Land off Balmoral Avenue, Banbury

Transport Statement

Rev A

DTA

Transport Planning Consultants

Land off Balmoral Avenue, Banbury

Transport Statement

12th October 2021
DN/NS/23158-01a Transport Statement

Prepared by:

David Tucker Associates
Forester House, Doctors Lane
Henley-in-Arden
Warwickshire
B95 5AW

Tel: 01564 793598
Fax: 01564 793983
inmail@dtatransportation.co.uk
www.dtatransportation.co.uk

Prepared For:

Lone Star Land

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1.0 INTRODUCTION

1.1 DTA Transportation have been commissioned by Lone Star Land to assess the traffic and transport implications of an outline application for a residential development of 49 dwellings, public open space, and other infrastructure on land off Balmoral Avenue, Banbury. The site layout plan is attached at **Appendix A**.

1.2 A residential development (20/01643/OUT) for 49 dwellings on land to the east of the site was granted outline planning permission at appeal on 1st June 2021.

1.3 Whilst Oxfordshire County Council as Local Highway Authority raised no objections to the development, Cherwell District Council's planning committee resolved to refuse planning permission with reason for refusal stating:

1. By virtue of the increased vehicular movements onto Broughton Road, the proposed development would cause harm to the safety of the local highway network. The proposal is therefore contrary to Policy SLE4 and ESD15 of the Cherwell Local Plan 2011-2031 Part 1 and Government guidance contained with National Planning Policy Framework.

1.4 Prior to the inquiry starting the Council changed their position and did not present any evidence to support their reasons for refusal. The inspector considered third part representations made to the appeal and in their decision notice stated:

8. All matters mentioned by local residents have been taken into account but they do not, either individually or collectively, alter the conclusion that the proposed development would not cause any significant harm to any matters of acknowledged importance.

1.5 This statement sets out that this further development served from Balmoral Avenue would also not lead to any detriment to highway safety.

1.6 This Transport Statement (TS) has been prepared in accordance with the National Planning Policy Framework (NPPF) July 2021. The NPPF document states that all developments that generate significant amounts of movements should be supported by a Transport Statement or Transport Assessment. This TS includes the following headings:

Chapter 2:	Existing Conditions
Chapter 3:	Development Proposals
Chapter 4:	Traffic Generation and Distribution
Chapter 5:	Traffic Impacts
Chapter 6:	Summary and Conclusions

1.7 The site is in an accessible location and within easy walking distance of a range of amenities and facilities, including local convenience store, post offices, schools, retail shops, doctor's surgeries, and dental practice. It is located with close proximity to a good frequency bus services and the strategic road network.

1.8 A review of personal injury collision data has been undertaken which confirms that there are no significant existing road safety issues that would be affected by traffic from the development proposals.

1.9 It is proposed that the site be served from the Land to the east of the site, onto Balmoral Avenue.

1.10 Overall, the proposed development provides suitable and safe access for all road users.

2.0 EXISTING CONDITIONS

2.1 Site Location

2.1.1 The development site is located in the Bretch Hill area of Banbury, approximately 2km to the south-west of the town centre. It is bound by Bretch Hill reservoir to the east, Balmoral Avenue and residential properties to the north and south, and agricultural land to the west. The location of the site is shown on **Figure 1**.

2.2 Local Highway Network

2.2.1 The development site will be served from Balmoral Avenue, an existing cul-de-sac with three spur roads of Denbigh Close, Dorchester Grove and Briggs Close. There are 69 residential properties in total. Balmoral Avenue is around 5.5m wide with 1.8m wide footways, and subject to a 30mph speed limit.

2.2.2 Balmoral Avenue connects onto Broughton Road via a priority junction arrangement. Broughton Road is a single lane carriageway and subject to a 30mph in the vicinity of Balmoral Avenue. It increases to 50mph approximately 100m to the west of Balmoral Avenue. Footway provision is provided on both sides of the carriageway.

2.2.3 Broughton Road connects onto the Woodgreen Avenue/ Queensway roundabout. Woodgreen Avenue routes in a north-south direction and is subject to a 30mph speed limit. The Avenue provides connections onto The Fairway/ Orchard Way/ Hilton Road roundabout.

2.2.4 Queensway routes in an east-west direction and is subject to a 30mph speed limit. Queensway provides connections onto the A361 Bloxham Road.

2.3 Existing Traffic Flows

2.3.1 An automatic traffic count (ATC) was undertaken on Broughton Road from Saturday 8th December to Friday 14th December 2018 as part of the Land to the East of the site planning application. A copy of the results is attached at **Appendix B**. The five-day average vehicle flows are summarised in **Table 1** and the average speeds and 85th percentile speeds are summarised in **Table 2**.

Table 1 – 5 Day Average Vehicle Flows for Broughton Road

	Eastbound	Westbound	Total
Weekday AM Peak (0800-0900)	545	381	926
Weekday PM Peak (1700-1800)	265	398	663
AADT	4,068	3,892	7,960

Table 2 – Average Speed Summary for Broughton Road

	Eastbound	Westbound
Average Speeds	32.3mph	34.7mph
85th Percentile Speeds	40.1mph	34.7mph

2.3.2 In addition to the ATC, a manual classified count was also undertaken at the Broughton Road/ Balmoral Road junction on Tuesday 11th December 2018. A copy of the results is attached at **Appendix B**.

2.3.3 An ATC was undertaken on Broughton Road from 15th to 21st June 2021. The survey was undertaken following an easing of restrictions during the Covid-19 pandemic. A copy of the results is attached at **Appendix B** and the five-day average vehicle flows is summarised in **Table 3** below.

Table 3 – 5 Day Average Vehicle Flows for Broughton Road

	Eastbound	Westbound	Total
Weekday AM Peak (0800-0900)	416	334	750
Weekday PM Peak (1700-1800)	263	319	582
AADT	3,573	3,561	7,134

2.3.4 As shown in **Table 3** the recorded vehicle flows are lower during the morning and evening peak, and also daily flows when compared against the 2018 ATC. The difference in flows is 19% in the morning peak and 12% in the evening peak.

2.3.5 In addition to the above, a manual classified turning count was undertaken at the Broughton Road/ Queensway/ Woodgreen Avenue roundabout on Tuesday 15th June 2021. A copy of the data is attached at **Appendix B**.

2.4 Personal Injury Collision Data

2.4.1 Personal Injury Collision (PIC) data has been provided by Oxfordshire County Council for the last available five-year period from 01/01/2013 to 31/07/2018. A copy of the data is attached at **Appendix C**.

2.4.2 A review of the data has indicated there were five recorded collisions within the study area of Balmoral Avenue and Broughton Road. The five collisions were recorded as slight in severity.

2.4.3 There was no recorded collision on Balmoral Avenue or at the junction with Broughton Road.

2.4.4 The five collisions were recorded at the Broughton Road/ Queensway roundabout. The collisions were recorded as:

- Car travelling northeast on Broughton Road collided with pedestrian on pedestrian crossing.
- Car travelling southwest on Broughton Road approaching roundabout and collided with pedestrian travelling on crossing.
- Car overtook parked vehicle and hit hand of pedestrian stood to the offside.
- Car failed to see/ give way to motorcyclist and collision occurred; and
- Pedestrian crossed in front of car and car moved off not seeing the pedestrian and collision occurred.

2.4.5 An update to the PIC data has been reviewed on www.crashmap.co.uk from 2018 to 2020. The review shows there were two collisions on the Broughton Road/ Queensway roundabout. One collision was recorded as serious and the other slight. The serious collision occurred in 2018 and involved two vehicles and two casualties. The slight collision occurred in 2018 and involved one vehicle and one casualty. Importantly, there have been no increases in collisions at the Balmoral Avenue junction.

2.5 Pedestrian and Cycle Access

2.5.1 Footway provision is provided on both sides of carriageway on Balmoral Avenue north and south of the site. The footway provision connects onto Bretch Hill to the north and Broughton Road to the south. Further connections will be provided through the land to the east.

2.5.2 There are no dedicated cycle routes along Broughton Road.

2.5.3 Public rights of way (route 120/24) extends along the northern boundary of the site routing in an east-west direction. It connects onto Bretch Hill to the east and to route 31/51 to the west.

2.6 Public Transport Provision

Bus

2.6.1 The nearest bus stops to the site are located on Bretch Hill approximately 250m north of the site and Broughton Road approximately 500m southeast of the site. A summary of the bus service frequency is detailed in **Table 4** below.

Table 4 – Bus Service Frequency

Bus Number	Bus Route	Frequency		
		Monday to Friday	Saturday	Sunday
6	Stratford-upon-Avon – Banbury	6 services	5 services	No services
50A	Stratford-upon-Avon – Banbury	7 services	9 services	No services
B7B	Bridge Street – Poets Corner	4 services	No services	No services

*Bus Service information correct as of September 2021

Rail

2.6.2 The nearest railway station is Banbury located approximately 2.3km to the east of the site. The station has car parking for 978 spaces with 14 accessible spaces, 63 cycle parking spaces, ticket office and machines, customer help points, refreshment facilities, toilets, waiting rooms, and step free access. The services and frequencies from the station are summarised in **Table 5** below.

Table 5 – Rail Services and Frequencies

Destination	Approx. Journey Time (minutes)	Approx. Frequency		
		Mon-Fri	Saturday	Sunday
Birmingham Snow Hill	52 minutes	20 minutes	20-30 minutes	20-30 minutes
London Marylebone	57 minutes	20 minutes	20-30 minutes	20-30 minutes
Southampton Central	1hr 48 minutes	30-60 minutes	30-60 minutes	60 minutes
Manchester Piccadilly	2hr 30 minutes	30 minutes	30 minutes	60 minutes

2.7 Local Amenities and Facilities

2.7.1 It is generally considered that for distances under 2km, walking offers the greatest potential to replace short car trips. For distances under 5km, cycling has the potential to substitute for short car trips.

2.7.2 Accessibility by foot to local amenities was determined by measuring the distances from the centre of the development site to the local amenity and then calculating the time it would take to walk that distance using an average walk speed of 1.4m/s. A similar approach was taken with regard to cycle accessibility, using an average cycle speed of 4.2m/s.

Education

2.7.3 The nearest primary school to the site is St Joseph's Roman Catholic Primary School located approximately 600m to the north of the site. This equates to a 7-minute walk time and a 2-minute cycle time.

2.7.4 Queensway primary school located approximately 700m from the site. This equates to an 8-minute walk time or 2-minute cycle time.

2.7.5 Banbury Academy is located approximately 1.5km to the southeast of the site. This equates to an 18-minute walk time or 6-minute cycle time.

2.7.6 The Blessed George Napier Catholic secondary school is located approximately 1.7km to the southeast of the site. This equates to a 20-minute walk time or 6-minute cycle time.

Employment

2.7.7 Accessibility to a range of employment opportunities locally and by different modes is important to ensure residents can fulfil their potential without an unduly high intensity of car travel. This will be dependent on the distribution of employment areas within the region and the structure of the transport system.

2.7.8 The site is located within the geographical middle super output area (MSOA) of Cherwell 005. The modal split for this area is summarised in **Table 6** below.

Table 6 – Modal Split – Cherwell 005

Mode of Transport	Percentage
Train	1.7%
Bus	6.4%
Taxi	1.7%
Motorcycle	1.4%
Car Driver	58.3%
Car Passenger	8.7%
Cycle	3.9%
Walking	17.5%

2.7.9 The 2011 Census journey to work data suggests that 72% of residents within the MSOA work within the Cherwell area.

Retail

2.7.10 Banbury town centre approximately 2km providing many amenities and facilities including Castle Quay shopping centre. The nearest supermarket to the site is Sainsbury's and Morrison's located approximately 2km to the east of the site.

2.7.11 Tesco, Aldi and the Co-op are located to the north of Banbury approximately 3km from the site.

Healthcare

2.7.12 Windrush and West Bar doctor's surgeries are located approximately 1km to the north-east of the site. This equates to a 12-minute walk time or 4 cycle time. Horton General Hospital is located approximately 2km to the southeast of the site.

3.0 DEVELOPMENT PROPOSALS

3.1 Proposals

3.1.1 The proposed development comprises of up to 49 residential dwellings.

3.2 Site Access and Layout

3.2.1 Access into the site will be taken from Balmoral Avenue as a continuation from the land to the east of the site. The access into the site will provide a minimum 5.5m wide carriageway with a 2.0m wide footway on one side of the carriageway and service margin where footways are not provided.

3.2.2 Whilst the internal layout is illustrative, **Drawing 23158-04-1** shows the internal site layout and the associated vehicle tracking for a large refuse vehicle. **Drawing 23158-04-2** shows key visibility splays based on the requirements of MfS2.

3.3 Pedestrian and Cycle Access

3.3.1 The site will be designed to facilitate foot and cycle movements along desire lines through the development, linking to the external access points. This will include the provision of the following where appropriate in line with the DfT's MfS and MfS2:

- A good level of street and path lighting
- On-site roads will be designed to 20mph
- Tactile and coloured surfacing

3.3.2 A footway connection will be provided to the north of the site into the existing public right of way and a footway will connect into the land east of the site residential development.

3.3.3 Cycle parking will be provided within the confines of a garage/ shed, or alternatively provided in secure, well lit, covered cycle storage facilities.

3.4 Car Parking

3.4.1 Car parking will be provided in accordance with OCC's Standards for New Developments.

4.0 TRAFFIC GENERATION AND DISTRIBUTION

4.1 Traffic Generation

4.1.1 DTA produced the previous Transport Statement that was submitted in support of planning application 20/01643/OUT for 49 dwellings on land to the east of the site. The trip rates and resulting traffic generation was agreed with OCC highways.

4.1.2 The trip rates were based on a site-specific rate calculated using a manual classified turning count undertaken at the Broughton Road/ Balmoral Avenue junction. The trip rates derived from the turning count, and the resulting traffic generation for 49 dwellings is summarised in **Table 7** and **Table 8**.

Table 7 – Calculated Trip Rates

Time Period	Arrival	Departure	Two-Way
07:00-08:00	0.101	0.406	0.507
08:00-09:00	**0.159**	**0.478**	**0.638**
09:00-10:00	0.116	0.217	0.333
16:00-17:00	0.420	0.232	0.652
17:00-18:00	**0.377**	**0.203**	**0.580**
18:00-19:00	0.449	0.290	0.739

Table 8 – Trip Generation – 47 dwellings

Time Period	Arrival	Departure	Two-Way
07:00-08:00	5	20	25
08:00-09:00	**8**	**23**	**31**
09:00-10:00	6	11	16
16:00-17:00	21	11	32
17:00-18:00	**18**	**10**	**28**
18:00-19:00	22	14	36

4.1.3 It can be seen in **Table 8** that the development is predicted to generate 31 trips during the AM peak and 28 trips during the PM peak.

4.2 Traffic Distribution and Assignment

4.2.1 The distribution and assignment for the land to the east of the site was previously agreed with OCC highways. Therefore, the same approach has been applied for this site. The traffic has been distributed to the following routes set out in **Table 9**.

Table 9 – Traffic Distribution

Road	Percentage	Trips AM Peak	Trips PM Peak
Broughton Road East	92%	29	26
Broughton Road West	8%	3	2
Queensway	17%	5	5
Woodgreen Avenue	47%	15	13
Broughton Road (towards Banbury town centre)	28%	9	8

4.2.2 The manual classified turning count undertaken for the Broughton Road/ Balmoral Avenue junction also confirms, taking the average of the morning and evening peak outbound trips, that 93% of trips route Broughton Road East and 7% route Broughton Road West.

5.0 TRAFFIC IMPACT

5.1 Junction Assessments

5.1.1 The following junction capacity assessments have been undertaken:

- Broughton Road/ Balmoral Avenue.
- Broughton Road/ Queensway/ Woodgreen Avenue.

5.1.2 The above junctions were assessed under the following scenarios:

- 2021 Baseline.
- 2026 Future Year without development.
- 2026 Future Year with development.

5.1.3 The traffic generation for the Land East of the Site has been included within the 2021 reference case flows.

5.2 Growth Factors

5.2.1 The Broughton Road/ Balmoral Road has been modelled using traffic count data undertaken in 2018 with growth factors applied for a 2021 base year and 2026 future year.

5.2.2 The Broughton Road/ Queensway/ Woodgreen Avenue junction has been modelled using traffic count data undertaken in 2021 with growth factors applied for a future year of 2026. As set out in Section 2.3 an ATC was undertaken on Broughton Road in December 2018 and June 2021. The data shows the vehicular flows were higher in 2018 than 2021 and this likely due to the Covid-19 pandemic. The difference in the morning flows is 19% and 12% in the evening. The traffic count for the Broughton Road/ Queensway/ Woodgreen Avenue junction was undertaken in June 2021 and therefore, a 19% uplift in vehicle flows has been applied to the junction for the morning peak and 12% to the evening peak.

5.2.3 Local TEMPRO growth factors have been used for Cherwell 005 (urban, principal road). The resulting factors are shown in **Table 10**.

Table 10 – TEMPRO Growth Factors

Year	AM Peak	PM Peak
2018-2021	1.0727	1.0798
2021-2026	1.0663	1.0721

Broughton Road/ Balmoral Avenue

5.2.4 This junction has been modelled in the Picady module of Junctions 10. The results are presented in **Table 11** and the outputs are attached at **Appendix D**.

Table 11 – Balmoral Avenue/ Broughton Road Junction Modelling Results

	AM			PM		
	Q (Veh)	Delay (s)	RFC	Q (Veh)	Delay (s)	RFC
	2021 Base					
Stream B-AC	0.2	9.39	0.14	0.1	7.01	0.05
Stream C-AB	0.1	4.97	0.06	0.3	4.68	0.11
	2026 Base					
Stream B-AC	0.2	9.76	0.16	0.1	7.10	0.06
Stream C-AB	0.1	4.93	0.06	0.3	4.65	0.13
	2026 Base + Dev					
Stream B-AC	0.3	10.53	0.21	0.1	7.30	0.08
Stream C-AB	0.2	5.00	0.09	0.4	4.79	0.17

Arm A: Broughton Road West, Arm B: Balmoral Avenue, Arm C: Broughton Road East

5.2.5 It can be seen in **Table 11** that the junction is forecast to operate well within capacity on all arms in the future year of 2026. With the addition of the development traffic the junction will continue to operate within capacity.

Broughton Road/ Queensway/ Woodgreen Avenue Roundabout

5.2.6 This junction has been modelled in the Arcady module of Junctions 10. The results are presented in **Table 12** and the outputs are attached at **Appendix E**.

Table 12 – Broughton Road/ Queensway/ Woodgreen Avenue Modelling Results

	AM			PM		
	Q (Veh)	Delay (s)	RFC	Q (Veh)	Delay (s)	RFC
	2021 Base					
1 - Broughton Road (NE)	3.4	20.40	0.78	0.7	6.83	0.43
2 - Queensway	3.2	12.91	0.77	2.2	8.67	0.69
3 - Broughton Road (SW)	0.4	5.64	0.29	0.8	6.79	0.45
4 - Woodgreen Avenue	8.5	24.78	0.91	2.7	9.34	0.73
	2026 Base					
1 - Broughton Road (NE)	5.7	32.80	0.87	0.9	7.69	0.48
2 - Queensway	4.7	18.38	0.83	3.0	11.00	0.76
3 - Broughton Road (SW)	0.5	6.22	0.32	1.0	7.94	0.50
4 - Woodgreen Avenue	18.1	48.66	0.97	3.6	11.99	0.79
	2026 Base + Development					
1 - Broughton Road (NE)	5.9	33.99	0.87	0.9	7.87	0.48
2 - Queensway	4.8	18.74	0.84	3.2	11.41	0.76
3 - Broughton Road (SW)	0.5	6.45	0.35	1.0	8.14	0.51
4 - Woodgreen Avenue	19.5	51.99	0.98	3.8	12.45	0.80

5.2.7 The results indicate that the junction is operating within capacity during the morning and evening peaks in the 2021 base scenario. The junction is operating with higher queuing and delay in the morning peak than the evening peak.

5.2.8 An intercept adjustment has been applied to the Broughton Road (NE) and Woodgreen Avenue arms to validate against the recorded queue length survey.

5.2.9 In the 2026 forecast year, the junction will continue to operate with increased queuing and delay on all arms during the morning and evening peaks. The junction is operating at its theoretical capacity on the Woodgreen Avenue arm during the morning peak.

5.2.10 With the addition of the development traffic, there is no material change in the operation of the junction with minimal increases in queuing and delay on all arms. The highest increase in queuing during the morning peak is on the Woodgreen Avenue arm where queuing increases by 1.4 vehicles.

6.0 SUMMARY AND CONCLUSIONS

6.1 This Transport Statement has reviewed the highways and transport implications of providing 49 residential dwellings on land off Balmoral Avenue, Banbury.

6.2 The proposed site is located in a location close to amenities and facilities within the Bretch Hill area of Banbury. The local roads running through the area have footway provision and provide access to bus services.

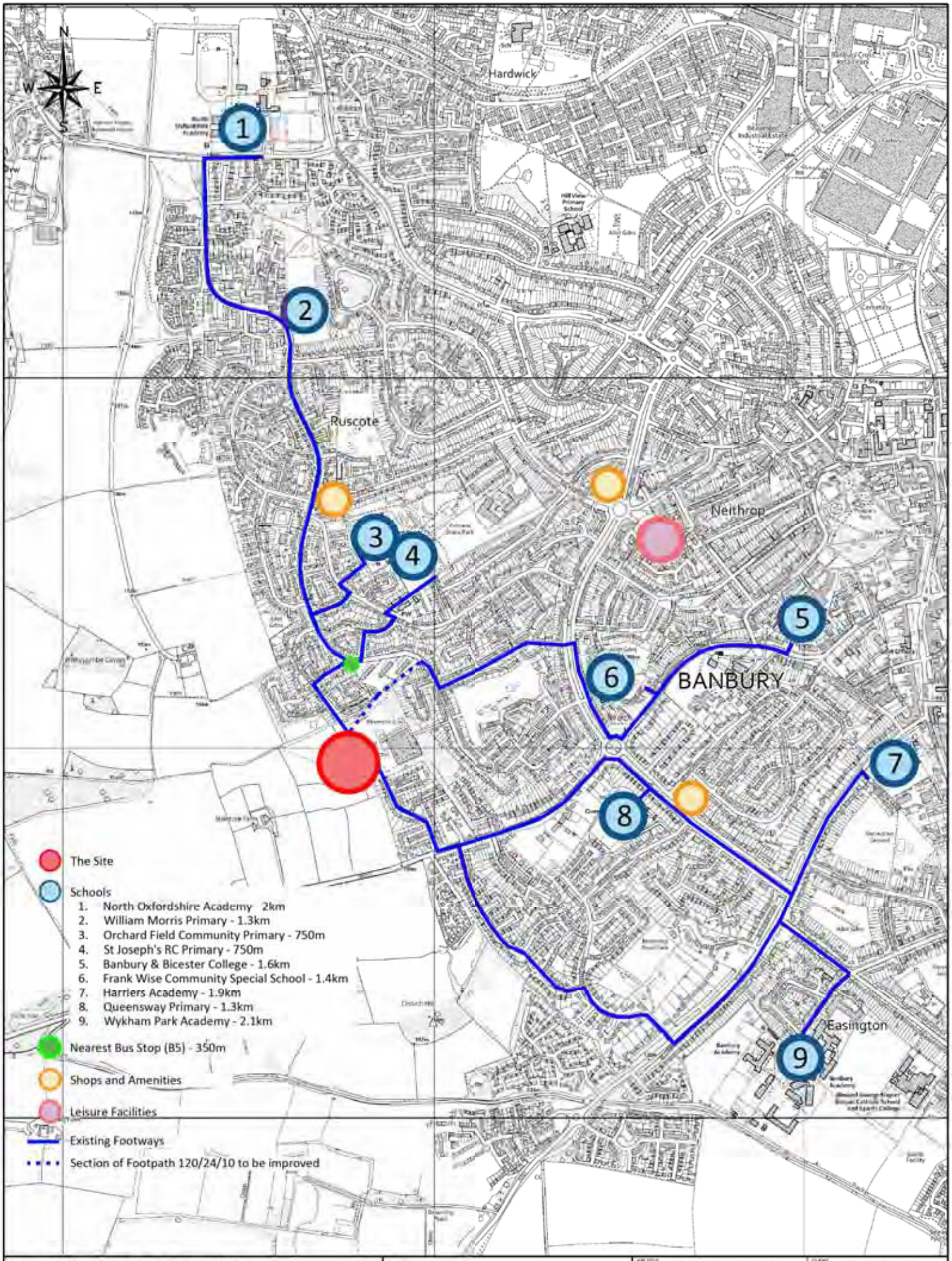
6.3 A site-specific trip rate has been derived and the proposed development traffic has been distributed onto the local network. The traffic generation confirms the development will generate modest traffic flows onto the local road network.

6.4 The development site will be served from the existing Balmoral Avenue. The Broughton Road/ Balmoral Avenue junction has been modelled and the results demonstrate that the junction is predicted to operate within capacity with the development in place.

6.5 Parking provision on site will be provided in accordance with parking standards set by the Local Authority.

6.6 In accordance with NPPF, the additional traffic would not have a material impact on the safety or operation of the local road network and it can clearly be concluded that the impact of the development will not be "severe" and overall there are no justifiable reasons for refusal on highway grounds.

Drawings



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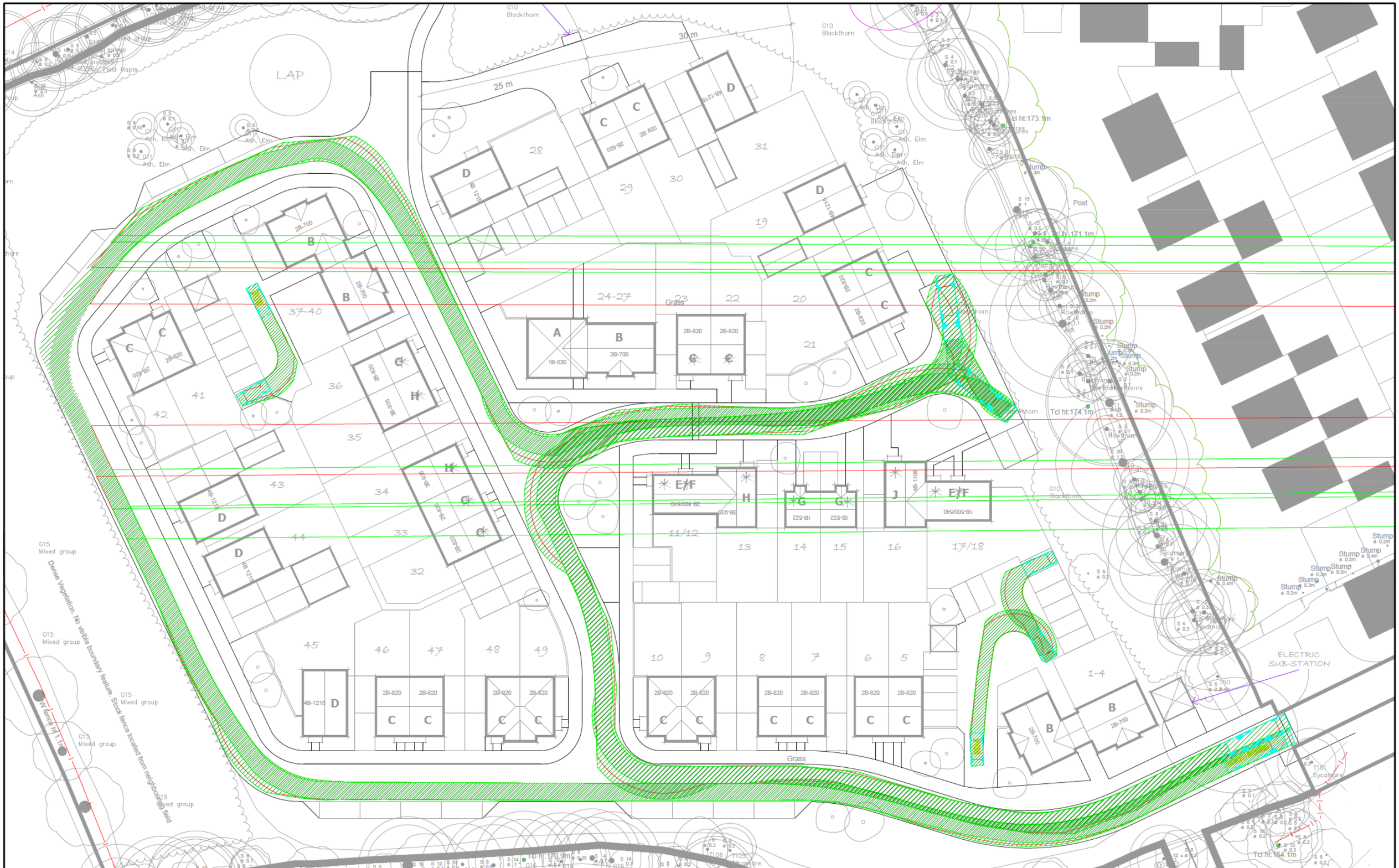
david tucker associates
transport planning consultants

JOB TITLE: Land off Balmoral Avenue			CLIENT: Lonestar Land
DRAWING TITLE: Land at Balmoral Way Walking Routes to Facilities			
SCALE: NTS	DRAWN BY: DN	DATE: Sept 21	DRAWING No: 23158–02



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Phoenix 2 Duo Recycler (P2-12W with EI te 6x2 MS chassis)

Overall Length	10.255m
Overall Width	2.550m
Overall Body Height	3.795m
Min Body Ground Clearance	0.305m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	11.450m

MPV (2006)

Overall Length	4.855m
Overall Width	1.860m
Overall Body Height	1.970m
Min Body Ground Clearance	0.300m
Max Track Width	1.779m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.700m

REV	DESCRIPTION	DRAWN	IN T ALS	DATE

DTA
Transport Planning Consultants

Forester House, Doctors Lane,
Henley in Arden,
Warwickshire B95 5AW
Tel: +44(0)1564 793598
Fax: +44(0)1564 793983
www.dtatransportation.co.uk

JOB TITLE	Balmoral Avenue
CLIENT	Lone Star Land Ltd
DRAWING TITLE	Illustrative Masterplan Vehicle Tracking (Refuse and MPV)
SCALE	1:500@A3
DRAWN BY	DN
DATE	Oct 21
DRAWING No	23158–04–1
REVISION	

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DTA
Transport Planning Consultants

Forester House, Doctors Lane,
Henley in Arden,
Warwickshire B95 5AW
Tel: +44(0)1564 793598
Fax: +44(0)1564 793983
www.dtatransportation.co.uk

JOB TITLE	CLIENT
Balmoral Avenue	Lone Star Land Ltd

DRAWING TITLE

Illustrative Masterplan

Internal Visibility Splays

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
1:500@A3	DN	Oct 21	23158–04–2	

Appendix A

Illustrative Masterplan

Land off Balmoral Avenue. Banbury. Development schedule PA/01B				
House type	Dwelling type	Plot nos	No.	Total sq.ft
Private units				
530	1 bed apartment	24. 26	2	1060
700	2 bed apartment	1. 2. 3. 4. 25. 27. 37. 38. 39. 40	10	7000
820	3 bed / 2 storey house	5. 6. 7. 8. 9. 10. 20. 21. 29. 30. 41. 42. 46. 47. 48. 49	16	13120
1215	4 bed / 2 storey house	19. 28. 31. 43. 44. 45	6	7290
Total Private Units			34	28470
Affordable units				
Rent				
500	1 bed maisonette [ground floor]	11. 17	2	1000
540	1 bed maisonette [first floor]	12. 18	2	1080
520	1 bed / 2 storey house	14. 15	2	1040
820	2 bed / 2 storey house	22. 23	2	1640
935	3 bed / 2 storey house	13	1	935
1108	4 bed / 2 storey house	16	1	1108
Shared				
820	2 bed / 2 storey house	32. 33. 36	3	2460
935	3 bed / 2 storey house	34. 35	2	1870
Total Affordable Units			15	11133
Total Units			49	39603

Private units	
1 bed	6%
2 bed	29%
3 bed	47%
4 bed	18%

Affordable units [total]	
1 bed	40%
2 bed	33%
3 bed	20%
4 bed	7%

Legend

- Red Line Boundary
- Blue Line Boundary
- Existing Buildings
- Existing Landscaping
- Existing Landscaping Removed
- Root Protection Areas
- Indicative Proposed Landscaping
- Affordable Unit
- Public Right of Way

Tree Survey Plan

Extent of Tree Canopy
Theoretical Root Protection Area BS5837
BS 5837 Category (See Below)
Tree Survey Number-BS 5837 Category

BS 5837 Category

(See Tree Survey for further details)

Category U Red Stem Disc
Those in such a condition that any existing value would be lost within 10 years and which should in the current context, be removed for reasons of sound arboricultural management.

Category A Green Stem Disc
Those of high quality and value: - in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).

Category B Blue Stem Disc
Those of moderate quality and value: - those in such a condition as to make a significant contribution (a minimum of 20 years is suggested)

Category C Grey Stem Disc
Those of low quality and value: - currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150 mm.

Trees not surveyed as individual trees but included within hedgerows or other groups

0 10 20 30 40 50m

N

ILLUSTRATIVE MASTERPLAN - 1:500

Intelligent Residential Design
Architecture | Design | Planning
M | 07768 013594 E | jglassford@btinternet.com

client

project: Land off Balmoral Avenue, Banbury, Oxfordshire

project no: 21303 | drawing no: PA/01

drawing description - Illustrative Masterplan

scale: 1:500 @ A0 | date drawn: September 2021 | rev: D

Appendix B

Traffic Count Data

AVAILABLE ON REQUEST

Appendix C

PIC Data

ACCIDENT REQUEST - (20496) BANBURY

OXFORDSHIRE COUNTY COUNCIL - INFRASTRUCTURE DELIVERY

Accidents between following dates:
01/01/2013 and 31/07/2018

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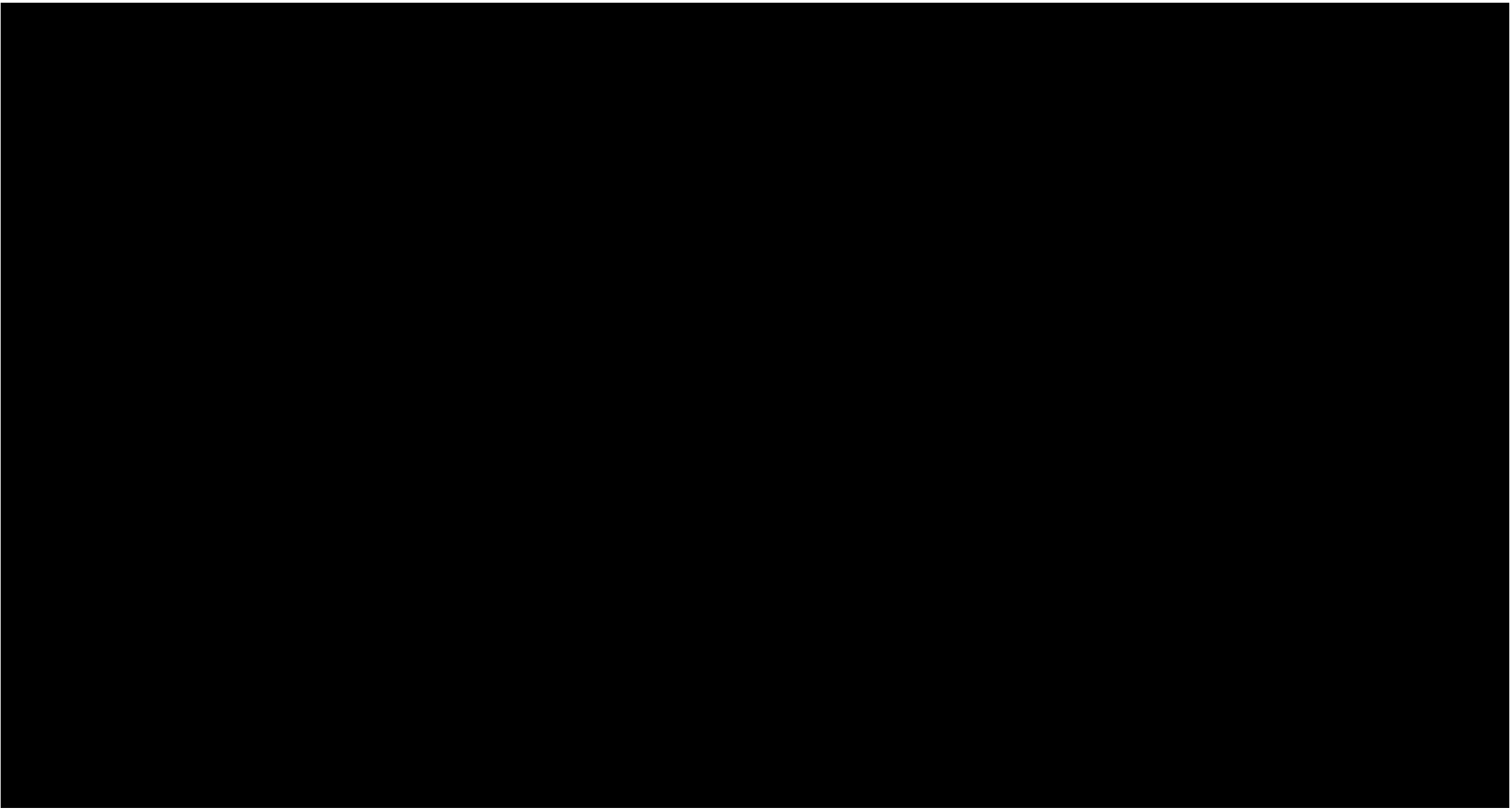
OXFORDSHIRE COUNTY COUNCIL

Date drawn: 05/12/2018
Drawn by: CJM

Map centre:
easting. 444360, northing. 239950

[redacted]



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Appendix D

Broughton Road/ Balmoral Avenue
Junction Modelling Outputs - PICADY

Junctions 10

PICADY 10 - Priority Intersection Module

Version: 10 0.2.1574
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+44 (0)1344 379777 software@trl.co.uk trlsoftware.com

The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: Broughton Road_Balmoral Avenue.j10
Path: P:\23000's\23158\Junction Assessments
Report generation date: 24/09/2021 10:01:46

Summary of junction performance

	AM			PM		
	Q (Veh)	Delay (s)	RFC	Q (Veh)	Delay (s)	RFC
	2021 Base					
Stream B-AC	0.2	9.39	0.14	0.1	7.01	0.05
Stream C-AB	0.1	4.97	0.06	0.3	4.68	0.11
	2026 Base					
Stream B-AC	0.2	9.76	0.16	0.1	7.10	0.06
Stream C-AB	0.1	4.93	0.06	0.3	4.65	0.13
	2026 Base + Dev					
Stream B-AC	0.3	10.53	0.21	0.1	7.30	0.08
Stream C-AB	0.2	5.00	0.09	0.4	4.79	0.17

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

File summary

File Description

Title	Broughton Road/ Balmoral Avenue
Location	Banbury
Site number	
Date	23/09/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	23158
Enumerator	DTA\Arcady
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q 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	2021 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2021 Base	PM	ONE HOUR	16:45	18:15	15	✓
D3	2026 Base	AM	ONE HOUR	07:45	09:15	15	✓
D4	2026 Base	PM	ONE HOUR	16:45	18:15	15	✓
D5	2026 Base + Dev	AM	ONE HOUR	07:45	09:15	15	✓
D6	2026 Base + Dev	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

2021 Base, 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		0.65	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.65	A

Arms

Arms

Arm	Name	Description	Arm type
A	Broughton Road West		Major
B	Balmoral Avenue		Minor
C	Broughton Road East		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 - Broughton Road East	6.50			119.0	✓	0.00

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 - Balmoral Avenue	One lane	3.00	22	17

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	493	0.088	0.222	0.140	0.317
B-C	634	0.095	0.240	-	-
C-B	643	0.244	0.244	-	-

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)	Run automatically
D1	2021 Base	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	Av. Demand (Veh/hr)	Scaling Factor (%)
A - Broughton Road West		ONE HOUR	✓	615	100 000
B - Balmoral Avenue		ONE HOUR	✓	58	100 000
C - Broughton Road East		ONE HOUR	✓	433	100 000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	2	613
	B - Balmoral Avenue	4	0	54
	C - Broughton Road East	415	18	0

Vehicle Mix

HV %s

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	0	1
	B - Balmoral Avenue	0	0	0
	C - Broughton Road East	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.14	9.39	0.2	A	53	80
C-AB	0.06	4.97	0.1	A	33	50
C-A					364	546
A-B					2	3
A-C					562	844

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	44	11	504	0 087	43	0.0	0.1	7.813	A
C-AB	23	6	748	0 031	23	0.0	0.0	4.968	A
C-A	303	76			303				
A-B	2	0.38			2				
A-C	461	115			461				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	52	13	480	0.109	52	0.1	0.1	8.406	A
C-AB	31	8	773	0 041	31	0.0	0.1	4.852	A
C-A	358	89			358				
A-B	2	0.45			2				
A-C	551	138			551				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	64	16	447	0.143	64	0.1	0.2	9.378	A
C-AB	46	11	810	0 056	46	0.1	0.1	4.706	A
C-A	431	108			431				
A-B	2	0.55			2				
A-C	675	169			675				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	64	16	447	0.143	64	0.2	0.2	9.386	A
C-AB	46	11	810	0 056	46	0.1	0.1	4.711	A
C-A	431	108			431				
A-B	2	0.55			2				
A-C	675	169			675				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	52	13	480	0.109	52	0.2	0.1	8.418	A
C-AB	31	8	773	0 041	32	0.1	0.1	4.862	A
C-A	358	89			358				
A-B	2	0.45			2				
A-C	551	138			551				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	44	11	504	0 087	44	0.1	0.1	7.830	A
C-AB	23	6	748	0 031	23	0.1	0.0	4.974	A
C-A	303	76			303				
A-B	2	0.38			2				
A-C	461	115			461				

2021 Base, 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		0.73	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.73	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)	Run automatically
D2	2021 Base	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	Av. Demand (Veh/hr)	Scaling Factor (%)
A - Broughton Road West		ONE HOUR	✓	250	100 000
B - Balmoral Avenue		ONE HOUR	✓	25	100 000
C - Broughton Road East		ONE HOUR	✓	496	100 000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	5	245
	B - Balmoral Avenue	2	0	23
	C - Broughton Road East	454	42	0

Vehicle Mix

HV %s

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	3	1
	B - Balmoral Avenue	0	0	0
	C - Broughton Road East	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.05	7.01	0.1	A	23	34
C-AB	0.11	4.68	0.3	A	76	114
C-A					379	568
A-B					4	7
A-C					225	337

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	19	5	567	0 033	19	0.0	0.0	6.568	A
C-AB	54	14	824	0 066	54	0.0	0.1	4.673	A
C-A	319	80			319				
A-B	4	0.91			4				
A-C	184	46			184				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	22	6	556	0 040	22	0.0	0.0	6.748	A
C-AB	72	18	861	0 084	72	0.1	0.2	4.562	A
C-A	374	93			374				
A-B	4	1			4				
A-C	220	55			220				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	28	7	541	0 051	27	0.0	0.1	7.014	A
C-AB	103	26	914	0.112	102	0.2	0.2	4.436	A
C-A	444	111			444				
A-B	5	1			5				
A-C	270	67			270				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	28	7	541	0 051	28	0.1	0.1	7.014	A
C-AB	103	26	914	0.112	103	0.2	0.3	4.441	A
C-A	443	111			443				
A-B	5	1			5				
A-C	270	67			270				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	22	6	556	0 040	23	0.1	0.0	6.752	A
C-AB	72	18	861	0 084	73	0.3	0.2	4.570	A
C-A	374	93			374				
A-B	4	1			4				
A-C	220	55			220				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	19	5	567	0 033	19	0.0	0.0	6.572	A
C-AB	54	14	824	0 066	54	0.2	0.1	4.681	A
C-A	319	80			319				
A-B	4	0.91			4				
A-C	184	46			184				

2026 Base, 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		0.68	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.68	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)	Run automatically
D3	2026 Base	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	Av. Demand (Veh/hr)	Scaling Factor (%)
A - Broughton Road West		ONE HOUR	✓	655	100 000
B - Balmoral Avenue		ONE HOUR	✓	62	100 000
C - Broughton Road East		ONE HOUR	✓	462	100 000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	2	653
	B - Balmoral Avenue	4	0	58
	C - Broughton Road East	443	19	0

Vehicle Mix

HV %s

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	0	1
	B - Balmoral Avenue	0	0	0
	C - Broughton Road East	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.16	9.76	0.2	A	57	85
C-AB	0.06	4.93	0.1	A	37	56
C-A					387	580
A-B					2	3
A-C					599	899

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	47	12	497	0 094	46	0.0	0.1	7.980	A
C-AB	26	6	756	0 034	25	0.0	0.0	4.925	A
C-A	322	81			322				
A-B	2	0.38			2				
A-C	492	123			492				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	56	14	472	0.118	56	0.1	0.1	8.642	A
C-AB	35	9	784	0 044	35	0.0	0.1	4.802	A
C-A	381	95			381				
A-B	2	0.45			2				
A-C	587	147			587				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	68	17	437	0.156	68	0.1	0.2	9.752	A
C-AB	51	13	825	0 062	51	0.1	0.1	4.652	A
C-A	457	114			457				
A-B	2	0.55			2				
A-C	719	180			719				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	68	17	437	0.156	68	0.2	0.2	9.761	A
C-AB	51	13	825	0 062	51	0.1	0.1	4.657	A
C-A	457	114			457				
A-B	2	0.55			2				
A-C	719	180			719				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	56	14	472	0.118	56	0.2	0.1	8.657	A
C-AB	35	9	784	0 045	35	0.1	0.1	4.815	A
C-A	380	95			380				
A-B	2	0.45			2				
A-C	587	147			587				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	47	12	497	0 094	47	0.1	0.1	8.000	A
C-AB	26	6	757	0 034	26	0.1	0.0	4.930	A
C-A	322	81			322				
A-B	2	0.38			2				
A-C	492	123			492				

2026 Base , 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		0.77	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.77	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)	Run automatically
D4	2026 Base	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	Av. Demand (Veh/hr)	Scaling Factor (%)
A - Broughton Road West		ONE HOUR	✓	268	100 000
B - Balmoral Avenue		ONE HOUR	✓	27	100 000
C - Broughton Road East		ONE HOUR	✓	532	100 000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	5	263
	B - Balmoral Avenue	2	0	25
	C - Broughton Road East	486	46	0

Vehicle Mix

HV %s

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	3	1
	B - Balmoral Avenue	0	0	0
	C - Broughton Road East	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.06	7.10	0.1	A	25	37
C-AB	0.13	4.65	0.3	A	88	132
C-A					400	600
A-B					4	7
A-C					241	362

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	20	5	564	0 036	20	0.0	0.0	6.615	A
C-AB	62	15	837	0 073	61	0.0	0.1	4.636	A
C-A	339	85			339				
A-B	4	0.91			4				
A-C	198	50			198				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	24	6	553	0 044	24	0.0	0.0	6.811	A
C-AB	83	21	878	0 094	82	0.1	0.2	4.530	A
C-A	396	99			396				
A-B	4	1			4				
A-C	236	59			236				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	30	7	537	0 055	30	0.0	0.1	7.101	A
C-AB	119	30	934	0.127	119	0.2	0.3	4.417	A
C-A	467	117			467				
A-B	5	1			5				
A-C	290	72			290				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	30	7	537	0 055	30	0.1	0.1	7.101	A
C-AB	119	30	935	0.128	119	0.3	0.3	4.423	A
C-A	466	117			466				
A-B	5	1			5				
A-C	290	72			290				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	24	6	553	0 044	24	0.1	0.0	6.812	A
C-AB	83	21	878	0 094	83	0.3	0.2	4.541	A
C-A	395	99			395				
A-B	4	1			4				
A-C	236	59			236				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	20	5	564	0 036	20	0.0	0.0	6.619	A
C-AB	62	15	838	0 074	62	0.2	0.1	4.647	A
C-A	339	85			339				
A-B	4	0.91			4				
A-C	198	50			198				

2026 Base + 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		0.95	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.95	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)	Run automatically
D5	2026 Base + 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	Av. Demand (Veh/hr)	Scaling Factor (%)
A - Broughton Road West		ONE HOUR	✓	655	100 000
B - Balmoral Avenue		ONE HOUR	✓	84	100 000
C - Broughton Road East		ONE HOUR	✓	469	100 000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	2	653
	B - Balmoral Avenue	6	0	78
	C - Broughton Road East	443	26	0

Vehicle Mix

HV %s

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	0	1
	B - Balmoral Avenue	0	0	0
	C - Broughton Road East	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.21	10.53	0.3	B	77	116
C-AB	0.09	5.00	0.2	A	51	77
C-A					379	569
A-B					2	3
A-C					599	899

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	63	16	495	0.128	63	0.0	0.1	8.319	A
C-AB	35	9	756	0 046	35	0.0	0.1	4.987	A
C-A	318	80			318				
A-B	2	0.38			2				
A-C	492	123			492				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	76	19	470	0.161	75	0.1	0.2	9.126	A
C-AB	48	12	784	0 061	48	0.1	0.1	4.886	A
C-A	374	93			374				
A-B	2	0.45			2				
A-C	587	147			587				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	92	23	434	0.213	92	0.2	0.3	10 515	B
C-AB	70	18	825	0.085	70	0.1	0.2	4.769	A
C-A	446	112			446				
A-B	2	0.55			2				
A-C	719	180			719				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	92	23	434	0.213	92	0.3	0.3	10 534	B
C-AB	70	18	825	0.085	70	0.2	0.2	4.777	A
C-A	446	111			446				
A-B	2	0.55			2				
A-C	719	180			719				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	76	19	470	0.161	76	0.3	0.2	9.149	A
C-AB	48	12	784	0 061	48	0.2	0.1	4.899	A
C-A	374	93			374				
A-B	2	0.45			2				
A-C	587	147			587				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	63	16	495	0.128	63	0.2	0.1	8.349	A
C-AB	35	9	757	0 046	35	0.1	0.1	4.996	A
C-A	318	79			318				
A-B	2	0.38			2				
A-C	492	123			492				

2026 Base + 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		1.04	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	1.04	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)	Run automatically
D6	2026 Base + 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	Av. Demand (Veh/hr)	Scaling Factor (%)
A - Broughton Road West		ONE HOUR	✓	266	100 000
B - Balmoral Avenue		ONE HOUR	✓	37	100 000
C - Broughton Road East		ONE HOUR	✓	543	100 000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	6	260
	B - Balmoral Avenue	3	0	34
	C - Broughton Road East	481	62	0

Vehicle Mix

HV %s

		To		
		A - Broughton Road West	B - Balmoral Avenue	C - Broughton Road East
From	A - Broughton Road West	0	3	1
	B - Balmoral Avenue	0	0	0
	C - Broughton Road East	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.08	7.30	0.1	A	34	51
C-AB	0.17	4.79	0.4	A	118	176
C-A					381	571
A-B					5	8
A-C					239	358

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	28	7	562	0 050	28	0.0	0.1	6.736	A
C-AB	82	21	835	0 099	82	0.0	0.2	4.778	A
C-A	327	82			327				
A-B	4	1			4				
A-C	196	49			196				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	33	8	550	0 060	33	0.1	0.1	6.961	A
C-AB	111	28	875	0.127	110	0.2	0.3	4.710	A
C-A	378	94			378				
A-B	5	1			5				
A-C	234	59			234				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	41	10	534	0 076	41	0.1	0.1	7.301	A
C-AB	159	40	931	0.171	159	0.3	0.4	4.664	A
C-A	439	110			439				
A-B	6	2			6				
A-C	287	72			287				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	41	10	534	0 076	41	0.1	0.1	7.301	A
C-AB	159	40	931	0.171	159	0.4	0.4	4.674	A
C-A	439	110			439				
A-B	6	2			6				
A-C	287	72			287				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	33	8	550	0 060	33	0.1	0.1	6.966	A
C-AB	111	28	875	0.127	112	0.4	0.3	4.726	A
C-A	377	94			377				
A-B	5	1			5				
A-C	234	59			234				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	28	7	562	0 050	28	0.1	0.1	6.739	A
C-AB	83	21	835	0 099	83	0.3	0.2	4.795	A
C-A	326	82			326				
A-B	4	1			4				
A-C	196	49			196				

Appendix E

Broughton Road/ Queensway/ Woodgreen Avenue Roundabout

Junction Modelling Outputs - ARCADY

Junctions 10

ARCADY 10 - Roundabout Module

Version: 10 0.2.1574
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+44 (0)1344 379777 software@trl.co.uk trlsoftware.com

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Filename: Broughton Rd_Queensway_Woodgreen Av.j10
Path: P:\23000's\23158\Junction Assessments
Report generation date: 27/09/2021 10:35:11

Summary of junction performance

	AM			PM		
	Q (Veh)	Delay (s)	RFC	Q (Veh)	Delay (s)	RFC
	2021 Base					
1 - Broughton Road (NE)	3.4	20.40	0.78	0.7	6.83	0.43
2 - Queensway	3.2	12 91	0.77	2 2	8.67	0.69
3 - Broughton Road (SW)	0.4	5.64	0 29	0 8	6.79	0.45
4 - Woodgreen Avenue	8.5	24.78	0 91	2.7	9.34	0.73
	2026 Base					
1 - Broughton Road (NE)	5.7	32 80	0 87	0 9	7.69	0.48
2 - Queensway	4.7	18 38	0 83	3 0	11.00	0.76
3 - Broughton Road (SW)	0.5	6.22	0 32	1 0	7.94	0.50
4 - Woodgreen Avenue	18.1	48 66	0 97	3 6	11.99	0.79
	2026 Base + Development					
1 - Broughton Road (NE)	5.9	33 99	0 87	0 9	7.87	0.48
2 - Queensway	4.8	18.74	0 84	3 2	11.41	0.76
3 - Broughton Road (SW)	0.5	6.45	0 35	1 0	8.14	0.51
4 - Woodgreen Avenue	19 5	51 99	0 98	3 8	12.45	0.80

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

File summary

File Description

Title	Broughton Road/ Queensway/ Woodgreen Avenue
Location	
Site number	
Date	23/09/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	23158
Enumerator	DTA\arcady
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)	Use iterations with HCM roundabouts	Max number of iterations for roundabouts
5.75						1.00	55.00	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	2021 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2021 Base	PM	ONE HOUR	16:45	18:15	15	✓
D3	2026 Base	AM	ONE HOUR	07:45	09:15	15	✓
D4	2026 Base	PM	ONE HOUR	16:45	18:15	15	✓
D5	2026 Base + Development	AM	ONE HOUR	07:45	09:15	15	✓
D6	2026 Base + Development	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

2021 Base, 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	Standard Roundabout		1, 2, 3, 4	18.79	C

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	18.79	C

Arms

Arms

Arm	Name	Description	No give-way line
1	Broughton Road (NE)		
2	Queensway		
3	Broughton Road (SW)		
4	Woodgreen Avenue		

Roundabout Geometry

Arm	V (m)	E (m)	l' (m)	R (m)	D (m)	PHI (deg)	Entry only	Exit only
1 - Broughton Road (NE)	3.59	6.70	3.3	21.0	53.0	43.0		
2 - Queensway	4.69	7.10	4.2	19.0	53.0	38.0		
3 - Broughton Road (SW)	3.10	8.59	15.0	14.5	53.0	38.0		
4 - Woodgreen Avenue	4.90	5.98	2.4	5 6	53.0	44.0		

Slope / Intercept / Capacity

Arm Intercept Adjustments

Arm	Type	Reason	Direct intercept adjustment (PCU/hr)
1 - Broughton Road (NE)	Direct		100
2 - Queensway	None		
3 - Broughton Road (SW)	None		
4 - Woodgreen Avenue	Direct		260

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Broughton Road (NE)	0.502	1366
2 - Queensway	0.573	1628
3 - Broughton Road (SW)	0.568	1626
4 - Woodgreen Avenue	0.478	1596

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)	Run automatically
D1	2021 Base	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	Av. Demand (Veh/hr)	Scaling Factor (%)
1 - Broughton Road (NE)		ONE HOUR	✓	569	100.000
2 - Queensway		ONE HOUR	✓	821	100.000
3 - Broughton Road (SW)		ONE HOUR	✓	236	100.000
4 - Woodgreen Avenue		ONE HOUR	✓	1191	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	82	219	268
	2 - Queensway	71	2	73	675
	3 - Broughton Road (SW)	104	32	0	100
	4 - Woodgreen Avenue	265	770	141	15

Vehicle Mix

HV %s

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	1	1	6
	2 - Queensway	2	0	3	2
	3 - Broughton Road (SW)	10	0	2	6
	4 - Woodgreen Avenue	4	1	3	31

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Broughton Road (NE)	0.78	20.40	3.4	C	522	783
2 - Queensway	0.77	12.91	3.2	B	753	1130
3 - Broughton Road (SW)	0.29	5.64	0.4	A	217	325
4 - Woodgreen Avenue	0.91	24.78	8.5	C	1093	1639

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	428	107	718	967	0.443	425	329	0.0	0.8	6.612	A
2 - Queensway	618	155	481	1313	0.471	615	663	0.0	0.9	5.126	A
3 - Broughton Road (SW)	178	44	771	1097	0.162	177	324	0.0	0.2	3.909	A
4 - Woodgreen Avenue	897	224	157	1483	0 605	891	792	0.0	1.5	6.017	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	512	128	860	897	0 571	509	394	0.8	1.3	9.249	A
2 - Queensway	738	185	576	1258	0 587	736	793	0.9	1.4	6.871	A
3 - Broughton Road (SW)	212	53	924	1013	0 209	212	388	0.2	0.3	4.492	A
4 - Woodgreen Avenue	1071	268	188	1468	0.729	1066	948	1.5	2.6	8.865	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	626	157	1041	807	0.776	619	479	1.3	3.2	18.447	C
2 - Queensway	904	226	699	1186	0.762	897	961	1.4	3.0	12.208	B
3 - Broughton Road (SW)	260	65	1125	903	0.288	259	471	0.3	0.4	5 592	A
4 - Woodgreen Avenue	1311	328	229	1447	0.906	1291	1155	2.6	7.7	20.721	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	626	157	1055	800	0.783	626	484	3.2	3.4	20.399	C
2 - Queensway	904	226	707	1181	0.765	903	973	3.0	3.2	12.911	B
3 - Broughton Road (SW)	260	65	1134	898	0.289	260	476	0.4	0.4	5 644	A
4 - Woodgreen Avenue	1311	328	230	1447	0.906	1308	1164	7.7	8.5	24.777	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	512	128	881	886	0.577	520	401	3.4	1.4	10.026	B
2 - Queensway	738	185	588	1251	0.590	745	812	3.2	1.5	7 207	A
3 - Broughton Road (SW)	212	53	937	1006	0.211	213	396	0.4	0.3	4 541	A
4 - Woodgreen Avenue	1071	268	189	1467	0.730	1093	961	8.5	2.8	10.179	B

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	428	107	727	962	0.445	431	333	1.4	0.8	6.800	A
2 - Queensway	618	155	487	1310	0.472	620	671	1.5	0.9	5.239	A
3 - Broughton Road (SW)	178	44	779	1093	0.163	178	328	0.3	0.2	3.938	A
4 - Woodgreen Avenue	897	224	158	1483	0 605	902	800	2.8	1.6	6.247	A

2021 Base, 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	Standard Roundabout		1, 2, 3, 4	8.37	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	8.37	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)	Run automatically
D2	2021 Base	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	Av. Demand (Veh/hr)	Scaling Factor (%)
1 - Broughton Road (NE)		ONE HOUR	✓	359	100.000
2 - Queensway		ONE HOUR	✓	858	100.000
3 - Broughton Road (SW)		ONE HOUR	✓	388	100.000
4 - Woodgreen Avenue		ONE HOUR	✓	945	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	83	104	172
	2 - Queensway	93	2	32	731
	3 - Broughton Road (SW)	161	42	0	185
	4 - Woodgreen Avenue	223	587	91	44

Vehicle Mix

HV %s

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	3	1	2
	2 - Queensway	0	0	7	0
	3 - Broughton Road (SW)	1	0	0	2
	4 - Woodgreen Avenue	2	0	0	10

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Broughton Road (NE)	0.43	6.83	0.7	A	329	494
2 - Queensway	0.69	8.67	2.2	A	787	1181
3 - Broughton Road (SW)	0.45	6.79	0.8	A	356	534
4 - Woodgreen Avenue	0.73	9.34	2.7	A	867	1301

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	270	68	574	1056	0 256	269	357	0.0	0.3	4.569	A
2 - Queensway	646	161	308	1444	0.447	643	535	0.0	0.8	4.476	A
3 - Broughton Road (SW)	292	73	781	1164	0 251	291	170	0.0	0.3	4.117	A
4 - Woodgreen Avenue	711	178	223	1475	0.482	708	848	0.0	0.9	4.670	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	323	81	687	999	0 323	322	428	0.3	0.5	5.308	A
2 - Queensway	771	193	369	1408	0 548	770	641	0.8	1.2	5.625	A
3 - Broughton Road (SW)	349	87	935	1077	0 324	348	204	0.3	0.5	4.937	A
4 - Woodgreen Avenue	850	212	267	1454	0 584	848	1016	0.9	1.4	5.921	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	395	99	840	924	0.428	394	523	0.5	0.7	6.783	A
2 - Queensway	945	236	451	1360	0 695	941	783	1.2	2.2	8.497	A
3 - Broughton Road (SW)	427	107	1143	959	0.445	426	249	0.5	0.8	6.730	A
4 - Woodgreen Avenue	1040	260	327	1425	0.730	1036	1242	1.4	2.6	9.117	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	395	99	843	922	0.429	395	525	0.7	0.7	6.833	A
2 - Queensway	945	236	452	1359	0 695	945	786	2.2	2.2	8.670	A
3 - Broughton Road (SW)	427	107	1147	957	0.446	427	250	0.8	0.8	6.794	A
4 - Woodgreen Avenue	1040	260	328	1425	0.730	1040	1246	2.6	2.7	9.345	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	323	81	693	997	0 324	324	431	0.7	0.5	5.359	A
2 - Queensway	771	193	371	1407	0 548	775	645	2.2	1.2	5.735	A
3 - Broughton Road (SW)	349	87	941	1073	0 325	350	205	0.8	0.5	4.989	A
4 - Woodgreen Avenue	850	212	269	1453	0 585	854	1022	2.7	1.4	6.060	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	270	68	578	1053	0 257	271	360	0.5	0.3	4.603	A
2 - Queensway	646	161	310	1442	0.448	648	539	1.2	0.8	4.538	A
3 - Broughton Road (SW)	292	73	786	1161	0 252	293	171	0.5	0.3	4.152	A
4 - Woodgreen Avenue	711	178	225	1474	0.483	713	854	1.4	0.9	4.745	A

2026 Base, 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	Standard Roundabout		1, 2, 3, 4	32.97	D

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	32.97	D

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	2026 Base	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	Av. Demand (Veh/hr)	Scaling Factor (%)
1 - Broughton Road (NE)		ONE HOUR	✓	607	100.000
2 - Queensway		ONE HOUR	✓	876	100.000
3 - Broughton Road (SW)		ONE HOUR	✓	253	100.000
4 - Woodgreen Avenue		ONE HOUR	✓	1270	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	88	233	286
	2 - Queensway	76	3	78	719
	3 - Broughton Road (SW)	111	35	0	107
	4 - Woodgreen Avenue	283	821	150	16

Vehicle Mix

HV %s

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	1	1	6
	2 - Queensway	2	0	3	2
	3 - Broughton Road (SW)	10	0	2	6
	4 - Woodgreen Avenue	4	1	3	31

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Broughton Road (NE)	0.87	32.80	5.7	D	557	835
2 - Queensway	0.83	18.38	4.7	C	804	1206
3 - Broughton Road (SW)	0.32	6.22	0.5	A	232	348
4 - Woodgreen Avenue	0.97	48.66	18.1	E	1165	1748

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	457	114	766	943	0.485	453	352	0.0	0.9	7.301	A
2 - Queensway	659	165	512	1295	0 509	655	708	0.0	1.0	5.590	A
3 - Broughton Road (SW)	190	48	823	1069	0.178	190	344	0.0	0.2	4.090	A
4 - Woodgreen Avenue	956	239	169	1477	0 647	949	844	0.0	1.8	6.726	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	546	136	916	868	0.628	543	421	0.9	1.6	10.957	B
2 - Queensway	788	197	613	1236	0.637	785	847	1.0	1.7	7 924	A
3 - Broughton Road (SW)	227	57	985	980	0.232	227	412	0.2	0.3	4.780	A
4 - Woodgreen Avenue	1142	285	202	1461	0.782	1135	1010	1.8	3.4	10.847	B

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	668	167	1095	780	0.857	655	507	1.6	5.0	26.360	D
2 - Queensway	964	241	737	1163	0.829	954	1013	1.7	4.4	16.391	C
3 - Broughton Road (SW)	279	70	1195	865	0.322	278	496	0.3	0.5	6.129	A
4 - Woodgreen Avenue	1398	350	246	1439	0.972	1355	1226	3.4	14.2	32.731	D

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	668	167	1116	770	0.868	665	514	5.0	5.7	32.799	D
2 - Queensway	964	241	750	1156	0.834	963	1032	4.4	4.7	18.384	C
3 - Broughton Road (SW)	279	70	1208	857	0.325	279	504	0.5	0.5	6 221	A
4 - Woodgreen Avenue	1398	350	248	1438	0.972	1383	1239	14 2	18.1	48.659	E

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	546	136	966	844	0.647	561	437	5.7	1.9	13.351	B
2 - Queensway	788	197	636	1222	0.644	799	891	4.7	1.9	8.719	A
3 - Broughton Road (SW)	227	57	1007	968	0.235	228	428	0.5	0.3	4 872	A
4 - Woodgreen Avenue	1142	285	204	1460	0.782	1199	1032	18.1	3.8	16.440	C

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	457	114	778	937	0.488	461	356	1.9	1.0	7.617	A
2 - Queensway	659	165	520	1290	0 511	663	719	1.9	1.1	5.762	A
3 - Broughton Road (SW)	190	48	833	1063	0.179	191	350	0.3	0.2	4.127	A
4 - Woodgreen Avenue	956	239	170	1477	0 648	964	854	3.8	1.9	7.122	A

2026 Base, 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	Standard Roundabout		1, 2, 3, 4	10.43	B

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	10.43	B

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D4	2026 Base	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	Av. Demand (Veh/hr)	Scaling Factor (%)
1 - Broughton Road (NE)		ONE HOUR	✓	385	100.000
2 - Queensway		ONE HOUR	✓	921	100.000
3 - Broughton Road (SW)		ONE HOUR	✓	415	100.000
4 - Woodgreen Avenue		ONE HOUR	✓	1013	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	89	111	185
	2 - Queensway	100	2	35	784
	3 - Broughton Road (SW)	172	45	0	198
	4 - Woodgreen Avenue	239	629	98	47

Vehicle Mix

HV %s

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	3	1	2
	2 - Queensway	0	0	7	0
	3 - Broughton Road (SW)	1	0	0	2
	4 - Woodgreen Avenue	2	0	0	10

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Broughton Road (NE)	0.48	7.69	0.9	A	353	530
2 - Queensway	0.76	11.00	3.0	B	845	1268
3 - Broughton Road (SW)	0.50	7.94	1.0	A	381	571
4 - Woodgreen Avenue	0.79	11.99	3.6	B	930	1394

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	290	72	615	1035	0 280	288	383	0.0	0.4	4.810	A
2 - Queensway	693	173	330	1431	0.485	690	573	0.0	0.9	4.834	A
3 - Broughton Road (SW)	312	78	837	1132	0 276	311	183	0.0	0.4	4.377	A
4 - Woodgreen Avenue	763	191	239	1467	0 520	758	909	0.0	1.1	5.047	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	346	87	736	975	0 355	345	458	0.4	0.5	5.712	A
2 - Queensway	828	207	396	1392	0 595	826	686	0.9	1.4	6.331	A
3 - Broughton Road (SW)	373	93	1003	1039	0 359	372	219	0.4	0.6	5.398	A
4 - Woodgreen Avenue	911	228	286	1445	0 630	908	1089	1.1	1.7	6.676	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	424	106	898	895	0.474	423	560	0.5	0.9	7 601	A
2 - Queensway	1014	254	483	1341	0.756	1008	837	1.4	3.0	10.610	B
3 - Broughton Road (SW)	457	114	1224	914	0.500	455	267	0.6	1.0	7 825	A
4 - Woodgreen Avenue	1115	279	350	1415	0.788	1108	1330	1.7	3.5	11.462	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	424	106	904	892	0.475	424	562	0.9	0.9	7 687	A
2 - Queensway	1014	254	485	1340	0.757	1014	842	3.0	3.0	11.004	B
3 - Broughton Road (SW)	457	114	1231	910	0.502	457	269	1.0	1.0	7 945	A
4 - Woodgreen Avenue	1115	279	351	1414	0.789	1115	1336	3.5	3.6	11.991	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	346	87	744	971	0 356	347	463	0.9	0.6	5.783	A
2 - Queensway	828	207	399	1391	0 595	834	693	3.0	1.5	6.535	A
3 - Broughton Road (SW)	373	93	1012	1033	0 361	375	221	1.0	0.6	5.482	A
4 - Woodgreen Avenue	911	228	288	1444	0 631	918	1098	3.6	1.7	6.943	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	290	72	620	1033	0 281	291	386	0.6	0.4	4.855	A
2 - Queensway	693	173	333	1429	0.485	696	578	1.5	1.0	4.923	A
3 - Broughton Road (SW)	312	78	844	1128	0 277	313	184	0.6	0.4	4.423	A
4 - Woodgreen Avenue	763	191	241	1467	0 520	765	917	1.7	1.1	5.151	A

2026 Base + 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	Standard Roundabout		1, 2, 3, 4	34.56	D

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	34.56	D

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	2026 Base + Development	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	Av. Demand (Veh/hr)	Scaling Factor (%)
1 - Broughton Road (NE)		ONE HOUR	✓	609	100.000
2 - Queensway		ONE HOUR	✓	877	100.000
3 - Broughton Road (SW)		ONE HOUR	✓	272	100.000
4 - Woodgreen Avenue		ONE HOUR	✓	1273	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	88	235	286
	2 - Queensway	76	3	79	719
	3 - Broughton Road (SW)	117	38	0	117
	4 - Woodgreen Avenue	283	821	153	16

Vehicle Mix

HV %s

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	1	1	6
	2 - Queensway	2	0	3	2
	3 - Broughton Road (SW)	10	0	2	6
	4 - Woodgreen Avenue	4	1	3	31

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Broughton Road (NE)	0.87	33.99	5.9	D	559	838
2 - Queensway	0.84	18.74	4.8	C	805	1207
3 - Broughton Road (SW)	0.35	6.45	0.5	A	250	374
4 - Woodgreen Avenue	0.98	51.99	19 5	F	1168	1752

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	458	115	770	941	0.487	455	356	0.0	0.9	7.352	A
2 - Queensway	660	165	515	1293	0 511	656	710	0.0	1.0	5.616	A
3 - Broughton Road (SW)	205	51	823	1070	0.191	204	349	0.0	0.2	4.154	A
4 - Woodgreen Avenue	958	240	175	1474	0 650	951	851	0.0	1.8	6.797	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	547	137	922	866	0.632	545	426	0.9	1.7	11.099	B
2 - Queensway	788	197	617	1234	0.639	786	849	1.0	1.7	7 982	A
3 - Broughton Road (SW)	245	61	985	980	0.249	244	418	0.2	0.3	4 888	A
4 - Woodgreen Avenue	1144	286	210	1457	0.786	1138	1019	1.8	3.5	11.056	B

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	671	168	1099	778	0.862	657	513	1.7	5.1	27.033	D
2 - Queensway	966	241	742	1161	0.832	955	1014	1.7	4.5	16.644	C
3 - Broughton Road (SW)	299	75	1194	865	0.346	299	502	0.3	0.5	6 343	A
4 - Woodgreen Avenue	1402	350	256	1434	0.977	1355	1237	3.5	15.0	34.168	D

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	671	168	1121	767	0.874	667	520	5.1	5.9	33.987	D
2 - Queensway	966	241	754	1153	0.837	964	1034	4.5	4.8	18.741	C
3 - Broughton Road (SW)	299	75	1208	858	0.349	299	511	0.5	0.5	6.449	A
4 - Woodgreen Avenue	1402	350	257	1433	0.978	1384	1250	15 0	19.5	51.987	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	547	137	975	839	0.652	563	443	5.9	1.9	13.739	B
2 - Queensway	788	197	642	1219	0.647	800	897	4.8	1.9	8 824	A
3 - Broughton Road (SW)	245	61	1008	968	0.253	245	435	0.5	0.3	4 989	A
4 - Woodgreen Avenue	1144	286	212	1456	0.786	1207	1041	19 5	3.9	17.612	C

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	458	115	783	935	0.490	462	361	1.9	1.0	7.683	A
2 - Queensway	660	165	524	1288	0 513	664	721	1.9	1.1	5.794	A
3 - Broughton Road (SW)	205	51	833	1064	0.193	205	354	0.3	0.2	4.196	A
4 - Woodgreen Avenue	958	240	177	1473	0 651	966	862	3.9	1.9	7.215	A

2026 Base + 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	Standard Roundabout		1, 2, 3, 4	10.79	B

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	10.79	B

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH mm)	Finish time (HH mm)	Time segment length (min)	Run automatically
D6	2026 Base + Development	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	Av. Demand (Veh/hr)	Scaling Factor (%)
1 - Broughton Road (NE)		ONE HOUR	✓	390	100.000
2 - Queensway		ONE HOUR	✓	924	100.000
3 - Broughton Road (SW)		ONE HOUR	✓	425	100.000
4 - Woodgreen Avenue		ONE HOUR	✓	1021	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	89	116	185
	2 - Queensway	100	2	38	784
	3 - Broughton Road (SW)	175	47	0	203
	4 - Woodgreen Avenue	239	629	106	47

Vehicle Mix

HV %s

		To			
		1 - Broughton Road (NE)	2 - Queensway	3 - Broughton Road (SW)	4 - Woodgreen Avenue
From	1 - Broughton Road (NE)	0	3	1	2
	2 - Queensway	0	0	7	0
	3 - Broughton Road (SW)	1	0	0	2
	4 - Woodgreen Avenue	2	0	0	10

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Broughton Road (NE)	0.48	7.87	0.9	A	358	537
2 - Queensway	0.76	11.41	3.2	B	848	1272
3 - Broughton Road (SW)	0.51	8.14	1.0	A	390	585
4 - Woodgreen Avenue	0.80	12.45	3.8	B	937	1405

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	294	73	622	1032	0 285	292	385	0.0	0.4	4.857	A
2 - Queensway	696	174	340	1425	0.488	692	574	0.0	0.9	4.889	A
3 - Broughton Road (SW)	320	80	837	1132	0 283	318	195	0.0	0.4	4.417	A
4 - Woodgreen Avenue	769	192	243	1466	0 524	764	913	0.0	1.1	5.100	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	351	88	745	971	0 361	350	461	0.4	0.6	5.792	A
2 - Queensway	831	208	407	1386	0 600	829	688	0.9	1.5	6.439	A
3 - Broughton Road (SW)	382	96	1003	1039	0 368	381	233	0.4	0.6	5.472	A
4 - Woodgreen Avenue	918	229	291	1443	0 636	915	1093	1.1	1.7	6.790	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	429	107	909	890	0.483	428	563	0.6	0.9	7.773	A
2 - Queensway	1017	254	498	1333	0.763	1011	839	1.5	3.1	10.968	B
3 - Broughton Road (SW)	468	117	1224	914	0.512	466	285	0.6	1.0	8 010	A
4 - Woodgreen Avenue	1124	281	355	1412	0.796	1116	1335	1.7	3.7	11.857	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	429	107	915	887	0.484	429	566	0.9	0.9	7 869	A
2 - Queensway	1017	254	500	1332	0.764	1017	844	3.1	3.2	11.413	B
3 - Broughton Road (SW)	468	117	1231	910	0.514	468	286	1.0	1.0	8.142	A
4 - Woodgreen Avenue	1124	281	357	1411	0.796	1124	1342	3.7	3.8	12.454	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	351	88	753	967	0 363	352	465	0.9	0.6	5.872	A
2 - Queensway	831	208	410	1384	0 600	837	695	3.2	1.5	6.662	A
3 - Broughton Road (SW)	382	96	1012	1033	0 370	384	235	1.0	0.6	5.560	A
4 - Woodgreen Avenue	918	229	293	1442	0 637	926	1103	3.8	1.8	7.080	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Broughton Road (NE)	294	73	628	1029	0 285	294	388	0.6	0.4	4.906	A
2 - Queensway	696	174	343	1423	0.489	698	579	1.5	1.0	4.978	A
3 - Broughton Road (SW)	320	80	844	1128	0 284	321	196	0.6	0.4	4.463	A
4 - Woodgreen Avenue	769	192	245	1465	0 525	771	920	1.8	1.1	5.210	A

Forester House
Doctor's Lane
Henley-in-Arden
Warwickshire
B95 5AW

Tel: +44(0)1564 793598
inmail@dtatransportation.co.uk
www.dtatransportation.co.uk