details of phasing and staging of the traffic signals has been provided. It is not clear whether or not the left turn for northbound traffic turning into the development will be a separate phase from the ahead movement. The stop line is indicated situated part way round the radius into the side road. The nearside primary signal head for the left turn will have to be located ahead of the stop line and as such may not be clearly visible to approaching drivers. The stop line for ahead traffic is also located too far advanced relative to the refuge islands where it is expected primary traffic signals need to be positioned.

Recommendation

The phasing and staging of the traffic signals should be confirmed.

The proposed location of the traffic signal heads should be confirmed. It may be preferable if the stop lines are located slightly further south, (away from the junction) to enable primary traffic signal heads to be positioned where they will be clearly visible to approaching drivers.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to junction geometry and details of traffic signal phasing.

Details of the phasing and staging of traffic signals is detailed within the Great Haddon Transport Assessment Appendices. The current phasing arrangement includes both the ahead and left turn manoeuvre northbound on the A15 and into the site respectively on the same phase. It should be noted that the current of the proposed junction has been amended to provide two forward lanes northbound on the A15, as indicated in drawing 15188/200/02, contained within appendix B for reference.

Its stop line position has been revised as to not be part way round a junction radius, as indicated in drawing 15188/200/02,

The revised drawing number 15188/200/02 indicates the proposed position of traffic signals, located such that they are visible to all approaching vehicles. The design of traffic signals will be considered further as part of the detailed design phase.

The length and width of the proposed traffic islands have been increased to adequately accommodate traffic signals. Vehicle stop lines will be provided a minimum of 1m in advance of primary signals heads in accordance with paragraph 2.62 of TD50/04- The Geometric Layout of Signal Controlled Junctions and Signalised Roundabouts.

2.8.2 Problem

Location - A15

Summary - Dual carriageway termination details not indicated

The drawings do not show how the lengths of dual carriageway through the junction are terminated. Termination of the dual carriageway section could give rise to conflict between merging traffic and also conflict between opposing traffic and could be associated with significant road safety risks.

Recommendation

The details of the termination of the dual carriageway sections should be provided for supplementary road safety audit.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to tapering out dualled sections through the proposed junction and tapers back to single carriageway.

The geometry of the junction has been amended to include appropriate an taper and road markings for a 100m taper on lane reduction after signals in accordance with TD 50/04- The Geometric Layout of Signal Controlled Junctions and Signalised Roundabouts Para. 2.31 and Fig. 2/11. The full arrangement of the proposed junction is indicated in drawing 15188/200/02, contained within Appendix B for reference.

2.8.3 Problem

Location - A15 southbound

Summary - Intended use of offside lane not clear – drivers may go ahead from offside lane

Further to 2.8.2 above, the A15 southbound approach to the junction designates the nearside lane for ahead movement and the offside lane for right turns. South of the junction there are 2 lanes going ahead. It is not clear why this layout has been provided. However, it may lead to some drivers using the offside lane as an overtaking opportunity, in conflict with vehicles slowing to make the right turn. Furthermore, the taper south of the junction indicates that traffic in the nearside lane should move over the offside. It would be expected that all traffic complying with the lane dedication markings would be in the nearside lane.

Recommendation

The purpose of the layout should be clarified.

The audit team consider that it would be safer that the offside lane is dedicated for right turning traffic as proposed, especially if there is likely to be a large number of right-turners queuing. The roadmarkings and layout of the central island may need revising to discourage drivers going ahead from attempting to overtake in the offside lane on the approach to the junction. If two lanes and merging arrangement south of the junction are necessary, it would be preferable for the offside lane to be indicated to merge to the left.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the right turn lane provision and road markings and the tapering out dualled sections through the proposed junction and nearside taper back to single carriageway.

The arrow road markings at the dualled section have been amended to show two forward lanes. The taper has been revised such that the dualled section tapers to the nearside, with vehicles merging to the left. The taper and road markings for a 100m taper on lane reduction after signals has been provided in accordance with TD 50/04- The Geometric Layout of Signal Controlled Junctions and Signalised Roundabouts Para. 2.31 and Fig. 2/11.

The above amendments are indicated in drawing 15188/200/02, contained within Appendix B for reference.

2.8.4 Problem

Location - *Signalised crossing points*

Summary - *Geometry to narrow for Toucan crossings*

The drawing indicates controlled crossings of A15 and the site access road.

It is not clear whether these are intended to be for pedestrians only or also for cyclists (Toucan Crossing). If they are intended to be Toucan crossings, the width of the crossing point (between studs) is too narrow and the width of the central islands may also be insufficient. Pedestrians and cyclists could be in conflict when using the crossing.

Recommendation

The status of the proposed crossings should be confirmed.

If they are to be Toucan crossings, then the width of the crossing and the width of the central island should be increased.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the width of crossings, i.e. distance between crossing studs, and continuation of the crossing on the central reserve.

The two proposed signalised crossings London Road are shown indicatively at this stage, the requirement for these crossings will be confirmed as part of the detailed design phase once the Client has confirmed what proposals, if any, will be taking place within the former Norman Cross Brickworks site to the south.

With respect to the central reserve, the width has been increased to a sufficient width to accommodate all proposed traffic signals and street furniture, as indicated in drawing 15188/200/002, contained within Appendix B for reference. The requirements for all street furniture, traffic signal locations provision for non-motorised road users and therefore the widths of the proposed central reserve, will be reviewed further in accordance with 'The Design of Pedestrian Crossing- Local Transport Note 2/95' and confirmed at the detailed design stage once non-motorised user routes are confirmed in detail.

2.8.5 Problem

Location - A15, east verge

Summary - Proposed crossing does not connect to footway (or cycle track)

Further to 2.8.4 above, a controlled crossing is shown on the A15, but there is currently no footway or cycle track on the eastern side of the A15. Therefore, pedestrians (and cyclists) will not be adequately or safely catered for on the eastern side of the A15.

Recommendation

Pedestrian and cyclist desire lines should be reviewed to determine the requirement for a controlled crossing of the A15. Assuming that the crossing is necessary, a suitable path (footway or footway/cycle track) should be provided on the eastern side, continuing to link to existing paths at Yaxley to the north and Normans Cross to the south.

A “non-motorised-user audit” should be carried out as part of the design process.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the connections between the non-motorised provisions at the proposed junction and the existing footpaths parallel to London Road.

It should be noted that the junctions proposals supplied for Safety Audit were based on information which does not show the existing footway to the north of London Road. Additional base topographical information, which indicates the existing footway, is indicated on drawing 15188/200/02, contained within Appendix B for reference.

At this stage the non-motorised user requirements and flows are subject to confirmation in detail, on this basis the type of controlled crossings subject to confirmation as part of the detailed design process. It is anticipated that a crossing will be required crossing the proposed site access carriageway as a continuation of the existing footpath to the north of London Road.

A review of desire lines, pedestrian/ cycle flows and non-motorised user requirements, based on the principles of HD42/05- Non-Motorised User Audits and TA91/05- Provision for Non-Motorised Users will be undertaken as part of the detailed design stage. London Road is not currently designated as a trunk road, on this basis it is not anticipated that a full audit will be required.

With respect to the central reserve, the width has been increased to a sufficient with to accommodate all proposed traffic signals and street furniture, as indicated in drawing 15188/200/002. The requirements for all street furniture, traffic signal locations, provision for non-motorised road users and therefore the widths of the proposed central reserve, will be reviewed further in accordance with 'The Design of Pedestrian Crossing- Local Transport Note 2/95', and confirmed at the detailed design stage once non-motorised user routes and flows are confirmed in detail.

See 2.8.4 for response

2.8.6 Problem

- Location* - *A15 northbound*
- Summary* - *Single file section too narrow*

The A15 north of the junction is constrained to single file traffic. It appears that the carriageway will be approximately 3.5m wide. Cyclists using the carriageway over this extended length would be in a vulnerable situation, when following vehicles try to pass.

Recommendation

The width of the single file section should be increased to enable sufficient width for a large vehicle to safely pass a cyclist. From an operational point of view, a wider carriageway width may also be justified, eg. to allow broken down vehicle or short-term highway maintenance operations.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the proposed carriageway widths to the north of the proposed signalised junction.

The length of the proposed central reserve island has been decreased and no longer extends to form a length of single lane carriageway, as indicated in drawing 15188/200/02, contained within Appendix B for reference. This reduction has removed the potential for blockages from broken down vehicles or clashes with cycles and passing vehicles.

Single lane widths following the dualled section have been provided at 3.65m in width to tie in with the existing lane widths on London Road, this lane width is considered to be appropriate by the Design Team.

2.8.7 Problem

- Location* - *Development access road*
- Summary* - *Stop line too close to crossing point*

The stop line indicated in the development access road is too close to the studs delineating the crossing point. This reduces any margin of safety from a vehicle overshooting the stop line and also makes it difficult to correctly locate the necessary traffic signal poles.

Recommendation

The distance between the stop line and the crossing should be increased.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the offset between stop line and controlled crossing studs.

The position of the stop line on the development access has been amended to be 2.5m from the controlled crossing stud markings, in accordance with Figure 15-4 of the Traffic Signs Manual Chapter 5- Road Markings, 2003. This is indicated in drawing 15188/200/02, contained within Appendix B for reference.

2.9 A15/Yaxley Bypass Junction South of Yaxley

2.9.1 Problem

- Location* - *Pedestrian crossing points*
- Summary* - *Stop lines too close to road-studs*

The stop lines are too close to the studs demarcating the pedestrian crossing points.

Recommendation

Increase the distance between the stop lines and the studs.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the offset between stop line and controlled crossing studs.

The position of the stop line has been amended to be 2.5m from the controlled crossing stud markings, in accordance with Figure 15-4 of the Traffic Signs Manual Chapter 5- Road Markings, 2003. This is indicated in drawing 15188/200/02, contained within Appendix B for reference.

2.9.2 Problem

- Location* - *Refuge islands*
- Summary* - *Refuge islands too narrow*

The refuge islands in the A15 on the southern side of the junction and London Road appear too narrow to accommodate the proposed staggered pedestrian crossing point.

Recommendation

The width of the refuge island should be increased in order to accommodate the staggered arrangement of the crossing.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the connections between the non-motorised provisions at the proposed junction and the existing footpaths parallel to London Road and the Yaxley Bypass

At this stage the non-motorised user requirements and flows are subject to confirmation in detail, on this basis the type of controlled crossings subject to confirmation as part of the detailed design process. It is anticipated that a crossings will be required as a continuation of the existing footpath on London Road and provided connectivity to the proposed non-motorised provisions on the Yaxley Bypass.

With respect to the central reserve, the width has been increased to a sufficient width to accommodate all proposed traffic signals and street furniture, as indicated in drawing 15188/200/003, contained within Appendix A for reference. The requirements for all street furniture, traffic signal locations, provision for non-motorised road users and therefore the widths of the proposed central reserve, will be reviewed further in accordance with 'The Design of Pedestrian Crossing- Local Transport Note 2/95', and confirmed at the detailed design stage once non-motorised user routes are confirmed in detail as part of the detailed design phase.

2.9.3 Problem

Location - Crossing points

Summary - Crossing widths

The drawing indicates controlled crossing points of the A15/London Road arms of the junction. However, it is not clear whether these crossings intended for pedestrians only or also for cyclists (Toucan crossing). If they are intended to be Toucan crossings, the width of the crossing points (between the studs) is too narrow.

Recommendation

The status of the crossings should be confirmed. If they are Toucan crossings, then the width of the crossing should be increased.

A "non-motorised-user audit" should be carried out as part of the design process.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the connections between the non-motorised provisions at the proposed junction and the existing footpaths parallel to London Road.

At this stage the non-motorised user requirements and flows are subject to confirmation in detail, on this basis the type of controlled crossings subject to confirmation as part of the detailed design process. It is anticipated that a crossings will be required as a continuation of the existing footpath on London Road and provided connectivity to the proposed non-motorised provisions on the Yaxley Bypass.

Crossing widths will be reviewed further in accordance with 'The Design of Pedestrian Crossing- Local Transport Note 2/95', and confirmed at the detailed design stage once non-motorised user routes are confirmed in detail as part of the detailed design phase.

A review of desire lines, pedestrian/ cycle flows and non-motorised user requirements, based on the principles of HD42/05- Non-Motorised User Audits and TA91/05- Provision for Non-Motorised Users will be undertaken as part of the detailed design stage. London Road is not currently designated as a trunk road, on this basis it is not anticipated that a full audit will be required.

2.9.4 Problem

Location - Southbound through junction

Summary - Alignment through junction

The alignment of the lane southbound ahead lane from the Yaxley bypass appears to conflict with the nose of the refuge island on the southern side of the junction. Vehicles will not be able to follow a smooth path, no shelter will be provided to opposing right-turners waiting to turn and the nose of the island is likely to be struck.

Recommendation

The layout of the junction should be amended to provide a smoother alignment for southbound traffic and improve shelter for vehicles waiting to turn right.

DESIGNER'S RESPONSE

The Design Team notes the Audit Team's comments with respect to the alignment of the southbound ahead lane of the Yaxly Bypass onto London Road.

The channel line of the central reserve island has been provided at a continuous radius of 181m and on this basis is considered by the Design Team to be a smooth path. This is indicated in drawing 15188/200/03, contained within Appendix B for reference.

It should be noted that the width of the central reserve islands has been increased to accommodate traffic signals and other streets furniture. It is considered that this increased width would provide additional protection for turning vehicles.

The proposed traffic signal phasing (contained within the Transport Assessment Appendices) does not propose a northbound right hand turning phase in conjunction with a south bound ahead phase, thus it is considered unlikely that any vehicle conflict will arise from the junction proposals.

2.9.5 Problem

Location - Left turn lane

Summary - Lane to narrow

The left turn from Yaxley Bypass to London Road follows quite a low radius. The left turn lane may not be wide enough to accommodate large vehicles without them over-running the kerbs.

Recommendation

Swept paths for large vehicles should be checked. If necessary to width of the left turn lane should be increased to accommodate the swept path of large vehicles.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the radius of the proposed left turn lane from the Yaxly bypass (southbound) onto London road (northbound).

A swept path analysis has been undertaken to demonstrate that HGVs can perform a left hand turn manoeuvre without encroaching upon other lanes. The revised layout of the junction indicated within drawing 15188/200/03, contained within Appendix B for reference.

A further review of vehicle swept paths will be undertaken for any further amendments to junction geometry as part of the detailed design.

2.9.6 **Problem**

Location - Existing accesses west side of A15

Summary - Existing accesses not catered for

There are two existing accesses on the western side of the A15 which are affected by the proposed layout. No details are shown explaining how these accesses will be treated. It would appear that it may become difficult to turn right in or right out from these accesses. Potentially they could be in use by large farm machinery and delivery vehicles.

Recommendation

Assuming these accesses are to be retained, the detailed design should make provision to safely accommodate these accesses. It would appear that it may be possible for the northbound stop line of the junction to be located slightly further north to assist.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the existing accesses to the farm buildings to the west of the proposed Yaxley Bypass and London Road junction, as indicated in drawing 15188/002/03, contained within Appendix B for reference.

It is anticipated that the northern, field gate, access will be closed by the junction proposals.

The southern access is to a single farm dwelling, the surrounding farmland will be developed as part of the Great Haddon developments, thus it is anticipated that the access will be lightly trafficked and not be accessed by farm plant.

The geometry of the junction has been amended to increase the length of the deceleration of the ghosted island right hand turn lane to accommodate right hand turning manoeuvres, this is indicated in drawing 15188/002/03.

2.9.7 **Problem**

Location -

Summary

On the A15 northbound approach, is to be widened on the nearside and there is hatching indicated which it is presumed is to encourage traffic to move to the left. The alignment of the channel has severe kinks and the taper of the hatching is very short. This does not provide a smooth alignment for vehicles to follow. Vehicles will not follow the intended alignment.

Recommendation

The channel alignment and hatched taper should be revised to provide a smooth alignment which vehicles can follow.

DESIGNER'S RESPONSE

The Design Team notes the Audit Team's comments with respect to the northbound approach alignment.

The amended northbound approach, which has a smooth alignment, is indicated in drawing 15188/200/03, contained within Appendix B for reference.

2.10 London Road / Broadway Junction (bus-link) Yaxley

It would appear that there are no physical changes proposed to this junction. The existing cul-de-sac arm to the west (London Road) will be extended to from a bus-link to the Yaxley Bypass.

2.10.1 Problem

Location - Junction

Summary - Geometry of existing junction may not accommodate turning buses

It is not clear that buses will be able to turn left out from or into the London road cul-de-sac without over-running the footway.

Recommendation

The swept paths for turning buses should be checked. If necessary, the junction will require existing channels realigning to accommodate turning busses.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the geometry of the existing junction with respect to the swept paths of buses.

The bus routes to serve Great Haddon are not confirmed in detail at this stage. It is currently not proposed that a bus route will follow the route identified by the safety audit at this stage. On this basis the junction audited does not currently form part of the Great Haddon highway proposals.

However, should the bus routes be confirmed as passing through this junction, vehicle swept paths will be reviewed as part of any off site improvement works required.

2.11 A15/Yaxley Bypass Junction North of Yaxley

2.11.1 Problem

Location - *Pedestrian crossing points*

Summary - *Stop lines too close to road-studs*

The stop lines indicated are too close to the studs demarcating the pedestrian crossing points.

Recommendation

Increase the distance between the stop lines and the studs.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the offset between stop line and controlled crossing studs.

The position of the stop line has been amended to be 2.5m from the controlled crossing stud markings, in accordance with Figure 15-4 of the Traffic Signs Manual Chapter 5- Road Markings, 2003. This is indicated in drawing 15188/200/03, contained within Appendix B for reference.

2.11.2 Problem

Location - *Refuge island south of junction*

Summary - *Refuge island too narrow*

The refuge island in the A15 on the southern side of the junction appears too narrow to accommodate the proposed staggered pedestrian crossing point.

Recommendation

Increase width of refuge island.

DESIGNER'S RESPONSE

The Design Team notes the Audit Team's comments, however no refuge islands are proposed at this location. This is indicated in drawing 15188/200/03, contained within Appendix B for reference.

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2.11.3 Problem

Location - *Crossing points*

Summary - *Crossing widths*

The drawing indicates controlled crossing points the Bypass and London Road arms of the junction. However, it is not clear whether these crossings intended for pedestrians only or also for cyclists (Toucan crossing). If they are intended to be Toucan crossings, the width of the crossing points (between the studs) is too narrow.

Recommendation

The status if the crossings should be confirmed. If they are Toucan crossings, then the width of the crossing should be increased.

A “non-motorised-user audit” should be carried out as part of the design process.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the proposed controlled crossing widths at the Yaxley bypass and London road.

At this stage the non-motorised user requirements and flows are subject to confirmation in detail, on this basis the type of controlled crossings is subject to confirmation as part of the detailed design process.

Crossing widths will be reviewed further in accordance with 'The Design of Pedestrian Crossing- Local Transport Note 2/95', and confirmed at the detailed design stage once non-motorised user routes are confirmed in detail as part of the detailed design phase.

2.11.4 Problem

Location - *Junction*

Summary - *Junction radii may be too tight*

It is not clear that buses will be able to turn left into/out from London Road without over-running the footways.

Recommendation

The swept paths for turning buses should be checked. If necessary, the junction will require channels realigning to accommodate turning busses.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the swept paths of busses making a left hand turn manoeuvre into London Road, through the bus priority system.

It should be noted that the junction arrangement has been amended to include a right hand turn lane for buses. The alignment of which has been reviewed with respect to vehicle swept paths. A further vehicle swept path analysis will be undertaken once bus routes, and therefore types of bus on the route are confirmed in detail as part of the detailed design stage.

2.11.5 Problem

Location - *A15/Bypass*

Summary - *Forward visibility may be restricted*

Forward visibility along the Yaxley Bypass where it merges/diverges from the existing A15 London Road may be restricted by vegetation and possible future development on the inside of the bend. This bend passes through the location of the Bus link signalised junction. Approaching drivers may not appreciate the layout of the road or see the traffic signal heads and queuing traffic ahead in sufficient time.

Recommendation

Adequate forward visibility along the main road alignment should be provided. It would appear that a significant visibility splay may be required through the inside of the bend.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to forward visibility lines to primary signals and visibility envelopes on the inside of the bend, northbound on the Yaxley bypass, turning onto London Road.

There are currently no future development proposals on the inside of this bend, the area will be retained as open space and the existing pond will remain. The proposed speed limit on the Yaxley bypass will be 30mph, therefore a minimum Stopping Sight Distance of 90m is appropriate. The forward visibility to primary signals is indicated on drawing 15188/200/03, contained with appendix B for reference.

The topographic survey of the proposed junction area has not identified any vegetation which would constrain visibility, notwithstanding it is anticipated that any existing vegetation would be trimmed back to provide appropriate visibilities. It is proposed that all areas within forward visibility envelopes be brought forward for adoption by the local highway authority, responsibility for maintaining any vegetation impacting upon visibility splays or envelopes will be passed to the adopting authority.

It should be noted that no visibilities splays or envelopes will be provided above the existing waterbody for adoption and maintenance reasons.

2.11.6 Problem

Location - *London Road*

Summary - *Forward visibility may be restricted*

For buses travelling northbound on London Road, forward visibility to the traffic signals may be restricted due to the alignment of the road. Approaching drivers may not see the traffic signals or other queuing vehicles in time

Recommendation

Adequate forward visibility along the main road alignment should be provided. It would appear that a significant visibility splay may be required through the inside of the bend.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to forward visibility lines to primary signals for north bound busses on approach to the proposed junction.

The proposed speed limit on London Road through Yaxley bypass will be 30mph, therefore a minimum Stopping Sight Distance of 90m is appropriate. The forward visibility to primary signals is indicated on drawing 15188/200/03, contained with appendix B for reference. Forward visibility is not considered to be an issue in this location.

It is proposed that all areas within forward visibility envelopes be brought forward for adoption by the local highway authority.

2.11.7 Problem

Location - London Road

Summary - Lack of turning facilities

The northern section of London Road will become a bus-only link. As a consequence, other traffic in London Road will need to be able to turn round to return to the south. The scheme details do not appear to include any provision for vehicles to turn.

Recommendation

Turning facilities will be required at the start of the bus link.

DESIGNER'S RESPONSE

The Design Team notes and acknowledges the Audit Team's comments with respect to the provision of a turning facility northbound on approach to the proposed bus only gate facility.

A turning head has been provided to the south of the proposed bus only gate to allow vehicles to turn round and return south. This is indicated in drawing 15188/200/03, contained within Appendix B for reference.

It should be noted that southbound vehicles on London Road on approach to the proposed junction will be deterred from making a right hand turn towards the bus only gate by an advanced sign, a bus only right hand turn lane and no entry except of busses signs at the junction. This is indicated within drawing 15188/200/03.

3 Summary

- 3.1 This Designer's Response to Stage 1 Road Safety Audit Report has been prepared to address the issues raised in the Stage 1 Safety Audit.
- 3.2 For issues where the Safety Audit Team's recommendations have not been fully implemented, reasons for this have been given.

Appendix A

List of Information Supplied to the Audit Team

Drawings

15188/100B/015C rev A	Indicative Junction Layout, Great North Road/A1(M).
15188/100B/017C	Indicative Junction Layout, Yaxley By-pass – A15 London Road
15188/100B/018	Great Haddon A15 Site Access Indicative Layout
15188/100B/020C	Indicative Junction Layout, Great North Road, Junction 1
15188/100B/021C	Indicative Junction Layout, Great North Road, Junction 2 – Roundabout Option
15188/100B/022C	Indicative Junction Layout, Great North Road, Junction 2 – T Junction Option
15188/100B/023C	Indicative Junction Layout, Great North Road, Junction 3
15188/100B/024C	Indicative Junction Layout, Great North Road, Junction 4
15188/100B/025C	Indicative Junction Layout, Great North Road, Junction 5

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Appendix B

Proposed Junction General Arrangement Drawings –

15188/200/01

15188/200/02

15188/200/03

15188/200/04

15188/200/05

15188/200/06

15188/200/07

15188/200/08

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