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 is 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 (known locally as the A4095 Strategic Link Road - SLR), 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, 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. 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 SLR.

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

1.2.4 It is understood that the previously agreed funding and timescales for the delivery of the A4095 SLR are uncertain as OCC took the decision to "reallocate" the agreed funding to other strategic highway schemes within the County. This information was only made public after the submission of information to CDC for consideration in November 2021.

1.2.5 Following the submission of the further documentation to address the concerns raised in relation to the potential traffic impact at the critical junction of the A4095 Howes Lane / Bucknell Road priority junction, further comments on the technical work were received within an OCC response dated the 05th of January 2022, which included the following objection:

> "*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*"

1.2.6 With respect to the A4095 Howes Lane / Bucknell Road junction assessments within TN005, the OCC response stated that the previous methodology applied at this junction was no longer applicable and that any new assessments must use the latest version of the Bicester Transport Model (BTM).

1.2.7 Whilst it was accepted that the response from OCC in early January 2022 identified the need to utilise data from an updated BTM, no indication was provided by OCC as to when this updated information would be available. As such, VTP commissioned a series of traffic surveys at the junction of the A4095 Howes Lane / Bucknell Road during the week commencing the 31st of January 2022, which included manual classified turning counts (MCC) for the 12-hour period of 07:00 to 19:00 on Wednesday the 02nd of February 2022, and observed queue lengths for the same period.

1.2.8 The updated BTM data was provided by OCC on the 11th of March 2022, and this included an interim 2026 Reference Case that was commissioned for the Albion Land application (21/03177/F). This updated BTM data removed the A4095 SLR and updated the development quantum at NW Bicester in line with the 2021 Annual Monitoring Report (AMR). OCC confirmed that the updated 2026 BTM Reference Case is considered adequate for the interim year testing of the impact on local junctions at NW Bicester in the absence of the SLR.

1.2.9 In response to the OCC comments, a new document was prepared by VTP (TN007) in March 2022, which provided a comprehensive response to the wider OCC comments, including the comments on the assessments at the A4095 Howes Lane / Bucknell Road junction.

1.2.10 Within TN007, a separate TN006 titled 'A4095 Interim Improvement Assessment' was included as an attachment which set out the details of a proposed interim mitigation scheme at the A4095 Howes Lane / Bucknell Road junction to mitigate the impact of the proposed development in the interim, i.e. whilst the delivery mechanisms for the A4095 SLR are agreed.

1.2.11 TN006 set out an interim solution, in the form of a proposed mini-roundabout scheme at the A4095 Howes Lane / Bucknell Road junction, with capacity assessments undertaken to demonstrate the impact of the mitigation at the junction. TN006 included assessments of the data from both the updated BTM traffic flows and the observed traffic flows from surveys undertaken in early 2022.

1.2.12 Following the submission of this further information, a subsequent response to the TN007 and supporting technical work within TN006 was received from OCC dated the 16th of May 2022.

1.2.13 The latest OCC response raised three key reasons for objection, including the suitability of the proposed mini-roundabout mitigation scheme in light of the initial modelling results. The other two objections related to the width of the Elmsbrook Spine Road south of the Bus Gate and the suitability of Braeburn Avenue to accommodate cyclists.

1.2.14 For completeness, the relevant objection in relation to the further assessment of the proposed Interim Improvement scheme, as set out in the OCC consultation response, is as follows:

> "*The application seeks to bring forward the full development ahead of the A4095 diversion. The traffic assessment provided shows that this would have a severe congestion impact on the local network, and the proposed mitigation would make queuing worse on Lords Lane*."

1.2.1 The layout of the Existing Priority Junction is presented on VTP Drawing 4600-1100-T-050 Rev A, and the

layout of the Proposed Mini-Roundabout Junction is presented on VTP Drawing 4600-1100-T-054 Rev C, a copy of both of which are included within **ATTACHMENT A**.

A4095 STRATEGIC HIGHWAY IMPROVEMENTS COMMENTARY

1.2.2 The responses from OCC to date in relation to the assessment of the A4095 Howes Lane / Bucknell Road junction are considered to be relevant as OCC's decision to "reallocate" the previously identified funds to deliver the A4095 SLR has resulted in the timescales for the implementation of the A4095 SLR to have less certainty.

1.2.3 This is primarily due to the fact that it is expected that the funds for the A4095 SLR, which is agreed to be the appropriate mitigation for all of the allocated development identified within the CDC Local Plan, are expected to be provided through contributions from developers seeking to deliver schemes within the allocated North West Bicester Masterplan.

1.2.4 The "reallocation" of the funding for the A4095 SLR by OCC has created a scenario whereby development opportunities are considered to be restrained, as the agreed strategic mitigation can no longer be provided prior to the occupation of dwellings to "unlock" development - which in turn would have provided an opportunity for the cost of the A4095 SLR to be "clawed back" through financial contributions from these developments through the respective Section 106 Agreements. Developers should reasonably be given the scope to deliver housing to generate the funds required to make the S106 contribution, which would require the implementation of the A4095 SLR prior to the occupation of dwellings.

1.2.5 It is accepted that the permitted A4095 SLR is 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 generated by the allocated sites within the adopted CDC Local Plan.

1.2.6 However, the proposed interim improvement scheme seeks to provide a mitigation solution that will accommodate the impact of all of the development traffic associated with the 530 dwellings of the proposed Firethorn development through this 'critical junction' prior to the implementation of the A4095 SLR. This approach ensures a robust assessment, even if all of the 530 dwellings are not occupied by the time the A4095 SLR is implemented.

1.3 REPORT PURPOSE AND STRUCTURE

1.3.1 This TN (referred to as 'TN008') seeks to present the technical information to respond to the latest OCC comments in order to address the reason(s) for objection that relate to the impact of the proposed Firethorn development on the A4095 Howes Lane / Bucknell Road junction prior to the implementation of the A4095 SLR.

1.3.2 This report has been prepared as a revision to the previous version of TN008 following comments from OCC on the validity of the traffic survey data obtained in early 2022 and the methodology used to calibrate the modelling of the junction to reflect the observed queues and observed operation of the junction.

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

- **Section 2**: A4095 Junction Assessment; and
- **Section 3**: Conclusions.

2 A4095 JUNCTION ASSESSMENT

2.1 OCC RESPONSE CONTEXT

2.1.1 The latest OCC consultation response dated the 16th of May 2022 stated the following as a reason for objection in relation to the impact of the proposed development on the A4095 Howes Lane / Bucknell junction:

> *"The application seeks to bring forward the full development ahead of the A4095 diversion. The traffic assessment provided shows that this would have a severe congestion impact on the local network, and the proposed mitigation would make queueing worse on Lords Lane."*

2.1.2 In particular, the OCC response referred to the proposed interim mini-roundabout mitigation scheme generating a queue of 208 PCUs on the A4095 Lords Lane approach, which would extend into and through the A4095 / B4100 junction to the east. This is noted by OCC as being an 'unacceptable' impact within the response, and therefore an objection was raised to the proposed interim mini-roundabout scheme.

2.1.3 The response from OCC is acknowledged, and for the purposes of this revised assessment, vehicles queuing into the A4095 Lords Lane / B4100 Banbury Road junction are considered to form the threshold for a 'severe' impact.

2.1.4 With respect to 'severity,' paragraph 111 of the National Planning Policy Framework states that (emphasis added):

> *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be **severe**."*

2.2 REVISED ASSESSMENT

2.2.1 It is noted that the assessment undertaken within TN006 assessed a total of 550 units at the proposed Firethorn scheme, which is consistent with the level of development that was considered for the scheme within the supporting Transport Assessment, which was therefore considered to be robust. However, it is acknowledged that the application is for up to 530 dwellings and the subsequent assessment of the development traffic flows through the A4095 Howe Lane / Bucknell Road junction reflects a maximum of 530 dwellings.

2.2.2 For completeness, an updated version of the previous assessment within TN006 is presented below with a minimum development quantum of 500 units and a maximum development quantum of 530 units at the proposed Firethorn scheme on both the existing junction arrangement and the proposed interim improvement mini-roundabout arrangement.

2.2.3 The assessment methodology is otherwise as per the assessments within TN006, including the model parameters and traffic flows.

2.2.4 **Table 2-1** presents the assessment of the existing priority junction arrangement in the 2026 BTM scenario, with a copy of the Junctions 10 output files included in **ATTACHMENT B**.

Table 2-1: A4095 Howes Lane / Bucknell Road Junction Modelling - Existing Priority Junction (BTM Data)

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	135.3	1.4	465
	Howes Lane (Right Turn)	6.3	999,999		0.5	0.37	
	Bucknell Road N (Right Turn)	193.0	1.40		134.6	1.25	
BTM Base 2026 + Proposed Development	Howes Lane (Left Turn)	69.3	1.26	376,644	301.9	1.88	1,043
	Howes Lane (Right Turn)	12.1	999,999		6.7	999,999	
	Bucknell Road N (Right Turn)	334.9	1.62		203.5	1.36	

2.2.5 **Table 2-2** presents the assessment for the proposed mini-roundabout mitigation scheme in the 2026 BTM scenario, with a copy of the Junctions 10 output files included in **ATTACHMENT C**.

Table 2-2: A4095 Howes Lane / Bucknell Road Junction Modelling - Proposed Mini-roundabout Junction (BTM Data)

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	3.3	0.76	351
	A4095 Howes Lane	3.5	0.77		55.5	1.12	
	Bucknell Road (North)	68.1	1.13		153.8	1.27	
BTM Base 2026 + Proposed Development	Bucknell Road (south)	5	0.84	290	3.5	0.77	510
	A4095 Howes Lane	4.7	0.82		100.2	1.24	
	Bucknell Road (North)	139.4	1.25		203.5	1.34	

2.2.6 In accordance with the previous assessment within TN006, the proposed mini-roundabout mitigation provides a significant improvement in the AM peak, reducing the queues on all approaches as well as reducing the total junction delay by 200 seconds (over three minutes). There is a notable improvement on Bucknell Road (north) in the AM peak, reducing the queue back onto Lords Lane from 193 PCUs to 139 PCUs.

2.2.7 With respect to the PM peak, the proposed mini-roundabout mitigation reduces the queueing on the A4095 Howes Lane when compared to the existing priority junction arrangement in the 2026 BTM Base scenario by approximately 34 PCUs (approximately 161m).

2.2.8 It is acknowledged that the results of the Junctions 10 assessment identify that the mini-roundabout junction arrangement would increase the queuing in the PM peak on Bucknell Road (north) back onto Lords Lane, with a queue of 203.5 PCUs (note that this is less than the previously identified 208 PCUs to reflect

the reduction in dwellings from 550 to 500). Nonetheless, it is noted that the existing priority junction will experience a queue of 193 PCUs in the 2026 BTM scenario irrespective of the proposed Firethorn development coming forward in the 'Do Nothing' scenario.

2.2.9 In comparison to the previous assessment within TN006, the reduction in the quantum of development at the proposed Firethorn scheme from 550 units down to a minimum of 500 units has reduced the queue by approximately 5 PCUs. This is due to the Bucknell Road arm already being significantly over capacity within the 2026 BTM Base PM peak scenario, meaning any additional development traffic does not enter the junction and instead sits at the back of the existing queue.

2.2.10 Crucially, the modelling undertaken suggests that the existing A4095 Howes Lane / Bucknell Road priority junction will be significantly over capacity, with an RFC exceeding 1.0 on two approaches in the 2026 BTM scenario across both the AM and PM peak hours, irrespective of whether the proposed Firethorn development comes forward or not.

2.3 ALTERNATIVE ASSESSMENT

2.3.1 As set out on page 7 of the OCC response, it is noted that OCC refers to discrepancies within the observed and modelled queues. The observed traffic flows within TN008 were based on surveys undertaken on Wednesday the 2nd of February 2022.

2.3.2 For completeness, the observed junction assessment using the February data for the existing priority junction arrangement of the A4095 Howes Lane / Bucknell Road is provided in **Table 2-3**.

Table 2-3: A4095 Howes Lane / Bucknell Road - Existing Junction Observed February 2022 (Feb 2022 Data)

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	4.3	0.81	28.31
	Howes Lane (Right Turn)	1.4	0.62		0.1	0.11	
	Bucknell Road N (Right Turn)	165	1.33		8.8	0.89	

2.3.3 Of particular note, the modelling undertaken suggests that the existing junction currently experiences a queue on the A4095 Lords Lane approach of up to 165 PCUs in the AM peak, with an RFC in excess of 1.0; which theoretically cannot be possible within an observed model, as it suggests the junction has exceeded its maximum capacity and no more traffic can pass through the junction.

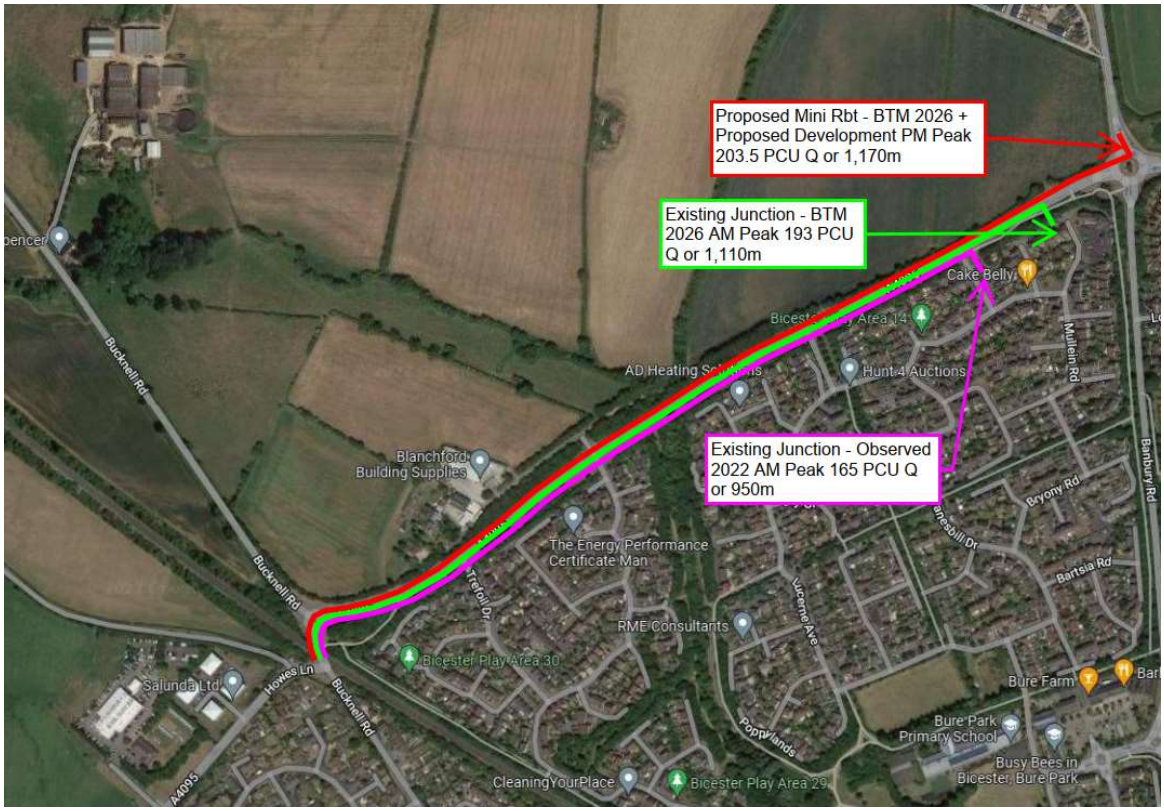
2.3.4 Evidently, an RFC in excess of 1.0 would not be possible for this junction, as traffic was observed passing through the junction within the surveys, which included substantial video evidence from a number of angles and for a considerable distance along the approaches to the existing priority junction.

2.3.5 In terms of the severity thresholds noted earlier within this TN008, **Figure 2-1** provides a schematic overview of the queueing back onto the A4095 Lords Lane for the following scenarios, based on the modelling undertaken:

- Existing Priority Junction - Observed 2022 (February surveys);

- Existing Priority Junction – 2026 BTM Base; and
- Proposed Mini-roundabout Junction – 2026 BTM Base + Proposed Firethorn Development (500 units).

Figure 2-1: Junction Modelling Impact - Queue Overview



2.4 ADDITIONAL SURVEY DATA

2.4.1 Following the initial submission of TN008 to OCC for comment, OCC responded by stating that there may have been incidents on the wider highway network that may have made the February flows 'atypical'.

2.4.2 Following this feedback from OCC, additional traffic surveys were commissioned covering the same extent as the Wednesday the 02nd of February 2022 surveys that were used to inform the observed model. The additional surveys were undertaken over three consecutive neutral weekdays on the week commencing the 04th of July 2022 to ensure that the flows were representative of the junction operation.

2.4.3 Traffic survey and queue length data were collected across the AM peak and PM peak on the following days:

- Tuesday the 05th of July 2022;
- Wednesday the 06th of July 2022; and
- Thursday the 07th of July 2022.

2.4.4 For completeness, a comparison between all the observed traffic data that has been collected is provided in **Table 2-4**. For reference, the 2026 BTM Reference Case is also included in this comparison.

Table 2-4: Observed 2022 Traffic Data Comparison (PCUs)

MOVEMENT	WEDNESDAY 2ND FEBRUARY 2022		TUESDAY 5TH JULY 2022		WEDNESDAY 6TH JULY 2022		THURSDAY 7TH JULY 2022		BTM REFERENCE CASE 2026	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	774	536	773	552	825	583	801	606	735	646
2	169	173	150	167	159	176	163	178	180	390
3	167	130	153	134	187	122	149	141	296	326
4	84	44	73	43	86	59	69	46	174	178
5	29	28	29	31	27	47	23	32	13	13
6	511	522	468	654	423	679	464	659	526	751
Total Flow	**1,734**	**1,433**	**1,646**	**1,581**	**1,707**	**1,666**	**1,669**	**1,662**	**1,924**	**2,304**

Movement 1: *Bucknell Road N, right turn into A4095 Howes Lane*
Movement 2*: Bucknell Road N travelling south*
Movement 3: *Bucknell Road S travelling north*
Movement 4: *Bucknell Road S left turn into A4095 Howes Lane*
Movement 5: *A4095 Howes Lane right turn*
Movement 6: *A4095 Howes Lane left turn onto Bucknell Road N*

2.4.5 Traffic flow diagrams presenting the data above are included in **ATTACHMENT D**.

2.4.6 The comparison between the survey data collected suggests the following:

- As identified by OCC, the flows in the observed February 2022 PM may have been atypical. The July surveys suggest that the total flow through the junction in the PM peak is higher than what was observed in the PM peak within the February surveys.
- The AM peak recorded within the February 2022 surveys is generally consistent with what has been observed within the July 2022 AM surveys.
- Across the consecutive July surveys, both the AM and PM peaks are generally consistent over the survey days.

2.4.7 In line with the above, it is regarded that the traffic flows collected in July 2022 would be representative of 'typical' conditions for the existing junction operation, whilst any previous conclusions relating to the AM peak using the February 2022 data would also be representative.

2.4.8 When the July 2022 flows are compared with the 2026 BTM Reference Case, whilst the BTM flows are higher than those observed in July 2022 (which it is considered would account for background traffic growth up to 2026), there are specific movements where the observed traffic flows exceed the BTM flows, namely vehicles turning right onto the A4095 Howes Lane from Bucknell Road in the AM, and the right turn from A4095 Howes Lane in the AM and PM.

2.4.9 As the Wednesday the 06th of July 2022 survey data had the greatest total flow, it is proposed to undertake an additional assessment of the existing junction operation using these flows (shown in **Table 2-5**), which are considered as 'typical' of the existing junction operation.

Table 2-5: A4095 Howes Lane / Bucknell Road - Existing Junction (Observed July 2022)

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)	5.7	0.88	949,641	37.4	1.07	102.1
	Howes Lane (Right Turn)	19	9,999		0.3	0.2	
	Bucknell Road N (Right Turn)	228.9	1.43		17.6	0.97	

2.4.10 The modelling for the observed junction suggests that in the AM peak, there is a queue of 228 PCUs on the A4095 Lords Lane approach, the equivalent to a 1,316m queue - which would queue through and past the A4095 Lords Lane / B4100 Banbury Road roundabout junction. The results from the Junctions 10 modelling identifies that the RFC also exceeds 1.0 on a number of the arms.

2.4.11 It is noted that the Bucknell Road (north) approach performs significantly worse using the July data than was previously assessed using the February data, which is down to the increase in right turn movements onto the A4095 Howes Lane from Bucknell Road (north), which to avoid confusion is the A4095 Lords Lane approach.

2.4.12 Following a review of the video survey data, it is evident that the model is still not accurately replicating observed conditions and requires calibration. This is in accordance with the previous OCC comment on the disparity between observed and modelled queues, as well as total junction delay.

2.5 CALIBRATION

2.5.1 With respect to calibration and best practice guidance, reference is made to the online guidance produced by Transport Research Laboratory[1] (TRL), which suggests the following checklist for calibration. A response to each point is provided to demonstrate compliance with this checklist.

- **How reliable are observed measurements?** Consecutive days of traffic survey data have been reviewed, alongside reviewing the video surveys. There is no evidence to suggest that the collected data is atypical.
- **Has demand been measured correctly?** The demand has been measured upstream of the junction rather than what has passed the give-way line. The traffic data suggests a 'one-hour' profile is representative of the typical junction performance.
- **Are geometries correct?** The geometry has been based on measurements of a topographical survey (not OS mapping) using AutoCAD, as per best practice.
- **Are units correct?** The units have been checked and are assessed in PCUs, as per best practice.

[1] https://trlsoftware.com/support/knowledgebase/queues-are-longer-or-shorter-than-arcady-predicts/

- **Consider applying calibration factors:** In accordance with best practice, it is proposed to apply calibration factors.

2.5.2 It is noted that there are limited opportunities to calibrate priority junctions within PICADY, particularly when the discrepancy is on the major arm. PICADY does allow for intercept adjustments but only on the minor arm (in this instance, the minor arm is the A4095 Howes Lane). However, this would not assist with appropriately calibrating the traffic flows along Bucknell Road (the major arm).

2.5.3 Nonetheless, it is acknowledged that the model appears to be significantly overestimating the queuing on the approaches to the junction, which is believed to be due to driver behaviour and operation of the junction, whereby the dominant movements do not have priority and are focused on vehicles turning right onto the A4095 Howes Lane from Bucknell Road (north) and left from the A4095 Howes Lane onto Bucknell Road (north) - as opposed to north to south along Bucknell Road, as would typically be expected at a priority junction along the major arm.

2.6 OBSERVATIONS

2.6.1 A detailed review of the video surveys has been undertaken to identify the observed queuing and operation of the junction. Due to the substantial file sizes and amount of data, the video surveys can be provided to OCC upon request by digital transfer.

2.6.2 In the AM peak, the videos show that traffic is generally free-flowing through the junction between Bucknell Road (north) and the A4095 Howes Lane, with relatively low volumes of traffic entering/exiting from Bucknell Road (south).

2.6.3 Even when the Bucknell Road (north) approach begins to queue, it is observed that the queue is not stationary and instead forms a 'sliver' or rolling queue, whereby vehicles continue to move through the junction at a slow speed. The greatest queue observed in the AM peak (despite still slowly moving) was approximately 400m in length back to the Purslane Drive junction, the equivalent to a queue of 69.5 PCUs, albeit vehicles were spaced out and also giving way at the Trefoil Drive junction. This occurred in the February 2022 surveys.

2.6.4 An extract of this observed queue is provided below in **Figure 2-2**.

Figure 2-2: A4095 Lords Lane Observed Queue - AM Peak February 2022

2.6.5 With respect to the July surveys, it is noted that the greatest queue was observed during the AM peak, with the queue reaching Trefoil Drive (equivalent to circa 180m queue or 30 PCUs), shown in **Figure 2-3**.

Figure 2-3: A4095 Lords Lane Observed Queue - AM Peak July 2022

2.6.6 In relation to the PM peak, it is again noted that there was little queueing observed and traffic was generally free-flowing between Bucknell Road (north) and the A4095 Howes Lane, with traffic on Bucknell Road (south) in some instances giving way to the other traffic in the junction, despite it having priority. The typical queue observed was approximately 3-4 PCUs (extract provided in **Figure 2-4**).

Figure 2-4: Bucknell Road Observed Queue - PM Peak (July 2022 survey)

2.6.7 Whilst not directly relevant to the calibration exercise, it is also acknowledged that the PICADY software would not account for the existing junction not being able to accommodate Heavy Goods Vehicle (HGV) movements without all the other movements giving way at that time, as shown in **Figure 2-5**.

2.6.8 Nevertheless, this is regarded as an additional constraint, not currently factored in or accounted for within the modelling for the existing junction, which would likely reduce the performance and increase any queuing within the existing junction further.

Figure 2-5: Bucknell Road Observed HGV Movement through the junction (February 2022 survey)

2.6.9 It is noted that when utilising the July traffic data, a significant calibration factor would need to be applied to the Bucknell Road (north) right turn movement onto the A4095 Howes Lane in order to calibrate this arm. This is due to there being a greater disparity in the observed vs modelled queues within the July data than previously assessed utilising the February data.

2.6.10 This calibration factor would exceed the 14% presented previously within TN008 and would be in the region of 30-40%. For robustness, it is proposed to retain the 14% calibration factor, as it retains more traffic on this arm.

2.6.11 The 14% reduction has only been applied to the Bucknell Road (north) approach AM, and PM traffic flows in order to replicate the driver behaviour at this arm. This is a comparable methodology to how a roundabout would be calibrated within ARCADY, with the reduction replicating an 'arm capacity adjustment'.

2.6.12 It is also acknowledged that this is the only method of calibrating the major arm within PICADY to reflect the unique driver behaviour at this arm.

2.6.13 This methodology is in accordance with the TRL best practice guidance, which states (emphasis added):

> *"**Alternatively you can find intercept corrections by a process of trial and error. Corrections are intended to account for factors at the junction which make the junction different to the 'average' junction with the same geometries, such as poor visibility, gradient, driver hesitation, unusual layout, and so on. Usually these factors apply at all times of day and in current and future years.** If you find that you need to apply very large adjustments to reproduce the observed queues, this suggests that there is something wrong with the model data and it's worth checking the points above again."*

2.6.14 It is considered that the Bucknell Road (north) approach could be calibrated further than a 14% reduction, as the RFC still exceeds 1.0. However, for the purpose of this assessment and in order to be robust, only a 14% reduction will be applied. In order to bring the RFC below 1.0, a reduction in the order of 40-50% would be required.

2.7 EXISTING JUNCTION ARRANGEMENT (CALIBRATED)

2.7.1 The results of the junction modelling for the calibrated existing priority junction across all scenarios are provided in **Table 2-6**.

2.7.2 To ensure a robust assessment of the proposed Firethorn scheme, a development quantum of 530 units has been assessed, which is consistent with the development quantum, which forms the basis of the planning application.

2.7.3 The Junctions 10 output files are included in **ATTACHMENT E**.

Table 2-6: A4095 Howes Lane / Bucknell Road - Existing Priority Junction (Calibrated)

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)	2.5	0.7	261	35.1	1.06	82

SCENARIO	ARM	AM PEAK (08:00-09:00)			PM PEAK (17:00-18:00)		
		QUEUE	RFC	JUNCTION DELAY (s)	QUEUE	RFC	JUNCTION DELAY (s)
	Howes Lane (Right Turn)	0.3	0.24		0.2	0.17	
	Bucknell Road N (Right Turn)	101.9	1.23		5.9	0.83	
BTM Base 2026	Howes Lane (Left Turn)	7.8	0.9		114.1	1.3	
	Howes Lane (Right Turn)	0.1	0.12	191	0.1	0.1	281
	Bucknell Road N (Right Turn)	86.8	1.21		53	1.08	
BTM Base 2026 + Proposed Development (530 Units)	Howes Lane (Left Turn)	30.6	1.12		197.4	1.46	
	Howes Lane (Right Turn)	1.7	0.97	442	0.2	0.15	505
	Bucknell Road N (Right Turn)	174	1.38		89.9	1.17	

2.7.4 It is noted that even with the addition of the 14% calibration factor, the queues on Bucknell Road (north) still significantly exceed the queues observed within the video data (suggesting a 585m or 102 PCU queue, which would extend well past the Purslane Drive junction).

2.7.5 Once calibrated, the existing junction would experience a queue of 102 PCUs in the AM peak and a queue of 6 PCUs in the PM peak, which is considered to be a robust representation of the operation of the existing junction based on the video surveys available.

2.7.6 Within the 2026 BTM Base scenario, the queue on the A4095 Howes Lane will reach 114 PCUs in the PM peak, which would queue through and past the Shakespeare Drive signal junction. The queue on Bucknell Road (north) will also reach 86 PCUs, the equivalent to approximately 500m and will queue past the Purslane Drive junction.

2.7.7 With the addition of the proposed Firethorn development, the queue on Bucknell Road reaches a peak of 174 PCUs, although it is noted that this does not meet the 'severe' threshold of 193 PCUs previously considered to be acknowledged by OCC as this is what would occur in the 'Do Nothing' scenario. It is also regarded that the queue on the A4095 Howes Lane reaches 197 PCUs or the equivalent to a 1,083m queue.

2.7.8 However, this arm is predicted to queue through the Shakespeare Drive junction in the 2026 BTM Base scenario anyway. Crucially, the queue does not reach the A4095 / Middleton Stoney Roundabout, so the impact could not be deemed as any more severe than that which is likely to take place in a 'Do Nothing' scenario without the proposed Firethorn development.

2.7.9 On that basis, whilst the addition of the proposed Firethorn Development increases delay and queueing at the existing junction when added to the 2026 BTM Base scenario, it does not result in a 'severe' impact on the existing arrangement once calibrated.

2.8 PROPOSED MINI-ROUNDABOUT (CALIBRATED)

2.8.1 An assessment of the proposed mini-roundabout mitigation scheme with the same calibration factors

applied to Bucknell Road (north) is provided in **Table 2-7**. The Junctions 10 output files are included in **ATTACHMENT F**.

Table 2-7: A4095 Howes Lane / Bucknell Road - Proposed Mini-roundabout Junction (Calibrated)

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)	3.9	0.79	44	3.3	0.76	161
	A4095 Howes Lane	3.5	0.77		55.4	1.12	
	Bucknell Road (North)	15.7	0.97		54.7	1.09	
BTM Base 2026 + Proposed Development (530 Units)	Bucknell Road (south)	4.9	0.83	98	3.5	0.77	302
	A4095 Howes Lane	4.8	0.83		103.3	1.24	
	Bucknell Road (North)	51	1.09		80.4	1.15	

2.8.2 The junction capacity assessment for the calibrated proposed mini-roundabout arrangement suggests that the mitigation scheme will result in a significant improvement in junction capacity in the AM peak, reducing the RFC and queue on Bucknell Road (north) to 1.09 and 51 PCUs, respectively. In addition, the total delay is reduced by 100 seconds even with the addition of the proposed Firethorn development.

2.8.3 With respect to the PM peak and when incorporating traffic associated with the proposed Firethorn development, the proposed mini-roundabout scheme reduces the RFC and queue on the A4095 Howes Lane to 1.24 and 103 PCUs, respectively, down from 1.3 and 114 PCUs in the 2026 BTM Base scenario with the existing priority junction arrangement.

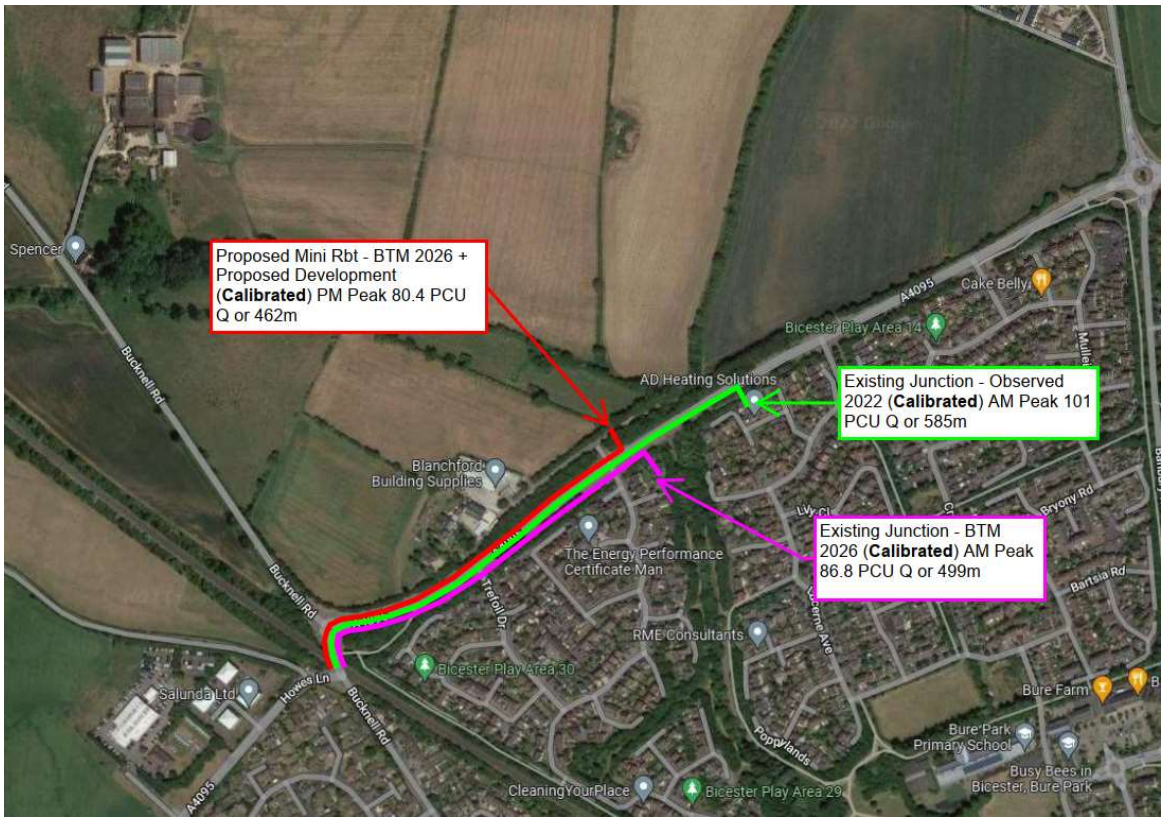
2.8.4 It is accepted that the proposed mini-roundabout mitigation scheme increases the queue on Bucknell Road (north) from 53 PCUs up to 80 PCUs (with the addition of the traffic associated with the proposed Firethorn development) when compared to the 2026 BTM Base scenario with the existing arrangement.

2.8.5 Nonetheless, reference is made to the severity thresholds referenced by OCC and queueing back through the A4095 Lords Lane / B4100 Banbury Road junction as being identified as the point at which the impact becomes 'severe'.

2.8.6 **Figure 2-6** provides a schematic diagram of the modelled queueing across the following scenarios:

- Existing Priority Junction - Observed 2022 AM Peak (Calibrated);
- Existing Priority Junction – 2026 BTM Base AM Peak (Calibrated); and
- Proposed Mini-roundabout Junction – 2026 BTM Base + Proposed Firethorn Development PM Peak (530 units, Calibrated).

Figure 2-6: Junction Modelling Impact - Queue Overview (Calibrated)



2.8.7 Due to the change in the proportion of movements between the observed and BTM data (the observed identified a higher proportion of right turn movements onto the A4095 Howes Lane), the queue for the existing junction would be greater than in the 2026 BTM Base scenario.

2.8.8 Whilst the proposed mini-roundabout mitigation scheme queues for the PM peak past the Trefoil Drive junction, this is still below the queueing that would be taking place anyway at the existing junction in the 2026 BTM Base scenario AM peak, in a 'Do Nothing' scenario assuming the proposed Firethorn development has not come forward.

2.8.9 On that basis, it is considered that the proposed mini-roundabout scheme helps to achieve a 'nil detriment' position in the PM peak and improves the performance of the junction significantly in the AM peak.

2.8.10 In the PM peak, the proposed mini-roundabout scheme also improves the performance of the A4095 Howes Lane approach. Whilst there is a minor reduction in performance on the Bucknell Road (north) approach, this is not considered to result in a severe impact and is also below the queueing that is predicted to take place in the calibrated 2026 BTM Base AM scenario in a 'Do Nothing' situation.

3 CONCLUSIONS

3.1 OVERVIEW

3.1.1 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.

3.1.2 This Technical Note (TN) has been prepared to respond to comments from OCC in relation to the impact of the proposed development on the A4095 Howes Lane / Bucknell Road junction, in the absence of the A4095 Strategic Highway Improvements, also referred to as the A4095 Strategic Link Road (SLR).

3.1.3 The "reallocation" of the funding for the A4095 SLR 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 SLR to be "clawed back" by these developments through the respective Section 106 Obligations.

3.1.4 An interim mitigation scheme in the form of a mini-roundabout arrangement has been developed to address the impact of the proposed 530 dwellings associated with the Firethorn development, whilst the delivery mechanisms and funding for the A4095 SLR are considered by OCC and an appropriate way forward identified and agreed to.

3.1.5 It is generally accepted that the permitted A4095 SLR is 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 within the adopted CDC Local Plan. However, the proposed interim improvement mini-roundabout 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 Firethorn development.

3.2 ASSESSMENT METHODOLOGY

3.2.1 Following consultation comments from OCC that acknowledged there was a disparity between the observed and modelled queues within the previous assessments, a calibration exercise has been undertaken to ensure that the model appropriately reflects the observed conditions within the video surveys.

3.2.2 Following comments received from OCC on the validity of the observed data used to calibrate the model, additional traffic survey data has been collected over consecutive weekdays to provide an appropriate representation of the junction performance.

3.2.3 In order to calibrate the model to reflect the observed conditions, a reduction of 14% has been applied to the Bucknell Road (north) approach AM, and PM traffic flows only in order to reflect the queues observed within the AM and PM video surveys. This is considered to be robust, as the model still significantly overestimates queueing on the Bucknell Road (north) approach.

3.2.4 Calibration has been undertaken in accordance with best practice methodology.

3.3 EXISTING PRIORITY JUNCTION

3.3.1 Once calibrated, the existing priority junction would experience a queue of 102 PCUs in the AM peak and a

queue of 6 PCUs in the PM peak, which is considered to be a robust representation of the operation of the existing junction based on the video surveys available.

3.3.2 Within the 2026 BTM Base scenario, the queue on the A4095 Howes Lane will reach 114 PCUs in the PM peak, which would queue through and past the Shakespeare Drive signal junction. The queue on Bucknell Road (north) will also reach 86 PCUs, the equivalent to a 500m queue, which would queue past the Purslane Drive junction to the east.

3.3.3 With the addition of the traffic associated with the proposed Firethorn development, the queue on Bucknell Road (north) reaches a peak of 174 PCUs, although it is noted that this does not meet the 'severe' threshold of 193 PCUs previously considered to be acknowledged by OCC.

3.3.4 It is also regarded that the queue on the A4095 Howes Lane reaches 197 PCUs, or the equivalent to a 1,083m queue. However, this arm is predicted to queue through the Shakespeare Drive junction in the 2026 BTM Base scenario anyway. Crucially, the queue does not reach the A4095 / Middleton Stoney Roundabout further to the south west, so the impact could not be deemed as any more severe than what is likely to take place in a 'Do Nothing' scenario without the proposed Firethorn development.

3.3.5 On that basis, whilst the addition of the traffic associated with the proposed Firethorn development increases delay and queueing at the existing junction when added to the 2026 BTM Base scenario, it is considered that it does not result in a 'severe' impact on the existing arrangement once calibrated.

3.4 PROPOSED INTERIM MINI-ROUNDABOUT

3.4.1 Once calibrated, the junction capacity assessment for the proposed mini-roundabout arrangement suggests that the interim mitigation scheme will result in the following (assuming the proposed Firethorn development is implemented):

- A significant improvement in junction capacity in the AM peak, reducing the RFC and queue on Bucknell Road (north) to 1.09 and 51 PCUs, respectively, as well as a reduction in the total delay by 100 seconds, even with the addition of the traffic associated with the proposed Firethorn development.
- A reduction in the PM peak to the RFC and queue on the A4095 Howes Lane to 1.24 and 103 PCUs, respectively, down from 1.3 and 114 PCUs in the 2026 BTM Base scenario with the existing junction arrangement.

3.4.2 Whilst the proposed mini-roundabout mitigation scheme increases the queue from 53 PCUs up to 80 PCUs on Bucknell Road (north) in the PM peak (with the addition of the traffic associated with the proposed Firethorn development) when compared to the 2026 BTM Base scenario with the existing priority arrangement, reference is made to the severity thresholds referenced by OCC of queueing back through the A4095 Lords Lane / B4100 Banbury Road junction being identified as the point at which the impact becomes 'severe'.

3.4.3 Whilst the proposed interim mitigation scheme increases the queuing from the PM peak past the Purslane Drive junction, this is still below the queueing that would be taking place anyway at the existing junction in the 2026 BTM Base scenario AM peak, in a 'Do Nothing' scenario assuming the proposed Firethorn development has not come forward.

3.4.4 In the PM peak, the proposed mini-roundabout scheme also improves the performance of the A4095 Howes Lane approach. Whilst there is a minor reduction in performance on the Bucknell Road (north) approach, this is not considered to result in a severe impact and is also below the queueing that is predicted to take

place in the calibrated 2026 BTM Base AM scenario in a 'Do Nothing' situation.

3.4.5 On that basis, it is considered that the proposed interim mini-roundabout scheme helps to achieve a 'nil detriment' position in the PM peak and improves the performance of the junction significantly in the AM peak.

3.5 SUMMARY AND CONCLUSIONS

3.5.1 It is generally accepted that the permitted and partially constructed A4095 SLR is 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.

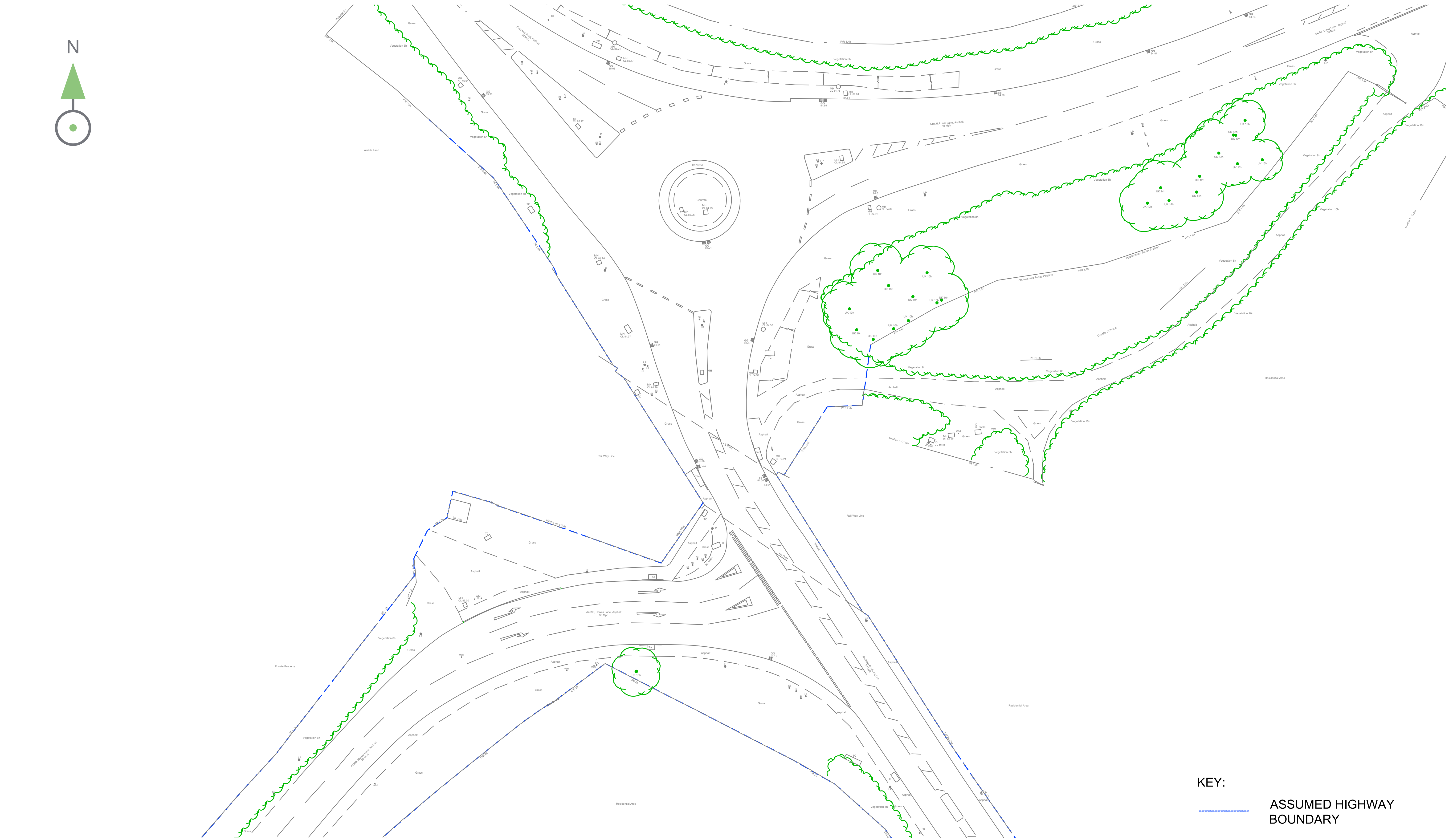
3.5.2 However, the proposed mini-roundabout mitigation scheme seeks to provide an interim mitigation solution that will accommodate the full level of development associated with the 530 dwellings prior to the implementation of the A4095 SLR.

3.5.3 Nonetheless, the assessments undertaken within this TN have demonstrated that whilst the proposed Firethorn development does impact the operation of the A4095 Howes Lane / Bucknell Road junction, the impact on the existing arrangement would not be 'severe', as it would be no worse than in a 'Do Nothing' scenario.

3.5.4 On that basis, the proposed development is considered to be in accordance with paragraph 111 of the National Planning Policy Framework as it does not generate 'severe' transport impacts.

ATTACHMENT A

EXISTING & PROPOSED JUNCTION LAYOUTS



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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.
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VELOCITY Transport Planning

Drawing Status: S2 - FOR INFORMATION

Client: Firethorn TRUST

Architect

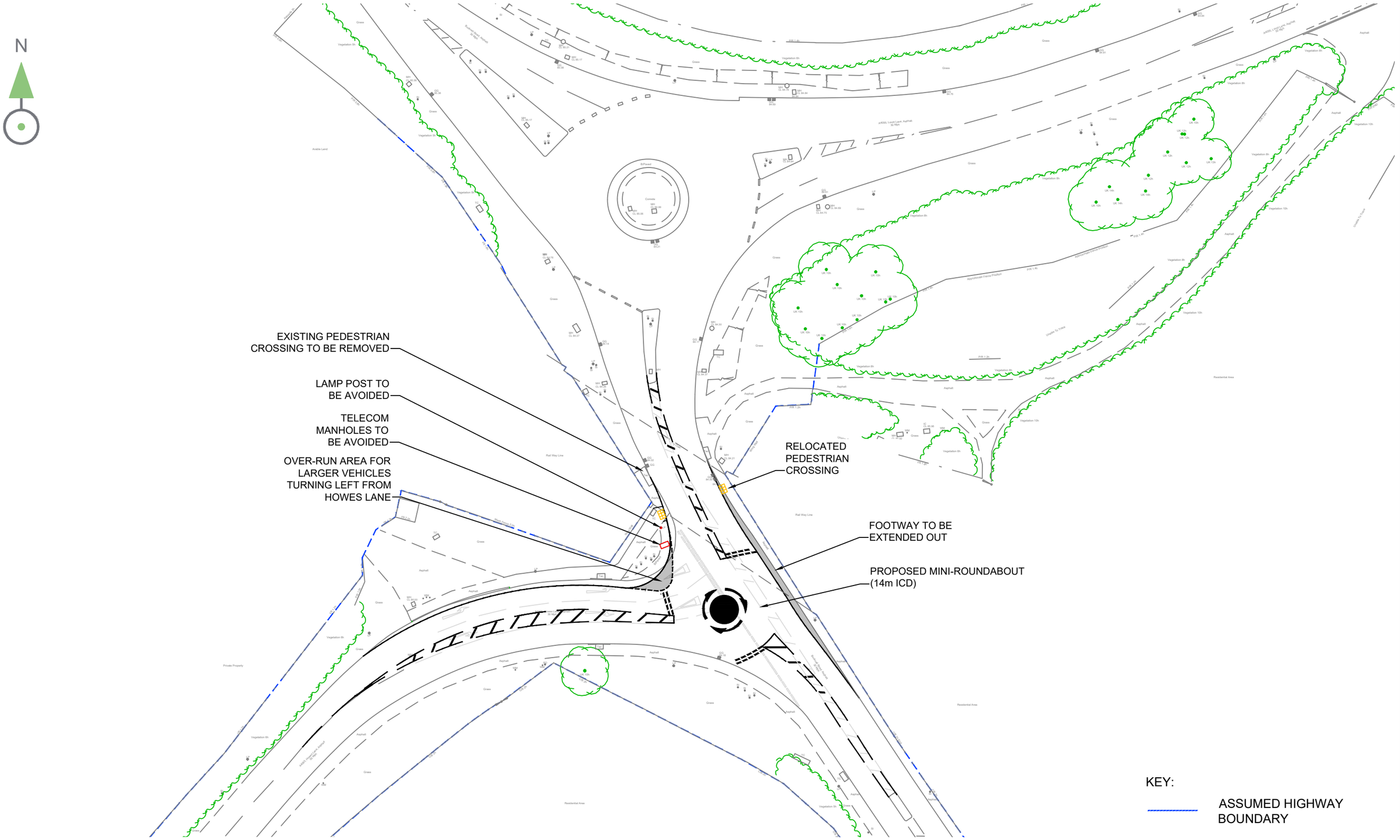
Project Title: NW BICESTER

Drawing Title: A4095 HOWES LANE/ BUCKNELL ROAD EXISTING JUNCTION 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-050	A

Drawing file: 4600-1100-T-050-A - A4095 Howes Lane - Bucknell Road - Existing Junction - General Arrangement.dwg Date: Mar 01, 2022 - 11:58am



1:500

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Rev	Date	Description	Drn	Chk	App
C	25/05/22	RELOCATED PEDESTRIAN CROSSING	GSF	CR	MK
B	15/03/22	ALIGNMENT CHANGE	GSF	CR	MK
A	01/03/22	FIRST ISSUE	GSF	CR	MK

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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 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	C

ATTACHMENT B

EXISTING PRIORITY JUNCTION MODELLING

Junctions 10

PICADY 10 - Priority Intersection Module

Version: 10.0.3.1598

For sales and distribution information, program advice and maintenance, contact TRL Software:
+44 (0)1344 379777 software@trl.co.uk trlsoftware.com

Filename: 2022.07.14 - NW BICESTER - HOWES LANE (Existing).j10
Path: P:\Firethorn Trust_4600\1100 - NW Bicester\Analysis\Modelling\Picady\BTM 2026 FLOWS
Report generation date: 14/07/2022 18:08:41

»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	490.10	D2	135.3	728.04	1.40	F	465.55
Stream B-A		6.3	2239.45	9999999999.00	F			0.5	145.00	0.37	F	
Stream C-AB		193.0	893.76	1.40	F			134.6	528.30	1.25	F	
BTM 2026 + Proposed Dev												
Stream B-C	D3	69.3	492.19	1.26	F	376644.81	D4	301.9	2007.83	1.88	F	1043.48
Stream B-A		12.1	59999940.00	9999999999.00	F			6.7	2405.01	9999999999.00	F	
Stream C-AB		334.9	1593.79	1.62	F			203.5	791.70	1.36	F	
OBS 2022												
Stream B-C	D5	5.7	44.37	0.88	E	949641.06	D6	37.4	171.25	1.07	F	102.10
Stream B-A		19.0	59999940.00	9999999999.00	F			0.3	19.28	0.20	C	
Stream C-AB		228.9	1042.06	1.43	F			17.6	75.02	0.97	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.

Generated on 14/07/2022 18:09:04 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\CRicci
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

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use iterations with HCM roundabouts	Max number of iterations for roundabouts
5.75						0.85	36.00	20.00		500

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
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	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	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.

Stream Intercept Adjustments

Stream intercept adjustment	Use adjustment	Reason	Direct intercept adjustment (PCU/hr)
B-A	✓		0
B-C			

Generated on 14/07/2022 18:09:04 using Junctions 10 (10.0.3.1598)

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)	Run automatically
D1	BTM Base 2026	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	470	100.000
B		ONE HOUR	✓	539	100.000
C		ONE HOUR	✓	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	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	1.17	199.32	29.9	F	483	724
B-A	9999999999.00	2239.45	6.3	F	12	18
C-AB	1.40	893.76	193.0	F	831	1246
C-A					9	14
A-B					160	239
A-C					272	407

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	396	99	694	0.571	390	0.0	1.4	12.828	B
B-A	10	2	289	0.034	10	0.0	0.0	14.180	B
C-AB	662	165	744	0.890	632	0.0	7.4	31.579	D
C-A	27	7			27				
A-B	131	33			131				
A-C	223	56			223				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	473	118	674	0.701	469	1.4	2.4	18.879	C
B-A	12	3	218	0.054	12	0.0	0.1	19.222	C
C-AB	823	206	751	1.096	732	7.4	30.0	106.545	F
C-A	0	0			0				
A-B	156	39			156				
A-C	266	67			266				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	579	145	638	0.907	560	2.4	7.1	43.036	E
B-A	14	4	102	0.140	14	0.1	0.2	44.610	E
C-AB	1007	252	718	1.402	717	30.0	102.6	344.260	F
C-A	0	0			0				
A-B	192	48			192				
A-C	326	81			326				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	579	145	496	1.167	488	7.1	29.9	156.451	F
B-A	14	4	2	8.227	1	0.2	3.4	2239.448	F
C-AB	1007	252	718	1.402	718	102.6	174.9	690.814	F
C-A	0	0			0				
A-B	192	48			192				
A-C	326	81			326				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	473	118	513	0.922	506	29.9	21.5	199.317	F
B-A	12	3	0	9999999999.000	0	3.4	6.3	1448.059	F
C-AB	823	206	751	1.096	750	174.9	193.0	893.761	F
C-A	0	0			0				
A-B	156	39			156				
A-C	266	67			266				

Generated on 14/07/2022 18:09:04 using Junctions 10 (10.0.3.1598)

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	396	99	525	0.755	466	21.5	4.1	84.937	F
B-A	10	2	22	0.455	18	6.3	4.2	1074.123	F
C-AB	662	165	744	0.890	747	193.0	171.6	892.302	F
C-A	27	7			27				
A-B	131	33			131				
A-C	223	56			223				

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		465.55	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	465.55	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)	Run automatically
D2	BTM Base 2026	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

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

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	751
	C	390	646	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 14/07/2022 18:09:04 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	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	1.40	728.04	135.3	F	689	1034
B-A	0.37	145.00	0.5	F	12	18
C-AB	1.25	528.30	134.6	F	910	1365
C-A					41	61
A-B					163	245
A-C					299	449

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	565	141	687	0.824	548	0.0	4.4	26.043	D
B-A	10	2	281	0.035	10	0.0	0.0	14.572	B
C-AB	674	168	852	0.791	654	0.0	5.0	19.240	C
C-A	106	26			106				
A-B	134	34			134				
A-C	245	61			245				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	675	169	666	1.014	632	4.4	15.2	72.831	F
B-A	12	3	212	0.055	12	0.0	0.1	19.707	C
C-AB	916	229	938	0.976	868	5.0	16.9	50.469	F
C-A	16	4			16				
A-B	160	40			160				
A-C	293	73			293				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	827	207	630	1.312	628	15.2	64.9	249.256	F
B-A	14	4	112	0.128	14	0.1	0.2	40.234	E
C-AB	1141	285	909	1.255	903	16.9	76.4	195.723	F
C-A	0	0			0				
A-B	196	49			196				
A-C	359	90			359				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	827	207	589	1.403	589	64.9	124.4	573.980	F
B-A	14	4	39	0.366	13	0.2	0.5	144.997	F
C-AB	1141	285	909	1.255	908	76.4	134.6	422.041	F
C-A	0	0			0				
A-B	196	49			196				
A-C	359	90			359				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	675	169	632	1.068	632	124.4	135.3	728.039	F
B-A	12	3	54	0.218	12	0.5	0.3	97.252	F
C-AB	916	229	938	0.976	952	134.6	125.4	528.298	F
C-A	16	4			16				
A-B	160	40			160				
A-C	293	73			293				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	565	141	677	0.835	672	135.3	108.7	654.656	F
B-A	10	2	126	0.078	11	0.3	0.1	34.598	D
C-AB	674	168	852	0.791	880	125.4	73.8	444.965	F
C-A	106	26			106				
A-B	134	34			134				
A-C	245	61			245				

Generated on 14/07/2022 18:09:04 using Junctions 10 (10.0.3.1598)

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		376644.81	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	376644.81	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)	Run automatically
D3	BTM 2026 + Proposed Dev	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	470	100.000
B		ONE HOUR	✓	579	100.000
C		ONE HOUR	✓	1027	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	566
	C	180	847	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	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	1.26	492.19	69.3	F	519	779
B-A	9999999999.00	59999940.00	12.1	F	12	18
C-AB	1.62	1593.79	334.9	F	942	1414
C-A					0	0
A-B					160	239
A-C					272	407

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	426	107	693	0.615	419	0.0	1.7	14.153	B
B-A	10	2	256	0.038	10	0.0	0.0	59999940.000	F
C-AB	773	193	754	1.025	703	0.0	17.6	57.750	F
C-A	0	0			0				
A-B	131	33			131				
A-C	223	56			223				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	509	127	671	0.758	503	1.7	3.1	22.731	C
B-A	12	3	164	0.071	12	0.0	0.1	59999940.000	F
C-AB	923	231	731	1.262	728	17.6	66.5	223.358	F
C-A	0	0			0				
A-B	156	39			156				
A-C	266	67			266				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	623	156	496	1.255	488	3.1	37.0	167.155	F
B-A	14	4	3	5.598	2	0.1	3.2	59999940.000	F
C-AB	1131	283	700	1.616	700	66.5	174.3	628.844	F
C-A	0	0			0				
A-B	192	48			192				
A-C	326	81			326				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	623	156	496	1.255	495	37.0	68.9	396.581	F
B-A	14	4	0	9999999999.000	0	3.2	6.8	59999940.000	F
C-AB	1131	283	700	1.616	700	174.3	282.0	1181.555	F
C-A	0	0			0				
A-B	192	48			192				
A-C	326	81			326				

Generated on 14/07/2022 18:09:04 using Junctions 10 (10.0.3.1598)

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	509	127	513	0.992	507	68.9	69.3	492.186	F
B-A	12	3	0	9999999999.000	0	6.8	9.7	59999940.000	F
C-AB	923	231	731	1.262	731	282.0	330.1	1495.063	F
C-A	0	0			0				
A-B	156	39			156				
A-C	266	67			266				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	426	107	525	0.812	517	69.3	46.7	406.726	F
B-A	10	2	0	9999999999.000	0	9.7	12.1	59999940.000	F
C-AB	773	193	754	1.025	754	330.1	334.9	1593.788	F
C-A	0	0			0				
A-B	131	33			131				
A-C	223	56			223				

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		1043.48	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	1043.48	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)	Run automatically
D4	BTM 2026 + Proposed Dev	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	504	100.000
B		ONE HOUR	✓	847	100.000
C		ONE HOUR	✓	1091	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	834
	C	390	701	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 14/07/2022 18:09:04 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	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	1.88	2007.83	301.9	F	765	1148
B-A	9999999999.00	2405.01	6.7	F	12	18
C-AB	1.36	791.70	203.5	F	976	1465
C-A					25	37
A-B					163	245
A-C					299	449

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	628	157	686	0.915	598	0.0	7.5	37.259	E
B-A	10	2	265	0.037	10	0.0	0.0	15.487	C
C-AB	747	187	870	0.858	718	0.0	7.2	24.460	C
C-A	74	19			74				
A-B	134	34			134				
A-C	245	61			245				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	750	187	665	1.128	653	7.5	31.5	126.519	F
B-A	12	3	190	0.061	12	0.0	0.1	22.135	C
C-AB	981	245	926	1.060	892	7.2	29.3	82.841	F
C-A	0	0			0				
A-B	160	40			160				
A-C	293	73			293				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	918	230	619	1.484	618	31.5	106.5	454.166	F
B-A	14	4	73	0.197	14	0.1	0.2	66.147	F
C-AB	1201	300	882	1.361	880	29.3	109.7	293.660	F
C-A	0	0			0				
A-B	196	49			196				
A-C	359	90			359				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	918	230	489	1.879	489	106.5	214.0	1162.530	F
B-A	14	4	0	9999999999.000	0	0.2	3.8	2310.071	F
C-AB	1201	300	882	1.361	882	109.7	189.5	606.247	F
C-A	0	0			0				
A-B	196	49			196				
A-C	359	90			359				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	750	187	506	1.480	506	214.0	274.8	1725.721	F
B-A	12	3	0	9999999999.000	0	3.8	6.7	2405.008	F
C-AB	981	245	926	1.060	925	189.5	203.5	791.697	F
C-A	0	0			0				
A-B	160	40			160				
A-C	293	73			293				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	628	157	519	1.209	519	274.8	301.9	2007.834	F
B-A	10	2	12	0.832	10	6.7	6.7	2390.143	F
C-AB	747	187	870	0.858	883	203.5	169.6	785.140	F
C-A	74	19			74				
A-B	134	34			134				
A-C	245	61			245				

TRL THE FUTURE OF TRANSPORT
Generated on 14/07/2022 18:09:04 using Junctions 10 (10.0.3.1598)

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		949641.06	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	949641.06	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)	Run automatically
D5	OBS 2022	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	273	100.000
B		ONE HOUR	✓	450	100.000
C		ONE HOUR	✓	984	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	86	187
	B	27	0	423
	C	159	825	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	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.88	44.37	5.7	E	388	582
B-A	9999999999.00	59999940.00	19.0	F	25	37
C-AB	1.43	1042.06	228.9	F	898	1347
C-A					5	7
A-B					79	118
A-C					172	257

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	318	80	719	0.443	315	0.0	0.9	9.719	A
B-A	20	5	295	0.069	20	0.0	0.1	59999940.000	F
C-AB	727	182	775	0.938	687	0.0	9.9	37.795	E
C-A	14	3			14				
A-B	65	16			65				
A-C	141	35			141				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	380	95	702	0.542	379	0.9	1.3	12.178	B
B-A	24	6	221	0.110	24	0.1	0.1	59999940.000	F
C-AB	885	221	777	1.138	766	9.9	39.6	131.138	F
C-A	0	0			0				
A-B	77	19			77				
A-C	168	42			168				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	466	116	653	0.713	461	1.3	2.5	20.035	C
B-A	30	7	96	0.309	28	0.1	0.5	59999940.000	F
C-AB	1083	271	759	1.427	758	39.6	120.9	391.400	F
C-A	0	0			0				
A-B	95	24			95				
A-C	206	51			206				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	466	116	532	0.876	453	2.5	5.7	44.369	E
B-A	30	7	0	9999999999.000	0	0.5	7.9	59999940.000	F
C-AB	1083	271	759	1.427	759	120.9	202.0	765.406	F
C-A	0	0			0				
A-B	95	24			95				
A-C	206	51			206				

TRL THE FUTURE OF TRANSPORT
Generated on 14/07/2022 18:09:04 using Junctions 10 (10.0.3.1598)

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	380	95	542	0.702	392	5.7	2.8	28.073	D
B-A	24	6	0	9999999999.000	0	7.9	14.0	59999940.000	F
C-AB	885	221	777	1.138	777	202.0	228.9	1005.590	F
C-A	0	0			0				
A-B	77	19			77				
A-C	168	42			168				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	318	80	549	0.580	323	2.8	1.6	17.914	C
B-A	20	5	0	9999999999.000	0	14.0	19.0	59999940.000	F
C-AB	727	182	775	0.938	776	228.9	216.6	1042.058	F
C-A	14	3			14				
A-B	65	16			65				
A-C	141	35			141				

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		102.10	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	102.10	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)	Run automatically
D6	OBS 2022	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	181	100.000
B		ONE HOUR	✓	726	100.000
C		ONE HOUR	✓	759	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	59	122
	B	47	0	679
	C	176	583	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 14/07/2022 18:09:04 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	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	1.07	171.25	37.4	F	623	935
B-A	0.20	19.28	0.3	C	43	65
C-AB	0.97	75.02	17.6	F	647	971
C-A					49	74
A-B					54	81
A-C					112	168

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	511	128	731	0.699	502	0.0	2.4	16.617	C
B-A	35	9	379	0.093	35	0.0	0.1	11.501	B
C-AB	496	124	770	0.644	488	0.0	2.1	13.709	B
C-A	75	19			75				
A-B	44	11			44				
A-C	92	23			92				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	610	153	719	0.849	600	2.4	5.1	30.661	D
B-A	42	11	332	0.127	42	0.1	0.2	13.633	B
C-AB	622	155	800	0.777	614	2.1	4.1	20.908	C
C-A	60	15			60				
A-B	53	13			53				
A-C	110	27			110				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	748	187	698	1.071	677	5.1	22.8	91.805	F
B-A	52	13	270	0.192	51	0.2	0.3	18.100	C
C-AB	823	206	852	0.966	785	4.1	13.6	49.236	E
C-A	12	3			12				
A-B	65	16			65				
A-C	134	34			134				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	748	187	696	1.074	689	22.8	37.4	171.250	F
B-A	52	13	257	0.201	52	0.3	0.3	19.275	C
C-AB	823	206	852	0.966	807	13.6	17.6	75.017	F
C-A	12	3			12				
A-B	65	16			65				
A-C	134	34			134				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	610	153	717	0.852	696	37.4	15.9	143.732	F
B-A	42	11	311	0.136	43	0.3	0.2	14.751	B
C-AB	622	155	800	0.777	672	17.6	5.2	39.846	E
C-A	60	15			60				
A-B	53	13			53				
A-C	110	27			110				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	511	128	731	0.700	564	15.9	2.8	30.027	D
B-A	35	9	371	0.095	36	0.2	0.1	11.800	B
C-AB	496	124	770	0.644	507	5.2	2.4	15.768	C
C-A	75	19			75				
A-B	44	11			44				
A-C	92	23			92				

ATTACHMENT C

PROPOSED MINI-ROUNDABOUT JUNCTION MODELLING

Junctions 10

ARCADY 10 - Roundabout Module

Filename: 2022.05.19 - NW BICESTER - HOWES LANE (Mini RBt Mitigation) - 500 unit.j10
Path: P:\Firethorn Trust_4600\1100 - NW Bicester\Analysis\Modelling\Picady\BTM 2026 FLOWS
Report generation date: 31/05/2022 14:37:29

»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	3.3	22.31	0.76	C	351.31
Arm B		3.5	22.05	0.77	C			55.5	221.62	1.12	F	
Arm C		68.1	248.48	1.13	F			153.8	607.00	1.27	F	
	BTM 2026 + Proposed Development											
Arm A	D3	5.0	36.90	0.84	E	290.56	D4	3.5	23.66	0.77	C	510.35
Arm B		4.7	28.30	0.82	D			100.2	446.13	1.24	F	
Arm C		139.4	555.80	1.25	F			203.5	785.51	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	VTP\CRicci
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

Generated on 31/05/2022 14:37:49 using Junctions 10 (10.0.3.1598)

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	132.46	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		132.46	F

Arms

Arms

Arm	Name	Description
A	Bucknell Road S	
B	Howes Lane	
C	Bucknell Road N	

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	6.9	12.80	11.60	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 31/05/2022 14:37:49 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	587	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	706	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	5.7	128.057	F

Generated on 31/05/2022 14:37:49 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	351.31	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		351.31	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	390	646	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	0.76	22.31	3.3	C
B	1.12	221.62	55.5	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	472	785	0.484	375	1.0	9.588	A
B	575	243	822	0.700	565	2.4	14.950	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	541	742	0.611	450	1.7	13.479	B
B	687	291	791	0.868	673	5.8	30.473	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	558	731	0.759	549	3.2	21.041	C
B	841	355	752	1.119	737	31.8	108.385	F
C	1141	13	896	1.273	894	83.5	223.996	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	559	730	0.760	554	3.3	22.305	C
B	841	359	750	1.122	747	55.5	221.624	F
C	1141	13	896	1.273	896	144.8	467.069	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	558	731	0.620	459	1.9	14.861	B
B	687	297	788	0.872	773	34.0	210.666	F
C	931	13	896	1.040	895	153.8	607.004	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	555	733	0.518	382	1.2	11.383	B
B	575	247	819	0.702	700	2.9	57.892	F
C	780	12	897	0.870	890	126.3	567.040	F

Generated on 31/05/2022 14:37:49 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	290.56	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		290.56	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		✓	577	100.000
C		✓	1020	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	564
	C	180	840	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	36.90	5.0	E
B	0.82	28.30	4.7	D
C	1.25	555.80	139.4	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	615	696	0.509	349	1.1	11.302	B
B	434	220	836	0.520	430	1.2	9.648	A
C	768	10	898	0.855	746	5.4	23.532	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	709	637	0.664	419	2.1	17.871	C
B	519	264	809	0.642	516	1.9	13.387	B
C	917	12	897	1.022	861	19.3	66.235	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	735	621	0.834	507	4.6	32.349	D
B	635	320	774	0.821	625	4.4	25.089	D
C	1123	14	895	1.254	893	76.9	206.105	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	737	619	0.835	516	5.0	36.897	E
B	635	325	771	0.824	634	4.7	28.302	D
C	1123	14	895	1.255	895	134.0	432.546	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	737	619	0.682	432	2.5	22.180	C
B	519	272	803	0.646	529	2.1	14.967	B
C	917	12	897	1.023	895	139.4	555.804	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	734	621	0.569	358	1.5	15.245	C
B	434	225	832	0.522	438	1.2	10.123	B
C	768	10	898	0.855	891	108.7	502.184	F

Generated on 31/05/2022 14:37:49 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	510.35	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		510.35	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		✓	842	100.000
C		✓	1088	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	829
	C	390	698	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	0.77	23.66	3.5	C
B	1.24	446.13	100.2	F
C	1.34	785.51	203.5	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	505	764	0.497	375	1.1	10.091	B
B	634	243	822	0.771	620	3.4	18.601	C
C	819	10	898	0.912	788	7.8	30.302	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	565	726	0.624	450	1.8	14.194	B
B	757	291	791	0.956	728	10.7	47.848	E
C	978	11	897	1.090	881	32.2	97.026	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	575	720	0.770	549	3.3	22.220	C
B	927	355	752	1.233	747	55.7	174.827	F
C	1198	12	897	1.336	896	107.7	291.518	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	575	720	0.771	554	3.5	23.660	C
B	927	359	750	1.237	749	100.2	379.985	F
C	1198	12	897	1.336	897	183.0	591.283	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	575	720	0.629	459	1.9	15.521	C
B	757	297	788	0.961	779	94.6	446.132	F
C	978	12	897	1.091	896	203.5	782.898	F

18:00 - 18:15

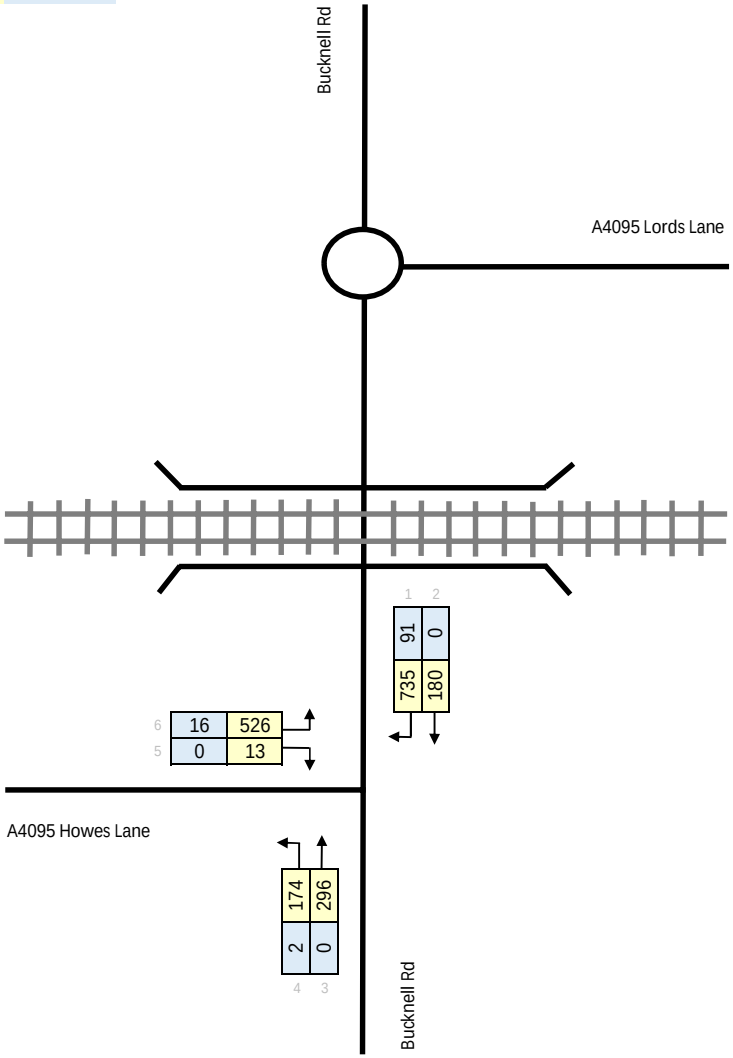
Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	379	572	722	0.525	382	1.2	11.745	B
B	634	247	819	0.774	809	50.7	325.820	F
C	819	12	896	0.914	891	185.4	785.508	F

ATTACHMENT D

TRAFFIC FLOW DIAGRAMS

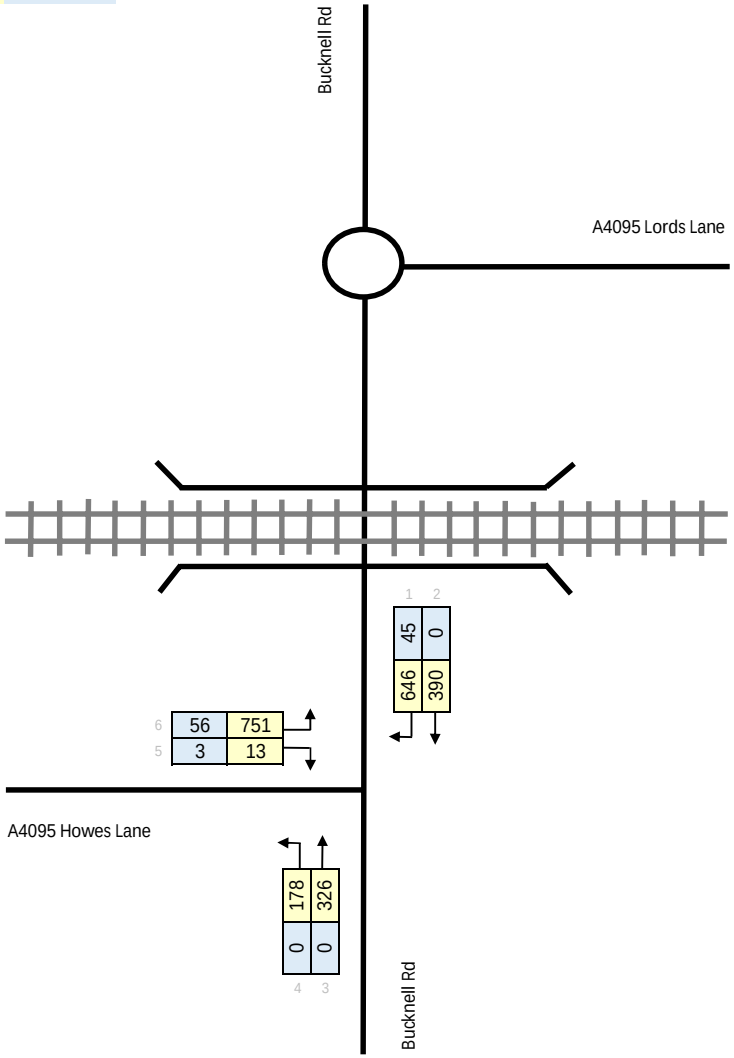
AM PEAK

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: 15/07/2022
Client:	Firethorn Trust		AM AND PM PEAK FLOWS	Diagram: A

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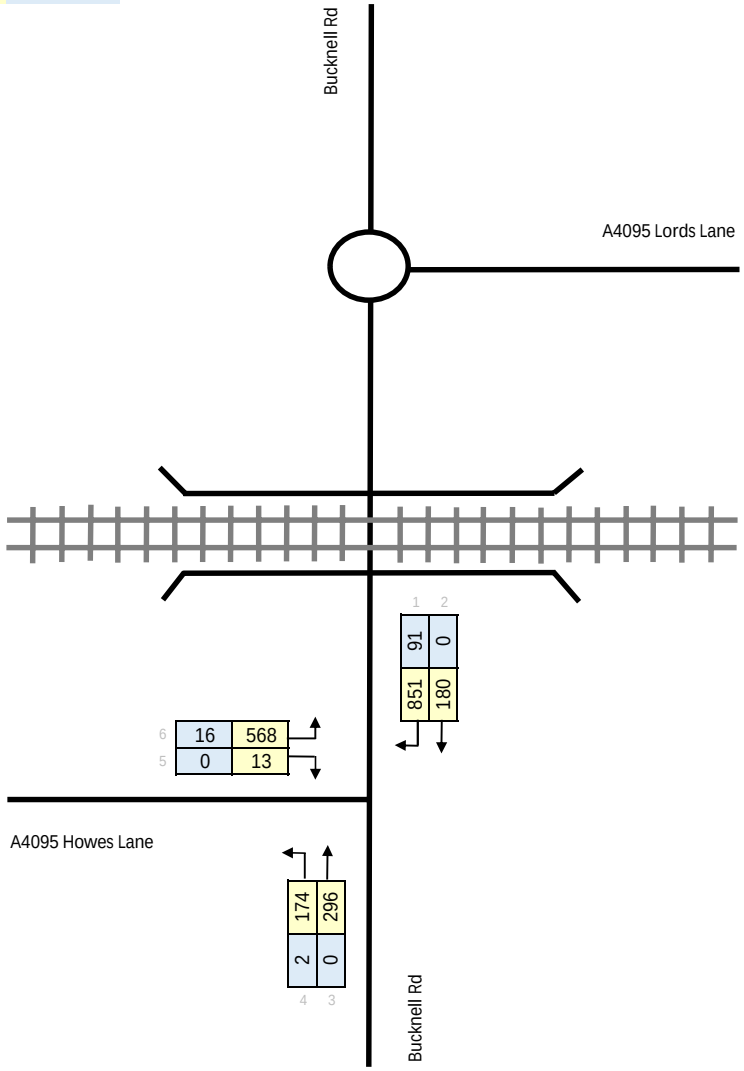
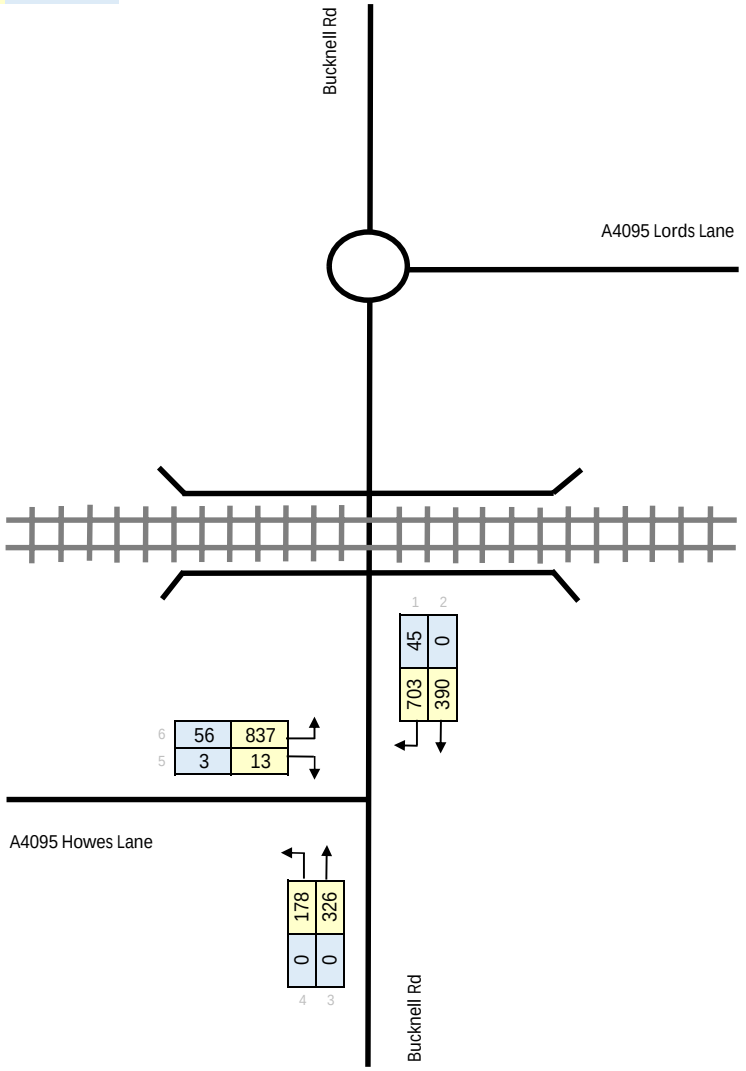
AM PEAK

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:	15/07/2022
Client:	Firethorn Trust		AM AND PM PEAK FLOWS	Diagram:	B

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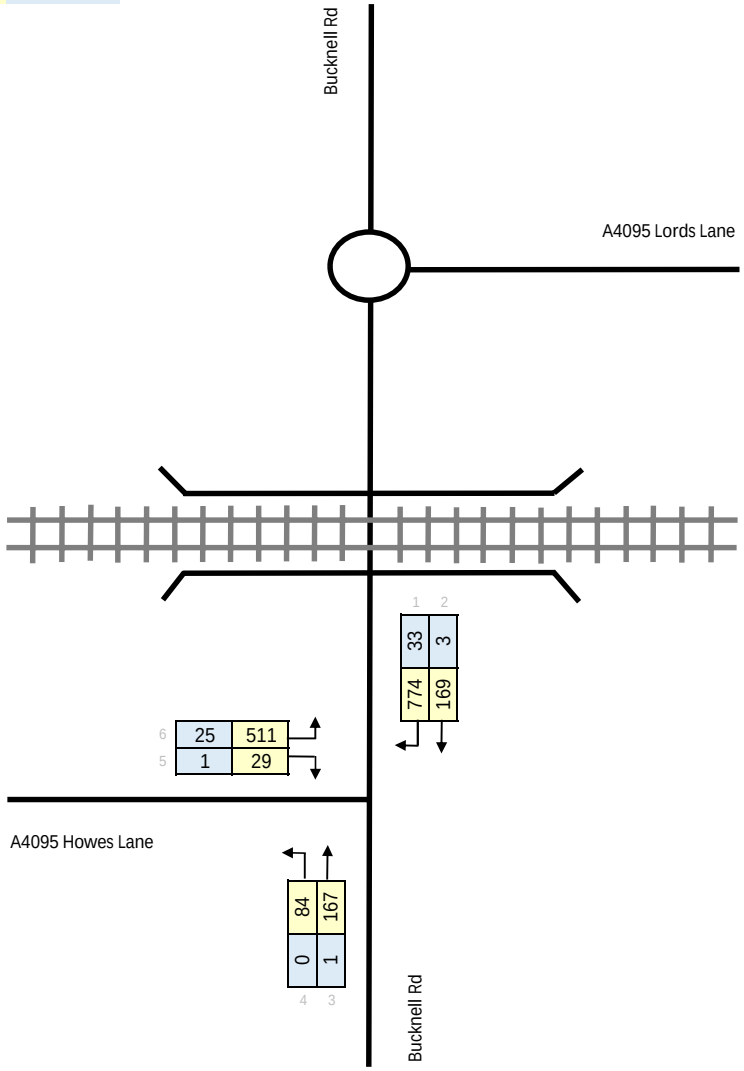
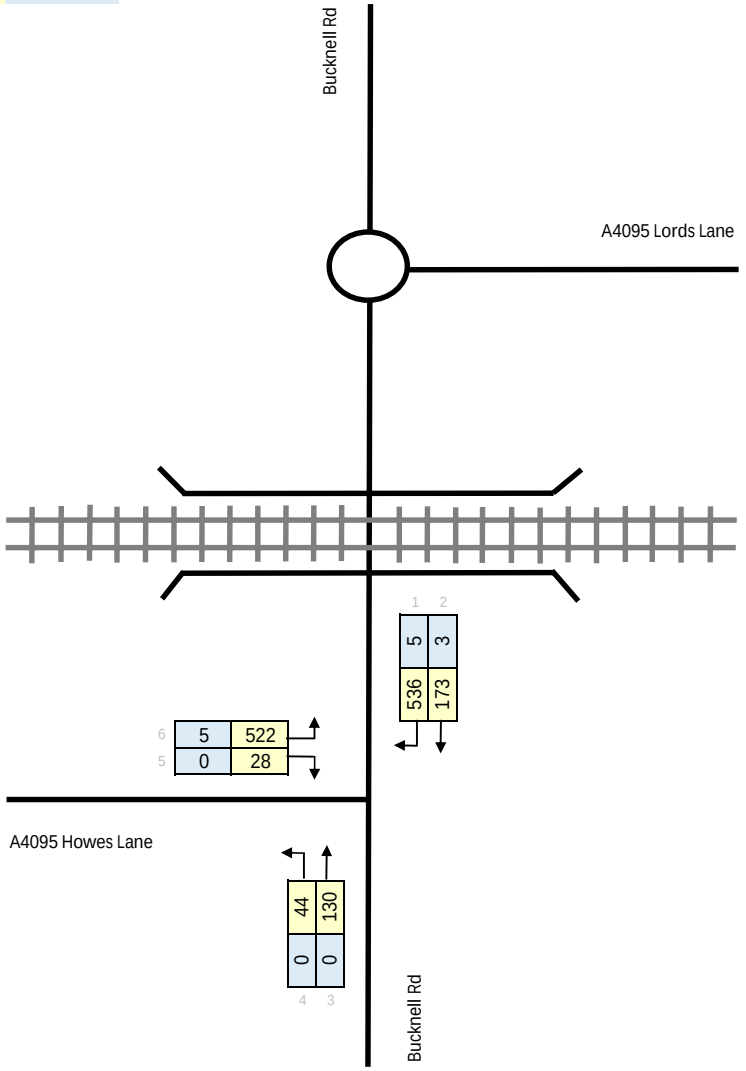
AM PEAK

PCUS	HGVS



PM PEAK

PCUS	HGVS



All Flows in PCUs

Project:	Land at North West Bicester	Title:	OBSERVED 2022 FLOWS (WEDNESDAY 2ND FEB)	Date: 15/07/2022
Client:	Firethorn Trust		AM AND PM PEAK FLOWS	Diagram: C

VELOCITY Transport Planning
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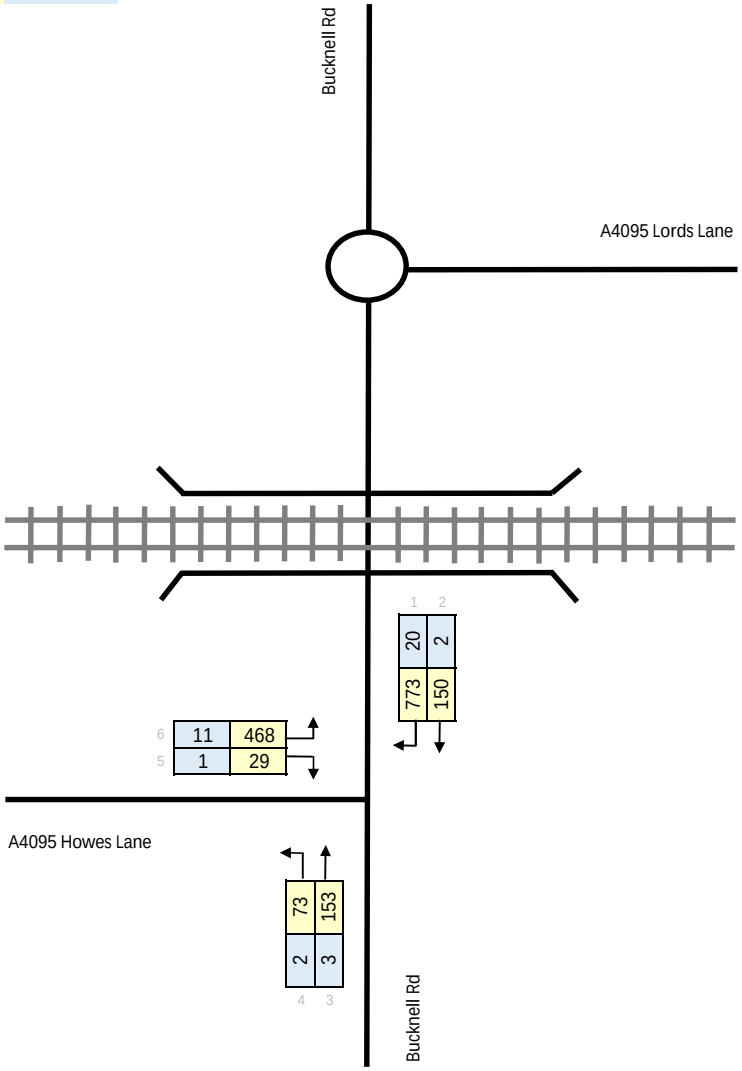
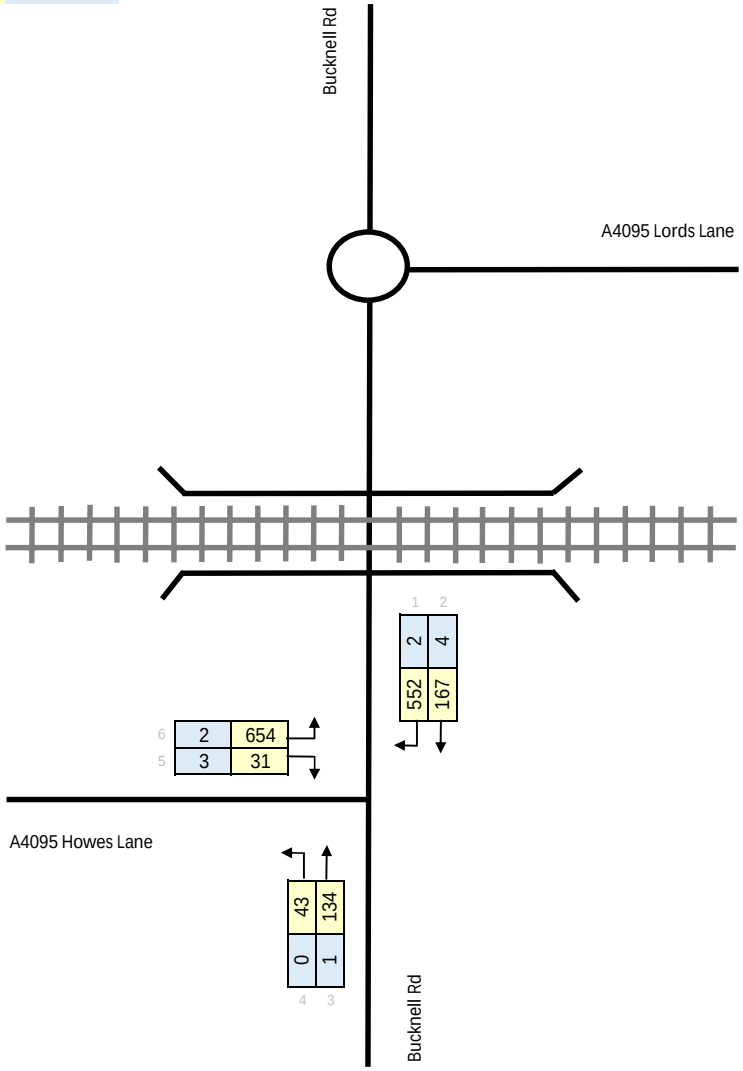
AM PEAK

PCUS	HGVS



PM PEAK

PCUS	HGVS



All Flows in PCUs

Project:	Land at North West Bicester	Title:	OBSERVED 2022 FLOWS (TUESDAY 5TH JULY)	Date: 15/07/2022
Client:	Firethorn Trust		AM AND PM PEAK FLOWS	Diagram: D

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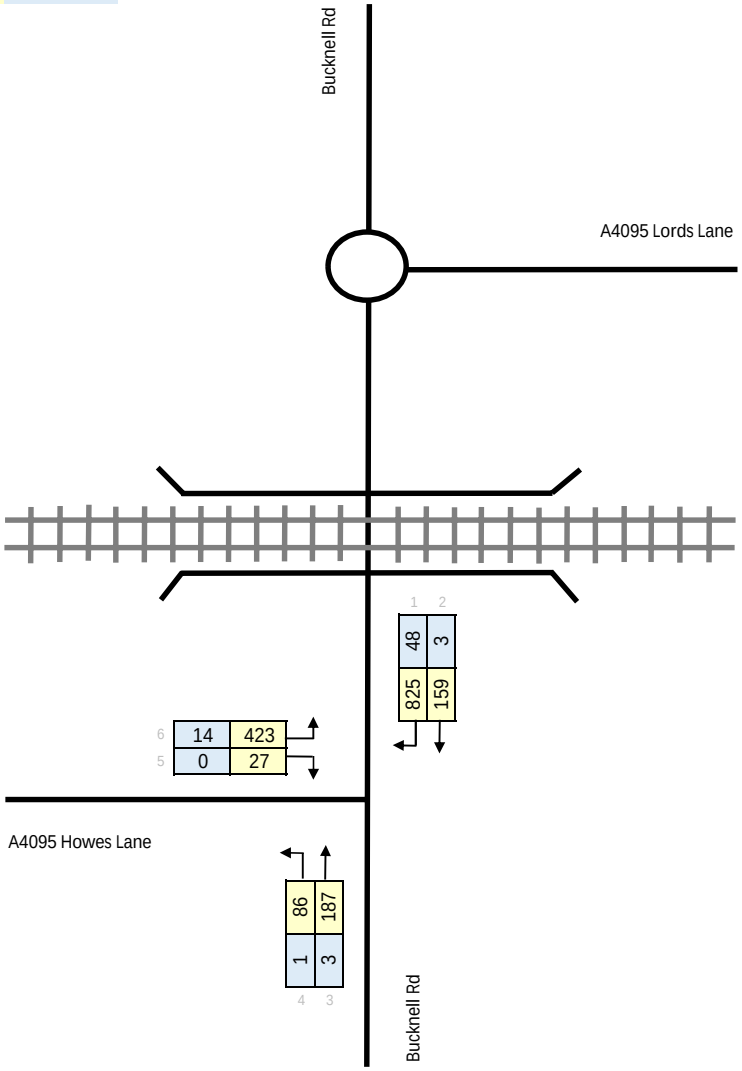
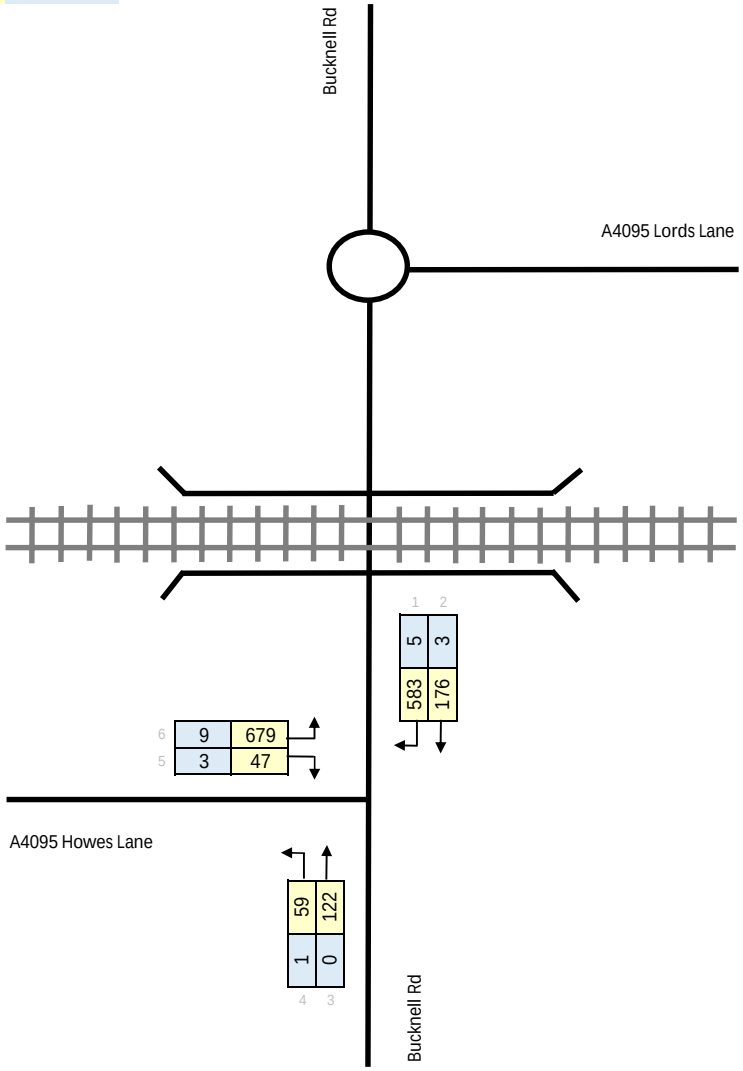
AM PEAK

PCUS	HGVS



PM PEAK

PCUS	HGVS



All Flows in PCUs

Project:	Land at North West Bicester	Title:	OBSERVED 2022 FLOWS (WEDNESDAY 6TH JULY)	Date: 15/07/2022
Client:	Firethorn Trust		AM AND PM PEAK FLOWS	Diagram: E

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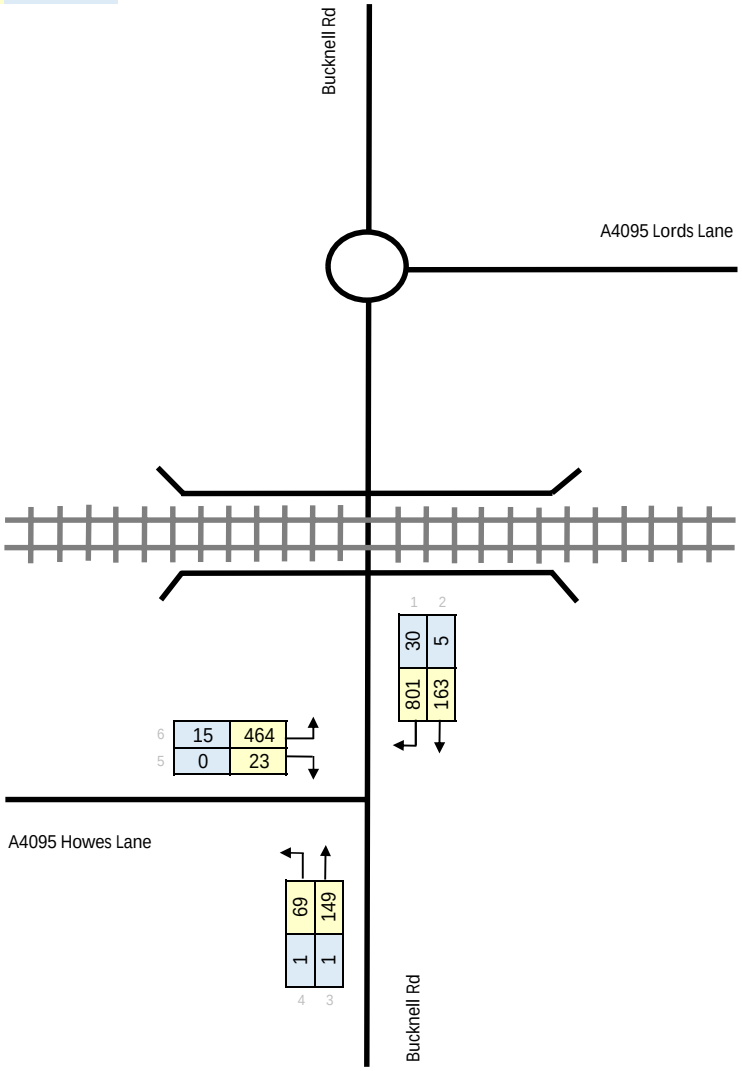
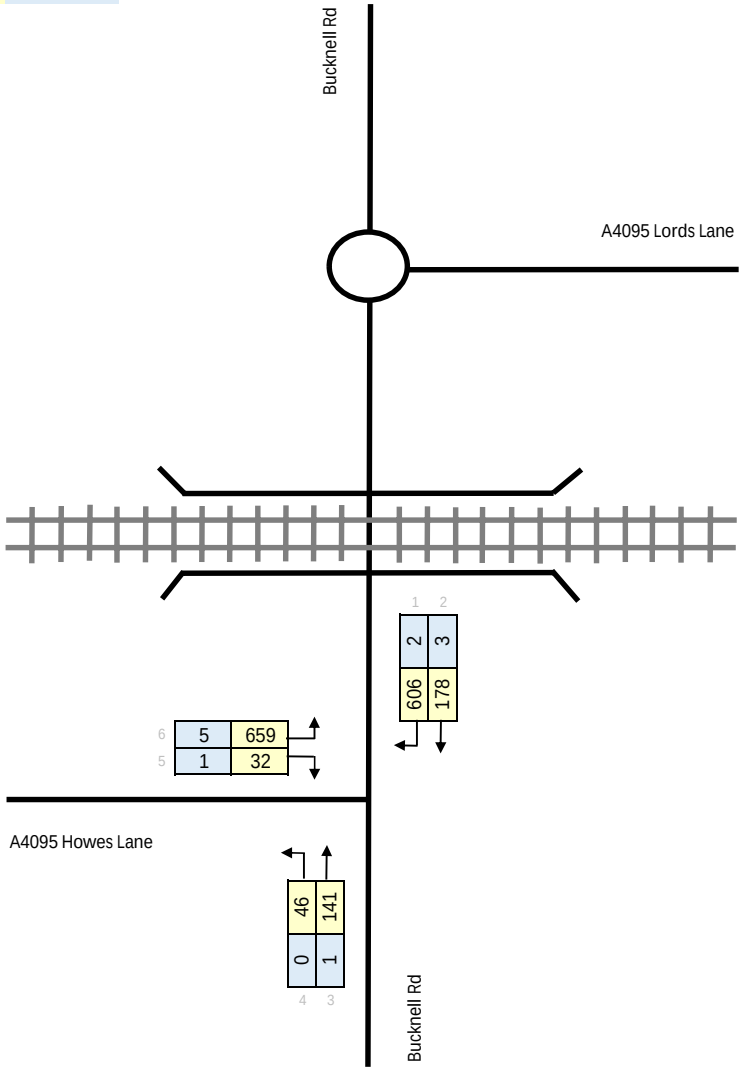
AM PEAK

PCUS	HGVS



PM PEAK

PCUS	HGVS



All Flows in PCUs

Project:	Land at North West Bicester	Title:	OBSERVED 2022 FLOWS (THURSDAY 7TH JULY)	Date: 15/07/2022
Client:	Firethorn Trust		AM AND PM PEAK FLOWS	Diagram: F

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ATTACHMENT E

EXISTING PRIORITY JUNCTION MODELLING (CALIBRATED)

Junctions 10

PICADY 10 - Priority Intersection Module

Version: 10.0.3.1598

For sales and distribution information, program advice and maintenance, contact TRL Software:
+44 (0)1344 379777 software@trl.co.uk trlsoftware.com

Filename: 2022.07.14 - NW BICESTER - HOWES LANE (Existing CALIBRATED).j10
Path: P:\Firethorn Trust_4600\1100 - NW Bicester\Analysis\Modelling\Picady\BTM 2026 FLOWS
Report generation date: 14/07/2022 18:09:34

»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	7.8	51.93	0.90	F	191.29	D2	114.1	611.79	1.30	F	281.18
Stream B-A		0.1	35.93	0.12	E			0.1	30.94	0.10	D	
Stream C-AB		86.8	413.00	1.21	F			53.0	181.20	1.08	F	
	BTM 2026 + Proposed Dev											
Stream B-C	D3	30.6	218.37	1.12	F	442.86	D4	197.4	1020.25	1.46	F	505.16
Stream B-A		1.7	528.78	0.97	F			0.2	47.21	0.15	E	
Stream C-AB		174.0	831.88	1.38	F			89.9	346.38	1.17	F	
	OBS 2022											
Stream B-C	D5	2.5	19.65	0.70	C	260.68	D6	35.1	161.92	1.06	F	81.82
Stream B-A		0.3	41.86	0.24	E			0.2	15.47	0.17	C	
Stream C-AB		101.9	480.37	1.23	F			5.9	29.13	0.83	D	

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 14/07/2022 18:16:40 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\CRicci
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		191.29	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	191.29	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

Generated on 14/07/2022 18:16:40 using Junctions 10 (10.0.3.1598)

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		✓	787	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	526
	C	155	632	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	0.90	51.93	7.8	F
B-A	0.12	35.93	0.1	E
C-AB	1.21	413.00	86.8	F
C-A				
A-B				
A-C				

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	694	0.570	390	1.4	12.804	B
B-A	10	322	0.030	10	0.0	12.667	B
C-AB	546	713	0.765	531	3.7	20.670	C
C-A	47			47			
A-B	131			131			
A-C	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	676	0.699	469	2.4	18.745	C
B-A	12	263	0.045	12	0.1	15.779	C
C-AB	692	735	0.942	665	10.6	47.865	E
C-A	15			15			
A-B	156			156			
A-C	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	648	0.893	563	6.5	40.052	E
B-A	14	178	0.080	14	0.1	24.167	C
C-AB	867	719	1.206	711	49.5	166.152	F
C-A	0			0			
A-B	192			192			
A-C	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	642	0.902	574	7.8	51.931	F
B-A	14	124	0.115	14	0.1	35.933	E
C-AB	867	719	1.206	717	86.8	350.932	F
C-A	0			0			
A-B	192			192			
A-C	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	670	0.706	493	2.8	24.428	C
B-A	12	148	0.079	12	0.1	29.207	D
C-AB	692	735	0.942	736	75.9	412.998	F
C-A	15			15			
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	396	691	0.573	401	1.5	13.884	B
B-A	10	216	0.045	10	0.1	19.250	C
C-AB	546	713	0.765	728	30.4	291.532	F
C-A	47			47			
A-B	131			131			
A-C	223			223			

Generated on 14/07/2022 18:16:40 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		281.18	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	281.18	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		✓	891	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	751
	C	335	556	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	1.30	611.79	114.1	F
B-A	0.10	30.94	0.1	D
C-AB	1.08	181.20	53.0	F
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	25.951	D
B-A	10	315	0.031	10	0.0	12.975	B
C-AB	540	793	0.681	528	2.8	14.660	B
C-A	131			131			
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	667	1.011	633	15.0	71.899	F
B-A	12	255	0.046	12	0.1	16.260	C
C-AB	716	852	0.840	700	6.7	25.798	D
C-A	85			85			
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	638	1.296	635	62.9	236.148	F
B-A	14	173	0.083	14	0.1	24.872	C
C-AB	981	908	1.080	878	32.4	88.850	F
C-A	0			0			
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	635	1.303	634	111.0	496.768	F
B-A	14	142	0.101	14	0.1	30.938	D
C-AB	981	908	1.080	899	53.0	181.202	F
C-A	0			0			
A-B	196			196			
A-C	359			359			

Generated on 14/07/2022 18:16:40 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	665	1.016	663	114.1	611.794	F
B-A	12	194	0.060	12	0.1	21.790	C
C-AB	716	852	0.840	869	14.7	169.715	F
C-A	85			85			
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	85.4	529.301	F
B-A	10	296	0.033	10	0.0	13.862	B
C-AB	540	793	0.681	585	3.3	23.510	C
C-A	131			131			
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		442.86	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	442.86	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		✓	577	100.000
C		✓	878	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	564
	C	155	723	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 14/07/2022 18:16:40 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	1.12	218.37	30.6	F
B-A	0.97	528.78	1.7	F
C-AB	1.38	831.88	174.0	F
C-A				
A-B				
A-C				

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	425	694	0.612	418	1.7	14.039	B
B-A	10	295	0.033	10	0.0	13.846	B
C-AB	635	725	0.875	608	6.6	30.325	D
C-A	26			26			
A-B	131			131			
A-C	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	507	675	0.751	502	3.0	22.139	C
B-A	12	227	0.052	12	0.1	18.418	C
C-AB	789	732	1.078	711	26.3	98.185	F
C-A	0			0			
A-B	156			156			
A-C	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	621	641	0.968	590	10.7	57.429	F
B-A	14	117	0.123	14	0.1	38.374	E
C-AB	967	701	1.379	699	93.1	319.402	F
C-A	0			0			
A-B	192			192			
A-C	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	621	555	1.119	546	29.3	152.988	F
B-A	14	23	0.620	11	1.0	290.027	F
C-AB	967	701	1.379	701	159.7	646.715	F
C-A	0			0			
A-B	192			192			
A-C	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	507	513	0.989	502	30.6	218.373	F
B-A	12	12	0.971	9	1.7	528.778	F
C-AB	789	732	1.078	732	174.0	831.878	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	425	643	0.661	538	2.4	66.624	F
B-A	10	51	0.190	16	0.3	121.113	F
C-AB	635	725	0.875	729	150.5	816.101	F
C-A	26			26			
A-B	131			131			
A-C	223			223			

Generated on 14/07/2022 18:16:40 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		505.16	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	505.16	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		✓	847	100.000
C		✓	938	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	834
	C	335	603	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	1.46	1020.25	197.4	F
B-A	0.15	47.21	0.2	E
C-AB	1.17	346.38	89.9	F
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	628	687	0.914	598	7.4	37.070	E
B-A	10	301	0.033	10	0.0	13.586	B
C-AB	595	806	0.738	581	3.7	17.015	C
C-A	111			111			
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	750	667	1.124	655	31.1	124.316	F
B-A	12	238	0.049	12	0.1	17.521	C
C-AB	794	872	0.911	768	10.3	36.264	E
C-A	49			49			
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	918	636	1.445	635	101.9	391.345	F
B-A	14	148	0.096	14	0.1	29.422	D
C-AB	1033	882	1.171	868	51.4	138.331	F
C-A	0			0			
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	918	627	1.465	627	174.8	785.074	F
B-A	14	98	0.147	14	0.2	47.212	E
C-AB	1033	882	1.171	879	89.9	298.996	F
C-A	0			0			
A-B	196			196			
A-C	359			359			

TRL THE FUTURE OF TRANSPORT
Generated on 14/07/2022 18:16:40 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	750	659	1.137	659	197.4	1020.251	F
B-A	12	131	0.089	12	0.1	33.451	D
C-AB	794	872	0.911	876	69.4	346.383	F
C-A	49			49			
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	628	684	0.918	680	184.3	1010.200	F
B-A	10	212	0.046	10	0.1	19.611	C
C-AB	595	806	0.738	844	7.2	207.540	F
C-A	111			111			
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		260.68	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	260.68	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		✓	273	100.000
B		✓	450	100.000
C		✓	846	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	86	187
	B	27	0	423
	C	136	710	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 14/07/2022 18:16:40 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	0.70	19.65	2.5	C
B-A	0.24	41.86	0.3	E
C-AB	1.23	480.37	101.9	F
C-A				
A-B				
A-C				

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	318	721	0.442	315	0.9	9.682	A
B-A	20	331	0.061	20	0.1	12.713	B
C-AB	602	747	0.807	585	4.5	22.843	C
C-A	34			34			
A-B	65			65			
A-C	141			141			

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	380	706	0.539	379	1.3	12.040	B
B-A	24	272	0.089	24	0.1	15.956	C
C-AB	756	772	0.980	718	13.8	57.180	F
C-A	5			5			
A-B	77			77			
A-C	168			168			

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	466	680	0.685	462	2.3	17.788	C
B-A	30	186	0.160	29	0.2	25.156	D
C-AB	931	758	1.228	753	58.4	186.070	F
C-A	0			0			
A-B	95			95			
A-C	206			206			

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	466	665	0.700	465	2.5	19.651	C
B-A	30	123	0.241	29	0.3	41.855	E
C-AB	931	758	1.228	757	101.9	389.200	F
C-A	0			0			
A-B	95			95			
A-C	206			206			

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	380	688	0.553	384	1.4	13.230	B
B-A	24	134	0.181	25	0.3	36.189	E
C-AB	756	772	0.980	765	99.6	480.369	F
C-A	5			5			
A-B	77			77			
A-C	168			168			

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	318	711	0.448	320	0.9	10.182	B
B-A	20	190	0.107	21	0.1	23.511	C
C-AB	602	747	0.807	755	61.5	404.580	F
C-A	34			34			
A-B	65			65			
A-C	141			141			

TRL THE FUTURE OF TRANSPORT
Generated on 14/07/2022 18:16:40 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		81.82	F

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	81.82	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)
D6	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		✓	181	100.000
B		✓	726	100.000
C		✓	652	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	59	122
	B	47	0	679
	C	151	501	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	1.06	161.92	35.1	F
B-A	0.17	15.47	0.2	C
C-AB	0.83	29.13	5.9	D
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	511	732	0.698	502	2.4	16.541	C
B-A	35	406	0.087	35	0.1	10.660	B
C-AB	414	748	0.553	408	1.4	11.504	B
C-A	77			77			
A-B	44			44			
A-C	92			92			

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	610	721	0.847	600	5.0	30.246	D
B-A	42	366	0.115	42	0.1	12.227	B
C-AB	513	768	0.668	509	2.4	15.195	C
C-A	73			73			
A-B	53			53			
A-C	110			110			

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	748	703	1.064	680	21.9	88.646	F
B-A	52	312	0.166	51	0.2	15.186	C
C-AB	668	805	0.830	656	5.5	25.651	D
C-A	50			50			
A-B	65			65			
A-C	134			134			

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	748	702	1.064	695	35.1	161.924	F
B-A	52	308	0.168	52	0.2	15.468	C
C-AB	668	805	0.830	666	5.9	29.126	D
C-A	50			50			
A-B	65			65			
A-C	134			134			

TRL THE FUTURE OF TRANSPORT
Generated on 14/07/2022 18:16:40 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	610	720	0.848	698	13.1	131.226	F
B-A	42	360	0.117	43	0.1	12.498	B
C-AB	513	768	0.668	526	2.7	17.321	C
C-A	73			73			
A-B	53			53			
A-C	110			110			

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	511	732	0.698	553	2.7	26.418	D
B-A	35	402	0.088	36	0.1	10.807	B
C-AB	414	748	0.553	418	1.5	12.218	B
C-A	77			77			
A-B	44			44			
A-C	92			92			

ATTACHMENT F

PROPOSED MINI-ROUNDABOUT JUNCTION MODELLING (CALIBRATED)

Junctions 10

ARCADY 10 - Roundabout Module

Filename: 2022.05.19 - NW BICESTER - HOWES LANE (Mini RBt Mitigation) - CALIBRATED 530 unit.j10
Path: P:\Firethorn Trust_4600\1100 - NW Bicester\Analysis\Modelling\Picady\BTM 2026 FLOWS
Report generation date: 23/05/2022 11:19:38

»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	3.9	28.53	0.79	D	44.04	D2	3.3	22.10	0.76	C	161.04
Arm B		3.5	22.06	0.77	C			55.4	221.47	1.12	F	
Arm C		15.7	68.34	0.97	F			54.7	187.83	1.09	F	
	BTM 2026 + Proposed Development											
Arm A	D3	4.9	35.98	0.83	E	98.28	D4	3.5	23.63	0.77	C	302.10
Arm B		4.8	28.69	0.83	D			103.3	462.28	1.24	F	
Arm C		51.0	177.08	1.09	F			80.4	307.10	1.15	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	VTP\CRicci
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

Generated on 23/05/2022 11:19:49 using Junctions 10 (10.0.3.1598)

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	44.04	E

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		44.04	E

Arms

Arms

Arm	Name	Description
A	Bucknell Road S	
B	Howes Lane	
C	Bucknell Road N	

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	6.9	12.80	11.60	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 23/05/2022 11:19:49 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		✓	787	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	526
	C	155	632	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	0.79	28.53	3.9	D
B	0.77	22.06	3.5	C
C	0.97	68.34	15.7	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	469	786	0.450	350	0.9	9.016	A
B	406	221	835	0.486	402	1.0	9.050	A
C	592	10	898	0.660	584	2.0	12.324	B

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	563	728	0.580	420	1.5	12.770	B
B	485	265	808	0.600	482	1.6	12.066	B
C	707	12	897	0.789	701	3.8	19.505	C

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	669	662	0.782	509	3.5	24.713	C
B	593	321	773	0.768	587	3.3	20.485	C
C	867	14	895	0.968	833	12.2	47.208	E

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	685	652	0.794	516	3.9	28.532	D
B	593	325	771	0.770	593	3.5	22.060	C
C	867	14	895	0.968	853	15.7	68.345	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	604	702	0.602	431	1.7	15.036	C
B	485	272	804	0.603	492	1.7	12.961	B
C	707	12	897	0.789	752	4.6	32.851	D

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	483	777	0.455	357	0.9	9.493	A
B	406	225	833	0.487	408	1.1	9.391	A
C	592	10	898	0.660	602	2.2	13.778	B

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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	161.04	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		161.04	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		✓	891	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	751
	C	335	556	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	0.76	22.10	3.3	C
B	1.12	221.47	55.4	F
C	1.09	187.83	54.7	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	411	822	0.461	376	0.9	8.798	A
B	575	243	821	0.700	565	2.4	14.957	B
C	671	10	898	0.747	659	3.0	15.835	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	490	773	0.586	451	1.5	12.192	B
B	687	292	791	0.868	673	5.8	30.495	D
C	801	11	897	0.893	785	7.0	31.500	D

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	549	737	0.753	549	3.1	20.398	C
B	841	355	752	1.119	737	31.8	108.335	F
C	981	13	896	1.095	879	32.4	95.842	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	557	732	0.758	554	3.3	22.096	C
B	841	358	750	1.122	747	55.4	221.470	F
C	981	13	896	1.095	892	54.7	187.829	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	548	737	0.615	459	1.8	14.520	B
B	687	297	788	0.872	773	33.9	210.509	F
C	801	13	896	0.894	878	35.4	187.203	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	498	768	0.494	382	1.1	10.335	B
B	575	247	819	0.702	699	2.9	57.843	F
C	671	12	897	0.748	797	3.7	64.156	F

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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	98.28	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		98.28	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		✓	579	100.000
C		✓	883	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	296
	B	13	0	566
	C	155	728	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	0.83	35.98	4.9	E
B	0.83	28.69	4.8	D
C	1.09	177.08	51.0	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	538	743	0.476	350	1.0	9.978	A
B	436	220	836	0.522	431	1.2	9.686	A
C	665	10	898	0.740	653	2.9	15.505	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	642	678	0.623	419	1.7	15.116	C
B	521	264	808	0.644	518	1.9	13.479	B
C	794	12	897	0.885	779	6.6	30.225	D

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	723	628	0.824	507	4.3	30.369	D
B	637	319	774	0.824	627	4.4	25.374	D
C	972	14	895	1.086	877	30.5	91.503	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	734	621	0.833	515	4.9	35.983	E
B	637	325	771	0.827	636	4.8	28.688	D
C	972	14	895	1.086	890	51.0	177.076	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	724	628	0.673	432	2.4	21.176	C
B	521	272	803	0.648	531	2.1	15.094	C
C	794	12	897	0.885	878	30.1	169.431	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	636	682	0.519	359	1.2	12.398	B
B	436	226	832	0.524	439	1.2	10.170	B
C	665	10	898	0.740	771	3.5	48.763	E

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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	302.10	F

Junction Network

Driving side	Lighting	Road surface	In London	Network delay (s)	Network LOS
Left	Normal/unknown	Normal/unknown		302.10	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		✓	847	100.000
C		✓	938	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	178	326
	B	13	0	834
	C	335	603	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	0.77	23.63	3.5	C
B	1.24	462.28	103.3	F
C	1.15	307.10	80.4	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	445	801	0.473	376	1.0	9.218	A
B	638	243	822	0.776	624	3.5	18.899	C
C	706	10	898	0.786	691	3.7	18.066	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	526	751	0.604	450	1.6	13.080	B
B	761	291	791	0.962	731	11.2	49.365	E
C	843	11	897	0.940	818	9.9	40.827	E

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	571	723	0.768	548	3.3	21.855	C
B	933	355	752	1.240	748	57.4	179.900	F
C	1033	11	897	1.151	888	46.1	127.764	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	575	720	0.771	554	3.5	23.634	C
B	933	358	750	1.244	749	103.3	391.083	F
C	1033	11	897	1.151	895	80.4	264.922	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	569	724	0.626	459	1.9	15.295	C
B	761	297	788	0.967	780	98.8	462.275	F
C	843	12	897	0.940	885	70.1	307.098	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	567	725	0.523	382	1.2	11.639	B
B	638	247	819	0.779	810	55.7	345.705	F
C	706	12	896	0.788	882	26.0	200.501	F

VELOCITY
Transport Planning