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Title: TRANSPORT ASSESSMENT
Project: Alington Estate, Little Barford
Client: Executors of the Late Nigel Alington
Project No.:   60830

1.   Access and Transportation Strategy

1.1.   The following technical briefing note is provided by way of clarification in relation to sustainable travel accessibility for the development of land at Little Barford.

1.2.   This note should be read in conjunction with the forms and associated information in relation to **the "new settlement** and parish growth **options"** (Growth and Spatial Strategy Options 2b, 2c and 2d of the Bedford Borough Local Plan 2040 – Draft Plan Strategy Options and Draft Policies Consideration, June 2021) in respect of the Alington Estate.   Reference has been made to enclosed Drawing 60830-PP-014A for the suggested on-site and off-site highway works to facilitate sustainable travel to / from the current main local conurbation that provides employment and local amenities, which is St Neots. The town centre of which is located within a 5km distance of most of the site, thus is considered a reasonable cycle distance for most able-bodied people.   Other key destinations for commuter journeys are Bedford, Huntingdon, Cambridge and London (in order of demand).

1.3.   The development proposals will provide non-residential development including local employment, commensurate scale convenience food retail and community infrastructure, to reduce the need to travel outside of the development boundaries (internalisation of journeys). This will be an excellent way to improve the project's sustainability credentials, however, it is recognised that St Neots might represent a destination for those on foot and by bicycle. Local bus travel to / from St Neots will also be a key feature for those that may have mobility issues and will assist in improving social inclusion.

1.4.   It will specifically refer to the aspects of the development connection junctions with the existing highway network, connectivity to the wider footway, cycleway and highway network as well as provision for public transport. The hierarchy of sustainable transport is considered, aligned with local and national transportation policy to deliver sustainable links for the development.

1.5.   It is assumed at this stage, that Barford Road which is currently a 40mph and 60mph road will be reduced to a 30mph road from the A428 roundabout junction to the most southern access into the development boundary.

1.6   Decisions in relation to East West Rail routes and station locations and whether a growth **location at Tempsford will be allocated in a future iteration of the Central Bedfordshire's** local plan are uncertain at this time. For this technical note these have not been factored into consideration of the potential for sustainable travel gains and/or diverting destination preferences away from St Neots. However, either of these will clearly improve the sustainable travel options of the development proposals at Little Barford and increase designation choice.

2.   Footway / Cycleway Connections

2.1.   Consideration has been given to the accessibility on foot and connections to the wider footpaths, footways and Public Rights of Way (PROW).

    Public Rights of Way

2.2.   There are very few PROW across the site, with the exception of the footpath that links to the north west of the development towards the River Great Ouse and onwards to the Ouse Valley Way and into St Neots. The site visit data has enabled a review of the potential that the connection to the PROW next to the River Great Ouse can be made more accessible and deliver greater potential for pedestrians and other users, if land constraints allow.

2.3. The PROW is indicated as Footpath 1 and 4 along the route from the north west corner of the development, near the southwest corner of the power station towards Pocket Park, Eynesbury, St Neots. The PROW is indicated to be within a development parcel and will need to be accommodated in a site layout or diverted via the necessary legal processes.

2.4. A review of the route has indicated that there are a number of pinch points due to infrastructure required by the power station which would make the route unsuitable as a continuous cycle path. The route is more suited as a recreational footpath and riverside walk.

2.5. Alternatively, dedicated cycle routes are achievable to destinations at St Neots via Barford Road, therefore the inability to upgrade this existing PROW should not affect the sustainable links between St Neots.

2.6. The first section of the footpath to the power station from the site is through woodland and varies in width from 1m to 2m approximately. The footpath in general is not very wide and there is a pinch point about 65m from the southwestern corner of the power station site, north, along the western boundary, where there is an outfall from the power station into the river.

2.7. The footpath continues north through woodland where there may be an opportunity to widen the route with the removal of some trees, subject to arboriculturist advice to encourage the use of the route and enhance the user experience. Enhancements may include seating, way markings or information boards with items of interest. Due to the natural characteristics of the route surfacing is not proposed.

2.8. Towards the north western edge of the power station site there is a concrete footpath crossing over the drain which flows from the power station, this is approximately 10m long and 1m wide. There appears to be little ability to widen the footbridge at this location.

2.9. Once the route continues north from the drain crossing, there is more woodland and trimming the trees in this location would be very beneficial. The route of the footpath across the grassed areas to the west of Alington Road, near the office blocks is not clearly defined. If possible the opportunity to demarcate the footpath in this location, would benefit the community, however, the ability of the development to achieve sustainable travel options is not predicated on this.

2.10. The route under the existing A428 is not clearly defined and this area could be enhanced to distinguish itself from the skate park area. Beyond and to the north of the existing A428 the footpath is wider and surfaced and links to the wider PROW network and existing leisure and community facilities, thus no improvements north of the A428 are proposed.

2.11. Although improvements to PROWs within a site boundary can be undertaken by the developer, outside of the development boundary, the responsibility lies with the landowners and/or the PROW officers at the local authority. The works could be funded through Section 106 obligations. However, it is considered that work undertaken to date is proportionate with stage of plan preparation (Regulation 18). If following further assessment all the enhancements are not deliverable this would not dimmish the ability of development at Little Barford to achieve sustainable travel option via alternative routes eg direct along the Barford Road.

2.12. Drawing 60830-PP-014A, indicates the location of new PROW connections to the existing PROW network. These are not essential to the sustainability of the proposals but would create leisure / dog walking routes.

3.   Adoptable Footways

3.1.   Footways and cycleways will be an integral part of the development infrastructure to deliver sustainable choices for residents, employees and visitors.

3.2.   Other connections from the development site are to be promoted. As an example, improvements to the current East Coast Railway Line (ECRL) underpass for pedestrians and cyclists. This is currently a private means of accessing from one side of the ECRL to the other. In addition, links over the existing ECRL in the southern part of the site and over the proposed A428 near to Top Farm. The latter is currently proposed as a private access to enable the Alington Estate to continue to operate as a farming estate following construction of the A428 Black Cat to Caxton Gibbet improvement. However the allocation of land within the Alington Estate for a new settlement will enable access near to Gipsy Corner on Potton Road to the wider footway network of PROW 1/11 near Parker's Farm and also PROW 1/9 near Hen Brook.

3.3.   From a review of Barford Road and the existing dwellings adjacent to the site boundary, it is considered that given the roads nature and land constraints that any principal pedestrian routes would be best retained within the development itself. The footways can then be of a width usable by all (i.e., disabled, wheelchair, prams etc.) as well as providing more direct attractive routes along key desire lines for the new residents. Therefore, very little footway works are suggested along Barford Road within the boundaries of the site, other than where it is necessary to cross the road between development parcels.

3.4.   North of the main development boundary, the highway boundary for the Barford Road has spare highway land to accommodate sustainable travel infrastructure. This is proposed as a shared use footway / cycleway.

4.   Adoptable Cycleways

4.1.   Promotion and delivery of cycling infrastructure is one of the key objectives and focuses of current planning policy, therefore, due consideration of desire lines and routing within the development masterplan will be very important to achieve the sites sustainability credentials. As mentioned, the main desire line, especially of those wishing to travel by bicycle, outside of the development boundary will be employment areas to the north and St Neots. These areas are within a 5km radius of most of the development site which is a reasonable cycling distance for most able-bodied people. Beyond this distance, cycling becomes less favourable but with the ever-increasing popularity of e-bikes this distance can easily increase to 10km. With the exception of Sandy this will not bring any further conurbations within reach but will increase the likely number of people that will consider cycling. Cycling can also be used as a dual mode of travel with public transport like the train, enabling people to cycle either to the railway station or at the end destination.

4.2.   There are currently no suggested cycle routes along Barford Road which is typically a 60mph speed limit, as Barford Road will need to have its speed limit reduced to 30mph within the development boundaries, this will support some on-road cycling. However, the primary aim is to facilitate off-road cycling in accordance with the DfT document LTN 1/20 'Cycle Infrastructure Guidance' taking into consideration the likely traffic volumes on Barford Road and the potential number of cyclists.

4.3.   As mentioned earlier, rather than facilitate cycling along the current Barford Road, the more direct route for future residents will be to have internal cycleways adjacent to the principal roads within the site.   These can be shared use, segregated lanes, dedicated cycleways within the development site which can be determined as the development masterplan is progressed.   The benefit of using proposed highway land is that foot/cycle paths can be constructed within utility easements, which will assist in maximising development land west of the existing railway line.

4.4. Proposed routes of cycleways are shown on Drawing 60830-PP-014A and where not identified within a development parcel, cycling, would be on-road. These routes will connect the development parcels and funnel cyclists towards the proposed northern access point for the development. This also applies to any key focal areas such as a public transport hub or community areas where cycling will need to be parallel to Barford Road within the development, given the land constraints alongside Barford Road, in the centre of the development area. The proposed infrastructure is therefore subject to confirmation of highway land along Barford Road and parts of the A428.

4.5. The proposed northern access to the site is a roundabout which will have cycleways around its perimeter and then two off-road shared use cycleways will be provided on both sides of a slightly realigned Barford Road to the current accesses to the Power Station. Due to land constraints further north, the objective is then to transition all cyclists to the eastern side of Barford Road only. Pedestrians can continue on the western side of Barford with a fully connected route of footways.

4.6. Based on the potential future traffic volumes along Barford Road, cyclists will need to be provided with a controlled Toucan (for pedestrians and cyclists) crossing. On the assumption that the existing roundabout access for the Power Station is fully within highway land, then it is proposed that this junction is signalised to enable cyclists to cross Barford Road and the eastern access to the Power Station. The design of the traffic signal junction does allow for the maximum legal HGV but it is known that occasionally the Power Station has abnormal loads to / from the site. Therefore, any future junctions will need to be subject to discussions with the highway authority and the Power Station operator.

4.7. North of the Power Station junction there will be a short section of footway connection to an existing footway on the western side of Barford Road but on the eastern side of Barford Road there will need to be a 3.5m wide shared use cycleway (3.0m minimum width over short sections i.e., the pedestrian overbridge for the Power Station). This shared use cycleway continues the full length of Barford Road to the A428 junction. On this side of the road, there appears to be sufficient highway land (that is reasonably level) to accommodate an off-road cycleway which will have limited effect on the operation of Barford Road during its construction. There will be a need for some minor regrading of verges, hedge trimming, and lamp column relocation. The route should have limited impact on existing utilities with the exception of altering any inspection covers. Where existing accesses are located, these can still be accommodated with a cycleway across them and still retain their purposes. Several design options are presented in the LTN 1/20 guidance document.

4.8. With regards to the A428 roundabout junction, in future years, it has been identified that the western arm of the A428 will accommodate many more traffic movements than the eastern arm; therefore to minimise impacts on the majority of traffic movements any form of crossing to the north will need to be on the eastern arm of the A428. The A428 is currently a 60mph single carriageway road and based on LTN 1/20 would require an overbridge for cyclists and pedestrians. However, there is insufficient land north and south of the A428 to provide an overbridge and accommodate the relevant gradients for cyclists and wheelchair users. Therefore, the speed limit for at least 600m in either direction of the A428 roundabout will need to be reduced to at least 50mph to enable an at-grade Toucan-controlled crossing on the eastern arm. This is shown on Drawing 60830-PP-014A and would need to be a staggered arrangement to reduce impacts on the A428 traffic. The position of this crossing is dictated by the Design Manual for Roads & Bridges (DMRB) document CD116, which will require the crossing to be 60m away from the give way line of the roundabout. Further topographical surveying is required along the A428 to further the design of this crossing.

4.9.   The introduction of the controlled Toucan crossing will alter the entry of the roundabout junction and to mitigate the reduction of one of the entry lanes, it is proposed to provide a dual lane approach that enables two lanes of traffic across the roundabout and then merge back again on the western exit lane. This has necessitated a longer two lane exit on the western arm of the A428 and thus requires road widening. As it is known that the western approach lane to the roundabout has capacity concerns, the works can also include for increasing the two lane approach capacity.

4.10. North of the A428 roundabout junction, the cycleway continues on the eastern side of the B1043 (Barford Road) to the B1043 / Tesco / Chapman Way roundabout. This appears to be achievable subject to some vegetation clearing. To continue the cycleway along the eastern side and keep the route direct, the roundabout will need to be narrowed around the perimeter to facilitate a 3.0m shared use cycleway that will then link with existing infrastructure north of the roundabout. The roundabout central island will also need to reduce in diameter accordingly. This will facilitate the main desire line to / from the site to St Neots.

4.11. It has also been noted, from worn grassed verge areas, that there is an existing desire line for pedestrians from the housing development in St Neots, east of the B1043 to the Tesco superstore. There will also be a desire line for pedestrians and cyclists from the proposed development at Little Barford in the same area. To accommodate this, it is proposed to provide a controlled Toucan crossing across the dual lane carriageway of the B1043, which will require a speed limit reduction from 50mph to 40mph. The controlled Toucan crossing will have a staggered central island to reduce the impacts on the traffic using the B1043 and reduce the potential for any backing up to the A428.

4.12. A short section of the existing footway on the western side of the B1043, will also need to be upgraded to a 3.0m wide cycleway for access to the Tesco superstore.

5.   Public Transport

5.1.   The existing public transport for Little Barford is currently poor and there is only a single service which runs between Biggleswade and St Neots on a Thursday.

5.2.   The proposal for the scheme would mean that accessibility to public transport would be greatly enhanced and all development would ideally be within 400m of the main public transport corridors (1200m at an absolute maximum) with an improved frequency to meet demand and local policy. Accessible compliant bus stops and infrastructure will be introduced with Real Time Passenger Information (RTPI) provision proposed where appropriate to enable better communication to customers of the services provided. Additional segregated bus infrastructure routes could be introduced should major benefits be realised by providing these.

5.3.   In terms of frequency this will need to be at least a half hourly service into St Neots but will be subject to discussions with a bus operator and the Local Authorities' passenger transport teams. In terms of the bus route final destination, this will be St Neots town centre, whilst passing the Tesco store, leisure centre and Ernulf Academy for secondary education. Further bus stops would be provided along Barford Road to serve the existing power station and business parks to enable enhanced sustainable travel options to existing employees.

5.4. Within the town centre, passengers can then link with the train station and other bus routes. The origin of the bus route, would be Sandy or Biggleswade. However, if development is delivered south of the Alington Estate the scale of development is likely to change destination choices away from St Neots.

5.5. The new bus service route would again be best facilitated within the proposed highway infrastructure on the site, this is shown on Drawing 60830-PP-014A and only utilises the existing Barford Road where necessary and beyond the development boundaries to the north and south. This reduces the need for any major offsite highway works to the existing Barford Road and increase the proximity of the bus route to the new residents.

5.6. Development east of the East Coast railway line would be within a 1200m distance of the proposed route. In order to be an attractive alternative to the car, a bus route needs to be as direct as possible with few interruptions. The bus route could be diverted into the development parcel and then return to Barford Road on an occasional basis (i.e., a peak hour service for traditional working hours), but the main route would be retained as that proposed. Further to this, it is recommended that the site includes a Public Transport Hub, which can also facilitate as a community hub. This could be a larger bus terminal with cycle parking facilities, small shops and other attractors for residents. The possible location is shown on the enclosed Drawing 60830-PP-014A. This will assist people in walking / cycling from development east of the railway line to the public transport hub and then accessing the bus service.

East – West Rail Link

5.7. The East West Rail Link (EWRL) is a valuable rail infrastructure project for the region to connect Oxford with Cambridge and more locally Bedford with Cambridge. The current planning stages of the EWRL is to provide the route between St Neots and Sandy although the exact route is not defined there is consultation underway on a preferred option. This will also create a new train station either within the Alington Estate or within the land to the south (Central Bedfordshire). This will provide a very good sustainable travel choice to those commuting to Bedford or Cambridge.

5.8. Cycle links to the chosen location of the EWRL train station will therefore be important. Whilst a decision on the route and station location is likely to be beyond Bedford Borough **Council's timeframe for the** Regulation 19 stage of the BBLP 2040 preparation a strategic option exists, which would future prove sustainable travel between the four EWR station options of St Neots South Option A, St Neots South Option B, Tempsford Option A and Tempsford Option B by incorporating a route immediately east of and parallel with the existing ECRL.

6. *Other sustainable travel principles*

6.1. The public transport hub could also be a local point for a community car club across the development. This will allow people to consider whether they own a car or second car if a pay as you go service is available on site.

6.2. Housing designed with home working in mind e.g. small office and excellent broadband infrastructure would further internalise and reduce journeys and their length.

6.3. The development will be required to implement a Travel Plan which will concentrate on key areas to assist in resident travel planning and habits.

7. *Phasing of Sustainable Travel Highway Works*

7.1. Access to / from the initial phases of development by modes other than the car will be important to establish sustainable travel habits. Subject to other early years infrastructure costs the Barford Road cycleway works from the northern access point to the Tesco superstore should be considered as earlier infrastructure provision.

7.2. To avoid delaying the start of construction or first occupation an interim dedicated bus service could be provided that links the site directly with the centre of St Neots, whilst cycling infrastructure and TRO's are implemented. This dedicated bus service could then develop into the suggested permanent bus service as the development construction progresses and the cycle infrastructure is completed.

7.3. The development phasing and phasing of other infrastructure costs will influence the phased implementation of the bus service.

7.4. On-site cycleways and bus stops etc. will develop as the development phasing progresses and masterplans for each parcel are designed.

8. *Highway Access*

8.1. Connectivity to the wider highway network would be provided to enable access to the neighbouring conurbations, employment, shopping and leisure activities.

8.2. The initial primary access can be made via Barford Road via junction types appropriate to the proposed number of trips expected, generated by the development type. The main accesses to the development will be provided by roundabouts. Other T-junctions and Right Turn Lanes may need to be provided but these will be kept to a minimum.

8.3. Access to the east of the ECRL will be made via an overbridge combining footway and cycleway facilities, with the existing centrally located railway underpass improved to provide pedestrian and cyclist provision. Subject to the final access option strategy a second overbridge of the ECRL may be required. Initial locations and designs are shown on drawings 60830-S-004 and 60830-S-005 submitted previously to Bedford Borough Council.

8.4. A further overbridge is proposed near to Top Farm as part of the A428 Black Cat to Caxton Gibbet new expressway for farm traffic. This location could also be used to provide an access for all modes of road transport to connect to the wider highway network at Potton Road or on to the proposed A428.

8.5. Where necessary access will be provided in line with local and national policy, designed to the Design Manual for Roads and Bridges (DMRB) where appropriate or local design standards for residential and commercial development.

8.6. Should any new access to the land east of the railway line be agreed with Highways England to the new A428, then this will not affect the sustainability appraisal or suggested infrastructure set out herein. This will assist, however, in reducing traffic volumes along Barford Road and at the existing A428 roundabout junction.

9. *Summary*

9.1. An initial overview of the development proposals and accessibility indicates that there are some infrastructure requirements to facilitate the access, some onsite improvements and wider highway network upgrades, however these all appear to be achievable (subject to confirmation of highway boundary and future traffic assessments). This assessment has also considered the new A428 proposal and existing constraints such as the ECRL and existing gas mains and overhead electricity pylons and cables.

Martin Doughty, Director, BEng(Hons), CEng, FICE, FCIHT, MAPM on behalf of Richard Jackson Ltd

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TRL THE FUTURE OF TRANSPORT

Junctions 9
ARCADY 9 - Roundabout Module
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Filename: A428-B1043 RJ Geom Existing.j9
Path: O:\60000 - Engineering\60800\60830 - Alington Estate, Little Barford\Calculations\Transport\Models
Report generation date: 12/08/2021 15:31:08

»Exising Layout - 2040 with A428 scheme, AM
»Exising Layout - 2040 with A428 scheme, PM
»Exising Layout - 2040 with A428 scheme + Phase 1, AM
»Exising Layout - 2040 with A428 scheme + Phase 1, PM

Summary of junction performance

	AM		PM	
	Q (Veh)	**RFC**	**Q (Veh)**	**RFC**
Exising Layout [Lane Simulation] - 2040 with A428 scheme				
1 - A428 (e)	2.9		3.8	
2 - Barford Road (s)	0.2		0.8	
3 - A428 (w)	3.1		3.6	
4 - B1043 Barford Road (n)	2.3		2.5	
Exising Layout [Lane Simulation] - 2040 with A428 scheme + Phase 1				
1 - A428 (e)	2.3		4.3	
2 - Barford Road (s)	0.4		1.2	
3 - A428 (w)	3.6		4.2	
4 - B1043 Barford Road (n)	2.0		2.5	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of Av. delay per arriving vehicle. Arm and junction delays are Av.s for all movements, including movements with zero delay.

File summary

File Description

Title	A428/Barford Road
Location	St Neots
Site number	
Date	06/08/2021
Version	
Status	TA
Identifier	
Client	
Jobnumber	
Enumerator	RJPLC\duncanpalmer
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	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75				0.85	36.00	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Av. animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			1873705793	86	16.11

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Results for central hour only	Run automatically
D1	2040 with A428 scheme	AM	ONE HOUR	07:45	09:15	15	✓	✓
D2	2040 with A428 scheme	PM	ONE HOUR	16:45	18:15	15	✓	✓
D3	2040 with A428 scheme + Phase 1	AM	ONE HOUR	07:45	09:15	15	✓	✓
D4	2040 with A428 scheme + Phase 1	PM	ONE HOUR	16:45	18:15	15	✓	✓
D5	2040 with A428 scheme + Phases 1&2	AM	ONE HOUR	07:45	09:15	15	✓	✓
D6	2040 with A428 scheme + Phases 1&2	PM	ONE HOUR	16:45	18:15	15	✓	✓
D7	2040 with A428 scheme + Phases 1,2&3	AM	ONE HOUR	07:45	09:15	15	✓	✓
D8	2040 with A428 scheme + Phases 1,2&3	PM	ONE HOUR	16:45	18:15	15	✓	✓

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Use specific Demand Set(s)	Specific Demand Set (s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Exising Layout	✓	✓	✓	D1,D2,D3,D4	100.000	100.000

Exising Layout - 2040 with A428 scheme, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - Exising Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - A428 (w) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D1 - 2040 with A428 scheme, AM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	9.22	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A428 (e)	
2	Barford Road (s)	
3	A428 (w)	
4	B1043 Barford Road (n)	

Roundabout Geometry

Arm	V (m)	E (m)	I' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - A428 (e)	4.70	11.10	80.0	20.0	49.0	34.5	
2 - Barford Road (s)	3.92	8.10	29.0	21.6	49.0	35.2	
3 - A428 (w)	4.20	9.30	40.0	44.7	49.0	27.6	
4 - B1043 Barford Road (n)	7.20	8.00	1.8	28.0	49.0	43.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A428 (e)	0.841	2922
2 - Barford Road (s)	0.671	2025
3 - A428 (w)	0.767	2454
4 - B1043 Barford Road (n)	0.701	2211

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

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A428 (e)	Evenly split	10.00
2 - Barford Road (s)	Evenly split	10.00
3 - A428 (w)	Evenly split	10.00
4 - B1043 Barford Road (n)	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Min Cap (PCU/hr)	Max Cap (PCU/hr)	Signalised
1 - A428 (e)	Entry	1	1	2	✓	12.00		0	99999	
		1	2	3	✓	12.00		0	99999	
		1	3	1, 4	✓	12.00		0	99999	
		2	1	(2, 3)	✓	5.00				
		2	2	(1, 3, 4)	✓	5.00				
		3	1	((1, 2, 3, 4))		Infinity				
	Exit	1	1			Infinity				
2 - Barford Road (s)	Entry	1	1	3, 4	✓	4.00		0	99999	
		1	2	1, 2, 4	✓	4.00		0	99999	
		2	1	(1, 2, 3, 4)		Infinity				
	Exit	1	1			Infinity				
3 - A428 (w)	Entry	1	1	4	✓	9.00		0	99999	
		1	2	1, 2, 3	✓	9.00		0	99999	
		2	1	(1, 2, 3, 4)		Infinity				
	Exit	1	1			Infinity				
4 - B1043 Barford Road (n)	Entry	1	1	1, 2		Infinity		0	99999	
		1	2	3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A428 (e)	Entry	1	1	0.280	974
			2	0.280	974
			3	0.280	974
2 - Barford Road (s)	Entry	1	1	0.335	1012
			2	0.335	1012
3 - A428 (w)	Entry	1	1	0.383	1227
			2	0.383	1227
4 - B1043 Barford Road (n)	Entry	1	1	0.351	1105
			2	0.351	1105

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	A428 (e)	Barford Road (s)	A428 (w)	B1043 Barford Road (n)
1 - A428 (e)	1	1		✓		
		2			✓	
		3	✓			✓
	2	1		✓	✓	
		2	✓		✓	✓
	3	1	✓	✓	✓	✓
2 - Barford Road (s)	1	1			✓	✓
		2	✓	✓		✓
	2	1	✓	✓	✓	✓
3 - A428 (w)	1	1				✓
		2	✓	✓	✓	
	2	1	✓	✓	✓	✓
4 - B1043 Barford Road (n)	1	1	✓	✓		
		2			✓	✓

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)	Results for central hour only	Run automatically
D1	2040 with A428 scheme	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 - A428 (e)		ONE HOUR	✓	692	100.000
2 - Barford Road (s)		ONE HOUR	✓	78	100.000
3 - A428 (w)		ONE HOUR	✓	1063	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	712	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	146	454	92
	2 - Barford Road (s)	24	0	25	29
	3 - A428 (w)	599	38	0	426
	4 - B1043 Barford Road (n)	168	106	438	0

Vehicle Mix

HV %s

From		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	0	3	2
	2 - Barford Road (s)	0	0	9	0
	3 - A428 (w)	6	9	0	3
	4 - B1043 Barford Road (n)	4	0	3	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	10.98	2.9	B	697	697
2 - Barford Road (s)	6.16	0.2	A	80	80
3 - A428 (w)	8.08	3.1	A	1071	1071
4 - B1043 Barford Road (n)	9.59	2.3	A	707	707

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	617	154	517	613	636	714	0.8	1.4	7.518	A
2 - Barford Road (s)	74	18	870	72	70	259	0.1	0.2	5.389	A
3 - A428 (w)	979	245	125	982	998	817	1.1	1.7	6.049	A
4 - B1043 Barford Road (n)	636	159	596	634	662	511	0.9	1.4	6.812	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	777	194	634	773	780	870	1.4	2.4	10.480	B
2 - Barford Road (s)	90	23	1092	89	89	314	0.2	0.2	5.939	A
3 - A428 (w)	1163	291	173	1157	1208	1009	1.7	2.7	7.899	A
4 - B1043 Barford Road (n)	784	196	719	785	803	610	1.4	1.8	9.153	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	778	194	629	774	786	875	2.4	2.8	10.977	B
2 - Barford Road (s)	84	21	1085	84	86	319	0.2	0.1	6.159	A
3 - A428 (w)	1172	293	156	1172	1227	1013	2.7	3.1	8.082	A
4 - B1043 Barford Road (n)	769	192	737	767	805	591	1.8	2.2	9.586	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	618	154	532	619	643	716	2.8	1.3	8.110	A
2 - Barford Road (s)	71	18	879	72	71	272	0.1	0.1	5.893	A
3 - A428 (w)	967	242	141	959	1006	809	3.1	2.1	6.350	A
4 - B1043 Barford Road (n)	639	160	607	641	658	493	2.2	1.4	7.347	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	134	825	0.162	134	134	0.2	0.1	5.082	A
		1	2	3	410	801	0.511	406	420	0.6	1.2	8.857	A
		1	3	1, 4	73	800	0.091	73	82	0.1	0.1	4.735	A
		2	1	(2, 3)	345			345	346	0.0	0.0	0.000	A
		2	2	(1, 3, 4)	272			272	292	0.0	0.0	0.000	A
		3	1	((1, 2, 3, 4))	617			617	639	0.0	0.0	0.000	A
	Exit	1	1		714			714	738	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	35	703	0.049	34	36	0.0	0.1	5.269	A
		1	2	1, 2, 4	39	712	0.055	38	34	0.0	0.1	5.510	A
		2	1	(1, 2, 3, 4)	74			74	71	0.0	0.0	0.000	A
	Exit	1	1		259			259	268	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	406	1144	0.355	409	400	0.4	0.6	4.966	A
		1	2	1, 2, 3	573	1113	0.515	573	598	0.7	1.1	6.769	A
		2	1	(1, 2, 3, 4)	979			979	1000	0.0	0.0	0.014	A
	Exit	1	1		817			817	852	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	243	863	0.281	243	253	0.3	0.5	5.929	A
		1	2	3, 4	393	859	0.459	391	409	0.6	0.9	7.362	A
	Exit	1	1		511			511	509	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	161	791	0.204	160	160	0.1	0.4	5.742	A
		1	2	3	504	770	0.654	502	513	1.2	1.8	13.046	B
		1	3	1, 4	112	774	0.145	111	106	0.1	0.2	5.273	A
		2	1	(2, 3)	414			414	420	0.0	0.0	0.030	A
		2	2	(1, 3, 4)	363			363	364	0.0	0.0	0.027	A
		3	1	((1, 2, 3, 4))	777			777	784	0.0	0.0	0.000	A
	Exit	1	1		870			870	910	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	45	605	0.075	44	47	0.1	0.1	6.139	A
		1	2	1, 2, 4	45	636	0.072	45	42	0.1	0.1	5.725	A
		2	1	(1, 2, 3, 4)	90			90	89	0.0	0.0	0.000	A
	Exit	1	1		314			314	319	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	468	1120	0.418	466	472	0.6	0.7	5.425	A
		1	2	1, 2, 3	695	1093	0.635	691	736	1.1	1.9	9.077	A
		2	1	(1, 2, 3, 4)	1163			1163	1212	0.0	0.0	0.272	A
	Exit	1	1		1009			1009	1038	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	306	817	0.374	306	307	0.5	0.7	6.975	A
		1	2	3, 4	479	814	0.588	479	495	0.9	1.1	10.512	B
	Exit	1	1		610			610	611	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	164	792	0.207	165	163	0.4	0.3	5.919	A
		1	2	3	516	767	0.673	513	518	1.8	2.3	13.664	B
		1	3	1, 4	97	772	0.126	96	105	0.2	0.2	5.554	A
		2	1	(2, 3)	421			420	424	0.0	0.0	0.029	A
		2	2	(1, 3, 4)	357			357	363	0.0	0.0	0.029	A
		3	1	((1, 2, 3, 4))	778			778	788	0.0	0.0	0.000	A
	Exit	1	1		875			875	917	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	40	614	0.065	40	43	0.1	0.1	6.443	A
		1	2	1, 2, 4	44	637	0.069	44	42	0.1	0.1	5.882	A
		2	1	(1, 2, 3, 4)	84			84	86	0.0	0.0	0.000	A
	Exit	1	1		319			319	325	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	465	1126	0.412	464	480	0.7	0.7	5.628	A
		1	2	1, 2, 3	706	1092	0.648	709	747	1.9	2.2	9.312	A
		2	1	(1, 2, 3, 4)	1172			1171	1228	0.0	0.2	0.224	A
	Exit	1	1		1013			1013	1044	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	293	814	0.360	291	306	0.7	0.7	6.943	A
			2	3, 4	476	806	0.590	476	499	1.1	1.5	11.212	B
	Exit	1	1		591			591	617	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	129	820	0.157	129	129	0.3	0.2	5.079	A
		1	2	3	399	795	0.502	399	426	2.3	1.0	9.735	A
		1	3	1, 4	90	804	0.112	91	88	0.2	0.1	4.935	A
		2	1	(2, 3)	323			323	339	0.0	0.0	0.005	A
		2	2	(1, 3, 4)	294			294	298	0.0	0.0	0.002	A
		3	1	((1, 2, 3, 4))	618			618	637	0.0	0.0	0.000	A
	Exit	1	1		716			716	756	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	33	645	0.051	33	36	0.1	0.0	6.084	A
		1	2	1, 2, 4	38	709	0.053	38	35	0.1	0.0	5.712	A
		2	1	(1, 2, 3, 4)	71			71	71	0.0	0.0	0.000	A
	Exit	1	1		272			272	265	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	377	1142	0.330	375	390	0.7	0.6	4.787	A
		1	2	1, 2, 3	589	1105	0.534	585	616	2.2	1.5	7.220	A
		2	1	(1, 2, 3, 4)	967			966	1003	0.2	0.0	0.104	A
	Exit	1	1		809			809	853	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	253	859	0.295	252	254	0.7	0.4	5.895	A
			2	3, 4	386	856	0.452	388	404	1.5	0.9	8.263	A
	Exit	1	1		493			493	505	0.0	0.0	0.000	A

Exising Layout - 2040 with A428 scheme, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - Exising Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - A428 (w) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D2 - 2040 with A428 scheme, PM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	11.89	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)	Results for central hour only	Run automatically
D2	2040 with A428 scheme	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 - A428 (e)		ONE HOUR	✓	873	100.000
2 - Barford Road (s)		ONE HOUR	✓	281	100.000
3 - A428 (w)		ONE HOUR	✓	1154	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	667	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	141	525	207
	2 - Barford Road (s)	143	0	49	89
	3 - A428 (w)	477	11	0	666
	4 - B1043 Barford Road (n)	91	75	501	0

Vehicle Mix

HV %s

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	0	2	1
	2 - Barford Road (s)	0	0	2	0
	3 - A428 (w)	2	10	0	1
	4 - B1043 Barford Road (n)	1	0	1	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	14.35	3.8	B	885	885
2 - Barford Road (s)	9.09	0.8	A	286	286
3 - A428 (w)	11.23	3.6	B	1161	1161
4 - B1043 Barford Road (n)	10.95	2.5	B	665	665

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	791	198	516	783	794	640	1.2	1.8	8.550	A
2 - Barford Road (s)	259	65	1101	259	253	198	0.5	0.5	6.902	A
3 - A428 (w)	1023	256	400	1021	1051	961	1.5	1.9	6.862	A
4 - B1043 Barford Road (n)	595	149	565	592	598	857	0.6	1.3	6.923	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	970	242	650	965	966	761	1.8	3.8	12.809	B
2 - Barford Road (s)	315	79	1355	316	312	259	0.5	0.8	8.439	A
3 - A428 (w)	1280	320	479	1284	1287	1192	1.9	3.6	10.510	B
4 - B1043 Barford Road (n)	726	182	680	731	732	1084	1.3	1.8	9.658	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	966	241	662	959	966	801	3.8	3.8	14.347	B
2 - Barford Road (s)	317	79	1383	320	317	238	0.8	0.6	9.090	A
3 - A428 (w)	1288	322	486	1292	1300	1216	3.6	3.6	11.230	B
4 - B1043 Barford Road (n)	756	189	711	752	753	1068	1.8	2.5	10.955	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	811	203	515	807	809	645	3.8	2.2	9.879	A
2 - Barford Road (s)	253	63	1118	253	258	204	0.6	0.6	7.161	A
3 - A428 (w)	1051	263	400	1052	1061	971	3.6	1.9	7.247	A
4 - B1043 Barford Road (n)	586	146	573	587	608	879	2.5	1.5	7.843	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	128	828	0.154	126	123	0.2	0.3	4.759	A
		1	2	3	475	815	0.583	470	487	0.7	1.2	10.651	B
		1	3	1, 4	188	820	0.229	187	183	0.3	0.3	5.560	A
		2	1	(2, 3)	356			356	367	0.0	0.0	0.001	A
		2	2	(1, 3, 4)	435			435	429	0.0	0.0	0.003	A
		3	1	((1, 2, 3, 4))	791			791	796	0.0	0.0	0.000	A
	Exit	1	1		640			640	640	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	91	630	0.144	91	91	0.2	0.2	6.074	A
		1	2	1, 2, 4	168	639	0.263	169	163	0.3	0.3	7.347	A
		2	1	(1, 2, 3, 4)	259			259	253	0.0	0.0	0.007	A
	Exit	1	1		198			198	200	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	586	1061	0.553	587	610	1.2	1.0	7.495	A
		1	2	1, 2, 3	436	1045	0.418	435	441	0.4	0.8	5.895	A
		2	1	(1, 2, 3, 4)	1023			1023	1052	0.0	0.0	0.035	A
	Exit	1	1		961			961	980	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	148	898	0.165	147	148	0.1	0.2	4.598	A
		1	2	3, 4	447	896	0.499	444	449	0.4	1.1	7.689	A
	Exit	1	1		857			857	875	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	163	790	0.206	164	160	0.3	0.2	5.663	A
		1	2	3	584	775	0.755	579	579	1.2	2.9	16.562	C
		1	3	1, 4	224	783	0.285	222	227	0.3	0.5	6.275	A
		2	1	(2, 3)	450			451	449	0.0	0.1	0.432	A
		2	2	(1, 3, 4)	520			520	525	0.0	0.1	0.365	A
		3	1	((1, 2, 3, 4))	970			970	974	0.0	0.1	0.048	A
	Exit	1	1		761			761	788	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	115	543	0.211	117	114	0.2	0.3	7.635	A
		1	2	1, 2, 4	199	552	0.361	199	198	0.3	0.5	8.847	A
		2	1	(1, 2, 3, 4)	315			315	313	0.0	0.0	0.032	A
	Exit	1	1		259			259	256	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	757	1032	0.734	765	746	1.0	2.2	11.719	B
		1	2	1, 2, 3	522	1019	0.513	519	540	0.8	1.3	7.400	A
		2	1	(1, 2, 3, 4)	1280			1279	1293	0.0	0.2	0.586	A
	Exit	1	1		1192			1192	1183	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	177	859	0.206	176	185	0.2	0.4	5.143	A
		1	2	3, 4	549	855	0.642	555	547	1.1	1.4	11.196	B
	Exit	1	1		1084			1084	1070	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	144	786	0.184	145	149	0.2	0.2	5.713	A
		1	2	3	597	770	0.777	591	591	2.9	3.1	18.382	C
		1	3	1, 4	222	780	0.284	223	227	0.5	0.2	6.554	A
		2	1	(2, 3)	445			445	441	0.1	0.1	0.675	A
		2	2	(1, 3, 4)	520			519	525	0.1	0.2	0.583	A
		3	1	((1, 2, 3, 4))	966			966	966	0.1	0.0	0.124	A
	Exit	1	1		801			801	806	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	114	538	0.212	114	116	0.3	0.2	7.670	A
		1	2	1, 2, 4	203	542	0.375	206	201	0.5	0.4	9.829	A
		2	1	(1, 2, 3, 4)	317			317	317	0.0	0.0	0.048	A
	Exit	1	1		238			238	240	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	738	1031	0.716	745	745	2.2	2.2	12.014	B
		1	2	1, 2, 3	548	1017	0.539	548	555	1.3	1.0	7.708	A
		2	1	(1, 2, 3, 4)	1288			1286	1298	0.2	0.4	1.027	A
	Exit	1	1		1216			1216	1218	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	186	846	0.220	183	184	0.4	0.4	5.428	A
			2	3, 4	570	843	0.675	568	570	1.4	2.1	12.737	B
	Exit	1	1		1068			1068	1073	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	129	828	0.156	128	127	0.2	0.3	5.237	A
		1	2	3	495	806	0.613	492	499	3.1	1.6	12.564	B
		1	3	1, 4	188	815	0.230	187	183	0.2	0.3	5.816	A
		2	1	(2, 3)	381			381	377	0.1	0.0	0.068	A
		2	2	(1, 3, 4)	431			431	427	0.2	0.0	0.058	A
		3	1	((1, 2, 3, 4))	811			811	802	0.0	0.0	0.000	A
	Exit	1	1		645			645	658	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	91	627	0.146	91	92	0.2	0.2	6.467	A
		1	2	1, 2, 4	162	631	0.258	162	167	0.4	0.4	7.512	A
		2	1	(1, 2, 3, 4)	253			253	258	0.0	0.0	0.017	A
	Exit	1	1		204			204	207	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	607	1064	0.570	607	607	2.2	1.1	7.816	A
		1	2	1, 2, 3	444	1053	0.422	445	454	1.0	0.8	6.128	A
		2	1	(1, 2, 3, 4)	1051			1051	1056	0.4	0.0	0.170	A
	Exit	1	1		971			971	998	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	150	895	0.168	149	152	0.4	0.3	4.844	A
			2	3, 4	436	891	0.489	438	455	2.1	1.2	8.858	A
	Exit	1	1		879			879	873	0.0	0.0	0.000	A

Exising Layout - 2040 with A428 scheme + Phase 1, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - Exising Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - A428 (w) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D3 - 2040 with A428 scheme + Phase 1, AM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	9.87	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)	Results for central hour only	Run automatically
D3	2040 with A428 scheme + Phase 1	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 - A428 (e)		ONE HOUR	✓	702	100.000
2 - Barford Road (s)		ONE HOUR	✓	154	100.000
3 - A428 (w)		ONE HOUR	✓	1090	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	734	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
	Arm	1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	156	454	92
	2 - Barford Road (s)	41	0	63	50
	3 - A428 (w)	599	65	0	426
	4 - B1043 Barford Road (n)	168	128	438	0

Vehicle Mix

HV %s

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	0	3	2
	2 - Barford Road (s)	0	0	9	0
	3 - A428 (w)	6	9	0	3
	4 - B1043 Barford Road (n)	4	0	3	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	11.36	2.3	B	704	704
2 - Barford Road (s)	6.72	0.4	A	154	154
3 - A428 (w)	9.20	3.6	A	1084	1084
4 - B1043 Barford Road (n)	10.12	2.0	B	737	737

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	638	159	580	640	643	721	0.8	1.2	7.543	A
2 - Barford Road (s)	141	35	899	141	147	320	0.2	0.2	5.631	A
3 - A428 (w)	970	242	177	968	1030	863	1.0	1.9	6.454	A
4 - B1043 Barford Road (n)	679	170	622	679	678	524	1.0	1.2	7.351	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	778	195	685	786	794	879	1.2	2.3	11.357	B
2 - Barford Road (s)	166	41	1079	167	171	392	0.2	0.4	6.508	A
3 - A428 (w)	1193	298	206	1190	1250	1039	1.9	3.5	9.199	A
4 - B1043 Barford Road (n)	791	198	769	795	812	627	1.2	2.0	9.929	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	754	188	706	756	780	888	2.3	1.9	10.827	B
2 - Barford Road (s)	169	42	1085	170	172	377	0.4	0.2	6.719	A
3 - A428 (w)	1187	297	195	1195	1261	1061	3.5	2.7	9.106	A
4 - B1043 Barford Road (n)	816	204	768	826	826	622	2.0	2.0	10.125	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	646	162	563	648	647	734	1.9	1.5	8.209	A
2 - Barford Road (s)	139	35	888	140	146	323	0.2	0.2	5.886	A
3 - A428 (w)	986	247	166	989	1046	862	2.7	1.7	6.536	A
4 - B1043 Barford Road (n)	660	165	637	659	683	517	2.0	1.3	7.349	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	144	807	0.179	144	141	0.1	0.2	5.150	A
			2	3	404	784	0.516	406	412	0.5	1.0	8.917	A
			3	1, 4	89	784	0.114	89	90	0.1	0.1	5.073	A
		2	1	(2, 3)	341			341	347	0.0	0.0	0.004	A
			2	(1, 3, 4)	296			296	299	0.0	0.0	0.007	A
		3	1	((1, 2, 3, 4))	638			638	645	0.0	0.0	0.000	A
	Exit	1	1		721			721	762	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	78	660	0.118	79	86	0.1	0.1	5.851	A
			2	1, 2, 4	62	702	0.089	62	61	0.1	0.1	5.334	A
		2	1	(1, 2, 3, 4)	141			141	147	0.0	0.0	0.004	A
	Exit	1	1		320			320	318	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	385	1124	0.343	385	396	0.4	0.5	4.880	A
			2	1, 2, 3	585	1090	0.536	584	633	0.6	1.3	7.378	A
		2	1	(1, 2, 3, 4)	970			970	1033	0.0	0.0	0.054	A
	Exit	1	1		863			863	884	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	275	856	0.321	275	268	0.2	0.3	5.912	A
			2	3, 4	405	850	0.476	404	411	0.8	0.9	8.300	A
	Exit	1	1		524			524	535	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	181	776	0.233	181	174	0.2	0.3	5.919	A
			2	3	492	750	0.655	498	515	1.0	1.9	14.235	B
			3	1, 4	106	759	0.140	107	105	0.1	0.1	5.563	A
		2	1	(2, 3)	429			429	437	0.0	0.0	0.115	A
			2	(1, 3, 4)	349			349	362	0.0	0.0	0.138	A
		3	1	((1, 2, 3, 4))	778			778	799	0.0	0.0	0.003	A
	Exit	1	1		879			879	926	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	92	608	0.152	93	98	0.1	0.2	6.848	A
			2	1, 2, 4	73	639	0.115	74	74	0.1	0.1	6.052	A
		2	1	(1, 2, 3, 4)	166			166	172	0.0	0.0	0.012	A
	Exit	1	1		392			392	387	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	466	1110	0.421	466	482	0.5	0.7	5.668	A
			2	1, 2, 3	725	1076	0.674	724	767	1.3	2.4	10.517	B
		2	1	(1, 2, 3, 4)	1193			1191	1256	0.0	0.4	0.564	A
	Exit	1	1		1039			1039	1073	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	319	804	0.397	321	327	0.3	0.5	7.567	A
			2	3, 4	473	794	0.596	474	485	0.9	1.5	11.529	B
	Exit	1	1		627			627	641	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	167	770	0.217	167	169	0.3	0.2	6.103	A
		1	2	3	495	748	0.661	497	508	1.9	1.5	13.514	B
		1	3	1, 4	92	756	0.121	92	103	0.1	0.2	5.526	A
		2	1	(2, 3)	412			412	424	0.0	0.0	0.013	A
		2	2	(1, 3, 4)	342			342	355	0.0	0.0	0.013	A
		3	1	((1, 2, 3, 4))	754			754	779	0.0	0.0	0.000	A
	Exit	1	1		888			888	938	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	95	602	0.158	96	99	0.2	0.1	7.148	A
		1	2	1, 2, 4	74	638	0.115	75	73	0.1	0.1	6.162	A
		2	1	(1, 2, 3, 4)	169			169	172	0.0	0.0	0.004	A
	Exit	1	1		377			377	386	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	473	1118	0.423	472	483	0.7	0.7	5.762	A
		1	2	1, 2, 3	716	1087	0.659	723	778	2.4	1.7	10.291	B
		2	1	(1, 2, 3, 4)	1187			1189	1258	0.4	0.2	0.598	A
	Exit	1	1		1061			1061	1075	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	326	801	0.408	329	331	0.5	0.7	7.458	A
			2	3, 4	489	798	0.613	497	495	1.5	1.3	11.922	B
	Exit	1	1		622			622	641	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	150	812	0.185	150	139	0.2	0.3	5.456	A
		1	2	3	412	788	0.523	414	423	1.5	1.0	9.771	A
		1	3	1, 4	84	799	0.105	84	85	0.2	0.1	5.140	A
		2	1	(2, 3)	354			354	349	0.0	0.0	0.005	A
		2	2	(1, 3, 4)	292			292	297	0.0	0.0	0.002	A
		3	1	((1, 2, 3, 4))	646			646	646	0.0	0.0	0.000	A
	Exit	1	1		734			734	780	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	78	654	0.119	79	86	0.1	0.1	6.177	A
		1	2	1, 2, 4	61	706	0.086	61	61	0.1	0.1	5.507	A
		2	1	(1, 2, 3, 4)	139			139	147	0.0	0.0	0.000	A
	Exit	1	1		323			323	315	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	387	1130	0.342	388	403	0.7	0.5	4.889	A
		1	2	1, 2, 3	600	1093	0.549	601	644	1.7	1.2	7.383	A
		2	1	(1, 2, 3, 4)	986			986	1043	0.2	0.0	0.144	A
	Exit	1	1		862			862	897	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	268	850	0.316	269	274	0.7	0.3	6.176	A
			2	3, 4	392	844	0.464	390	409	1.3	1.0	8.137	A
	Exit	1	1		517			517	532	0.0	0.0	0.000	A

Exising Layout - 2040 with A428 scheme + Phase 1, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - Exising Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - A428 (w) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D4 - 2040 with A428 scheme + Phase 1, PM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	11.99	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)	Results for central hour only	Run automatically
D4	2040 with A428 scheme + Phase 1	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 - A428 (e)		ONE HOUR	✓	888	100.000
2 - Barford Road (s)		ONE HOUR	✓	350	100.000
3 - A428 (w)		ONE HOUR	✓	1181	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	685	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
	Arm	1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	156	525	207
	2 - Barford Road (s)	155	0	83	112
	3 - A428 (w)	477	38	0	666
	4 - B1043 Barford Road (n)	91	93	501	0

Vehicle Mix

HV %s

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	0	2	1
	2 - Barford Road (s)	0	0	2	0
	3 - A428 (w)	2	10	0	1
	4 - B1043 Barford Road (n)	1	0	1	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	14.54	4.3	B	894	894
2 - Barford Road (s)	9.44	1.2	A	352	352
3 - A428 (w)	11.71	4.2	B	1178	1178
4 - B1043 Barford Road (n)	10.42	2.5	B	684	684

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	816	204	576	812	804	640	1.3	2.2	8.768	A
2 - Barford Road (s)	315	79	1130	316	317	258	0.4	0.6	6.869	A
3 - A428 (w)	1069	267	432	1068	1075	1014	1.7	2.3	7.289	A
4 - B1043 Barford Road (n)	621	155	596	620	616	904	0.8	1.2	7.297	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	984	246	691	986	977	790	2.2	3.7	14.185	B
2 - Barford Road (s)	394	99	1369	394	389	309	0.6	1.1	9.182	A
3 - A428 (w)	1282	321	534	1292	1306	1228	2.3	3.6	10.882	B
4 - B1043 Barford Road (n)	754	188	728	753	759	1098	1.2	2.5	10.424	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	985	246	696	976	995	805	3.7	4.3	14.543	B
2 - Barford Road (s)	384	96	1360	382	385	313	1.1	1.1	9.438	A
3 - A428 (w)	1297	324	525	1299	1327	1217	3.6	4.1	11.714	B
4 - B1043 Barford Road (n)	760	190	740	762	756	1083	2.5	2.1	10.282	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	791	198	550	796	822	652	4.3	1.9	10.327	B
2 - Barford Road (s)	314	79	1102	315	317	244	1.1	0.6	7.144	A
3 - A428 (w)	1065	266	422	1067	1100	995	4.1	1.9	7.289	A
4 - B1043 Barford Road (n)	602	150	600	602	624	889	2.1	1.2	8.007	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	141	810	0.174	140	139	0.2	0.2	5.448	A
			2	3	483	795	0.607	478	476	0.9	1.7	10.804	B
			3	1, 4	193	803	0.240	193	189	0.2	0.3	6.047	A
		2	1	(2, 3)	389			389	383	0.0	0.0	0.023	A
			2	(1, 3, 4)	427			427	425	0.0	0.0	0.015	A
		3	1	((1, 2, 3, 4))	816			816	808	0.0	0.0	0.000	A
	Exit	1	1		640			640	659	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	129	619	0.207	129	129	0.1	0.2	6.588	A
			2	1, 2, 4	186	628	0.297	187	188	0.3	0.4	7.023	A
		2	1	(1, 2, 3, 4)	315			315	318	0.0	0.0	0.021	A
	Exit	1	1		258			258	258	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	611	1053	0.580	615	604	1.0	1.2	7.943	A
			2	1, 2, 3	457	1033	0.443	453	471	0.7	1.0	6.260	A
		2	1	(1, 2, 3, 4)	1069			1069	1078	0.0	0.0	0.075	A
	Exit	1	1		1014			1014	1004	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	162	889	0.183	162	165	0.1	0.3	5.032	A
			2	3, 4	458	882	0.520	459	451	0.6	0.9	8.129	A
	Exit	1	1		904			904	891	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	165	777	0.212	166	168	0.2	0.2	5.832	A
			2	3	587	761	0.769	588	581	1.7	2.8	18.678	C
			3	1, 4	233	769	0.303	233	228	0.3	0.5	6.930	A
		2	1	(2, 3)	459			460	463	0.0	0.1	0.431	A
			2	(1, 3, 4)	525			525	520	0.0	0.1	0.454	A
		3	1	((1, 2, 3, 4))	984			984	983	0.0	0.0	0.033	A
	Exit	1	1		790			790	801	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	165	539	0.307	165	161	0.2	0.4	8.199	A
			2	1, 2, 4	229	547	0.418	229	227	0.4	0.7	9.677	A
		2	1	(1, 2, 3, 4)	394			394	391	0.0	0.0	0.108	A
	Exit	1	1		309			309	318	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	734	1009	0.727	739	734	1.2	2.1	11.586	B
			2	1, 2, 3	553	998	0.555	554	571	1.0	1.3	8.083	A
		2	1	(1, 2, 3, 4)	1282			1287	1311	0.0	0.1	0.811	A
	Exit	1	1		1228			1228	1224	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	204	838	0.244	204	206	0.3	0.4	5.759	A
			2	3, 4	550	837	0.657	548	553	0.9	2.1	12.157	B
	Exit	1	1		1098			1098	1089	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	167	777	0.215	167	168	0.2	0.3	6.002	A
			2	3	577	763	0.756	575	592	2.8	3.0	18.717	C
			3	1, 4	237	771	0.308	234	235	0.5	0.6	6.571	A
		2	1	(2, 3)	459			458	465	0.1	0.1	0.624	A
			2	(1, 3, 4)	525			523	532	0.1	0.2	0.592	A
		3	1	((1, 2, 3, 4))	985			983	997	0.0	0.1	0.227	A
	Exit	1	1		805			805	815	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	162	546	0.296	160	159	0.4	0.4	8.525	A
			2	1, 2, 4	222	551	0.403	222	227	0.7	0.7	9.815	A
		2	1	(1, 2, 3, 4)	384			384	385	0.0	0.0	0.157	A
	Exit	1	1		313			313	311	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	727	1013	0.718	731	744	2.1	2.5	12.127	B
			2	1, 2, 3	571	1003	0.570	568	582	1.3	1.5	8.889	A
		2	1	(1, 2, 3, 4)	1297			1298	1329	0.1	0.1	0.999	A
	Exit	1	1		1217			1217	1240	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	212	838	0.253	211	202	0.4	0.4	5.519	A
			2	3, 4	548	834	0.657	551	555	2.1	1.7	12.025	B
	Exit	1	1		1083			1083	1098	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2	134	817	0.164	133	141	0.3	0.2	5.454	A
			2	3	473	803	0.589	479	494	3.0	1.3	12.859	B
			3	1, 4	185	806	0.229	184	187	0.6	0.4	6.255	A
		2	1	(2, 3)	374			374	386	0.1	0.0	0.247	A
			2	(1, 3, 4)	416			416	428	0.2	0.0	0.210	A
		3	1	((1, 2, 3, 4))	791			791	813	0.1	0.0	0.128	A
	Exit	1	1		652			652	667	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	129	631	0.205	129	132	0.4	0.3	6.685	A
			2	1, 2, 4	185	638	0.290	186	185	0.7	0.3	7.448	A
		2	1	(1, 2, 3, 4)	314			314	315	0.0	0.0	0.014	A
	Exit	1	1		244			244	259	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	604	1054	0.574	606	621	2.5	1.2	7.909	A
			2	1, 2, 3	461	1036	0.445	461	479	1.5	0.7	6.393	A
		2	1	(1, 2, 3, 4)	1065			1065	1091	0.1	0.0	0.040	A
	Exit	1	1		995			995	1029	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	163	889	0.184	163	167	0.4	0.2	5.006	A
			2	3, 4	438	880	0.498	439	457	1.7	0.9	9.114	A
	Exit	1	1		889			889	909	0.0	0.0	0.000	A

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Junctions 9
ARCADY 9 - Roundabout Module
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Filename: A428-B1043 RJ Geom Proposed.j9
Path: O:\60000 - Engineering\60800\60830 - Alington Estate, Little Barford\Calculations\Transport\Models
Report generation date: 12/08/2021 15:42:27

»Proposed Layout - 2040 with A428 scheme + Phase 1, AM
»Proposed Layout - 2040 with A428 scheme + Phase 1, PM
»Proposed Layout - 2040 with A428 scheme + Phases 1&2, AM
»Proposed Layout - 2040 with A428 scheme + Phases 1&2, PM
»Proposed Layout - 2040 with A428 scheme + Phases 1,2&3, AM
»Proposed Layout - 2040 with A428 scheme + Phases 1,2&3, PM

Summary of junction performance

	AM		PM	
	Q (Veh)	**RFC**	**Q (Veh)**	**RFC**
Proposed Layout [Lane Simulation] - 2040 with A428 scheme + Phase 1				
1 - A428 (e)	1.4		2.3	
2 - Barford Road (s)	0.3		1.3	
3 - A428 (w)	6.0		9.1	
4 - B1043 Barford Road (n)	2.7		2.3	
Proposed Layout [Lane Simulation] - 2040 with A428 scheme + Phases 1&2				
1 - A428 (e)	1.5		3.4	
2 - Barford Road (s)	1.9		2.5	
3 - A428 (w)	10.8		18.4	
4 - B1043 Barford Road (n)	2.8		3.4	
Proposed Layout [Lane Simulation] - 2040 with A428 scheme + Phases 1,2&3				
1 - A428 (e)	2.4		42.6	
2 - Barford Road (s)	241.6		19.1	
3 - A428 (w)	95.4		268.4	
4 - B1043 Barford Road (n)	3.9		5.6	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of Av. delay per arriving vehicle. Arm and junction delays are Av.s for all movements, including movements with zero delay.

File summary

File Description

Title	A428/Barford Road
Location	St Neots
Site number	
Date	06/08/2021
Version	
Status	TA
Identifier	
Client	
Jobnumber	
Enumerator	RJPLC\duncanpalmer
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	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75				0.85	36.00	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Av. animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			188988298	103	19.12

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Results for central hour only	Run automatically
D1	2040 with A428 scheme	AM	ONE HOUR	07:45	09:15	15	✓	✓
D2	2040 with A428 scheme	PM	ONE HOUR	16:45	18:15	15	✓	✓
D3	2040 with A428 scheme + Phase 1	AM	ONE HOUR	07:45	09:15	15	✓	✓
D4	2040 with A428 scheme + Phase 1	PM	ONE HOUR	16:45	18:15	15	✓	✓
D5	2040 with A428 scheme + Phases 1&2	AM	ONE HOUR	07:45	09:15	15	✓	✓
D6	2040 with A428 scheme + Phases 1&2	PM	ONE HOUR	16:45	18:15	15	✓	✓
D7	2040 with A428 scheme + Phases 1,2&3	AM	ONE HOUR	07:45	09:15	15	✓	✓
D8	2040 with A428 scheme + Phases 1,2&3	PM	ONE HOUR	16:45	18:15	15	✓	✓

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Use specific Demand Set(s)	Specific Demand Set (s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Proposed Layout	✓	✓	✓	D3,D4,D5,D6,D7,D8	100.000	100.000

Proposed Layout - 2040 with A428 scheme + Phase 1, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Proposed Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D3 - 2040 with A428 scheme + Phase 1, AM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	11.45	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A428 (e)	
2	Barford Road (s)	
3	A428 (w)	
4	B1043 Barford Road (n)	

Roundabout Geometry

Arm	V (m)	E (m)	I' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - A428 (e)	4.67	7.59	40.8	20.0	49.0	26.5	
2 - Barford Road (s)	3.92	7.55	23.9	21.6	49.0	47.7	
3 - A428 (w)	4.20	7.97	27.8	20.0	49.0	27.6	
4 - B1043 Barford Road (n)	7.20	8.00	1.8	28.0	49.0	43.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A428 (e)	0.704	2161
2 - Barford Road (s)	0.618	1816
3 - A428 (w)	0.689	2086
4 - B1043 Barford Road (n)	0.701	2211

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

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A428 (e)	Evenly split	10.00
2 - Barford Road (s)	Evenly split	10.00
3 - A428 (w)	Evenly split	10.00
4 - B1043 Barford Road (n)	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Min Cap (PCU/hr)	Max Cap (PCU/hr)	Signalised
1 - A428 (e)	Entry	1	1	2, 3	✓	10.00		0	99999	
		1	2	1, 3, 4	✓	10.00		0	99999	
		2	1	(1, 2, 3, 4)		Infinity				
	Exit	1	1			Infinity				
2 - Barford Road (s)	Entry	1	1	3, 4	✓	7.00		0	99999	
		1	2	1, 2, 4	✓	7.00		0	99999	
		2	1	(1, 2, 3, 4)		Infinity				
	Exit	1	1			Infinity				
3 - A428 (w)	Entry	1	1	4	✓	16.00		0	99999	
		1	2	1, 2, 3	✓	16.00		0	99999	
		2	1	(1, 2, 3, 4)		Infinity				
	Exit	1	1			Infinity				
4 - B1043 Barford Road (n)	Entry	1	1	1, 2		Infinity		0	99999	
		1	2	3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A428 (e)	Entry	1	1	0.352	1080
			2	0.352	1080
2 - Barford Road (s)	Entry	1	1	0.309	908
			2	0.309	908
3 - A428 (w)	Entry	1	1	0.344	1043
			2	0.344	1043
4 - B1043 Barford Road (n)	Entry	1	1	0.351	1105
			2	0.351	1105

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm A428 (e)	Destination arm Barford Road (s)	Destination arm A428 (w)	Destination arm B1043 Barford Road (n)
1 - A428 (e)	1	1		✓	✓	
	1	2	✓		✓	✓
	2	1	✓	✓	✓	✓
2 - Barford Road (s)	1	1			✓	✓
	1	2	✓	✓		✓
	2	1	✓	✓	✓	✓
3 - A428 (w)	1	1				✓
	1	2	✓	✓	✓	
	2	1	✓	✓	✓	✓
4 - B1043 Barford Road (n)	1	1	✓	✓		
		2			✓	✓

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)	Results for central hour only	Run automatically
D3	2040 with A428 scheme + Phase 1	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 - A428 (e)		ONE HOUR	✓	702	100.000
2 - Barford Road (s)		ONE HOUR	✓	154	100.000
3 - A428 (w)		ONE HOUR	✓	1090	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	734	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	156	454	92
	2 - Barford Road (s)	41	0	63	50
	3 - A428 (w)	599	65	0	426
	4 - B1043 Barford Road (n)	168	128	438	0

Vehicle Mix

HV %s

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	0	3	2
	2 - Barford Road (s)	0	0	9	0
	3 - A428 (w)	6	9	0	3
	4 - B1043 Barford Road (n)	4	0	3	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	6.69	1.4	A	698	698
2 - Barford Road (s)	7.75	0.3	A	153	153
3 - A428 (w)	15.62	6.0	C	1104	1104
4 - B1043 Barford Road (n)	10.31	2.7	B	731	731

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	629	157	550	626	645	742	0.8	1.1	5.405	A
2 - Barford Road (s)	140	35	868	139	148	308	0.1	0.2	6.601	A
3 - A428 (w)	996	249	172	993	1021	835	1.4	2.8	9.137	A
4 - B1043 Barford Road (n)	646	161	648	644	675	517	0.9	1.4	7.223	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	763	191	695	764	791	912	1.1	1.3	6.605	A
2 - Barford Road (s)	166	41	1076	166	171	383	0.2	0.3	7.287	A
3 - A428 (w)	1236	309	203	1227	1253	1039	2.8	6.0	15.479	C
4 - B1043 Barford Road (n)	816	204	794	813	829	636	1.4	2.7	10.309	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	773	193	682	770	786	891	1.3	1.4	6.690	A
2 - Barford Road (s)	167	42	1067	166	178	385	0.3	0.4	7.750	A
3 - A428 (w)	1198	300	198	1202	1261	1034	6.0	4.8	15.617	C
4 - B1043 Barford Road (n)	808	202	771	802	836	629	2.7	2.3	9.870	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	626	156	565	624	644	724	1.4	1.2	5.701	A
2 - Barford Road (s)	138	35	872	137	145	316	0.4	0.2	6.636	A
3 - A428 (w)	988	247	170	987	1045	840	4.8	2.7	10.497	B
4 - B1043 Barford Road (n)	653	163	635	654	684	521	2.3	1.4	7.653	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	335	865	0.387	333	342	0.4	0.6	5.501	A
		1	2	1, 3, 4	294	856	0.345	292	303	0.4	0.5	5.294	A
		2	1	(1, 2, 3, 4)	629			629	647	0.0	0.0	0.000	A
	Exit	1	1		742			742	765	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	76	587	0.129	76	84	0.1	0.1	6.901	A
		1	2	1, 2, 4	64	632	0.101	63	64	0.1	0.1	6.232	A
		2	1	(1, 2, 3, 4)	140			140	149	0.0	0.0	0.000	A
	Exit	1	1		308			308	314	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	388	953	0.407	384	392	0.5	0.9	6.281	A
		1	2	1, 2, 3	609	929	0.656	609	629	0.9	1.9	10.949	B
		2	1	(1, 2, 3, 4)	996			997	1027	0.0	0.0	0.013	A
	Exit	1	1		835			835	886	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	264	849	0.311	265	270	0.4	0.4	6.036	A
		1	2	3, 4	382	839	0.455	379	405	0.5	1.0	8.017	A
	Exit	1	1		517			517	524	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	398	812	0.490	398	413	0.6	0.7	6.760	A
		1	2	1, 3, 4	365	812	0.450	366	378	0.5	0.6	6.434	A
		2	1	(1, 2, 3, 4)	763			763	792	0.0	0.0	0.000	A
	Exit	1	1		912			912	933	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	92	534	0.173	93	98	0.1	0.1	7.804	A
		1	2	1, 2, 4	74	566	0.130	74	73	0.1	0.1	6.627	A
		2	1	(1, 2, 3, 4)	166			166	171	0.0	0.0	0.000	A
	Exit	1	1		383			383	390	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	478	947	0.505	478	481	0.9	0.9	7.464	A
		1	2	1, 2, 3	751	917	0.819	749	772	1.9	4.4	19.330	C
		2	1	(1, 2, 3, 4)	1236			1230	1263	0.0	0.7	0.691	A
	Exit	1	1		1039			1039	1079	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	337	792	0.425	334	338	0.4	0.9	7.578	A
		1	2	3, 4	479	789	0.608	479	491	1.0	1.8	12.200	B
	Exit	1	1		636			636	641	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	406	820	0.495	405	413	0.7	0.8	6.870	A
			2	1, 3, 4	367	812	0.453	365	374	0.6	0.6	6.488	A
		2	1	(1, 2, 3, 4)	773			773	787	0.0	0.0	0.000	A
	Exit	1	1		891			891	933	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	91	527	0.171	91	102	0.1	0.2	8.071	A
			2	1, 2, 4	76	569	0.133	75	76	0.1	0.2	7.344	A
		2	1	(1, 2, 3, 4)	167			167	178	0.0	0.0	0.000	A
	Exit	1	1		385			385	392	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	474	949	0.499	477	489	0.9	1.0	7.863	A
			2	1, 2, 3	725	911	0.795	725	772	4.4	3.6	18.362	C
		2	1	(1, 2, 3, 4)	1198			1199	1258	0.7	0.1	1.469	A
	Exit	1	1		1034			1034	1088	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	334	799	0.418	333	336	0.9	0.7	7.579	A
			2	3, 4	474	794	0.597	469	500	1.8	1.6	11.420	B
	Exit	1	1		629			629	648	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	333	860	0.387	332	340	0.8	0.6	5.825	A
			2	1, 3, 4	293	856	0.342	293	304	0.6	0.6	5.562	A
		2	1	(1, 2, 3, 4)	626			626	643	0.0	0.0	0.000	A
	Exit	1	1		724			724	776	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	77	589	0.131	77	84	0.2	0.1	7.222	A
			2	1, 2, 4	61	631	0.096	61	61	0.2	0.1	5.878	A
		2	1	(1, 2, 3, 4)	138			138	145	0.0	0.0	0.000	A
	Exit	1	1		316			316	325	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	389	957	0.407	388	399	1.0	0.7	6.597	A
			2	1, 2, 3	599	923	0.648	598	646	3.6	2.0	12.443	B
		2	1	(1, 2, 3, 4)	988			988	1037	0.1	0.0	0.367	A
	Exit	1	1		840			840	886	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	267	853	0.313	266	276	0.7	0.5	6.299	A
			2	3, 4	386	847	0.456	387	408	1.6	0.9	8.578	A
	Exit	1	1		521			521	531	0.0	0.0	0.000	A

Proposed Layout - 2040 with A428 scheme + Phase 1, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Proposed Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D4 - 2040 with A428 scheme + Phase 1, PM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	15.41	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)	Results for central hour only	Run automatically
D4	2040 with A428 scheme + Phase 1	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 - A428 (e)		ONE HOUR	✓	888	100.000
2 - Barford Road (s)		ONE HOUR	✓	350	100.000
3 - A428 (w)		ONE HOUR	✓	1181	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	685	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	156	525	207
	2 - Barford Road (s)	155	0	83	112
	3 - A428 (w)	477	38	0	666
	4 - B1043 Barford Road (n)	91	93	501	0

Vehicle Mix

HV %s

	To			
From		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
	1 - A428 (e)	0	0	2	1
	2 - Barford Road (s)	0	0	2	0
	3 - A428 (w)	2	10	0	1
	4 - B1043 Barford Road (n)	1	0	1	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	7.96	2.3	A	891	891
2 - Barford Road (s)	11.43	1.3	B	349	349
3 - A428 (w)	24.71	9.1	C	1180	1180
4 - B1043 Barford Road (n)	11.01	2.3	B	685	685

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	802	200	568	803	810	646	1.0	1.3	6.079	A
2 - Barford Road (s)	311	78	1114	313	312	257	0.5	0.6	8.219	A
3 - A428 (w)	1055	264	426	1056	1072	1001	2.1	3.2	10.737	B
4 - B1043 Barford Road (n)	617	154	598	616	622	884	0.9	1.3	7.343	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	972	243	696	971	983	792	1.3	2.2	7.723	A
2 - Barford Road (s)	380	95	1353	381	381	314	0.6	1.2	10.770	B
3 - A428 (w)	1306	326	516	1293	1298	1217	3.2	9.1	21.147	C
4 - B1043 Barford Road (n)	753	188	733	754	754	1077	1.3	2.2	10.277	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	988	247	696	988	993	802	2.2	2.2	7.957	A
2 - Barford Road (s)	384	96	1365	383	385	318	1.2	1.3	11.432	B
3 - A428 (w)	1299	325	522	1305	1325	1226	9.1	8.5	24.712	C
4 - B1043 Barford Road (n)	757	189	742	756	759	1085	2.2	2.3	11.009	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	802	200	568	801	817	654	2.2	1.4	6.375	A
2 - Barford Road (s)	320	80	1109	320	322	260	1.3	0.7	8.795	A
3 - A428 (w)	1061	265	429	1064	1103	1000	8.5	3.2	12.883	B
4 - B1043 Barford Road (n)	615	154	604	618	629	888	2.3	1.1	7.933	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	387	867	0.446	388	391	0.5	0.6	5.950	A
			2	1, 3, 4	415	863	0.481	415	419	0.6	0.7	6.200	A
		2	1	(1, 2, 3, 4)	802			802	811	0.0	0.0	0.000	A
	Exit	1	1		646			646	653	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	129	552	0.234	130	130	0.2	0.2	7.642	A
			2	1, 2, 4	182	559	0.326	183	182	0.3	0.4	8.626	A
		2	1	(1, 2, 3, 4)	311			311	313	0.0	0.0	0.001	A
	Exit	1	1		257			257	259	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	597	888	0.672	598	602	1.3	2.0	12.332	B
			2	1, 2, 3	458	872	0.526	459	470	0.8	1.1	8.582	A
		2	1	(1, 2, 3, 4)	1055			1055	1076	0.0	0.0	0.034	A
	Exit	1	1		1001			1001	1014	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	166	887	0.187	166	166	0.2	0.3	4.950	A
			2	3, 4	451	882	0.511	450	456	0.8	1.1	8.217	A
	Exit	1	1		884			884	889	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	474	821	0.577	473	479	0.6	1.1	7.489	A
			2	1, 3, 4	498	819	0.607	498	504	0.7	1.1	7.939	A
		2	1	(1, 2, 3, 4)	972			972	987	0.0	0.0	0.003	A
	Exit	1	1		792			792	798	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	161	479	0.335	161	161	0.2	0.5	9.816	A
			2	1, 2, 4	220	484	0.454	220	220	0.4	0.7	11.446	B
		2	1	(1, 2, 3, 4)	380			380	383	0.0	0.0	0.007	A
	Exit	1	1		314			314	319	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	734	855	0.858	728	724	2.0	5.7	24.042	C
			2	1, 2, 3	564	843	0.669	565	574	1.1	2.0	13.018	B
		2	1	(1, 2, 3, 4)	1306			1299	1317	0.0	1.4	1.795	A
	Exit	1	1		1217			1217	1225	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	204	840	0.242	203	205	0.3	0.4	5.562	A
			2	3, 4	549	835	0.658	551	549	1.1	1.9	12.036	B
	Exit	1	1		1077			1077	1075	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	482	821	0.587	481	482	1.1	1.1	7.768	A
		1	2	1, 3, 4	506	819	0.618	506	511	1.1	1.2	8.136	A
		2	1	(1, 2, 3, 4)	988			988	993	0.0	0.0	0.000	A
	Exit	1	1		802			802	811	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	162	474	0.341	161	163	0.5	0.5	10.394	B
		1	2	1, 2, 4	222	480	0.463	222	222	0.7	0.8	12.169	B
		2	1	(1, 2, 3, 4)	384			384	386	0.0	0.0	0.009	A
	Exit	1	1		318			318	320	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	728	854	0.852	732	741	5.7	5.4	27.663	D
		1	2	1, 2, 3	573	840	0.682	574	585	2.0	2.2	14.002	B
		2	1	(1, 2, 3, 4)	1299			1301	1325	1.4	0.9	3.064	A
	Exit	1	1		1226			1226	1237	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	206	836	0.247	206	205	0.4	0.3	5.727	A
		1	2	3, 4	550	831	0.662	550	554	1.9	2.0	12.972	B
	Exit	1	1		1085			1085	1094	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	387	865	0.447	386	395	1.1	0.7	6.257	A
		1	2	1, 3, 4	415	862	0.481	415	422	1.2	0.8	6.485	A
		2	1	(1, 2, 3, 4)	802			802	814	0.0	0.0	0.000	A
	Exit	1	1		654			654	667	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	133	552	0.242	134	135	0.5	0.3	8.228	A
		1	2	1, 2, 4	186	560	0.333	186	187	0.8	0.4	9.199	A
		2	1	(1, 2, 3, 4)	320			320	320	0.0	0.0	0.000	A
	Exit	1	1		260			260	266	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	599	886	0.676	600	622	5.4	2.1	14.993	B
		1	2	1, 2, 3	462	871	0.531	464	481	2.2	1.1	9.410	A
		2	1	(1, 2, 3, 4)	1061			1062	1085	0.9	0.0	0.428	A
	Exit	1	1		1000			1000	1026	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	169	884	0.191	169	169	0.3	0.2	5.061	A
		1	2	3, 4	446	880	0.507	449	460	2.0	0.9	9.000	A
	Exit	1	1		888			888	912	0.0	0.0	0.000	A

Proposed Layout - 2040 with A428 scheme + Phases 1&2, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Proposed Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D5 - 2040 with A428 scheme + Phases 1&2, AM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	17.71	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)	Results for central hour only	Run automatically
D5	2040 with A428 scheme + Phases 1&2	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 - A428 (e)		ONE HOUR	✓	729	100.000
2 - Barford Road (s)		ONE HOUR	✓	460	100.000
3 - A428 (w)		ONE HOUR	✓	1130	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	759	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	183	454	92
	2 - Barford Road (s)	120	0	218	122
	3 - A428 (w)	599	105	0	426
	4 - B1043 Barford Road (n)	168	153	438	0

Vehicle Mix

HV %s

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	0	3	2
	2 - Barford Road (s)	0	0	9	0
	3 - A428 (w)	6	9	0	3
	4 - B1043 Barford Road (n)	4	0	3	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	7.45	1.5	A	729	729
2 - Barford Road (s)	12.13	1.9	B	458	458
3 - A428 (w)	30.20	10.8	D	1131	1131
4 - B1043 Barford Road (n)	11.92	2.8	B	764	764

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	647	162	628	650	667	803	0.8	1.0	5.731	A
2 - Barford Road (s)	418	105	882	420	434	396	0.7	0.8	8.764	A
3 - A428 (w)	1011	253	306	1016	1066	996	2.0	3.7	12.018	B
4 - B1043 Barford Road (n)	687	172	745	686	699	576	1.0	1.7	7.856	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	809	202	778	813	822	974	1.0	1.5	7.276	A
2 - Barford Road (s)	503	126	1096	501	525	495	0.8	1.9	11.672	B
3 - A428 (w)	1246	312	368	1239	1281	1229	3.7	9.9	23.832	C
4 - B1043 Barford Road (n)	846	211	903	848	861	704	1.7	2.5	11.049	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	800	200	770	799	816	978	1.5	1.5	7.447	A
2 - Barford Road (s)	501	125	1087	503	528	482	1.9	1.5	12.134	B
3 - A428 (w)	1243	311	369	1243	1306	1221	9.9	10.6	30.201	D
4 - B1043 Barford Road (n)	841	210	906	841	864	705	2.5	2.7	11.924	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	660	165	627	657	674	807	1.5	1.2	6.028	A
2 - Barford Road (s)	410	102	889	411	437	395	1.5	1.0	9.561	A
3 - A428 (w)	1023	256	302	1026	1101	998	10.6	4.0	17.774	C
4 - B1043 Barford Road (n)	682	171	752	682	698	576	2.7	1.6	8.588	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	346	839	0.412	348	357	0.4	0.5	5.953	A
		1	2	1, 3, 4	301	829	0.363	302	310	0.4	0.5	5.473	A
		2	1	(1, 2, 3, 4)	647			647	668	0.0	0.0	0.000	A
	Exit	1	1		803			803	832	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	243	584	0.416	244	261	0.4	0.5	9.808	A
		1	2	1, 2, 4	175	628	0.279	176	174	0.2	0.3	7.247	A
		2	1	(1, 2, 3, 4)	418			418	435	0.0	0.0	0.025	A
	Exit	1	1		396			396	400	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	378	909	0.416	378	396	0.5	0.8	6.715	A
		1	2	1, 2, 3	633	883	0.716	638	670	1.5	2.8	14.997	B
		2	1	(1, 2, 3, 4)	1011			1011	1073	0.0	0.1	0.140	A
	Exit	1	1		996			996	1042	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	295	815	0.362	294	294	0.4	0.6	6.773	A
		1	2	3, 4	392	806	0.486	392	405	0.6	1.0	8.648	A
	Exit	1	1		576			576	592	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	430	787	0.546	433	438	0.5	0.8	7.507	A
		1	2	1, 3, 4	379	777	0.488	379	384	0.5	0.7	7.010	A
		2	1	(1, 2, 3, 4)	809			809	824	0.0	0.0	0.000	A
	Exit	1	1		974			974	1003	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	289	517	0.561	287	310	0.5	1.3	13.284	B
		1	2	1, 2, 4	213	560	0.380	214	215	0.3	0.5	9.176	A
		2	1	(1, 2, 3, 4)	503			502	529	0.0	0.1	0.125	A
	Exit	1	1		495			495	496	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	465	889	0.523	467	479	0.8	1.2	9.294	A
		1	2	1, 2, 3	776	864	0.897	772	802	2.8	6.8	27.337	D
		2	1	(1, 2, 3, 4)	1246			1241	1299	0.1	2.0	3.179	A
	Exit	1	1		1229			1229	1271	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	359	757	0.475	361	363	0.6	0.7	8.409	A
		1	2	3, 4	487	751	0.648	487	498	1.0	1.8	12.981	B
	Exit	1	1		704			704	719	0.0	0.0	0.000	A

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08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	426	790	0.539	425	433	0.8	0.8	7.733	A
		1	2	1, 3, 4	375	778	0.481	374	383	0.7	0.7	7.119	A
		2	1	(1, 2, 3, 4)	800			800	816	0.0	0.0	0.000	A
	Exit	1	1		978			978	1018	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	289	522	0.553	290	315	1.3	1.0	13.752	B
		1	2	1, 2, 4	212	562	0.377	213	212	0.5	0.5	9.394	A
		2	1	(1, 2, 3, 4)	501			501	526	0.1	0.0	0.232	A
	Exit	1	1		482			482	496	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	467	890	0.524	467	484	1.2	1.1	8.936	A
		1	2	1, 2, 3	774	861	0.899	776	822	6.8	6.9	31.498	D
		2	1	(1, 2, 3, 4)	1243			1240	1306	2.0	2.6	7.140	A
	Exit	1	1		1221			1221	1278	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	354	757	0.468	354	362	0.7	0.9	9.111	A
		1	2	3, 4	487	749	0.650	487	502	1.8	1.9	13.973	B
	Exit	1	1		705			705	721	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	355	839	0.424	354	363	0.8	0.7	6.169	A
		1	2	1, 3, 4	304	830	0.366	304	311	0.7	0.5	5.861	A
		2	1	(1, 2, 3, 4)	660			660	672	0.0	0.0	0.000	A
	Exit	1	1		807			807	861	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	236	579	0.408	236	262	1.0	0.6	10.763	B
		1	2	1, 2, 4	174	626	0.278	174	175	0.5	0.3	7.812	A
		2	1	(1, 2, 3, 4)	410			410	435	0.0	0.0	0.036	A
	Exit	1	1		395			395	410	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	389	909	0.428	386	401	1.1	0.9	7.399	A
		1	2	1, 2, 3	640	882	0.727	640	701	6.9	2.9	19.590	C
		2	1	(1, 2, 3, 4)	1023			1029	1083	2.6	0.2	3.050	A
	Exit	1	1		998			998	1045	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	289	809	0.357	289	294	0.9	0.6	7.412	A
		1	2	3, 4	393	804	0.489	392	404	1.9	1.0	9.456	A
	Exit	1	1		576			576	594	0.0	0.0	0.000	A

Proposed Layout - 2040 with A428 scheme + Phases 1&2, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Proposed Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D6 - 2040 with A428 scheme + Phases 1&2, PM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	23.72	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)	Results for central hour only	Run automatically
D6	2040 with A428 scheme + Phases 1&2	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 - A428 (e)		ONE HOUR	✓	962	100.000
2 - Barford Road (s)		ONE HOUR	✓	483	100.000
3 - A428 (w)		ONE HOUR	✓	1292	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	752	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	230	525	207
	2 - Barford Road (s)	189	0	151	143
	3 - A428 (w)	477	149	0	666
	4 - B1043 Barford Road (n)	91	160	501	0

Vehicle Mix

HV %s

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	0	2	1
	2 - Barford Road (s)	0	0	2	0
	3 - A428 (w)	2	10	0	1
	4 - B1043 Barford Road (n)	1	0	1	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	11.57	3.4	B	965	965
2 - Barford Road (s)	14.82	2.5	B	487	487
3 - A428 (w)	42.05	18.4	E	1291	1291
4 - B1043 Barford Road (n)	13.18	3.4	B	749	749

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	869	217	725	861	872	672	1.3	1.9	7.170	A
2 - Barford Road (s)	434	109	1100	436	435	486	0.9	1.0	9.276	A
3 - A428 (w)	1148	287	478	1142	1178	1059	2.2	4.2	12.803	B
4 - B1043 Barford Road (n)	684	171	715	682	673	906	1.0	1.8	8.154	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	1070	267	874	1082	1079	827	1.9	3.2	11.541	B
2 - Barford Road (s)	527	132	1358	527	525	597	1.0	2.2	13.790	B
3 - A428 (w)	1427	357	604	1412	1420	1282	4.2	12.6	26.324	D
4 - B1043 Barford Road (n)	806	201	891	809	820	1125	1.8	3.0	12.385	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	1064	266	888	1065	1067	830	3.2	3.4	11.567	B
2 - Barford Road (s)	539	135	1360	529	534	593	2.2	2.4	14.819	B
3 - A428 (w)	1421	355	588	1418	1448	1302	12.6	18.2	42.052	E
4 - B1043 Barford Road (n)	827	207	891	827	834	1115	3.0	3.4	13.175	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	857	214	741	860	884	686	3.4	1.7	7.762	A
2 - Barford Road (s)	448	112	1102	450	450	498	2.4	1.3	10.831	B
3 - A428 (w)	1166	291	502	1162	1255	1050	18.2	4.5	21.425	C
4 - B1043 Barford Road (n)	680	170	751	676	696	913	3.4	1.7	9.767	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	450	809	0.556	447	446	0.6	1.0	7.157	A
			2	1, 3, 4	419	810	0.518	414	426	0.7	1.0	7.183	A
		2	1	(1, 2, 3, 4)	869			869	874	0.0	0.0	0.000	A
	Exit	1	1		672			672	685	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	203	558	0.363	207	206	0.3	0.3	9.094	A
			2	1, 2, 4	232	564	0.411	230	229	0.5	0.6	9.436	A
		2	1	(1, 2, 3, 4)	434			434	436	0.0	0.0	0.000	A
	Exit	1	1		486			486	490	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	600	867	0.692	595	603	1.1	2.3	13.268	B
			2	1, 2, 3	547	844	0.647	547	575	1.1	1.9	12.262	B
		2	1	(1, 2, 3, 4)	1148			1147	1185	0.0	0.1	0.014	A
	Exit	1	1		1059			1059	1070	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	229	845	0.271	230	226	0.3	0.3	5.666	A
			2	3, 4	455	838	0.543	452	448	0.8	1.4	9.408	A
	Exit	1	1		906			906	913	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	544	757	0.720	551	545	1.0	1.6	11.634	B
			2	1, 3, 4	526	753	0.699	530	534	1.0	1.6	11.276	B
		2	1	(1, 2, 3, 4)	1070			1071	1084	0.0	0.0	0.084	A
	Exit	1	1		827			827	828	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	247	476	0.519	246	249	0.3	1.0	12.602	B
			2	1, 2, 4	283	482	0.586	281	277	0.6	1.2	14.609	B
		2	1	(1, 2, 3, 4)	527			530	530	0.0	0.0	0.127	A
	Exit	1	1		597			597	606	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	727	827	0.880	732	723	2.3	5.1	24.449	C
			2	1, 2, 3	689	805	0.859	680	697	1.9	5.7	23.688	C
		2	1	(1, 2, 3, 4)	1427			1416	1448	0.1	1.9	2.149	A
	Exit	1	1		1282			1282	1302	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	273	780	0.350	273	275	0.3	0.5	6.839	A
			2	3, 4	533	776	0.687	537	545	1.4	2.4	15.198	C
	Exit	1	1		1125			1125	1109	0.0	0.0	0.000	A

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17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	542	754	0.719	543	536	1.6	1.7	11.618	B
		1	2	1, 3, 4	522	747	0.699	522	531	1.6	1.8	11.473	B
		2	1	(1, 2, 3, 4)	1064			1064	1068	0.0	0.0	0.021	A
	Exit	1	1		830			830	840	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	255	474	0.537	253	259	1.0	0.9	13.784	B
		1	2	1, 2, 4	284	481	0.590	277	274	1.2	1.5	15.400	C
		2	1	(1, 2, 3, 4)	539			539	535	0.0	0.0	0.193	A
	Exit	1	1		593			593	607	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	731	832	0.878	731	731	5.1	6.8	31.228	D
		1	2	1, 2, 3	687	811	0.849	688	717	5.7	6.1	31.071	D
		2	1	(1, 2, 3, 4)	1421			1417	1456	1.9	5.4	10.717	B
	Exit	1	1		1302			1302	1317	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	270	782	0.345	273	277	0.5	0.5	7.289	A
		1	2	3, 4	557	776	0.718	554	557	2.4	2.8	16.108	C
	Exit	1	1		1115			1115	1119	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	433	802	0.539	436	446	1.7	0.8	7.759	A
		1	2	1, 3, 4	424	799	0.531	424	438	1.8	0.9	7.764	A
		2	1	(1, 2, 3, 4)	857			857	877	0.0	0.0	0.000	A
	Exit	1	1		686			686	720	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	205	554	0.370	206	212	0.9	0.5	10.547	B
		1	2	1, 2, 4	243	562	0.433	244	238	1.5	0.8	11.064	B
		2	1	(1, 2, 3, 4)	448			448	445	0.0	0.0	0.015	A
	Exit	1	1		498			498	512	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	595	861	0.691	592	637	6.8	2.2	19.570	C
		1	2	1, 2, 3	572	835	0.686	569	618	6.1	2.3	18.563	C
		2	1	(1, 2, 3, 4)	1166			1167	1220	5.4	0.0	2.863	A
	Exit	1	1		1050			1050	1093	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	228	831	0.274	227	231	0.5	0.4	6.279	A
		1	2	3, 4	453	827	0.547	449	465	2.8	1.3	11.533	B
	Exit	1	1		913			913	959	0.0	0.0	0.000	A

Proposed Layout - 2040 with A428 scheme + Phases 1,2&3, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Proposed Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	2 - Barford Road (s) - Lane Simulation	Arm 2: Q at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Last Run	Lane Simulation	3 - A428 (w) - Lane Simulation	Arm 3: Q at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D7 - 2040 with A428 scheme + Phases 1,2&3, AM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	323.99	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)	Results for central hour only	Run automatically
D7	2040 with A428 scheme + Phases 1,2&3	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 - A428 (e)		ONE HOUR	✓	797	100.000
2 - Barford Road (s)		ONE HOUR	✓	1233	100.000
3 - A428 (w)		ONE HOUR	✓	1233	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	821	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	251	454	92
	2 - Barford Road (s)	320	0	608	305
	3 - A428 (w)	599	208	0	426
	4 - B1043 Barford Road (n)	168	215	438	0

Vehicle Mix

HV %s

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	0	3	2
	2 - Barford Road (s)	0	0	9	0
	3 - A428 (w)	6	9	0	3
	4 - B1043 Barford Road (n)	4	0	3	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	9.83	2.4	A	807	807
2 - Barford Road (s)	786.27	241.6	F	1228	1228
3 - A428 (w)	267.10	95.4	F	1233	1233
4 - B1043 Barford Road (n)	14.43	3.9	B	822	822

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	738	184	759	735	737	944	1.0	1.5	6.931	A
2 - Barford Road (s)	1100	275	890	1014	1068	604	6.7	27.4	62.945	F
3 - A428 (w)	1107	277	600	1083	1134	1305	3.9	12.7	30.741	D
4 - B1043 Barford Road (n)	738	185	969	733	758	714	1.4	2.4	9.702	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	888	222	924	891	895	1016	1.5	2.2	9.173	A
2 - Barford Road (s)	1358	340	1104	963	1008	711	27.4	125.2	286.907	F
3 - A428 (w)	1348	337	591	1191	1245	1476	12.7	54.8	110.372	F
4 - B1043 Barford Road (n)	913	228	1026	914	922	757	2.4	3.4	13.568	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	888	222	938	888	898	987	2.2	2.3	9.833	A
2 - Barford Road (s)	1347	337	1100	935	992	727	125.2	225.6	648.340	F
3 - A428 (w)	1369	342	579	1198	1263	1456	54.8	94.8	227.985	F
4 - B1043 Barford Road (n)	901	225	1019	906	923	757	3.4	3.8	14.430	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	715	179	786	716	748	1001	2.3	1.5	7.360	A
2 - Barford Road (s)	1101	275	884	1060	1081	617	225.6	241.7	786.272	F
3 - A428 (w)	1104	276	627	1162	1240	1317	94.8	77.9	267.100	F
4 - B1043 Barford Road (n)	735	184	1052	735	760	737	3.8	2.4	11.285	B

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	411	793	0.519	409	411	0.7	0.9	7.287	A
			2	1, 3, 4	326	782	0.418	326	326	0.4	0.6	6.476	A
		2	1	(1, 2, 3, 4)	738			738	739	0.0	0.0	0.000	A
	Exit	1	1		944			944	972	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	561	577	0.970	556	607	3.4	5.4	30.546	D
			2	1, 2, 4	460	625	0.737	459	461	1.3	2.6	18.735	C
		2	1	(1, 2, 3, 4)	1100			1021	1082	1.9	19.3	37.323	E
	Exit	1	1		604			604	623	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	369	810	0.456	375	388	0.8	0.7	8.698	A
			2	1, 2, 3	725	782	0.926	708	747	3.1	8.8	33.874	D
		2	1	(1, 2, 3, 4)	1107			1094	1158	0.0	3.2	5.170	A
	Exit	1	1		1305			1305	1376	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	346	734	0.472	348	355	0.6	0.8	9.126	A
			2	3, 4	392	726	0.540	386	403	0.8	1.6	10.214	B
	Exit	1	1		714			714	726	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	485	737	0.658	485	485	0.9	1.4	9.771	A
			2	1, 3, 4	402	725	0.555	406	410	0.6	0.8	8.446	A
		2	1	(1, 2, 3, 4)	888			888	898	0.0	0.0	0.004	A
	Exit	1	1		1016			1016	1043	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	527	518	1.017	526	568	5.4	6.1	41.363	E
			2	1, 2, 4	437	558	0.784	437	441	2.6	3.3	25.986	D
		2	1	(1, 2, 3, 4)	1358			964	1014	19.3	115.8	252.271	F
	Exit	1	1		711			711	722	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	414	814	0.509	414	426	0.7	1.2	11.561	B
			2	1, 2, 3	782	786	0.997	778	820	8.8	14.1	58.823	F
		2	1	(1, 2, 3, 4)	1348			1196	1270	3.2	39.5	67.120	F
	Exit	1	1		1476			1476	1539	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	434	713	0.609	433	426	0.8	1.5	11.933	B
			2	3, 4	478	709	0.676	481	497	1.6	1.9	14.991	B
	Exit	1	1		757			757	767	0.0	0.0	0.000	A

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08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	482	730	0.661	483	488	1.4	1.4	10.494	B
		1	2	1, 3, 4	406	716	0.568	406	410	0.8	1.0	9.000	A
		2	1	(1, 2, 3, 4)	888			888	898	0.0	0.0	0.016	A
	Exit	1	1		987			987	1046	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	506	512	0.988	507	558	6.1	6.1	42.548	E
		1	2	1, 2, 4	429	557	0.770	428	434	3.3	3.2	26.372	D
		2	1	(1, 2, 3, 4)	1347			935	992	115.8	216.4	615.162	F
	Exit	1	1		727			727	731	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	416	821	0.508	414	428	1.2	1.6	12.106	B
		1	2	1, 2, 3	783	791	0.992	784	835	14.1	14.7	66.621	F
		2	1	(1, 2, 3, 4)	1369			1200	1267	39.5	78.6	180.074	F
	Exit	1	1		1456			1456	1528	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	411	718	0.574	412	422	1.5	1.4	12.685	B
		1	2	3, 4	489	706	0.694	494	501	1.9	2.4	15.917	C
	Exit	1	1		757			757	772	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	397	784	0.507	399	416	1.4	0.9	7.779	A
		1	2	1, 3, 4	317	772	0.411	317	332	1.0	0.6	6.827	A
		2	1	(1, 2, 3, 4)	715			715	744	0.0	0.0	0.001	A
	Exit	1	1		1001			1001	1035	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	570	579	0.981	568	607	6.1	5.9	38.323	E
		1	2	1, 2, 4	491	627	0.782	492	474	3.2	3.2	24.050	C
		2	1	(1, 2, 3, 4)	1101			1061	1080	216.4	232.6	757.196	F
	Exit	1	1		617			617	648	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	386	805	0.480	393	410	1.6	1.0	12.052	B
		1	2	1, 2, 3	765	771	0.994	769	830	14.7	13.8	66.400	F
		2	1	(1, 2, 3, 4)	1104			1151	1234	78.6	63.1	219.460	F
	Exit	1	1		1317			1317	1395	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	344	705	0.488	342	354	1.4	1.2	10.520	B
		1	2	3, 4	390	697	0.560	392	406	2.4	1.2	11.966	B
	Exit	1	1		737			737	751	0.0	0.0	0.000	A

Proposed Layout - 2040 with A428 scheme + Phases 1,2&3, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Proposed Layout [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	3 - A428 (w) - Lane Simulation	Arm 3: Q at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Geometry	1 - A428 (e) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Demand Sets	D8 - 2040 with A428 scheme + Phases 1,2&3, PM	Time results are shown for central hour only. (Model is run for a 90 minute period.)

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	A428/Barford Road	Standard Roundabout		1, 2, 3, 4	290.53	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

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)	Results for central hour only	Run automatically
D8	2040 with A428 scheme + Phases 1,2&3	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 - A428 (e)		ONE HOUR	✓	1146	100.000
2 - Barford Road (s)		ONE HOUR	✓	822	100.000
3 - A428 (w)		ONE HOUR	✓	1572	100.000
4 - B1043 Barford Road (n)		ONE HOUR	✓	921	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	1 - A428 (e)	0	414	525	207
	2 - Barford Road (s)	277	0	322	223
	3 - A428 (w)	477	429	0	666
	4 - B1043 Barford Road (n)	91	329	501	0

Vehicle Mix

HV %s

		To			
		1 - A428 (e)	2 - Barford Road (s)	3 - A428 (w)	4 - B1043 Barford Road (n)
From	**1 - A428 (e)**	0	0	2	1
	2 - Barford Road (s)	0	0	2	0
	3 - A428 (w)	2	10	0	1
	4 - B1043 Barford Road (n)	1	0	1	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Q (Veh)	Max LOS	Av. Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A428 (e)	107.44	42.6	F	1140	1140
2 - Barford Road (s)	70.61	19.1	F	821	821
3 - A428 (w)	685.43	268.4	F	1574	1574
4 - B1043 Barford Road (n)	19.44	5.6	C	922	922

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	1025	256	1089	1025	1026	724	2.4	4.7	15.295	C
2 - Barford Road (s)	733	183	1091	732	729	1023	1.7	3.4	14.634	B
3 - A428 (w)	1412	353	623	1308	1369	1200	7.5	30.2	52.529	F
4 - B1043 Barford Road (n)	820	205	997	817	826	935	1.7	2.7	11.031	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	1261	315	1276	1182	1184	788	4.7	27.3	54.094	F
2 - Barford Road (s)	911	228	1310	872	871	1148	3.4	14.2	40.683	E
3 - A428 (w)	1723	431	743	1298	1349	1439	30.2	135.2	233.987	F
4 - B1043 Barford Road (n)	1012	253	1043	1021	1005	998	2.7	5.5	17.982	C

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	1253	313	1265	1194	1203	789	27.3	42.6	107.438	F
2 - Barford Road (s)	901	225	1305	892	895	1154	14.2	19.1	70.606	F
3 - A428 (w)	1727	432	748	1289	1341	1449	135.2	243.7	530.523	F
4 - B1043 Barford Road (n)	1016	254	1037	1017	1024	1000	5.5	5.6	19.437	C

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Throughput (exit) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	1022	255	1119	1112	1169	748	42.6	10.1	70.557	F
2 - Barford Road (s)	736	184	1162	760	801	1069	19.1	4.1	37.862	E
3 - A428 (w)	1426	357	658	1334	1374	1264	243.7	267.9	685.431	F
4 - B1043 Barford Road (n)	840	210	1028	839	851	964	5.6	3.0	12.841	B

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

| Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	551	678	0.813	552	549	1.4	2.6	16.382	C
		1	2	1, 3, 4	473	670	0.706	473	477	1.0	1.9	13.385	B
		2	1	(1, 2, 3, 4)	1025			1024	1035	0.0	0.2	0.281	A
	Exit	1	1		724			724	729	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	377	557	0.678	375	377	0.8	1.8	15.006	C
		1	2	1, 2, 4	355	565	0.627	357	353	0.9	1.4	13.432	B
		2	1	(1, 2, 3, 4)	733			732	736	0.0	0.2	0.378	A
	Exit	1	1		1023			1023	1046	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	561	819	0.685	562	579	1.5	2.8	16.142	C
		1	2	1, 2, 3	761	781	0.974	746	790	5.1	11.7	45.248	E
		2	1	(1, 2, 3, 4)	1412			1322	1402	0.9	15.7	19.110	C
	Exit	1	1		1200			1200	1213	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	374	739	0.507	373	376	0.8	1.1	9.939	A
		1	2	3, 4	445	732	0.608	444	450	0.9	1.6	11.946	B
	Exit	1	1		935			935	962	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	608	614	0.991	605	605	2.6	7.6	38.631	E
		1	2	1, 3, 4	584	607	0.961	577	579	1.9	6.4	31.557	D
		2	1	(1, 2, 3, 4)	1261			1192	1222	0.2	13.3	18.330	C
	Exit	1	1		788			788	793	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	446	490	0.910	440	446	1.8	4.4	29.271	D
		1	2	1, 2, 4	436	497	0.877	432	424	1.4	3.8	26.774	D
		2	1	(1, 2, 3, 4)	911			883	891	0.2	6.0	12.319	B
	Exit	1	1		1148			1148	1168	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	545	779	0.700	551	557	2.8	3.1	22.497	C
		1	2	1, 2, 3	747	745	1.004	747	792	11.7	14.6	67.702	F
		2	1	(1, 2, 3, 4)	1723			1292	1363	15.7	117.4	184.775	F
	Exit	1	1		1439			1439	1441	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	468	724	0.647	469	458	1.1	2.0	13.713	B
		1	2	3, 4	544	718	0.758	552	548	1.6	3.4	21.556	C
	Exit	1	1		998			998	1007	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	611	617	0.990	610	610	7.6	8.5	49.066	E
			2	1, 3, 4	587	611	0.961	584	593	6.4	6.7	40.562	E
		2	1	(1, 2, 3, 4)	1253			1197	1208	13.3	27.4	62.459	F
	Exit	1	1		789			789	803	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	456	491	0.929	455	459	4.4	4.7	36.552	E
			2	1, 2, 4	438	498	0.878	437	436	3.8	4.2	32.718	D
		2	1	(1, 2, 3, 4)	901			893	897	6.0	10.2	35.831	E
	Exit	1	1		1154			1154	1176	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	548	777	0.706	547	554	3.1	3.7	24.427	C
			2	1, 2, 3	742	742	0.998	742	787	14.6	14.7	70.792	F
		2	1	(1, 2, 3, 4)	1727			1290	1344	117.4	225.2	479.812	F
	Exit	1	1		1449			1449	1472	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	464	725	0.640	467	467	2.0	1.7	14.502	B
			2	3, 4	552	718	0.768	550	557	3.4	3.9	23.591	C
	Exit	1	1		1000			1000	1012	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Av. throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - A428 (e)	Entry	1	1	2, 3	565	668	0.846	580	603	8.5	3.9	35.790	E
			2	1, 3, 4	519	660	0.786	532	566	6.7	2.9	29.727	D
		2	1	(1, 2, 3, 4)	1022			1084	1135	27.4	3.3	39.120	E
	Exit	1	1		748			748	765	0.0	0.0	0.000	A
2 - Barford Road (s)	Entry	1	1	3, 4	385	535	0.721	392	413	4.7	1.9	25.929	D
			2	1, 2, 4	365	543	0.671	367	388	4.2	1.7	22.458	C
		2	1	(1, 2, 3, 4)	736			750	780	10.2	0.5	14.487	B
	Exit	1	1		1069			1069	1111	0.0	0.0	0.000	A
3 - A428 (w)	Entry	1	1	4	560	808	0.693	559	568	3.7	4.0	24.100	C
			2	1, 2, 3	776	772	1.004	775	806	14.7	14.7	68.898	F
		2	1	(1, 2, 3, 4)	1426			1335	1375	225.2	249.2	638.464	F
	Exit	1	1		1264			1264	1328	0.0	0.0	0.000	A
4 - B1043 Barford Road (n)	Entry	1	1	1, 2	391	728	0.537	389	385	1.7	1.3	10.804	B
			2	3, 4	449	721	0.623	450	467	3.9	1.7	14.559	B
	Exit	1	1		964			964	993	0.0	0.0	0.000	A
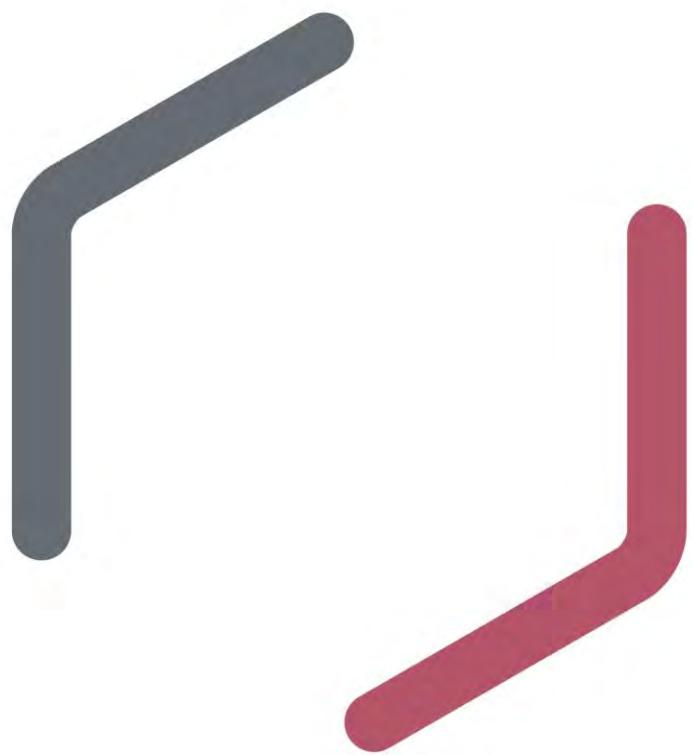
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