1 INTRODUCTION

1.1 INTRODUCTION

1.1.1 Velocity Transport Planning (VTP) has been appointed by Firethorn Trust (the Applicant) to provide highways and transport planning advice for an outline planning application relating to the development of up to 530 dwellings on land which forms part of the North West Bicester Eco Town development (Policy Bicester 1 of the adopted CDC Local Plan), located in Oxfordshire.

1.1.2 The Proposed Development description for the outline planning application, planning reference: 21/01630/OUT, is as follows:

> *"Outline planning application for up to 530 residential dwellings (within Use Class C3), open space provision, access, drainage and all associated works and operations including but not limited to demolition, earthworks, and engineering operations, with the details of appearance, landscaping, layout and scale reserved for later determination."*

1.1.3 Further information was submitted to CDC in November 2021, which included updated ES Chapters, a Technical Note (TN003) responding to the respective consultation responses that related to highway matters, including an assessment of the Suitability of the Elmsbrook Spine Road (TN004), and an assessment of the Grampian Condition (TN005) relative to the delivery of the A4095 Strategic Link Road (SLR). OCC provided a further consultation response to the additional information dated the 05th of January 2022.

1.1.4 This response has been prepared to address the four reasons for objection raised by OCC in their latest consultation response, as well as to provide additional information relative to highway matters.

1.2 OCC CONSULTATION RESPONSE

1.2.1 The four highway reasons for objection raised by OCC are as follows:

1. *The assessment of the impact of the development in the absence of the A4095 diversion/Strategic Link Road is not sound and therefore it is not possible to predict the traffic impact of this proposal.*
2. *The development as proposed would have an unacceptable congestion impact on the junction of Charlotte Ave/B4100 in its current form.*
3. *The assessment of the traffic impact on Elmsbrook Spine Road does not take into account the suitability of narrow parts of the road for the volume of traffic.*
4. *There is insufficient commitment to provide pedestrian/cycle connections through to adjacent sites, in order to maximise opportunities for sustainable travel*.

1.2.2 In addition to the four reasons for objection, a number of other highways matters were included within the OCC consultation response, which are summarised as follows:

- Updated drawings are required for Accesses A + C;
- The proposed construction access to the eastern parcel would require a temporary speed restriction to 30mph to ensure adequate visibility splays can be achieved; and
- The proposed construction access to the western parcel would require traffic regulation orders to restrict parking provision within the existing layby.

2 VTP RESPONSE TO OCC REASONS FOR OBJECTION

2.1 INTRODUCTION

2.1.1 The four reasons for objection raised by OCC are summarised within this Technical Note. The following paragraphs seek to address each of these reasons for objection to satisfy OCC that the appropriate measures can be taken or have been considered for these reasons for objection to be removed.

2.2 REASON 1 – ASSESSMENT OF IMPACT IN THE ABSENCE OF THE A4095 SLR

2.2.1 VTP has prepared a standalone Technical Note 006 – A4095 Interim Improvement, which addresses the concerns raised by OCC, and this Technical Note should be considered in association with this response. TN006 is included at **ATTACHMENT A**.

2.2.2 The summary and conclusions of TN006 are set out below for ease of reference:

> *"It is generally accepted that the committed A4095 Strategic Highway Improvements are required to alleviate pressure at the A4095 Howes Lane / Bucknell Road junction and across the local network.*
>
> *However, the proposed mini-roundabout mitigation scheme seeks to provide an interim mitigation solution whilst the details of the delivery and funding for the A4095 Strategic Highway Improvements are agreed.*
>
> *In conclusion, the proposed mitigation scheme and mini-roundabout arrangement provides a significant improvement from the existing arrangement, mitigating both the impact of the Proposed Development and improving the junction in a number of ways, including traffic capacity, road safety, access for HGVs and pedestrian and cyclist amenity."*

2.3 REASON 2 – THE DEVELOPMENT WOULD HAVE AN UNACCEPTABLE IMPACT ON THE EXISTING JUNCTION OF CHARLOTTE AVENUE WITH THE B4100

2.3.1 The technical work provided within the supporting evidence which has been submitted to date acknowledges that traffic flows predicted to be generated by the Proposed Development and those associated with the adjacent Hallam Land Development, which is the subject of a current planning application (Planning Ref 21/04275/OUT), would have an adverse impact on the operation of the existing priority junction of Charlotte Avenue with the B4100.

2.3.2 OCC has requested that a financial contribution of £47,289 be included within a Section 106 Agreement, which would be associated with the signalisation of this junction. This is considered to be an appropriate means of mitigating the traffic impact at this junction as a result of the implementation of the Proposed Development and that associated with the Hallam Land proposals.

2.3.3 The Applicant has not disputed this contribution. As such, it is considered that the mitigation to address the impact of the proposed development at this junction has been identified and agreed upon.

2.4 REASON 3 – THE ASSESSMENT OF TRAFFIC IMPACTS ON ELMSBROOK SPINE ROAD

2.4.1 VTP prepared TN004 – Spine Road Assessment, which was included with the November 2021 submission of further information for consultation. This Technical Note considered the suitability of the Elmsbrook Spine

Road along Charlotte Avenue at the point where the existing bridge is provided between the Gagle Brook Primary School and the Eco Business Centre.

2.4.2 However, following further discussion with OCC, it is evident that there is still a concern regarding the suitability of the narrow section of the Elmsbrook Spine Road to the north of the Gagle Brook Primary School, where the existing width of the road is identified as being 4.1m in places.

2.4.3 VTP Drawing 4600-1100-T-070 Rev A – Elmsbrook Spine Road Assessment (a copy of which is included at **ATTACHMENT B**) has been prepared to identify the existing dimensions along this section of the Spine Road, and it is clear that there are a number of locations where the existing width is reduced to as little as 4.1m. In addition, this plan shows that there are currently a total of 52 dwellings, 99 car parking spaces, and 14 garages associated with the existing Elmsbrook scheme currently accessed via this section of the Elmsbrook Spine Road. In addition to the residential dwellings, access is currently accommodated for refuse vehicles, buses using the Elmsbrook Spine Road, and any other heavy goods vehicle activity that has been permitted for the Elmsbrook development (i.e. emergency vehicles, removals vans, deliveries, etc).

2.4.4 It is acknowledged that the Elmsbrook Spine Road is not currently an adopted highway, but a signed S38 Agreement between A2Dominion (the developer of Elmsbrook) and OCC was entered into and signed on the 09th of July 2014 as part of the discharge of Condition 60 of the Elmsbrook Planning Consent (Planning Ref 10/01780/HYBRID). As such, it is considered that the provision of this road in its current form is acceptable to OCC to accommodate the level and mix of traffic expected along this route.

2.4.5 To identify what this level of traffic impact might be, a first principles approach has been adopted in line with the agreed methodology, including trip rates, a spilt of 70/30 for private/affordable housing, and a 40% mode share associated with car trips, as was set out within the Transport Assessment that supports the Firethorn outline planning application. This methodology was set out again in TN004 – Spine Road Assessment, which was submitted in November 2021.

2.4.6 The total person trips for all modes (adjusted to reflect the CDC desire for 40% car use) are presented in **Table 2-1** for the 52 existing Elmsbrook dwellings, the 69 proposed Firethorn dwellings on the western parcel, and the 138 proposed Firethorn dwellings on the eastern parcel that are all expected to utilise this part of the Spine Road. The busiest hour is identified as being the AM peak hour, but total daily flows have also been identified for the respective development parcels.

Table 2-1: Two-Way Total Person Trips Along the Elmsbrook Spine Road (North of Gagle Brook School)

Method of Travel	Adjusted Split	52 Dwellings		69 Dwellings		138 Dwellings		259 Dwellings	
		AM	AADT	AM	AADT	AM	AADT	AM	AADT
Driver	40%	28	211	37	279	75	557	140	1,050
Passenger	13.1%	9	69	12	91	24	183	46	344
Rail (walk)	4.7%	3	25	4	33	9	66	17	123
Rail (other)	4.7%	3	25	4	33	9	66	17	123
Bus (walk)	9.1%	6	48	8	63	17	127	32	238
Cycle	7.2%	5	38	7	50	13	100	25	189
Walk	19.4%	14	102	18	135	36	271	68	510
Other	1.8%	1	9	2	13	3	25	6	47
Total	**100.0%**	**70**	**527**	**93**	**697**	**186**	**1,394**	**351**	**2,625**

2.4.7 In order to establish if the carriageway width of 4.1m is suitable to accommodate two-way traffic flows of as much as 140 cars and a maximum of say 4 HGV movements (2 one-way bus movements and 1 two-way refuse vehicle movement), consideration has been given to the information presented at Table 4-1 of TN004, which identified the capacity of carriageways of varying widths, as set out in DMRB TA 77/99. For

clarity, a 4.1m carriageway was identified as being suitable to accommodate a maximum of 482 one-way flows (60% of two-way flow) and 804 two-way flows over an hour.

2.4.8 As the evidence presented in **Table 2-1** identifies that a maximum of 140 two-way cars + 4 two-way HGV movements (assumed) would be expected when the full Firethorn Development is occupied and shares the use of this stretch of the Elmsbrook Spine Road with the existing Elmsbrook development, it is clear that a narrow carriageway width of 4.1m for limited sections of the Elmsbrook Spine Road to the north of the Gagle Brook Primary School, would be suitable.

2.4.9 The above stands to reason as the layout of the existing Elmsbrook Spine Road will prevent any through traffic due to the bus gate to the north of the access junctions to the Firethorn development, meaning that all of the traffic that utilises this portion of the Spine Road will be local traffic only. In addition, there is not expected to be any additional HGV movements than those that are already utilising this section of the Spine Road as there are no commercial uses accessed, the same bus services will use the route as can currently be accommodated, and no additional refuse vehicles will be required as a single refuse vehicle is considered acceptable to service the existing and proposed dwellings along this route. As such, the only increase in traffic flows will be car drivers associated with the proposed Firethorn development.

2.4.10 With respect to cyclists using this stretch of the Elmsbrook Spine Road, assuming that 50% of rail users might walk and 50% might cycle or be a passenger in a car to the nearby railway station(s), a total two-way hourly cycle demand of 42 cyclists (17 rail + 25 cycle) will use this stretch of the carriageway. This level of cycle use is considered to be acceptable as on-carriageway in accordance with LTN 1/20. This leaves the footway provision available for use by pedestrians only, and it could accommodate vulnerable cyclists, such as primary school children cycling to the Gagle Brook Primary School.

2.5 REASON 4 – THERE IS INSUFFICIENT COMMITMENT TO PROVIDE SUITABLE PED/CYCLE LINKS TO THE ADJACENT SITES

2.5.1 The Illustrative Masterplan (Rev C) that was submitted with the planning application (copy enclosed at **ATTACHMENT C**) identified a number of pedestrian and cycle links from the application site to the adjacent sites and the public highway. Some of these links were referenced as being "*potential pedestrian connections*", and some were identified on the Illustrative Masterplan but not referenced as being a pedestrian or cycle connection at all.

2.5.2 Whilst the Illustrative Masterplan is only a representation of what might be delivered on the Application Site, it has informed the Access & Movement Parameter Plan, which has been updated in order to reflect the pedestrian/cycle connections that are being committed to. The Access & Movement Parameter Plan (Rev M) is included within **ATTACHMENT C**.

2.5.3 Item 11 of the "Detailed Comments" provided by OCC in the response dated the 05th of January 2022 noted that a contribution towards the proposed ped/cycle connection to the nearby Hallam Land development via a footbridge over the watercourse to the south of the western parcel, is accepted. However, OCC has requested that further details be provided for this proposed footbridge, including the location and a cost associated with this footbridge in order that a financial contribution (25%) can be identified within the associated Section 106 Agreement should the application be granted planning permission.

2.5.4 Based on this request for further details of the footbridge, a topographical survey of the watercourse was commissioned and VTP Drawing 4600-1100-T-059 Rev A has been prepared to show the proposed layout, cross-section, and details of how this footbridge could be delivered.

2.5.5 The design of this footbridge is identified as being in the order of 8.0m in length to cross the identified watercourse and 4.0m in width, to accommodate both pedestrians and cyclists. Beaver Bridges has been contacted to provide details of a potential footbridge and have included a cost estimate by email dated the 22nd of March 2022 for the installation of this footbridge. This cost estimate would be subject to further considerations as details of the ground conditions, the cost of materials, and labour would still need to be clarified at the detailed design stage. However, a review of the costs provided within the email quotation could be considered to be robust at a total cost of £70,000 + VAT. Based on a 25% contribution that would be considered reasonable to be committed to by the Applicant, a Section 106 Contribution of £17,500 would be required.

2.5.6 The full details of the VTP Drawing, the Beaver Bridge brochure for a polybridge, and the cost estimate dated the 22nd of March 2022, are included at **ATTACHMENT D**.

3 VTP RESPONSE TO ADDITIONAL OCC COMMENTS

3.1 INTRODUCTION

3.1.1 Having addressed the four reasons for OCC's objections in the previous section of this TN, this section seeks to address the additional comments made by OCC within their consultation response dated the 05th of January 2022.

3.2 UPDATED DRAWINGS FOR SITE ACCESSES A & C

3.2.1 OCC requested that an updated Site Access Plan be presented for Site Access A – to the eastern parcel, which would identify the required works to deliver this access arrangement if Site Access B – to the western parcel south of the bus gate were to be excluded.

3.2.2 VTP Drawing 4600-1100-T-040 Rev A presents this arrangement and identifies that there will be a need to realign the existing kerb on the western side of the Spine Road in order to facilitate the swept path of a large refuse vehicle as it turns right towards the access road to the eastern parcel. Suitable visibility splays and footway provisions are identified on the updated VTP Drawing, a copy of which is included at **ATTACHMENT B**.

3.2.3 For completeness, VTP Drawing 4600-1100-T-041 Rev A presents the combined site access arrangements for Site Access A & B, which includes details of the swept path assessment for a large refuse vehicle accessing the western parcel, visibility splays, and footway provisions. A copy of this updated Site Access arrangement is included at **ATTACHMENT B**.

3.2.4 In addition to the details for Site Access A, OCC requested further details be provided at Site Access C to identify any land that might need to be identified for adoption to provide improved visibility for drivers utilising this access, as well as identifying an acceptable stopping sight distance (SSD) for drivers approaching the junction from the north via Braeburn Avenue.

3.2.5 VTP Drawing 4600-1100-T-042 Rev A presents the visibility splays for this site access junction, including details of the appropriate SSD for drivers approaching the junction from Braeburn Avenue. An area of grass verge is identified for adoption, which would ensure that adequate visibility can be provided at this junction. A copy of this updated Site Access arrangement is included at **ATTACHMENT B**.

3.3 TEMPORARY SPEED RESTRICTION FOR THE EASTERN CONSTRUCTION ACCESS

3.3.1 It is acknowledged that the existing speed limit along the B4100 in the vicinity of the proposed temporary construction access to the eastern parcel is 40mph. In accordance with DMRB, this would require a junction visibility splay of 2.4m x 90.0m. VTP Drawing 4600-1100-T-011 Rev F, a copy of which is included at **ATTACHMENT B**, identifies that this visibility can be achieved towards the east, but due to the existing drainage ditch located to the immediate west of the proposed temporary access, the visibility splay is compromised.

3.3.2 As set out in the response from OCC, should the speed limit along this stretch of the B4100 be reduced to 30mph, this would require visibility splays of 2.4m x 70.0m, which are shown to be achievable on the updated Proposed Construction Access plan.

3.3.3 In order to change the speed limit from 40mph to 30mph, a change to the existing Traffic Regulation Order

(TRO) will need to be agreed with OCC. It is acknowledged that if this TRO were to be required for more than 18 months, then the TRO would need to be permanent in nature and subject to further consultation once planning consent is granted for the Firethorn scheme and following further detailed design. However, subject to confirmation from the developer that might build out the proposed eastern parcel of development, if the temporary construction access is only required for a period of up to 18 months, it is expected that a Temporary TRO could be implemented by OCC to accommodate the construction phase and the lifespan of this temporary junction.

3.4 TRAFFIC REGULATION ORDER(S) FOR THE WESTERN CONSTRUCTION ACCESS

3.4.1 The temporary construction access to the western parcel is presented on VTP Drawing 4600-1100-T-027 Rev B, a copy of which is included at **ATTACHMENT B**.

3.4.2 As this temporary access is proposed to be taken directly from the existing layby on the B4100, which currently has no parking constraints or restrictions and is acknowledged to be regularly used by large HGVs, there will be a need to ensure that the appropriate TROs are implemented to restrict vehicle parking within this layby.

3.4.3 It is considered that the full extent of the parking restrictions, and other aspects of detailed design, including the extent of impact on the existing vegetation, a crossing of the drainage ditch, and any further impact on the infrastructure within this layby, can be agreed upon and identified in full as part of the detailed design.

4 SUMMARY & CONCLUSIONS

4.1 OVERVIEW

4.1.1 VTP has been appointed by the Firethorn Trust to provide highways and transport planning advice for an outline planning application relating to the development of up to 530 dwellings on land which forms part of the North West Bicester Eco Town development, located in Oxfordshire.

4.1.2 Following submission of the planning application in early 2021, consultation responses were received from OCC and CDC, which resulted in further information being submitted in November 2021. This Technical Note has been prepared to respond to the further consultation comments from OCC dated the 05th of January 2022.

4.1.3 In summary, the OCC response identified four highways' reasons for objection to the proposals, as well as a request for further clarification on a number of other aspects.

4.2 RESPONSE TO OCC REASONS FOR OBJECTION

4.2.1 Objection Reason 1 states that "*the assessment of the impact of the development in the absence of the A4095 diversion/Strategic Link Road is not sound and therefore it is not possible to predict the traffic impact of this proposal*."

4.2.2 The A4095 Strategic Highway Improvement scheme is recognised as being the appropriate form of permanent mitigation to accommodate the predicted level of traffic impact associated with all of the allocated development set out within the adopted CDC Local Plan. The application site forms part of the allocated development within the CDC Local Plan, as referenced in Policy Bicester 1.

4.2.3 At the time that the original planning application was validated in May 2021, and at the later date of November 2021, when further information was submitted in response to the original comments from OCC and CDC, the funding of the permitted A4095 Strategic Link Road was agreed and in place. It is accepted that an appropriate level of financial contribution towards the permitted A4095 Strategic Link Road will be identified and set out within the Section 106 Agreement to be associated with the application, but these details have not yet been provided by OCC. This is acknowledged within the OCC consultation response.

4.2.4 Notwithstanding the above, OCC's Future Oxford Partnership (formerly the Oxfordshire Growth Board) decided to reallocate the agreed funds for the permitted A4095 Strategic Highway Improvement scheme, subsequent to the additional information being submitted in relation to the outline planning application.

4.2.5 In order to address the potential impact of the traffic associated with the application site for a limited period on a key part of the local highway network that will ultimately benefit from the implementation of the A4095 Strategic Highways Improvements once the funding for this has been agreed upon, a temporary Interim Improvement Scheme has been developed in the form of a mini-roundabout junction to replace the existing priority junction at the A4095 Howes Lane / Bucknell Road junction.

4.2.6 The details of the technical work to support this proposed Interim Improvement Scheme are set out within a standalone Technical Note that is included within this response to OCC. The conclusions are that even with the increased level of vehicular activity through the junction of the A4095 Howes Lane / Bucknell Road, the mini-roundabout option would result in improved performance of the junction, less delay to drivers using this junction and improved highway safety measures. As such, it is considered that Objection Reason 1 has been addressed.

4.2.7 Objection Reason 2 states that "*the development as proposed would have an unacceptable congestion impact on the junction of Charlotte Ave/B4100 in its current form*". This has been acknowledged in all of the supporting evidence submitted to date, and the original Transport Assessment identified a traffic signal scheme at this junction that would mitigate not only the impact of the traffic associated with the Proposed Development but also the considerable levels of traffic predicted to be generated by the adjacent Hallam Land development, which is now the subject of a live planning application (Planning Ref 21/04275/OUT).

4.2.8 This improvement scheme has been acknowledged by OCC as a request for a financial contribution of £47,289 is included within the consultations response(s) received from OCC to date. As such, it is considered that Objection Reason 2 has been addressed.

4.2.9 Objection Reason 3 states that "*the assessment of the traffic impact on the Elmsbrook Spine Road does not take into account the suitability of narrow parts of the road for the volume of traffic*." This Technical Note identifies what the cumulative levels of traffic that might utilise this stretch of the Elmsbrook Spine Road might be once the Firethorn scheme is fully occupied.

4.2.10 It is considered that the overall level of traffic flows, the nature of the traffic that would be expected to utilise the Spine Road, including large HGVs, and the pedestrian and cycle activity along this route, can all be accommodated in accordance with thresholds calculated from DMRB TA 77/99. As such, it is considered that Objection Reason 3 has been addressed.

4.2.11 Objection Reason 4 states that "*there is insufficient commitment to provide pedestrian/cycle connections through to adjacent sites, in order to maximise opportunities for sustainable travel*." An updated Access & Movement Parameter Plan has been prepared to provide the locations of the pedestrian/cycle connections that the outline application is committed to delivering.

4.2.12 It is worth noting that all of the identified locations for connections to adjacent sites are subject to the internal highway network being adopted for the Elmsbrook development, and the other adjacent sites not only obtaining successful planning consent(s), but the internal links tying up with those proposed by the Firethorn application. A single connection point to the adopted highway is identified from the eastern parcel to the B4100 that will lead to a new pedestrian crossing facility to the St Laurence Church.

4.2.13 In addition to the identified pedestrian/cycle connection points, a link is proposed to the adjacent Hallam Land development, which will need to include the provision of a new footbridge that will cross an existing watercourse. This Technical Note includes the details of this proposed footbridge, including drawings and a cost estimate for these proposed works. It is considered reasonable for a contribution of 25% of the cost of these works to be included within the Section 106 Agreement, which is identified as being in the order of £17,500. As such, it is considered that Objection Reason 4 has been addressed.

4.3 RESPONSE TO FURTHER OCC COMMENTS

4.3.1 In addition to the four reasons for objection, OCC requested further details be provided for Site Access A & C, as well as commenting on the need for temporary changes to Traffic Regulation Orders to accommodate both the construction accesses to the eastern and western parcels.

4.3.2 This Technical Note provides the updated drawings and a commitment to progress the Traffic Regulation Order(s), subject to successful planning permission being granted and further detailed design work.

ATTACHMENT A

TN006 – A4095 INTERIM IMPROVEMENT MITIGATION

1 INTRODUCTION

1.1 INTRODUCTION

1.1.1 Velocity Transport Planning (VTP) has been appointed by Firethorn Trust (the Applicant) to provide highways and transport planning advice for an outline planning application relating to the development of up to 530 dwellings on land which forms part of the North West Bicester Eco Town development (Policy Bicester 1 of the adopted CDC Local Plan), located in Oxfordshire.

1.1.2 The Application Site falls within the administrative area of Cherwell District Council (CDC) and within the authority of Oxfordshire County Council (OCC), which are the local highway authority.

1.1.3 The Proposed Development description for the outline planning application, planning reference: 21/01630/OUT, is as follows:

> *"Outline planning application for up to 530 residential dwellings (within Use Class C3), open space provision, access, drainage and all associated works and operations including but not limited to demolition, earthworks, and engineering operations, with the details of appearance, landscaping, layout and scale reserved for later determination."*

1.2 PLANNING CONTEXT

1.2.1 The outline planning application was originally validated by CDC on the 06th of May 2021. A response to the outline planning application was received from OCC on the 06th of July 2021 and from CDC on the 21st of September 2021, with the third page of the CDC letter covering matters related to transport. It is noted that paragraph four of the CDC transport comments referred to the potential need for a Grampian Condition to restrict the level of development prior to the implementation of the A4095 Strategic Highway Improvement scheme, which was consented by CDC on the 21st of August 2021 (Planning Ref 14/01968/F).

1.2.2 In response to the comments from both OCC and CDC, a VTP produced a Technical Note (TN) in November 2021, titled 'Grampian Condition Review' TN005, which was submitted as part of the wider response to the consultation comments received. The TN005 referred to previous consultant work at the A4095 Howes Lane / Bucknell Road junction, which determined the level of development that could come forward in the area prior to the implementation of the A4095 Strategic Highway Improvements, as permitted.

1.2.3 Further details on the historical and planning context of the A4095 Strategic Highway Improvements are detailed within the VTP 'Grampian Condition Review' TN005.

1.2.4 Following the planning consultation on the additional documentation submitted in November 2021, further comments on the technical work were received within an OCC response dated the 05th of January 2022.

1.2.5 With respect to the A4095 and assessments within TN005, the OCC response stated:

> *"OCC considers that the methodology is now too old to be reliable as it made use of out-dated scenarios of the Bicester Transport Model, which did not include local plan development at Heyford. A further assessment should be carried out using a revised reference case of the BTM which is currently being developed in relation to another project. The consideration of severity of impact should take into account the strategic function of the A4095 around Bicester."*

1.2.6 In addition to the feedback received from OCC, it is also now understood that the previously agreed funding and timescales for the delivery of the A4095 Strategic Highway Improvements are uncertain. This information was only made public after the submission of further information to CDC for consideration in November 2021.

1.2.7 On that basis, the response from OCC in relation to the assessment of the A4095 Howes Lane / Bucknall Road junction is very relevant as the timescales for the implementation of the A4095 Strategic Highway Improvements has less certainty. This is primarily due to the fact that it is expected that the funds for the A4095 Strategic Highway Improvements, which has been agreed to be the appropriate mitigation for all of the allocated development identified within the CDC Local Plan, are to be provided through contributions from developers seeking to deliver schemes within the allocated North West Bicester Masterplan.

1.2.8 The withdrawal (or reallocation) of the funding for the A4095 Strategic Highway Improvements by OCC has created a scenario whereby development opportunities are considered to be restrained as the key strategic mitigation can no longer be provided to "unlock" development, which in turn would have provided an opportunity for the cost of the A4095 Strategic Highway Improvements to be "clawed back" by these developments through the respective Section 106 Obligations.

1.2.9 VTP and the Applicant have engaged in a series of discussions with CDC and OCC with a view to agreeing on how best to accommodate the 530 dwellings associated with the Firethorn Scheme prior to the implementation of the A4095 Strategic Highway Improvements on the surrounding local highway network.

1.2.10 To this extent, a temporary or interim mitigation scheme has been developed at the A4095 Howes Lane / Bucknell Road junction, which seeks to provide an interim improvement to a critical part of the local highway network that would be permanently alleviated by the implementation of the A4095 Strategic Highway Improvements, whilst the mechanisms for funding the A4095 Strategic Highway Improvements are ongoing and agreed with all relevant stakeholders.

1.2.11 The suitability of the interim mitigation scheme will be tested using the latest 2026 'Reference Case' traffic flow outputs from the Bicester Transport Model (BTM) that have been obtained from OCC and assume the A4095 Strategic Highway Improvements are not in place.

1.2.12 Within recent discussions with OCC, it was agreed that the latest BTM 2026 Reference Case flows are the most appropriate to assess the suitability of the proposed interim mitigation scheme.

1.2.13 In addition to the data received from the BTM, a series of traffic surveys were undertaken the week commencing the 31st of January 2022 to understand the existing operation of the junction and local area.

1.2.14 It is regarded that whilst the proposals are for an interim mitigation scheme, the scheme could potentially be permanently implemented by OCC once the A4095 Strategic Highway Improvements are delivered. The proposed mitigation scheme aims to implement a wider array of improvements rather than focusing solely on capacity, so provides residual benefits to the local transport network.

1.2.15 It is generally accepted that the permitted A4095 Strategic Highway Improvements are required to alleviate pressure at the A4095 Howes Lane / Bucknell Road junction and across the wider local highway network that is to be associated with the development traffic expected to be generated by the allocated sites included within the adopted CDC Local Plan. However, the proposed interim improvement scheme seeks to provide a mitigation solution that will accommodate the impact of all of the traffic associated with the 530 dwellings of the Proposed Development prior to the implementation of the A4095 Strategic Highway Improvements.

1.3 REPORT PURPOSE AND STRUCTURE

1.3.1 This TN seeks to present the technical information for the proposed interim mitigation scheme to demonstrate that the proposals provide an improvement from the existing arrangement, i.e. a priority junction, using the latest traffic flows obtained from the BTM that have been provided by OCC.

1.3.2 Following this Introduction, this TN is structured as follows:

- Existing Junction Operation;
- Proposed Mitigation; and
- Summary and Conclusions.

2 EXISTING JUNCTION OPERATION

2.1 METHODOLOGY

2.1.1 The operation of the existing priority junction will be assessed using the interim BTM 2026 Reference Case traffic flows that have been provided by OCC.

2.1.2 Modelling will be undertaken using the industry standard software, Junctions 10. Modelling measurements will be obtained using AutoCAD measurements of a topographical survey of the junction.

2.1.3 Junctions 10 assesses the capacity of a junction through Ratio of Flow to Capacity (RFC), with a junction being deemed to reach practical capacity when it reaches 0.85. However, in more congested scenarios, an RFC value of 1.0 is deemed to be the theoretical limit of acceptable operation. An RFC value below 0.85 generally means the junction will operate with additional capacity.

2.1.4 'Queue' refers to the number of Passenger Car Units (PCUs) that may be queueing at each arm, with one PCU generally equating to one car or an effective length of 5.75m per PCU. 'Junction Delay' refers to the total time delay in seconds that drivers will face whilst passing through the junction.

2.1.5 Development traffic flows for the Proposed Development that are considered to pass through the junction are consistent with the traffic flows and distribution presented within the Transport Assessment (TA) that was submitted in support of the outline planning application and as agreed with OCC.

2.1.6 For completeness, a copy of the existing junction parameters is presented on VTP Drawing 4600-1100-T-062 Rev A, a copy of which is included at **ATTACHMENT A. A** copy of the Junctions 10 Output files for the existing priority junction arrangement are contained at **ATTACHMENT B**.

2.1.7 The following scenarios will be assessed:

- BTM Base 2026 (Reference Case); and
- BTM Base 2026 + Proposed Development Scenarios

2.1.8 Traffic flow diagrams for both scenarios are included at **ATTACHMENT C**.

2.2 EXISTING JUNCTION MODELLING

2.2.1 The results of the PICADY modelling for the existing junction arrangement using the BTM 2026 Reference Case flows are provided in **Table 2-1.**

Table 2-1: A4095 Howes Lane / Bucknell Road - Existing Junction Operation (BTM Flows)

SCENARIO	ARM	AM PEAK (08:00-09:00)			PM PEAK (17:00-18:00)		
		QUEUE	RFC	JUNCTION DELAY (s)	QUEUE	RFC	JUNCTION DELAY (s)
BTM Base 2026	Howes Lane (Left Turn)	29.9	1.17	490.10	112.1	1.29	200.45
	Howes Lane (Right Turn)	6.3	999,999		0.1	0.08	
	Bucknell Road N (Right Turn)	193.0	1.40		6.3	0.76	

SCENARIO	ARM	AM PEAK (08:00-09:00)			PM PEAK (17:00-18:00)		
		QUEUE	RFC	JUNCTION DELAY (s)	QUEUE	RFC	JUNCTION DELAY (s)
BTM Base 2026 + Proposed Development	Howes Lane (Left Turn)	70.6	1.26	375,579	194.8	1.44	346.12
	Howes Lane (Right Turn)	12.6	999,999		0.1	0.08	
	Bucknell Road N (Right Turn)	340.9	1.62		6.6	0.76	

2.2.2 It is noted that the junction modelling suggests that the junction will operate significantly over capacity in the BTM Base 2026 future scenario, even without any traffic associated with the Proposed Development. The results show significant levels of junction delay and an RFC well above the theoretical maximum capacity of 1.0 in the AM peak. In the PM peak, the left turn from Howes Lane experiences a queue of 112 PCUs and an RFC of 1.29. It must be acknowledged that based on the results presented in **Table 2-1**, the existing priority junction arrangement will fail in the near future (certainly earlier than 2026) if no mitigation is proposed to alleviate the level of traffic growth that is expected on the local highway network, even without any further development.

2.2.3 The junction performance deteriorates further with the addition of traffic flows associated with the Proposed Development, although it is noted that the junction is already well over capacity in the BTM Base 2026 scenario.

2.2.4 As the traffic flows within the BTM 2026 Reference Case scenario are considered to be predicted flows, which have not been derived from observed traffic surveys, it is not possible to calibrate the junction with the BTM flows to ensure that the model is appropriately reflecting the real-life performance of the junction.

2.2.5 In order to provide a comparison to the BTM data and modelling above, the observed traffic flows obtained by VTP for the period during the week commencing the 31st of January 2022 will be used as a benchmark to present and compare against the current conditions at the junction.

2.3 OBSERVED TRAFFIC DATA

2.3.1 A series of traffic surveys were undertaken during the week commencing the 31st of January 2022. The timings for the surveys were agreed as acceptable with OCC prior to the surveys being undertaken.

2.3.2 The surveys incorporated manual classified counts (MCC) at the existing A4095 Howes Lane / Bucknell Road junction, which also included queue length surveys and video data. The MCC, queue length, and video data also included the A4095 Lords Lane / Bucknell Road roundabout, located to the immediate north of the existing priority junction and just to the north of the railway bridge that crosses the link between the two junctions.

2.3.3 In addition to this, an automatic traffic counter (ATC) was placed on the A4095 Howes Lane approximately 190m to the west of the A4095 Howes Lane / Bucknell Road junction for the period of one week to capture both vehicle speeds and total vehicle flows.

2.3.4 Further video cameras were placed around the existing junction to capture the length of any existing vehicle queues along the A4095 both to the east and west of the A4095 Howes Lane / Bucknell Road junction, capturing the potential for any queues that may be blocking the A4095 Howes Lane / Shakespeare Drive

signal junction and the A4095 Lords Lane / Trefoil Drive priority junction.

2.3.5 For completeness, traffic flow diagrams for the Observed 2022 data are included at **ATTACHMENT C**.

2.3.6 A copy of the full traffic survey data is included at **ATTACHMENT D**, with the video evidence available upon request.

2.4 TRAFFIC SURVEY OBSERVATIONS

2.4.1 The following key observations were made through reviewing the observed traffic survey data and the videos.

DOMINANT FLOWS

2.4.2 The dominant flow at the junction was observed to be vehicles turning right from Bucknell Road (north) into the A4095 Howes Lane in the AM peak hour and vehicles turning left from the A4095 Howes Lane into Bucknell Road (north) in the PM peak hour, with these movements equating to 75% of the total flow at this junction.

2.4.3 The overall junction peak was identified as being 08:00-09:00 for the AM peak and 17:00-18:00 for the PM peak.

BUCKNELL ROAD

2.4.4 It was observed that the right turn movement from Bucknell Road (north) onto the A4095 Howes Lane was almost always queueing. However, the queues generally dissipated quickly and formed 'slither' queues, where vehicles slowly rolled whilst waiting for a gap to turn onto the A4095 Howes Lane.

2.4.5 During the morning peak hours, it was observed that vehicles queue back through the A4095 Lords Lane / Bucknell Road roundabout and this queue extended beyond the junction of the A4095 Lords Lane / Trefoil Drive junction, with a peak queue of 12 vehicles counted east of the A4095 Lords Lane / Trefoil Drive junction between 08:25 to 08:35. This would equate to a queue of approximately 300m (or 53 PCUs, assuming one car is 5.75m in length) at the A4095 Howes Lane / Bucknell Road priority junction for vehicles waiting to turn right onto the A4095 Howes Lane.

A4095 HOWES LANE

2.4.6 Similarly, there was typically always a queue observed along the A4095 Howes Lane left turn lane, although again, this formed a 'slither' queue rather than the vehicles being left stationary. The maximum observed queue was a total of 24 vehicles or approximately 135m from the junction.

2.4.7 At no point did the queues block past the A4095 Howes Lane / Shakespeare Drive signal junction.

DRIVER POSITION

2.4.8 With respect to driver position, it is noted that most vehicles turning right from Bucknell Road (north) onto the A4095 Howes Lane significantly overrun the centre line into the right turn lane on the A4095 Howes Lane. This causes conflict for any large vehicles turning right from Bucknell Road if a vehicle is waiting to turn right from the A4095 Howes Lane, to travel south along Bucknell Road (south).

HEAVY GOODS VEHICLES

2.4.9 In relation to Heavy Goods Vehicles (HGV), **Figure 2-1** presents a snapshot from the morning peak hour and

shows a large HGV turning left onto Bucknell Road (north) from the A4095 Howes Lane, which swings over the opposing side of the carriageway and causes the oncoming vehicle travelling southbound on Bucknell Road to give way.

2.4.10 When two HGVs attempt to pass, this is only possible where a vehicle is not waiting in the right turn lane on the A4095 Howes Lane. This movement also requires the two HGVs to give way to each other. The HGV turning left from the A4095 Howes Lane again swings over into the southbound lane of Bucknell Road, causing the vehicles to give way, as shown on the extract from the morning peak hour in **Figure 2-2**.

Figure 2-1: HGV turning left from A4095 Howes Lane

Figure 2-2: HGVs attempting to pass simultaneously at junction

PEDESTRIANS AND CYCLISTS

2.4.11 Very few pedestrians were observed using the junction, with less than 10 pedestrians observed across each peak hour. It is noted that no pedestrians were observed crossing the junction from the east of Bucknell

Road to the west, with all of the demand identified along Bucknell Road in a north-south direction. It was observed that the majority of pedestrians travel southbound in the AM peak and northbound in the PM peak. It is acknowledged that a Bridleway (129/9/10) is provided to the north of the A4095 Howes Lane

2.4.12 With respect to cyclists, there were few very observed using the junction. A total of 3 cyclists were recorded using the junction across both the AM and PM peak hours. Across the duration of the survey, a total of 35 two-way cyclist trips were recorded.

2.5 JUNCTION MODELLING

2.5.1 Whilst it is acknowledged that OCC specifically requested an assessment of the BTM 2026 Reference Case scenario, a capacity assessment of the observed 2022 flows using Junctions 10 is provided within **Table 2-2**. Aside from the use of the observed 2022 traffic flows, the methodology is otherwise as presented within Section 2.1 of this TN.

Table 2-2: A4095 Howes Lane / Bucknell Road - Existing Junction Operation (Observed 2022 Flows)

SCENARIO	ARM	AM PEAK (08:00-09:00)			PM PEAK (17:00-18:00)		
		QUEUE	RFC	JUNCTION DELAY (s)	QUEUE	RFC	JUNCTION DELAY (s)
Observed 2022	Howes Lane (Left Turn)	8.5	0.93	412.85	4.1	0.80	11.02
	Howes Lane (Right Turn)	1.4	0.62		0.1	0.08	
	Bucknell Road N (Right Turn)	165.0	1.33		0.6	0.29	

2.5.2 The modelling assessment of the observed flows suggests the junction operates above capacity in the AM peak, with the RFC on Bucknell Road (north) exceeding 1.0 and the A4095 Howes Lane approach nearing full capacity. In the PM, the junction operates with some spare capacity, with only the A4095 Howes Lane (Left Turn) movement close to capacity with an RFC of 0.80.

CALIBRATION AND COMPARISON

2.5.3 It is noted that due to the limitations within the PICADY module of Junctions 10, it is not possible to calibrate the model precisely using queues or adjustments. However, it is acknowledged that the Observed 2022 model in the AM peak does capture significant queuing on Bucknell Road (north) with vehicles waiting to turn right, which was observed within the video data. However, the queue as modelled (165 PCUs) significantly exceeds the queue that was observed (53 PCUs) in the surveys.

2.5.4 In comparison to the BTM Base 2026 assessment presented within **Table 2-1**, the results of the observed modelling generally align and are consistent with what the BTM data would suggest. Across each of the arms and both peak hours, the RFCs and queues increase proportionally in the BTM Base 2026 scenario – as would be expected to reflect the increase in traffic flows associated with additional development and background strategic growth.

2.5.5 On that basis, it is considered that the junction models are appropriately representing the current observed conditions at the junction (as far as is practicably possible within limitations of the software) and that the results of the BTM 2026 Reference Case scenarios are appropriate to compare to any proposed mitigation scheme.

3 PROPOSED MITIGATION STRATEGY

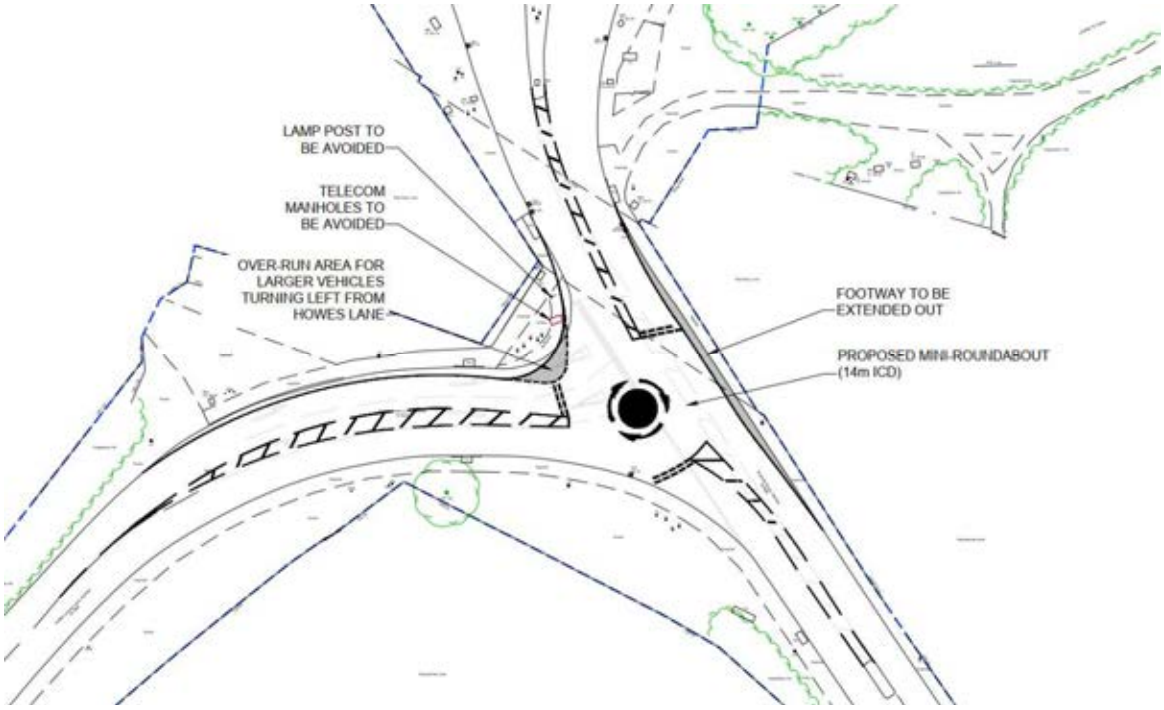
3.1 MITIGATION SCHEME

3.1.1 To mitigate the impact of the traffic associated with heh 530 dwellings of the Proposed Development at the junction and improve the operation of the existing A4095 Howes Lane / Bucknell Road priority junction, a mitigation scheme in the form of a proposed mini-roundabout arrangement has been developed.

3.1.2 The proposed mini-roundabout design has been developed in accordance with the requirements of the Design Manual for Roads and Bridges (DMRB) CD 116 Revision 2 'Geometric Design of Roundabouts'.

3.1.3 A plan showing the proposed arrangement of the mini-roundabout is included at **ATTACHMENT E,** and an extract of the General Arrangement is presented below in **Figure 3-1**.

Figure 3-1: Proposed Mini-roundabout General Arrangement



3.1.4 The proposed plans at **ATTACHMENT E** also include a design review of the proposed mini-roundabout arrangement with respect to the Stopping Sight Distance (SSD) and Visibility parameters as set out within DMRB, as well as swept path analysis.

3.2 DEPARTURES FROM STANDARDS

3.2.1 The desirable minimum SSD for roads with a design speed of 50kph (30mph), which both the A4095 Howes Lane and Bucknell Road are identified as, should be 70m (Table 2.10 of CD 109). Whilst the SSD for both the A4095 Howes Lane and the Bucknell Road northbound approaches can be achieved, the SSD for the southbound approach is identified as being in the order of 37m. This is less than "one step below desirable minimum" for a 30mph road, but it must be acknowledged that with the introduction of the give way line for the proposed mini-roundabout, vehicle speeds approaching from the north will be considerably lower than the design speed of 30mph.

3.2.2 It is also noted that due to the dominance of flows for vehicles turning right from Bucknell Road (north) onto the A4095 Howes Lane, this movement was observed to be queueing during the video surveys, again strengthening the case that vehicles are not approaching speeds of 30mph at present.

3.2.3 The visibility splay from the southbound Bucknell Road give way line at the proposed mini-roundabout junction identifies an 'F' distance of less than the recommended 9.0m (paragraph 5.24 of CD 116). Whilst an 'F' distance of 4.5m is achievable in accordance with CD 116, the projected flows on the southbound arm of Bucknell Road (north) exceed the suggested threshold of 300 vehicles per hour.

3.2.4 To compensate for the shortfall in the 'F' distance, appropriate signage will be implemented in accordance with the Traffic Signs Regulations and General Directions (TSRGD) to ensure drivers can see approaching vehicles without encroaching past the give way line.

3.3 ROAD SAFETY

3.3.1 In terms of road safety, it is noted that the collision data purchased from OCC for the latest five-year period (01/01/2016 – 31/12/2021) suggests that there were no recorded collisions at the junction with the existing layout. For completeness, a copy of the collision data is included at **ATTACHMENT F**.

3.3.2 With respect to the road safety implications of the proposed mini-roundabout scheme, it is acknowledged that the Department for Transport (DfT) 'Mini-roundabouts: Good Practice Guidance' (2011) document states within paragraph 2.5:

> *"Mini-roundabouts are most commonly introduced as an accident remedial measure:*
>
> - *to reduce the number of accidents at a junction. For 3-arm sites, the mean accident rate for mini-roundabouts is similar to that of priority T-junctions and about 30% less than for signalled junctions.*
> - *to reduce the severity of accidents at a junction. The severity of accidents (percentage of fatal and serious accidents to all injury accidents) at 3-arm mini-roundabout sites is lower than at 3-arm signalled junctions and considerably lower than at 30 mph T-junctions."*

3.3.3 The DfT extract suggests that in road safety and collision terms, the proposed mini-roundabout arrangement would be comparable in terms of the number of accidents to the existing priority junction arrangement and would result in fewer accidents than a traffic signal arrangement.

3.3.4 In addition, the DfT extract suggests that the proposed mini-roundabout arrangement would reduce the severity of any accidents that do occur from both the existing priority arrangement and any potential traffic signal junction scheme.

3.3.5 It can therefore be regarded that the proposed mitigation scheme in the form of a mini-roundabout junction provides a road safety improvement from the existing priority junction arrangement.

ROAD SAFETY AUDIT

3.3.6 In order to ensure that the proposed mini-roundabout scheme is appropriate in terms of road safety, a Stage 1 Road Safety Audit (RSA) has been undertaken by an independent auditor and in accordance with GG119 requirements.

3.3.7 An associated Designer's Response has been prepared, which responds to the comments raised within the Stage 1 RSA. For completeness, a copy of the Stage 1 RSA and accompanying Designer's Response is included

at **ATTACHMENT G**.

3.3.8 In summary, the majority of the points raised within the Stage 1 RSA will be addressed at the Detailed Design stage, subject to the proposals being considered acceptable. It is noted that concerns were raised within the Stage 1 RSA regarding the existing pedestrian provision and crossing visibility on Bucknell Road (north), although it is noted that this is an existing constraint and improvements to this issue could be incorporated at the Detailed Design stage of the proposal.

3.3.9 In parallel to the Stage 1 RSA being produced, the approach lane width on the A4095 Howes Lane arm was reduced to ensure that it is treated as a single lane approach by traffic rather than a two-lane approach. However, this change is not considered material to the comments received within the Stage 1 RSA or the Designer's Response.

3.3.10 In addition to the Stage 1 RSA of the proposed mini-roundabout arrangement, an additional road safety audit was undertaken regarding the principle of converting the existing priority junction. This additional road safety audit is also provided at **ATTACHMENT H**.

3.3.11 In conclusion, the auditor stated the following within paragraphs 4.2.4 to 4.2.5:

> *"With the absence of strong evidence to rule out the conversion of the junction to a mini-roundabout, there are some benefits in such a conversion, and these are associated with traffic capacity improvements and introducing priority for right turning movements from Bucknell Road, which would assist in capacity improvement and play a part in reducing potential junction blocking at the Lords Lane roundabout, which would in turn reduce the likelihood of collisions associated with such junction blocking.*
>
> *Overall, the conversion of the existing T-junction would provide positive impacts in terms of traffic capacity, to enable a level of residential development to be implemented. Any adverse effects that may be associated with such a conversion are questionable and appear to be able to be mitigated by a 'best practice' design of the three armed mini-roundabout."*

3.4 VULNERABLE ROAD USERS

3.4.1 With respect to pedestrians, it is acknowledged that there is little existing demand, with less than 10 pedestrians observed across each peak hour. The vast majority of the pedestrian demand was along the eastern footway of Bucknell Road. No pedestrians were observed crossing Bucknell Road (under the railway bridge) or at any of the arms at the junction.

3.4.2 Nevertheless, the proposals seek to improve pedestrian provision at the junction by increasing the width of the footway along the eastern side of Bucknell Road. This provides an improvement along the link with the greatest level of pedestrian demand.

3.4.3 In addition, for any pedestrians that may wish to cross the A4095 Howes Lane at the existing uncontrolled crossing, which is located approximately 15m to the west of the existing give way line, the proposals reduce the number of lanes that pedestrians would need to cross from three to two, meaning pedestrians have more opportunities to cross the road and less lanes of traffic to negotiate. This is arguably an improvement in safety terms for pedestrians.

3.4.4 In relation to cyclists and mini-roundabouts, paragraphs 10.7.33 to 10.7.35 of Local Transport Note (LTN) 1/20 states:

> *"Mini-roundabouts can work well for cycling in a mixed traffic environment (see Section 4.2) when traffic speeds and volumes are low and can provide an alternative to priority junctions since traffic on all arms is required to give way*
>
> *…They should be designed to reduce speeds at the junction using tight geometry, with single lane approaches and exits so that cyclists and motor vehicles pass through the roundabout in a single stream (see Figure 10.46). To be comfortable for cycling, the inscribed circle diameter should not be greater than 15.0m"*

3.4.5 Whilst it is acknowledged that the traffic volumes through the junction are considered to be high, in response to the suggestion of LTN 1/20, the proposed mini-roundabout arrangement has single lane approaches on all arms, and the ICD is less than 15m.

3.4.6 It is therefore considered that the proposed mitigation scheme thereby provides an improvement for both pedestrians and cyclists from the existing arrangement.

3.5 OPERATIONAL FLOWS

3.5.1 It is noted that at present, two HGVs cannot pass simultaneously and any HGV turning left from the A4095 Howes Lane onto Bucknell Road (north) swings over the centreline into the opposing southbound lane of Bucknell Road (north), causing the southbound vehicle to give way to the HGV.

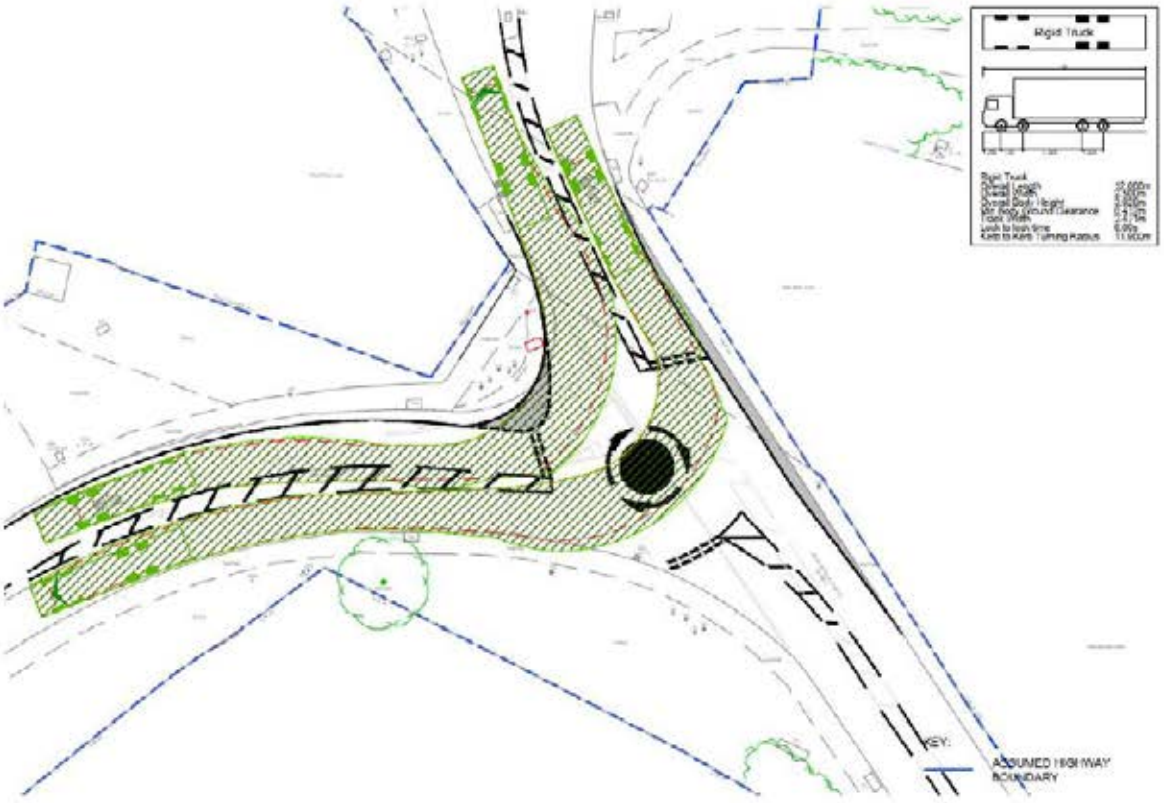
3.5.2 The proposed mitigation scheme seeks to revise the north western kerb line of the junction and provide an increased entry radius for vehicles turning left from the A4095 Howes Lane onto Bucknell Road (north). It is anticipated that this area will be hatched and identified as a vehicle overrun area to reduce maintenance.

3.5.3 With respect to HGVs, swept path analysis has been undertaken of the proposed mitigation scheme showing that vehicles up to a 16.5m max articulated vehicle can now pass through the junction without the need to cross over the reconfigured central hatched area of Bucknell Road (north) and into the lane of oncoming traffic. It is noted that this is not possible at present without significant incursion into the opposing lane.

3.5.4 In addition, two 12m rigid vehicles can now pass simultaneously through the junction, as well as other HGVs and a car. An extract of this movement is included in **Figure 3-2,** and a full copy is provided at **ATTACHMENT E.**

3.5.5 The proposed mitigation scheme, therefore, provides operational improvements from the existing arrangement by allowing easier movement of vehicles, particularly HGVs, through the junction without incursion into the opposing lanes.

Figure 3-2: Proposed Mini-roundabout Arrangement Swept Path Analysis



3.6 JUNCTION CAPACITY

3.6.1 An assessment of the proposed mitigation scheme using the BTM 2026 Reference Case flows is provided in **Table 3-1**.

3.6.2 The junction modelling parameters for the proposed mini-roundabout arrangement are provided within **ATTACHMENT I**, with a copy of the Junctions 10 output files included at **ATTACHMENT J**.

3.6.3 Aside from the junction geometry, the methodology is otherwise as per the methodology discussed within Section 2.1 of this TN.

Table 3-1: A4095 Howes Lane / Bucknell Road - Proposed Mitigation Scheme (BTM Flows)

SCENARIO	ARM	AM PEAK (08:00-09:00)			PM PEAK (17:00-18:00)		
		QUEUE	RFC	JUNCTION DELAY (s)	QUEUE	RFC	JUNCTION DELAY (s)
BTM Base 2026	Bucknell Road (south)	4.5	0.82	132	1.9	0.64	350
	A4095 Howes Lane	3.5	0.77		55.8	1.12	
	Bucknell Road (North)	68.1	1.13		153.8	1.27	
BTM Base 2026 + Proposed Development	Bucknell Road (south)	5	0.84	309	1.9	0.63	527
	A4095 Howes Lane	4.9	0.83		105.7	1.25	

SCENARIO	ARM	AM PEAK (08:00-09:00)			PM PEAK (17:00-18:00)		
		QUEUE	RFC	JUNCTION DELAY (s)	QUEUE	RFC	JUNCTION DELAY (s)
	Bucknell Road (North)	149.5	1.27		208.4	1.34	

3.6.4 The results of the junction modelling for the proposed mitigation scheme suggests that in the AM peak, the Bucknell Road (north) approach will have an RFC of 1.13, which rises to an RFC of 1.27 with the addition of the traffic associated with the Proposed Development. The total delay at the junction increases from 132 seconds in the BTM Base 2026 scenario to 309 seconds with the addition of the traffic associated with the Proposed Development.

3.6.5 In the PM peak, the RFC on both the A4095 Howes Lane and Bucknell Road (north) approaches both exceed an RFC of 1.0, with a respective RFC of 1.12 and 1.27 in the BTM Base 2026 scenario. With the addition of the traffic associated with the Proposed Development, this increases to an RFC of 1.25 and 1.34, respectively. The total delay at the junction increases from 350 seconds to 527 seconds with the addition of the traffic associated with the Proposed Development.

3.7 MODELLING INTERPRETATION

3.7.1 A comparison of the junction modelling undertaken using the BTM 2026 Reference Case flows with both the existing priority junction arrangement and the proposed mitigation scheme in the form of a mini-roundabout, is discussed below.

AM PEAK HOUR

3.7.2 In the BTM Base 2026 scenario for the existing priority junction arrangement, a queue on the A4095 Howes Lane reaches a maximum of 30 PCUs (approximately 172.5m) and an RFC of 1.32 (excluding Howes Lane right turn). The queue on Bucknell Road is estimated to reach 193 PCUs (approximately 1,109.75m) with an RFC of 1.40. In terms of total delay, the modelling suggests a delay of 490 seconds across the junction, suggesting drivers would experience significant levels of delay.

3.7.3 With the proposed mini-roundabout mitigation scheme in the BTM Base 2026 + Proposed Development scenario, the queue on the A4095 Howes Lane reduces to approximately 5 PCUs (approximately 28.75m) with an RFC of 0.83. On Bucknell Road, the queue reduces to 150 PCUs (approximately 862.5m) with an RFC of 1.27. In terms of total delay, this would reduce to 309 seconds.

3.7.4 In summary, across the AM peak hour, the results of the junction modelling suggest that the proposed mitigation scheme achieves a nil detriment position, mitigating both the impact of the Proposed Development and providing a significant improvement from the BTM Base 2026 Scenario when considered in the context of the existing priority junction.

PM PEAK HOUR

3.7.5 In the BTM Base 2026 scenario for the existing priority junction arrangement, a queue on the A4095 Howes Lane reaches a maximum of 112 PCUs (approximately 644m) an RFC of 1.29. There is estimated to be a queue of 6 PCUs (approximately 34.5m) on Bucknell Road, with an RFC of 0.83. Across the junction, there will be a total delay of 200 seconds.

3.7.6 In the BTM Base 2026 + Proposed Development scenario for the existing junction arrangement, there is a queue of 195 vehicles (approximately 1,121.25m) on the A4095 Howes Lane, with an RFC of 1.44. The total junction delay reaches 346 seconds.

3.7.7 With the proposed mini-roundabout mitigation scheme in the BTM Base 2026 + Proposed Development scenario, the queues on the A4095 Howes Lane reduce to 105 PCUs (approximately 603.75m), with an RFC of 1.25. It is noted that the mitigation scheme results in an increase on Bucknell Road, with a queue of 208 PCUs (approximately 1,196.0m) and an RFC of 1.34.

3.7.8 Whilst the proposed mitigation scheme does not deliver a true nil detriment position in the PM peak, it does provide a significant improvement in the queueing along the A4095 Howes Lane, reducing the queue by approximately 90 PCUs (approximately 517.5m).

3.7.9 It is considered that this provides a significant improvement in the PM as it reduces the impact of queueing on the A4095 Howes Lane and reduces the likelihood of any queueing back through the A4095 / Shakespeare Drive signal junction, which could otherwise lead to potential road safety concerns.

SEVERITY THRESHOLDS

3.7.10 Specific reference is made to the severity thresholds referred to in the 2014 memorandum produced by Hyder Consulting in relation to the planning application for 'Application 1' (Planning Ref 14/01384/OUT). Within the memorandum, OCC identified the "severe" trigger point as the point where vehicles would queue back and block the A4095 / Shakespeare Drive Signal junction.

3.7.11 It is acknowledged that queues could impact the A4095 / Bucknell Road roundabout, with the historic assessments undertaken regarding a 10-vehicle queue on Bucknell Road as the maximum acceptable queue, which may partially queue into and through the existing roundabout junction of the A4095 Lords Lane / Bucknell Road.

3.7.12 It is also noted that across the modelling undertaken for both the existing arrangement and the proposed mitigation scheme, the queues on Bucknell Road typically exceed 10-vehicles in most scenarios assessed. In addition, this is occurring at present and was observed within the traffic surveys, with queues observed past the junction of the A4095 Lords Lane / Trefoil Drive in the AM peak, which is identified as being approximately 145m from the junction with the A4095 Howes Lane, or approximately 25-vehicles.

3.7.13 However, given the nature of roundabouts and the observed existing junction operation, it is considered that these queues form 'sliver queues' and still allow traffic to move slowly through the junction. It is regarded that queues at this junction would therefore not present as much of a safety concern as any queues at the A4095 / Shakespeare Drive signal junction, as drivers would just wait to give way.

3.7.14 From a review of the geometry along the A4095 Howes Lane, it is considered that the key tipping point is reached when the queue exceeds 390m or is the equivalent to a queue of 65 PCUs, which would cause vehicles to block back and queue through the A4095 / Shakespeare Drive signal junction.

3.7.15 In relation to the existing arrangement, the queues on the A4095 Howes Lane exceed 65 PCUs in the BTM Base 2026 PM peak. Whilst this was not observed to be taking place at present, it is likely this could occur with the predicted additional traffic growth.

3.7.16 However, with the implementation of the proposed mitigation scheme, the queueing on the A4095 Howes Lane only exceeds 65 PCUs in the PM peak of the BTM Base 2026 + Proposed Development scenario. Nonetheless, this still presents a reduction of 90 PCUs from the BTM Base 2026 Scenario with the existing

arrangement in the PM peak, which would take place regardless of the Proposed Development coming forward or any mitigation being delivered.

3.7.17 On that basis, it is considered that the proposed interim improvement scheme in the form of a mini-roundabout associated with the Proposed Development provides a material improvement on the A4095 Howes Lane using the severity thresholds previously identified by OCC.

3.8 DELIVERY

3.8.1 Subject to a successful planning consent being granted, the Applicant would commit to funding the delivery of the proposed interim improvement mitigation scheme by way of a Section 278 agreement, which would enable the Proposed Development to come forward with no restrictions on the number of units that could be delivered prior to the A4095 Strategic Highway Improvements being implemented.

4 CONCLUSIONS

4.1 OVERVIEW

4.1.1 Velocity Transport Planning (VTP) has been appointed by Firethorn Trust (The Applicant) to provide highways and transport planning advice for an outline planning application relating to the development of up to 530 dwellings on land which forms part of the North West Bicester Eco Town development, located in Oxfordshire.

4.1.2 Following submission of the planning application, consultation responses were received from OCC and CDC, which resulted in further assessment of the A4095 Howes Lane / Bucknell Road junction.

4.1.3 In addition to the feedback received from OCC, it is also now understood that the funding and timescales for the delivery of the permitted A4095 Strategic Highway Improvements (Planning Ref 14/01968/F) are uncertain.

4.1.4 The purpose of this Technical Note is to identify the current and predicted operation of the existing priority junction arrangement of the A4095 Howes Lane / Bucknell Road junction, compared with the predicted operation of a proposed interim improvement to this junction in the form of a mini-roundabout that could be delivered by The Applicant prior to the implementation of the A4095 Strategic Highway Improvement.

4.1.5 The junction modelling was undertaken using the latest version of the BTM 2026 Reference Case traffic flows that were provided by OCC.

4.2 EXISTING JUNCTION

4.2.1 The modelling for the existing priority junction arrangement suggests that the junction will operate significantly over capacity in the BTM Base 2026 future scenario, with significant levels of junction delay and an RFC well above the theoretical maximum capacity of 1.0 in the AM peak. In the PM peak, the left turn from Howes Lane experiences a queue of 112 PCUs and an RFC of 1.29.

4.2.2 The junction performance deteriorates further with the addition of the traffic associated with the Proposed Development, although it is noted that the junction is already well over capacity in the BTM Base 2026 scenario.

4.2.3 As an exercise to determine whether the BTM 2026 Reference Case flows were reasonable, traffic surveys were undertaken during the week commencing the 31st of January 2022.

4.2.4 A series of key observations from the surveys were made at the existing junction, including:

- The dominant flows at the junction are vehicles turning right from Bucknell Road (north) into the A4095 Howes Lane and vehicles turning left onto Bucknell Road (north) from the A4095 Howes Lane, with these movements equating to 75% of the total flow at this junction;
- Most vehicles turning right from Bucknell Road (north) into the A4095 Howes Lane significantly overrun the centre line of the right turn lane on the A4095 Howes Lane. This causes conflict for any large vehicles turning right from Bucknell Road (north) if a vehicle is waiting to turn right from the A4095 Howes Lane to travel south along Bucknell Road (south);
- HGVs turning left from the A4095 Howes Lane swing over the central hatching of Bucknell Road (north) into the opposing side of the carriageway and require southbound vehicles to give way;

- Vehicles turning right from Bucknell Road (north) onto the A4095 Howes Lane were observed to queue through the A4095 Lords Lane / Bucknell Road roundabout and queue back past the junction of the A4095 Lords Lane / Trefoil Drive in some instances;
- Queues were observed on the A4095 Howes Lane approach throughout the survey, with the vast majority of vehicles waiting to turn left onto Bucknell Road (north). However, the observed queues did not extend back as far as the junction of the A4095 Howes Lane / Shakespeare Drive signal junction; and
- Pedestrian and cyclist demand through the junction was very low, with no pedestrians observed crossing the junction at all over the survey period.

4.2.5 Using the observed flows from 2022, the existing junction arrangement was again modelled to ensure that the future BTM Base 2026 future scenario flows were reasonable in relation to what is taking place at present.

4.2.6 In summary, it is considered that the junction models are appropriately representing the current observed conditions at the junction (as far as is practicably possible within the limitations of the software) and that the results of the BTM 2026 Reference Case scenarios are appropriate to compare to any proposed mitigation scheme.

4.3 PROPOSED MITIGATION SCHEME

4.3.1 To mitigate the impact of the traffic associated with the Proposed Development at the junction and improve the operation of the existing A4095 Howes Lane / Bucknell Road priority junction, an interim mitigation scheme in the form of a proposed mini-roundabout arrangement has been developed.

4.3.2 The proposed mini-roundabout scheme has been designed in accordance with the requirements of the Design Manual for Roads and Bridges (DMRB) CD 116 Revision 2 'Geometric Design of Roundabouts'

4.3.3 The general arrangement of the proposed mini-roundabout is presented on the VTP drawing included at **ATTACHMENT E** and offers the following improvements from the existing priority junction arrangement:

- Improved provision for pedestrians, cyclists and other road users by reducing speeds and the number of lanes of traffic that need to be crossed;
- Improvements of the operational flows of HGVs, with two HGVs now able to pass simultaneously, as well as the reinforcement of appropriate driver position;
- Improvements in road safety, with research suggesting mini-roundabouts reduce the severity of collisions when compared to priority junctions; and
- Improvements in junction capacity, with the proposed mitigation scheme providing a nil detriment position in the AM peak and improving overall junction performance, whilst significantly reducing the queues on the A4095 Howes Lane in the PM peak.

4.3.4 Crucially, the proposed mitigation scheme reduces queueing back on the A4095 Howes Lane back through the A4095 Howes Lane / Shakespeare Drive signal junction, which is predicted to happen in the BTM Base 2026 year PM peak irrespective of whether the Proposed Development comes forward or not.

4.3.5 A Stage 1 Road Safety Audit and accompanying Designer's Response is included at **ATTACHMENT G**. In addition, the independent auditor has provided a Road Safety Assessment that compares the existing priority junction arrangement with the proposed mini-roundabout junction arrangement, which concludes

that the conversion of the existing priority junction to the proposed mini-roundabout junction would be positive.

4.4 SUMMARY AND CONCLUSIONS

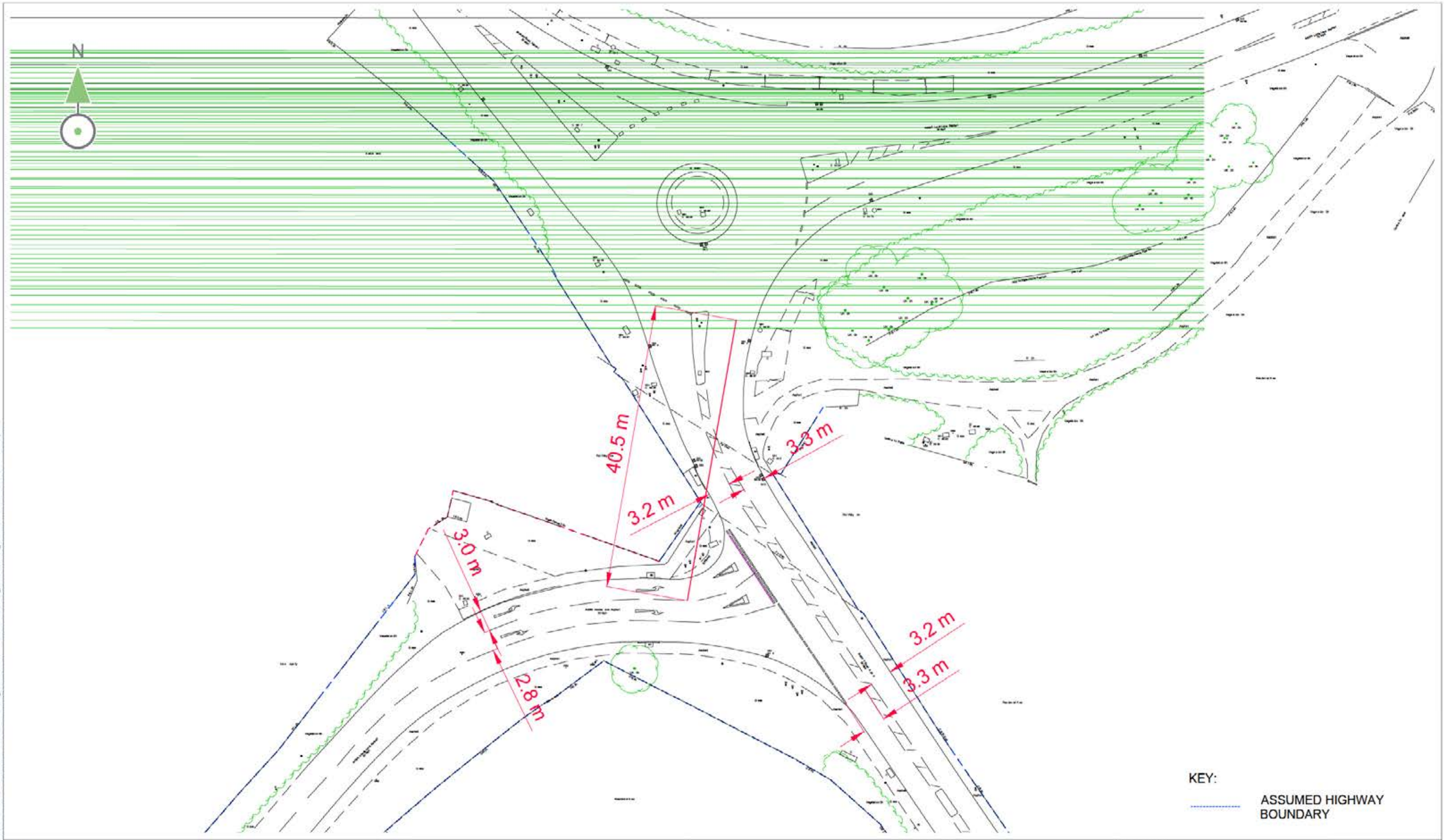
4.4.1 It is generally accepted that the committed A4095 Strategic Highway Improvements are required to alleviate pressure at the A4095 Howes Lane / Bucknell Road junction and across the local highway network to address the cumulative impact of the traffic associated with the allocated sites included within the adopted CDC Local Plan.

4.4.2 However, the proposed mini-roundabout mitigation scheme seeks to provide an interim mitigation solution that will accommodate the full level of development associated with the 530 dwellings prior to the implementation of the A4095 Strategic Highway Improvements.

4.4.3 In conclusion, the proposed mitigation scheme and mini-roundabout arrangement provide a significant improvement from the existing arrangement, mitigating both the impact of the Proposed Development and improving the junction in a number of ways, including traffic capacity, road safety, access for HGVs and pedestrian and cyclist amenity.

ATTACHMENT A

EXISTING PRIORITY JUNCTION PARAMETERS



KEY:

ASSUMED HIGHWAY BOUNDARY

1:500

0 10m 20m 30m 40m 50m

Rev	Date	Description	Drn	Chk	App
A	01/03/22	FIRST ISSUE	GSF	CR	MK

Notes:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

VELOCITY Transport Planning

Drawing Status: S2 - FOR INFORMATION

Client: Firethorn TRUST

Architect:

Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD EXISTING JUNCTION MEASUREMENTS

Scale @ A3	Date	Designed/Drawn	Checked	Approved
1:500	01/03/22	GSF	CR	MK

Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-062	A

ATTACHMENT B

EXISTING PRIORITY JUNCTION – JUNCTIONS 10 OUTPUT FILES

Junctions 10

PICADY 10 - Priority Intersection Module

Filename 2022 03.14 - NW BICESTER - HOWES LANE (Existing).j10
Path P:\Firethorn Trust_4600\1100 - NW Bicester\Analysis\Modelling\Picady\BTM 2026 FLOWS
Report generation date 23/03/2022 16:09:06

- »BTM Base 2026, AM
- »BTM Base 2026, PM
- »BTM 2026 + Proposed Dev, AM
- »BTM 2026 + Proposed Dev, PM
- »OBS 2022, AM
- »OBS 2022, PM

Summary of junction performance

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)
BTM Base 2026												
Stream B C	D1	29.9	199.32	1.17	F	460.10	D2	112.1	600.00	1.29	F	200.45
Stream B A		6.3	2239.45	9999999999.00	F			0.1	22.66	0.08	C	
Stream C AB		193.0	893.76	1.40	F			6.3	15.61	0.76	C	
BTM 2026 + Proposed Dev												
Stream B C	D3	70.6	501.13	1.26	F	3755.06	D4	194.8	999.20	1.44	F	346.12
Stream B A		12.6	50000040.00	9999999999.00	F			0.1	24.40	0.08	C	
Stream C AB		340.9	1621.46	1.62	F			6.6	16.02	0.76	C	
OBS 2022												
Stream B C	D5	8.5	55.41	0.93	F	412.85	D6	4.1	27.03	0.80	D	11.02
Stream B A		1.4	217.54	0.62	F			0.1	11.28	0.08	B	
Stream C AB		105.0	750.00	1.33	F			0.0	6.49	0.29	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

Generated on 23/03/2022 16:10:53 using Junctions 10 (10.0.3.1598)

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	02/11/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	VTP\CRiddi
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	BTM Base 2026	AM	ONE HOUR	07:45	09:15	15
D2	BTM Base 2026	PM	ONE HOUR	16:45	18:15	15
D3	BTM 2026 + Proposed Dev	AM	ONE HOUR	07:45	09:15	15
D4	BTM 2026 + Proposed Dev	PM	ONE HOUR	16:45	18:15	15
D5	OBS 2022	AM	ONE HOUR	07:45	09:15	15
D6	OBS 2022	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

BTM Base 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		490.10	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	490.10	F

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.40			250.0	✓	1.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane Width (Left) (m)	Lane Width (Right) (m)	Visibility to left (m)	Visibility to right (m)
B	Two lanes	3.00	2.80	41	250

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A B	Slope for A C	Slope for C A	Slope for C B
B-A	602	0.108	0.272	0.171	0.389
B-C	781	0.118	0.297	-	-
C-B	719	0.274	0.274	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined in which case capacity will be adjusted.

Values are shown for the first time segment only they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	BTM Base 2026	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	470	100.000
B		✓	539	100.000
C		✓	915	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	526
	C	180	735	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B C	1.17	199.32	29.9	F
B A	9999999999.00	2239.45	6.3	F
C AB	1.40	893.76	193.0	F
C A				
AB				
AC				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	396	604	0.571	390	1.4	12.828	B
B A	10	289	0.034	10	0.0	14.180	B
C AB	662	744	0.890	632	7.4	31.579	D
C A	27			27			
AB	131			131			
AC	223			223			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	473	674	0.701	469	2.4	18.879	C
B A	12	218	0.054	12	0.1	19.222	C
C AB	823	751	1.096	732	30.0	106.545	F
C A	0			0			
AB	156			156			
AC	266			266			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	579	638	0.907	560	7.1	43.036	E
B A	14	102	0.140	14	0.2	44.618	E
C AB	1007	718	1.402	717	102.6	344.260	F
C A	0			0			
AB	192			192			
AC	326			326			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	579	496	1.167	488	29.9	156.461	F
B A	14	2	8.227	1	3.4	2239.448	F
C AB	1007	718	1.402	718	174.9	600.814	F
C A	0			0			
AB	192			192			
AC	326			326			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	473	513	0.922	506	21.5	199.317	F
B A	12	0	9999999999.000	0	6.3	1448.059	F
C AB	823	751	1.096	750	193.0	803.761	F
C A	0			0			
AB	156			156			
AC	266			266			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	396	525	0.755	466	4.1	84.937	F
B A	10	22	0.466	18	4.2	1074.123	F
C AB	662	744	0.890	747	171.6	892.302	F
C A	27			27			
AB	131			131			
AC	223			223			

TRL THE FUTURE OF TRANSPORT
Generated on 23/03/2022 16:10:53 using Junctions 10 (10.0.3.1598)

BTM Base 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		200.45	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	200.45	F

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	BTM Base 2026	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	504	100.000
B		✓	764	100.000
C		✓	1036	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	751
	C	646	390	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B C	1.29	600.80	112.1	F
B A	0.08	22.86	0.1	C
C AB	0.76	15.61	6.3	C
C A				
A B				
A C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	565	687	0.823	548	4.3	25.930	D
B A	10	323	0.030	10	0.0	12.623	B
C AB	412	863	0.477	407	1.4	8.631	A
C A	368			368			
A B	134			134			
A C	245			245			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	675	668	1.011	633	14.9	71.691	F
B A	12	267	0.044	12	0.0	15.483	C
C AB	562	954	0.589	558	2.4	10.070	B
C A	369			369			
A B	160			160			
A C	293			293			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	827	639	1.294	637	62.5	234.281	F
B A	14	191	0.075	14	0.1	22.336	C
C AB	848	1119	0.757	834	6.0	14.205	B
C A	293			293			
A B	196			196			
A C	359			359			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	827	639	1.294	638	109.6	489.225	F
B A	14	188	0.076	14	0.1	22.861	C
C AB	848	1119	0.757	846	6.3	15.611	C
C A	293			293			
A B	196			196			
A C	359			359			

Generated on 23/03/2022 16:10:53 using Junctions 10 (10.0.3.1598)

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	675	668	1.011	665	112.1	600.801	F
B A	12	262	0.045	12	0.1	15.841	C
C AB	562	954	0.589	577	2.7	11.133	B
C A	369			369			
A B	160			160			
A C	293			293			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	565	687	0.823	680	83.3	518.085	F
B A	10	320	0.031	10	0.0	12.772	B
C AB	412	863	0.477	417	1.5	9.037	A
C A	368			368			
A B	134			134			
A C	245			245			

BTM 2026 + Proposed Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		375579.06	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	375579.06	F

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	BTM 2026 + Proposed Dev	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	470	100.000
B		✓	581	100.000
C		✓	1031	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	568
	C	180	851	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Generated on 23/03/2022 16:10:53 using Junctions 10 (10.0.3.1598)

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B C	1.26	501.13	70.6	F
B A	9999999999.00	59999940.00	12.6	F
C AB	1.62	1521.48	340.9	F
C A				
AB				
AC				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	428	693	0.617	421	1.7	14.226	B
B A	10	266	0.038	10	0.0	59999940.000	F
C AB	776	753	1.030	704	18.1	59.006	F
C A	0			0			
AB	131			131			
AC	223			223			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	511	671	0.761	505	3.2	22.961	C
B A	12	162	0.072	12	0.1	59999940.000	F
C AB	927	731	1.268	727	68.0	228.615	F
C A	0			0			
AB	156			156			
AC	266			266			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	625	496	1.260	488	37.6	169.202	F
B A	14	0	9999999999.000	0	3.7	59999940.000	F
C AB	1135	699	1.623	699	177.1	640.395	F
C A	0			0			
AB	192			192			
AC	326			326			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	625	496	1.260	496	70.0	402.286	F
B A	14	0	9999999999.000	0	7.2	59999940.000	F
C AB	1135	699	1.623	699	286.1	1200.002	F
C A	0			0			
AB	192			192			
AC	326			326			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	511	513	0.996	508	70.6	501.128	F
B A	12	0	9999999999.000	0	10.2	59999940.000	F
C AB	927	731	1.268	731	335.1	1517.975	F
C A	0			0			
A B	156			156			
A C	266			266			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	428	525	0.815	517	48.4	417.042	F
B A	10	0	9999999999.000	0	12.6	59999940.000	F
C AB	776	753	1.030	753	340.9	1621.479	F
C A	0			0			
A B	131			131			
A C	223			223			

Generated on 23/03/2022 16:10:53 using Junctions 10 (10.0.3.1598)

BTM 2026 + Proposed Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		346.12	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	346.12	F

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	BTM 2026 + Proposed Dev	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	504	100.000
B		✓	850	100.000
C		✓	1093	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	837
	C	703	390	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B C	1.44	999.20	194.8	F
B A	0.08	24.40	0.1	C
C AB	0.76	15.02	6.6	C
C A				
A B				
A C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	630	687	0.917	600	7.6	37.521	E
B A	10	316	0.031	10	0.0	12.927	B
C AB	423	885	0.477	417	1.4	8.420	A
C A	400			400			
A B	134			134			
A C	245			245			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	752	668	1.127	656	31.6	125.981	F
B A	12	259	0.045	12	0.1	16.035	C
C AB	581	986	0.589	577	2.5	9.754	A
C A	402			402			
A B	160			160			
A C	293			293			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	922	638	1.444	638	102.6	391.276	F
B A	14	180	0.079	14	0.1	23.781	C
C AB	885	1168	0.757	870	6.2	13.650	B
C A	319			319			
A B	196			196			
A C	359			359			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	922	638	1.445	638	173.5	772.101	F
B A	14	177	0.081	14	0.1	24.396	C
C AB	885	1168	0.757	883	6.6	15.021	C
C A	319			319			
A B	196			196			
A C	359			359			

Generated on 23/03/2022 16:10:53 using Junctions 10 (10.0.3.1598)

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	752	667	1.128	667	194.8	999.195	F
B A	12	253	0.046	12	0.1	16.434	C
C AB	581	986	0.589	596	2.8	10.801	B
C A	402			402			
A B	160			160			
A C	293			293			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	630	687	0.917	683	181.6	992.150	F
B A	10	313	0.031	10	0.0	13.086	B
C AB	423	885	0.477	428	1.5	8.821	A
C A	400			400			
A B	134			134			
A C	245			245			

OBS 2022, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		412.85	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	412.85	F

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	OBS 2022	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	251	100.000
B		✓	540	100.000
C		✓	943	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	84	167
	B	29	0	511
	C	169	774	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

TRL THE FUTURE OF TRANSPORT
Generated on 23/03/2022 16:10:53 using Junctions 10 (10.0.3.1598)

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B C	0.93	55.41	8.5	F
B A	0.62	217.34	1.4	F
C AB	1.33	739.60	165.0	F
C A				
AB				
AC				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	305	724	0.532	300	1.2	11.366	B
B A	22	312	0.070	22	0.1	13.593	B
C AB	681	780	0.874	654	6.7	28.474	D
C A	29			29			
AB	63			63			
AC	126			126			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	459	708	0.649	456	1.9	15.537	C
B A	26	247	0.106	26	0.1	17.913	C
C AB	848	800	1.059	774	25.0	87.230	F
C A	0			0			
AB	76			76			
AC	150			150			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	563	675	0.833	552	4.6	29.768	D
B A	32	144	0.222	31	0.3	35.055	F
C AB	1038	784	1.325	782	89.2	274.638	F
C A	0			0			
AB	92			92			
AC	184			184			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	563	605	0.930	547	8.5	55.406	F
B A	32	54	0.595	28	1.2	143.388	F
C AB	1038	784	1.325	783	159.0	560.822	F
C A	0			0			
AB	92			92			
AC	184			184			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	459	595	0.772	476	4.2	36.763	E
B A	28	42	0.620	28	1.4	217.341	F
C AB	848	800	1.059	800	165.0	730.598	F
C A	0			0			
A B	76			76			
A C	150			150			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	385	675	0.570	395	1.5	14.679	B
B A	22	81	0.268	28	0.4	74.357	F
C AB	681	780	0.874	784	130.3	713.462	F
C A	29			29			
A B	63			63			
A C	126			126			

Generated on 23/03/2022 16:10:53 using Junctions 10 (10.0.3.1598)

OBS 2022, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		11.02	B

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	11.02	B

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	OBS 2022	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	174	100.000
B		✓	550	100.000
C		✓	709	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	44	130
	B	28	0	522
	C	536	173	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B C	0.80	27.03	4.1	D
B A	0.08	11.28	0.1	B
C AB	0.29	6.49	0.6	A
C A				
A B				
A C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	393	740	0.531	388	1.2	11.121	B
B A	21	452	0.047	21	0.1	9.179	A
C AB	147	772	0.191	146	0.3	6.314	A
C A	386			386			
A B	33			33			
A C	98			98			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	469	731	0.642	467	1.9	14.829	B
B A	25	422	0.060	25	0.1	9.964	A
C AB	185	803	0.230	184	0.4	6.404	A
C A	453			453			
A B	40			40			
A C	117			117			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	575	718	0.800	567	3.9	24.881	C
B A	31	382	0.081	31	0.1	11.266	B
C AB	245	855	0.286	244	0.6	6.479	A
C A	536			536			
A B	48			48			
A C	143			143			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	575	718	0.800	574	4.1	27.033	D
B A	31	382	0.081	31	0.1	11.279	B
C AB	245	855	0.286	244	0.6	6.494	A
C A	536			536			
A B	48			48			
A C	143			143			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	469	731	0.642	477	2.1	16.109	C
B A	25	422	0.060	25	0.1	9.982	A
C AB	185	803	0.230	185	0.4	6.428	A
C A	453			453			
A B	40			40			
A C	117			117			

18:00 - 18:15

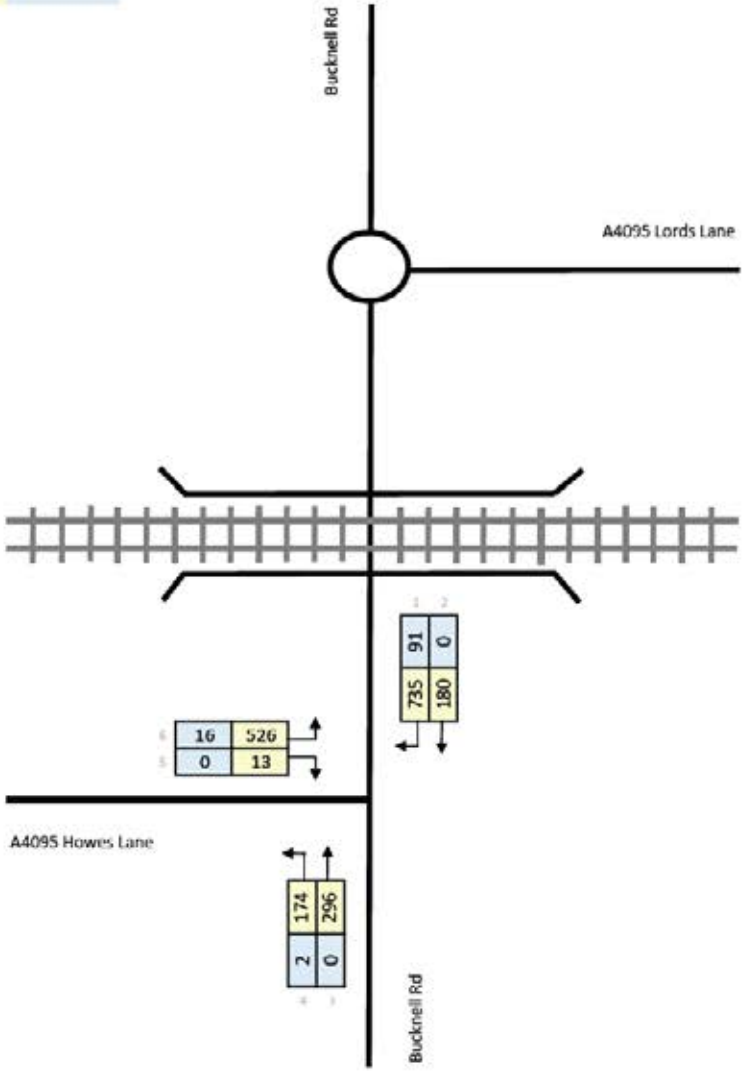
Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B C	393	739	0.531	396	1.3	11.636	B
B A	21	451	0.047	21	0.1	9.203	A
C AB	147	772	0.191	148	0.3	6.345	A
C A	386			386			
A B	33			33			
A C	98			98			

ATTACHMENT C

TRAFFIC FLOW DIAGRAMS

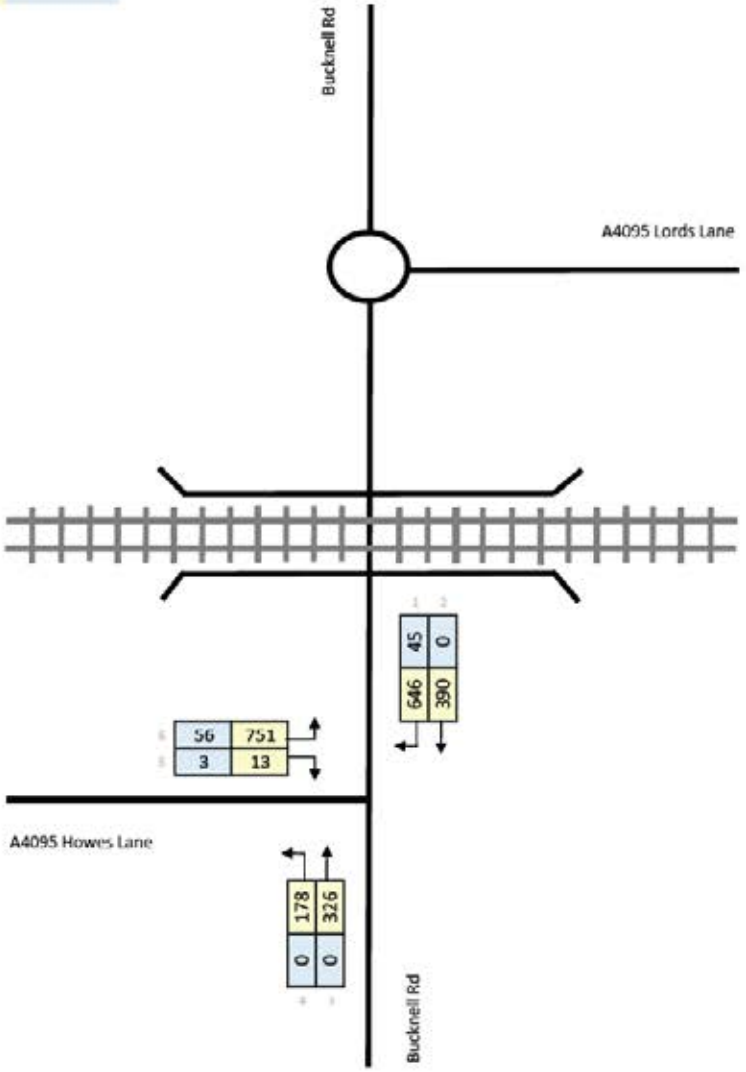
AM PEAK

PCUS	HGVS



PM PEAK

PCUS	HGVS



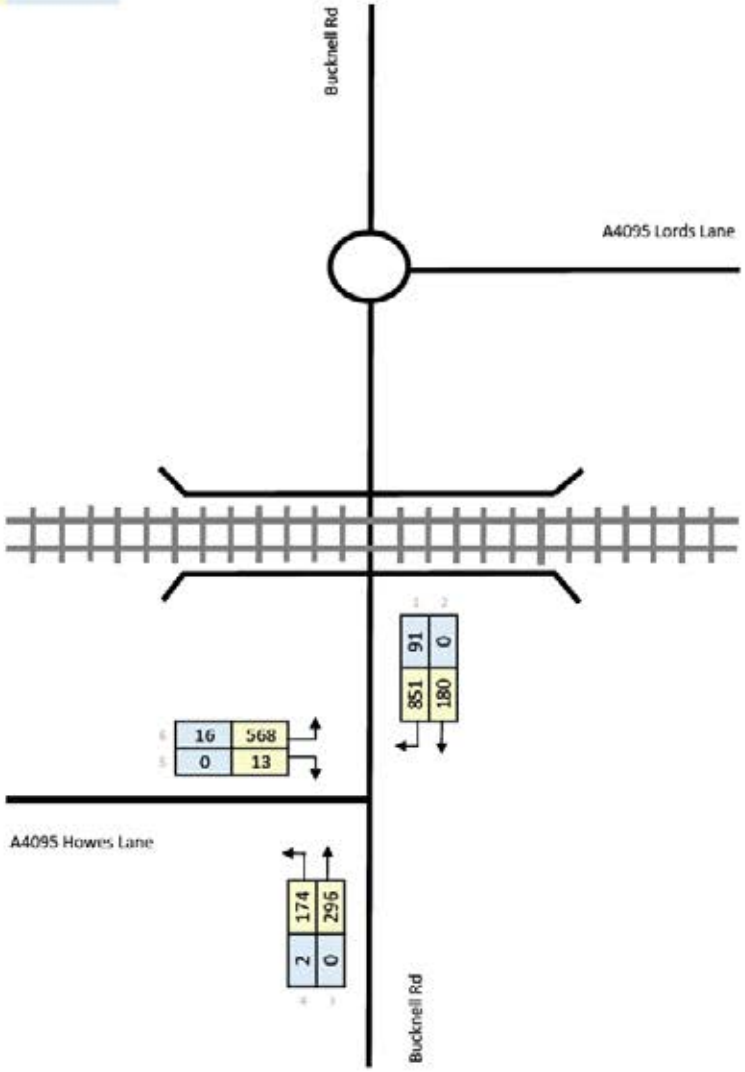
Traffic Flows from the BTM
All Flows in PCUs

Project:	Land at North West Bicester	Title:	BTM INTERIM 'REFERENCE CASE' BASE 2026 SCENARIO	Date: 25/03/2022
Client:	Firethorn Trust		AM AND PM PEAK FLOWS	Diagram: A

VELOCITY Transport Planning
www.velocity-tp.com

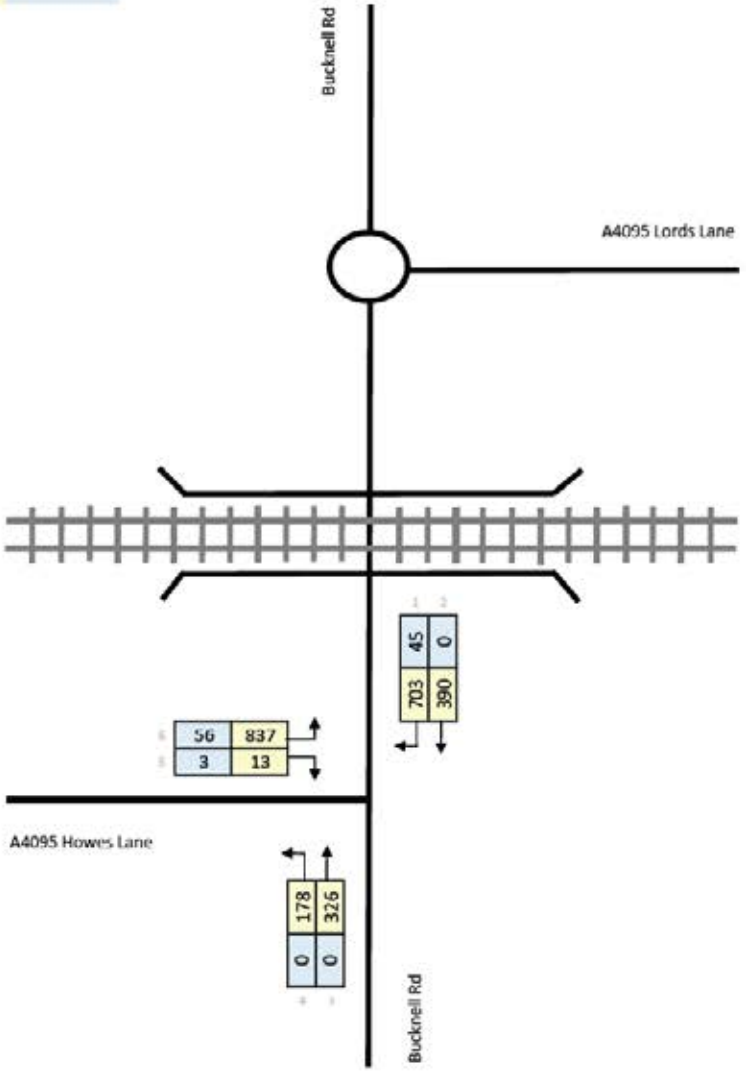
AM PEAK

PCUS	HGVS



PM PEAK

PCUS	HGVS



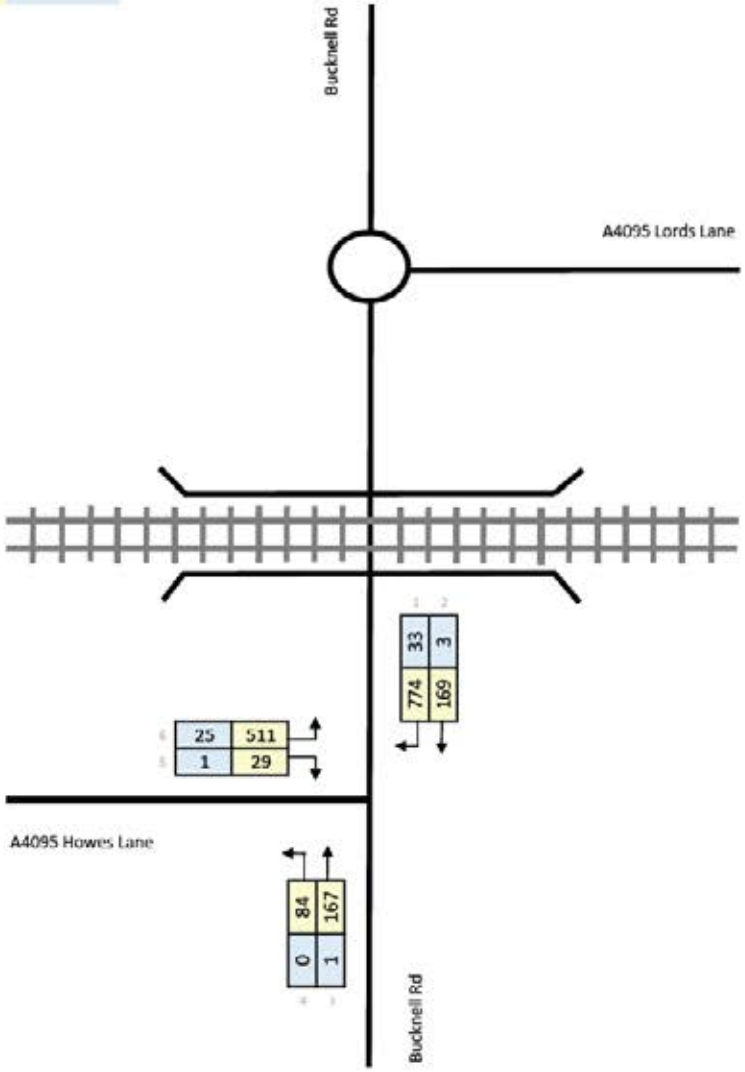
Traffic Flows from the BTM
All Flows in PCUs

Project:	Land at North West Bicester	Title:	BTM BASE 2026 + PROPOSED DEVELOPMENT SCENARIO	Date: 25/03/2022
Client:	Firethorn Trust		AM AND PM PEAK FLOWS	Diagram: B

VELOCITY Transport Planning
www.velocity-tp.com

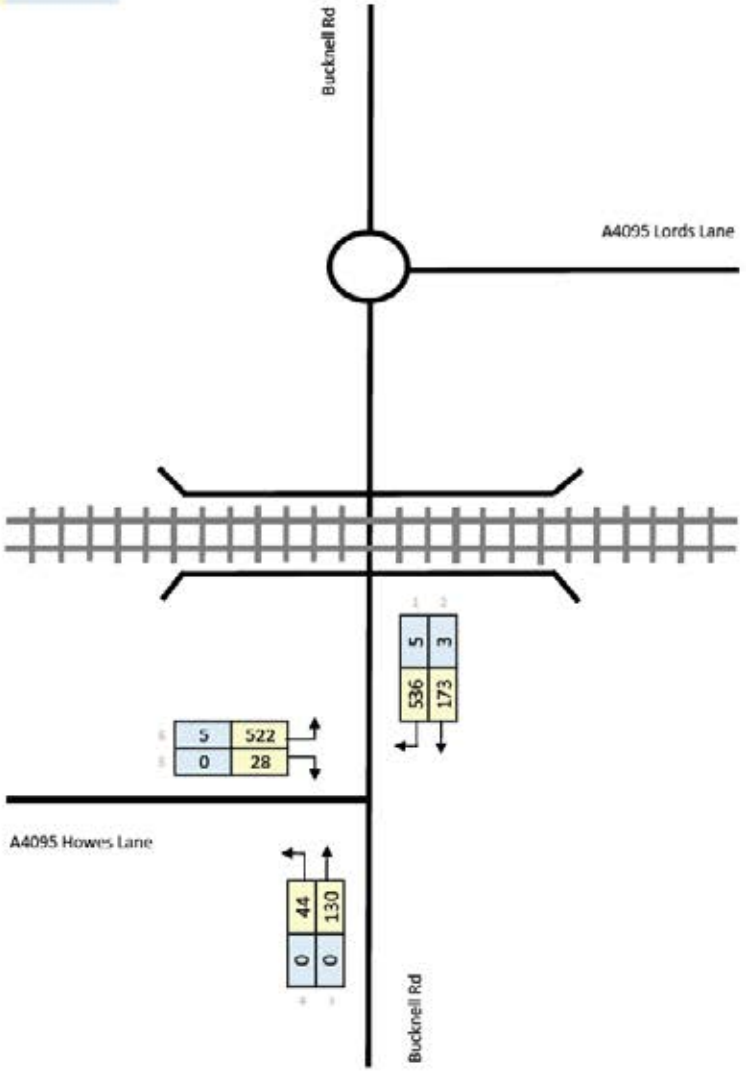
AM PEAK

PCUS	HGVS



PM PEAK

PCUS	HGVS



Surveys undertaken w/c 31st January 2022
All Flows in PCUs

Project: Land at North West Bicester	Title: OBSERVED 2022 FLOWS	Date: 25/03/2022	VELOCITY Transport Planning www.velocity-tp.com
Client: Firethorn Trust	AM AND PM PEAK FLOWS	Diagram: C	

ATTACHMENT D

TRAFFIC SURVEY DATA

SMART TRANSPORT HUB

Job 567 Howes Lane

CLASSIFIED TURNING COUNTS
Wednesday 02nd February 2022
Site 2 Howes Lane / Bucknell Road

For Velocity TP

Cam 10

Cam 11

CLASSIFIED TURNING COUNTS

STUDY NAME	Job 567 Howes Lane
SITE LOCATION	Site 2 - Howes Lane / Bucknell Road
DATE	Wednesday 02nd February 2022
TIME PERIOD	12 hours (07:00-19:00)
WEATHER	
COMMENTS	

DETAILS OF ARMS

ARM A: Bucknell Road (North)

ARM B: Bucknell Road (South)

ARM C: Howes Lane

ARM D: Unnamed Road

CAMERA IMAGE

Site 2 - Howes Lane / Bucknell Road

CLASSIFIED TURNING COUNTS

Site 2 - Howes Lane / Bucknell Road
Wednesday 02nd February 2022

ARM A: Bucknell Road (North)

IME	O ARM A: Bucknell Road (North)									O ARM B: Bucknell Road (South)								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	0	0	0	0	0	0	0	0	0	50	12	0	0	0	1	1	63	63
0800-0900	0	0	0	0	0	0	0	0	0	1 2	22	2	0	1	0	0	167	169
0900-1000	0	0	0	0	0	0	0	0	0	75	12	3	0	0	0	1	90	92
1000-1100	0	0	0	0	0	0	0	0	0	60	5	0	0	0	1	0	66	65
1100-1200	0	0	0	0	0	0	0	0	0	82	15	1	0	0	0	1	98	99
1200-1300	0	0	0	0	0	0	0	0	0	90	11		1	0	2	0	108	110
1300-1 00	0	0	0	0	0	0	0	0	0	85	9	1	0	0	2	2	97	97
1 00-1500	0	0	0	0	0	0	0	0	0	10	12	1	0	0	1	1	118	118
1500-1600	0	0	0	0	0	0	0	0	0	132	1	1	0	0	1	0	1 8	1 8
1600-1700	0	0	0	0	0	0	0	0	0	115	26	3	0	0	1	1	1 5	1 6
1700-1800	0	0	0	0	0	0	0	0	0	155	13	3	0	0	0	0	171	173
1800-1900	0	0	0	0	0	0	0	0	0	117	6	0	0	0	1	0	12	123
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1207**	**157**	**19**	**1**	**1**	**10**	**7**	**1395**	**1402**

IME	O ARM C: Howes Lane									O ARM D: Unnamed Road								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	606	156	10	7	7		1	790	809	0	0	0	0	0	0	0	0	0
0800-0900	602	106	13	18	2	1	1	7 2	77	1	0	0	0	0	0	0	1	1
0900-1000	382	71	12	16	0	2	0	83	509	0	1	0	0	0	0	0	1	1
1000-1100	313	62	12	11	0	0	1	398	19	0	0	0	0	0	0	0	0	0
1100-1200	2	73	12	13	0	0	5	3 2	366	1	0	0	0	0	0	0	1	1
1200-1300	277	5	8	13	1	5	2	3 9	368	1	0	1	0	0	0	0	2	3
1300-1 00	278	2	12	22	2	2	0	358	393	1	0	0	0	0	0	0	1	1
1 00-1500	301	7	7	16	1	1	0	373	398	0	0	0	0	0	0	0	0	0
1500-1600	351	7	6	8	1	2	1	15	28	3	0	0	0	0	0	0	3	3
1600-1700	355	60	5	3	1	2	0	26	32	0	1	0	0	0	0	0	1	1
1700-1800	89	37	2	1	2	1	0	532	536	0	0	0	0	0	0	0	0	0
1800-1900	363	2	1	1	1	0	0	390	393	0	0	0	0	0	0	0	0	0
TOTAL	**4561**	**770**	**100**	**129**	**18**	**20**	**11**	**5598**	**5824**	**7**	**2**	**1**	**0**	**0**	**0**	**0**	**10**	**11**

ARM B: Bucknell Road (South)

IME	O ARM A: Bucknell Road (North)									O ARM B: Bucknell Road (South)								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	110	18	3	1	0	0	0	132	135	0	0	0	0	0	0	0	0	0
0800-0900	155	10	1	0	0	0	0	166	167	0	0	0	0	0	0	0	0	0
0900-1000	8	1	1	0	0	0	0	99	100	0	0	0	0	0	0	0	0	0
1000-1100	83	1	3	1	0	0	2	101	10	0	0	0	0	0	0	0	0	0
1100-1200	71	11	0	0	0	1	1	83	83	0	0	0	0	0	0	0	0	0
1200-1300	93	11	0	2	0		0	110	110	0	0	0	0	0	0	0	0	0
1300-1 00	76	11		1	0	1	0	93	96	0	0	0	0	0	0	0	0	0
1 00-1500	87	15	2	0	0	0	0	10	105	0	0	0	0	0	0	0	0	0
1500-1600	13	12	3	0	0	0	0	1 9	151	0	0	0	0	0	0	0	0	0
1600-1700	101	1	0	0	1	0	0	116	117	0	0	0	0	0	0	0	0	0
1700-1800	112	18	0	0	0	0	1	130	130	0	0	0	0	0	0	0	0	0
1800-1900	101	9	0	0	0	0	0	110	110	0	0	0	0	0	0	0	0	0
TOTAL	**1207**	**157**	**17**	**5**	**1**	**6**	**4**	**1393**	**1406**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

IME	O ARM C: Howes Lane									O ARM D: Unnamed Road								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	2	8	2	0	0	1	1	53	5	0	0	0	0	0	0	0	0	0
0800-0900	78	6	0	0	0	1	0	85	8	0	0	0	0	0	0	0	0	0
0900-1000	19	7	2	0	0	0	0	28	29	0	0	0	0	0	0	0	0	0
1000-1100	27	8	1	0	0	1	0	37	37	0	0	0	0	0	0	0	0	0
1100-1200	37	7	3	0	0	0	0	7	9	0	0	0	0	0	0	0	0	0
1200-1300	26		1	0	0	0	2	31	32	0	0	0	0	0	0	0	0	0
1300-1 00	29	6	3	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0
1 00-1500	39	0	2	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
1500-1600	5	5	0	0	0	0	0	50	50	0	0	0	0	0	0	0	0	0
1600-1700	23	13	0	0	0	1	0	37	36	0	0	0	0	0	0	0	0	0
1700-1800	0		0	0	0	0	0			0	0	0	0	0	0	0	0	0
1800-1900	23	2	0	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0
TOTAL	**428**	**70**	**14**	**0**	**0**	**4**	**3**	**516**	**521**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

ARM C: Howes Lane

IME	O ARM A: Bucknell Road (North)									O ARM B: Bucknell Road (South)								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	252	1	6		3	1	0	307	318		3	0	0	0	0	0	7	7
0800-0900	20	2	9	11	5	0	0	87	511	20	7	1	0	0	0	0	28	29
0900-1000	2 6	0	13	10	0	0		309	329	8	3	0	0	0	0	0	11	11
1000-1100	206	3	6	12	0	1	1	259	277	7	1	1	0	0	0	0	9	10
1100-1200	225	25	7	12	0	1	0	270	289	20	1	3	0	0	0	0	2	26
1200-1300	259		1	10	0	1	0	328	3 7	11		3	0	0	0	0	18	20
1300-1 00	27	37	7	13	0	2	1	333	352	1	2	0	0	0	0	0	16	16
1 00-1500	27	51	10	1	0	2	0	351	373	17	2	2	0	0	0	0	21	22
1500-1600	328	70	13	10		1	1	26	9	10			0	0	1	0	19	20
1600-1700	26	98	8	5	2	5	0	5	55	23	3	2	0	0	0	1	28	29
1700-1800	60	51	2	2	1	3	2	519	522	23		0	0	0	2	0	29	28
1800-1900	519	5	2	2	2	3	0	573	577	18	0	0	0	0	0	0	18	18
TOTAL	**3889**	**578**	**97**	**105**	**17**	**20**	**9**	**4706**	**4898**	**175**	**34**	**16**	**0**	**0**	**3**	**1**	**228**	**234**

IME	O ARM C: Howes Lane									O ARM D: Unnamed Road								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0	0	1	2
1000-1100	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	3
1100-1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200-1300	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	3
1300-1 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 00-1500	1	0	1	0	0	0	0	2	3	1	0	1	0	0	0	0	2	3
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800-1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**3**	**4**	**3**	**0**	**4**	**0**	**0**	**0**	**0**	**7**	**9**

ARM D: Unnamed Road

IME	O ARM A: Bucknell Road (North)									O ARM B: Bucknell Road (South)								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	0	1	0	0	0	0	1	2	0	1	0	0	0	0	0	1	1
1000-1100	0	0	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
1100-1200	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0
1200-1300	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
1300-1 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 00-1500	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-1700	2	1	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800-1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**7**	**1**	**2**	**0**	**0**	**0**	**0**	**10**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**

IME	O ARM C: Howes Lane									O ARM D: Unnamed Road								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000-1100	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
1100-1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200-1300	0	0	2	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0
1300-1 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 00-1500	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0
1500-1600	1	0	1	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800-1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**4**	**0**	**3**	**0**	**0**	**0**	**0**	**7**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

CLASSIFIED COUNTS

Site 2 - Howes Lane / Bucknell Road
Wednesday 02nd February 2022

ARM A: Bucknell Road (North)

IME	O UNC ION									FROM UNC ION									O AL FLOW								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	656	168	10	7	7	5	2	853	872	363	59	9	5	3	1	0	0	53	1019	227	19	12	10	6	2	1293	1325
0800-0900	7 5	128	15	18	3	1	1	910	9	575	52	10	11	5	0	0	653	677	1320	180	25	29	8	1	1	1563	1621
0900-1000	57	8	15	16	0	2	1	57	601	330	5	15	10	0	0		09	30	787	138	30	26	0	2	5	983	1032
1000-1100	373	67	12	11	0	1	1	6	8	289	8	10	13	0	1	3	361	383	662	115	22	2	0	2		825	867
1100-1200	327	88	13	13	0	0	6	1	66	298	36	7	12	0	2	1	355	373	625	12	20	25	0	2	7	796	839
1200-1300	368	56	13	1	1	7	2	59	81	353	55	1	12	0	5	0	39	59	721	111	27	26	1	12	2	898	9 0
1300-1 00	36	51	13	22	2		2	56	91	350	8	11	1	0	3	1	26	8	71	99	2	36	2	7	3	882	939
1 00-1500	05	59	8	16	1	2	1	91	516	362	66	12	1	0	2	0	56	79	767	125	20	30	1		1	9 7	995
1500-1600	86	61	7	8	1	3	1	566	579	62	82	16	10		1	1	575	600	9 8	1 3	23	18	5		2	11 1	1179
1600-1700	70	87	8	3	1	3	1	572	579	529	113	8	5	3	5	0	663	67	999	200	16	8		8	1	1235	1253
1700-1800	6	50	5	1	2	1	0	703	708	572	69	2	2	1	3	3	6 9	652	1216	119	7	3	3		3	1352	1361
1800-1900	80	30	1	1	1	1	0	51	516	620	5	2	2	2	3	0	683	687	1100	8	3	3	3		0	1197	1203
TOTAL	**5775**	**929**	**120**	**130**	**19**	**30**	**18**	**7003**	**7237**	**5103**	**736**	**116**	**110**	**18**	**26**	**13**	**6109**	**6315**	**10878**	**1665**	**236**	**240**	**37**	**56**	**31**	**13112**	**13552**

ARM B: Bucknell Road (South)

IME	O UNC ION									FROM UNC ION									O AL FLOW								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	152	26	5	1	0	1	1	185	188	5	15	0	0	0	1	1	70	70	206	1	5	1	0	2	2	255	258
0800-0900	233	16	1	0	0	1	0	251	251	162	29	3	0	1	0	0	195	198	395	5		0	1	1	0	6	8
0900-1000	103	21	3	0	0	0	0	127	129	83	16	3	0	0	0	1	102	10	186	37	6	0	0	0	1	229	232
1000-1100	110	22		1	0	1	2	138	1 1	67	6	1	0	0	1	0	75	75	177	28	5	1	0	2	2	213	216
1100-1200	108	18	3	0	0	1	1	130	131	102	16		0	0	0	1	122	12	210	3	7	0	0	1	2	252	255
1200-1300	119	15	1	2	0		2	1 1	1 2	101	15	7	1	0	2	0	126	130	220	30	8	3	0	6	2	267	272
1300-1 00	105	17	7	1	0	1	0	131	135	99	11	1	0	0	2	2	113	113	20	28	8	1	0	3	2	2	2 8
1 00-1500	126	15		0	0	0	0	1 5	1 7	121	1	3	0	0	1	1	139	1 0	2 7	29	7	0	0	1	1	28	287
1500-1600	179	17	3	0	0	0	0	199	201	1 2	18	5	0	0	2	0	167	168	321	35	8	0	0	2	0	366	369
1600-1700	12	27	0	0	1	1	0	153	153	138	29	5	0	0	1	2	173	175	262	56	5	0	1	2	2	326	329
1700-1800	152	22	0	0	0	0	1	17	17	178	17	3	0	0	2	0	200	200	330	39	3	0	0	2	1	37	375
1800-1900	12	11	0	0	0	0	0	135	135	135	6	0	0	0	1	0	1 2	1 1	259	17	0	0	0	1	0	277	276
TOTAL	**1635**	**227**	**31**	**5**	**1**	**10**	**7**	**1909**	**1927**	**1382**	**192**	**35**	**1**	**1**	**13**	**8**	**1624**	**1638**	**3017**	**419**	**66**	**6**	**2**	**23**	**15**	**3533**	**3565**

ARM C: Howes Lane

IME	O UNC ION									FROM UNC ION									O AL FLOW								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	256		6		3	1	0	31	325	6 8	16	12	7	7	5	2	8 3	863	90	208	18	11	10	6	2	1157	1187
0800-0900	0	9	10	11	5	0	0	515	539	680	112	13	18	2	2	1	827	858	1120	161	23	29	7	2	1	13 2	1397
0900-1000	25		1	10	0	0		322	3 3	01	79	1	16	0	2	0	512	539	655	123	28	26	0	2		83	881
1000-1100	21	35	8	12	0	1	1	270	289	3 1	70	13	11	0	1	1	36	56	555	105	21	23	0	2	2	706	7 6
1100-1200	2 5	26	10	12	0	1	0	29	31	281	80	15	13	0	0	5	389	1	526	106	25	25	0	1	5	683	728
1200-1300	271	8	18	10	0	1	0	3 8	369	303	9	11	13	1	5		382	03	57	97	29	23	1	6		730	773
1300-1 00	288	39	7	13	0	2	1	3 9	368	307	8	15	22	2	2	0	396	33	595	87	22	35	2		1	7 5	801
1 00-1500	293	53	1	1	0	2	0	376	00	3 3	7	10	16	1	1	0	18		636	100	2	30	1	3	0	79	8
1500-1600	338	7	17	10		2	1	5	70	397	52	7	8	1	2	1	67	81	735	126	2	18	5		2	912	950
1600-1700	9	101	10	5	2	5	1	572	583	378	73	5	3	1	3	0	63	69	827	17	15	8	3	8	1	1035	1051
1700-1800	83	55	2	2	1	5	2	5 8	550	529	1	2	1	2	1	0	576	580	1012	96		3	3	6	2	112	1130
1800-1900	537	5	2	2	2	3	0	591	595	386	26	1	1	1	0	0	15	18	923	71	3	3	3	3	0	1006	1013
TOTAL	**4068**	**613**	**118**	**105**	**17**	**23**	**10**	**4944**	**5145**	**4994**	**841**	**118**	**129**	**18**	**24**	**14**	**6124**	**6357**	**9062**	**1454**	**236**	**234**	**35**	**47**	**24**	**11068**	**11502**

ARM D: Unnamed Road

IME	O UNC ION									FROM UNC ION									O AL FLOW								
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	O AL	PCU
0700-0800	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1
0800-0900	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1
0900-1000	0	1	1	0	0	0	0	2	3	0	1	1	0	0	0	0	2	3	0	2	2	0	0	0	0		5
1000-1100	1	0	1	0	0	0	0	2	3	1	0	1	0	0	0	0	2	3	2	0	2	0	0	0	0		5
1100-1200	2	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	1	1	3	0	0	0	0	0	0	3	3
1200-1300	1	0	2	0	0	0	0	3		2	0	2	0	0	0	0		5	3	0		0	0	0	0	7	9
1300-1 00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1
1 00-1500	3	0	0	0	0	0	0	3	3	1	0	1	0	0	0	0	2	3		0	1	0	0	0	0	5	6
1500-1600	1	0	1	0	0	0	0	2	3	3	0	0	0	0	0	0	3	3		0	1	0	0	0	0	5	6
1600-1700	2	1	0	0	0	0	0	3	3	0	1	0	0	0	0	0	1	1	2	2	0	0	0	0	0		
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800-1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**11**	**2**	**5**	**0**	**0**	**0**	**0**	**18**	**21**	**10**	**2**	**5**	**0**	**0**	**0**	**0**	**17**	**20**	**21**	**4**	**10**	**0**	**0**	**0**	**0**	**35**	**40**

Junction: A - Bucknell Road (North) / B - Bucknell Road (South) / C - Howes Lane / D - Unnamed Road

Vehicle Class:	All classes
Show single Session:	No
	07:00 to 19:00
Custom Start / End:	07:00 – 19:00
Show Peak Times:	No

Arm Destination

Arm Origin	A	B	C	D	Total
A	0	1395	5598	10	**7003**
B	1393	0	516	0	**1909**
C	4706	228	3	7	**4944**
D	10	1	7	0	**18**
Total	**6109**	**1624**	**6124**	**17**	

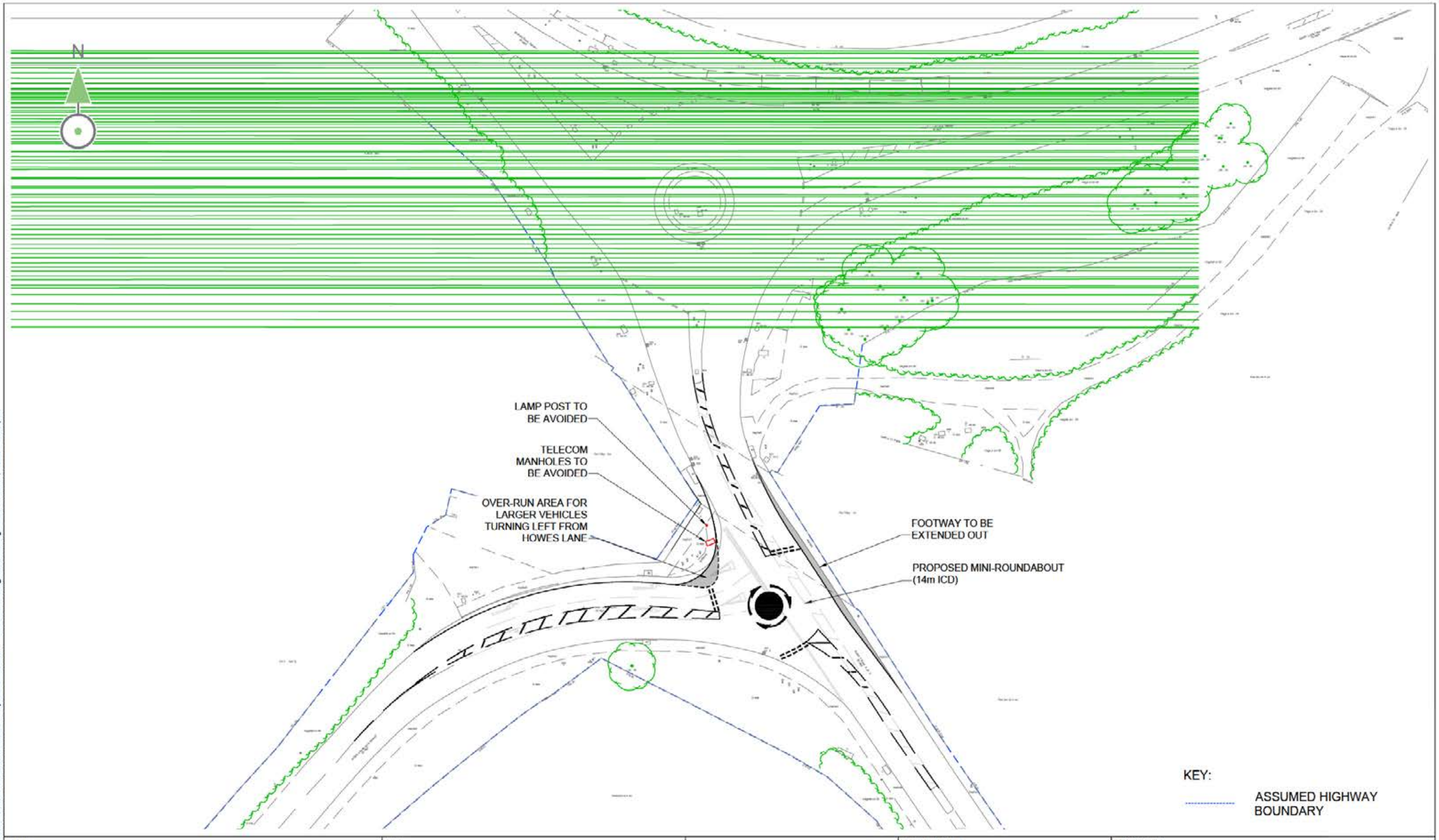
Job 567 Cou t LaneHowes Lane Queue Length Su vey - Wednesday 02nd eb ua y 2022

Junc tion A - Buckne l Road No 1f2 / B - Buckne l Road South) / C - Howes ane / D - Unnamed Ro d

A												
07:00	07:05	4	0	0	0	0	0	2	0			
07:05	07:10	6	0	0	0	0	0	2	0			
07:10	07:15	6	0	0	0	0	0	2	0			
07:15	07:20	2	0	0	0	0	0	3				
07:20	07:25	6	0	0	0	0	0	2				
07:25	07:30	6	0	0	0	0	0	2				
07:30	07:35	4	0	0	0	0	0	3				
07:35	07:40	8	0	0	0	0	0	5	0			
07:40	07:45	9	0	5	0	0	0	6				
07:45	07:50	7	0			0	0	6	0			
07:50	07:55	8	0	0	0	0	0	6				
07:55	08:00	9	0	0	0	0	0	3	0			
08:00	08:05	8	0	0	0	0		4	0			
08:05	08:10	8	0	0	4	0	0	4				
08:10	08:15	8	0	0	0	0	0	6				
08:15	08:20	8	0	0	0	0	0	5				
08:20	08:25	9	0	0	3	0	0	6				
08:25	08:30	7			5	0	0	6				
08:30	08:35	9	0	0	22	0	0	6				
08:35	08:40	9	0	0	5	0	0	4				
08:40	08:45	5	0	0	0	0	0	3	2			
08:45	08:50	8	0	0		0	0	4				
08:50	08:55	8	0	0	0	0	0	6				
08:55	09:00	8	0	0	0	0	0	3				
09:00	09:05	9	0	0	0	0	0	6	0			
09:05	09:10	8	0	0	4	0		4				
09:10	09:15	7	0	0	0	0	0	6	0			
09:15	09:20	4	0	0	0	0	0	5	0			
09:20	09:25	3	0	0	0	0	0	4	0			
09:25	09:30	5	0	0	0	0	0	5				
09:30	09:35	2	0	0	0	0	0	4				
09:35	09:40	4	0	0	2	0	0	6	0			
09:40	09:45	4	0			0	0	6				
09:45	09:50	3	0	0	0	0		5				
09:50	09:55	5	0	0	0	0	0	6	0			
09:55	10:00	3	0	0	4	0	0					
10:00	10:05	2	0	0	0	0	0	4	0			
10:05	10:10	4	0	0	0	0	0	4				
10:10	10:15	3	0	0	0	0	0	2	0			
10:15	10:20	2	0	0	0	0	0	2	0			
10:20	10:25	3	0	0	0	0	0	2				
10:25	10:30	7	0	0	0	0	0	3	0			
10:30	10:35	7	0	0		0	0	5	0			
10:35	10:40	4	0	0	0	0	0	4				
10:40	10:45	4	0	0	0	0	0	4				
10:45	10:50	7	0	0	0	0	0	3	0			
10:50	10:55	4	0	0	0	0	0	4	0			
10:55	11:00	3	0	0	0	0	0	3	0			
11:00	11:05	2	0	0	0	0	0	4	0			
11:05	11:10	2	0	0	0	0	0	4	0			
11:10	11:15	2	0	0	0	0	0	4	0			
11:15	11:20	2	0	0	0	0	0	4	0			
11:20	11:25	2	0	0	0	0	0	4				
11:25	11:30	4	0	0	0	0	0	4				
11:30	11:35	6	0	0	0	0	0	4	2			
11:35	11:40	2	0	0		0	0	4				
11:40	11:45	3	0	0	0	0	0	3	0			
11:45	11:50	4	0	0	0	0	0	4				
11:50	11:55	3	0	0	0	0	0	5				
11:55	12:00	4	0	0	0	0	0	4				
12:00	12:05	3	0	0	0	0	0	4				
12:05	12:10	4	0	0	0	0	0	4				
12:10	12:15	4	0	0	0	0	0	4				
12:15	12:20	4	0	0	0	0	0	4				
12:20	12:25	4	0	0	0	0	0	4				
12:25	12:30	4	0	0	0	0	0	4				
12:30	12:35	4	0	0	0	0	0	4				
12:35	12:40	4	0	0	0	0	0	4				
12:40	12:45	4	0	0	0	0	0	4				
12:45	12:50	4	0	0	0	0	0	4				
12:50	12:55	4	0	0	0	0	0	4				
12:55	13:00	4	0	0	0	0	0	4				
13:00	13:05	4	0	0	0	0	0	4				
13:05	13:10	4	0	0	0	0	0	4				
13:10	13:15	4	0	0	0	0	0	4				
13:15	13:20	4	0	0	0	0	0	4				
13:20	13:25	4	0	0	0	0	0	4				
13:25	13:30	4	0	0	0	0	0	4				
13:30	13:35	4	0	0	0	0	0	4				
13:35	13:40	4	0	0	0	0	0	4				
13:40	13:45	4	0	0	0	0	0	4				
13:45	13:50	4	0	0	0	0	0	4				
13:50	13:55	4	0	0	0	0	0	4				
13:55	14:00	4	0	0	0	0	0	4				

ATTACHMENT E

PROPOSED MINI-ROUNDABOUT DRAWINGS



1:500

0 10m 20m 30m 40m 50m

Rev	Date	Description	Drn	Chk	App
B	15/03/22	ALIGNMENT CHANGE	GSF	CR	MK
A	01/03/22	FIRST ISSUE	GSF	CR	MK

Notes:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

VELOCITY Transport Planning

Drawing Status: S2 - FOR INFORMATION

Clien: Firethorn TRUST

Architect:

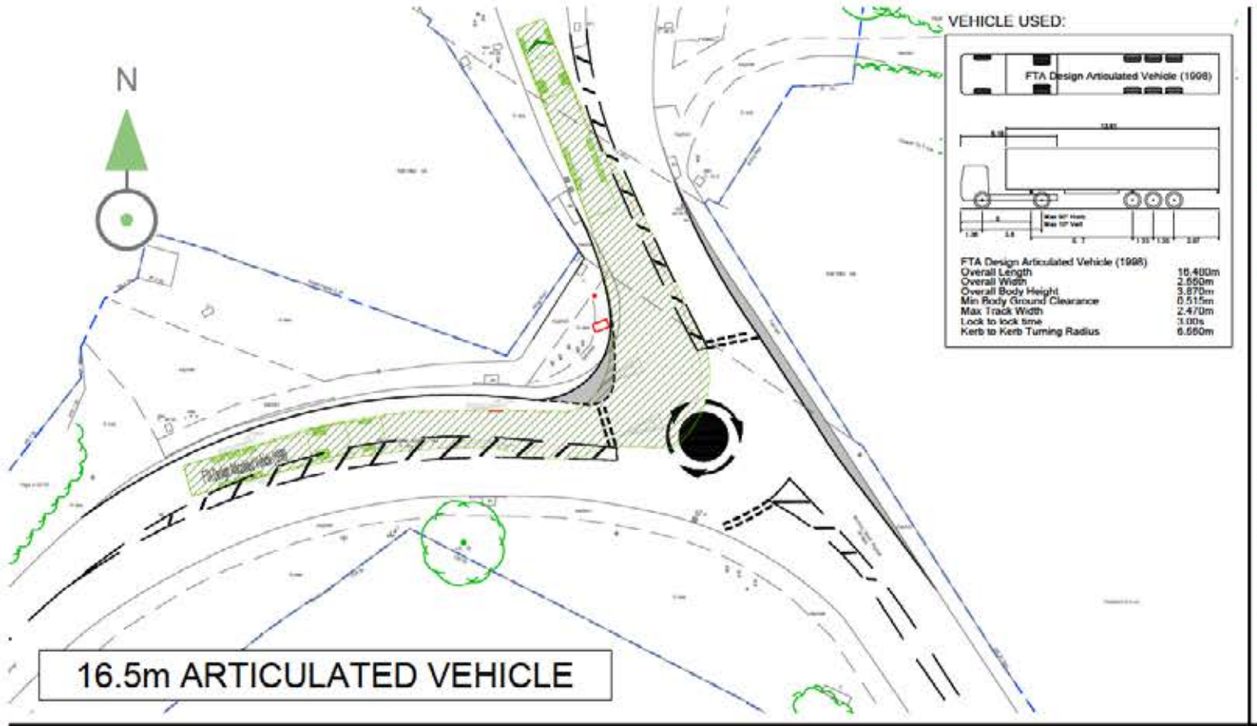
Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD PROPOSED JUNCTION GENERAL ARRANGEMENT

Scale @ A3	Date	Designed/Drawn	Checked	Approved
1:500	01/03/22	GSF	CR	MK

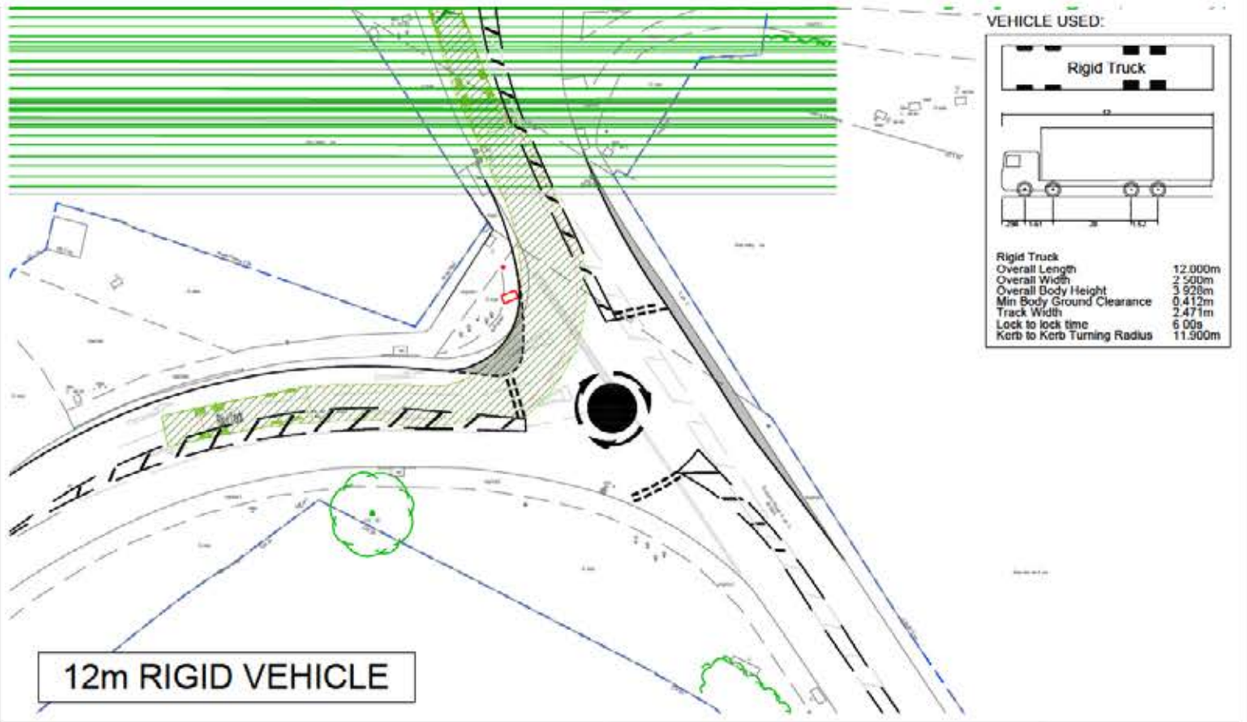
Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-054	B

Drawing file: 4600-1100-T-054-B - A4095 Howes Lane - Bucknell Road - Proposed Junction - General Arrangements.dwg Date: Mar 24, 2022 - 5:46pm



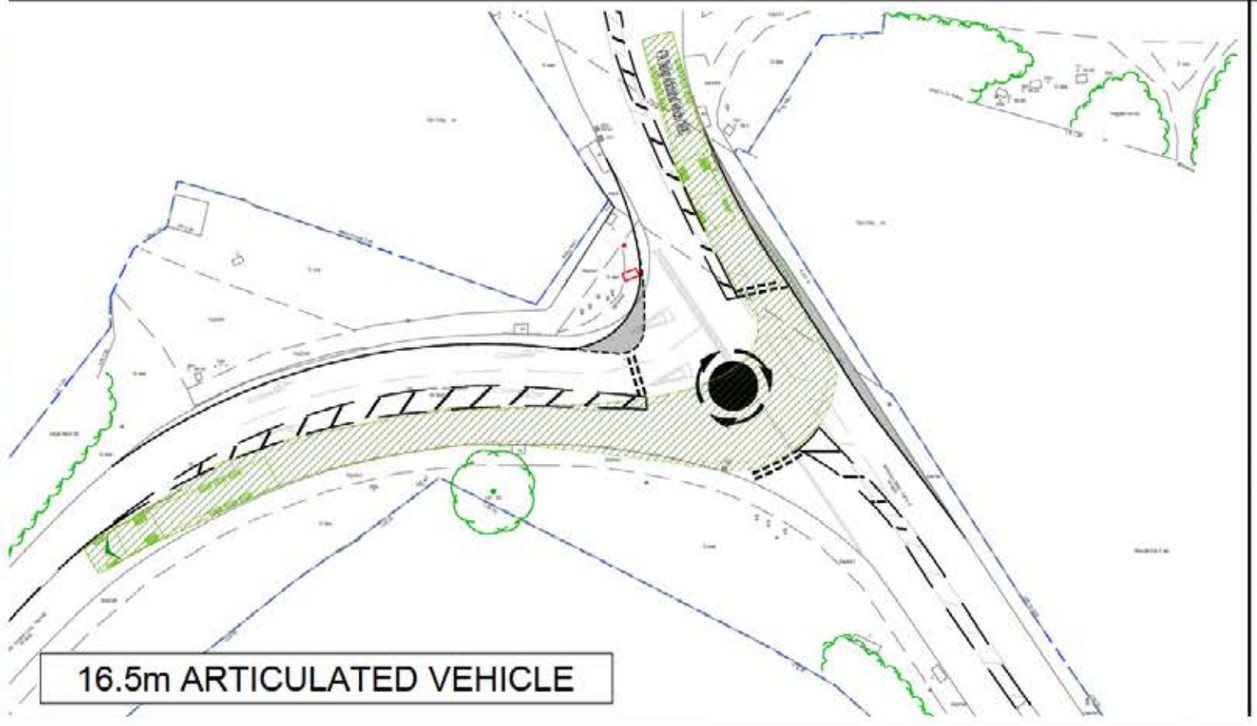
VEHICLE USED:

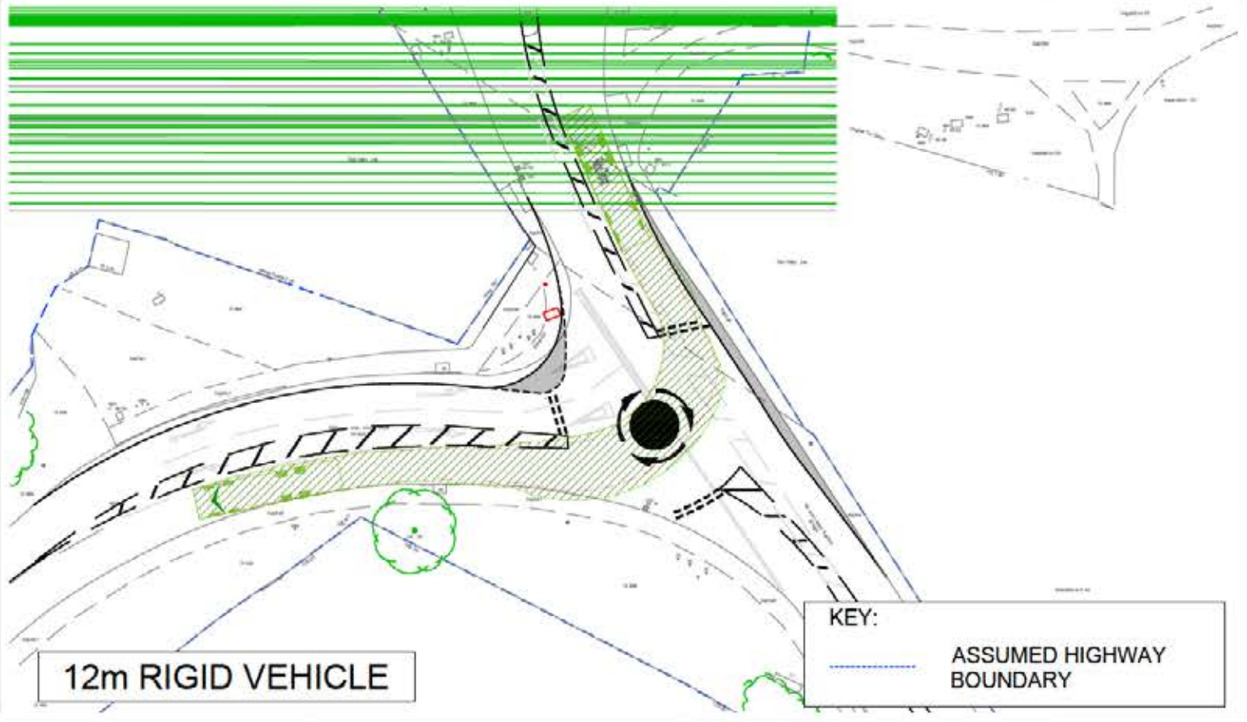
FTA Design Articulated Vehicle (1998)	
Overall Length	16.400m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.550m



VEHICLE USED:

Rigid Truck	
Overall Length	12.000m
Overall Width	2.500m
Overall Body Height	3.928m
Min Body Ground Clearance	0.412m
Track Width	2.471m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	11.900m





1:500

0 10m 20m 30m 40m 50m

Rev	Date	Description	Drn	Chk	App
B	24/03/22	ROUNDABOUT AMENDMENTS	GSF	CR	MK
A	01/03/22	FIRST ISSUE	GSF	CR	MK

Notes:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

VELOCITY Transport Planning

Drawing Status: S2 - FOR INFORMATION

Client: Firethorn TRUST

Architect:

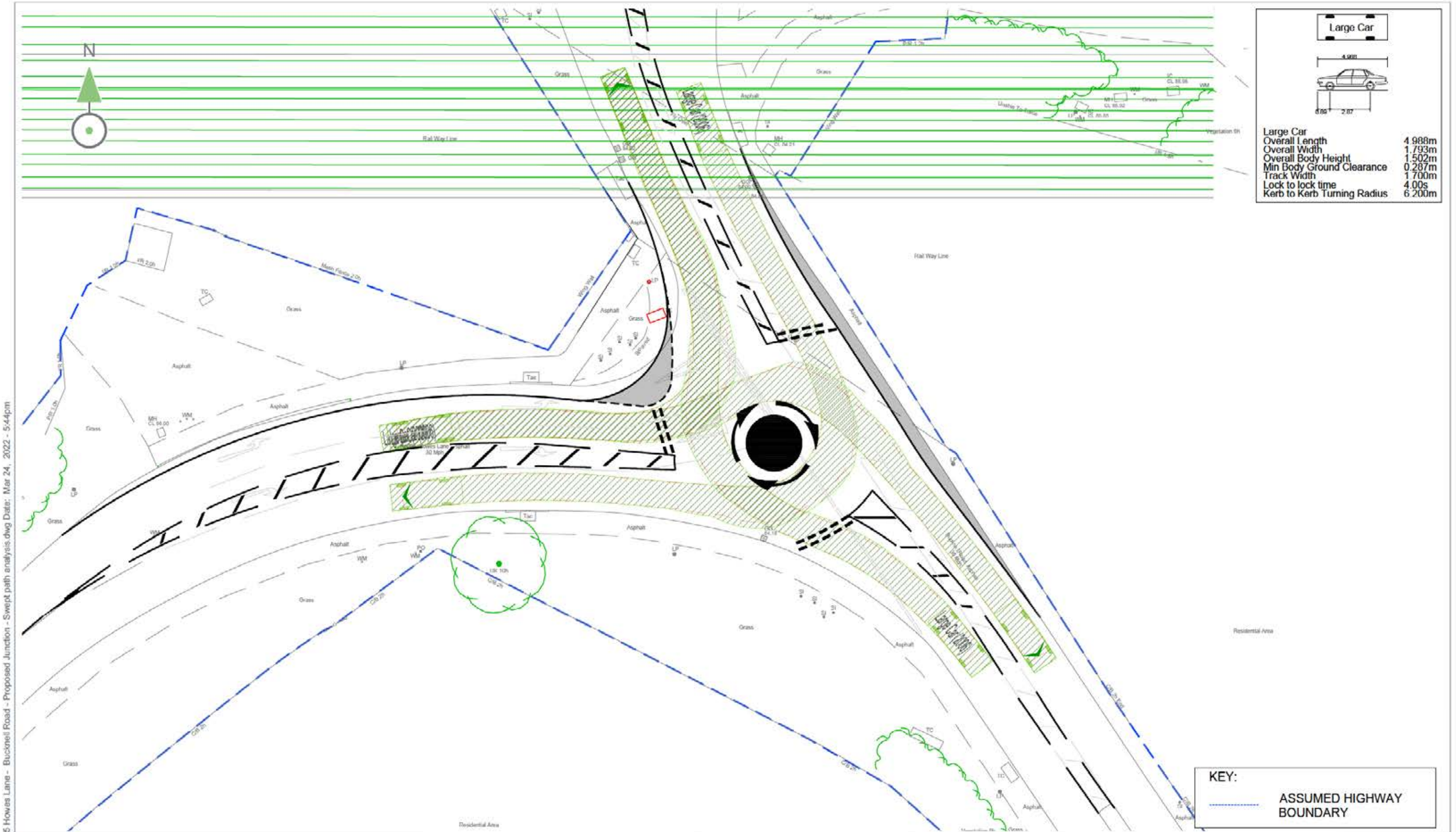
Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD PROPOSED JUNCTION SWEPT PATH ANALYSIS

Scale @ A3	Date	Designed/Drawn	Checked	Approved
1:500	01/03/22	GSF	CR	MK

Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-055	B

Drawing file: 4600-1100-T-055-056-B - A4095 Howes Lane - Bucknell Road - Proposed Junction - Swept path analysis.dwg Date: Mar 24, 2022 - 5:43pm



1:250

0 5m 10m 15m 20m 25m

Rev	Date	Description	Drn	Chk	App
B	15/03/22	ALIGNMENT CHANGE	GSF	CR	MK
A	01/03/22	FIRST ISSUE	GSF	CR	MK

Notes:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

VELOCITY Transport Planning

Drawing Status: S2 - FOR INFORMATION

Client: Firethorn TRUST

Architect:

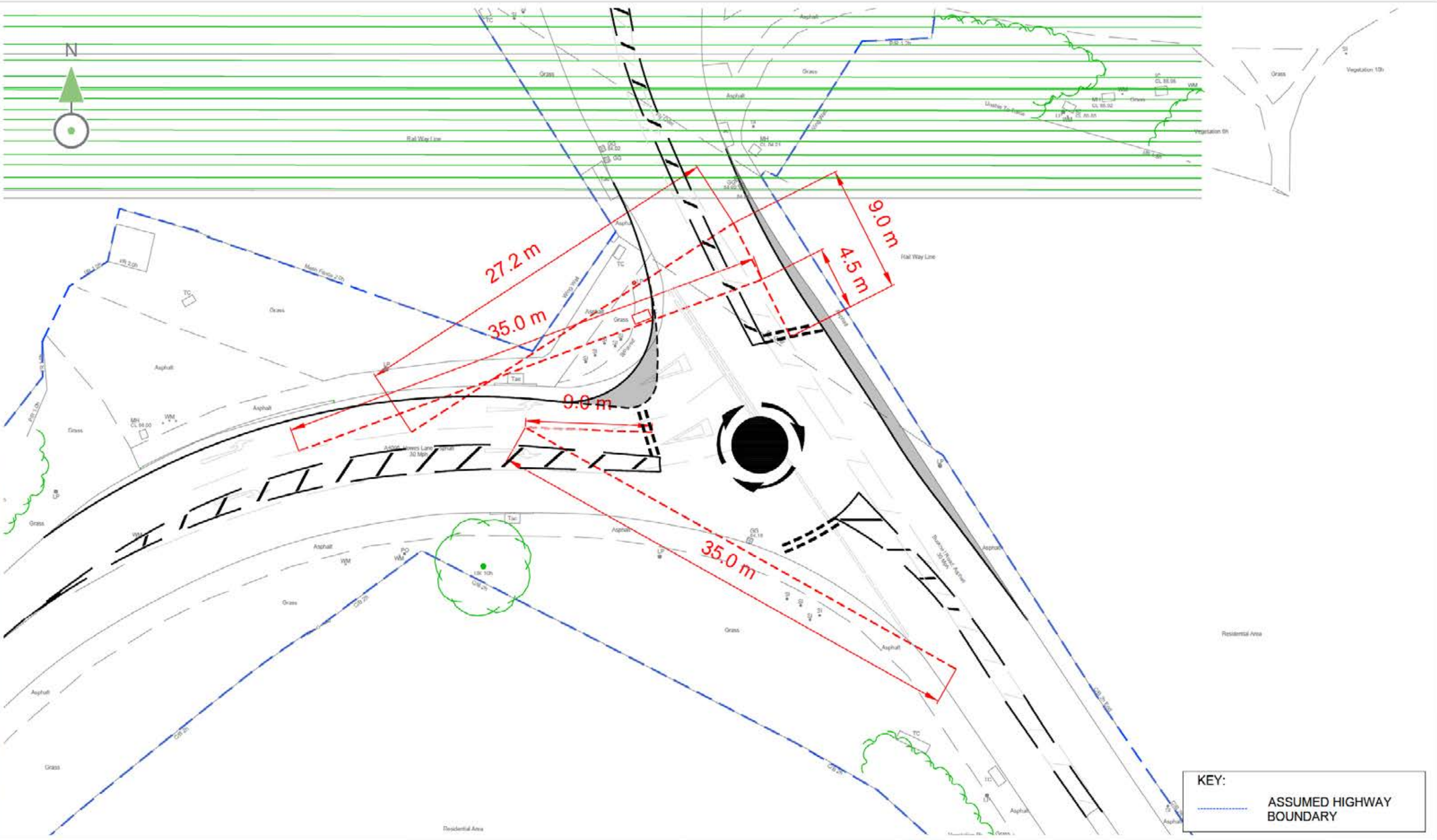
Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD PROPOSED JUNCTION SWEPT PATH ANALYSIS

Scale @ A3	Date	Designed/Drawn	Checked	Approved
1:250	01/03/22	GSF	CR	MK

Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-056	B

Drawing file: 4600-1100-T-055-056-B - A4095 Howes Lane - Bucknell Road - Proposed Junction - Swept path analysis.dwg Date: Mar 24, 2022 - 5:44pm



1:250

0 5m 10m 15m 20m 25m

Rev	Date	Description	Drn	Chk	App
B	15/03/22	ALIGNMENT CHANGE	GSF	CR	MK
A	01/03/22	FIRST ISSUE	GSF	CR	MK

Notes:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

VELOCITY Transport Planning

Drawing Status: S2 - FOR INFORMATION

Client: Firethorn TRUST

Architect:

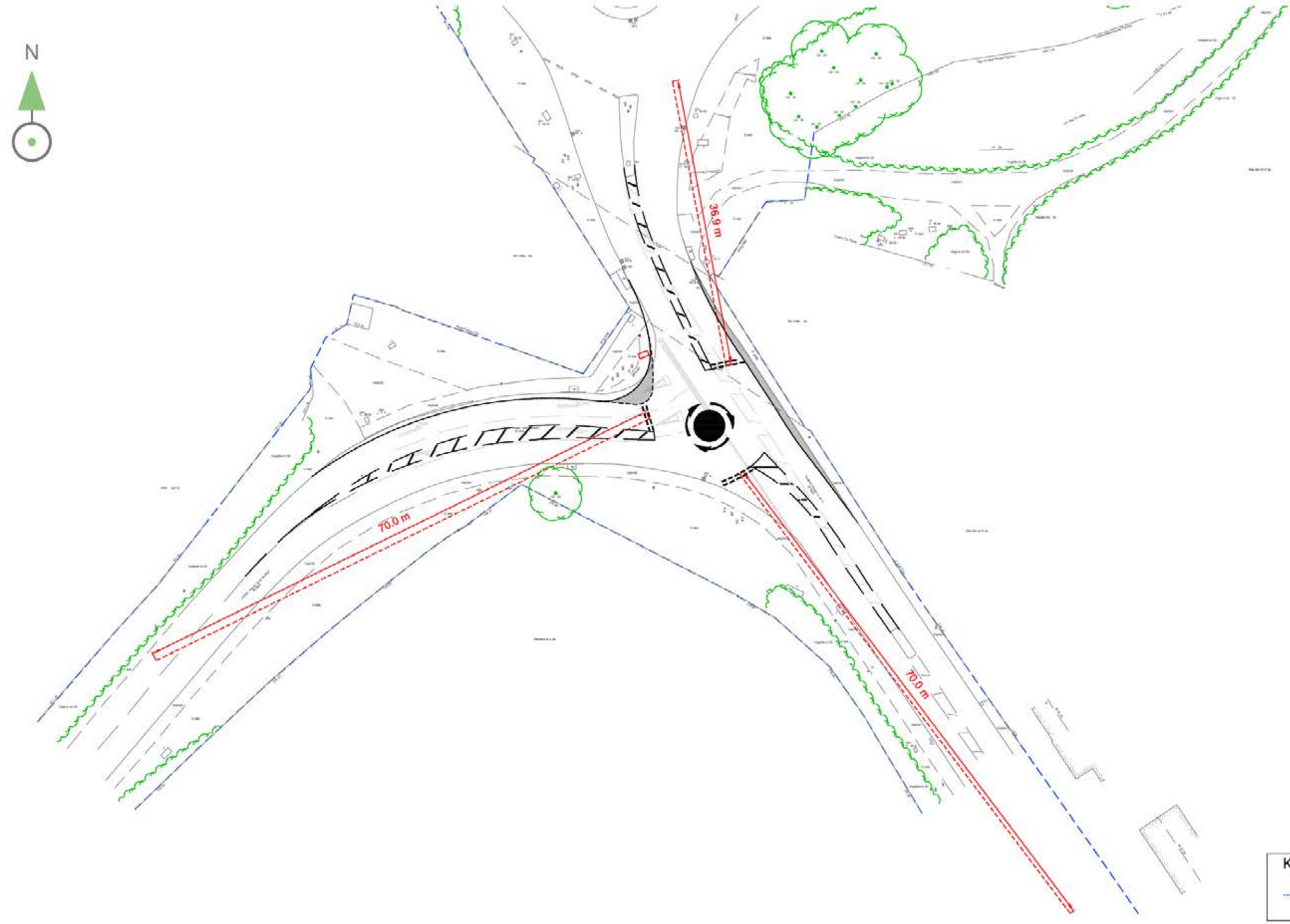
Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD PROPOSED JUNCTION VISIBILITY SPLAYS

Scale @ A3	Date	Designed/Drawn	Checked	Approved
1:250	01/03/22	GSF	CR	MK

Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-057	B

Drawing file: 4600-1100-T-057-B - A4095 Howes Lane - Bucknell Road - Proposed Junction - Visibility Splay.dwg Date: Mar 24, 2022 - 5.45pm



KEY:

ASSUMED HIGHWAY BOUNDARY

1:500

0 10m 20m 30m 40m 50m

Rev	Date	Description	Drn	Chk	App
B	15/03/22	ALIGNMENT CHANGE	GSF	CR	MK
A	01/03/22	FIRST ISSUE	GSF	CR	MK

Notes:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

VELOCITY Transport Planning

Drawing Status: S2 - FOR INFORMATION

Client: Firethorn TRUST

Architect:

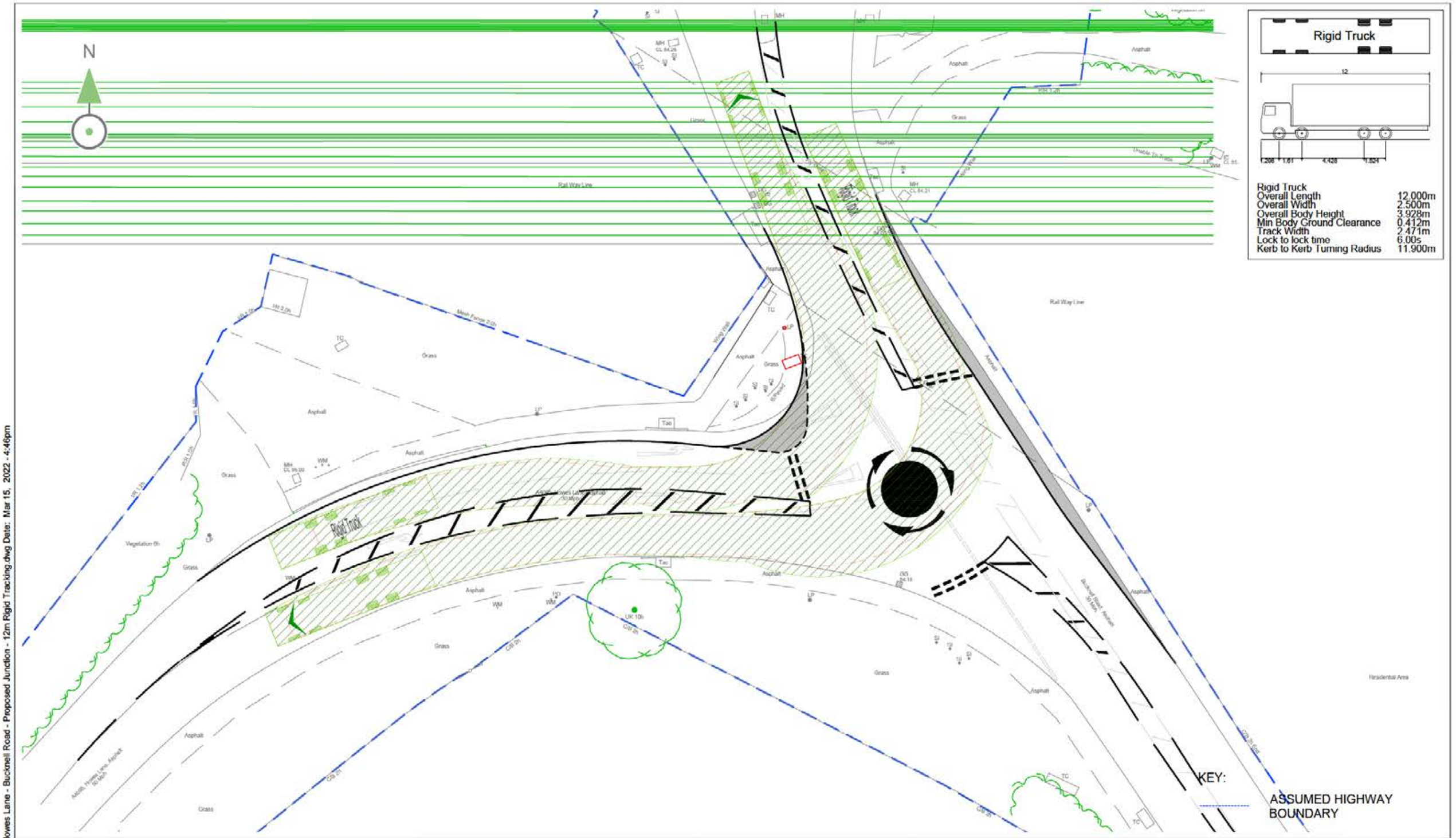
Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD PROPOSED JUNCTION STOPPING SIGHT DISTANCE

Scale @ A3	Date	Designed/Drawn	Checked	Approved
1:500	01/03/22	GSF	CR	MK

Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-058	B

Drawing file: 4600-1100-T-058-B - A4095 Howes Lane - Bucknell Road - Proposed Junction - Stopping Sight Distance dwg Date: Mar 24, 2022 - 5:45pm



Rigid Truck	
Overall Length	12.000m
Overall Width	2.500m
Overall Body Height	3.928m
Min Body Ground Clearance	0.412m
Track Width	2.471m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	11.900m

1:500

0 10m 20m 30m 40m 50m

Rev	Date	Description	Drn	Chk	App
A	15/03/22	FIRST ISSUE	GSF	CR	MK

Notes:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

VELOCITY Transport Planning
© VELOCITY TRANSPORT PLANNING LTD

Drawing Status: S2 - FOR INFORMATION

Clien: Firethorn TRUST

Architect

Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD PROPOSED JUNCTION SWEPT PATH OF 12m RIGID VEHICLE

Scale @ A3	Date	Designed/Drawn	Checked	Approved
1:500	15/03/22	GSF	CR	MK

Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-061	A

Drawing file: 4600-1100-T-061-A - A4095 Howes Lane - Bucknell Road - Proposed Junction - 12m Rigid Tracking.dwg Date: Mar 15, 2022 - 4:46pm

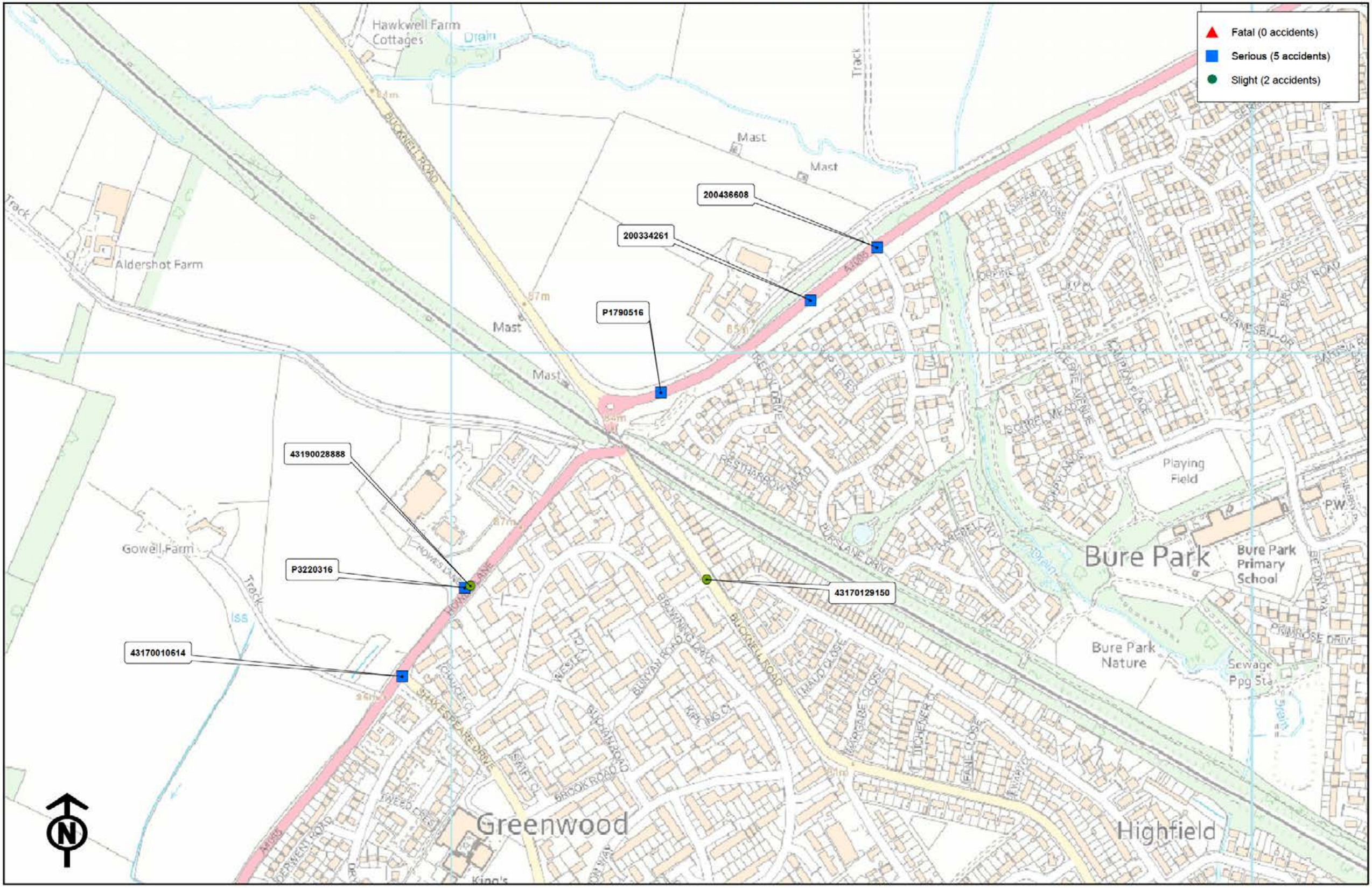
ATTACHMENT F

ACCIDENT DATA

ACCIDENT DATA - A4095/Bucknell Road, BICESTER

OXFORDSHIRE COUNTY COUNCIL - ENVIRONMENT & PLACE

accidents between: 01/01/2016 - 31/12/2021



date drawn: 28/02/2022
drawn by: CJM

approx. map centre:
easting: 457285, northing: 223880

OXFORDSHIRE COUNTY COUNCIL

Accidents between dates **01/01/2016** **and** **31/12/2021** (72) months

Selection: **Notes:**

Selected using Manual Selection

Tuesday 29/03/2016 Time 1210 Serious at A4095 HOWES LANE J/W ACCESS TO POLICE STATION BICESTER
E: 457016 N: 223708 Junction Detail: 3 Control 4
Fine without high winds Road surface Dry Daylight
Vehicle Reference 1 Motorcycle over 500cc Moving from N to S Turning right
Casualty Reference 1 Age 38 Male Driver/rider Severity Serious Injured by vehicle 1

Wednesday 18/05/2016 Time 1608 Serious at A4095 LORDS LANE APPROX 50M E OF RBT J/W BUCKNELL ROAD BICESTER
E: 457261 N: 223952 Junction Detail: 0 Control
Raining without high winds Road surface Wet/Damp Daylight
Vehicle Reference 1 Car Moving from NE to S Going ahead other
Casualty Reference: 1 Age: 51 Female Driver/rider Severity: Serious Injured by vehicle: 1
Vehicle Reference 2 Car Moving from S to NE Going ahead but held up
Vehicle Reference 3 Car Moving from S to NE Going ahead other
Casualty Reference: 2 Age: 28 Female Driver/rider Severity: Slight Injured by vehicle: 3

Thursday 29/12/2016 Time 1240 Serious at A4095 HOWES LANE J/W SHAKESPEARE DRIVE BICESTER
E: 456938 N: 223597 Junction Detail: 3 Control 2
Fine without high winds Road surface Dry Daylight
Vehicle Reference 1 Car Moving from NE to S Going ahead other
Casualty Reference: 2 Age: 24 Female Passenger Severity: Slight Injured by vehicle: 1
Vehicle Reference 2 Car Moving from S to SE Turning right
Casualty Reference: 1 Age: 17 Female Driver/rider Severity: Serious Injured by vehicle: 2

Accidents between dates **01/01/2016** **and** **31/12/2021** (72) months

Selection: **Notes:**

Selected using Manual Selection

Tuesday 18/04/2017 Time 1734 Slight at BUCKNELL ROAD J/W KINGSLEY ROAD BICESTER
E: 457318 N: 223718 Junction Detail: 3 Control 4
Fine without high winds Road surface Dry Daylight
Vehicle Reference 1 Car Moving from S to N Turning left
Vehicle Reference 2 Pedal Cycle Moving from N to SE Going ahead other
Casualty Reference 1 Age 34 Female Driver/rider Severity Slight Injured by vehicle 2

Monday 28/01/2019 Time 0820 Slight at A4095 HOWES LANE J/W ACCESS TO POLICE STATION BICESTER
E: 457023 N: 223710 Junction Detail: 3 Control 4
Fine without high winds Road surface Dry Daylight
Vehicle Reference 1 Car Moving from NE to S Going ahead other
Casualty Reference: 1 Age: 23 Female Driver/rider Severity: Slight Injured by vehicle: 1
Vehicle Reference 2 Car Moving from NE to S Waiting to turn right
Casualty Reference: 2 Age: 42 Female Driver/rider Severity: Slight Injured by vehicle: 2

Tuesday 20/10/2020 Time 1653 Serious at A4095 100M SW FROM PURSLANE DRIVE BICESTER
E: 457448 N: 224067 Junction Detail: 0 Control
Fine without high winds Road surface Wet/Damp Daylight
Vehicle Reference 1 Car Moving from NE to S Going ahead other
Casualty Reference: 1 Age: 38 Male Driver/rider Severity: Serious Injured by vehicle: 1

Accidents between dates **01/01/2016** **and** **31/12/2021** (72) months

Selection: **Notes:**

Selected using Manual Selection

Wednesday 23/12/2020 Time 0729 Serious at A4095 LORDS LANE J/W PURSLANE DRIVE BICESTER
E: 457531 N: 224133 Junction Detail: 3 Control 4
Raining without high winds Road surface Wet/Damp Darkness: street lights present and lit

Vehicle Reference 1 Car Moving from S to E Turning right

Vehicle Reference 2 Pedal Cycle Moving from NE to S Going ahead other

Casualty Reference 1 Age 43 Male Driver/rider Severity Serious Injured by vehicle 2

Accidents between dates **01/01/2016** **and** **31/12/2021** (72) months

Selection:

Selected using Manual Selection

Notes:

Accidents involving:

	Fatal	Serious	Slight	Total
Motor vehicles only (excluding 2-wheels)	0	3	1	4
2-wheeled motor vehicles	0	1	0	1
Pedal cycles	0	1	1	2
Horses & other	0	0	0	0
Total	0	5	2	7

Casualties:

	Fatal	Serious	Slight	Total
Vehicle driver	0	3	3	6
Passenger	0	0	1	1
Motorcycle rider	0	1	0	1
Cyclist	0	1	1	2
Pedestrian	0	0	0	0
Other	0	0	0	0
Total	0	5	5	10

Number of casualties meeting the criteria: **10**

ATTACHMENT G

STAGE 1 RSA DESIGNER'S RESPONSE

LAND AT NORTH WEST BICESTER

STAGE 1 RSA DESIGNER'S RESPONSE (A4095)

PROJECT NO. 4600/1100 DOC NO. D017

DATE: MARCH 2022

VERSION: 0.1

CLIENT: FIRETHORN TRUST

Velocity Transport Planning Ltd

www.velocity-tp.com

TABLE OF CONTENTS

APPENDICES

1 DESIGNER'S STATEMENT

1.1 INTRODUCTION

1.1.1 Velocity Transport Planning (VTP) has been appointed by Firethorn Trust (The Applicant) to provide highways and transportation support for the current planning application at the scheme referred to as Land to the North West of Bicester. The Application Site forms part of the wider allocated site identified at Policy Bicester 1: North West Bicester Eco-Town in the adopted Cherwell District Council (CDC) Local Plan 2011-2031 (Adopted 20 July 2015).

1.1.2 The Proposed Development description for the outline planning application (Planning Ref 21/01630/OUT), is as follows:

> *"Outline planning application for residential development (within Use Class C3), open space provision, access, drainage and all associated works and operations including but not limited to demolition, earthworks, and engineering operations, with the details of appearance, landscaping, layout and scale reserved for later determination."*

1.1.3 The Firethorn Trust application was validated by CDC on the 06th of May 2021. During the consultation process, the Local Highway Authority, Oxfordshire County Council (OCC) withdrew the agreed funding for the permitted A4095 Strategic Link Road (SLR), which was consented by CDC on the 21st of August 2014 (Planning Ref 14/01968/F). The A4095 SLR was identified as being a suitable means of permanent mitigation to accommodate the predicted traffic and highways impacts associated with the allocated development identified within the adopted Local Plan on this part of the local highway network.

1.1.4 With the withdrawal of the agreed funding for the A4095 SLR, the impacts on the local highway network will be considerably pronounced and it has been identified through discussions with OCC that the existing priority junction arrangement of the A4095 Howes Lane with Bucknell Road will not be suitable to accommodate further traffic impacts associated with the allocated sites identified in the adopted Local Plan.

1.1.5 With the above in mind, VTP has prepared an Interim Improvement Scheme at the existing priority junction of the A4095 Howes Lane with Bucknell Road to convert the existing priority junction to a mini-roundabout junction as part of the proposals associated with the Proposed Development. This Interim Improvement Scheme has been designed to mitigate the traffic impact associated with the Proposed Development for a temporary period until the agreed A4095 SLR can be implemented, or an alternative permanent mitigation strategy is agreed between CDC and OCC.

1.1.6 The Stage 1 Road Safety Audit (RSA) was carried out be an independent audit company, Road Safety Consulting Ltd, and a number of comments were raised which this Designer's Response seeks to address.

1.1.7 I have considered the issues and problems raised in the Stage 1 RSA and my comments are set out within this Designer's Response.

Signed 

Date: 24th March 2022

2 INTRODUCTION

2.1 INTRODUCTION

2.1.1 Road Safety Consultants Ltd (RSC) were commissioned by VTP to carry out a Stage 1 RSA of the proposals to convert the existing priority junction of the A4095 Howes Lane with Bucknell Road into a mini-roundabout junction arrangement.

2.1.2 The Stage 1 RSA considered the following drawings:

- **4600-1100-T-050 Rev A** – A4095 Howes Lane/Bucknell Road – Existing Junction – General Arrangement
- **4600-1100-T-51 Rev A** – A4095 Howes Lane/Bucknell Road – Existing Junction – Swept Path Analysis (16.5m Articulated Vehicle)
- **4600-1100-T-52 Rev A** – A4095 Howes Lane/Bucknell Road – Existing Junction – Swept Path Analysis (12.0m Rigid Vehicle)
- **4600-1100-T-53 Rev A** – A4095 Howes Lane/Bucknell Road – Existing Junction – Visibility Splays
- **4600-1100-T-054 Rev A** – A4095 Howes Lane/Bucknell Road – Proposed Junction – General Arrangement
- **4600-1100-T-55 Rev A** – A4095 Howes Lane/Bucknell Road – Proposed Junction – Swept Path Analysis (16.5m & 12.0m Vehicle)
- **4600-1100-T-56 Rev A** – A4095 Howes Lane/Bucknell Road – Proposed Junction – Swept Path Analysis (Large Car)
- **4600-1100-T-057 Rev A** – A4095 Howes Lane/Bucknell Road – Proposed Junction – Visibility Splays
- **4600-1100-T-058 Rev A** – A4095 Howes Lane/Bucknell Road – Proposed Junction – Stopping Sight Distance

2.1.3 In addition to the above-mentioned drawings, the Stage 1 RSA Brief also included details of Road Traffic Collision Data from 01/01/2016 to 31/12/2021 and Traffic Flow Diagrams for the following scenarios in the AM and PM Peak Hours:

- Diagram A – 2022 Observed Base Traffic Flows (Wednesday 02/02/2022)
- Diagram B – 2028 Growthed Base Traffic Flows (TEMPRO Growth Factors)
- Diagram C – Proposed Development Traffic Flows (as agreed with OCC)
- Diagram D – 2028 Base + Proposed Development Traffic Flows

2.1.4 The Stage 1 RSA Brief is included at **Appendix A**.

2.1.5 The signed Stage 1 RSA prepared by RSC is included at **Appendix B**.

2.1.6 This Designer's Response addresses the problems raised in the Stage 1 RSA and draws together the following documents and information:

- Column 1 – identifies the item number in the Stage 1 RSA;

- Column 2 – summarises the problem identified within the Stage 1 RSA;
- Column 3 – sets out the Auditor's recommendation;
- Column 4 – sets out the Designer's Response; and
- Column 5 – allows for comments from the Local Highway Authority.

3 DESIGNER'S RESPONSE TABLES

Item	Problem	Auditor's Recommendation	Designer's Response	OCC Response
4.1	***Location:*** On Bucknell Road – northern arm of the junction ***Summary:*** Reduced footway width may lead to pedestrian to vehicle collisions The realigned kerb of the northern exit arm of Bucknell Road, produces a reduced footway width on the western side of the road. The design sketch appears to show a footway width of approximately 1m. The reduced footway width may lead to pedestrians walking in the carriageway to pass others on the footway. This may lead to pedestrian to vehicle collisions. This may be exacerbated by the restricted inter-visibility between opposing pedestrians at this location, due to the railway bridge wing wall. The reduced footway width may bring pedestrians closer to the carriageway edge, and the wing mirrors of large vehicles may overhang the footway resulting in wing mirror strikes to pedestrians.	It is recommended that measures are introduced to provide a footway width that enables opposing users to pass without entering carriageway areas; measures may include the realignment of kerb lines.	The RSA comment on the footway amendment is noted but not accepted. The proposed kerbs have been aligned in order to allow for heavy goods vehicles (HGVs) and other vehicles to turn left from the A4095 Howes Lane onto Bucknell Road without incursion into the southbound lane of Bucknell Road. Whilst this change has reduced the effective footway width, it is noted that there is very little (if any) pedestrian demand in this location, with no pedestrians observed using this route within the traffic surveys undertaken 02/02/2022. On that basis, the likelihood of any conflict between pedestrians is minimal. It is also noted that the footway is reduced to a minimum of 1m for a very limited stretch, which still accords with the minimum requirements set out within Department for Transport (DfT) Inclusive Mobility Guidance (2002). In addition, the proposals improve the pedestrian footway provision along the eastern kerb of Bucknell	

			Road, where the greatest pedestrian demand was observed. On that basis, no changes are proposed to the design and if any were, it might be to remove the provision of the pedestrian footway on the western side of the Bucknell Road and the northern side of Howes Lane completely, thus preventing the opportunity for any pedestrians to utilise the crossing or the existing footway provision when there is considered to be no demand for this.	
4.2	***Location:*** At the mini roundabout, northbound travel through the junction ***Summary:*** Excessive entry path through the junction may lead to vehicle to vehicle collisions The offset central island location produces an excessive vehicle path through the junction for northbound users. This may lead to drivers failing to appropriately 'negotiate' the central island. Poor compliance with the circulatory requirements of the junction may lead to vehicle to vehicle collisions.	It is recommended that the size and location of the central island is amended to encourage appropriate circulatory movements for all turning manoeuvres. Measures may include a reduction in central island diameter, realignment of the eastern kerb realignment and a reduction of the circulatory carriageway width	The RSA comment on the alignment of the mini roundabout is noted but not accepted. The current location and arrangement of the central island is to allow for access through the mini roundabout for southbound HGVs turning right onto the A4095 Howes Lane. In addition, it is considered that with appropriate signage (details confirmed at the Detailed Design stage), drivers will be notified of the new junction layout.	
4.3	***Location:*** At the mini roundabout ***Summary:*** Construction joint issues may lead to loss of control type collisions The construction joint of the existing junction will fall within the circulatory carriageway area of the junction.	It is recommended that measures are introduced to ensure the integrity of the existing construction joint. Measures may include the resurfacing of the junction area to remove the construction joint	The RSA comment on the construction joint is noted and accepted. The details to ensure the integrity of the existing construction joint will be addressed at the Detailed Design	

	Large turning vehicles will increase stresses on the construction joint, which may lead to deterioration of the joint and pot holes within turning areas for vehicles. Poor carriageway surfaces within turning areas will increase the likelihood of loss of control type collisions, particularly for two-wheeled users.	within likely stress areas	stage. If it is considered necessary to resurface the junction area, this will be identified.	
4.4	***Location:*** At the mini roundabout – Bucknell Road Northern entry ***Summary:*** Late braking or failure to give way type collisions On the northern, Bucknell Road entry, drivers may fail to appreciate the presence of the mini roundabout, as siting of the diag 611.1 sign may be problematic and there may be reduced forward visibility to the sign. Poor perception of the change junction arrangements may lead to failure to give way or late braking shunt type collisions	It is recommended that forward visibility to the diag 611.1 sign is maximised to provide adequate warning of the junction type. Existing map type direction signs for the conventional roundabout on the A4095 (E) and Bucknell Road (N) approaches should be amended to clearly identify the new roundabout junction at Howes Lane	The RSA comment on signage is noted and accepted. The details of the signage strategy will be agreed at the Detailed Design stage.	
4.5	***Location:*** At the mini roundabout ***Summary:*** Swept path of large vehicles may lead to vehicle to vehicle collisions Whilst on site, the audit team noted that the drivers of large vehicles over-ran the central hatched area and opposing traffic lane when making a left turn manoeuvre from Howes Lane on to Bucknell Road. The swept path drawings provided indicate that drivers of large vehicles may have to carry out a precise left turn manoeuvre to avoid over-running the opposing traffic lane or striking nearside kerbs. This manoeuvre may lead to vehicle to vehicle collisions with the introduction of the mini roundabout and revised kerb line of the eastern side of Bucknell Road.	It is recommended that measures should be introduced to minimise the likelihood of large vehicle swept paths crossing the hatched areas and entering the opposing traffic lane; measures may include widening the hatched markings separating the two traffic streams, reducing the southbound traffic lane width, and amending the eastern kerb line	The RSA comment is noted but not accepted. The width of the existing southbound lane on Bucknell Road has been widened, with additional kerb alignment changes to the northbound lane in order to maximise the carriageway space available and prevent vehicles and HGVs travelling over the centreline. The proposals are considered to be the most appropriate within the constraints of the railway bridge to reduce conflict between vehicles The 'AutoTrack' vehicle tracking	

			software used contains safety allowances within the software, meaning in 'real life' situations a vehicle will be able to turn with greater ease and would be less onerous. No changes are therefore proposed to the current arrangement.	
4.6	***Location:*** On Bucknell Road – northern arm of the junction western crossing point ***Summary:*** Restricted inter-visibility may lead to pedestrian to vehicle collisions The relocation of the give way line back into Howes Lane means that inter-visibility between a pedestrian waiting at the existing crossing point on the western side and a driver turning left from Howes Lane will be further restricted (existing inter-visibility between users is poor). This may lead to an increased likelihood of pedestrian to vehicle collisions.	It is recommended that the existing crossing point is relocated to a point where appropriate adequate inter-visibility can be achieved. It may be appropriate to extend the footway on the western side of Bucknell Road and provide a dropped kerb crossing point at the splitter island of the Lords Lane roundabout.	The RSA comment is acknowledged but not accepted. It is noted that the intervisibility for pedestrians is an existing constraint, with the collision data suggesting this has not led to any accidents occurring in the latest 5-year period. In addition, it is noted that no pedestrians were observed using this crossing in the observed traffic surveys undertaken, meaning the likelihood of any conflict is low given there is currently little (if any) demand. If required by OCC, the feasibility of a relocated crossing could be determined at the Detailed Design stage. Alternatively, the pedestrian facilities on the western side of Bucknell Road and the northern side of Howes Lane, could be removed completely.	

APPENDIX A

STAGE 1 RSA BRIEF

VELOCITY
Transport Planning

TECHNICAL NOTE: STAGE 1 RSA BRIEF

Table 1: Project Summary

Date:	01 March 2022
Document Reference:	4600-1100 Doc: 008 V0.1
Prepared by:	Velocity Transport Planning
On behalf of:	Firethorn Trust
AUTHORISATION SHEET	
Project:	Land at North West Bicester
Report title:	Stage 1 RSA Brief
PREPARED BY	
Name:	Mark Kirby
Signed:	[redacted]
Organisation:	Velocity Transport Planning
Date:	01 March 2022

Table 2: General Details

Highway scheme name and road number:		A4095 Howes Lane / Bucknell Road Junction		
Type of scheme:	Proposed introduction of a mini-roundabout junction to replace the existing priority junction at the A4095 Howes Lane / Bucknell Road			
RSA Stage (tick as appropriate)	1 ✓	2	3	4
	Interim			
Overseeing Organisation Details		**Design Organisation Details**		
Oxfordshire County Council, County Hall, New Road, Oxford. OX1 1ND		Velocity Transport Planning. Unit A, Taper Studios, The Leather Market, 120 Weston Street, London, SE1 4GS		
Police Contact Details:		**Maintaining Agent Contact Details:**		
(Required for Stage 3 RSAs)		Oxfordshire County Council		
RSA Team Membership				
Road Safety Consulting Ltd				
Terms of Reference				

Table 3: Scheme Details

General
• Replace the existing priority junction of the A4095 Howes Lane / Bucknell Road with a proposed mini-roundabout junction of 14m ICD.
Design Standards Applied to the Scheme
MfS/MfS2, the OCC Residential Design Guide (2nd Edition – 2015), and DMRB CD116 & CD109
Design Speed
30mph
Speed Limits
30mph
Existing Traffic Flows/Queues
A Traffic Survey was undertaken on Wednesday the 02nd of February 2022. • Diagram A – 2022 Observed Traffic Flows – AM & PM Peak Hours
Forecast Traffic Flows
Whilst Traffic Data from the Bicester Transport Model (BTM) for a Future Year is awaited, as this information has not been forthcoming, TEMPRO Growth Factors have been used to growth the 2022 Observed Traffic flows to a Future Year of 2028 (Diagram B). This assumes that a Planning Consent is granted in 2022, construction starts in 2023, and the 530 dwellings could be completed by 2028. • Diagram B – 2028 Growthed Base Traffic Flows – AM & PM Peak Hours • Diagram C – Proposed Development Traffic Flows – AM & PM Peak Hours • Diagram D – 2028 Base + Proposed Development Traffic Flows – AM & PM Peak Hours
Pedestrian, Cyclist and Equestrian Desire Lines
The proposed junction improvement does not prejudice the existing desire lines for pedestrians, cyclists and equestrians
Environmental Constraints
N/A

Table 4: Locality

Description of Locality
The junction of the A4095 Howes Lane/Bucknell Road is located on the western side of Bicester. An existing railway bridge spans the northern part of the junction.
General Description:

The proposed development is for up to 530 residential units, the access to the development is to be taken from the as-built estate road that runs from a priority junction with the B4100 to the south-east of the proposed development with Charlotte Avenue to a priority junction to the north-east of the proposed development with Braeburn Avenue. A Bus Only link is located between the Eastern and Western Parcels of the proposed development. Two site access junctions will be formed to the south of the bus gate and one new site access junction to be formed to the north of the bus gate. A new extended access road is to be provided on the northern boundary of the western parcel of the proposed development. A temporary access is proposed to access the Eastern Parcel of land from the B4100 during construction only and a temporary access is proposed to the Western Parcel from the existing layby on the B4100 Banbury Road during construction only.
Relevant Factors which may Affect Road Safety
The Existing Priority Junction is considered to be somewhat constrained, and it is therefore requested that a Safety audit is undertaken of this arrangement to be compared to the Proposed Mini-Roundabout Junction. General Arrangement Drawings have been provided for both the Existing Junction and the Proposed Junction.

Table 5: Analysis

Collision Data Analysis
Latest three-year PIA data is included. A Plan showing the locations and severity of the accidents is included, as well as a review of these accidents. It should be noted that we have been provided with PUBLIC and PRIVATE data and notified to ensure that only the PUBLIC data is presented within a report that will be available to the public. However, the details of the accidents are only presented on the PRIVATE data. As such, both sets of data are provided. A single accident was recorded on the A4095 Lords Lane approx 50m from the junction with Bucknell Road on 18/05/2016 (Ref P1790516). The cause of this accident was due to "*illness or disability, mental or physical*" and is not attributed to the geometry of the existing junction.
Departures from Standards:
The following Departures from Standards are identified: • The visibility splay from the southbound Bucknell Road give way line at the proposed mini-roundabout junction identifies an "F" distance of less than the recommended 9.0m (paragraph 5.24 of CD 116). • The desirable minimum stopping sight distance (SSD) for roads with a design speed of 50kph (30mph), which both the A4095 Howes Lane and Bucknell Road are identified as, should be 70.m (Table 2.10 of CD 109). Whilst the SSD for both he A4095 Howes Lane and the Bucknell Road northbound approaches can be achieved, the SSD for the southbound approach is identified as being in the order of 37m. This is less than "one step below desirable minimum" for a 30mph road, but it must be acknowledged that with the introduction of the give way line for the mini-roundabout, vehicle speeds approaching from the north, will be considerably lower than the design speed of 30mph.
Previous Road Safety Audit Stage Reports, Road Safety Audit Responses and Evidence of Agreed Actions
N/A

Strategic Decisions:
OCC have taken the decision to redirect the previously agreed funding for the Approved A4095 Strategic Link Road (14/01968/F). As such, the proposed Interim Improvement at the A4095 Howes Lane/Bucknell Road junction is proposed to accommodate all of the development traffic associated with the full Firethorn Development prior to the implementation of the A4095 Strategic Link Road.
List of Included Documents & Drawings:
Documents: • Summary of Accident Data – PRIVATE & PUBLIC (including Accident Location Plan) • Traffic Flow Diagrams A-D
Drawings: • **4600-1100-T-050 Rev A** – A4095 Howes Lane/Bucknell Road – Existing Junction – General Arrangement • **4600-1100-T-054 Rev A** – A4095 Howes Lane/Bucknell Road – Proposed Junction – General Arrangement • **4600-1100-T-057 Rev A** – A4095 Howes Lane/Bucknell Road – Proposed Junction – Visibility Splays • **4600-1100-T-058 Rev A** – A4095 Howes Lane/Bucknell Road – Proposed Junction – Stopping Sight Distance

APPENDIX B

STAGE 1 RSA

VELOCITY
Transport Planning

ROAD SAFETY CONSULTING LTD

Stage 1 Road Safety Audit

Howes Lane junction with Bucknell Road, Bicester

Proposed Mini Roundabout

Date: 18/03/2022

Report produced for: Firethorn Trust

Report requested by: Velocity Transport Planning

On behalf of: Oxfordshire County Council

Report prepared by: Kevin Seymour, Road Safety Consulting Ltd

Reference: RSC/KS/EB/21093

Document Control Sheet

Project Title	Howes Lane junction with Bucknell Road, Bicester Proposed Mini Roundabout
Report Title	Stage 1 Road Safety Audit Reference: RSC/KS/EB/21093
Revision	-
Status	Final
Control Date	18/03/2022

Record of Issue

Issue	Author	Date	Check	Date	Authorised	Date
Final	**KS**	**16/03/22**	**EB**	**17/03/22**	**KS**	**17/03/22**

Distribution

Organisation	Contact	Copies
Velocity Transport Planning	**Mark Kirby**	ecopy

Road Safety Consulting Ltd
4 Paramore Close
Whetstone
Leicestershire
LE8 6EY
Registered in England and Wales
Company Number 5225549

1. Introduction

1.1. This report results from a Stage 1 Road Safety Audit carried out on the proposed mini-roundabout at the Howes Lane junction with Bucknell Road, Bicester, associated with the development of land off NW Bicester. The Audit was carried out during March 2022.

1.2. This Road Safety Audit was produced for (client): Firethorn Trust, requested by (design organisation): Velocity Transport Planning, on behalf of (overseeing organisation): Oxfordshire County Council.

1.3. The Audit Team membership was as follows:

Audit Team Leader
Kevin Seymour
B Sc, PG Dip TS, MCIHT, MSoRSA
Highways England Certificate of Competence (Road Safety Audit)
Road Safety Consulting Ltd

Audit Team Member
Elaine Bingham
B Eng (Hons), MCIHT, MSoRSA
Highways England Certificate of Competence (Road Safety Audit)
Road Safety Consulting Ltd

1.4. The audit took place at the offices of Road Safety Consulting Ltd between 14th and 17th March 2022. The audit was undertaken in accordance with the Road Safety Audit brief provided and with reference to the Design Manual for Roads and Bridges (DMRB) GG 119.

1.5. The Audit Team visited the site together on the 14h March 2022, between 11:30am and 12:30pm. The weather at the time of the audit was sunny and dry. The road surface was dry. Traffic flows were moderate at the junction. Low pedestrian and cycle volumes were observed; two equestrian users were observed using the junction during the site visit. At the junction, the predominant traffic flow movements were observed to be the left turn manoeuvre from Howes Lane to Bucknell Road, and the reverse right turn manoeuvre from Bucknell Road to Howes Lane.

1.6. The audit comprised an examination of the information provided by the Design Organisation and listed in Appendix 1.

1.7. The team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.

1.8. All comments and recommendations are referenced to the design drawing and the locations have been indicated on plans in Appendix 2.

2. Items Considered

2.1. Scheme Proposals

2.1.1. The overall development is for up to 530 residential units, the access to the development is to be taken from the as-built estate road that runs from a priority junction with the B4100 to the south-east of the proposed development with Charlotte Avenue to a priority junction to the north-east of the proposed development with Braeburn Avenue.

2.1.2. A Bus Only link is located between the Eastern and Western Parcels of the proposed development. Two site access junctions will be formed to the south of the bus gate and one new site access junction to be formed to the north of the bus gate. A new extended access road is to be provided on the northern boundary of the western parcel of the proposed development. A temporary access is proposed to access the Eastern Parcel of land from the B4100 during construction only and a temporary access is proposed to the Western Parcel from the existing layby on the B4100 Banbury Road during construction only.

2.1.3. The highways element of this scheme consists of the replacement of the existing priority junction of the A4095 Howes Lane / Bucknell Road with a proposed mini-roundabout junction of 14m ICD.

2.2. Information Provided to the Audit Team

2.2.1. Information that has been provided to the Audit Team, for the purpose of this audit, is as outlined within Appendix 1 of this report.

2.2.2. The Audit Team has also received the latest three-year PIA data:

2.2.3. A plan showing the locations and severity of the accidents, as well as a review of these accidents. It should be noted that we have been provided with PUBLIC and PRIVATE data and notified to ensure that only the PUBLIC data is presented within a report that will be available to the public. However, the details of the accidents are only presented on the PRIVATE data. As such, both sets of data are provided.

2.2.4. A single accident was recorded on the A4095 Lords Lane approx. 50m from the junction with Bucknell Road on 18/05/2016 (Ref P1790516). The cause of this accident was due to “illness or disability, mental or physical” and is not attributed to the geometry of the existing junction.

2.3. Departures from Standards (Design)

2.3.1. The Audit Team notes the following Departures from Standards are identified:

2.3.2. The visibility splay from the southbound Bucknell Road give way line at the proposed mini-roundabout junction identifies an “F” distance of less than the recommended 9.0m (paragraph 5.24 of CD 116).

2.3.3. The desirable minimum stopping sight distance (SSD) for roads with a design speed of 50kph (30mph), which both the A4095 Howes Lane and Bucknell Road are identified as, should be 70.m (Table 2.10 of CD 109). Whilst the SSD for both the A4095 Howes Lane and the Bucknell Road northbound approaches can be achieved, the SSD for the southbound approach is identified as being in the order of 37m. This is less than "one step below desirable minimum" for a 30mph road, but it must be acknowledged that with the introduction of the give way line for the mini- roundabout, vehicle speeds approaching from the north, will be considerably lower than the design speed of 30mph.

3. Items Raised at Previous Road Safety Audits

3.1. The Audit Team is unaware of any previous Road Safety Audits on this proposal.

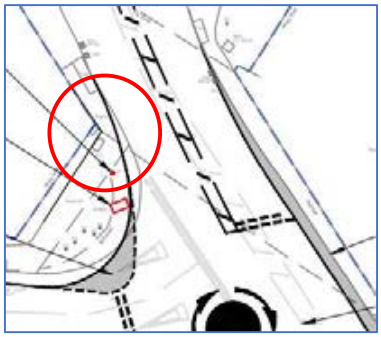
.

4. Items Raised by this Stage 1 Road Safety Audit

4.1. Problem

Location: On Bucknell Road – northern arm of the junction

Summary: Reduced footway width may lead to pedestrian to vehicle collisions



The realigned kerb of the northern exit arm of Bucknell Road, produces a reduced footway width on the western side of the road. The design sketch appears to show a footway width of approximately 1m. The reduced footway width may lead to pedestrians walking in the carriageway to pass others on the footway. This may lead to pedestrian to vehicle collisions. This may be exacerbated by the restricted inter-visibility between opposing pedestrians at this location, due to the railway bridge wing wall.

The reduced footway width may bring pedestrians closer to the carriageway edge, and the wing mirrors of large vehicles may overhang the footway resulting in wing mirror strikes to pedestrians.

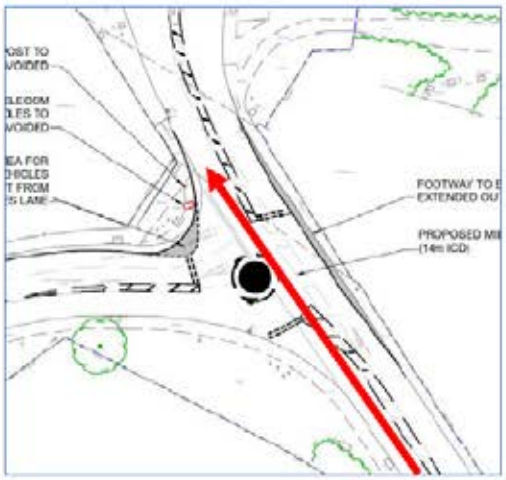
Recommendation:

It is recommended that measures are introduced to provide a footway width that enables opposing users to pass without entering carriageway areas; measures may include the realignment of kerb lines.

4.2. Problem

Location: At the mini roundabout, northbound travel through the junction

Summary: Excessive entry path through the junction may lead to vehicle to vehicle collisions



The offset central island location produces an excessive vehicle path through the junction for northbound users. This may lead to drivers failing to appropriately 'negotiate' the central island. Poor compliance with the circulatory requirements of the junction may lead to vehicle to vehicle collisions.

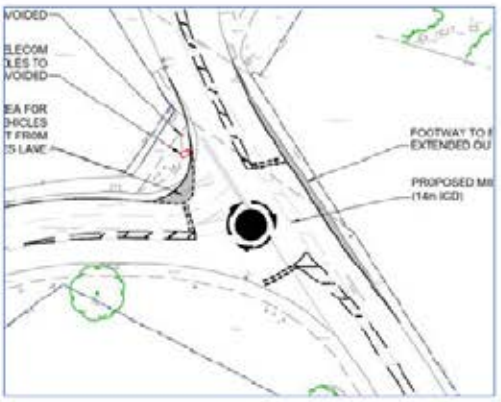
Recommendation:

It is recommended that the size and location of the central island is amended to encourage appropriate circulatory movements for all turning manoeuvres. Measures may include a reduction in central island diameter, realignment of the eastern kerb realignment and a reduction of the circulatory carriageway width.

4.3. Problem

Location: At the mini roundabout

Summary: Construction joint issues may lead to loss of control type collisions



The construction joint of the existing junction will fall within the circulatory carriageway area of the junction. Large turning vehicles will increase stresses on the construction joint, which may lead to deterioration of the joint and pot holes within turning areas for vehicles. Poor carriageway surfaces within turning areas will increase the likelihood of loss of control type collisions, particularly for two-wheeled users.

Recommendation:

It is recommended that measures are introduced to ensure the integrity of the existing construction joint. Measures may include the resurfacing of the junction area to remove the construction joint within likely stress areas.

4.4. Problem

Location: At the mini roundabout – Bucknell Road Northern entry

Summary: Late braking or failure to give way type collisions

On the northern, Bucknell Road entry, drivers may fail to appreciate the presence of the mini roundabout, as siting of the diag 611.1 sign may be problematic and there may be reduced forward visibility to the sign. Poor perception of the change junction arrangements may lead to failure to give way or late braking shunt type collisions.

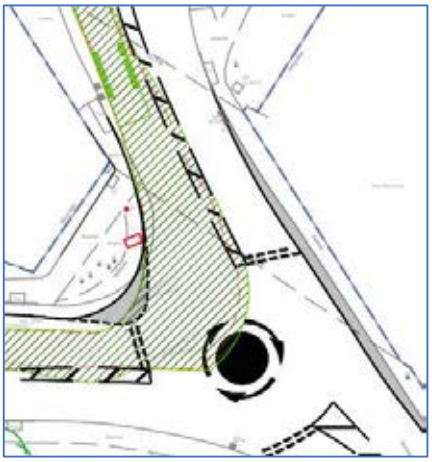
Recommendation:

It is recommended that forward visibility to the diag 611.1 sign is maximised to provide adequate warning of the junction type. Existing map type direction signs for the conventional roundabout on the A4095 (E) and Bucknell Road (N) approaches should be amended to clearly identify the new roundabout junction at Howes Lane.

4.5. Problem

Location: At the mini roundabout

Summary: Swept path of large vehicles may lead to vehicle to vehicle collisions



Whilst on site, the audit team noted that the drivers of large vehicles over-ran the central hatched area and opposing traffic lane when making a left turn manoeuvre from Howes Lane on to Bucknell Road. The swept path drawings provided indicate that drivers of large vehicles may have to carry out a precise left turn manoeuvre to avoid over-running the opposing traffic lane or striking nearside kerbs. This manoeuvre may lead to vehicle to vehicle collisions with the introduction of the mini roundabout and revised kerb line of the eastern side of Bucknell Road.

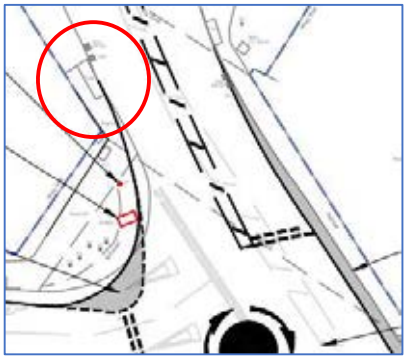
Recommendation:

It is recommended that measures should be introduced to minimise the likelihood of large vehicle swept paths crossing the hatched areas and entering the opposing traffic lane; measures may include widening the hatched markings separating the two traffic streams, reducing the southbound traffic lane width, and amending the eastern kerb line.

4.6. Problem

Location: On Bucknell Road – northern arm of the junction western crossing point

Summary: Restricted inter-visibility may lead to pedestrian to vehicle collisions



The relocation of the give way line back into Howes Lane means that inter-visibility between a pedestrian waiting at the existing crossing point on the western side and a driver turning left from Howes Lane will be further restricted (existing inter-visibility between users is poor). This may lead to an increased likelihood of pedestrian to vehicle collisions.

Recommendation:

It is recommended that the existing crossing point is relocated to a point where appropriate adequate inter-visibility can be achieved. It may be appropriate to extend the footway on the western side of Bucknell Road and provide a dropped kerb crossing point at the splitter island of the Lords Lane roundabout.

End of Safety Comments

5. Audit Team Statement

We certify that this Stage 1 Road Safety Audit has been carried with reference to GG 119.

Audit Team Leader

Kevin Seymour
B Sc, PG Dip TS, MCIHT, MSoRSA
Highways England Certificate of Competence (Road Safety Audit)

Signed: [redacted] . Dated 16h March 2022

Director of Road Safety Consulting Ltd

Audit Team Member

Elaine Bingham,
B Eng (Hons), MCIHT, MSoRSA
Highways England Certificate of Competence (Road Safety Audit)
Director of Road Safety Consulting Ltd

Signed: .. [redacted] ..... Dated 17th March 2022

Director of Road Safety Consulting Ltd

Road Safety Consulting Ltd
4 Paramore Close
Whetstone
Leicestershire
LE8 6EY

APPENDIX 1: Information Provided

List of Information Provided

- Drawing 4600-1100-T-050 Rev A – A4095 Howes Lane/Bucknell Road – Existing Junction – General Arrangement
- Drawing 4600-1100-T-051 Rev A – A4095 Howes Lane/Bucknell Road – Existing Junction – Swept Path Analysis (1)
- Drawing 4600-1100-T-052 Rev A – A4095 Howes Lane/Bucknell Road – Existing Junction – Swept Path Analysis (2)
- Drawing 4600-1100-T-053 Rev A – A4095 Howes Lane/Bucknell Road – Existing Junction – Visibility Splays
- Drawing 4600-1100-T-054 Rev A – A4095 Howes Lane/Bucknell Road – Proposed Junction – General Arrangements
- Drawing 4600-1100-T-055 Rev A – A4095 Howes Lane/Bucknell Road – Proposed Junction – Swept Path Analysis (1)
- Drawing 4600-1100-T-056 Rev A – A4095 Howes Lane/Bucknell Road – Proposed Junction – Swept Path Analysis (2)
- Drawing 4600-1100-T-057 Rev A – A4095 Howes Lane/Bucknell Road – Proposed Junction – Visibility Splays
- Drawing 4600-1100-T-058 Rev A – A4095 Howes Lane/Bucknell Road – Proposed Junction – Stopping Sight Distance

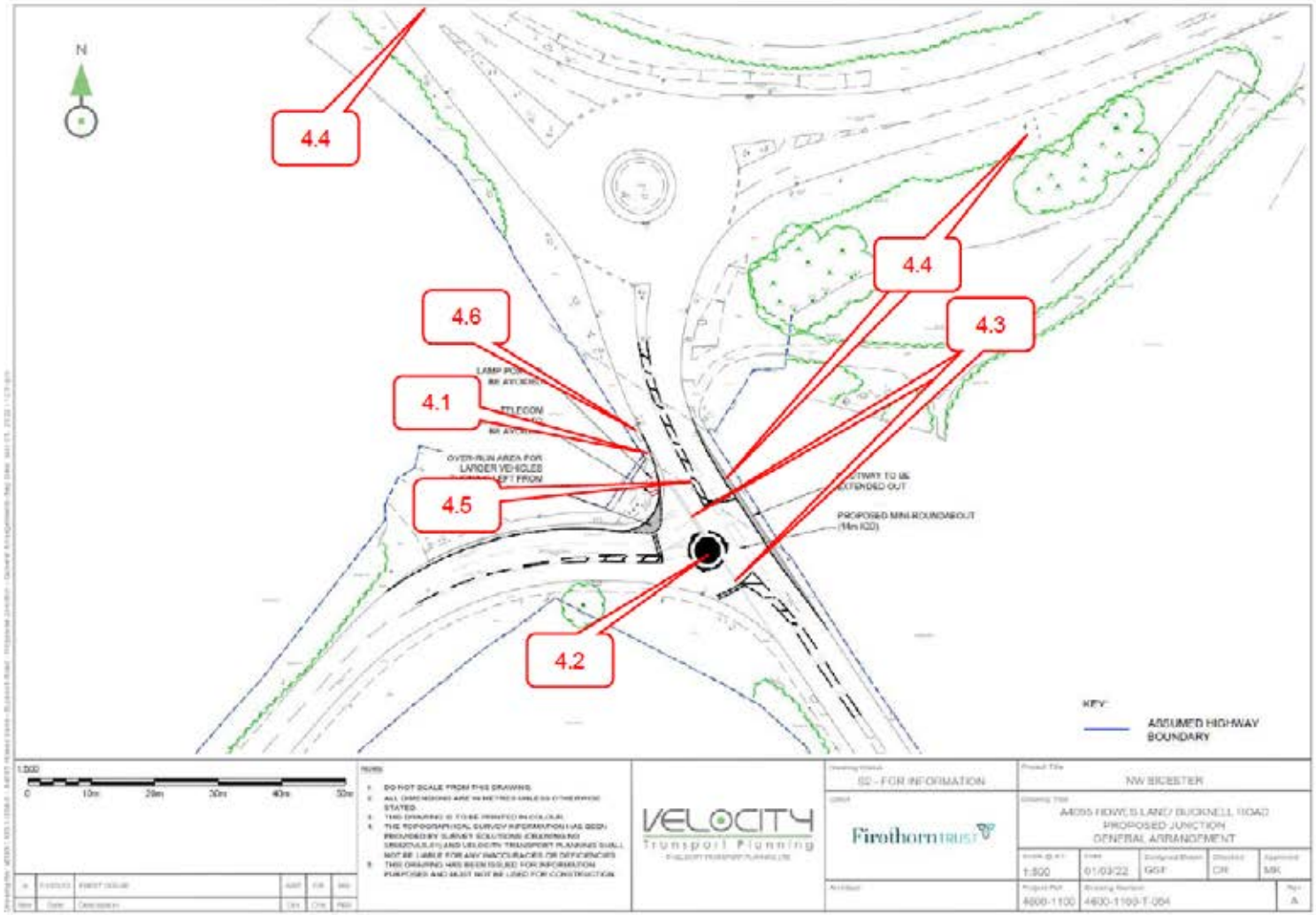
Stage 1 Road Safety Audit Brief

Road traffic collision data

Traffic flow data

APPENDIX 2: Drawing Showing Problem Locations

Problem numbers shown on the attached drawing refer to Problem numbers within the report.



ATTACHMENT H

ROAD SAFETY ASSESSMENT

ROAD SAFETY CONSULTING LTD

Road Safety Assessment

A4095 Howes Lane, junction with Bucknell Road, Bicester

Conversion of Junction to a Mini Roundabout

Date: 17/03/2022

Report produced for: Velocity Transport Planning

Report produced by: Kevin Seymour, Road Safety Consulting Ltd

Reference: RSC/KS/EB/21095

Document Control Sheet

Project Title	A4095 Howes Lane, junction with Bucknell Road, Bicester Conversion of Junction to a Mini Roundabout
Report Title	Road Safety Assessment Reference: RSC/KS/EB/21095
Revision	-
Status	Draft
Control Date	17/03/2022

Record of Issue

Issue	Author	Date	Check	Date	Authorised	Date
Draft	**KS**	**16/03/22**	**EB**	**17/03/22**	**KS**	**17/03/22**

Distribution

Organisation	Contact	Copies
Velocity Transport Planning	**Mark Kirby**	ecopy

Road Safety Consulting Ltd
4 Paramore Close
Whetstone
Leicestershire
LE8 6EY
Registered in England and Wales
Company Number 5225549

1. Introduction

1.1. Project Brief & Background

1.1.1. As part of the proposed development for up to 530 residential units on land on the north-west side of Bicester, there is a proposal to convert the existing give way controlled tee junction at the A4095 Howes Lane junction with Bucknell Road, Bicester, to a three armed mini roundabout. Road Safety Consulting Ltd has been commissioned to assess the road safety implications associated with the existing layout and proposed conversion of the junction, to inform the designer and client on the relative merits and risks of the proposed conversion.

1.1.2. The conversion of this junction is being proposed as a result of Oxfordshire County Council's decision to redirect the previously agreed funding for the Approved A4095 Strategic Link Road (14/01968/F). As such, the proposed Interim Improvement (i.e., the conversion of the A4095 Howes Lane/Bucknell Road junction to a mini roundabout) is proposed to accommodate all of the development traffic associated with the full Firethorn Development prior to the implementation of the A4095 Strategic Link Road.

1.1.3. The access to the proposed residential development is to be taken from the as-built estate road that runs from a priority junction with the B4100 to the south-east of the proposed development with Charlotte Avenue to a priority junction to the north-east of the proposed development with Braeburn Avenue.

1.1.4. A Bus Only link is located between the Eastern and Western Parcels of the proposed development. Two site access junctions will be formed to the south of the bus gate and one new site access junction to be formed to the north of the bus gate. A new extended access road is to be provided on the northern boundary of the western parcel of the proposed development. A temporary access is proposed to access the Eastern Parcel of land from the B4100 during construction only and a temporary access is proposed to the Western Parcel from the existing layby on the B4100 Banbury Road during construction only.

1.2. Outline of Methodology

1.2.1. This safety assessment has been carried out by comparing road safety issues associated with the layout of the existing junction form with the aid of the reported road traffic collision record for the junction, with the possible road safety related issues associated with the proposed conversion of the junction to a mini roundabout. This comparative assessment is qualitative in nature and specific to this particular change in junction form.

1.2.2. The road safety issues have been identified with both layouts and a discussion on the benefits / disbenefits of the proposed conversion of junction form carried, with final concluding remarks.

2. The Existing Junction

2.1. Junction Layout

2.1.1. Currently, the junction of the A4095 Howes Lane with Bucknell Road is a three-armed give way controlled tee junction. This section of the highway network is subject to a posted speed limit of 30mph and street lighting is present.

2.1.2. Howes Lane has a two lane give way line and the approach has a series of horizontal curves on the eastbound approach to the junction; this reduces forward visibility to the junction area, but there appears to be adequate stopping sight distance along Howes Lane, towards the junction, consistent with the posted speed limit. This approach is on a slight downhill gradient towards the junction. There is an existing map type direction sign on the immediate approach to the junction.

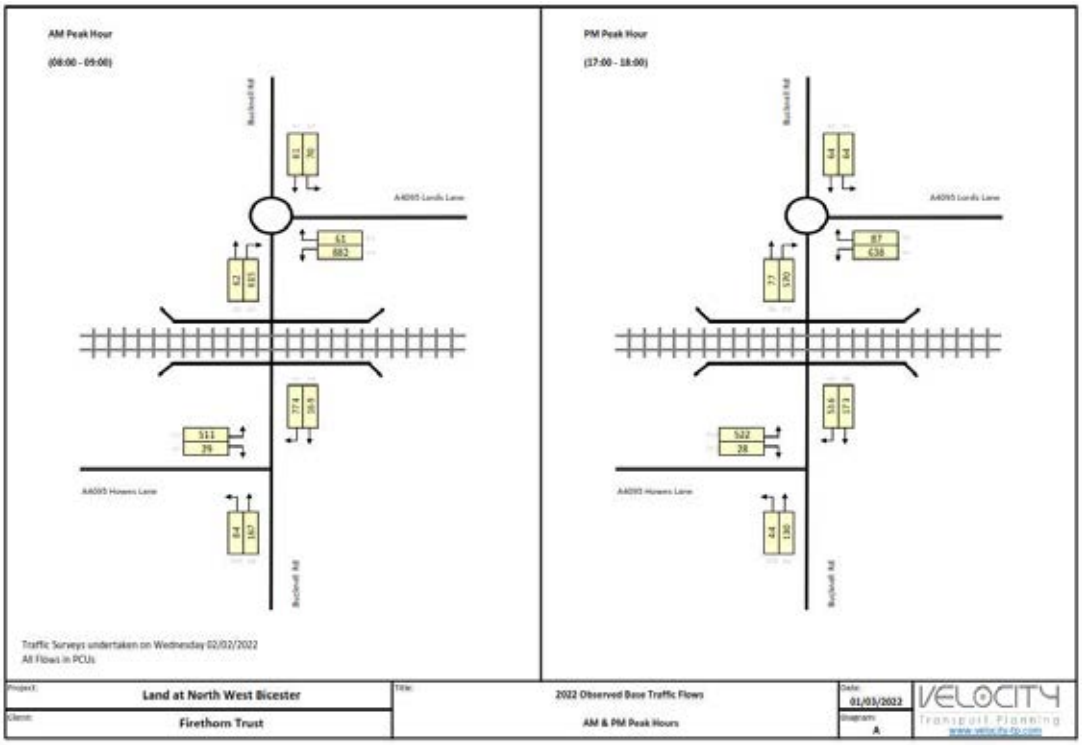
2.1.3. On Howes Lane, approximately 40m west of the junction with Bucknell Road, there is a bridleway, to the north of the road and equestrians were observed to be using Howes Lane and Bucknell Road during the site visit.

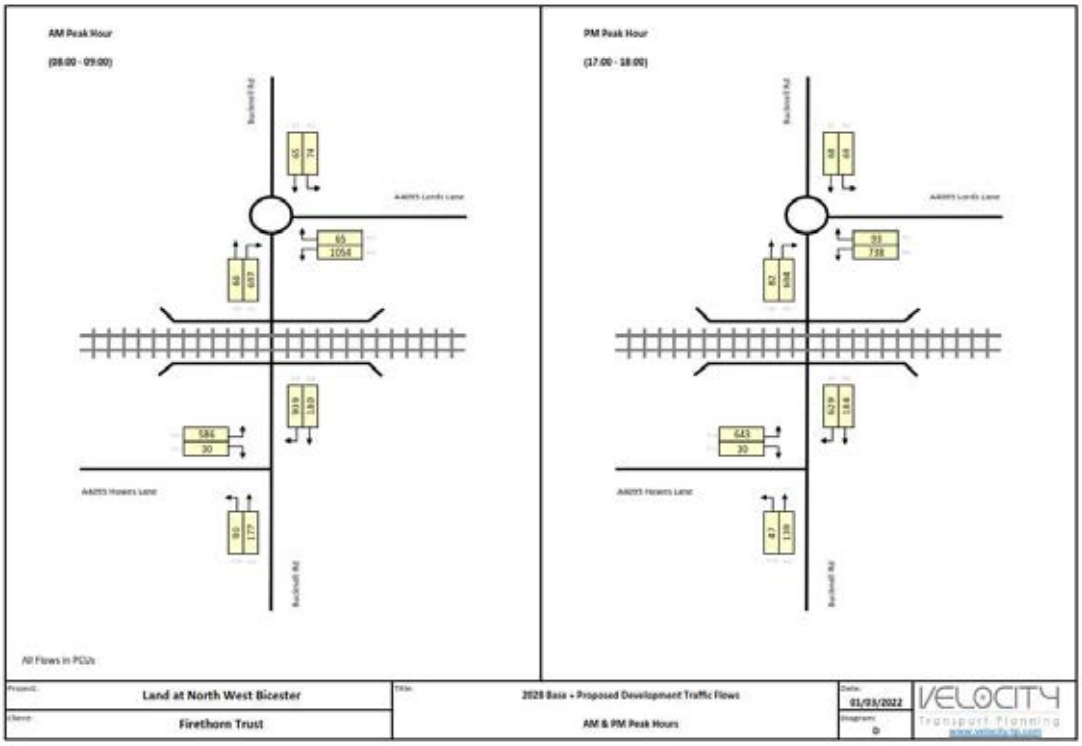
2.1.4. Bucknell Road (southern arm), is on a straight alignment and there is a TRIEF kerbed traffic island approximately 40m from the centre of the junction. There is a continuous hatched marking separator strip; the strip appears to have been highlighted with red surfacing in the past, although this is faded. The hatched area extends through the junction, to provide a narrow, 1m wide, right turn area for users wishing to turn from Bucknell Road on to Howes Lane. This hatched area does not allow right turning vehicles to clear the through lane, and this led to some, minimal, queuing at the junction in the off-peak site visit period.

2.1.5. Bucknell Road (northern arm), is at the southbound exit from an adjacent small conventional roundabout; the junction of Bucknell Road with the A4095 Lords Lane, and the roundabout exit is approximately 40m from the centre of the junction with Howes Lane. There is an uncontrolled pedestrian crossing, on Bucknell Road, just north of the Howes Lane junction; this crossing forms a link to the nearby footpath, which links with an adjacent residential development. There are map type direction signs on both the A4095 Lords Lane and Bucknell Road (N) approaches to the roundabout.

2.2. Traffic Flow Data

2.2.1. Peak hour traffic flow data has been provided to the assessment team, for both existing (2022) conditions and projected (2028) conditions, with possible development traffic added. This data is shown, in diagrammatic form below.





2.2.2. The traffic flow data indicates that the predominant traffic flows at the junction are:

- The left turn manoeuvre from Howes Lane to Bucknell Road, and
- The right turn manoeuvre from Bucknell Road to Howes Lane.

2.2.3. The traffic flow data also indicates that in the AM peak hour the increase in traffic at the junction will be 15.5% (from 1744 vehicles in 2022, to 2002 by 2028 with development) and 16.7% in the pm peak hours (from 1433 in 2022, to 1672 in 2028 with development).

2.2.4. Whilst capacity modelling information has not been provided to the assessment team, it can be seen that the turning traffic proportions would indicate that the current junction priorities do not reflect the predominant traffic movements and queuing at the junction (particularly for the right turn manoeuvre from Bucknell Road) is likely at peak times with increased traffic volumes associated with the proposed development.

2.2.5. No vehicle speed information has been made available to the assessment team, however, the proximity of the Lords Lane roundabout to the Howes Lane junction is likely to result in low approach vehicle speeds.

2.3. Road Traffic Collision History

2.3.1. Road traffic collision data has been provided to the assessment team for the five year period 01/01/2016 and 31/12/2021. This data indicates that there have been no reported injury collisions at the Howes Lane junction, nor the roundabout junction with Bucknell Road with the A4095 in that period.

2.3.2. One injury collision occurred on the A4095 Lords Lane, approximately 50m from the roundabout junction. This collision appears to be related to a medical episode and not related to the highway layout at this location.

2.4. Road Safety Related Issues of the Existing Layout

2.4.1. Notwithstanding the absence of reported road traffic collisions, there are a number of potential road safety related issues associated with the existing layout; these are outlined below and are associated with both the existing traffic flow conditions and in future traffic flow scenarios with the proposed development.

2.4.2. On Bucknell Road (N), at the uncontrolled pedestrian crossing, inter-visibility between pedestrians crossing from the western footway and drivers turning left from Howes Lane is restricted by the railway bridge wing wall. At the time of the site visit traffic flows were such that it was difficult to assess a safe gap for pedestrians to make the crossing; it is likely that during peak traffic periods assessing safe gaps is likely to be more problematic. Additional traffic volumes associated with the proposed development is likely to exacerbate the issue.

2.4.3. On Bucknell Road (N), the right turn manoeuvre to Howes Lane is the predominant traffic flow at present, this is reflected in the traffic flow data provide above. There is a short stacking space between the right turn area and the exit of the Lords Lane roundabout. It is likely that occasionally queuing vehicles may exceed this stacking space, which may lead to blocking of the roundabout junction. Queuing vehicles within the roundabout junction area may increase the risk of collisions involving unexpected lane change or filtering manoeuvres, particularly involving two-wheeled users. Additional traffic volumes associated with the proposed development is likely to exacerbate the issue.

2.4.4. With the current collision record, the apparent road safety issues have not led to reported road traffic collisions, however increased traffic volumes, and possible increases in pedestrian movements associated with the proposed development may increase the likelihood of the road safety related hazards maturing into reported collisions. The increase in traffic volumes will increase exposure to risk, however there is no clear calculable method of identifying whether the increase in exposure to risk will mature into injury collisions.

3. The Proposed Junction

3.1. Junction Layout

3.1.1. The proposal to convert the give way controlled tee junction has been triggered by Oxfordshire County Council's decision to redirect the previously agreed funding for the Approved A4095 Strategic Link Road (14/01968/F). As such, the proposed Interim Improvement (i.e. the conversion of the A4095 Howes Lane/Bucknell Road junction to a mini roundabout) is proposed to accommodate all of the development traffic associated with the full Firethorn Development prior to the implementation of the A4095 Strategic Link Road.

3.1.2. The proposed mini roundabout junction layout has been subject to a Stage 1 Road Safety Audit (RSA) (audit reference RSC/KS/EB/21093). This audit raised six road safety related issues, with associated recommendations to mitigate these issues. This report should be read in conjunction with the Stage 1 RSA report and the issues identified within the Stage 1 RSA will not be repeated within this report.

3.2. Mini Roundabout Road Safety

3.2.1. TRL research report TRL 281 – Accidents at Urban Mini Roundabouts indicates that three arm mini roundabouts have similar mean collision rates to three arm priority T-junctions and up to 30% fewer collisions than for signalled junctions. This research (confirmed by DfT Mini Roundabout Good Practice Guidance – 2006) also indicates that the severity of collisions (percentage of fatal and serious collisions to all injury accidents) at three arm mini-roundabout sites is lower than at three arm signalled junctions and considerably lower than at 30 mph T-junctions.

3.2.2. The same research also indicates that at three arm sites 39.9% of injury collisions involved two wheeled users; the majority of these were of the entering/circulating type. Research from TfL indicates, that in London, 37% of collisions at priority junctions involved two-wheeled users, compared to 33% for mini roundabouts – "Levels of Risk in Greater London, issue 13, TfL 2012.

4. Discussion and Conclusions

4.1. Discussion

4.1.1. According to DfT / County Surveyors document "Mini Roundabout Good Practice Guidance" the introduction of a three arm mini roundabout can improve the operation of a junction by:

- **Reducing the dominance of one traffic flow**
  As the mini-roundabout works on the principle of 'priority to circulating traffic from the right,' a minor traffic flow can be given priority over a major traffic flow that would otherwise dominate the junction.
- **Giving priority to right turners**
  Again the 'priority' principle of operation has been exploited for right-turning traffic, giving it priority over ahead movements from the opposing direction.
- **Facilitating access and reducing delay at side roads**
  The 'priority to the right' rule effectively halves the traffic to which side road flow has to yield priority, making it easier for side road traffic to turn.
- **Improving capacity at overloaded junctions**
  For a given road space, the mini-roundabout has a higher capacity than most alternatives and is very flexible in coping with variations in both volumes and proportions of traffic flow during the day.

4.1.2. Additionally, the injury collision rates for mini roundabouts are generally similar to urban T-junctions, and show lower severity of injury when compared with urban T-junctions. Mini roundabouts are generally believed to have high proportions of collisions involving two-wheeled users, although this is likely to be layout dependent and figures from TfL show mixed outcomes, and in Greater London the proportions of two-wheeled user involvement for the two junction types is similar.

4.1.3. At the specific location in question, i.e. the junction of A4095 Howes Lane, there have been no recorded injury collisions in the past five years. Whilst no vehicle speed information has been made available to the assessment team, the proximity of the Lords Lane roundabout to the study junction is likely to result in low approach vehicle speeds and this may be contributing to the good collision record history and continue to assist in reducing collision risk with the introduction of a mini roundabout.

4.1.4. From a road safety related point of view, there are potential road safety related issues associated with the proposed mini roundabout layout, as highlighted within the Stage 1 Road Safety Audit, although the design is likely to be amenable to amendment to overcome the issues directly related to the proposed junction conversion.

4.1.5. There are pedestrian safety issues associated with both the existing and proposed layouts, specifically, restricted inter-visibility at the uncontrolled crossing of the northern arm of Bucknell Road. The lack of any injury collisions involving pedestrians at this location at present, may be a result of low pedestrian crossing volumes. The proposed layout is unlikely to improve conditions for pedestrians at the junction, particularly with increased traffic volumes, as well as possible increased pedestrian activity. Any increase in traffic flows will increase the exposure to risk for

vulnerable users, therefore there may be a need to introduce measures to improve the pedestrian crossing environment; the Stage 1 RSA has recommended improvement measures.

4.1.6. At the Howes Lane junction, the predominant turning movement are the left turn from Howes Lane to Bucknell Road northern arm and the reverse right turn movement from Bucknell Road in to Howes Lane. The introduction of a mini roundabout junction would provide a level of priority for the right turn manoeuvre in to Howes Lane and this is likely to be beneficial in reducing the possibility of junction blocking at the adjacent Lords Lane roundabout.

4.2. Conclusions

4.2.1. The existing T-junction layout exhibits a good road safety record, with no reported road traffic collisions in the past five year period.

4.2.2. The conversion of the existing junction to a mini roundabout is unlikely to materially adversely affect road safety at the junction, with collision control data indicating similar collision rates between T-junctions and mini roundabouts, and with the proportion of serious injuries being less with mini roundabouts.

4.2.3. Some research has indicated that mini roundabouts tend to have higher portions of collisions involving two-wheeled users than T-junctions, although control data from TfL shows similar proportions of two-wheeled users involvement with the different junction types.

4.2.4. With the absence of strong evidence to rule out the conversion of the junction to a mini roundabout, there are some benefits in such a conversion, and these are associated with traffic capacity improvements and introducing priority for right turning movements from Bucknell Road, which would assist in capacity improvement and play a part in reducing potential junction blocking at the Lords Lane roundabout, which would in turn reduce the likelihood of collisions associated with such junction blocking.

4.2.5. Overall, the conversion of the existing T-junction would provide positive impacts in terms of traffic capacity, to enable a level of residential development to be implemented. Any adverse effects that may be associated with such a conversion are questionable and appear to be able to be mitigated by a ‘best practice’ design of the three armed mini roundabout.

4.2.6. One issue that should be carefully considered when converting the junction form would be pedestrian safety and amenity at the junction. This is clearly an issue with the current T-junction layout and improved provision, as recommended with the Stage 1 RSA, would mitigate an existing issue and provide a more ‘pedestrian friendly’ crossing environment with the proposed converted layout.

Safety Assessors

Kevin Seymour, B Sc, PG Dip TS, MCIHT, MSoRSA

Signed: [redacted] ate: 16th March 2022

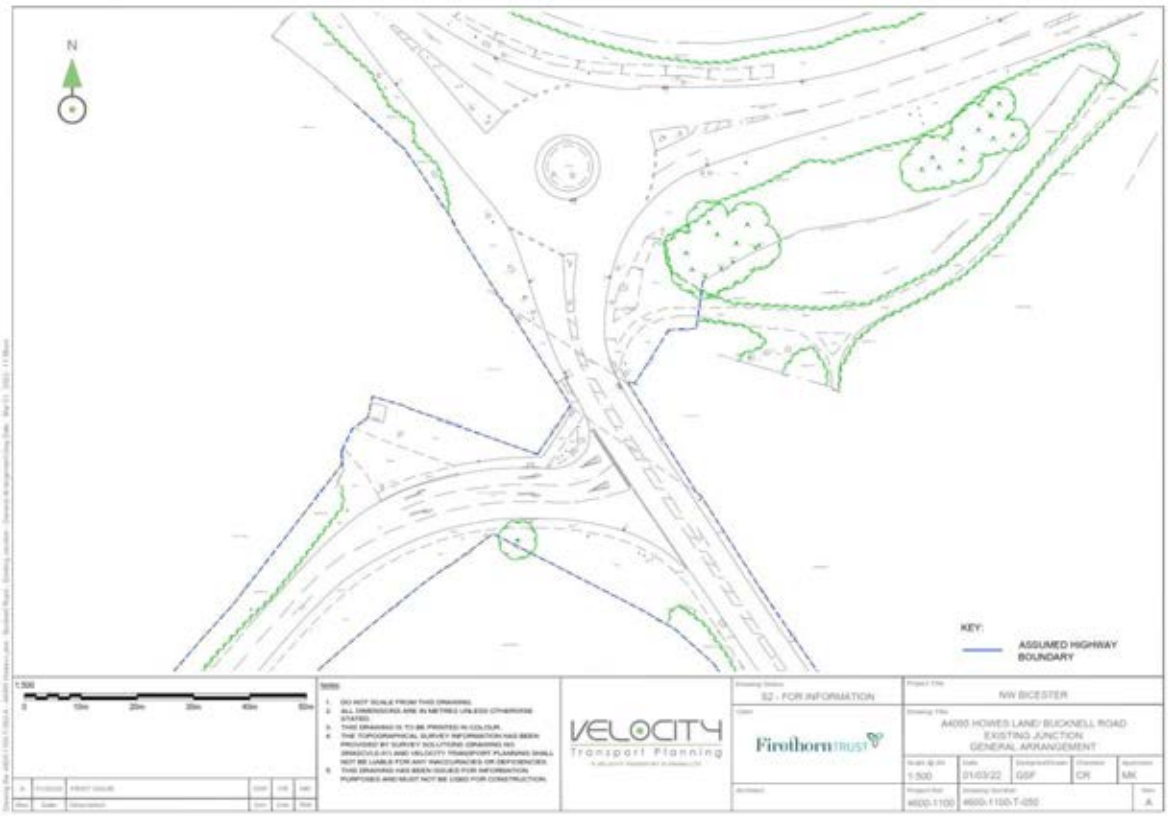
Elaine Bingham, BEng (Hons), MCIHT, MSoRSA

Signed: ..... [redacted] ..... Date: 17th March 2022

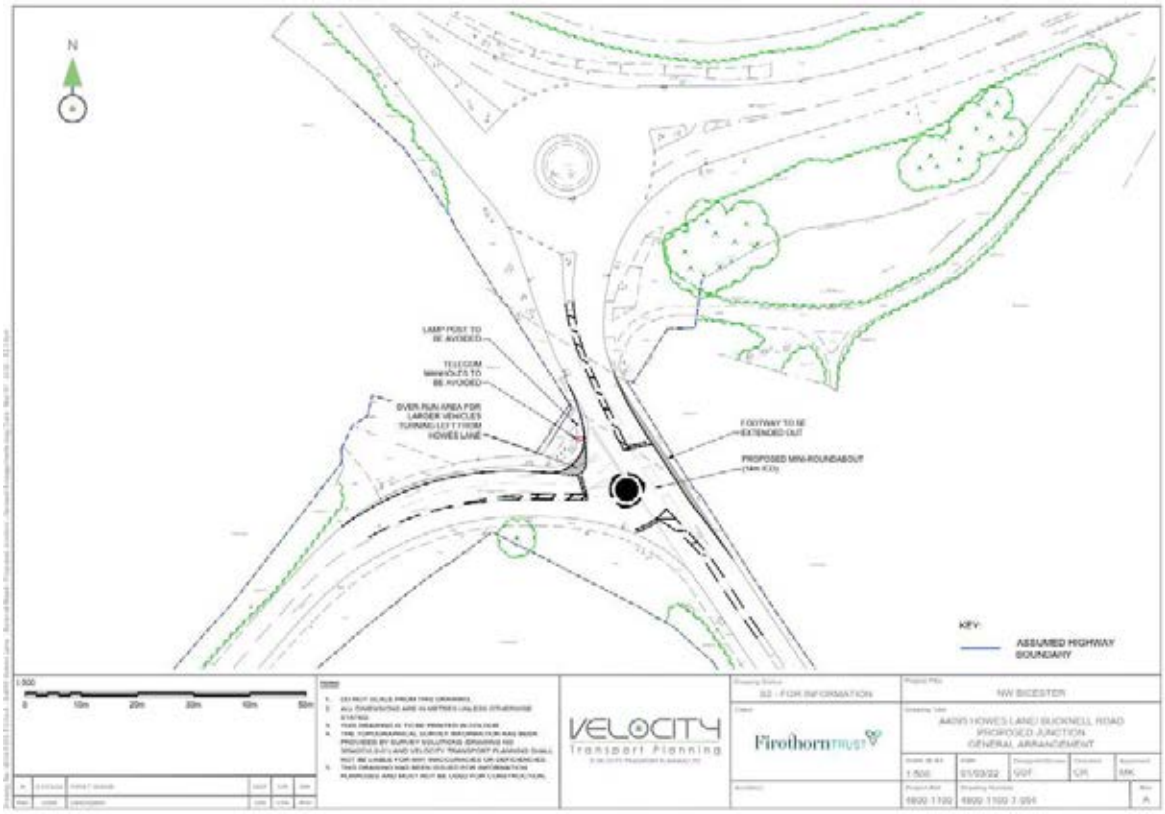
Road Safety Consulting Ltd
4 Paramore Close
Whetstone
Leicestershire
LE8 6EY

APPENDIX 1: Existing and Proposed Junction Layouts

Existing Layout



Proposed Layout



ATTACHMENT I

PROPOSED MINI-ROUNDABOUT JUNCTION PARAMETERS

ARM C - BUCKNELL ROAD SOUTHBOUND
Approach Road Half Width - 3.5m
Entry Width - 3.9m
Effective Flare Length - 1.5m
Distance to Next Arm - 12.5m
Entry Corner Kerb Distance - 12.9m

ARM B - HOWES LANE
Approach Road Half Width - 3.0m
Entry Width - 3.9m
Effective Flare Length - 30.0m
Distance to Next Arm - 7.18m
Entry Corner Kerb Distance - 4.6m

ARM A - BUCKNELL ROAD NORTHBOUND
Approach Road Half Width - 3.1m
Entry Width - 4.0M
Effective Flare Length - 6.9m
Distance to Next Arm - 12.8m
Entry Corner Kerb Distance - 11.6m

KEY:
ASSUMED HIGHWAY BOUNDARY

1:500
0 10m 20m 30m 40m 50m

Notes:
1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

Rev	Date	Description	Drn	Chk	App
A	15/03/22	FIRST ISSUE	GSF	CR	MK

VELOCITY Transport Planning
© VELOCITY TRANSPORT PLANNING LTD

Drawing Status: S2 - FOR INFORMATION

Clien: Firethorn TRUST

Architect

Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD PROPOSED JUNCTION GENERAL ARRANGEMENT - MEASUREMENTS

Scale @ A3	Date	Designed/Drawn	Checked	Approved
1:500	15/03/22	GSF	CR	MK

Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-060	A

Drawing file: 4600-1100-T-060-A - A4095 Howes Lane - Bucknell Road - Proposed Junction - General Arrangement Measurements.dwg Date: Mar 15, 2022 - 12:20pm

ATTACHMENT J

PROPOSED MINI-ROUNDABOUT JUNCTION – JUNCTIONS 10 OUTPUT FILES

Junctions 10

ARCADY 10 - Roundabout Module

Filename 2022 03.14 - NW BICESTER - HOWES LANE (Mini RBt Mitigation).j10
Path P:\Firethorn Trust_4600\1100 - NW Bicester\Analysis\Modelling\Picady\BTM 2026 FLOWS
Report generation date 23/03/2022 15:21:26

- »BTM Base 2026, AM
- »BTM Base 2026, PM
- »BTM 2026 + Proposed Development, AM
- »BTM 2026 + Proposed Development, PM

Summary of junction performance

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)
	BTM Base 2026											
Arm A	D1	4.5	33.19	0.82	D	132.46	D2	1.9	12.62	0.64	B	349.83
Arm B		3.5	22.05	0.77	C			55.8	222.98	1.12	F	
Arm C		68.1	348.48	1.13	F			153.6	667.00	1.27	F	
	BTM 2026 + Proposed Development											
Arm A	D3	5.0	37.26	0.84	E	302.47	D4	1.9	12.20	0.63	B	827.20
Arm B		4.9	29.15	0.83	D			105.7	472.77	1.25	F	
Arm C		149.5	591.54	1.27	F			200.4	807.01	1.34	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	02/11/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	VITTORIcci
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Mini roundabout model	Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9			0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	BTM Base 2026	AM	ONE HOUR	07:45	09:15	15
D2	BTM Base 2026	PM	ONE HOUR	16:45	18:15	15
D3	BTM 2026 + Proposed Development	AM	ONE HOUR	07:45	09:15	15
D4	BTM 2026 + Proposed Development	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

BTM Base 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		A, B, C	152.46	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		152.46	F

Arms

Arms

Arm	Name	Description
A	untitled	
B	untitled	
C	untitled	

Mini Roundabout Geometry

Arm	Approach road half width (m)	Minimum approach road half width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
A	3.10	3.10	4.00	0.9	12.80	11.00	0.0	
B	3.00	3.00	3.90	30.0	7.18	4.60	0.0	
C	3.50	3.50	3.60	1.5	12.50	12.90	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.622	1078
B	0.621	972
C	0.621	904

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	BTM Base 2026	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Generated on 23/03/2022 15:21:43 using Junctions 10 (10.0.3.1598)

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	470	100.000
B		✓	539	100.000
C		✓	915	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	526
	C	180	735	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.82	33.19	4.5	D
B	0.77	22.05	3.5	C
C	1.13	248.48	68.1	F

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	354	543	740	0.478	350	1.0	10.044	B
B	406	220	836	0.486	402	1.0	9.047	A
C	689	10	898	0.767	676	3.3	16.914	C

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	423	645	677	0.624	419	1.8	15.204	C
B	485	264	808	0.599	482	1.6	12.056	B
C	823	12	897	0.917	803	8.3	35.901	E

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	517	709	636	0.813	508	4.1	28.893	D
B	593	320	774	0.767	687	3.3	20.438	C
C	1007	14	895	1.125	883	39.4	112.013	F

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	517	717	632	0.819	516	4.5	33.193	D
B	593	325	771	0.770	593	3.5	22.050	C
C	1007	14	895	1.125	893	68.1	227.823	F

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	423	709	637	0.663	431	2.3	20.012	C
B	485	272	804	0.603	492	1.7	12.964	B
C	823	12	897	0.917	882	53.1	248.483	F

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	354	709	639	0.554	357	1.4	14.242	B
B	406	225	833	0.487	408	1.1	9.392	A
C	689	10	898	0.767	879	8.7	126.087	F

Generated on 23/03/2022 15:21:43 using Junctions 10 (10.0.3.1598)

BTM Base 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		A, B, C	349.63	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		349.63	F

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	BTM Base 2026	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	504	100.000
B		✓	764	100.000
C		✓	1036	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	751
	C	646	390	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.64	12.62	1.9	B
B	1.12	222.96	55.8	F
C	1.27	607.00	153.8	F

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	379	285	901	0.421	376	0.8	7.504	A
B	575	243	821	0.700	566	2.4	14.069	B
C	780	10	898	0.868	756	5.9	24.902	C

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	453	326	875	0.518	452	1.2	9.321	A
B	687	292	791	0.868	673	5.8	30.559	D
C	931	11	897	1.038	867	21.9	72.622	F

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	555	337	869	0.639	552	1.9	12.393	B
B	841	357	751	1.121	736	32.1	109.222	F
C	1141	13	898	1.273	894	83.5	223.987	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	566	337	868	0.639	566	1.9	12.618	B
B	841	359	749	1.122	746	55.8	222.963	F
C	1141	13	896	1.273	896	144.8	467.059	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	453	337	868	0.522	456	1.2	9.662	A
B	687	295	789	0.870	774	34.8	211.055	F
C	931	13	896	1.040	896	153.8	607.003	F

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	379	335	870	0.436	381	0.9	8.128	A
B	575	246	819	0.702	700	2.9	57.686	F
C	780	12	897	0.870	896	126.3	567.040	F

Generated on 23/03/2022 15:21:43 using Junctions 10 (10.0.3.1598)

BTM 2026 + Proposed Development, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		A, B, C	309.47	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		309.47	F

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	BTM 2026 + Proposed Development	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	470	100.000
B		✓	581	100.000
C		✓	1031	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	568
	C	180	851	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.84	37.25	5.0	E
B	0.83	29.15	4.9	D
C	1.27	591.54	149.5	F

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	354	622	691	0.512	349	1.1	11.446	B
B	437	220	836	0.523	433	1.2	9.716	A
C	776	10	898	0.864	753	5.7	24.464	C

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	423	714	633	0.667	419	2.1	18.113	C
B	522	264	809	0.646	519	1.9	13.644	B
C	927	12	897	1.033	865	21.1	70.606	F

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	517	737	619	0.836	507	4.6	32.653	D
B	640	320	774	0.827	629	4.5	25.604	D
C	1135	14	895	1.268	893	81.6	218.800	F

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	517	730	618	0.837	516	5.0	37.250	E
B	640	325	771	0.830	630	4.9	29.150	D
C	1135	14	895	1.268	895	141.7	457.317	F

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	423	739	618	0.684	433	2.5	22.363	C
B	522	272	803	0.650	533	2.1	15.231	C
C	927	12	897	1.034	896	149.8	591.538	F

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	354	736	620	0.571	356	1.5	15.325	C
B	437	225	832	0.525	441	1.2	10.205	B
C	776	10	898	0.864	891	120.7	548.457	F

Generated on 23/03/2022 15:21:43 using Junctions 10 (10.0.3.1598)

BTM 2026 + Proposed Development, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		A, B, C	537.20	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		537.20	F

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	BTM 2026 + Proposed Development	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	504	100.000
B		✓	850	100.000
C		✓	1093	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	837
	C	703	390	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.63	12.20	1.9	B
B	1.25	472.77	105.7	F
C	1.34	807.01	208.4	F

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	379	282	903	0.420	376	0.8	7.478	A
B	640	243	821	0.779	626	3.5	19.099	C
C	823	10	898	0.916	791	8.1	30.907	D

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	453	315	882	0.514	452	1.1	9.164	A
B	764	292	791	0.966	732	11.5	50.457	F
C	983	11	897	1.095	882	33.3	99.667	F

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	555	320	879	0.631	552	1.8	12.008	B
B	936	357	751	1.247	746	58.9	184.471	F
C	1203	11	897	1.342	896	110.2	298.553	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	555	320	879	0.631	555	1.9	12.203	B
B	936	359	749	1.249	749	105.7	399.949	F
C	1203	11	897	1.342	897	186.8	603.780	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	453	320	879	0.515	456	1.2	9.413	A
B	764	295	789	0.968	781	101.4	472.771	F
C	983	12	897	1.096	896	208.4	800.353	F

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	379	318	880	0.431	381	0.8	7.953	A
B	640	246	819	0.781	811	58.7	357.827	F
C	823	12	896	0.918	892	191.2	807.011	F

ATTACHMENT B

VTP DRAWINGS

VELOCITY
Transport Planning

www.velocity-tp.com

Key:

- Existing Elmsbrook Housing (52 Dwellings)
- Existing Elmsbrook Parking (99 Spaces)
- Existing Elmsbrook Garages (14 Units)

69 Dwellings

138 Dwellings

6.0m

6.5m

4.1m

4.1m

6.0m

4.1m

6.0m

Rev	Date	By	Comment
A	25.03.22	GSF	First Issue

Revision Details

Drawing No.
4600-1100-T-070

Drawn	Approved	Date
GSF	MK	Mar 22

Scale	Rev
1:1000 @ A3	A

Client
Firethorn Trust

Project
NW Bicester

Drawing Title
Elmsbrook Spine
Road Assessment

VISIBILITY SPLAY
2.4m X 35.0m

2.0 m

2.0m WIDE PEDESTRIAN
FOOTWAY TO BE PROVIDED

REALIGNED KERB LINE
TO ACCOMMODATE SWEPT
PATH OF REFUSE VEHICLE

PEDESTRIAN CROSSING
WITH TACTILE PAVING
TO BE PROVIDED

2.0 m

PROPOSED FOOTWAY TO
TIE INTO EXISTING FOOTWAY

R6.0 m
2.0 m
6.0 m
2.0 m
R6.0 m

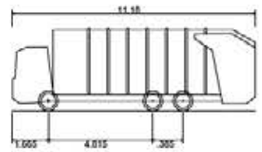
VISIBILITY SPLAY
2.4m X 35.0m

KEY::
APPLICATION BOUNDARY

REFUSE VEHICLE - ACCESS

REFUSE VEHICLE - EGRESS

VELOCITY
Transport Planning
www.velocity-tp.com



Phoenix 2 One Pass (with Elite 6x4 chassis)

Overall Length	11.180m
Overall Width	2.550m
Overall Body Height	3.760m
Min Body Ground Clearance	0.312m
Track Width	2.550m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	10.150m

Rev	Date	Comment	App
A	20.01.22	FIRST ISSUE	MK

Revision Details

Drawing No.
4600-1100-T-040

Drawn	Approved	Date
EP	MK	JAN 22

Scale	Rev
1:500 @ A3	A

Client
FIRETHORN TRUST

Project
LAND AT NORTH WEST BICESTER

Drawing Title
SITE ACCESS A
ACCESS TO EASTERN PARCEL

VISIBILITY SPLAY
2.4m X 35.0m

2.0m WIDE PEDESTRIAN
FOOTWAY TO BE PROVIDED

VISIBILITY SPLAY
2.4m X 35.0m

2.0 m

R3.0 m

2.0 m

6.0 m

2.0 m

R6.0 m

R6.0 m

2.0 m

6.0 m

REALIGNED KERB LINE

PEDESTRIAN CROSSING
WITH TACTILE PAVING
TO BE PROVIDED

2.0 m

R6.0 m

2.0 m

VISIBILITY SPLAY
2.4m X 35.0m

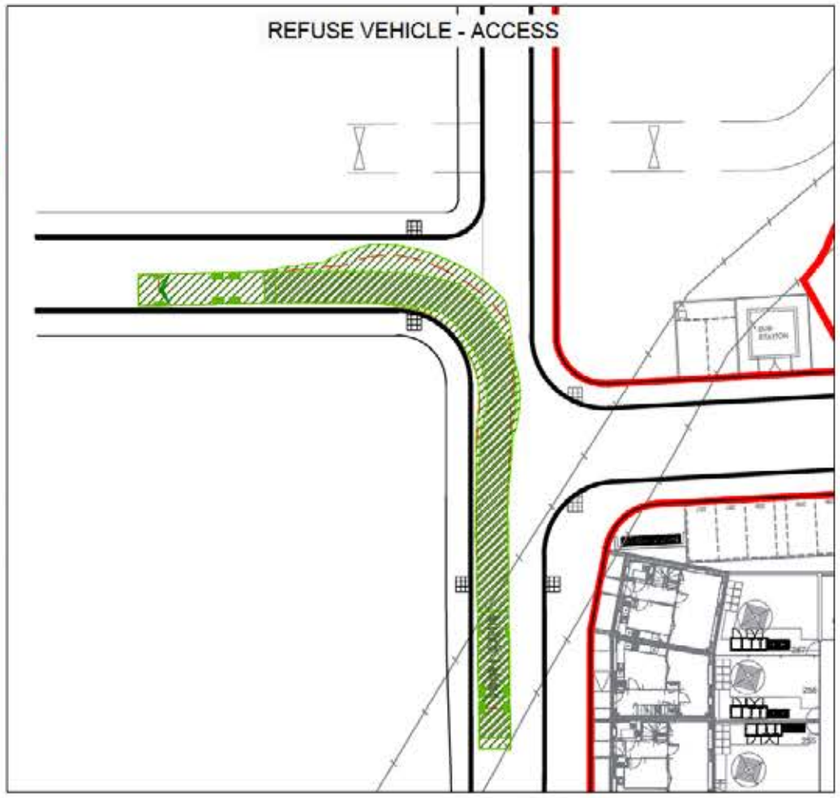
PROPOSED FOOTWAY TO
TIE INTO EXISTING FOOTWAY

VISIBILITY SPLAY
2.4m X 35.0m

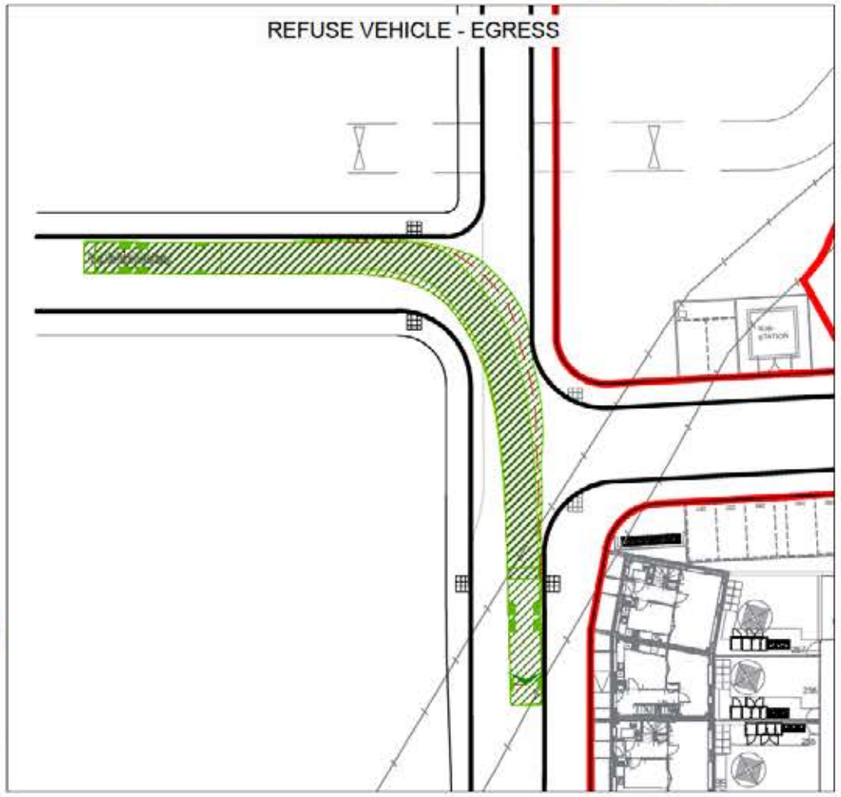
KEY::

APPLICATION BOUNDARY

REFUSE VEHICLE - ACCESS

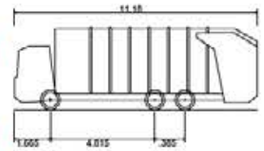


REFUSE VEHICLE - EGRESS



VELOCITY
Transport Planning

www.velocity-tp.com



Phoenix 2 One-Pass (with Elite 6x4 chassis)

Overall Length	11.180m
Overall Width	2.550m
Overall Body Height	3.760m
Min Body Ground Clearance	0.312m
Track Width	2.550m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	10.150m

Rev	Date	Comment	App
A	20.01.22	FIRST ISSUE	MK

Revision Details

Drawing No.
4600-1100-T-041

Drawn	Approved	Date
EP	MK	JAN 22

Scale	Rev
1:500 @ A3	A

Client
FIRETHORN TRUST

Project
LAND AT NORTH WEST BICESTER

Drawing Title
SITE ACCESSES A & B
ACCESS TO EASTERN PARCEL & WESTERN PARCEL (SOUTH)

VISIBILITY SPLAY
2.4m X 35.0m

35.0m FORWARD VISIBILITY

PEDESTRIAN CROSSING
WITH TACTILE PAVING
TO BE PROVIDED

VISIBILITY SPLAY
2.4m X 35.0m

PROPOSED FOOTWAY TO
TIE INTO EXISTING FOOTWAY

GRASS VERGE TO BE
ADOPTED TO ENSURE
IMPROVED VISIBILITY

2.0 m
R6.0 m
15 m
6.0 m
2.0 m
R3.0 m
2.0 m
2.0 m

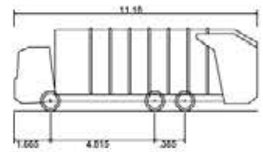
VISIBILITY SPLAY
2.4m X 35.0m

KEY::
APPLICATION BOUNDARY

REFUSE VEHICLE - ACCESS

REFUSE VEHICLE - EGRESS

VELOCITY
Transport Planning
www.velocity-tp.com



Phoenix 2 One-Pass (with Elite 6x4 chassis)

Overall Length	11.180m
Overall Width	2.550m
Overall Body Height	3.760m
Min Body Ground Clearance	0.312m
Track Width	2.550m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	10.150m

Rev	Date	Comment	App
A	20.01.22	FIRST ISSUE	MK

Revision Details

Drawing No.
4600-1100-T-042

Drawn	Approved	Date
EP	MK	JAN 22

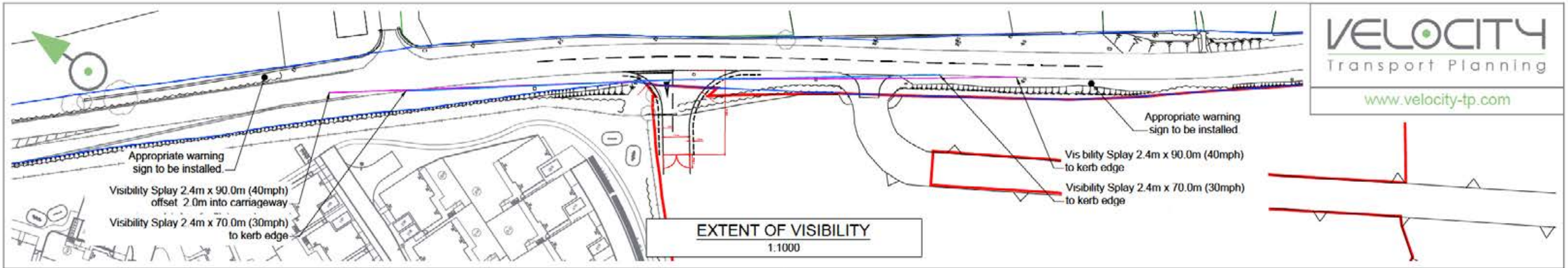
Scale	Rev
1:500 @ A3	A

Client
Firethorn Trust

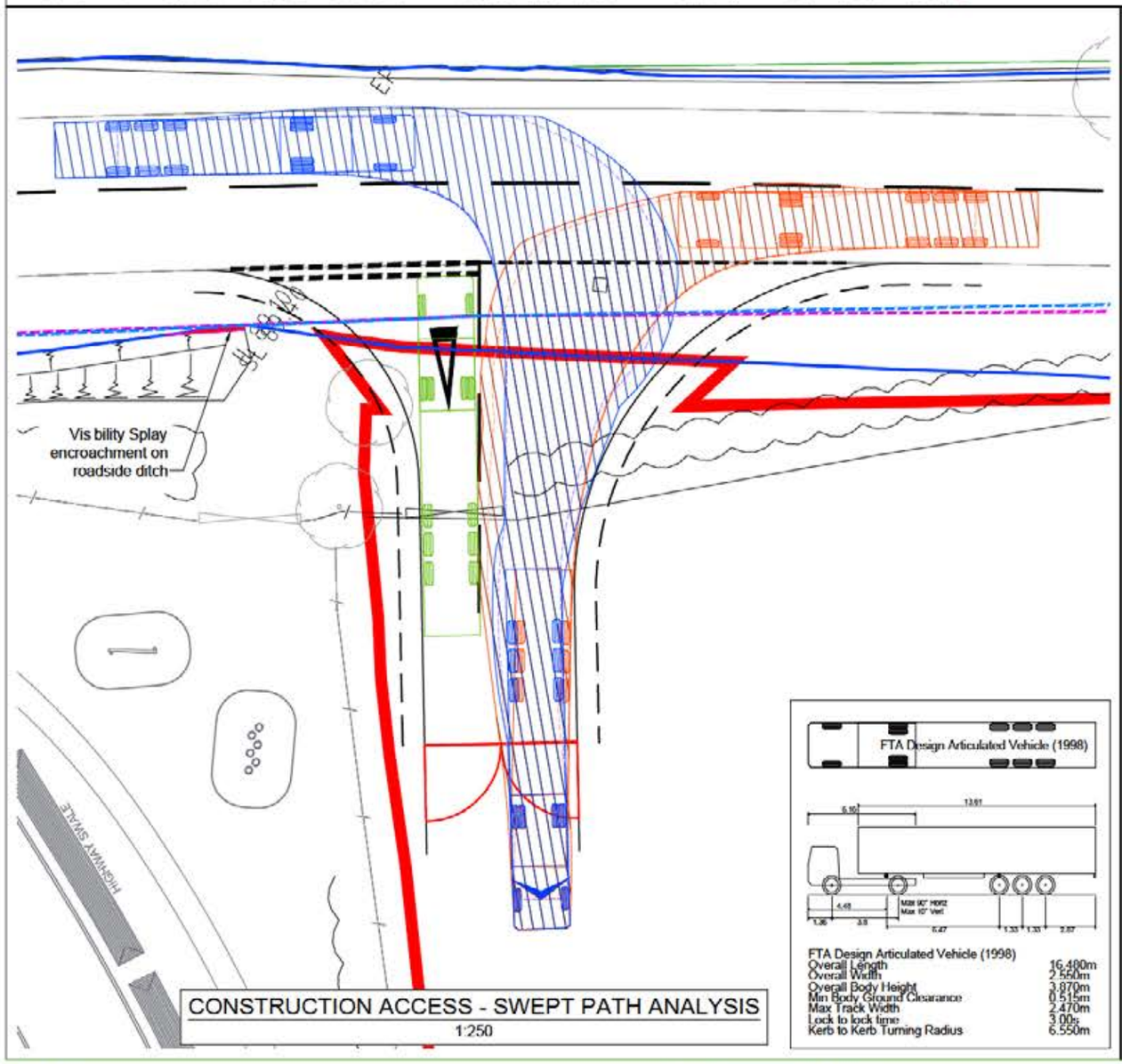
Project
Land at North West Bicester

Drawing Title
Site Access C
Access to Western Parcel (North)

VELOCITY
Transport Planning
www.velocity-tp.com



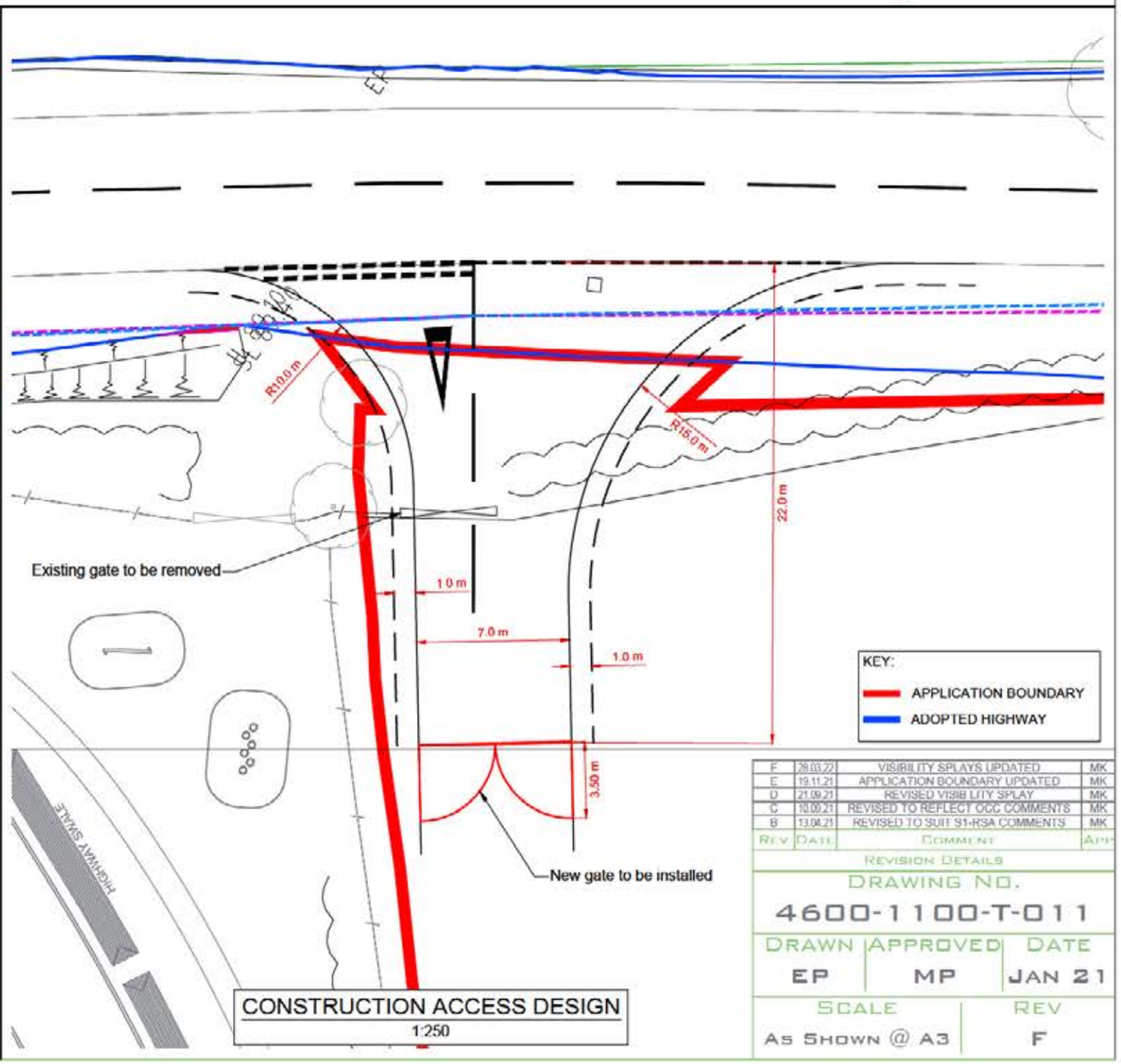
EXTENT OF VISIBILITY
1:1000



CONSTRUCTION ACCESS - SWEPT PATH ANALYSIS
1:250

FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.550m



CONSTRUCTION ACCESS DESIGN
1:250

KEY:
- APPLICATION BOUNDARY
- ADOPTED HIGHWAY

Rev	Date	Comment	App
F	28.03.22	VISIBILITY SPLAYS UPDATED	MK
E	19.11.21	APPLICATION BOUNDARY UPDATED	MK
D	21.09.21	REVISED VISIBILITY SPLAY	MK
C	10.09.21	REVISED TO REFLECT OCC COMMENTS	MK
B	13.04.21	REVISED TO SUIT S1-RSA COMMENTS	MK

Revision Details

Drawing No.
4600-1100-T-011

Drawn	Approved	Date
EP	MP	JAN 21

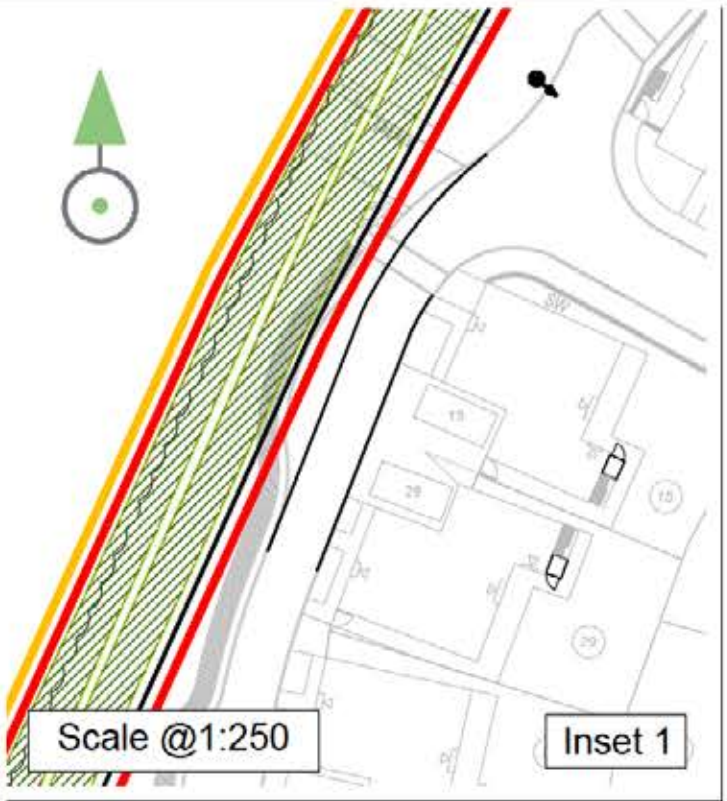
Scale	Rev
As Shown @ A3	F

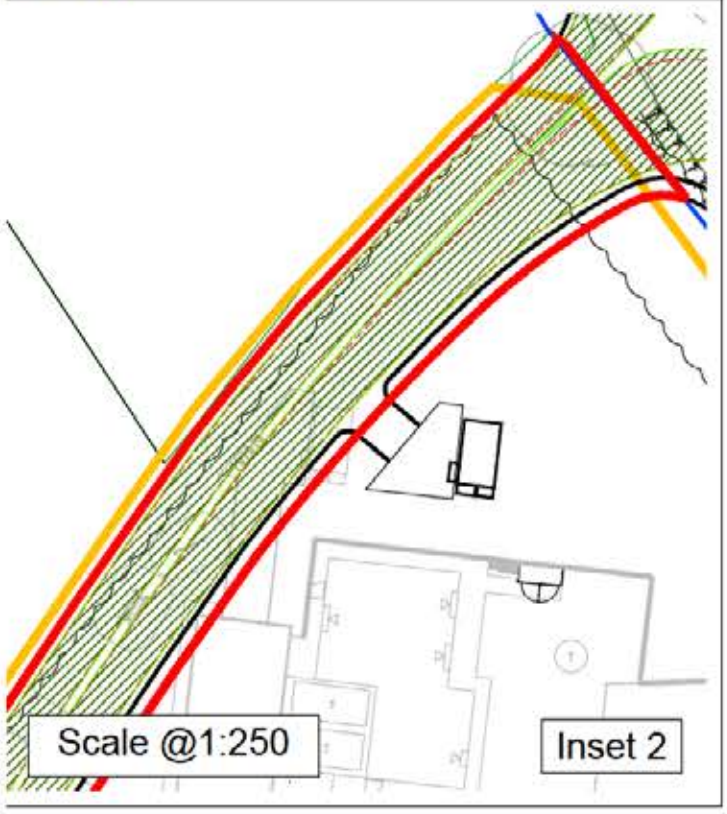
Client
Firethorn Trust

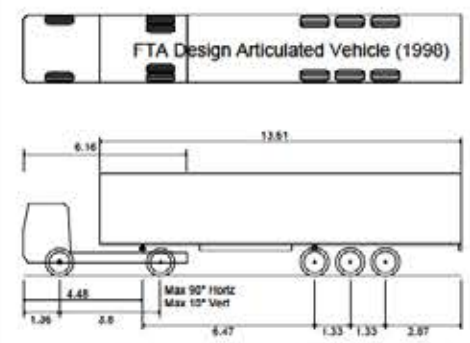
Project
Land at North West Bicester

Drawing Title
Site Access E
Proposed Construction Access

VELOCITY
Transport Planning
www.velocity-tp.com







FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to lock time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

- Highway Boundary
- Elmsbrook Site Boundary
- Application Boundary

B4100

Inset 2

Structure relocated to accommodate Haul road, access from Haul road added.

Inset 1

Adjustment to Phase 4 road design to accommodate Proposed Haul road

Rev	Date	By	Comment
B	19.11.21	GSF	APPLICATION BOUNDARY UPDATED
A	14.09.21	GSF	FIRST ISSUE

Revision Details

Drawing No.
4600-1100-T-027

Drawn	Approved	Date
GSF	MK	Sep 21

Scale	Rev
1:1000 @ A3	B

Client
Firethorn Trust

Project
NW Bicester

Drawing Title
Construction Access
Western Parcel

ATTACHMENT C

APPLICATION DRAWINGS

Key

- 01 Vehicular, pedestrian and cycle access point
- 02 View to church
- 03 Sustainable Drainage System(SuDS)
- 04 Play
- 05 Small new copses
- 06 Trim trail
- 07 Edible landscapes
- 08 Wetland habitat
- 09 Woodland with some limited public access
- 10 Pedestrian connection
- 11 Potential oedestrian connection
- 12 Modern farmstead interpretation
- 13 Lower density rural edge
- Site boundary

0m 100m

N.

CLIENT:
Firethorn

PROJECT:
North West Bicester

DRAWING:
Illustrative masterplan

PROJECT NUMBER:
1192

DRAWING NUMBER: SK004
CHECKED BY: ML/LA
REVISION: C
STATUS: Draft
DATE: 14/04/2021
SCALE: 1:2,000

MOSAIC
Urban Design & Masterplanning

Application boundary 24.16 hectares

Vehicular, pedestrian and cycle connection zone

Pedestrian and cycle connection - subject to adoption and/or future development proposals beyond the site boundary

Temporary construction access zone

N

0 metres 100

(1:2,500)

Project
Land at North West Bicester

Drawing Title
Development Parameter Plan 3 : Access and Movement

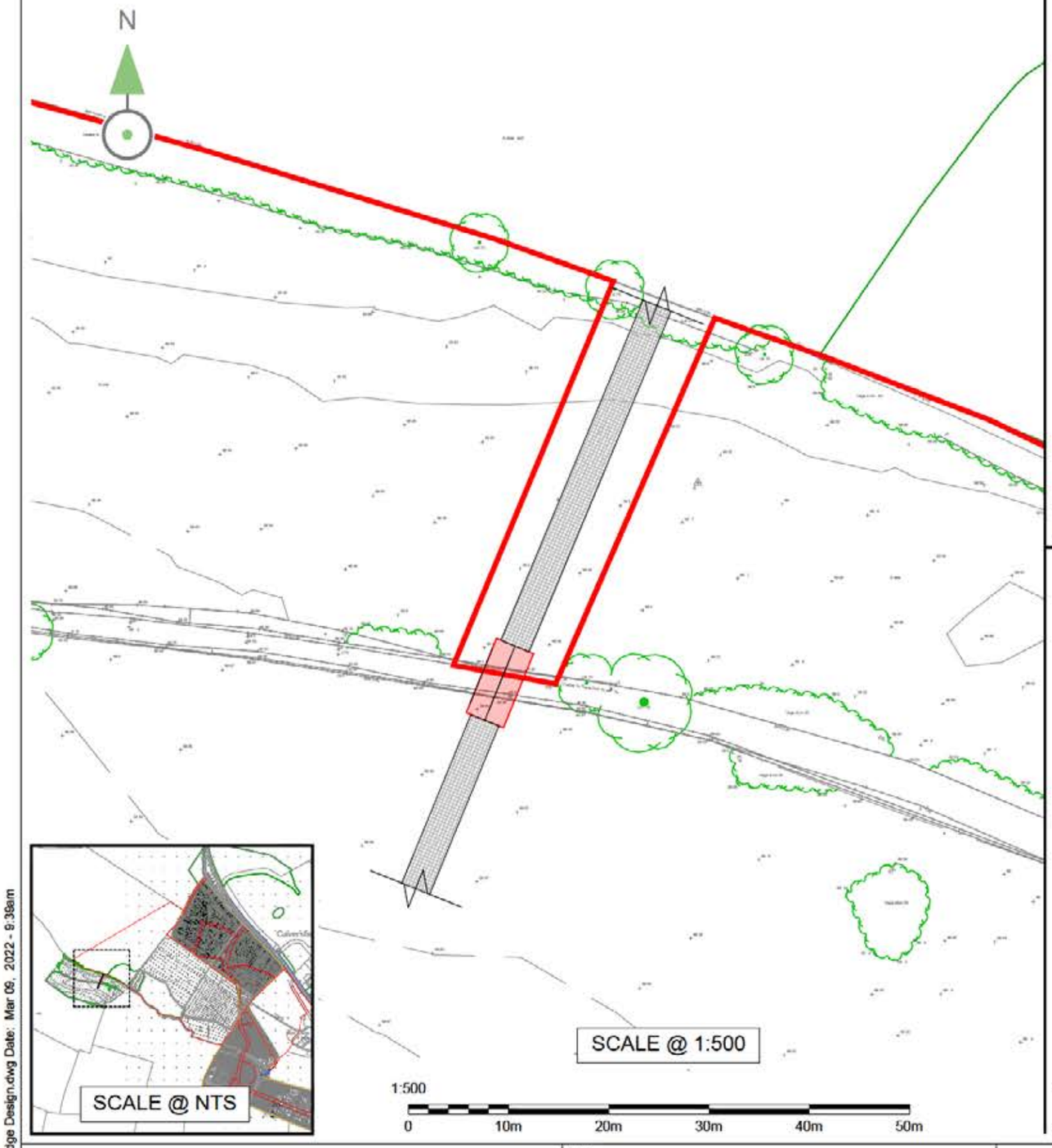
Date	Scale	Drawn by	Check by
28/03/2022	1:2,500 at A2	LA	LA

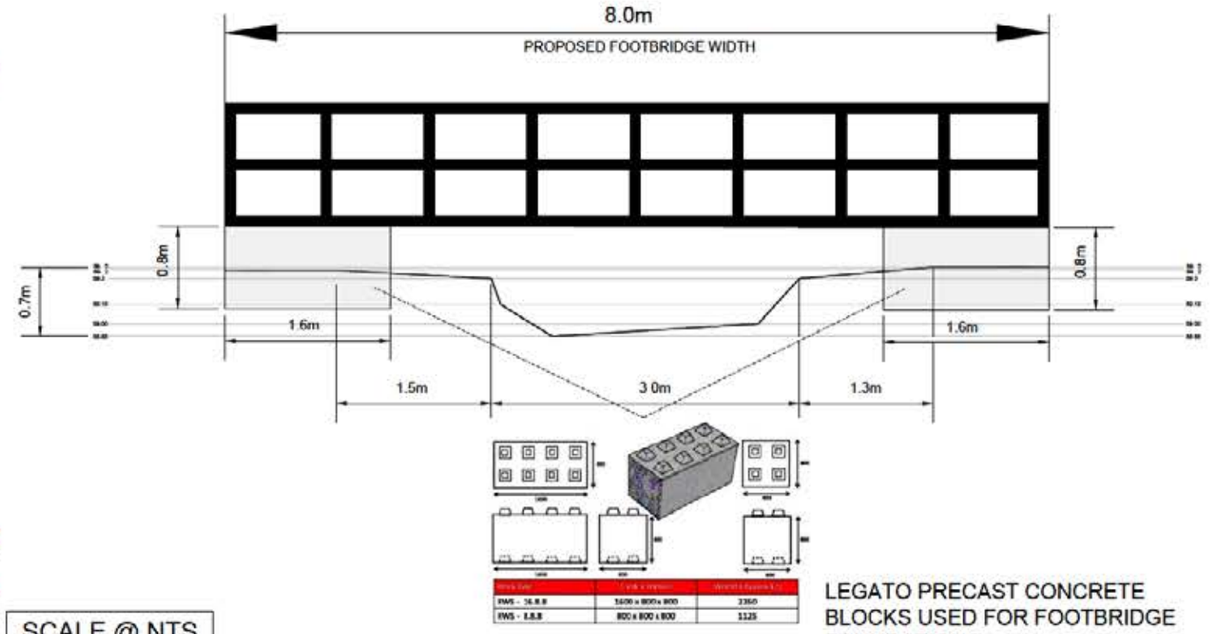
Project No	Drawing No	Revision
1192	003	M

Mosaic

ATTACHMENT D

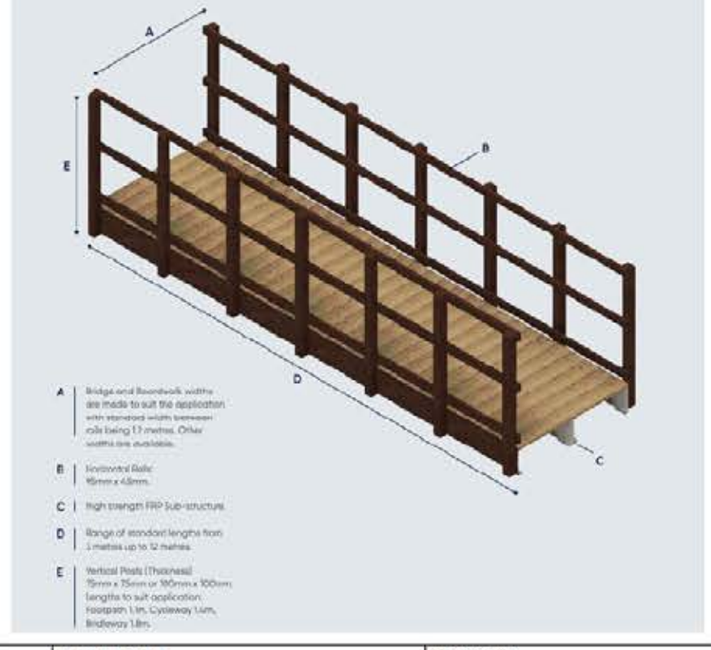
FOOTBRIDGE INFORMATION





LEGATO PRECAST CONCRETE BLOCKS USED FOR FOOTBRIDGE FOUNDATIONS

IMAGE TAKEN FROM BEAVER BRIDGE POLYBRIDGE BROCHURE



Rev	Date	Description	Drn	Chk	App
A	08/03/22	FIRST ISSUE	GSF	CR	MK

Notes:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING IS TO BE PRINTED IN COLOUR.
4. THE TOPOGRAPHICAL SURVEY INFORMATION HAS BEEN PROVIDED BY SURVEY SOLUTIONS (DRAWING NO 38942CVLS-01) AND VELOCITY TRANSPORT PLANNING SHALL NOT BE LIABLE FOR ANY INACCURACIES OR DEFICIENCIES.
5. THIS DRAWING HAS BEEN ISSUED FOR INFORMATION PURPOSES AND MUST NOT BE USED FOR CONSTRUCTION.

VELOCITY Transport Planning
© VELOCITY TRANSPORT PLANNING LTD

Drawing Status: S2 - FOR INFORMATION

Client: Firethorn TRUST

Architect:

Project Title: NW BICESTER

Drawing Title: PROPOSED FOOTBRIDGE CROSSING WATERCOURSE

Scale @ A3	Date	Designed/Drawn	Checked	Approved
AS SHOWN	08/03/22	GSF	CR	MK

Project Ref	Drawing Number	Rev
4600-1100	4600-1100-T-059	A

Drawing file: 4600-1100-T-059-A - Footbridge Design.dwg Date: Mar 09, 2022 - 9:38am

BEAVER BRIDGES

POLYbridge™

LINKING NEW FRP TECHNOLOGY
WITH THE ENVIRONMENT

WELCOME TO

A NEW INNOVATION IN BRIDGING CONSTRUCTION

POLYbridge™ and POLYwalk™ are a new innovation in the replacement of tanalised wood and steel used in the construction of right-of-way bridges, ditch crossings and boardwalks. Providing local authorities with an exceptionally long-life product, POLYbridge™ and POLYwalk™ installations won't warp over time unlike 100% recycled plastic alternatives.

POLYbridge™ and POLYwalk™ employ a unique composite of structural FRP outer with a recycled plastic core. These installations look great and authentic, are fast and simple to install and far outlast traditional alternatives. Our high-quality planks are also available as an alternative to wood for a deck on any of your existing bridges or walkways.

WHY POLYbridge™?

QUALITY ASSURED

Complies with BS4592-0:2006+A1:2012 5kN/m² loading requirements.

DURABLE DESIGN

With a design life in excess of 60 years, POLYbridge™ is highly impact resistant, won't rot like wood or rust like steel, and will keep its good looks long after traditional alternatives need to be replaced. Unlike fully recycled plastic profiles, the glass reinforced outer skin means units will not wrap and twist through thermal expansion when exposed to sunlight.

ENVIRONMENTALLY FRIENDLY

Wood preservatives can be very harmful to the environment and are toxic to many animals and plants. But above all else, they only work in preserving wood for a short time, resulting in further negative environmental impact when they need regular replacement. With no leaching of containments and a core that contains 140 recycled 500ml plastic bottles per sqm, POLYbridge™ is great for the environment in so many ways.

AESTHETICALLY PLEASING

POLYbridges™ and POLYwalks™ are hard to distinguish from natural wood, with a range of shades available to suit the surroundings in which they are installed. A drawback for steel and other composite bridges is the industrial aesthetic which makes then standout in an otherwise natural environment.

LIGHTWEIGHT STRUCTURES

Factory pre-made bridges and walkways are easy to handle and carry. As such, they can be taken to sites that are often hard to access and lifted into place and fixed. This leads to drastically reduced installation times when compared with wood or steel.

INSTALLATION SERVICE

As POLYbridge™ and POLYwalk™ are so simple to install, why wouldn't we offer this service?

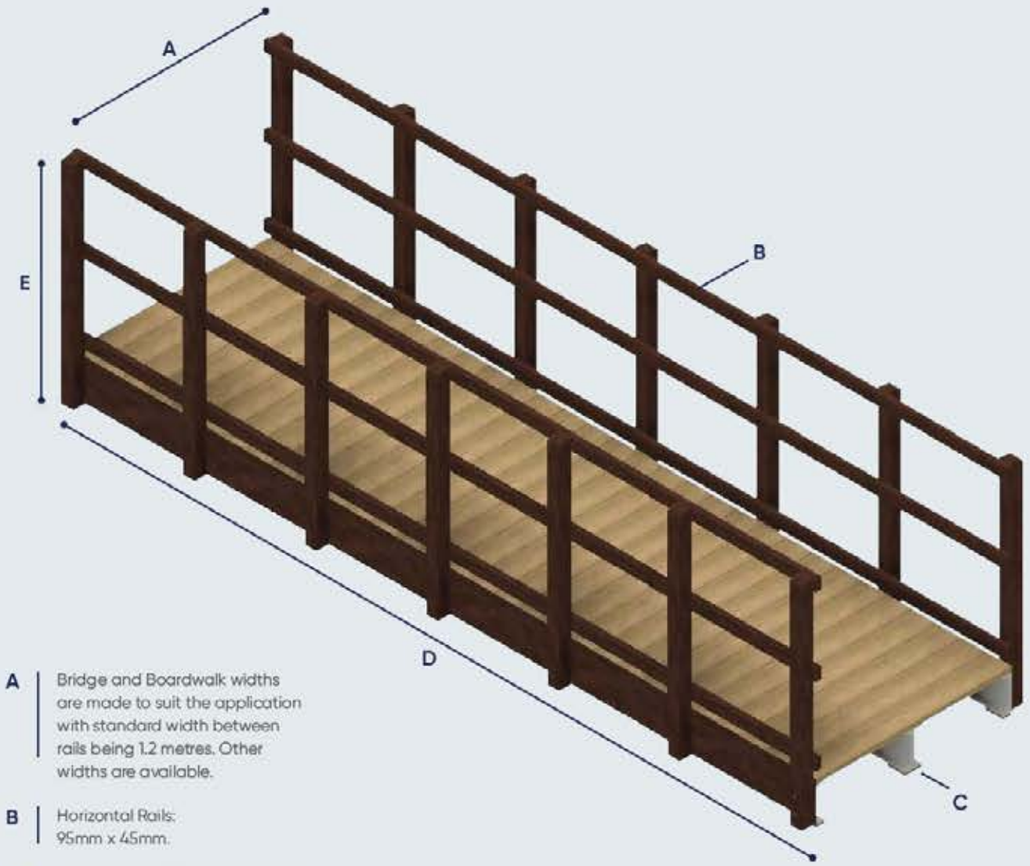
BEAVER BRIDGES

POLYbridge™ EXPLAINED

POLYbridge™ solves the major problem local authorities have in the maintenance and constant replacement of wooden right-of-way structures.

In some environments, wood structures last only a few years.
By installing POLYbridge™, it's a case of fit it – and forget it!

140 recycled plastic bottles per square metre!



A | Bridge and Boardwalk widths are made to suit the application with standard width between rails being 1.2 metres. Other widths are available.

B | Horizontal Rails: 95mm x 45mm.

C | High strength FRP Sub-structure.

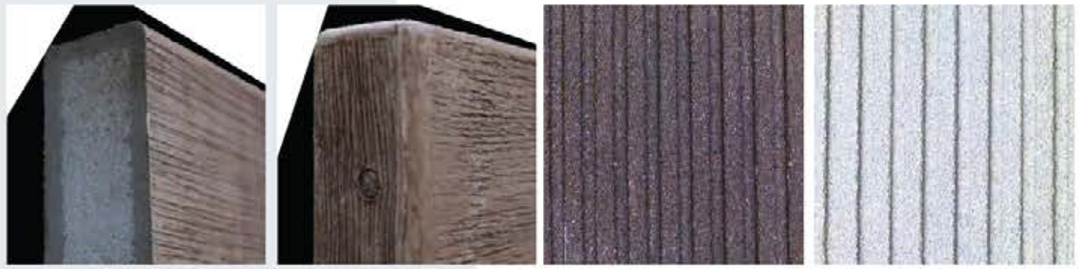
D | Range of standard lengths from 3 metres up to 12 metres.

E | Vertical Posts (Thickness): 75mm x 75mm or 100mm x 100mm. Lengths to suit application: Footpath 1.1m, Cycleway 1.4m, Bridleway 1.8m.

Simpler Ditch Crossings are also available in 'Rail Sleeper' plank and single hand rail.

All profiles have a recycled bottle core with a closed off end to complete the natural wood appearance.

Deck Planks of 200mm wide / 5mm anti-slip castellated top with 5mm near diamond hard, wear resistant, surface. Available in two colours: Pine or Redwood.



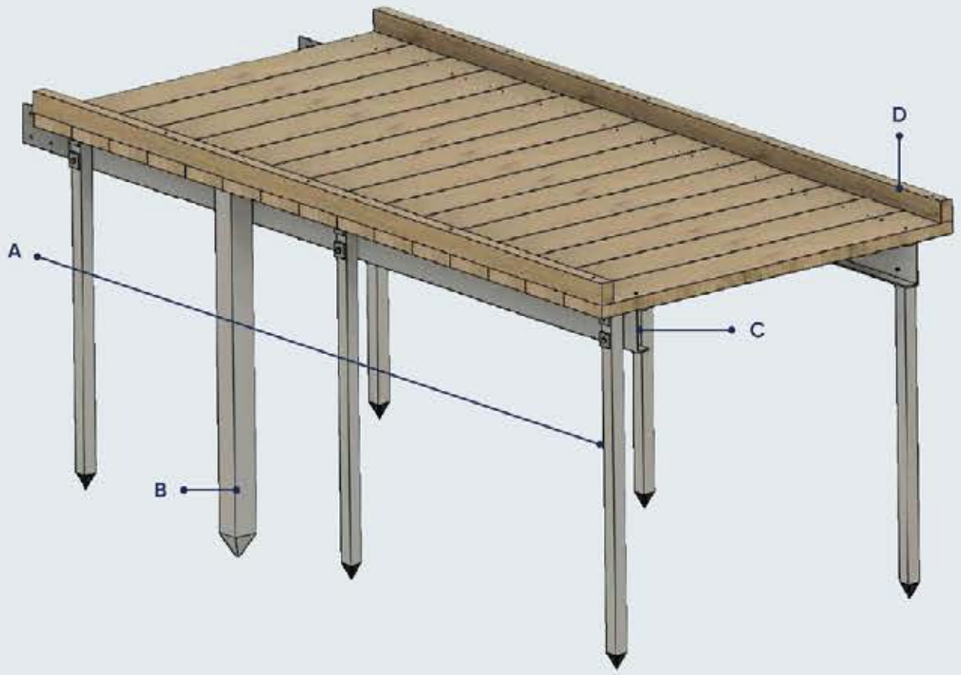
BEAVER BRIDGES

POLYwalk™ EXPLAINED

POLYwalk™ blends perfectly into the natural environment where it replaces wooden boardwalks, providing a safe, non-slip walkway that's suitable for all weathers.

The lightweight, all FRP sub-structure provides for easy carrying of the 3-metre-long components to the installation site. Installation time is quick and simple, and the finished installation provides many years of near maintenance-free use.

140 recycled plastic bottles per square metre!



A | Standard 3 metre interlocking lengths.

B | FRP & Recycled plastic stakes are driven into the ground to support the structure and these will not rot or corrode and are not affected by water.

C | High strength FRP Sub-structure.

D | Edging rails for wheelchair safety.

5mm near diamond hard gritted surface with a recycled bottle core on planks.

Deck Planks of 200mm wide / 5mm anti-slip castellated top with 5mm near diamond hard, wear resistant, surface. Available in two colours: Pine or Redwood.

BEAVER BRIDGES

5 Knights Court
Archers Way
Battlefield Enterprise Park
Shrewsbury SY1 3GA

info@beaverbridges.co.uk
01743 811 811

beaverbridges.co.uk

Mark Kirby

Subject: FW: Bicester Footbridge

Switch-MessageId: db66d05df07e4a67bc56c205a6d162f8

From: Ian McCrerie <ian@beaverbridges.co.uk>
Sent: 22 March 2022 09:52
To: Mark Kirby <mkirby@velocity-tp.com>
Subject: RE: Bicester Footbridge

[EXTERNAL] This message was sent from outside your organization

Mark,
Good Morning, I hope the below (updated) will suffice.
Some Budget Prices for you, all subject to review on receipt of firm scope & Such as measure GIs sales site visit etc

- Based on a size of circa 8 Mtr Span x 4 Mtr Width
- ~~C24 Timber Bridge largely as indicated £ 10,000 Ex works not offered~~
- Hardwood unit (Ekki) circa £56,700
- FRP construction bridge Circa £ 50,355.98 Ex works
- Transport to be confirmed budget on £1000/1500
- Foundations (based on Legato precast block) Like LEGO £1,740 blocks only
- Install Foundations as above include an amount of sundry items £5,750 does not include "Muck Away"
- Install bridge to foundations £2,250 (labour and sundries only.
- I have not included for any lifting equipment as the detail is too vague to quantify however budget up to say £1,500 although a survey may suggest something more / less.

Best regards,

Ian McCrerie
Engineer
Email ian@beaverbridges.co.uk

BEAVER BRIDGES

M: 07773 031596 | T: 01743 811 811 | W: www.beaverbridges.co.uk
Pedestrian Bridges | Vehicle Bridges | Full Turn Key Packages

VELOCITY
Transport Planning