Technical Note

Project: Land South of Banbury Rise, Banbury (Ref: 22/02101/OUT)

Subject: OCC Highways Modelling Response Note

Client:	Bloor Homes	**Version:**	A
Project No:	06104	**Author:**	KN
Date:	20/10/2022	**Approved:**	KN

1 Introduction

1.1 Overview

1.1.1 PJA was appointed to provide transport support in relation to an "*outline planning application for a residential development comprising up to 250 dwellings (with up to 30% affordable housing), public open space, landscaping and associated supporting infrastructure. Means of vehicular access to be determined via Edinburgh Way, with additional pedestrian and cycle connections via Dover Avenue and Balmoral Avenue. Emergency access provision also via Balmoral Avenue. All other matters reserved*".

1.1.2 A Transport Assessment, Transport Assessment Addendum Report (covering junction modelling) and Travel Plan were prepared on the basis of parameters agreed with OCC Highways officers during scoping discussions and submitted to support the planning application.

1.1.3 Following the review of the submitted information, a formal response was issued by OCC Highways officers. This set out some points which OCC required further clarification on in order to respond positively to the application from a transport and highways perspective.

1.1.4 This Technical Note sets out additional information and clarification around the points raised regarding the assessment of traffic impacts. In particular the OCC response specified that:

The TA has not provided a satisfactory assessment of the development impact on the network in two ways.

1) There are two possible accesses from the site which the application has only assessed one; and

2) Future year assessments fail to include the entire trips from the consented Banbury Rise development.

Such omissions mean that it is not possible to robustly assess development impact on the network in accordance with paragraphs 109 and 111 of the NPPF.

2 Treatment of Committed Development

2.1.1 The OCC Highways response specified that:

"Banbury Rise development was granted planning permission for 480 residential dwellings. Although currently the development is partially occupied, I fail to see where the entire traffic flows from the original TA have been accounted for in this assessment – contrary to para 3.3.3 of the Technical Note supporting the application. The Banbury Rise TA which originally was based on 400 residential dwellings presented (Table 4.3) a total trip generation of 66 and 189 AM peak hour arrivals and departures respectively. The PM peak hour in turn was forecasted to generate 184 and 110 vehicular arrival and departures respectively. Through a subsequent reserved matters application, the development was scaled up by an additional 80 dwellings. This account of trips has not been included."

Interrogation of the traffic flow diagrams and the demand input in the model future years only shows a small percentage of the full extent of these trips. As such, without this information, I am not in a position to conclude that a satisfactory assessment has been undertaken.

2.1.2 At the time of undertaking the traffic surveys on which the submitted impact assessment was based, 371 of the consented 480 dwellings were occupied. As such account was taken of the additional 109 dwellings which are consented but not occupied at the time of the traffic surveys.

2.1.3 To determine the number of trips generated by 109 dwellings, the trip generation set out in the Banbury Rise Transport Assessment was pro-rated by a factor of 0.23 (109/480) and this resulting trip generation assigned to the network in the proportions determined in the original TA. The comment made by OCC is however noted and since the original TA trip generation was for 400 dwellings, the calculation should pro-rate the original Transport Assessment trip generation by a factor of 0.27 (109/400).

2.1.4 This calculation would produce committed development traffic flows for the consented but not yet occupied element of Banbury Rise that are 20% higher than those used in the assessment. This is a relatively modest discrepancy and it is not agreed that only a "*small percentage of the full extent of these trips*" has been accounted for.

2.1.5 It is also worth considering this in the context of the originally adopted trip rates compared to those adopted in the more recent assessment. A summary is provided in Table 1.

Table 1: Trip Rate Comparison

Peak Hour	Original Transport Assessment – Banbury Rise			Recent Transport Assessment – Land South of Banbury Rise		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM	0.149	0.459	0.608	0.135	0.365	0.500
PM	0.440	0.255	0.695	0.346	0.161	0.507

2.1.6 The previously adopted trip rates (and used in the assessment of the consented but not yet occupied element of Banbury Rise) are 22% and 38% higher than the trip rates adopted for the assessment of Land South of Banbury Rise in the AM and PM peak hours respectively. The more recent trip rates provide a more realistic assessment of the likely travel demand of the development based on recent surveys included within the TRICS database.

2.1.7 Therefore, whilst the trip generation calculation using the pro-rated method set out above underestimated the likely traffic generation of the consented but not yet occupied Banbury Rise development based on historically used trip rates, when comparing this to a more realistic travel demand for the development, it is deemed that this would balance out. As such, the allowance made for the consented but not yet occupied element of the Banbury Rise development in the modelling is deemed appropriate and the previously established conclusions still apply.

3 Site Access Assessment

3.1 Background

3.1.1 The methodology for distributing and assigning development traffic and the resulting geographic scope of the modelling was agreed in advance with OCC Highways officers.

3.1.2 This included a lesser usage of the northern of the two vehicular access points (i.e. greater use of the Bretch Hill/George Parish Road junction than the Bailey Road/Edinburgh Way junction) for the following reasons:

- Due to the position of the Land South of Banbury Rise parcel in relation to the vehicular access points; and
- The distribution adopted which forecasts a greater pull towards the east and south.

3.1.3 It was on this basis, that it was not deemed necessary to undertake modelling of the northern access point, and this was agreed with OCC.

3.1.4 The comments made by OCC Highways in their formal response are however noted and modelling has been undertaken of the George Parish Road/Bretch Hill junction. This has been

modelled for the 2028 Base + Committed Development + Proposed Development scenario for the following access utilisation scenarios, as requested by OCC Highways:

- 50%/50% George Parish Road/Bailey Road.
- 30%/70% George Parish Road/Bailey Road.
- 90%/10% George Parish Road/Bailey Road.

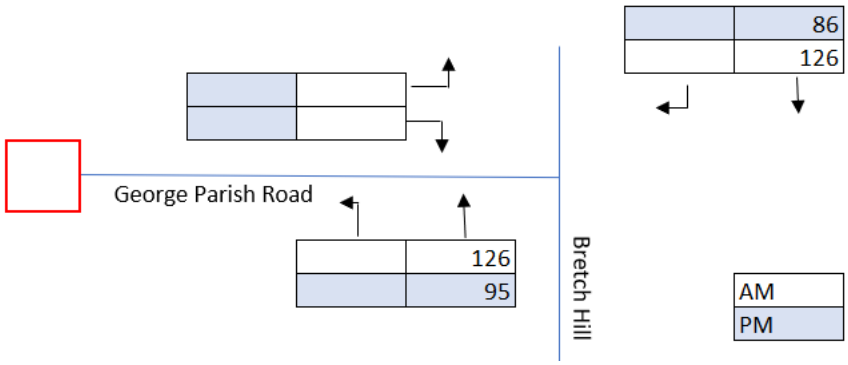
3.2 Assessment Flows

Background Flows

3.2.1 Background traffic flows on Bretch Hill have been taken from a nearby automatic traffic count undertaken on 28th June 2022 (at the time of the classified turning counts which informed the wider modelling already presented).

3.2.2 The 2022 surveyed flows recorded on Bretch Hill have been uplifted to 2028 levels using the previously agreed TEMPro factors. A summary of the future year baseline flows is provided in Figure 1.

Figure 1: 2028 Base Traffic Flows – Bretch Hill

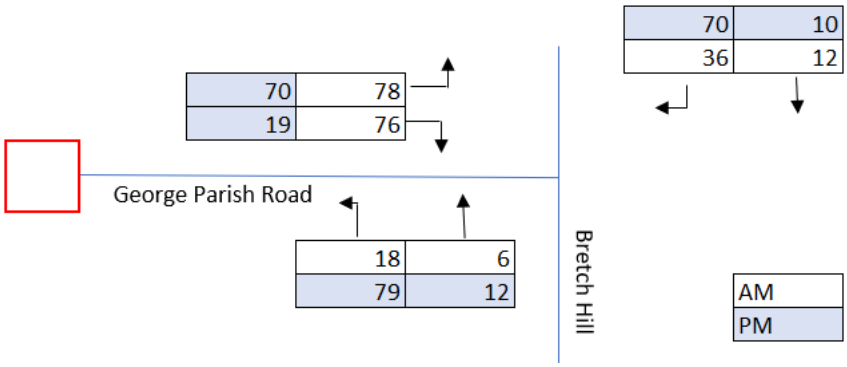


3.2.3 In terms of accounting for consented Banbury Rise traffic at the junction, the following has been carried out and set out in Figure 2:

- In the absence of a turning count, the turning movements into and out of the Banbury Rise development have been estimated from the original TA forecasts of utilisation of this junction and uplifted to account for 480 dwellings (as opposed to 400 dwellings assessed in the original TA). This is robust since the previously adopted trip rates have been demonstrated to be high.

- In terms of the flows through the junction, the background flows calculated from an ATC on Bretch Hill would already include the traffic generated by the 371 occupied dwellings at the Banbury Rise development. To account for the consented but not yet implemented Banbury Rise element (109 dwellings), the through movements have been uplifted by pro-rating the Banbury Rise flows in the original Transport Assessment by a factor of 0.27 (109/400) to account for any residual trips. Again, for the reasons explained above, this provides a robust estimate of the residual Banbury Rise development traffic.

Figure 2: Consented Banbury Rise Development Traffic (480 dwellings)



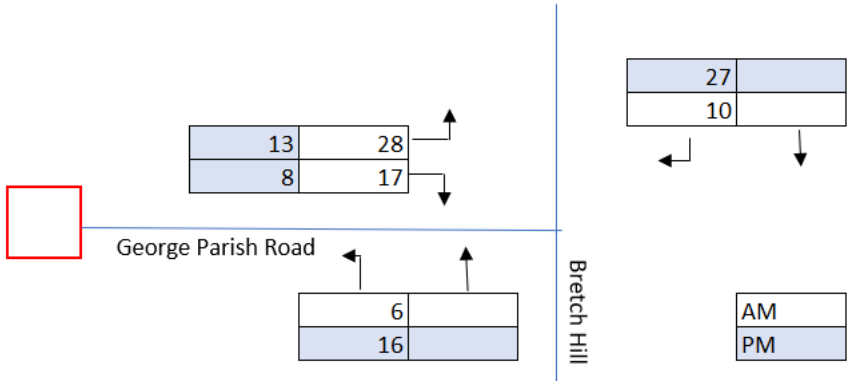
Proposed Development Flows (250 dwellings)

3.2.4 The revised assignment of the proposed development traffic to account for the different access usage scenarios has been based on the overall distribution of trips at the edge of the network assessed and the most logical alternative routes to these points from the corresponding access points. This has been considered using Google traffic to replicate typical journey times during the peak hours to determine an appropriate left/right in and out split. Where two routes have a similar journey time these have been split proportionally based on the journey time according to Google traffic.

Scenario 1 – 50%/50% Split

3.2.5 The assignment of proposed development traffic at the George Parish Road/Bretch Hill junction assuming a 50%/50% split of traffic across the two access points is shown below.

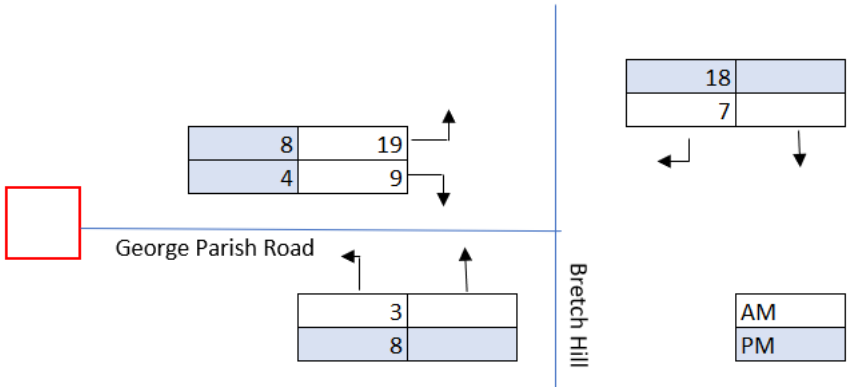
Figure 3: Proposed Development Trip Assignment - 50%/50% Access Usage



Scenario 2 – 30%/70% Split

3.2.6 The assignment of proposed development traffic at the George Parish Road/Bretch Hill junction assuming a 30%/70% split of traffic across the northern and southern access points, respectively, is shown below.

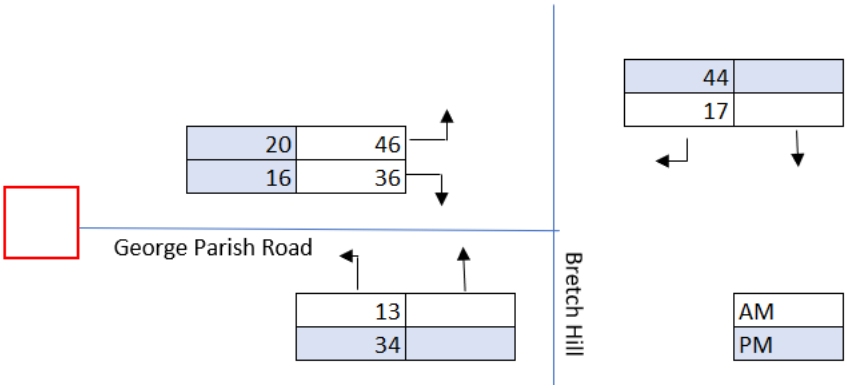
Figure 4: Proposed Development Trip Assignment - 30%/70% Access Usage



Scenario 3 – 90%/10% Split

3.2.7 The assignment of proposed development traffic at the George Parish Road/Bretch Hill junction assuming a 90%/10% split of traffic across the northern and southern access points, respectively, is shown below.

Figure 5: Proposed Development Trip Assignment - 90%/10% Access Usage



3.3 Modelling Results

3.3.1 The junction has been modelled in the PICADY module of Junctions 10 with geometries taken from mapping of the junction.

3.3.2 The corresponding junction operation for the above access usage scenarios is summarised in Table 2 with full outputs provided in Appendix A.

Table 2: George Parish Road/Bretch Hill – Junction Capacity Assessment Results – 2028 Base + Committed Development + Proposed Development

Arm	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Max. RFC	Queue (PCU)	Delay (s)	Max. RFC	Queue (PCU)	Delay (s)
2022 Base + Committed + Dev (50% Sensitivity)						
George Parish Road Left/Right	0.45	1	13	0.23	0	9
Bretch Hill Southbound	0.09	0	7	0.19	0	8
2022 Base + Committed + Dev (30% Sensitivity)						
George Parish Road Left/Right	0.40	1	12	0.21	0	9
Bretch Hill Southbound	0.08	0	7	0.17	0	7
2022 Base + Committed + Dev (90% Sensitivity)						
George Parish Road Left/Right	0.53	1	16	0.27	0	10
Bretch Hill Southbound	0.10	0	7	0.22	0	8

3.3.3 The George Parish Road/Bretch Hill junction is forecast to operate well within acceptable capacity thresholds for all potential access usage scenarios considered with minimal queues and delays. This has demonstrated that the existing vehicular access points have sufficient resilience to accommodate the projected usage and the sensitivity scenarios considered.

4 Summary

4.1.1 There is a small discrepancy in the allowance made in the modelling presented in the Transport Assessment Addendum for the consented but not yet occupied element of Banbury Rise. It has however been demonstrated that the trip rates utilised previously would overestimate the traffic generated by the development and so this would balance out. As such, the allowance made for consented but not yet occupied Banbury Rise development traffic is deemed appropriate and the conclusions on highway impacts set out in the Transport Assessment Addendum still hold.

4.1.2 The approach to assessing highway impacts was agreed with OCC Highways during scoping discussions. Further clarification and testing has been requested around the potential operation of the northern of the two existing vehicular points (George Parish Road/Bretch Hill). This additional modelling has been set out which demonstrates under a variety of access usage scenarios, the junction is forecast to continue to operate well within acceptable capacity thresholds.

Appendix A Modelling Outputs

Junctions 10

PICADY 10 - Priority Intersection Module

Filename: 06104-GeorgeParishAccess.j10
Path: C:\PJA\OneDrive - Phil Jones Associates\Oct 22 Modelling - SharedData
Report generation date: 20/10/2022 10:18:02

»2022 Base + Committed + Dev (30% Sensitivity), AM
»2022 Base + Committed + Dev (30% Sensitivity), PM
»2022 Base + Committed + Dev (50% Sensitivity), AM
»2022 Base + Committed + Dev (50% Sensitivity), PM
»2022 Base + Committed + Dev (90% Sensitivity), AM
»2022 Base + Committed + Dev (90% Sensitivity), PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2022 Base + Committed + Dev (30% Sensitivity)									
Stream B-AC	D1	0.7	12.24	0.40	B	D2	0.3	8.53	0.21	A
Stream C-AB		0.1	6.62	0.08	A		0.2	7.37	0.17	A
	2022 Base + Committed + Dev (50% Sensitivity)									
Stream B-AC	D3	0.8	13.19	0.45	B	D4	0.3	8.84	0.23	A
Stream C-AB		0.1	6.66	0.09	A		0.2	7.53	0.19	A
	2022 Base + Committed + Dev (90% Sensitivity)									
Stream B-AC	D5	1.1	15.73	0.53	C	D6	0.4	9.51	0.27	A
Stream C-AB		0.1	6.76	0.10	A		0.3	7.88	0.22	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

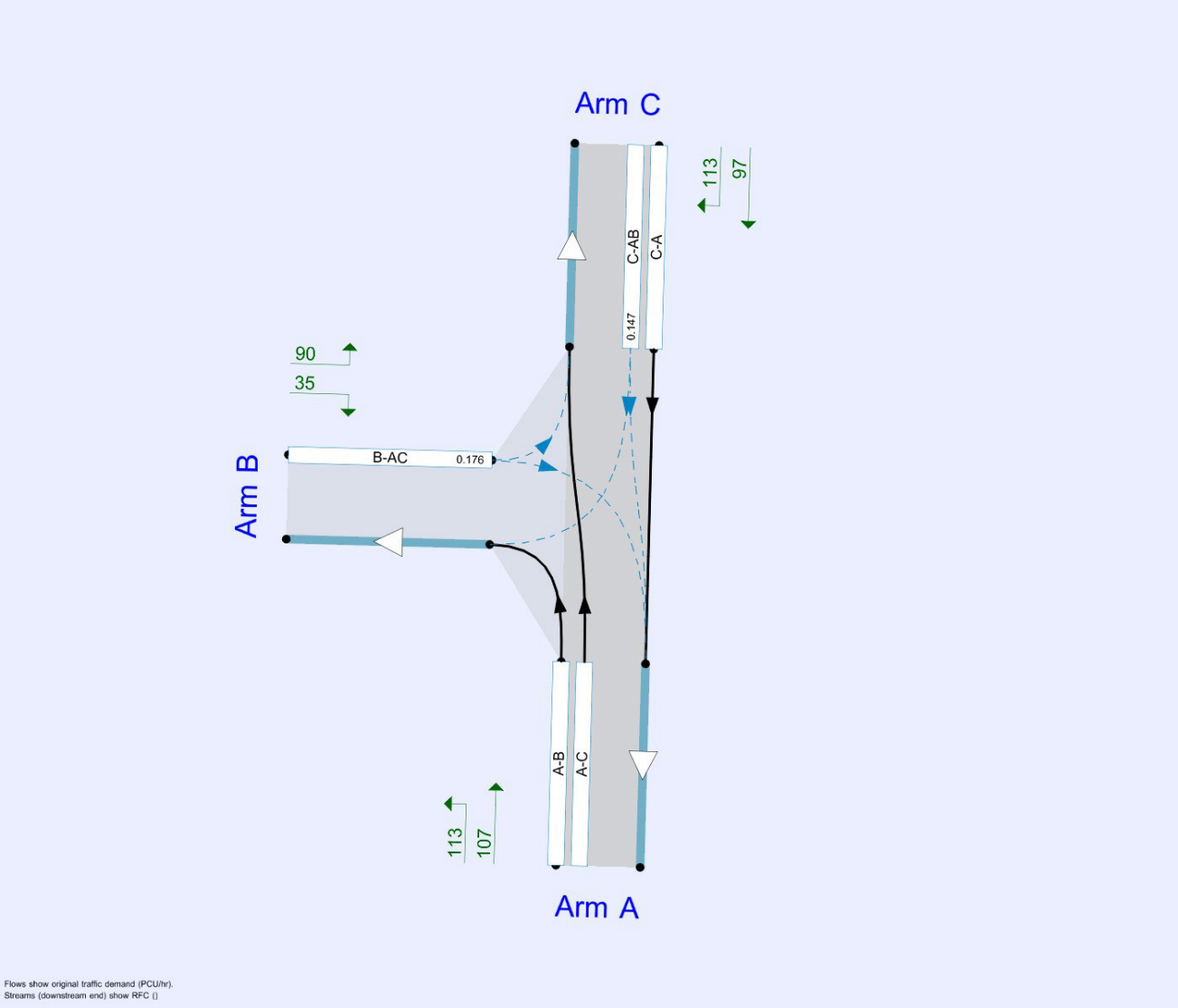
File summary

File Description

Title	
Location	
Site number	
Date	18/10/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PJA\Matthew Wykes
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



The junction diagram reflects the last run of Junctions.

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	2022 Base + Committed + Dev (30% Sensitivity)	AM	ONE HOUR	07:45	09:15	15
D2	2022 Base + Committed + Dev (30% Sensitivity)	PM	ONE HOUR	16:45	18:15	15
D3	2022 Base + Committed + Dev (50% Sensitivity)	AM	ONE HOUR	07:45	09:15	15
D4	2022 Base + Committed + Dev (50% Sensitivity)	PM	ONE HOUR	16:45	18:15	15
D5	2022 Base + Committed + Dev (90% Sensitivity)	AM	ONE HOUR	07:45	09:15	15
D6	2022 Base + Committed + Dev (90% Sensitivity)	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2022 Base + Committed + Dev (30% Sensitivity), 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		4.86	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.86	A

Arms

Arms

Arm	Name	Description	Arm type
A	Bretch Hill (south)		Major
B	Site Access		Minor
C	Bretch Hill (north)		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	7.50			75.0	✓	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 (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.80	20	17

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	483	0.082	0.208	0.131	0.297
B-C	622	0.089	0.225	-	-
C-B	617	0.224	0.224	-	-

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	2022 Base + Committed + Dev (30% Sensitivity)	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		✓	153	100.000
B		✓	181	100.000
C		✓	181	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	21	132
	B	84	0	97
	C	138	43	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.40	12.24	0.7	B
C-AB	0.08	6.62	0.1	A
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-AC	136	511	0.267	135	0.4	9.534	A
C-AB	33	597	0.055	32	0.1	6.371	A
C-A	104			104			
A-B	16			16			
A-C	99			99			

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-AC	163	504	0.323	162	0.5	10.532	B
C-AB	39	595	0.066	39	0.1	6.480	A
C-A	124			124			
A-B	19			19			
A-C	119			119			

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-AC	199	493	0.404	199	0.7	12.176	B
C-AB	48	592	0.082	48	0.1	6.622	A
C-A	151			151			
A-B	23			23			
A-C	145			145			

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-AC	199	493	0.404	199	0.7	12.239	B
C-AB	48	592	0.082	48	0.1	6.622	A
C-A	151			151			
A-B	23			23			
A-C	145			145			

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-AC	163	504	0.323	163	0.5	10.606	B
C-AB	39	595	0.066	39	0.1	6.484	A
C-A	124			124			
A-B	19			19			
A-C	119			119			

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-AC	136	511	0.267	137	0.4	9.632	A
C-AB	33	597	0.055	33	0.1	6.377	A
C-A	104			104			
A-B	16			16			
A-C	99			99			

2022 Base + Committed + Dev (30% Sensitivity), 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		3.16	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.16	A

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	2022 Base + Committed + Dev (30% Sensitivity)	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		✓	195	100.000
B		✓	101	100.000
C		✓	184	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	88	107
	B	23	0	78
	C	97	87	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.21	8.53	0.3	A
C-AB	0.17	7.37	0.2	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	76	550	0.138	75	0.2	7.583	A
C-AB	66	593	0.112	66	0.1	6.828	A
C-A	72			72			
A-B	66			66			
A-C	81			81			

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-AC	91	543	0.167	91	0.2	7.959	A
C-AB	80	590	0.135	80	0.2	7.052	A
C-A	86			86			
A-B	79			79			
A-C	96			96			

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-AC	111	533	0.208	111	0.3	8.516	A
C-AB	99	587	0.168	99	0.2	7.365	A
C-A	104			104			
A-B	97			97			
A-C	118			118			

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-AC	111	533	0.209	111	0.3	8.527	A
C-AB	99	587	0.168	99	0.2	7.371	A
C-A	104			104			
A-B	97			97			
A-C	118			118			

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-AC	91	543	0.167	91	0.2	7.974	A
C-AB	80	590	0.135	80	0.2	7.060	A
C-A	86			86			
A-B	79			79			
A-C	96			96			

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-AC	76	550	0.138	76	0.2	7.610	A
C-AB	66	593	0.112	67	0.1	6.845	A
C-A	72			72			
A-B	66			66			
A-C	81			81			

2022 Base + Committed + Dev (50% Sensitivity), 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		5.45	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.45	A

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	2022 Base + Committed + Dev (50% Sensitivity)	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		✓	156	100.000
B		✓	199	100.000
C		✓	184	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	24	132
	B	93	0	106
	C	138	46	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.45	13.19	0.8	B
C-AB	0.09	6.66	0.1	A
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-AC	150	510	0.294	148	0.4	9.909	A
C-AB	35	597	0.059	35	0.1	6.398	A
C-A	104			104			
A-B	18			18			
A-C	99			99			

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-AC	179	502	0.356	178	0.5	11.092	B
C-AB	42	595	0.071	42	0.1	6.513	A
C-A	123			123			
A-B	22			22			
A-C	119			119			

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-AC	219	492	0.445	218	0.8	13.104	B
C-AB	52	592	0.087	52	0.1	6.662	A
C-A	151			151			
A-B	26			26			
A-C	145			145			

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-AC	219	492	0.445	219	0.8	13.192	B
C-AB	52	592	0.087	52	0.1	6.663	A
C-A	151			151			
A-B	26			26			
A-C	145			145			

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-AC	179	502	0.356	180	0.6	11.194	B
C-AB	42	595	0.071	42	0.1	6.517	A
C-A	123			123			
A-B	22			22			
A-C	119			119			

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-AC	150	510	0.294	150	0.4	10.032	B
C-AB	35	597	0.059	35	0.1	6.404	A
C-A	104			104			
A-B	18			18			
A-C	99			99			

2022 Base + Committed + Dev (50% Sensitivity), 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		3.38	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.38	A

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	2022 Base + Committed + Dev (50% Sensitivity)	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		✓	203	100.000
B		✓	109	100.000
C		✓	193	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	96	107
	B	27	0	82
	C	97	96	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.23	8.84	0.3	A
C-AB	0.19	7.53	0.2	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	82	544	0.151	81	0.2	7.763	A
C-AB	73	592	0.124	73	0.1	6.923	A
C-A	72			72			
A-B	72			72			
A-C	81			81			

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-AC	98	537	0.182	98	0.2	8.190	A
C-AB	88	590	0.150	88	0.2	7.176	A
C-A	85			85			
A-B	86			86			
A-C	96			96			

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-AC	120	527	0.228	120	0.3	8.830	A
C-AB	109	587	0.186	109	0.2	7.525	A
C-A	103			103			
A-B	106			106			
A-C	118			118			

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-AC	120	527	0.228	120	0.3	8.842	A
C-AB	109	587	0.186	109	0.2	7.535	A
C-A	103			103			
A-B	106			106			
A-C	118			118			

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-AC	98	537	0.182	98	0.2	8.207	A
C-AB	88	590	0.150	88	0.2	7.185	A
C-A	85			85			
A-B	86			86			
A-C	96			96			

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-AC	82	544	0.151	82	0.2	7.793	A
C-AB	73	592	0.124	74	0.1	6.944	A
C-A	72			72			
A-B	72			72			
A-C	81			81			

2022 Base + Committed + Dev (90% Sensitivity), 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		6.91	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.91	A

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	2022 Base + Committed + Dev (90% Sensitivity)	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		✓	163	100.000
B		✓	236	100.000
C		✓	191	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	31	132
	B	112	0	124
	C	138	53	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.53	15.73	1.1	C
C-AB	0.10	6.76	0.1	A
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-AC	178	507	0.350	176	0.5	10.787	B
C-AB	40	597	0.068	40	0.1	6.463	A
C-A	103			103			
A-B	23			23			
A-C	99			99			

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-AC	212	499	0.425	211	0.7	12.464	B
C-AB	48	595	0.082	48	0.1	6.591	A
C-A	123			123			
A-B	28			28			
A-C	119			119			

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-AC	260	488	0.532	258	1.1	15.538	C
C-AB	60	593	0.101	60	0.1	6.760	A
C-A	150			150			
A-B	34			34			
A-C	145			145			

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-AC	260	488	0.532	260	1.1	15.730	C
C-AB	60	593	0.101	60	0.1	6.760	A
C-A	150			150			
A-B	34			34			
A-C	145			145			

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-AC	212	499	0.425	214	0.8	12.664	B
C-AB	48	595	0.081	49	0.1	6.596	A
C-A	123			123			
A-B	28			28			
A-C	119			119			

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-AC	178	507	0.350	179	0.5	10.979	B
C-AB	40	597	0.068	40	0.1	6.472	A
C-A	103			103			
A-B	23			23			
A-C	99			99			

2022 Base + Committed + Dev (90% Sensitivity), 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		3.80	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.80	A

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	2022 Base + Committed + Dev (90% Sensitivity)	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		✓	220	100.000
B		✓	125	100.000
C		✓	210	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	113	107
	B	35	0	90
	C	97	113	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.27	9.51	0.4	A
C-AB	0.22	7.88	0.3	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	94	535	0.176	93	0.2	8.127	A
C-AB	87	591	0.147	86	0.2	7.119	A
C-A	71			71			
A-B	85			85			
A-C	81			81			

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-AC	112	527	0.213	112	0.3	8.668	A
C-AB	104	589	0.177	104	0.2	7.429	A
C-A	84			84			
A-B	102			102			
A-C	96			96			

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-AC	138	516	0.267	137	0.4	9.494	A
C-AB	130	587	0.221	129	0.3	7.866	A
C-A	102			102			
A-B	124			124			
A-C	118			118			

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-AC	138	516	0.267	138	0.4	9.514	A
C-AB	130	587	0.221	130	0.3	7.876	A
C-A	102			102			
A-B	124			124			
A-C	118			118			

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-AC	112	527	0.213	113	0.3	8.692	A
C-AB	104	589	0.177	105	0.2	7.441	A
C-A	84			84			
A-B	102			102			
A-C	96			96			

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-AC	94	535	0.176	94	0.2	8.170	A
C-AB	87	591	0.147	87	0.2	7.141	A
C-A	71			71			
A-B	85			85			
A-C	81			81			