

Howes Lane/Bucknell Road/Lords Lane

Technical Review

Alan Baxter Associates

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PROJECT
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1. INTRODUCTION

- 1.1 Alan Baxter Associates (ABA) has submitted a Transport Assessment Addendum in support of proposals to upgrade the junction of Howes Lane/Bucknell Road and Lords Lane as part of a planning application for Himley Village in Bicester, Oxfordshire.
- 1.2 Oxfordshire County Council (OCC), the Local Highway Authority, has raised safety concerns on elements of the proposal, which ABA have responded to accordingly by giving detailing on how the proposals improve the current situation.
- 1.3 Project Centre Ltd (PCL) has recently undertaken a Stage 1 Road Safety Audit on the proposed junction upgrade and a Stage 3 Road Safety Audit on the existing situation and is therefore familiar with the issues relating to this location. Therefore, PCL have been requested to undertake a technical review of the issues raised by OCC, the responses by ABA to the original OCC comments and the latest ABA response in terms of the safety concerns.
- 1.4 PCL have been provided with the ABA report, also containing 30 drawings, that sets out the justification for the current design, the response from OCC that identifies technical issues and states that the scheme is not acceptable in highway safety terms and the ABA technical note further responding to OCC.
- 1.5 A copy of the documentation provided, the Stage 1 Road Safety Audit and Stage 3 Road Safety Audit, are attached in Appendix A for information.
- 1.6 This Technical Note will set out will:
 - Review OCC concerns;
 - Review ABA rebuttal statement;
 - Identify the risk associated with the existing layout compared to the proposed layout;
 - Identify options for consideration.

2. REVIEW OF OCC CONCERNS

2.1 The table below summarises OCC’s concerns, ABA’s response to those concerns and PCLs review of the issues in terms of road safety.

OCC CONCERNS	ABAs RESPONSE	PCL ASSESSMENT
Pedestrian Facilities		
<p>Comments dated 1/12/2016</p> <p>Pinch point on Howes Lane reducing footway width to 800mm adjacent to close boarded fence.</p> <p>This is on a bend, and there is a risk of conflict between pedestrians/joggers/cyclists.</p> <p>Creates a barrier for some disabled and elderly pedestrians.</p> <p>Comments dated 16/12/2016</p> <p>MfS and OCC Residential Road Design refer to inclusive Mobility and a minimum width of 1m. However, DMRB should apply as the scheme is on an 'A' Class Road which states a minimum of 1.3 over short distances. However, are prepared to follow Inclusive Mobility and agree that a footway width of 1m would be acceptable.</p> <p>Whilst 5m forward visibility is sufficient for pedestrians to pass it could be an issue for cyclists. Whilst the risk is low the risk has not been removed.</p>	<p>Response dated 6/12/2016</p> <p>There is scope to increase the footway width to 900mm which is in accordance with OCC’s Residential Road Design Guide and Manual for Streets.</p> <p>Whilst the pinch point does occur on a bend visibility of around 5m is still achievable.</p> <p>The issue regarding the pinch-point should be assessed with regards to future use including potential increase in movements, type of pedestrians and expected safety risk.</p> <p>The footway runs to Shakespeare Drive and is the only paved access to Avonbury Business Park, which currently has no pedestrian access out of the business park. It is estimated that up to 30 people could be walking to and from the park, of which some may be coming from other areas. This movement is likely to be tidal thus reducing the chances of meeting opposing pedestrians.</p> <p>Proposed an option to extend the footway on the north side which is accessed by the proposed central refuges at the traffic signal junction.</p> <p>Cyclists should not be using the footways and the proposed improvements benefits cyclists using the carriageway.</p>	<p>Existing Situation</p> <p>The key pedestrian movements on Howes Lane are to and from:</p> <ul style="list-style-type: none"> • The Bridle-path • Avonbury Business Park • The Police Training Centre • Shakespeare Drive <p>A site visit was undertaken 7:40 and 8:40am on Thursday, 15th December and observed two pedestrian movements on Howes Lane, one in each direction.</p> <p>The first travelled south-east along Bucknell Road crossed south of Howes Lane and then continued on Howes Lane crossing again into the Business Park.</p> <p>The second appeared to come from Shakespeare Drive and continued towards the centre of Bicester.</p> <p>Five cyclists were observed on Howes Lane during this period. Three were observed travelling on the footway illegally. Of the three, two were travelling northeast and the other in a south-westerly direction to the Business Park.</p> <p>Whilst PCL have not been provided with full-day pedestrian and cyclists’ surveys, this snap shot gives some indication of the limited movements at this location.</p> <p>The existing footway on the south east side is between 1.2m and– 1.5m wide and runs between Bucknell Road and Shakespeare Drive.</p> <p>Proposals</p> <p>It is proposed to widen the carriageway to introduce a central refuge, traffic signal junction and improve turning movements for motor vehicles (particularly HGVs) turning into and out of the Howes Lane junction from Bucknell Road.</p>

<p>The safety aspect of cyclists using the footway at the junction does need to be considered, as it is inevitable. The scheme does not provide any dedicated on or off carriageway facilities. Particularly for the right turn out of Howes Lane into Bucknell Road: getting into the right hand lane on approach to the traffic lights could be difficult at busy times – plus cyclists may not want to wait in the queue.</p>		<p>This has resulted in two pinch points of less than 1m on each side of the carriageway.</p> <p>Observations and Assessment of Risk</p> <p>OCC are concerned about the risk the pinch point on the south east side of Howes Lane poses to pedestrians who may come to into conflict with other users, including cyclists.</p> <p>Whilst full pedestrian and cyclist surveys have not been undertaken a site visit to the location during peak hours identified only two pedestrians and three cyclists on the footway in a one hour period, which confirms that both pedestrian and cyclist movements are very low. It is likely the pinch point would be raised as an issue of concern in a Road Safety Audit; however, the risk of a conflict actually occurring is considered minimal due to the very low pedestrian flows.</p> <p>Cyclists are not permitted on the footway at this location and cyclists are using the footway illegally and at their own risk.</p> <p>Any pedestrians using the route (particularly blind or partially sighted users) may not be expecting to encounter cyclists; therefore providing facilities such as cycle friendly dropped kerbs as proposed by OCC might encourage increased use by cyclists, resulting in an increase in the risk of a conflict occurring and thus would not be recommended.</p> <p>The pinch point is over a very short distance and ABA have confirmed that sightlines of 5m are achievable, which gives adequate visibility for pedestrians and even cyclists to adjust their behaviour/speed accordingly.</p> <p>OCC have referenced the MfS which states a minimum width of 1m, not 900mm as indicated by ABA. They have also indicated that the scheme falls on an A-Road and therefore DMRB is a more appropriate design standard than MfS. This is acknowledged, however, it is still true that the low pedestrian movements mean that the risk of a potential conflict is negligible.</p> <p>They have conceded that a width of 1m would be acceptable.</p> <p>Cyclists</p> <p>Whilst no specific improvements for cyclists have been proposed, the widened junction and increased control of movement makes driver behaviour more predictable and easier for cyclists to negotiate the</p>
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		<p>junction safely.</p> <p>For example: the current arrangement finds vehicles on the wrong side of the road when turning into Howes Lane, leaving cyclists vulnerable as the drivers of the turning vehicles may not have seen them in time to take appropriate action to avoid them.</p> <p>The proposed arrangement removes this conflict and is therefore an improvement for cyclists.</p> <p>Turning from Bucknell Road into Howes Lane is similar to the current situation and there has been no increase in risk to cyclists.</p> <p>Provision of Advance Stop Lines for cyclists could provide additional protection and convenience to encourage cyclists to use the carriageway.</p> <p>Swept Path Analysis</p> <p>In the existing situation vehicles, particularly HGVs turning into Howes Lane regularly turn into the right turn lane out of Howes Lane bringing them into conflict with other vehicles. This is a regular occurrence and presents a high risk of a collision occurring.</p> <p>Swept path analysis indicates that HGVs can safely carry out the proposed right turn. Therefore, the risk of a collision occurring with a pedestrian in the proposed arrangement very low and significantly lower than the risk of a collision occurring involving a right turn vehicle in the existing arrangement.</p> <p>It is noted that if a pedestrian at the pinch point coincides with an HGV turning into the junction it could lead to a feeling of vulnerability; therefore increasing the width of the footway would be desirable. However, it is also noted that the frequency of this event occurring and the number of people it will affect is low due to the low pedestrian movements.</p> <p>Inclusive Mobility</p> <p>OCC refers to guidance for inclusive mobility in terms of footway widths. PCL agree with ABA that this should be assessed in terms of projected use. People with mobility issues tend to undertake short journeys with a specific destination.</p> <p>The Business Park and Police training centre are the only real destination at this location and due to travel distances and lack of</p>
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		<p>other destinations the likelihood of a pedestrian with mobility issues using this route is very low. Therefore the risk of a collision occurring is considered negligible.</p> <p>Footway Extension</p> <p>The proposed extension of the footway on the north side of Howes Lane would benefit pedestrians travelling to the Business Park as long as sufficient widths can be maintained around existing street furniture. Consideration should be given to extending this further to the Police Training Centre (PTC) rather than force pedestrians to the training centre by having them cross the road or walk in the verge as at present</p> <p>Options for consideration</p> <p>Investigate whether relocating the central refuge on Howes Lane could allow for additional footway width.</p> <p>Consider undertaking pedestrian/cycle surveys during peak hours and at weekends to obtain a full picture of existing pedestrian and cycle flows and movements, for further development and finalisation of the junction design.</p> <p>Consider the provision of cycle Advanced Stop Lines.</p>
<p>Comments dated 1/12/2016</p> <p>Loss of short section of footway on the SW side of Bucknell Rd adjacent to the bridge abutment forcing people to cross closer to the junction.</p> <p>Traffic stopping at the signals helps pedestrians find a gap, but lack of signal phase could cause confusion.</p> <p>Lack of a full inter-visibility zone could present a risk to pedestrians.</p>	<p>Response dated 6/12/2016</p> <p>The replacement crossing closer to the junction better aligns with the Howes Lane to Lords Lane desire line than the existing crossing thus negating the need for the footway to continue under the bridge.</p> <p>It is estimated that traffic flows at the junction would increase by up to 30% in 2021 compared to 2016 surveyed flow thereby increasing the level of severance for pedestrians on Bucknell Road and Howes Lane. Traffic signals will stop southbound traffic and create gaps in northbound traffic, improving the current situation for pedestrians crossing at this</p>	<p>Existing Situation</p> <p>The existing uncontrolled crossing is located beneath the bridge and visibility of pedestrians on the tactile paving on the west side is poor; similarly visibility of vehicles waiting to turn left out of Howes Lane is restricted.</p> <p>Pedestrians must observe vehicles pulling off from the roundabout, travelling north-east on Bucknell Road and coming out of the junction of Howes Lane. During peak conditions it is difficult to find a gap to cross safely.</p> <p>Drivers turning left out of Howes Lane are focussed on north-eastbound vehicles on Bucknell Road, and may not be aware of a pedestrian waiting to cross; particularly as pedestrian movements are so low. This could result in them pulling out at the same time as the pedestrian steps into the road resulting in a potentially serious collision.</p>

<p>Comments dated 16/12/2016</p> <p>OCC agree the loss of footway does not appear to be an issue. However, there are still concerns about the safety of pedestrians crossing Bucknell Road west to east by the bridge due to restricted visibility until close to the kerb.</p> <p>OCC agree that the inter-visibility appears to comply with standards.</p> <p>OCC agree that the scheme could create more gaps in the traffic for pedestrians to cross through. However, whilst in the current layout pedestrians would need to judge gaps in uncontrolled traffic flows, the introduction of signals (without pedestrian phases) will change driver behaviour and patterns of accelerating and decelerating, making their movements less predictable to the pedestrian, who will not be able to see or make sense of the various signal phases. This could introduce hesitation or over confidence in pedestrian decision making, which could be particularly hazardous at this location due to there being no refuge.</p>	<p>location.</p> <p>The purpose of the junction inter-visibility zone is to allow line of sight between drivers at stop lines and pedestrians using crossings. A driver at the stop line has visibility to the full extent of all other stop lines and the full extent of all other pedestrian crossings. The interim junction layout would be an improvement in this regard compared to the existing layout.</p>	<p>An increase in traffic flows will reduce the available gaps and increase the risk of a collisions occurring.</p> <p>During the course of a site visit on 30 November 2016 an apparent collision had occurred under the bridge. There were no police in attendance therefore it is not known if this will be reported. However, there was large amount of blood in the carriageway and on the footway in the vicinity of the existing crossing suggesting the collision involved a pedestrian or cyclist.</p> <p>Proposals</p> <p>It is proposed to move the uncontrolled crossing closer to the junction with Howes Lane, improving visibility of pedestrians from Howes Lane and for pedestrians of vehicles waiting to pull out of Howes Lane.</p> <p>Observations and Assessment of Risk</p> <p>OCC are concerned with the reduced visibility to the north west.</p> <p>Site observations on 15 December 2016 determined that visibility of Howes Lane and Bucknell Road to the south east is significantly better in the proposed location than in the existing. Visibility to the north west towards the roundabout also remains good.</p> <p>ABA has confirmed that on Bucknell Road visibility of up to 50m is achieved in both directions in the proposed layout.</p> <p>The proposed arrangement provides a stop line on Bucknell Road for south-eastbound traffic in close proximity to the crossing and visibility of the signal heads is good meaning pedestrians will be able to determine safe periods to cross.</p> <p>Overall, the proposed arrangement improves visibility of and for pedestrians from Howes Lane without negatively affecting visibility in other directions.</p> <p>OCC are concerned that an uncontrolled crossing would be confusing for pedestrians crossing the road. They are also concerned that the traffic signals will make driver behaviour less predictable and pedestrians will become hesitant or over confidence when making decisions as to when/if to cross the road.</p> <p>Pedestrians are known to regularly cross at signalised junctions, with and without pedestrian phases. Regular users are likely to become familiar with the phasing of traffic signals and will cross in gaps in</p>
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		<p>traffic whether there is a pedestrian phase or not.</p> <p>In peak-flows traffic is fairly constant and it is difficult to find a gap in the traffic, or predict when a vehicle may decide to turn left out of Howes Lane; this combined with existing visibility issues means that there is a significant risk of a collision occurring.</p> <p>Rather than providing a level of unpredictability, traffic signals have set phases and provide a level of control making traffic movements more predictable and easier to determine when a gap will occur. Those particularly familiar with the site are likely to learn the phasing of the signals, making it easier to determine when a gap might occur thereby reducing the risk of a collision occurring at this location.</p> <p>Furthermore, a driver waiting to turn left out of Howes Lane will not be focussed on vehicles travelling north-eastbound on Bucknell Road. This combined with improved visibility of the pedestrian means they are more likely to see a pedestrian waiting and adjust their approach speed accordingly.</p> <p>Options for consideration</p> <p>It is not currently proposed to provide a pedestrian phase as part of the proposals. Observations on site indicate pedestrian movements are very low; therefore a pedestrian phase could potentially be introduced with minimal impact on congestion.</p> <p>It is understood that a pedestrian phase was previously considered on the assumption that there would be a call every cycle. However, observations suggest this is unlikely to be the case.</p> <p>In view of this it is recommended to reconsider the option of including pedestrian phases to aid pedestrian movements.</p>
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Signal Equipment and Traffic Signs		
<p>Comments dated 1/12/2016</p> <p>Traffic signal heads appear to be shown in the centre of footways, potentially creating further unacceptable pinch points.</p> <p>Opposite the Howes Lane junction, however, there is a traffic signal head in the 1m wide concrete service margin. This may not provide sufficient room from the signal head clearance to the edge of the carriageway in order to prevent vehicle strikes.</p> <p>There are signs shown in the footways which may not be able to be mounted on cantilevered or double posts to provide adequate width for wheelchair users to pass them. There also needs to be a minimum of 450mm to the edge of any sign from the edge of the carriageway</p>	<p>Response dated 6/12/2016</p> <p>Proposed to erect signal heads on cranked posts with posts located at back of footway to maximise footway widths. Enlarge the footway on the SE side of Bucknell Road</p> <p>The concrete service margin has a width of 1.1m. Standard details for signal installations have been reviewed and this shows that this width is sufficient to provide 450mm clearance, even if 'hoods' are used on the signal heads.</p> <p>ABA are confident that given the size of signs and the available footway and verge widths this can be resolved using single, double or cantilevered post arrangements.</p>	<p>No further comments, it is concluded that ABA responses address the OCC concerns and the position of street furniture can be addressed as part of on-going design process.</p>
Vehicle Tracking		
<p>Comments dated 1/12/2016</p> <p>There are instances where a tracked vehicle crosses the centre line of the road or is very close to kerb lines.</p> <p>It appears that a vehicle approaching the junction on Howes Lane has to come to a complete stop and then turn its wheels before moving off so that it can negotiate the junction layout. This would interfere with efficient movement of traffic at the junction and dilute the</p>	<p>Response dated 6/12/2016</p> <p>There is still scope and space within the limits of the public highway for further refinement of the layout to address these issues.</p> <p>Nonetheless, it must be noted that these situations would only arise with the very largest of vehicles and would only be an issue if an equally large vehicle were to be travelling in an adjacent or opposing traffic lane. In reality, because of the</p>	<p>Existing Situation</p> <p>Site observation indicate that current vehicle movements, particularly for HGVs include:</p> <ul style="list-style-type: none"> • Left turn out of Howes Lane crossing over the centre line into the opposing lane • Right turning vehicles into Howes Lane turning into the oncoming right turn lane out of Howes Lane • High speed right turning movements into Howes Lane to get across the junction in small gaps when drivers become frustrated in queuing traffic

<p>capacity benefits that the scheme may offer.</p> <p>Where drivers do not negotiate the junction perfectly, it would result in damage to infrastructure.</p> <p>Should a vehicle with any kind of overhanging load try to use this junction then there could be concerns for pedestrian safety and possibly damage to centre islands / signal equipment or even the Bucknell Road bridge itself, where a section of footway has been removed altogether and the carriageway moved to 700mm from the bridge abutment.</p> <p>At this point there is uncertainty over whether Network Rail would give permission for the kerb line to be so close to the bridge structure, because of the risk of damage.</p> <p>Comments dated 6/12/2016</p> <p>OCC agree the introduction of refuges would provide some benefit to pedestrians, although as they are narrow, they do introduce the risk of overhanging vehicle bodies clipping pedestrians with bikes or prams due to the tight tracking.</p>	<p>natural mix of vehicle types there would be sufficient clearance.</p> <p>All manoeuvres are on the basis of a vehicle moving while turning its wheels.</p> <p>Vehicle containment kerbs can be used to mitigate risk of collisions with the infrastructure and bridge structure.</p> <p>The proximity of the kerb line to the bridge will need to be confirmed with Network Rail; however the risk of loss of control collisions is predicted to be reduced as a result of reduced speeds at the junction.</p>	<ul style="list-style-type: none"> Left turns into Howes Lane coming into conflict with right turn movements into Howes Lane. <p>All movements were seen to result in heavy and sudden braking. These conflicts occur on a regular basis and predicted increases in traffic flows will increase the risk of a collision.</p> <p>Projected increase in traffic flows through the junction is likely to result in increased congestion which in turn could result in drivers becoming more impatient and taking increased risks.</p> <p>Proposals</p> <p>The proposals increase the size of the junction, set stop lines away from swept paths and provide control thus reducing conflicts between turning vehicles.</p> <p>Observations and Assessment of Risk</p> <p>ABAs indicate there is scope to refine the designs to accommodate instances where swept paths show vehicles crossing the centre line and coming close to the kerb line.</p> <p>It is accepted the combination of low pedestrian flows and low numbers of the largest HGVs means the risk of a conflict occurring is minimal in comparison to existing conflicts at the junction.</p> <p>OCC are concerned about poor driving skills resulting in overhanging of the footway and central refuges. They are also concerned that the central refuges are too narrow, leaving pedestrians vulnerable.</p> <p>The proposals increase the size of the Howes Lane/Bucknell Road junction. Swept path analysis indicates that vehicles including HGVs can safely undertake turning movements through the junction, reducing the risk of a collision with other vehicles This is particularly true of left turn vehicles that currently overrun the south –eastbound lane on Bucknell Road, and right turning vehicles into Howes Lane who overrun the right turn lane out of Howes Lane.</p> <p>The swept path analysis provides a margin of safety and it is felt the risk of vehicles overhanging the footways and striking highway infrastructure is low.</p> <p>The design of the central refuge is in accordance with current guidance. They provide a safe place for pedestrians to wait and therefore are an improvement on the current situation where</p>
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		<p>pedestrians must cross three lanes of traffic with no refuge.</p> <p>Whilst there may always be some risk of HGVs overhanging footways in any highway environment, the swept path analysis shows that they can safely undertake the turn without overhanging the footway at this location.</p> <p>The conflicts described above indicate that there are existing risks of collision occurring with the current layout which the proposed design removes or reduces.</p> <p>The issue of the bridge needs to be considered in liaison with Network Rail; however the provision of the containment kerbs proposed by ABA will provide greater protection to the bridge and pedestrians.</p>
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3. SUMMARY

- 3.1 Observations confirm that pedestrian flows are very low. During the course of a site visit two pedestrians and three cyclists were observed using the footway in Howes Lane within a one hour period, between 7:40am and 8:40am on 15h December 2016. The frequency of use by pedestrians indicates that the risk of a conflict between other pedestrians at the pinch points is minimal.
- 3.2 ABA have concluded that it would be feasible to provide 1m footways at the pinch points in accordance with Inclusive Mobility guidance and OCC have indicated that this would be acceptable.
- 3.3 Cyclists are not permitted on the footway at this location and are therefore using it illegally and at their own risk. Provision of facilities such as dropped kerbs to aid cyclists as suggested by OCC, could encourage greater illegal use resulting in an increased risk of a conflict as pedestrians, particularly blind and partially sighted, will not expect to encounter them. Therefore it is not recommended to provide for and encourage cyclists to use a facility illegally.
- 3.4 The proposed relocation of the crossing beneath the bridge improves visibility of and for pedestrians and therefore reduces the risk of a collision occurring.
- 3.5 Low pedestrian movements mean that it could be feasible to provide controlled crossings without negatively affecting traffic flow and should be further investigated.
- 3.6 The current arrangement results in conflicts with oncoming and turning vehicles. Predicted increases in traffic flows will increase the risk of a collision occurring. The proposed signalisation provides controlled movements and reduces and removes the risk of these conflicts occurring.
- 3.7 Swept paths analysis indicates that all vehicles can safely negotiate the junction.
- 3.8 It is proposed to widen the junction which makes it easier for all vehicles including HGV to negotiate the junction safely reducing the risk of conflict with oncoming vehicles.
- 3.9 Cycle facilities could be improved with the provision of Advanced Stop Lines which could encourage experienced cyclists to use the carriageway.
- 3.10 In conclusion, with the exception of two pinch points which result in a minimal risk of conflict due to very low pedestrian flow, the proposed junction improves road safety at this location by:
 - Improving site lines for pedestrians;
 - Widening the junction to aid turning movements;
 - Removing the conflict between vehicles waiting to turn right into and out of Howes Lane;
 - Reducing the conflict between left- and right-turning vehicles into Howes Lane;
 - Reducing vehicle speeds by replacing the roundabout with traffic signals thus bringing vehicles to a controlled stop rather than marginally slowing on approach to and accelerating through the junction.

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- Improve productivity by having consistent procedures;
- Increase flexibility of staff and systems through the adoption of a common approach to staff appraisal and training;
- Continually improve the standard of service we provide internally and externally;
- Achieve continuous and appropriate improvement in all aspects of the company;

Our Quality Management Manual is supported by detailed operational documentation. These relate to codes of practice, technical specifications, work instructions, Key Performance Indicators, and other relevant documentation to form a working set of documents governing the required work practices throughout the Company.

All employees are trained to understand and discharge their individual responsibilities to ensure the effective operation of the Quality Management System.



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Job Number	Issue	Description	Originator	Checked	Authorised
1000003645	Draft	Technical Note	Naomi Barnes 15/12/16	Carlos Da Rocha 19/12/16	Paul Chandler 20.12.16

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APPENDIX A

STAGE 1 AND STAGE 3 ROAD SAFETY AUDIT REPORTS

Award Winning

national
transport awards

london
transport awards

british
parking
awards



Accreditations



Memberships



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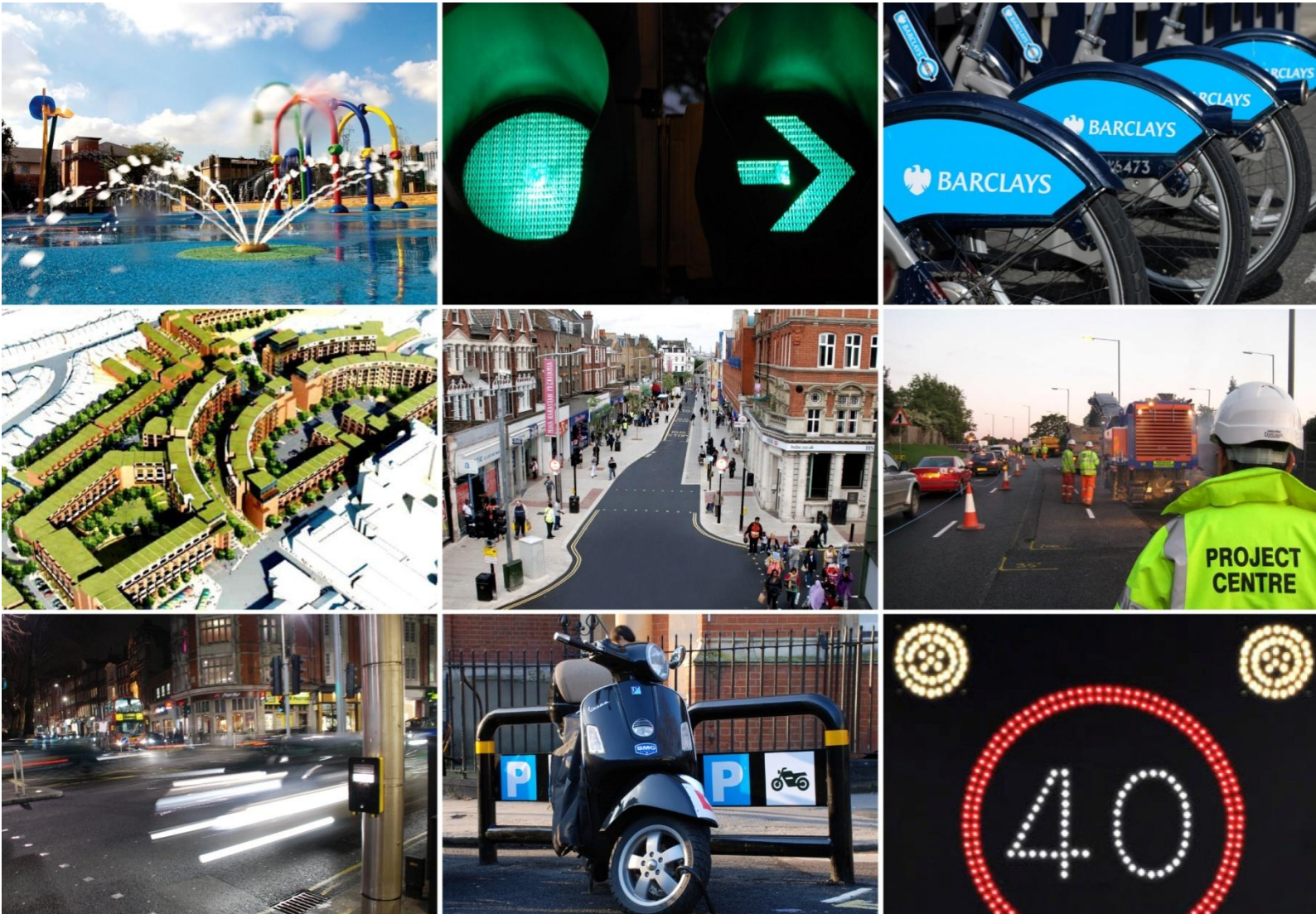
PROJECT CENTRE

Road Safety Audit Stage 1

Himley Village, NW Bicester, Oxfordshire

Alan Baxter & Associates LLP

August 2016



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Report Reference	Issue	Description	Originator	Checked	Authorised
1000003217	1	Draft	Martin Morris 19/08/2016	Kevin Seymour 19/08/2016	Tim Mantle 24/08/2016
1000003217	2	Draft	Martin Morris 07/09/2016	Kevin Seymour 07/09/2016	Tim Mantle 09/09/2016

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1. INTRODUCTION

- 1.1 This report details the results of a Stage 1 Road Safety Audit on the proposed signalisation of the junctions of Howes Lane, Bucknel Road and Lords Lane in Bicester, Oxfordshire.
- 1.2 The Audit Team:-
- Martin Morris (Team Leader) Project Centre (Traffic)
 - Kevin Seymour (Team Member) Project Centre (Traffic)
 - Andy Nellist (Observer) Project Centre (Traffic)
- 1.3 The Design Team:-
- Alan Baxter & Associates LLP
- 1.4 This report has been prepared in response to a brief provided by the Design Team dated 12th August 2016.
- 1.5 The Audit was undertaken in accordance with procedures laid out in the Design Manual for Roads and Bridges - HD 19/15 for Road Safety Audits. The Audit comprised an examination of the drawings, documents and a visit to the site.
- 1.6 The Audit comprised an examination of the drawings and documents provided as listed in Appendix A of this report. A site visit was carried out during daylight hours on 15th August 2016 for the purposes of the Stage 1 Audit between 18:15 and 19:15. The weather was dry and bright and the condition of the road surface was dry.
- 1.7 The Auditors have examined and reported only on the road safety implications of the proposed scheme as presented. The Audit report does not include an examination of any collision data for the site. The Audit has not examined or verified the compliance of the scheme to any other criteria. The drawings provided were deemed acceptable for the purpose of the Audit.
- 1.8 All comments and recommendations are referenced to the A4 location plans in Appendix B of this report.

2. ITEMS RAISED AT PREVIOUS AUDIT

2.1 No previous Road Safety Audits were provided to the Audit Team.

3. STAGE 1 ROAD SAFETY AUDIT

3.1 GENERAL

3.1.1 PROBLEM:

Location: Approaches to traffic signals - Drawing 1665 / 75 / 200 rev B.

Summary: Inappropriate surfacing could compromise road safety.

Detail: Drivers travelling at even moderately high speeds, on roads where signal control is installed, can find themselves with a difficult decision to make when green changes to amber; where drivers are often faced with a choice between attempting to brake to a halt at the stop line, or continuing at the same speed through the junction and clearing it safely. The proposals do not include the introduction of anti-skid surfacing or a surface with a high polished stone value (PSV). Surfacing with an inadequate PSV could lead to vehicles not being able to stop, leading to possible rear end shunt or side impact accidents.

RECOMMENDATION:

That high friction surfacing should be provided on the approaches to the signals and the controlled crossing.

3.1.2 PROBLEM:

Location: The Scheme - Drawing 1665 / 75 / 200 rev B.

Summary: Ponding could lead to loss of control accidents.

Detail: The carriageway is being realigned and kerb lines amended. No details of the drainage proposal or carriageway profiles have been provided for assessment. Low or flat areas may cause ponding of surface water. This would be detrimental to road safety and could lead to loss of control accidents, particularly in icy conditions.

RECOMMENDATION

That the vertical profiles should be checked to ensure that there are no low spots and that drainage details and vertical profiles should be provided at Safety Audit Stage 2.

3.1.3 PROBLEM:

Location: The Scheme - Drawing 1665 / 75 / 200 rev B.

Summary: Insufficient construction details could compromise road safety.

Detail: No construction details were provided for assessment, in particular, details of tie-ins and carriageway construction. Inappropriate tie-ins or significant changes in PSV could lead to differential braking, particularly under severe braking conditions.

RECOMMENDATION:

That tie-ins and carriageway construction details should be provided for assessment at Stage 2 Safety Audit and that:

- The tie-in should not be on the running path of powered two wheeled vehicles.
- Materials used in carriageway construction should be consistent with those used along the length of the carriageway.

3.1.4 PROBLEM:

Location: The Scheme - Drawing 1665 / 75 / 200 rev B.

Summary: Existing undertaker plant may compromise road safety.

Detail: There appears to be existing statutory undertaker apparatus that may be affected by the proposals; no details have been provided for the diversion of this apparatus. Inappropriate access to this plant could compromise operative safety.

RECOMMENDATION:

That details of the relocation of the apparatus should be provided for assessment at Stage 2 Safety Audit.

3.1.5 PROBLEM:

Location: The Scheme - Drawing 1665/75/200 rev B.

Summary: Change of junction type may compromise road safety.

Detail: In the Transport Assessment provided, accident details were provided for the surrounding area, but not for the specific junctions considered as part of this Audit.

Therefore, Auditors can only comment in general terms that the change of junction type to traffic signals, from a roundabout, and priority junction could lead to an increase in accidents.

RECOMMENDATION:

That the accident history of the roundabout and priority junction should be investigated further and considered against the accident frequency of traffic signals in the local area.

3.2 LOCAL ALIGNMENT

3.2.1 PROBLEM:

Location: The Scheme - Drawing 1665/75/201 & 202 rev B.

Summary: Lack of carriageway space could compromise road safety.

Detail: Swept path information has been provided for assessment; however, the movements provided show conflict between vehicles. It was observed on site that regular larger vehicles are negotiating these junctions. In addition, the tyre scrub marks at the junction of Howes Lane / Bucknel Road indicate that the majority of the road is utilised for turning. Insufficient turning space may prevent access by larger vehicles or cause these vehicles to mount the footway, endangering pedestrians; kerb strikes; over running of the traffic islands and possible loss of control accidents.

RECOMMENDATION:

That the available carriageway space should be sufficient to accommodate the safe turning movements of all vehicle types.

3.2.2 PROBLEM:

Location: The Scheme - Drawing 1665 / 75 / 200 rev B.

Summary: Lack of forward visibility could compromise road safety.

Detail: Howes Lane bends and descends on the approach to the signals, this change in vertical and horizontal profile reduces the forward visibility. This lack of forward visibility may reduce the visibility to the signal heads and also traffic that may be queuing at the signals. Restricted visibility could lead to rear end shunt accidents.

RECOMMENDATION

That the appropriate stopping site distances should be provided for assessment at Stage 2 Safety Audit and that consideration be given to high mast or double aspect signals.

3.3 JUNCTIONS

3.3.1 PROBLEM:

Location: The Scheme - Drawing 1665 / 75 / 200 rev B.

Summary: Operation of signalised junctions may compromise road safety.

Detail: The proposed staging allows for straight-ahead movements along with right turning traffic. No early start or cut off is proposed and this could lead to side impact type accidents. In addition, although indicated on the plans, there are no pedestrian crossing phases within the signal operation. This could lead to pedestrians crossing at inappropriate times, or at less safe locations. This would be particularly problematic for pedestrians who have visual or mobility impairments.

RECOMMENDATION:

That the right turn and straight-ahead movements should be separated or at least have early cut off or late start, and that pedestrian crossing phases should be included.

3.3.2 PROBLEM:

Location: The Scheme - Drawing 1665/75/200 rev B.

Summary: Vehicle approach speeds could compromise road safety.

Detail: It was observed on site that existing speed limits are 30 mph at the junctions, however, the 30mph limit commences close to the junctions on the Lords Lane, Bucknel Road (north) and Howes Lane arms. If the 85th percentile speed is predicted to be above 35mph, then the junction is within a high-speed category. High approach speeds and an inappropriate detection system could lead to pedestrian or rear end shunt accidents.

RECOMMENDATION:

That a speed assessment be undertaken to establish the 85th percentile speeds and if required that a speed discrimination system should be incorporated into the design, in order to minimise accidents.

3.4 NON MOTORISED USERS

3.4.1 PROBLEM:

Location: The Scheme - Drawing 1665 / 75 / 200 rev B.

Summary: Lack of continuity of cycle facilities could compromise road safety.

Detail: There are existing sections of cycle ways and cycle paths on Bucknel Road and Lords Lane. These routes seem to end at this junction, where no cycle facilities have been provided. A lack of route continuity may lead to a reduction in usage and a possible increase in conflict with pedestrians and other road users. It is likely that cyclists will continue to ride on the existing narrow footway, or be forced onto the carriageway, which could lead to conflict with vehicles.

RECOMMENDATION

That, where possible, continuous routes should be provided for cyclists and that cycle Advance Stop Lines should be provided.

3.4.2 PROBLEM:

Location B: - Drawing 1665/75/200 rev B.

Summary: Lack of facilities could compromise pedestrian safety.

Detail: There are no pedestrian crossing facilities on Bucknel Road north of Howes Lane; where this could be a desire line for pedestrians. A lack of suitable pedestrian facilities could lead to pedestrians crossing in less safe places. A lack of suitable pedestrian facilities may lead to vehicle / pedestrian conflicts, this is particularly problematic for the visually and mobility impaired.

RECOMMENDATION

That suitable pedestrian facilities should be provided across this junction.

3.5 ROAD SIGNS, CARRIAGEWAY MARKINGS AND LIGHTING

3.5.1 PROBLEM:

Location: Approaches to the signals on Bucknel Rd - Drawing 1665 / 75 / 200 rev B.

Summary: Lack of offside primary signal aspects could compromise road safety.

Detail: There are no offside primary signals shown and due to the width of the junctions, the secondary signals are some distance away from the stop lines. The nearside primary signal could be hidden or masked and the secondary aspect, due to its location, may not be easily seen. This could lead to non-compliance of the signals and could compromise road safety, leading to rear end shunt or side impact type accidents.

RECOMMENDATION

That offside primary signals should be installed.

3.5.2 PROBLEM:

Location A: Approach to the signals on Bucknel Rd - Drawing 1665 / 75 / 200 rev B.

Summary: Lack of visibility to signal aspects could compromise road safety.

Detail: There is an existing Advance Direction Sign (ADS) on the southbound approach to the traffic signals on Bucknel Road. This ADS will restrict the visibility to the nearside primary signal. This could lead to non-compliance of the signals and could compromise road safety, leading to rear end shunt or side impact type accidents.

RECOMMENDATION

That the ADS should be relocated to provide sufficient visibility to the traffic signals.

4. ISSUES IDENTIFIED DURING THE RSA OUTSIDE THE TERMS OF REFERENCE

- 4.1 Any issues that the Audit Team wish to bring to the attention of the Client Officer which are not covered by the road safety implications of this audit have been included in the following section. These issues could include maintenance items, operational issues or poor existing provision. It should be understood however, that in raising these issues, the Audit Team do not warrant that a full review of the existing highway environment has been undertaken beyond the scope of the Audit.
- 4.2 The Audit Team has no issues to raise within this section.

5. AUDIT TEAM STATEMENT

The Audit has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme. The problems identified have been noted in this report together with suggestions for safety improvements, which we recommend should be studied for implementation.

No member of the Safety Audit Team has been involved with the design of the measures.

Martin Morris

Team Leader

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Signed: 

Date: 19/08/16

Kevin Seymour

Team Member

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Date: 19/08/16

6. QUALITY

It is the policy of Project Centre to supply Services that meet or exceed our clients' expectations of Quality and Service. To this end, the Company's Quality Management System (QMS) has been structured to encompass all aspects of the Company's activities including such areas as Sales, Design and Client Service.

By adopting our QMS on all aspects of the Company, Project Centre aims to achieve the following objectives:

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- Ensure projects are completed to programme and within budget;
- Improve productivity by having consistent procedures;
- Increase flexibility of staff and systems through the adoption of a common approach to staff appraisal and training;
- Continually improve the standard of service we provide internally and externally;
- Achieve continuous and appropriate improvement in all aspects of the company;

Our Quality Management Manual is supported by detailed operational documentation. These relate to codes of practice, technical specifications, work instructions, Key Performance Indicators, and other relevant documentation to form a working set of documents governing the required work practices throughout the Company.

All employees are trained to understand and discharge their individual responsibilities to ensure the effective operation of the Quality Management System.



APPENDIX A – SCHEDULE OF DOCUMENTS EXAMINED

SCHEDULE OF DOCUMENTS EXAMINED

(Documents Forming the Audit Brief)

Title	Numbers (s)
Vehicle Tracking for Articulated Vehicle and Single Decker Bus	1665/75/201&202 rev B.
General Layout	1665/75/200 rev B

Other documents:

- Himley Village outline Planning Transport Statement, Alan Baxter Associates, December 2014.
- Himley Village Technical Note 4, Alan Baxter Associates, June 2016.
- Himley Village Consultation October 2014, P3 Eco Group.
- Option 5b Phase / Stage diagrams – 120 cycle – Scenario 1a.

APPENDIX B – LOCATION DRAWING

Accreditations



Memberships





Stage 3 Road Safety Audit

Howes Lane / Bucknell Road – Lords Lane / Bucknell
Road junctions, Bicester

P3Eco & Alan Baxter Ltd

1000003421/RSA3/16/NB
December 2016

Created by
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**PROJECT
CENTRE**

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APPENDIX A – LOCATION PLAN

QUALITY

1. INTRODUCTION

- 1.1 This report details the results of a Stage 3 Road Safety Audit on the current road layout at the roundabout at the junction of Bucknell Road / Lords Lane and the junction of Bucknell Road and Howes Lane towards Witney.
- 1.2 The Audit Team:-
- Naomi Barnes (Team Leader) Project Centre (Traffic and Transportation)
 - Hardeep Dhand (Team Member) Project Centre (Traffic and Transportation)
- 1.3 The Client Organisation:-
- P3Eco & Alan Baxter Ltd
- 1.4 The Client Officer:-
- Malcolm Turner – Alan Baxter Ltd
- 1.5 This report has been prepared in response to a request to undertake a Stage 3 Road Safety Audit on the existing road layout.
- 1.6 The Audit was undertaken in accordance with procedures laid out in the Design Manual for Roads and Bridges - HD 19/15 for Road Safety Audits. The Audit comprised of a visit to the site in hours of daylight and darkness. A copy of a topo survey of the existing environment was provided for information.
- 1.7 The site visit was undertaken on 30 November 2016 between the hours of 15:00 and 16:00 in hours of daylight and 18:00 and 18:30 in hours of darkness. The weather was fine with icy patches.
- 1.8 The Auditors have examined and reported only on the road safety implications of the existing layout.
- 1.9 Oxfordshire County Council has advised that there have been 3 collisions resulting in a slight injury and 1 resulting in a serious injury in the last 15 years. No further details of the collisions have been provided. One collision was observed during the course of the site visit which is detailed later in the report; however, no police were in attendance so it is unclear whether this will be reported.
- 1.10 The Audit has not examined or verified the compliance of the existing layout to any other criteria.
- 1.11 All comments and recommendations are referenced to the A3 location plan in Appendix A of this report.

2. ITEMS RAISED AT PREVIOUS AUDIT

- 2.1 A Stage 1 Road Safety Audit was previously undertaken on the proposed new junction layout. The Audit was reviewed for information but has not been commented on as part of this report.

3. STAGE 3 ROAD SAFETY AUDIT

3.1 LOCAL ALIGNMENT

3.1.1 PROBLEM:

Location: Bucknell Road southeast exit arm off roundabout

Summary: Vehicles accelerating off roundabout at risk of collision with vehicles waiting to turn right into Howes Lane.

Detail: Vehicles turning left were observed exiting the roundabout at speed from the A4095 Lords Lane onto the southeast arm of Bucknell Road when the roundabout was clear. Visibility to the left is slightly obscured and a driver may not see a vehicle waiting to turn right into Howes Lane if their attention is focussed on the roundabout and whether it is clear to proceed without stopping. The Audit Team is concerned the high exit speeds could result in a collision with vehicles waiting to turn right into Howes Lane.

Recommendation: Investigate options to reduce vehicle speeds exiting the roundabout, advise drivers of the right turn into Howes Lane in advance of the roundabout, encourage drivers to stop.

3.2 JUNCTIONS

3.2.1 PROBLEM:

Location: Roundabout at junction with Bucknell Road and A4095 Lords Lane

Summary: High entry speeds resulting in a potential for single vehicle loss of control collisions and collisions with other vehicles entering the roundabout.

Detail: During the course of the site visit the Audit Team observed vehicles approaching and entering the roundabout at speed from all directions; sometimes these coincided with only minor glances to observe other vehicles entering the roundabout. Vehicles were observed having to sharply apply their brakes to avoid a collision on the roundabout.

The Audit Team are concerned that the high entry speeds could result in loss of control collisions on the roundabout and rear end shunts on the entry arms due to sudden braking.

As detailed in photo 3.2.1 an existing lamp column located on the northern side of the roundabout has been struck.



Photo 3.2.1 Damaged lamp column

Recommendation: Investigate options to reduce speeds entering the roundabout and / or provide greater levels of control to encourage drivers to slow / stop before undertaking the turn.

3.2.2 PROBLEM

Location: A4095 Howes Lane junction with Bucknell Road

Summary: High speed left turn movements resulting in collisions with vehicles turning right into Howes Lane.

Detail: During the course of the site visit the Audit Team observed vehicles queuing on the approach to the roundabout. A vehicle travelling north-west along Bucknell Road towards the roundabout had stopped to allow another vehicle to turn right into Howes Lane, a second vehicle travelling in the same direction was seen approaching at speed and turning left at the same time, both vehicles braked sharply to avoid a collision.

The Audit Team are concerned that similar incidents in the future could result in a collision occurring.

Recommendation: Investigate options to reduce entry speeds for vehicles turning left from Bucknell Road into Howes Lane or to prevent vehicles being able to undertake the manoeuvres at the same time.

3.2.3 PROBLEM

Location: Bucknell Road junction with Howes Lane

Summary: Vehicles turning right into Howes Lane cutting across the exit right turn lane resulting in a conflict with oncoming vehicles.

Details: During the course of the site visit vehicles turning right into Howes Lane were regularly observed cutting the corner and entering on the wrong side of the road as seen in photos 3.2.2 and 3.2.3. During free flow conditions right turn movements were sometimes undertaken at speed to avoid having to stop for a vehicle approaching on Bucknell Road.



Photo 3.2.2 Example of right turner cutting corner



Photo 3.2.3 Example of HGV on wrong side of road turning right

The Audit Team are concerned that vehicles turning right at speed on the wrong side of the road could come into conflict with vehicles approaching in the right turn lane resulting in a collision occurring.

Recommendation: Assess the existing layout of the junction and investigate options to discourage vehicles turning right from cutting the corner into the path of oncoming vehicles or to encourage them to stop and wait before turning to enable them to observe oncoming traffic and turn safely.

3.3 NON MOTORISED USERS

3.3.1 PROBLEM

Location: A4095 Howes Lane junction with Bucknell Road

Summary: Carriageway width resulting in pedestrians getting caught in the road resulting in conflicts between pedestrians and motor vehicles.

Detail: There are existing dropped kerbs with tactile paving on A4095 Howes Lane just west of its junction with Bucknell Road as detailed in photo 3.3.1.



Photo 3.3.1 Location of dropped crossing on Howes Lane

The carriageway is wide at this location with two north eastbound lanes approaching the junction and one in the opposite direction. During peak times there are few opportunities for pedestrians to cross in a single movement. The Audit Team are concerned that a pedestrian could find themselves within the carriageway waiting to cross between stationary and moving vehicles resulting in a collision.

In addition, vehicles were observed turning left into Howes Lane from Bucknell Road at speed. The crossing is set away from the junction and a pedestrian waiting to cross or crossing may not be immediately visible to the driver of a vehicle turning left. The Audit Team is concerned that if a pedestrian stepped into the road or was in the process of crossing the road that a vehicle turning left at speed will not have sufficient time to stop resulting in a collision.

Recommendation: Investigate options to reduce vehicle entry speeds and investigate option to improve crossing facilities for pedestrians.

3.3.2 PROBLEM

Location: Bucknell Road underneath the Railway Bridge

Summary: Poor visibility at dropped crossing resulting in a pedestrian stepping into the carriageway when it is not safe to do so and resulting in a collision.

Detail: There is an existing dropped crossing located under the railway bridge on Bucknell Road as detailed in photo 3.3.2.



Photo 3.3.2 Dropped crossing under Railway Bridge (@googlemaps)

Pedestrians waiting on the west side of the carriageway to cross the road have restricted visibility (approximately 1 car length) of vehicles waiting at the junction of Howes Lane as detailed in photo 3.3.3. Pedestrians need to be aware of vehicles coming from several directions including coming off the roundabout, straight along Bucknell Road and out of Howes Lane, and particularly at peak times when traffic flow is high, meaning a lot of activity to account of and resulting in it being difficult to find a safe period to cross. The site visit was undertaken during school finishing times and traffic volumes were high. The Audit Team did not feel comfortable trying to cross at this location during this period.

Furthermore, the visibility of the pedestrians waiting to cross on the west side is restricted for drivers pulling out of Howes Lane. A drivers focus is naturally to the right to determine a safe period to pull out rather than to the left where pedestrians may be waiting to cross.

It is also worth noting that when the Audit Team arrived on site it was evident that an incident had just occurred under the bridge. There were 3 cars with doors open and various people walking around out of their vehicles. A person was seen being assisted into a vehicle which drove off. Large amounts of fresh blood were noted on the carriageway under the bridge and on the footway suggesting there had been a collision involving a pedestrian.



Photo 3.3.3 View from dropped crossing (looking away from the roundabout)

The Audit Team are concerned that during peak times when traffic flow is fairly constant that drivers will be focussed on trying to get out of the junction, resulting in them being unaware of a pedestrian waiting to cross or stepping into the carriageway and a collision occurring.

Recommendation: Investigate options to improve crossing facilities including the provision of a controlled crossing and / or relocating the crossing to a point with better visibility.

3.3.3 PROBLEM

Location: Bucknell Road south east of junction with Howes Lane

Summary: Lack of crossing facilities resulting in collisions between pedestrians and motor vehicles.

Detail: There is an existing double height kerb central island located south east of the junction with Howes Lane which appears to act as a gateway into the weight restricted area as detailed in photo 3.3.4.

There are no crossing facilities on Bucknell Road south east of Howes Lane and the Audit Team are concerned that pedestrians may try to use the central island to assist them in crossing the road. The double height kerbs are such that pedestrians could fall off or step awkwardly off the island resulting in them becoming unsteady and falling into the road and into the path of an oncoming vehicle.



Photo 3.3.4 Existing Central Island

Recommendation: Investigate options to provide pedestrian crossing facilities on Bucknell Road south east of Howes Lane.

3.4 ROAD SIGNS, CARRIAGEWAY MARKINGS AND LIGHTING

3.4.1 PROBLEM:

Location: Howes Lane north eastbound approach

Summary: Proximity of sign to junction resulting in potential side swipe collisions.

Detail: The existing direction signage is located in close proximity to the junction with Bucknell Lane. There are two north eastbound approach lanes to the junction for left and right turners. The Audit Team are concerned that due to the proximity of the sign to the

junction that drivers will not see the sign in time to get into the correct lane. This could result in side swipe collisions if drivers manoeuvre suddenly to change lanes.

Recommendation: Investigate options to relocate the direction signs further from the junction.

3.4.2 PROBLEM:

Location: Bucknell Road south east of junction with Howes Lane

Summary: Vegetation obscuring direction sign resulting in late decision making and hard braking.

Detail: There is an existing direction sign on Bucknell Road south east of the junction with Howes Lane. Vegetation in the summer months is likely to obscure the sign meaning that drivers will be unaware they need to turn left towards Witney until they are almost on the junction. The Audit Team are concerned that this will result in rear end shunt collisions due to sudden and heavy braking.

Recommendation: Ensure vegetation is regularly maintained.

4. ISSUES IDENTIFIED DURING THE ROAD SAFETY AUDIT OUTSIDE THE TERMS OF REFERENCE

- 4.1 Any issues that the Audit Team wish to bring to the attention of the Client Officer which are not covered by the road safety implications of this audit have been included in the following section. These issues could include maintenance items, operational issues or poor existing provision. It should be understood however, that in raising these issues, the Audit Team do not warrant that a full review of the existing highway environment has been undertaken beyond the scope of the Audit.
- 4.2 Whilst outside the remit of the Audit the Client has requested that the Audit Team consider how traffic flows in the area might have an impact on road safety issues at this location.
- 4.3 Whilst the site was not visited during the AM peak, traffic flows are higher through the junction, particularly westbound, than at the time of the day when the site visit occurred. Eastbound along Howes Lane is notably higher in the PM peak and queues were seen back to the Middleton Stony roundabout during the course of the night time visit. It is therefore feasible that queues will be similar in the opposite direction in the AM peak meaning more drivers may take risks trying to turn right into Howes Lane. Higher traffic flows have a tendency to increase the risk of a collision occurring, however, full details of the collisions at this location were not available to determine if this a real or a perceived risk.
- 4.4 The Vendee Drive development provides a link around Bicester to the A41 and the M40 avoiding the town centre. This has increased traffic flow along Lords Lane, Bucknell Road and Howes Lane in the last 2-3 years. The increased traffic flow has the potential to increase the risk of a collision occurring; the number of reported collisions at the junction has remained low meaning that the current development does not appear to have had a negative impact on road safety. Notwithstanding this, it is the opinion of the Audit Team that the continued expansion of Bicester will bring increased traffic flow through the junction; this is likely to increase congestion in the peak periods and at school drop off and pick up times and in turn increase the risk of a collision occurring.
- 4.5 As noted earlier in the report, the Audit Team witnessed a collision on the day of the Audit which appeared to involve a pedestrian. No police were present and therefore it is not known if the collision will be reported through the STATS19 forms. It was also noted that a lamp column has been struck on the roundabout, however, it is not known if this collision resulted in a casualty or a damage only incident. In view of this and observations of driver behaviour on site, it is feasible that a number of damage only collisions occur at this location and could increase with further increase in traffic flows.

5. AUDIT TEAM STATEMENT

The Audit has been carried out with the sole purpose of identifying any features of the existing environment that could be removed or modified in order to improve the safety of the existing location. The problems identified have been noted in this report together with suggestions for safety improvements, which we recommend should be studied for implementation.

No member of the Safety Audit Team has been involved with any designs of options at this location.

Naomi Barnes

Signed: *Naomi Barnes*

Team Leader

Traffic and Transportation

Date: 5/12/16

Project Centre

Level 4 Westgate House

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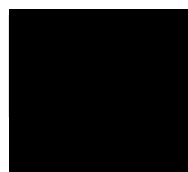
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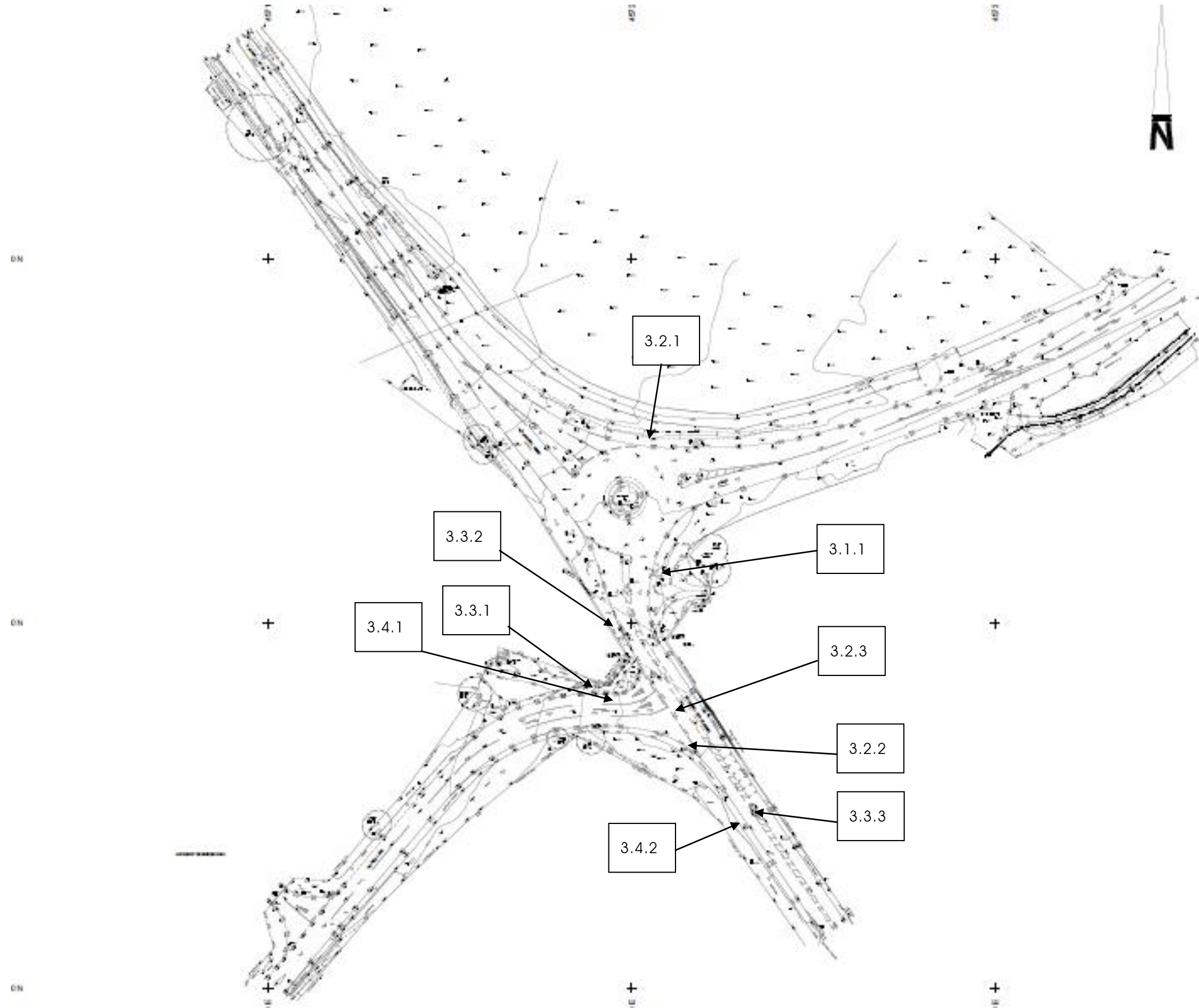
Signed

Team Member



Date: 5/12/16

Appendix A - Location Plan



Quality

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All employees are trained to understand and discharge their individual responsibilities to ensure the effective operation of the Quality Management System.



DOCUMENT CONTROL

Project Centre has prepared this report in accordance with the instructions from Alan Baxter Ltd. Project Centre shall not be liable for the use of any information contained herein for any purpose other than the sole and specific use for which it was prepared.

Job Number	Issue	Description	Originator	Checked	Authorised
1000003421	V1	RSA3	Naomi Barnes 01.12.16	Hardeep Dhand 05.12.16	Tim Mantle 05.12.16
1000003421	Final	RSA3	Naomi Barnes 06.12.16	Hardeep Dhand 06.12.16	Tim Mantle 06.12.16

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