Local Plan Technical Report

2018/2019 Infrastructure Delivery Plan Appendices

Part 5: Transport – North West Harpenden

Appendices 21 to 23

St Albans City & District Council

Appendix 21: Brookbanks North West Harpenden Local Plan Transportation Study (June 2016)

Land at Luton Road
North West Harpenden

Local Plan Transportation Study

Brookbanks

Document Control Sheet

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Executive Summary

Brookbanks Consulting Engineers (BCL) has been instructed by CEG who are working in collaboration with Legal & General Property (L&G) to prepare a transport study to assist St. Albans District Council (SACDC) in supporting the allocation of land North West of Harpenden for residential development. The land to the south of Cooters End Lane is controlled by CEG and the land to the north of the site is controlled by L&G. The site is referred to as Broad Location 5 (BL5) and is identified by an allocation under Policy SLP13c of the Publication Draft Strategic Local Plan 2011-2031 (SLP).

Two vehicular accesses are proposed onto the existing highway network, the primary being a traffic signal-controlled junction on Luton Road and the secondary being a priority junction at Cooters End Lane to the north of the site.

Improvements to public transport provision are also included within this report as well as new and enhanced footways with improvements to cycle routes in the area, which will reduce the need to travel by private car. Pedestrian and cycle connections to the neighbouring Harpenden and the public transport network are proposed to be enhanced for which improved bus services will connect the proposed allocation to the town centre.

The potential impact of the proposals for North West Harpenden has been fully appraised. This assessment indicates that the delivery of these proposals will not significantly increase the flows through the town or impede access to the local highway network for existing residents. This is in relation to the policy basis for traffic testing which is outlined in further detail within the report.

Where highway impacts dictate, strategies for delivery mitigations are proposed.

In summary, the proposals demonstrate that a well-considered approach to developing transport and highways proposals for the proposed allocation at North West Harpenden is able to ensure the proposals meet national, regional and local policy and guidance while delivering the identified aspirations of the growth area.

1 Introduction

1.1 (BCL has been instructed by CEG to prepare a transport study to assist SACDC in supporting the allocation of land North West of Harpenden for residential development. The land is controlled by CEG who are working in collaboration with L&G. The site, referred to as Broad Location 5 (BL5) and identified by an allocation under Policy SLP13c of the SLP, is identified with capacity for approximately 500 residential units (to provide a mix of unit sizes and tenures). The SLP was most recently consulted in January 2016, and it is anticipated that the SLP will be submitted to the Secretary of State in July 2016 for Examination in autumn 2016.

1.2 This report has been prepared following discussions with officer at SACDC and Hertfordshire County Council (HCC) and provides additional evidence on transport matters related to residential development at BL5. It provides additional technical assessment to demonstrate the deliverability of SLP13c, and the associated highway works in particular, with a focus on those matters identified in the policy and the Council's Site Assessment Matrix. It also responds to comments on highway matters raised during the consultation process. This study has regard to relevant paragraphs of the Planning Practice Guidance (PPG) but does not consider strategic or district-wide highway matters as BCL understand these matters are addressed in other local plan evidence base documents.

1.3 This study outlines the existing highway situation including capacity/accident statistics and context in detail and explains the proposed allocation before considering wider accessibility matters including sustainable location/access to services, and identifying areas requiring mitigation. The study then sets out opportunities for accessibility improvements and considers in detail the highway mitigation measures which would be secured though Policy SLP13c as currently drafted. The study concludes with some overall observations on the transport and accessibility matters arising from residential development in BL5. The study is supported by information from a range of nationally recognised sources and modelling outputs from work undertaken by HCC in so far as these are available at this time, and this information is provided in the technical appendices found at the end of this document.

1.4 CEG who are controlling the land to the south of Cooters End Lane and L&G who are controlling the land to the north of Cooters End Lane, consider the development of this site to represent an appropriate and available location for a proposed allocation.

1.5 SACDC has published the emerging SLP for consultation to seek comments from key stakeholders. Following which the SLP will be reviewed by a Government appointed inspector through a formal Examination in Public to determine if the SLP is 'sound'.

1.6 The objective of the study is to provide an evidence base to suggest that the proposed allocation is acceptable from a transportation and highways viewpoint. In addition, the transport effects will be assessed to demonstrate the scale of impacts of the proposed allocation in accordance with the National Planning Policy Framework (NPPF) and PPG.

2 Allocation Description

Location

2.1 The proposed allocation lies to the north west of the town of Harpenden. The town of Harpenden, in Hertfordshire, is located centrally between Luton, Hemel Hempstead, St Albans, Hatfield and Stevenage. The location of Harpenden in relation to the wider hinterland is shown overleaf.

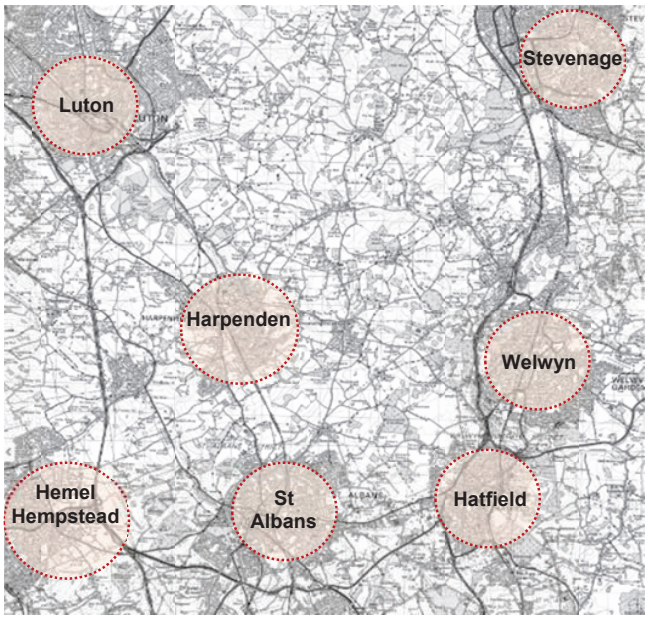


Figure 2a: Strategic location

2.2 The site is bound by Luton Road to the west with Ambrose Lane to the east, open farmland to the north of the site and Bloomfield Road located to the south. Cooters End Lane in turn bisects the proposed allocation to the north and south which is under the control of L&G and CEG respectively.

2.3 The land is currently undeveloped and it is not thought to have been historically constructed on. The site location and boundary is shown indicatively on Figure 2a, below.

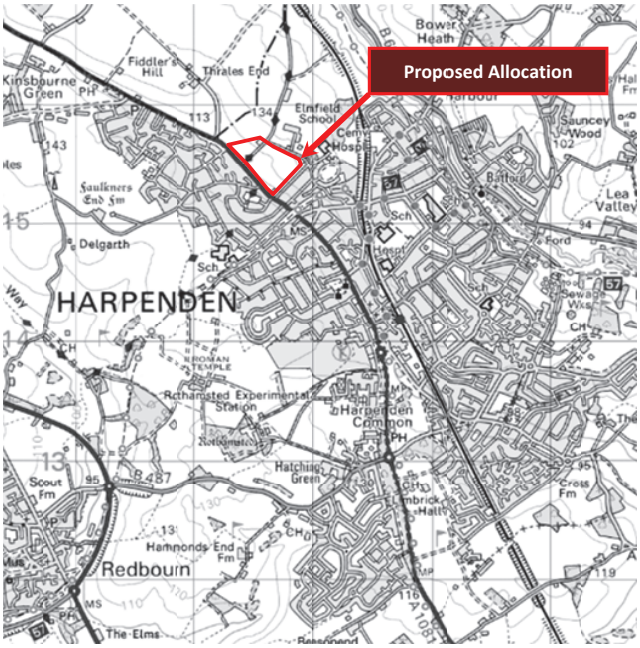


Figure 2b: Site Location

Proposed Allocation Description

2.4 The proposed allocation is to comprise circa 500 dwellings. The proposed allocation will deliver a mix of housing types and tenure to respond to the emerging demand of Harpenden.

2.5 The site will also likely provide a new two form entry primary school on a site to the north of Ambrose Lane to respond to the educational demand from both the proposed allocation and existing North West Harpenden hinterland.

Local Planning Policy Context

2.6 The following sections represent a comprehensive review of the proposed allocation and how it contributes towards fulfilling SACDC's policies SLP 25 and SLP 13c proposals which are part of the wider SADC Draft Strategic Local Plan Consultation (2014). It also refers to the relevance of the draft Harpenden Urban Transport Plan (2011).

Policy SLP25 – Transport Strategy

2.7 As required, the proposed allocation is in an accessible location which will reduce the need to travel over distance, encourage walking and cycling as well as using public transport services which run past this site and are therefore available to residents. As part of the proposed highway access and off-site mitigation measures such as junction improvements, the existing transport infrastructure and hierarchy will be maintained and improved. It has also been identified that road improvements are required, to secure environmental and transportation benefits, particularly at key junctions on the main roads in Harpenden Town Centre.

2.8 With respect to public transport, any proposed improvement or additional routes to bus services offered in conjunction with the proposed allocation will also improve accessibility improvements to and at Harpenden railway station

2.9 A fully comprehensive Travel Plan will be provided as is required for all residential and non-residential developments. Such plans will set out measures to encourage people to use alternative modes of travel to the single occupancy car. Detailed guidance included in the SLP will also be followed throughout this.

Policy SLP 13c – North West Harpenden

2.10 CEG and L&G consider that the proposed allocation provides an urban extension primarily for housing in a sustainable location close to existing communities and facilities in Harpenden, as is required in this policy.

2.11 The existing strategic road network and residential road network has been fully considered in producing this report and it has been demonstrated that both an appropriate highway access strategy as well as suitable off-site mitigation can be achieved. It has also been demonstrated that a two-form entry primary school can be delivered as part of the proposals with improved local public transport. This will be discussed at the detailed planning stage.

Harpenden Urban Transport Plan 2011

2.12 CEG and L&G consider that the proposed allocation will contribute towards fulfilling the following objectives:

- This report outlines improved cycle routes towards the station from the proposed allocation;
- In with the above, this report includes improvements to the cycle network and promotion of cycling;
- The proposed allocation can potentially improve sustainable transport, for which the Travel Plan will outline smarter choices, encouraging greater uptake of Safe Routes to Schools and active promotion of sustainable travel modes;
- The proposed allocation will include pedestrian crossings in the access strategy.

Access proposals

2.13 An allocation delivering this scale preferably requires two points of access. The southern access will be designed with capacity to serve the majority of the southern part of the site under the control of CEG. The northern access will be

designed to serve the northern part of the site under the control of L&G and provide a secondary access to the southern part of the site. The characteristics of the site are such that suitable access solutions are available.

2.14 The A1081 bounds the site to the west, which is a single carriageway road. The A1081 provides access to individual properties as well as forming a junction with Roundwood Lane. To minimise the number of junctions along the A1081, it is considered that the main point of access into the site should consider upgrading the existing A1081 junction with Roundwood Lane, which is presently signal controlled. It is considered that a forth arm could be provided, maintaining the current level of control. Alternatively, the junction could be converted into a roundabout.

2.15 It is further considered appropriate to utilise the junction with Cooters End Lane located to the north of the allocation to provide the secondary point of access. This access will be used to serve the developable area both north and south of Cooters End Lane.

2.16 The potential access solutions are presented below and contained in the Appendix E.

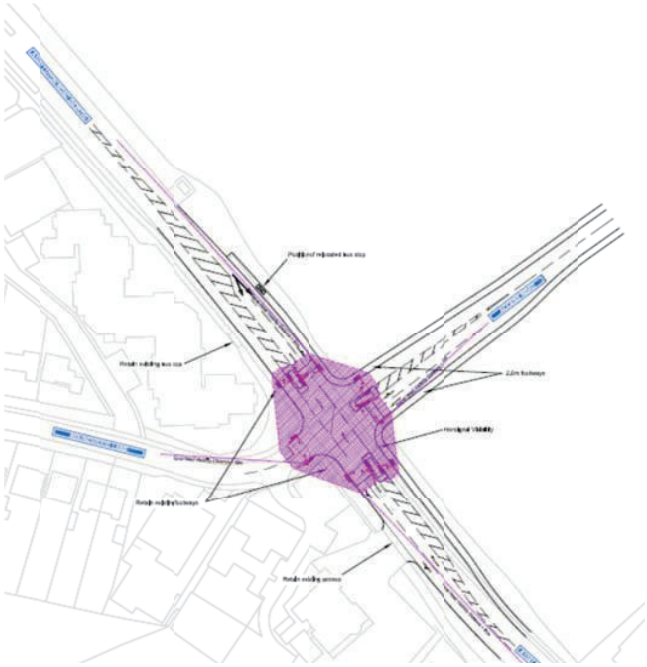


Figure 2c: Potential signalised access junction at A1081 / Roundwood Lane

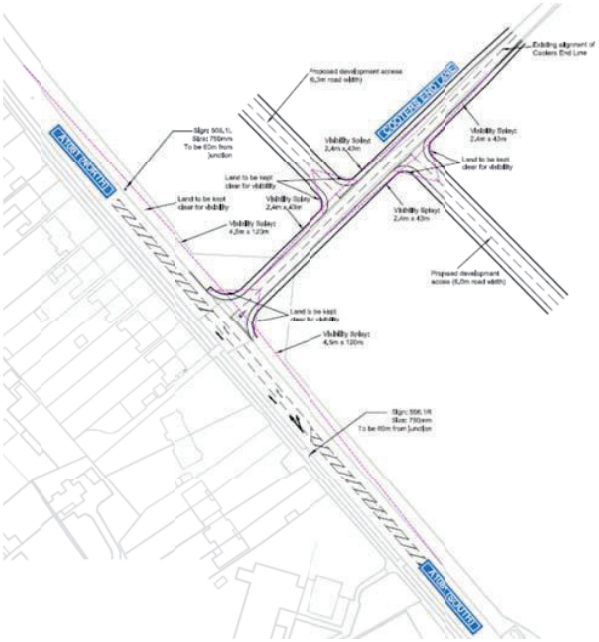


Figure 2d: Potential access junction at Cooters End Lane

Internal Site Hierarchy

2.17 Within the site, the masterplan proposes a street network having a clear hierarchy as described below:

Primary route: The design speed for the internal street is based on a speed limit of 30mph, although the aspiration of the proposed allocation is to achieve lower speeds with design of the streetscape. A main link through the site will be delivered.

Secondary Routes: Secondary routes are designed to penetrate the individual allocated blocks and cater for vehicles at the reduced speeds, which will be reflected in the design and appearance of these roads.

Tertiary Routes: These will be designed to penetrate individual housing clusters and will be designed to encourage lower vehicle speeds and could incorporate shared spaces between motor vehicles, pedestrians and cyclists.

2.18 Additional details for the SLP and council master planning process will be provided at a later stage.

3 Highway Capacity

Introduction

3.1 The operation of the existing road network could potentially be affected by the proposed allocation. A review of highway capacity has therefore been completed, including link and junction capacity assessments. The methodology used has been discussed with the Highway Authority, in this case HCC.

3.2 The methodology employs traffic counts on the existing highways together with an estimation of proposed allocation traffic flows generated using trip rates from TRICS being distributed by 2011 Census travel to work statistics. In addition to this, the locations of potential impacts of the proposed allocation have been identified through the use of the formal COMET traffic model operated by HCC. Highway network capacity has been appraised using nationally accepted capacity modelling tools.

3.3 However, the formal COMET traffic model has not currently been provided to BCL by HCC. Therefore a traditional modelling methodology has been hereby adopted to deduce the impact of the proposed allocation on the local highway network and the subsequent highway mitigation measures that will be required.

3.4 The final highway mitigation measures may be subject to change should the formal COMET traffic model be provided to BCL.

Background Data

3.5 **Traffic Surveys:** To form the basis of the assessment, classified turning counts together with queue length surveys have taken place at agreed locations, these being the junctions considered most likely to be affected by the proposed allocation. The junctions are as follows:

- Location 1 – A5183 / B487 Redbourn Lane roundabout
- Location 2 – A1081 St. Albans Road / B487 roundabout
- Location 3 – A1081 High Street / B652 mini roundabout
- Location 4 – A1081 Luton Road / The Common mini roundabout
- Location 5 – A1081 Luton Road / Roundwood Lane traffic signals

3.6 It is proposed that the assessment of the proposed allocation impacts will follow a manual method which will include the following steps:

- Calculation of base traffic levels based on recently commissioned surveys
- Base traffic to be growthed to 2016 (application submission date) and 2031 (future year) using Tempro/NTM.
- There are no committed developments that should be taken into account
- Proposed allocation generated trips based on TRICS.
- Proposed allocation trips assigned to the network based on Census OD data.

3.7 **Assessment Year:** The proposed allocation has been assessed in 2031. This is to reflect the penultimate year cited within the long-term strategies outlined in the Publication Draft Strategic Local Plan 2011-2031 (SLP).

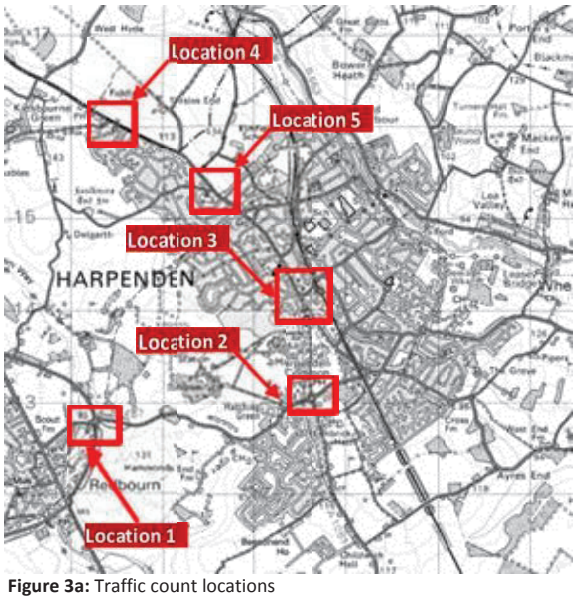


Figure 3a: Traffic count locations

3.8 **Traffic Generation:** Residential trip rates for the proposed allocation have been informed by the nationally accepted trip rate database TRICS, as attached in Appendix A. The TRICS output is attached in Appendix A. TRICS makes selections

from similarly sized development sites across the United Kingdom which are considered to exhibit similar traffic behaviours on completion and subsequent occupation. It is deemed from this that the selected sites are representative of the proposed allocation.

3.9 A proposed allocation of this size will deliver affordable housing. The final mix of affordable housing will be agreed during formal planning application discussions. The context of the policy within the core strategy states that developers will seek to provide 40% of affordable housing within allocated sites for the wider St. Albans and Harpenden area.

3.10 However, the trip rates for affordable housing are lower than for open market housing. Therefore, for the purposes of completing a robust assessment and to represent a worst case scenario, it has been assumed that 20% of the dwellings will be assumed to be of an affordable tenure, resulting in the following trip rates. The figures below identify the total number of vehicle trips generated by the proposed allocation, based on a total of 420 primary school places provided.

Trips	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
Housing – 500 units	74	182	256	158	104	262
Primary School – 420 places	122	85	207	87	101	188

Figure 3b: Total Vehicle trips

3.11 **Internalisation:** The proposed allocation is likely to deliver a complimentary mix of land uses that will reduce the number of trips exiting the proposed allocation. To determine the likely demand for school places created by the proposed allocation, Census statistics have been reviewed for the Harpenden North ward. This indicates that 150 primary school age children will be generated by the proposed allocation. The figure below quantifies the external trips.

Trips	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
Housing – 500 units	74	182	256	158	104	262
School external trips – 270 places	78	55	133	7	11	18

Figure 3c: External Vehicle trips

3.12 **Trip Distribution:** To distribute and assign the proposed allocation trips identified above, 2011 Census O-D travel to work statistics has been employed.

3.13 With respect to the primary school's location on the local network, it has been assumed that all traffic accessing the primary school from the A1081 Luton Road will do so via the proposed site access junction with the A1081 Luton Road and Roundwood Lane, as opposed to Ambrose Lane which is a very constrained road to the north of the site. This is due to the master plan options given so far, together with modelling for a worst case scenario within the design of the junction.

3.14 To discourage motorists from using Ambrose Lane as a "rat-run", it is envisaged that the access road through the site will also serve as the designated access to the primary school, with priority over the existing Ambrose lane alignment. However, this will be discussed at the detailed planning stage.

3.15 **COMET Modelling:** The HCC strategic network model, COMET, has been employed to model the impacts of the proposed allocation. Using the traffic model, HCC has undertaken a review of the model outputs to identify potential areas of stress on the highway network. This indicates that the following locations, together with those identified in Clause 3.5, could experience detrimental operation in the future:

- Thrales End Lane / Luton Road
- Luton Road / Park Hill junctions

3.16 The junctions included in Clause 3.5 have been assessed in this report, while the aforementioned junctions in the COMET model will be considered on receiving further information concerning the COMET model from HCC.

Link Capacity

3.17 The predicted traffic flows in the Future Year Scenario has been assessed along several key highway links. The increases in two way flow due to the proposed allocation have been screened using the following criteria.

Rating	Score
Negligible increase of up to 5%	
Minor increase between 5% and 10%	
Moderate Increase greater than 10%	

Figure 3d: Link assessment

3.18 This exercise demonstrates that the proposed allocation will increase traffic in excess of 5% on Cooters End Lane and along Luton Road south of the proposed allocation. This is not unexpected, as these links will be on the key traffic routes for traffic accessing the proposed allocation, especially Luton Road. The link show red, being Cooters End Lane is greater than 10% due to the existing low levels of traffic.

3.19 To determine the likely operation of these links, the link capacity has been assessed against the theoretical capacity as identified in the Advice Notes and TA 46/97: Traffic Flow Ranges for the Assessment of New Rural Roads in the case of Cooters End Lane; and TA 79/99: Traffic Capacity of Urban Roads for all other roads. The result of this assessment is shown overleaf:

	Link	Link Type	Two Way Theoretical Capacity	Peak vehicle flow	Percentage Capacity	Peak vehicle flow (with proposed allocation traffic)	Percentage Capacity
1	A1081 north of The Common	UAP1	3350	1712	51.1%	1783	53.2%
2	The Common	UAP2	1700	560	32.9%	568	33.4%
3	A1081 south of The Common	UAP1	4250	2099	49.4%	2178	51.2%
4	Cooters End lane	SC (2 lane)	335	206	61.5%	263	78.5%
5	A1081 south of Cooters End lane	UAP1	4250	2257	53.1%	2356	55.4%
6	A1081 north of Roundwood Lane	UAP1	3350	1722	51.4%	1835	54.8%
7	Roundwood Lane	UAP3	1500	388	25.9%	400	26.7%
8	A1081 south of Roundwood Lane	UAP2	2583	1907	73.8%	2063	79.9%
9	A1081 north of Station Road	UAP2	2583	1909	73.9%	2115	81.9%
10	Station Road	UAP3	2167	1115	51.5%	1148	53.0%
11	A1081 south of Station Road	UAP2	2583	2117	81.9%	2291	88.7%
12	A1081 north of Walkers Road	UAP1	4250	2155	50.7%	2211	52.0%
13	Walkers Road	UAP2	2583	1124	43.5%	1131	43.8%
14	A1081 south of Walkers Road	UAP1	3350	1622	48.4%	1659	49.5%
15	B487 Redbourn Lane	UAP1	3350	2245	67.0%	2259	67.4%
16	A5183 north of B487 Redbourn Lane	UAP1	3350	2815	84.0%	2816	84.1%
17	A1081 south of B487 Redbourn Lane	UAP1	4667	2719	58.3%	2731	58.5%
18	Harpenden Lane west of A5183	UAP2	2450	501	20.4%	502	20.5%

Figure 3e: Link Capacity check

3.20 The above indicates that the predicted traffic flow for the links in the Future Year Scenario with and without the proposed allocation does not exceed highway capacity.

Junction Capacity

3.21 Link flow can also be constrained by junction capacity and the key junctions identified above have also been assessed.

3.22 Industry accepted capacity assessment methods have been used to appraise the highway network capacity. The junctions have been assessed in the Base Year Scenario, together with the Future Year Scenario. The assessment outputs are attached in Appendix C.

3.23 Worst case results in the peak periods are summarised below, showing the junctions that operate above the normally accepted thresholds of capacity. Additional information is included in the Appendix regarding the individual junction assessments.

Junction	Future year without proposed allocation	Future year with proposed allocation
A5183 with Redbourn Lane	RFC = 1.270	RFC = 1.273
A1081 St. Albans Road / B487	RFC = 1.299	RFC = 1.315
A1081 with Station Road	RFC = 1.094	RFC = 1.289
A1081 with The Common	RFC = 1.001	RFC = 1.015
A1081 with Roundwood Lane	✓	✓
A1081 with Cooters End Lane	✓	✓

Figure 3f: Junction Capacity check

3.24 This indicates that the thresholds of capacity will be exceeded at the following junctions:

- A5183 / B487 Redbourn Lane roundabout
- A1081 St. Albans Road / B487 roundabout
- A1081 High Street / B652 mini roundabout

- A1081 Luton Road / The Common mini roundabout

3.25 The junctions identified above have been reviewed to determine the extent of mitigation required to deliver nil-detriment improvement solutions. These are contained in Appendix D with the final results presented below.

Junction	Future year without mitigation	Future year with mitigation
A5183 with Redbourn Lane	✗	✓
A1081 St. Albans Road / B487	✗	✓
A1081 with Station Road	✗	✓
A1081 with The Common	✗	✓

Figure 3f: Junction operation

3.26 This demonstrates that through the identified highway interventions, the impact of the proposed allocation can be mitigated.

COMET Highway Stress Points

3.27 While traffic flow data has yet to be made available from the COMET model by the Highway Authority, the junctions have also been reviewed at a high level.

3.28 **Thrales End Lane / Luton Road:** This junction is located to the north of the site and forms a T junction that benefits from a right turn lane. Thrales End Lane provides access to an employment area and Luton Hoo Estate, which together would only generate modest volumes of traffic. The junction currently provides a right turn lane that assists with maintain the northbound flow along Luton Road. Therefore, any impact from the proposed allocation will be associated with the southbound flow, which could affect the ability to turn right into Thrales End Lane or traffic exiting Thrales End Lane. A review of the traffic distribution, indicates that there could be an increase of circa 15 (equivalent to an additional vehicle every four minutes) and 45 (equivalent to an additional vehicle every one minute) southbound movements in the morning and evening peak respectively. This level of increase is unlikely to have a significant impact at this junction. However, should an improvement be justified following a detailed assessment, this junction could be improved by widening the exit from Thrales End Lane. This will benefit the operation of the junction providing space for two vehicles exiting Thrales End Lane to wait side by side.

3.29 **Luton Road / Park Hill junction:** This junction is located to the south of the site and is currently signal controlled T junction. To the immediate south of this junction, the available width of Luton Road is constrained at the underpass to 'The Nickey Line'. However this junction could be improved through the introduction of Microprocessor Optimised Vehicle Actuation (MOVA) traffic control. MOVA is now an established strategy for the control of traffic light signals. For the major part of the day before congestion occurs, MOVA operates to minimise delay to motorists. However, should any approach become overloaded, MOVA then alters the signal timings to reflect the traffic conditions to maximize capacity. It is typically considered that the introduction of MOVA can reduce delays by over 10%.

3.30 The improvement in junction performance through the inclusion of MOVA is reported in the Traffic Advisory Leaflet 3/97. This note evaluated 20 sites where MOVA was introduced and identifies that MOVA reduces delays by an average of 13%. These benefits were further supported by TAL 2/93, that quotes:

"The original advantages claimed for MOVA remain valid; those of decreased delay and increased capacity."

3.31 Therefore, based on the use of MOVA, this junction is likely to operate more efficiently which will reduce the predicted levels of delay and congestion.

Summary

3.32 This section demonstrates that although traffic levels will inevitably increase on the local roads as a result of the proposed allocation, suitable highway mitigation measures can be implemented to achieve Nil Detriment at all affected junctions.

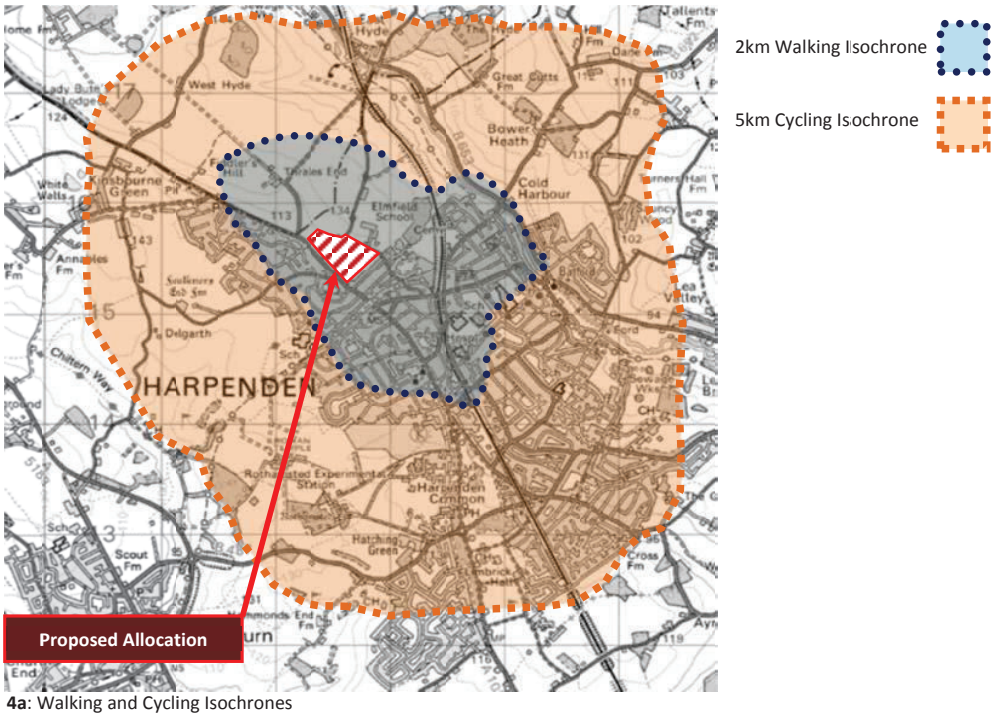
4 Accessibility

4.1 The accessibility of the proposed allocation is achieved through successfully forming transport links from the proposed allocation to the external transport routes, so a permeable layout is delivered. This allows future site occupiers to access local facilities and amenities by different modes of travel. A qualitative review of the accessibility implications of the proposed allocation has been conducted. Harpenden Town Centre is located less than 1km away from the proposed allocation and is therefore within very close proximity.

4.2 In accordance with guidance given in LTN 1/04 – Policy, Planning and Design for Walking and Cycling, journeys of less than 2km should be targeted for the promotion of walking as a suitable and sustainable mode of travel. The equivalent distance quoted for cycling is 5km. These are the accepted standard measures used in a Transport Assessment.

4.3 Harpenden Town Centre offers a large range of restaurants, public houses and both independent and national retailers in a High Street setting as well as local amenities including a sports centre, swimming pool and leisure facilities.

4.4 The locations of the key destinations are indicated below.



4a: Walking and Cycling Isochrones

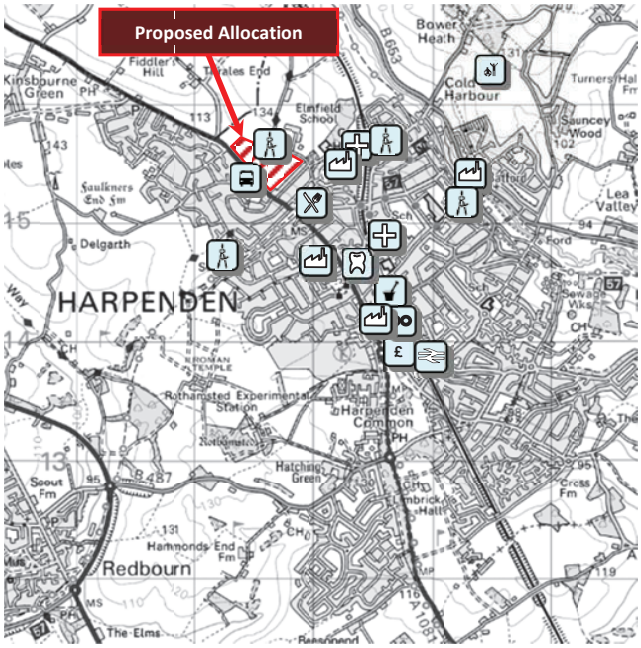


Figure 4b: Key Local Amenities

4.5 This demonstrates that a wide range of local amenities are within walking / cycling range, the site having very good accessibility. Harpenden Town Centre has a compact layout with the railway station nearby, meaning that the amenities are generally located in close proximity of each other. Together with the location of the proposed allocated site, this advocates that it is in a very good location with convenient access to the necessary facilities.

4.6 As indicated, the proposed allocation will deliver a primary school that will serve the proposed allocation as well as the existing residents. This will reduce the need to travel which will reduce the impact on the wider road network.

Summary

4.7 This section demonstrates that the proposed allocation site is well placed and has good walking access with limited dedicated cycling access to Harpenden Town Centre; however it is in close proximity to local facilities and amenities. It is therefore considered that there are alternative choices of transport to the car.

5 Walking and Cycling

5.1 Presently, a number of discontinuous footways are provided alongside Luton Road, A1081. The junction between Roundwood Lane and the A1081 includes pedestrian crossing facilities. The current extent of pedestrian facilities is indicated below.

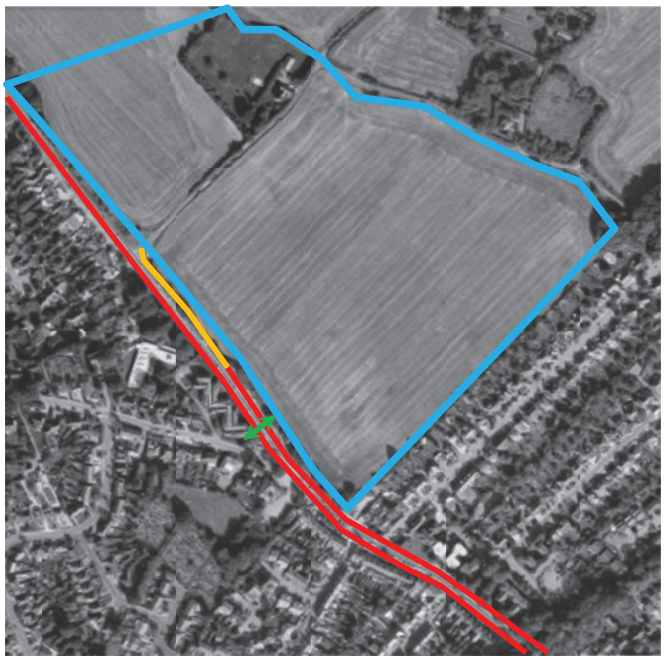


Figure 5a: Walking and cycling connections

5.2 The masterplan for the site will include a comprehensive network of walking and cycling routes that will connect the housing blocks within the proposed allocation. The network will be inclusive to all potential users on site and cater for all future users. The masterplan for the site will include a new section of footway along the site frontage. The masterplan will include connections into the existing network.

5.3 To offer a further choice of sustainable travel between the proposed site of the allocation and Harpenden Town Centre together with Harpenden Railway Station, improvements to the walking and cycling network will be provided, as illustratively indicated in Figure 5b.

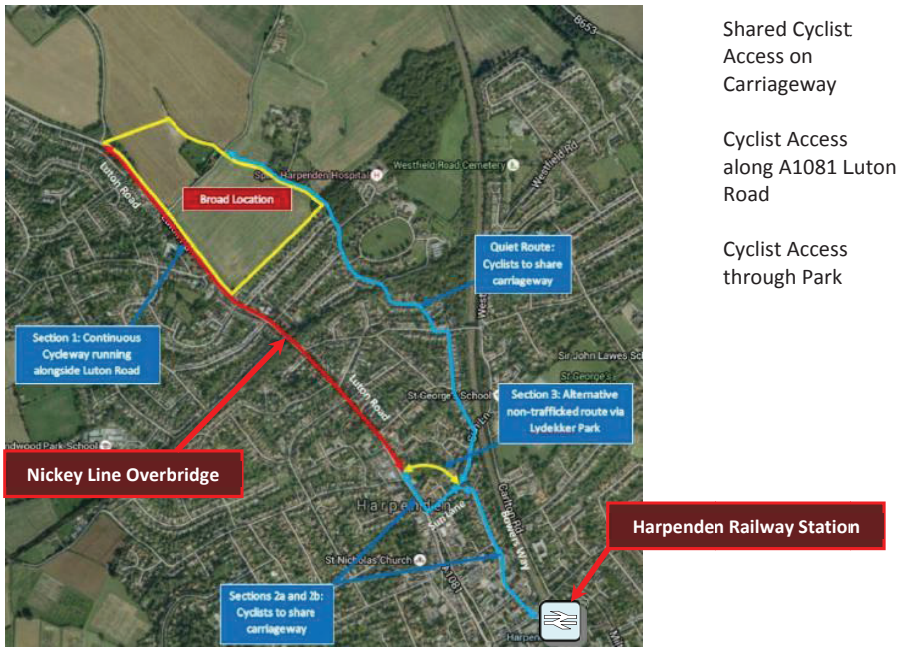


Figure 5b: Potential Cycling Routes from the Proposed Allocation to Harpenden Town Centre

5.4 Figure 5b represents the possible ways to reach Harpenden from the proposed allocation. There are two possible routes to Harpenden Town Centre, these are:

- A combination of a dedicated cycle route and shared carriageway via the A1081 Luton Road; or
- A "quiet" cycle route via a shared carriageway along the lightly trafficked Ambrose Lane.

Summary

5.5 Although the proposed cycle route along the A1081 Luton Road is constrained by the former railway bridge that carries the Nickey Line (now a shared pedestrian/cyclist route) overhead, however, the reach of Luton Road to the north of the bridge offers sufficient width to include a shared cycle route along the carriageway.

5.6 A quiet route to Harpenden Town Centre is available via Ambrose Lane which also gives direct and easy access to Harpenden Railway Station which has secure parking for cycles. This will allow cyclists to avoid the Town Centre should they wish to make the journey from the proposed allocated site to Harpenden Railway Station by cycle.

5.7 This section demonstrates that the proposed allocation has good cycle and pedestrian connections to Harpenden Town Centre as well as Harpenden Railway Station.

6 Public Transport

Road Based Public Transport

6.1 The site is supported by existing public transport that currently operates along Luton Road. The current level of services will offer a sustainable alternative to the motorcar. The services that operate adjacent to the site are highlighted below:

- Route 321 – Luton to St Albans
- Route 366 – Luton to Welwyn / Hatfield
- Route 636 – Luton to St Albans

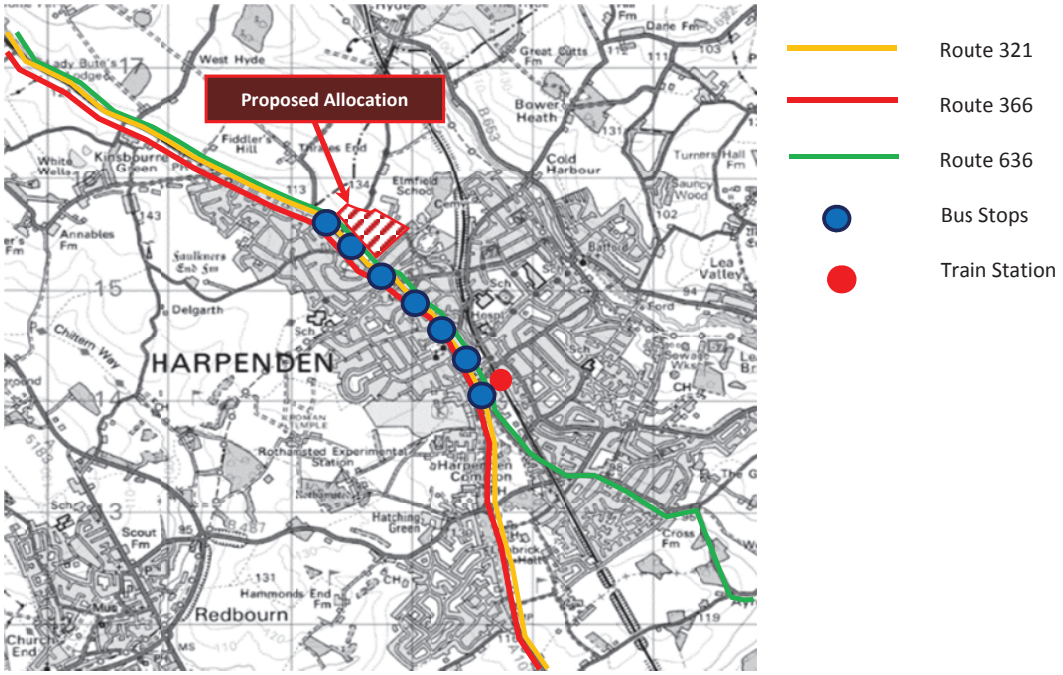


Figure 6a: Public Transport Routes

6.2 The bus stops adjacent to the site provide sheltered waiting areas and are located to the north of Roundwood Lane.

6.3 The road based public transport services provide comprehensive coverage during the day, but limited over the weekend. Therefore, the identified routes that operate adjacent to the site will be improved to deliver regular services over the weekend. The proposed allocation will help support a critical mass to justify the weekend service enhancements while providing additional patronage to the weekday services to ensure the longer term viability of existing routes.

6.4 The existing bus services that operate close to the proposed site are identified in Figure 6b.

Service	Destination	Frequency
321	**Luton to Harpenden to St. Albans to Watford** **Operator: Arriva**	Monday to Saturday: 20 minute frequency Sunday: 60 minute frequency
366	**Luton to Harpenden to Wheathampstead to Welwyn Garden City to Hatfield** **Operator: Centrebus**	Monday to Friday: 60 minute frequency Saturday and Sunday: No Services
636	**Luton to Harpenden to St. Albans to London Colney** **Operator: Uno**	Monday to Friday: 60 minute frequency Saturday and Sunday: No Services

Figure 6b: Bus Routes closest to the site

6.5 Presently, two routes operated by Arriva and Centrebus pass adjacent to the site boundary. It has been discussed that both of the existing routes are suitable for serving the proposed allocation. However, to maximise the opportunities to travel by public transport, it is proposed to improve these current routes that operate in Harpenden.

6.6 Routes 321, 366 and 636 do not currently offer sufficient frequencies of service. Therefore potential improvements could include:

- Route 321 to be improved to give a 15 minute frequency from Monday to Friday;
- Route 366 to be improved to give a 30 minute frequency from Monday to Friday with a 60 minute frequency on Saturdays.

6.7 The long term viability of any public transport routes is critical if it is to serve the community into the future. Therefore discussions with Arriva and Centrebus will establish the likely level of revenue that could be generated by the proposed allocation, which can be offset by the likely costs to understand the viability.

6.8 As a result of this work, financial support is likely to be needed initially, but over time it is expected that patronage levels will be sufficient to safeguard the long term viability of the proposed public transport interventions. This will be discussed in greater detail with the local public transport providers in the transport assessment.

Rail Based Public Transport

6.9 The Harpenden railway station is located within walking and cycling distance to the south east of the proposed site and is located on the electrified Midland Main Line railway that links London with the North of England. The road based public transport routes can also enhance connectivity with the train station. This in turn offers further sustainable transport to the City of London and the wider South East region, as well as the East Midlands and Yorkshire Regions.

6.10 The train station includes numerous facilities, including:

- Sheltered cycle parking (for cyclists wishing to commute to the railway station)
- 209 space car park
- Manned ticket office
- Ticket machines, including collection for pre-purchased tickets
- CCTV
- Pay phones
- Refreshment facilities
- Toilets

- Waiting rooms
- Lifts to platforms

6.11 The train station provides regular connections to:

- Six routes per hour to St Albans with a journey time of circa 6 minutes
- Seven routes per hour to Luton with a journey time of circa 17 minutes
- Eight routes per hour to London St. Pancras with a journey time of circa 26 minutes
- Five routes per hour to Bedford with a journey time of circa 33 minutes
- Four routes per hour to East Croydon with a journey time of circa 68 minutes
- Two routes per hour to Sutton with a journey time of circa 79 minutes
- Four routes per hour to London Gatwick Airport with a journey time of circa 82 minutes
- One route per hour to Sevenoaks with a journey time of circa 83 minutes
- Three routes per hour to Brighton with a journey time of circa 114 minutes

Summary

6.12 This section demonstrates that the proposed allocation site has good access to public transport with choices of sustainable transport available as an alternative to using the private car.

7 Accident Review

7.1 Existing road safety issues can sometimes be exacerbated with an increase in traffic. To determine if the proposed allocation could affect road safety, a review of the historical accidents has been carried out.

7.2 Data have been obtained from HCC relating to all personal injury road accidents (PIAs) reported as occurring during the last five years on the A1081 and B487 through Harpenden, as indicated in Figure 7a below:

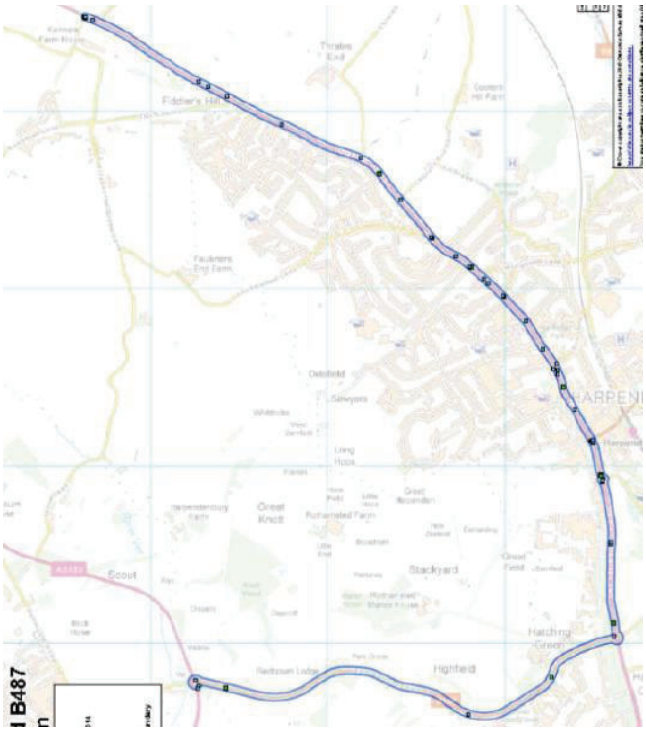


Figure 7a: Distribution of Accidents on the Local Highway Network

7.3 A total of 52 accidents were reported, resulting in 68 casualties. One accident resulted in fatal injury when a light goods vehicle turned right out of Kinsbourne Green Lane into the path of a motorcycle travelling north on the A1081. A further six accidents resulted in serious injury, in two case to a pedestrian, one to a pedal cyclist and the other three to motor cyclists.

	Number of PIAs				Casualties
	Slight	Serious	Fatal	Total	
Year 1	14	1	0	15	21
Year 2	5	0	0	5	5
Year 3	7	2	0	9	10
Year 4	11	2	1	14	18
Year 5	8	1	0	9	14
5 year period total	45	6	1	52	68

Figure 7b: Total number of PIAs by year and severity, with casualties

7.4 The most notable overall feature of the accidents is that 33% of them involved at least one vulnerable road user including four pedestrians and 13 cyclists.

7.5 Other notable common factors are that 11 or 22% of the accidents involved at least one young driver or rider aged 23 years or under and that 22% of the accidents occurred on a wet road surface. A high proportion of accidents resulted from vehicles failing to give way at junctions. There does not appear to be any consistent pattern over time.

	Pedestrian	Pedal cyclist	Total
Year 1	2	3	5
Year 2	0	2	2
Year 3	1	2	3
Year 4	1	2	3
Year 5	0	4	4
5 year period total	4	13	17

Figure 7c: PIAs involving vulnerable road users

7.6 One geographic cluster of accidents has been identified, at the A1081 roundabout junction with Bull Road where nine accidents occurred during the study period, just short of two per year. Two of the accidents resulted in serious injury and six of the nine involved vulnerable road users (one pedestrian; four pedal cyclists and one motor cyclist). Six of the accidents occurred during the hours of darkness and all but the one involving a pedestrian involved vehicles failing to give way to another vehicle using the junction, and in five of these incidents the cause was due to a vehicle travelling north on St Albans Road that was at fault.

7.7 All of the reported accidents involving vulnerable road users have been analysed. The majority of the accidents occurred on the A1081 between the B487 roundabout and just north of the railway line, with six at the Bull Road roundabout itself. There was no specific trend to the accidents.

Summary

7.8 52 personal injury accidents were reported to have occurred within the study area during the most recent 5-year period for which information is available at the time of writing. This included one fatal accident.

7.9 The only significant cluster of accidents is at the A1081 roundabout junction with Bull Road where nine injury accidents were reported, including four pedal cyclists. There was no specific trend to the accidents.

7.10 Whilst the proposed allocation will add traffic to the network, there is no evidence that this will significantly compromise the relatively safe performance of the existing road system. Therefore it is considered from this that the proposed allocation will not affect the road safety on the local highway network.

Appendix A – TRICS Outputs

Calculation Reference: AUDIT-346901-150706-0748

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED

VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	EX	ESSEX	1 days
	WS	WEST SUSSEX	1 days
04	**EAST ANGLIA**		
	SF	SUFFOLK	1 days
05	**EAST MIDLANDS**		
	LN	LINCOLNSHIRE	2 days
06	**WEST MIDLANDS**		
	SH	SHROPSHIRE	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	NE	NORTH EAST LINCOLNSHIRE	2 days
	NY	NORTH YORKSHIRE	1 days
08	**NORTH WEST**		
	CH	CHESHIRE	2 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	Number of dwellings
Actual Range:	108 to 432 (units:)
Range Selected by User:	100 to 2000 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/07 to 11/12/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	2 days
Tuesday	5 days
Thursday	3 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	11 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	4
Edge of Town	6

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	8
No Sub Category	3

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	190	0.077	11	190	0.257	11	190	0.334
08:00 - 09:00	11	190	0.152	**11**	**190**	**0.391**	11	190	0.543
09:00 - 10:00	11	190	0.154	11	190	0.172	11	190	0.326
10:00 - 11:00	11	190	0.141	11	190	0.177	11	190	0.318
11:00 - 12:00	11	190	0.162	11	190	0.155	11	190	0.317
12:00 - 13:00	11	190	0.178	11	190	0.173	11	190	0.351
13:00 - 14:00	11	190	0.163	11	190	0.145	11	190	0.308
14:00 - 15:00	11	190	0.172	11	190	0.185	11	190	0.357
15:00 - 16:00	11	190	0.291	11	190	0.211	11	190	0.502
16:00 - 17:00	11	190	0.288	11	190	0.181	11	190	0.469
17:00 - 18:00	**11**	**190**	**0.333**	11	190	0.216	**11**	**190**	**0.549**
18:00 - 19:00	11	190	0.238	11	190	0.197	11	190	0.435
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.349			2.460			4.809

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	108 - 432 (units:)
Survey date date range:	01/01/07 - 11/12/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

TAXIS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	190	0.003	11	190	0.002	11	190	0.005
08:00 - 09:00	11	190	0.002	11	190	0.003	11	190	0.005
09:00 - 10:00	11	190	0.002	11	190	0.002	11	190	0.004
10:00 - 11:00	11	190	0.003	11	190	0.004	11	190	0.007
11:00 - 12:00	11	190	0.001	11	190	0.001	11	190	0.002
12:00 - 13:00	11	190	0.001	11	190	0.001	11	190	0.002
13:00 - 14:00	11	190	0.001	11	190	0.000	11	190	0.001
14:00 - 15:00	11	190	0.003	11	190	0.003	11	190	0.006
15:00 - 16:00	**11**	**190**	**0.005**	**11**	**190**	**0.005**	**11**	**190**	**0.010**
16:00 - 17:00	11	190	0.002	11	190	0.001	11	190	0.003
17:00 - 18:00	11	190	0.002	11	190	0.001	11	190	0.003
18:00 - 19:00	11	190	0.001	11	190	0.001	11	190	0.002
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.026			0.024			0.050

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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Parameter summary

Trip rate parameter range selected:	108 - 432 (units:)
Survey date date range:	01/01/07 - 11/12/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

OGVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	**11**	**190**	**0.004**	11	190	0.002	11	190	0.006
08:00 - 09:00	11	190	0.001	11	190	0.002	11	190	0.003
09:00 - 10:00	11	190	0.003	11	190	0.001	11	190	0.004
10:00 - 11:00	11	190	0.003	11	190	0.004	**11**	**190**	**0.007**
11:00 - 12:00	11	190	0.002	11	190	0.002	11	190	0.004
12:00 - 13:00	11	190	0.004	11	190	0.003	11	190	0.007
13:00 - 14:00	11	190	0.003	**11**	**190**	**0.004**	11	190	0.007
14:00 - 15:00	11	190	0.002	11	190	0.004	11	190	0.006
15:00 - 16:00	11	190	0.001	11	190	0.001	11	190	0.002
16:00 - 17:00	11	190	0.002	11	190	0.001	11	190	0.003
17:00 - 18:00	11	190	0.000	11	190	0.000	11	190	0.000
18:00 - 19:00	11	190	0.000	11	190	0.000	11	190	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.025			0.024			0.049

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	108 - 432 (units:)
Survey date date range:	01/01/07 - 11/12/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

PSVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	190	0.000	11	190	0.000	11	190	0.000
08:00 - 09:00	**11**	**190**	**0.000**	**11**	**190**	**0.000**	11	190	0.000
09:00 - 10:00	11	190	0.000	11	190	0.000	11	190	0.000
10:00 - 11:00	11	190	0.000	11	190	0.000	11	190	0.000
11:00 - 12:00	11	190	0.000	11	190	0.000	11	190	0.000
12:00 - 13:00	11	190	0.000	11	190	0.000	11	190	0.000
13:00 - 14:00	11	190	0.000	11	190	0.000	11	190	0.000
14:00 - 15:00	11	190	0.000	11	190	0.000	11	190	0.000
15:00 - 16:00	11	190	0.000	11	190	0.000	11	190	0.000
16:00 - 17:00	11	190	0.000	11	190	0.000	11	190	0.000
17:00 - 18:00	11	190	0.000	11	190	0.000	11	190	0.000
18:00 - 19:00	11	190	0.000	11	190	0.000	11	190	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	108 - 432 (units:)
Survey date date range:	01/01/07 - 11/12/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

CYCLISTS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	11	190	0.008	11	190	0.011	11	190	0.019
08:00 - 09:00	11	190	0.005	**11**	**190**	**0.017**	11	190	0.022
09:00 - 10:00	11	190	0.005	11	190	0.003	11	190	0.008
10:00 - 11:00	11	190	0.003	11	190	0.007	11	190	0.010
11:00 - 12:00	11	190	0.006	11	190	0.004	11	190	0.010
12:00 - 13:00	11	190	0.008	11	190	0.005	11	190	0.013
13:00 - 14:00	11	190	0.004	11	190	0.006	11	190	0.010
14:00 - 15:00	11	190	0.004	11	190	0.005	11	190	0.009
15:00 - 16:00	**11**	**190**	**0.021**	11	190	0.013	**11**	**190**	**0.034**
16:00 - 17:00	11	190	0.011	11	190	0.007	11	190	0.018
17:00 - 18:00	11	190	0.012	11	190	0.013	11	190	0.025
18:00 - 19:00	11	190	0.012	11	190	0.007	11	190	0.019
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.099			0.098			0.197

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	108 - 432 (units:)
Survey date date range:	01/01/07 - 11/12/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Calculation Reference: AUDIT-346901-150706-0707

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 04 - EDUCATION
Category : A - PRIMARY

VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	HC	HAMPSHIRE	1 days
	SC	SURREY	1 days
05	**EAST MIDLANDS**		
	LE	LEICESTERSHIRE	1 days
	LN	LINCOLNSHIRE	1 days
	NR	NORTHAMPTONSHIRE	2 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	NE	NORTH EAST LINCOLNSHIRE	1 days
	NY	NORTH YORKSHIRE	1 days
	WY	WEST YORKSHIRE	1 days
08	**NORTH WEST**		
	MS	MERSEYSIDE	1 days
09	**NORTH**		
	TW	TYNE & WEAR	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of pupils
Actual Range: 92 to 414 (units:)
Range Selected by User: 92 to 420 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/07 to 20/05/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Tuesday	3 days
Wednesday	4 days
Thursday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	11 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	5
Edge of Town	2
Neighbourhood Centre (PPS6 Local Centre)	3

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

VEHICLES

Calculation factor: 1 PUPILS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.013	1	312	0.003	1	312	0.016
07:00 - 08:00	11	273	0.043	11	273	0.017	11	273	0.060
08:00 - 09:00	**11**	**273**	**0.291**	11	273	0.202	**11**	**273**	**0.493**
09:00 - 10:00	11	273	0.037	11	273	0.068	11	273	0.105
10:00 - 11:00	11	273	0.014	11	273	0.012	11	273	0.026
11:00 - 12:00	11	273	0.025	11	273	0.021	11	273	0.046
12:00 - 13:00	11	273	0.031	11	273	0.032	11	273	0.063
13:00 - 14:00	11	273	0.019	11	273	0.028	11	273	0.047
14:00 - 15:00	11	273	0.048	11	273	0.023	11	273	0.071
15:00 - 16:00	11	273	0.207	**11**	**273**	**0.240**	11	273	0.447
16:00 - 17:00	11	273	0.051	11	273	0.086	11	273	0.137
17:00 - 18:00	11	273	0.027	11	273	0.040	11	273	0.067
18:00 - 19:00	10	260	0.016	10	260	0.028	10	260	0.044
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.032	1	312	0.032
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.822			0.832			1.654

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	92 - 414 (units:)
Survey date date range:	01/01/07 - 20/05/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

TAXIS

Calculation factor: 1 PUPILS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.000	1	312	0.000	1	312	0.000
07:00 - 08:00	11	273	0.000	11	273	0.000	11	273	0.000
08:00 - 09:00	**11**	**273**	**0.004**	**11**	**273**	**0.004**	**11**	**273**	**0.008**
09:00 - 10:00	11	273	0.001	11	273	0.000	11	273	0.001
10:00 - 11:00	11	273	0.000	11	273	0.000	11	273	0.000
11:00 - 12:00	11	273	0.000	11	273	0.000	11	273	0.000
12:00 - 13:00	11	273	0.000	11	273	0.001	11	273	0.001
13:00 - 14:00	11	273	0.001	11	273	0.001	11	273	0.002
14:00 - 15:00	11	273	0.000	11	273	0.000	11	273	0.000
15:00 - 16:00	11	273	0.004	11	273	0.004	11	273	0.008
16:00 - 17:00	11	273	0.000	11	273	0.000	11	273	0.000
17:00 - 18:00	11	273	0.000	11	273	0.000	11	273	0.000
18:00 - 19:00	10	260	0.000	10	260	0.000	10	260	0.000
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.000	1	312	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.010			0.010			0.020

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	92 - 414 (units:)
Survey date date range:	01/01/07 - 20/05/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

OGVS

Calculation factor: 1 PUPILS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	**1**	**312**	**0.003**	**1**	**312**	**0.003**	**1**	**312**	**0.006**
07:00 - 08:00	11	273	0.000	11	273	0.000	11	273	0.000
08:00 - 09:00	11	273	0.000	11	273	0.000	11	273	0.000
09:00 - 10:00	11	273	0.001	11	273	0.001	11	273	0.002
10:00 - 11:00	11	273	0.001	11	273	0.001	11	273	0.002
11:00 - 12:00	11	273	0.000	11	273	0.001	11	273	0.001
12:00 - 13:00	11	273	0.000	11	273	0.000	11	273	0.000
13:00 - 14:00	11	273	0.000	11	273	0.000	11	273	0.000
14:00 - 15:00	11	273	0.000	11	273	0.000	11	273	0.000
15:00 - 16:00	11	273	0.000	11	273	0.000	11	273	0.000
16:00 - 17:00	11	273	0.000	11	273	0.000	11	273	0.000
17:00 - 18:00	11	273	0.000	11	273	0.000	11	273	0.000
18:00 - 19:00	10	260	0.000	10	260	0.000	10	260	0.000
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.000	1	312	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.005			0.006			0.011

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	92 - 414 (units:)
Survey date date range:	01/01/07 - 20/05/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

PSVS

Calculation factor: 1 PUPILS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.000	1	312	0.000	1	312	0.000
07:00 - 08:00	11	273	0.000	11	273	0.000	11	273	0.000
08:00 - 09:00	11	273	0.000	11	273	0.000	11	273	0.000
09:00 - 10:00	11	273	0.000	11	273	0.000	11	273	0.000
10:00 - 11:00	**11**	**273**	**0.001**	**11**	**273**	**0.001**	**11**	**273**	**0.002**
11:00 - 12:00	11	273	0.000	11	273	0.000	11	273	0.000
12:00 - 13:00	11	273	0.000	11	273	0.000	11	273	0.000
13:00 - 14:00	11	273	0.000	11	273	0.000	11	273	0.000
14:00 - 15:00	11	273	0.000	11	273	0.000	11	273	0.000
15:00 - 16:00	11	273	0.000	11	273	0.000	11	273	0.000
16:00 - 17:00	11	273	0.000	11	273	0.000	11	273	0.000
17:00 - 18:00	11	273	0.000	11	273	0.000	11	273	0.000
18:00 - 19:00	10	260	0.000	10	260	0.000	10	260	0.000
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.000	1	312	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.001			0.001			0.002

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	92 - 414 (units:)
Survey date date range:	01/01/07 - 20/05/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

CYCLISTS

Calculation factor: 1 PUPILS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.000	1	312	0.000	1	312	0.000
07:00 - 08:00	11	273	0.003	11	273	0.000	11	273	0.003
08:00 - 09:00	**11**	**273**	**0.014**	11	273	0.002	**11**	**273**	**0.016**
09:00 - 10:00	11	273	0.002	11	273	0.003	11	273	0.005
10:00 - 11:00	11	273	0.000	11	273	0.000	11	273	0.000
11:00 - 12:00	11	273	0.000	11	273	0.000	11	273	0.000
12:00 - 13:00	11	273	0.000	11	273	0.000	11	273	0.000
13:00 - 14:00	11	273	0.000	11	273	0.001	11	273	0.001
14:00 - 15:00	11	273	0.001	11	273	0.000	11	273	0.001
15:00 - 16:00	11	273	0.006	**11**	**273**	**0.009**	11	273	0.015
16:00 - 17:00	11	273	0.000	11	273	0.008	11	273	0.008
17:00 - 18:00	11	273	0.000	11	273	0.003	11	273	0.003
18:00 - 19:00	10	260	0.000	10	260	0.000	10	260	0.000
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.000	1	312	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.026			0.026			0.052

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	92 - 414 (units:)
Survey date date range:	01/01/07 - 20/05/14
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Appendix B – Model Output Data

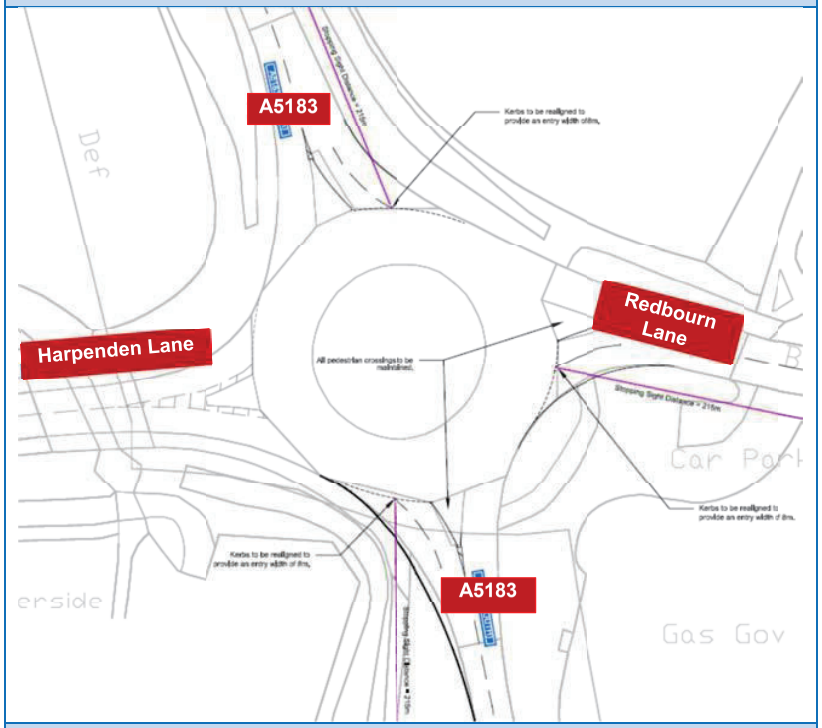
A5183 with Redbourn Lane

EXISTING LAYOUT

JUNCTION RESULTS

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Base Year	**1.007**	**37.6**	**1.006**	**37.2**
Future Year	**1.270**	**305.4**	**1.266**	**308.7**
Future with allocation	**1.271**	**306.7**	**1.273**	**317.1**

IMPROVED LAYOUT



JUNCTION RESULTS -

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Future with allocation	**1.252**	**289.6**	**1.255**	**300.3**

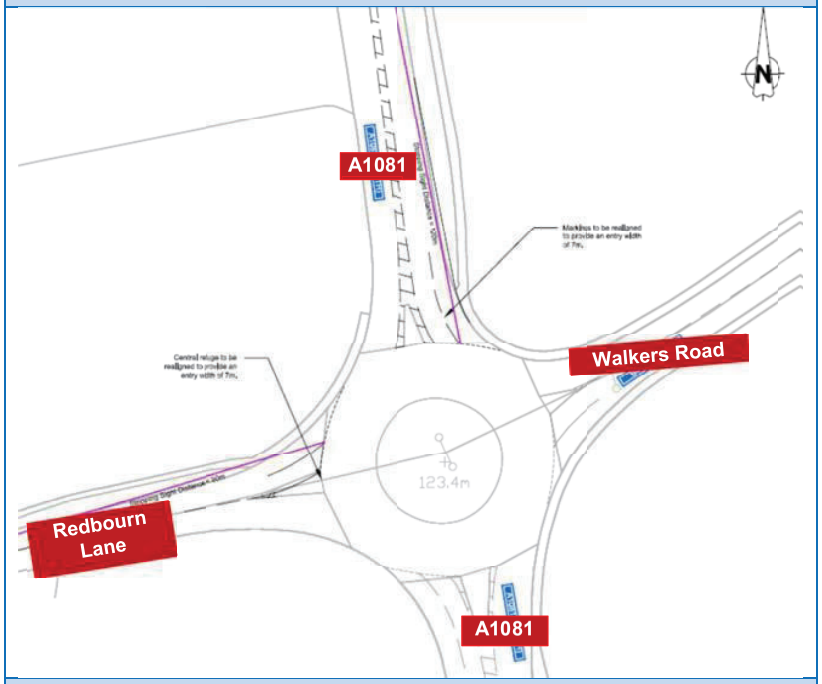
A1081 St. Albans Road / B487

EXISTING LAYOUT

JUNCTION RESULTS

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Base Year	**1.006**	**34.0**	**0.806**	**4.0**
Future Year	**1.299**	**282.2**	**1.049**	**59.9**
Future with allocation	**1.315**	**294.1**	**1.067**	**72.9**

IMPROVED LAYOUT



JUNCTION RESULTS -

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Future with allocation	**1.268**	**259.8**	**1.029**	**46.5**

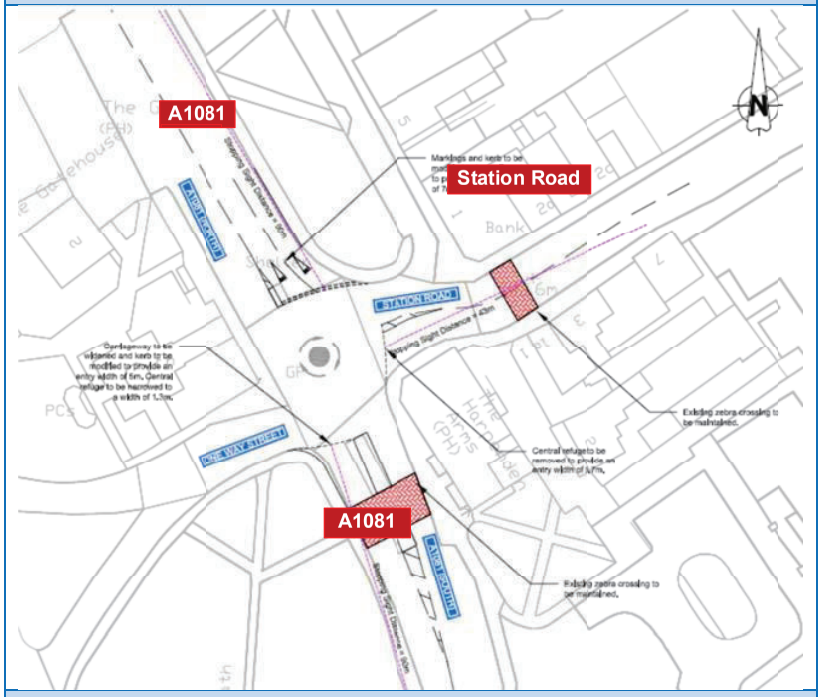
A1081 with Station Road

EXISTING LAYOUT

JUNCTION RESULTS

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Base Year	**0.768**	**3.2**	**0.691**	**2.2**
Future Year	**1.094**	**51.9**	**0.997**	**21.0**
Future with allocation	**1.289**	**117.7**	**1.096**	**53.1**

IMPROVED LAYOUT



JUNCTION RESULTS -

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Future with allocation	**1.094**	**52.4**	**0.936**	**10.7**

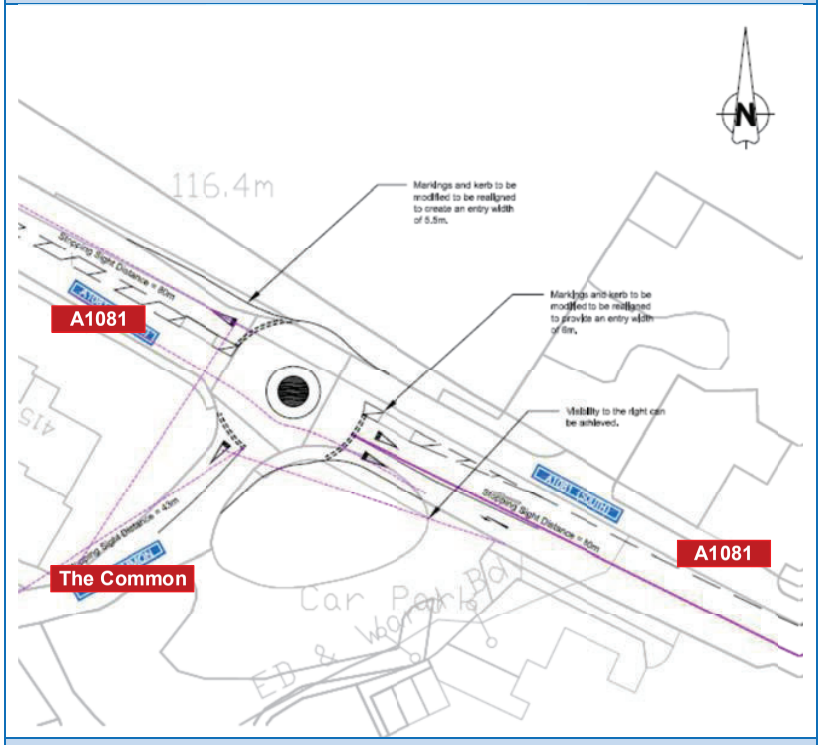
A1081 with The Common

EXISTING LAYOUT

JUNCTION RESULTS

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Base Year	**0.807**	**4.1**	**0.677**	**2.1**
Future Year	**1.001**	**33.2**	**0.823**	**4.5**
Future with allocation	**1.015**	**41.8**	**0.846**	**5.3**

IMPROVED LAYOUT



JUNCTION RESULTS -

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Future with allocation	**0.994**	**29.7**	**0.827**	**4.6**

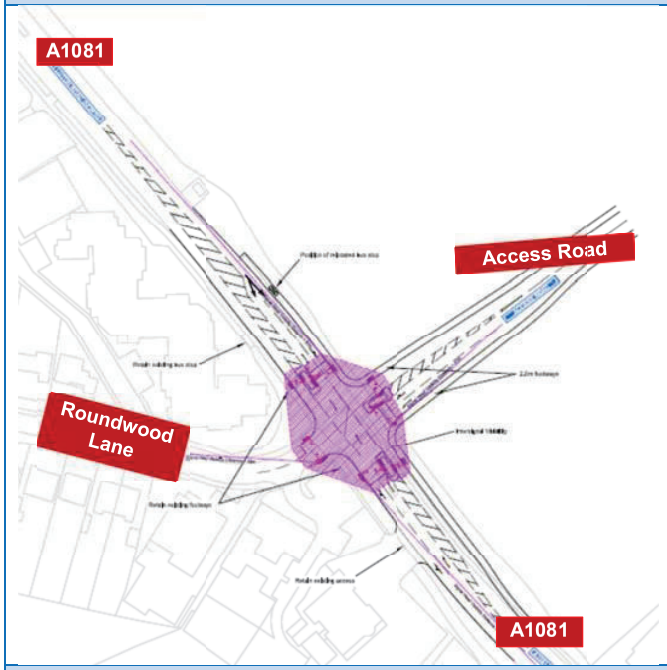
A1081 with Roundwood Lane

EXISTING LAYOUT

JUNCTION RESULTS

Traffic Scenario	AM Peak		PM Peak	
	Degree of Saturation	Queue	Degree of Saturation	Queue
Base Year	N/A	N/A	N/A	N/A
Future Year	N/A	N/A	N/A	N/A
Future with allocation	N/A	N/A	N/A	N/A

PROPOSED LAYOUT



JUNCTION RESULTS -

Traffic Scenario	AM Peak		PM Peak	
	Degree of Saturation	Queue	Degree of Saturation	Queue
Future with allocation	89.5%	31.7	89.6%	29.6

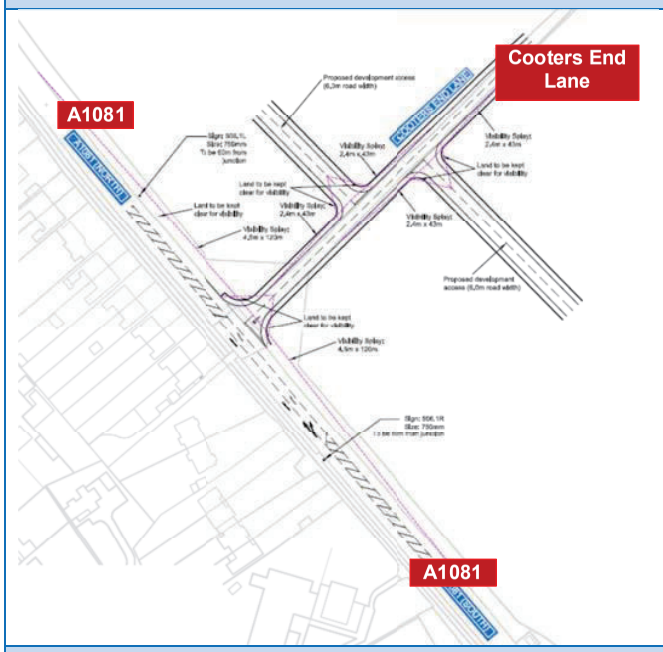
A1081 with Cooters End Lane

PROPOSED LAYOUT

JUNCTION RESULTS

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Base Year	**0.304**	**0.4**	**0.185**	**0.2**
Future Year	**0.484**	**0.9**	**0.243**	**0.3**
Future with allocation	**N/A**	**N/A**	**N/A**	**N/A**

PROPOSED LAYOUT



JUNCTION RESULTS -

Traffic Scenario	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
Future with allocation	**0.651**	**1.8**	**0.292**	**0.4**

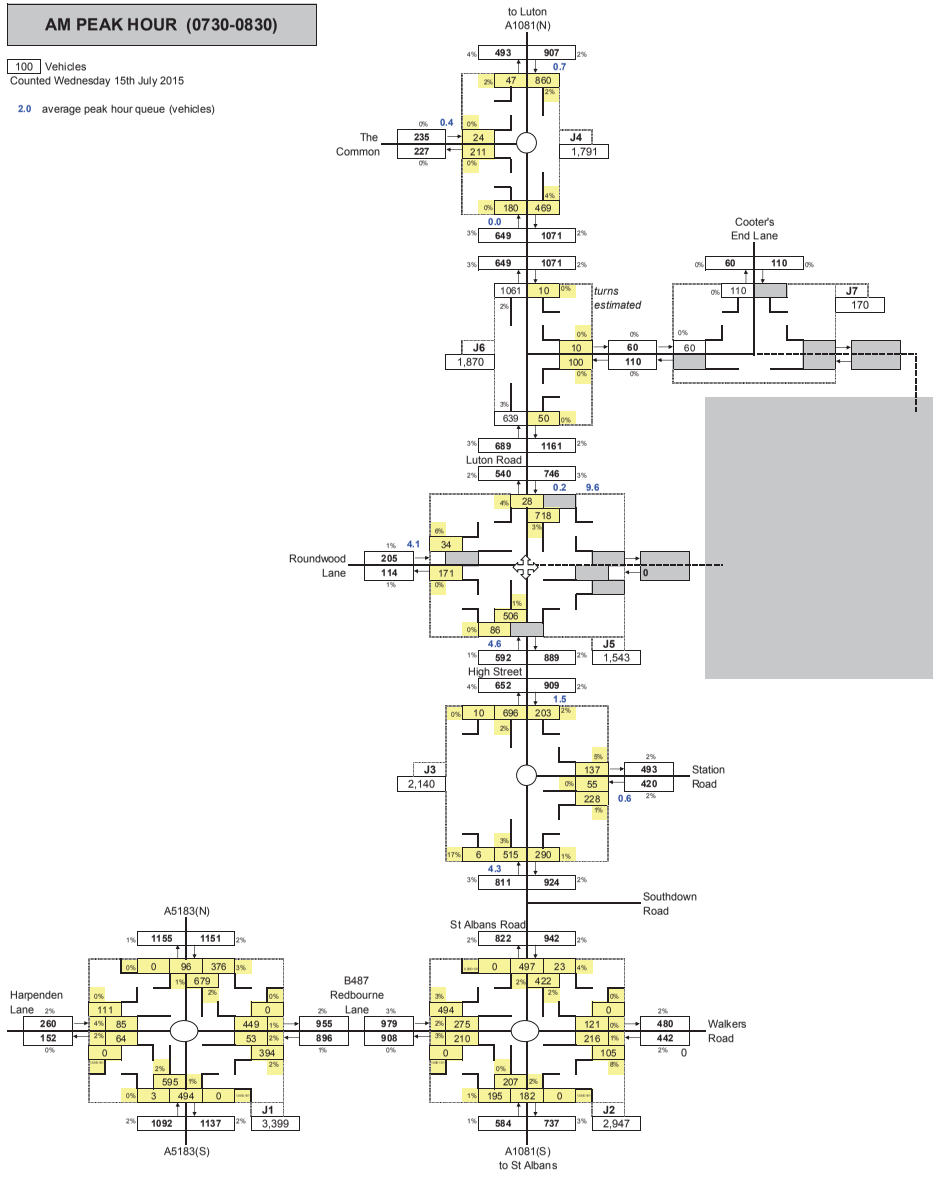
Appendix C – Assessment Outputs

Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2015 Counted Traffic Flows [Vehicles]**	**Figure 1**	

AM PEAK HOUR (0730-0830)

100 Vehicles
Counted Wednesday 15th July 2015

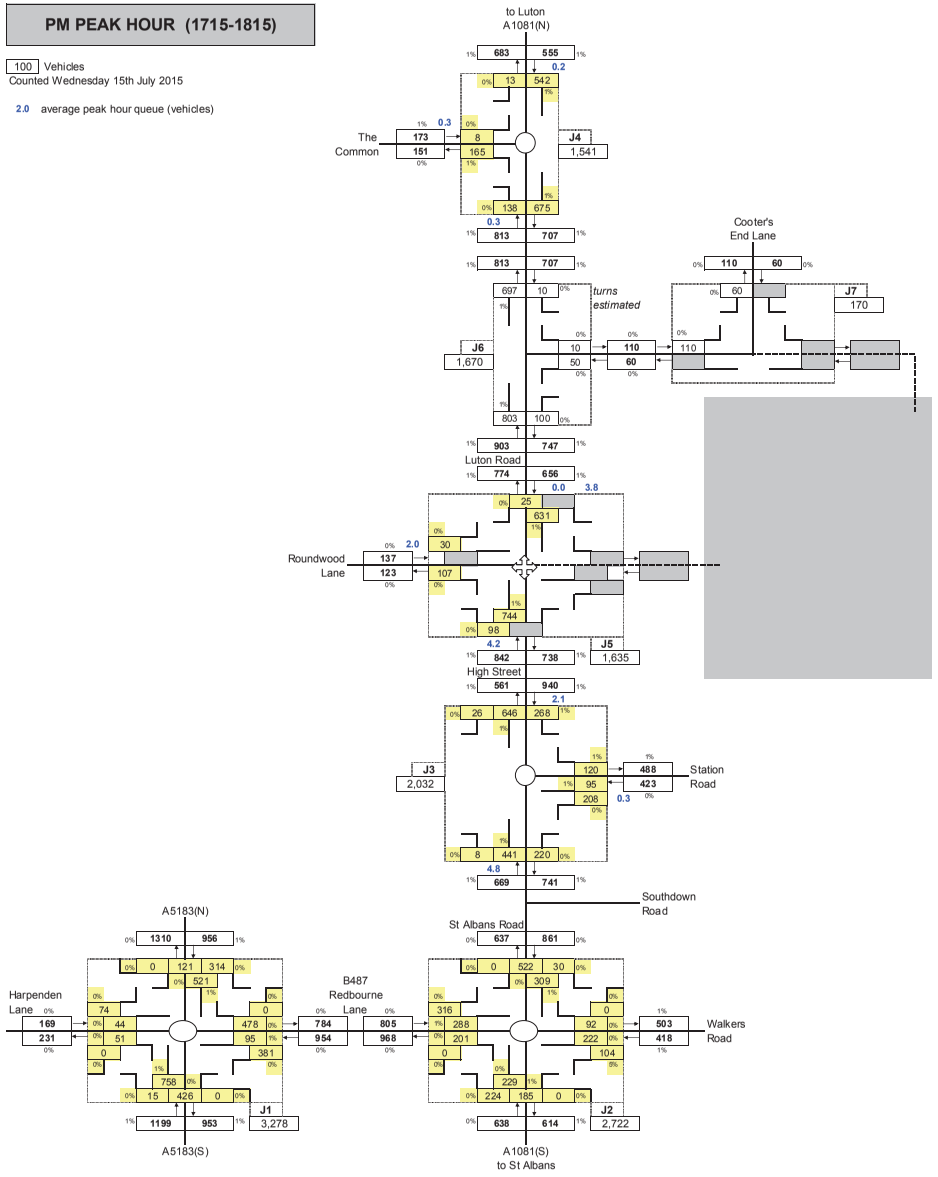
2.0 average peak hour queue (vehicles)



PM PEAK HOUR (1715-1815)

100 Vehicles
Counted Wednesday 15th July 2015

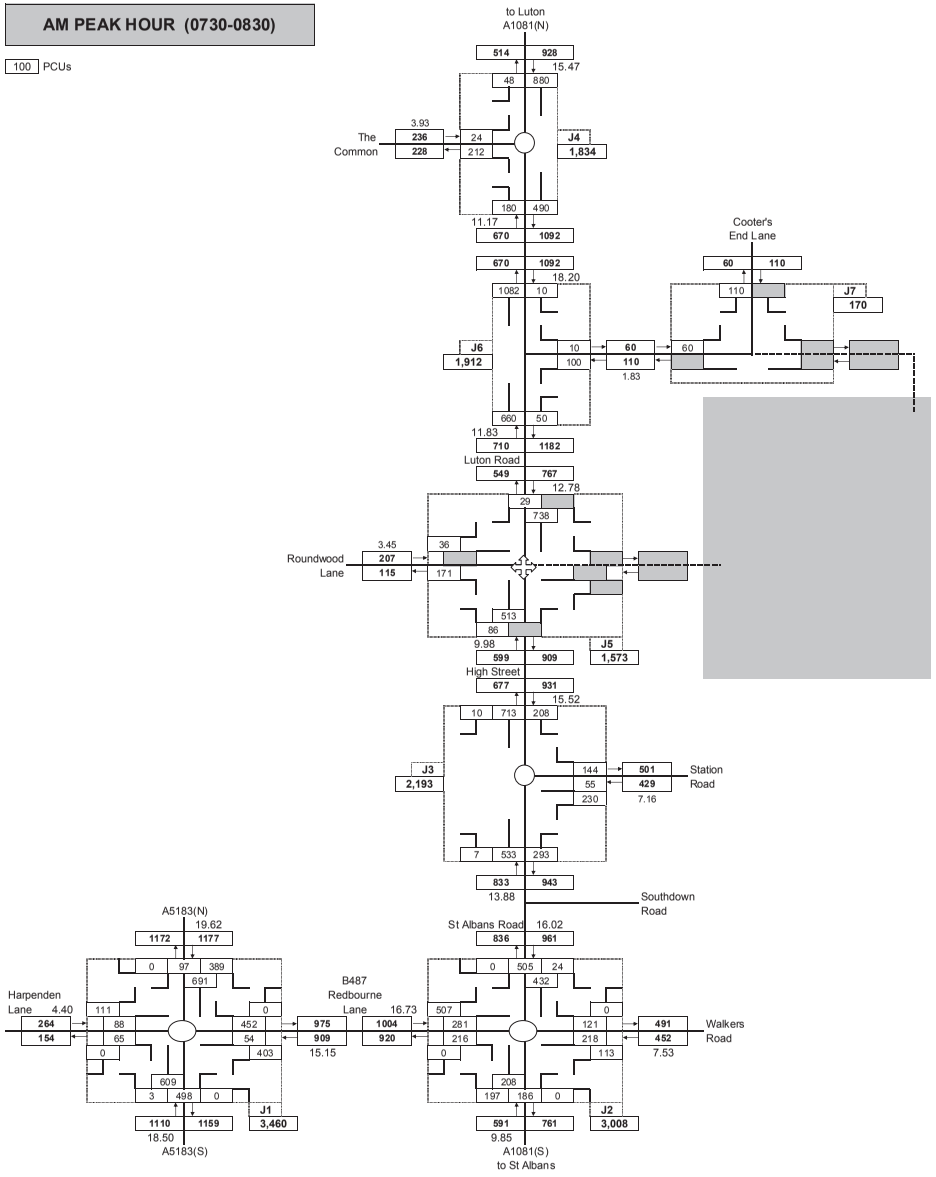
2.0 average peak hour queue (vehicles)



Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2015 Counted Traffic Flows [PCUs]**	**Figure 2**	© Brookbanks Consulting Limited 2016

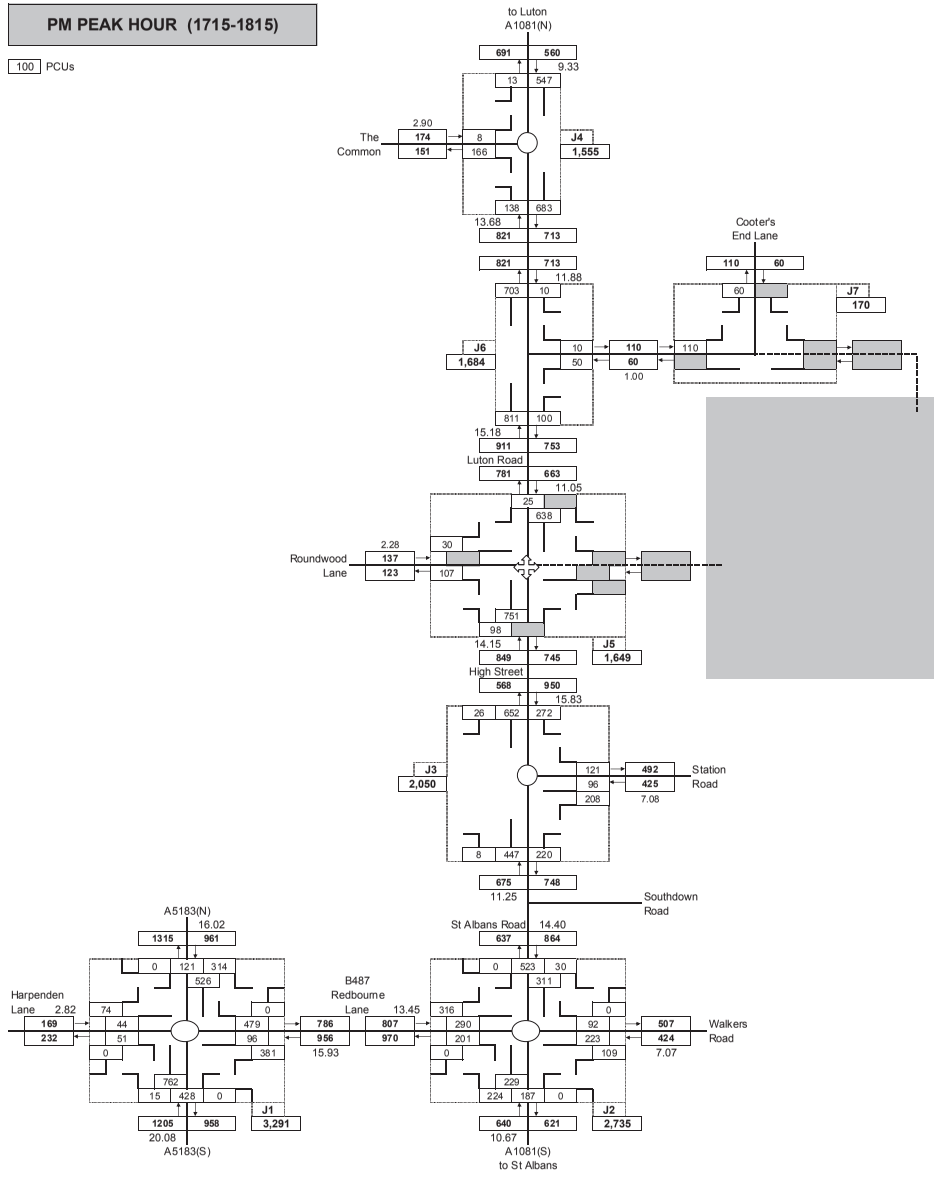
AM PEAK HOUR (0730-0830)

100 PCUs



PM PEAK HOUR (1715-1815)

100 PCUs

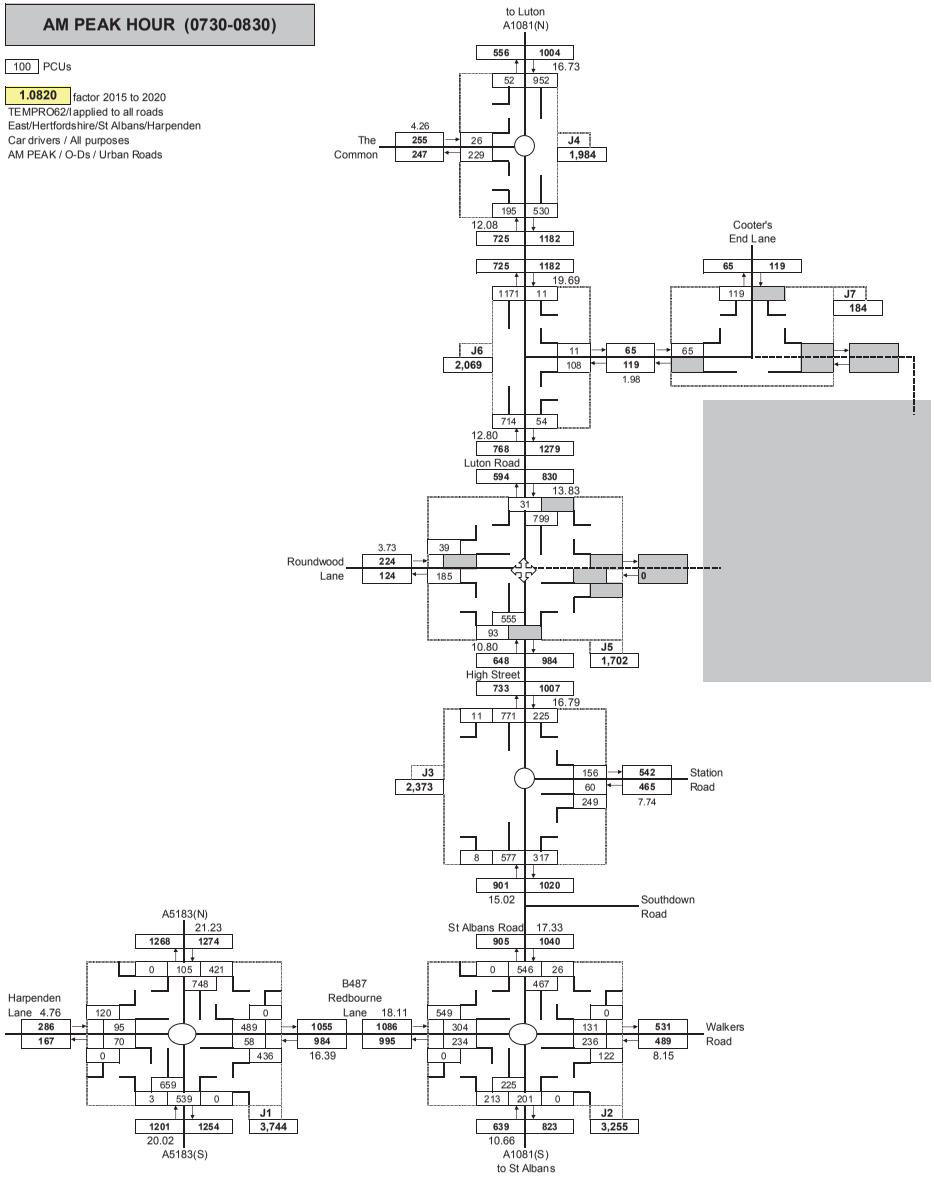


Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2020 Forecast Traffic Flows [PCUs]**	**Figure 3**	

AM PEAK HOUR (0730-0830)

100 PCUs

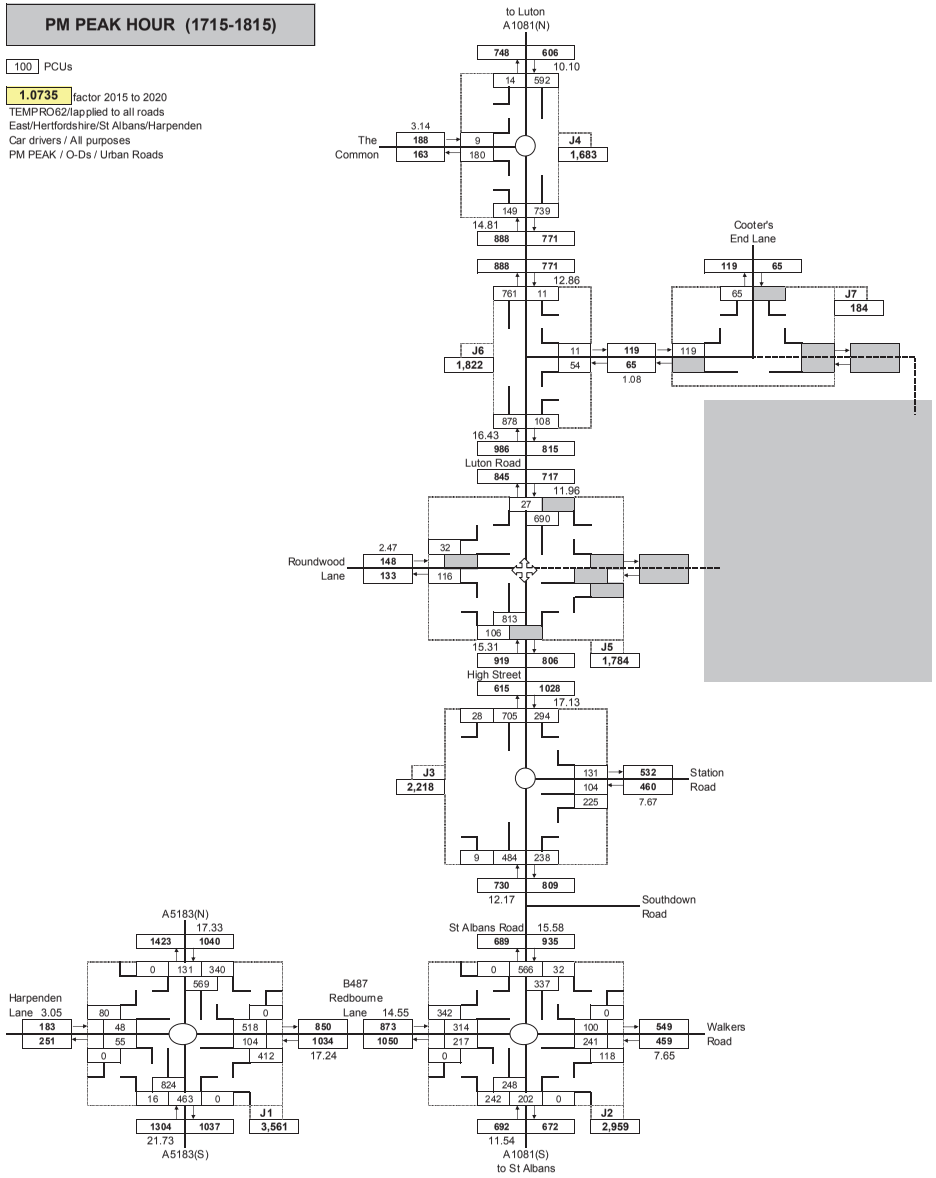
1.0820 factor 2015 to 2020
TEMPRO62/I applied to all roads
East/Hertfordshire/St Albans/Harpenden
Car drivers / All purposes
AM PEAK / O-Ds / Urban Roads



PM PEAK HOUR (1715-1815)

100 PCUs

1.0735 factor 2015 to 2020
TEMPRO62/I applied to all roads
East/Hertfordshire/St Albans/Harpenden
Car drivers / All purposes
PM PEAK / O-Ds / Urban Roads

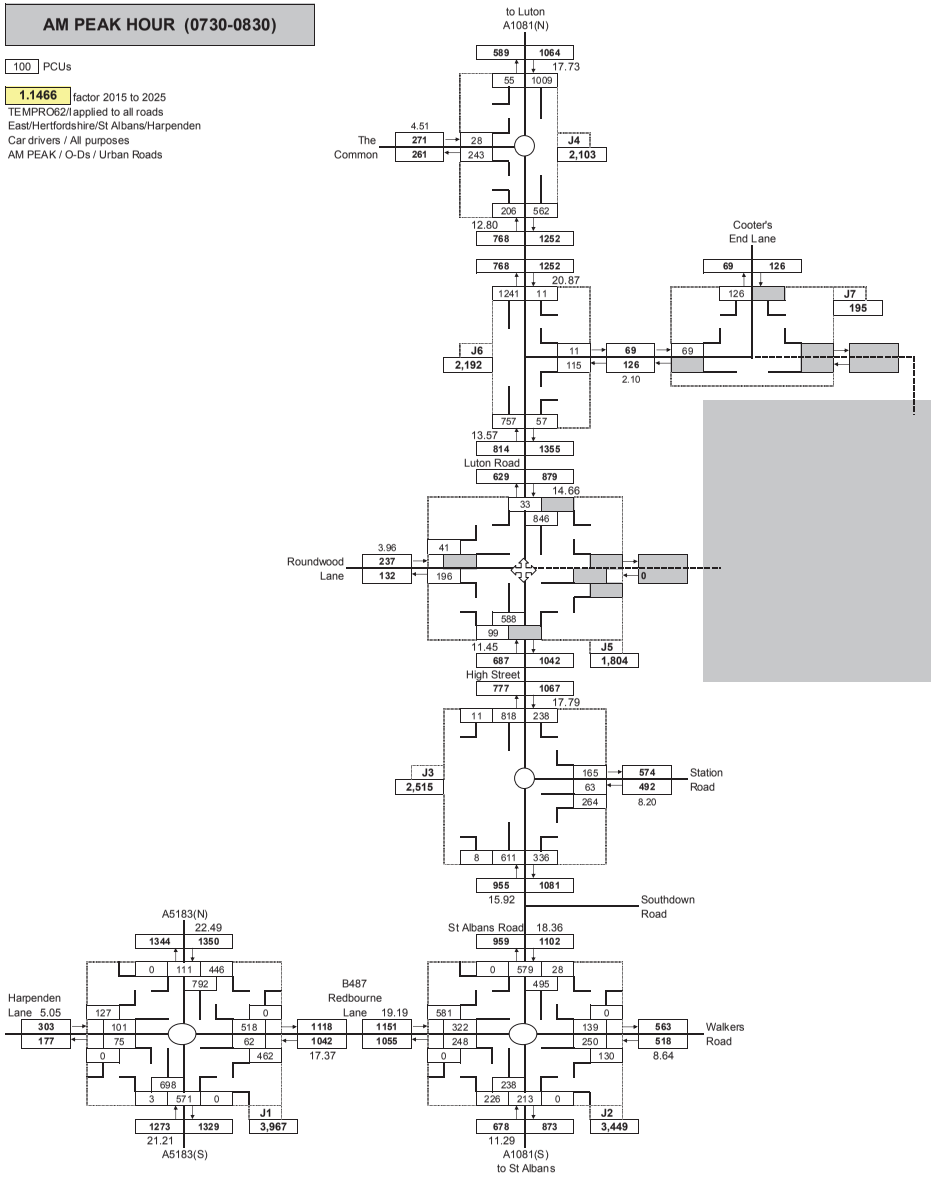


Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2025 Forecast Traffic Flows [PCUs]**	**Figure 4**	© Brookbanks Consulting Limited 2016

AM PEAK HOUR (0730-0830)

100 PCUs

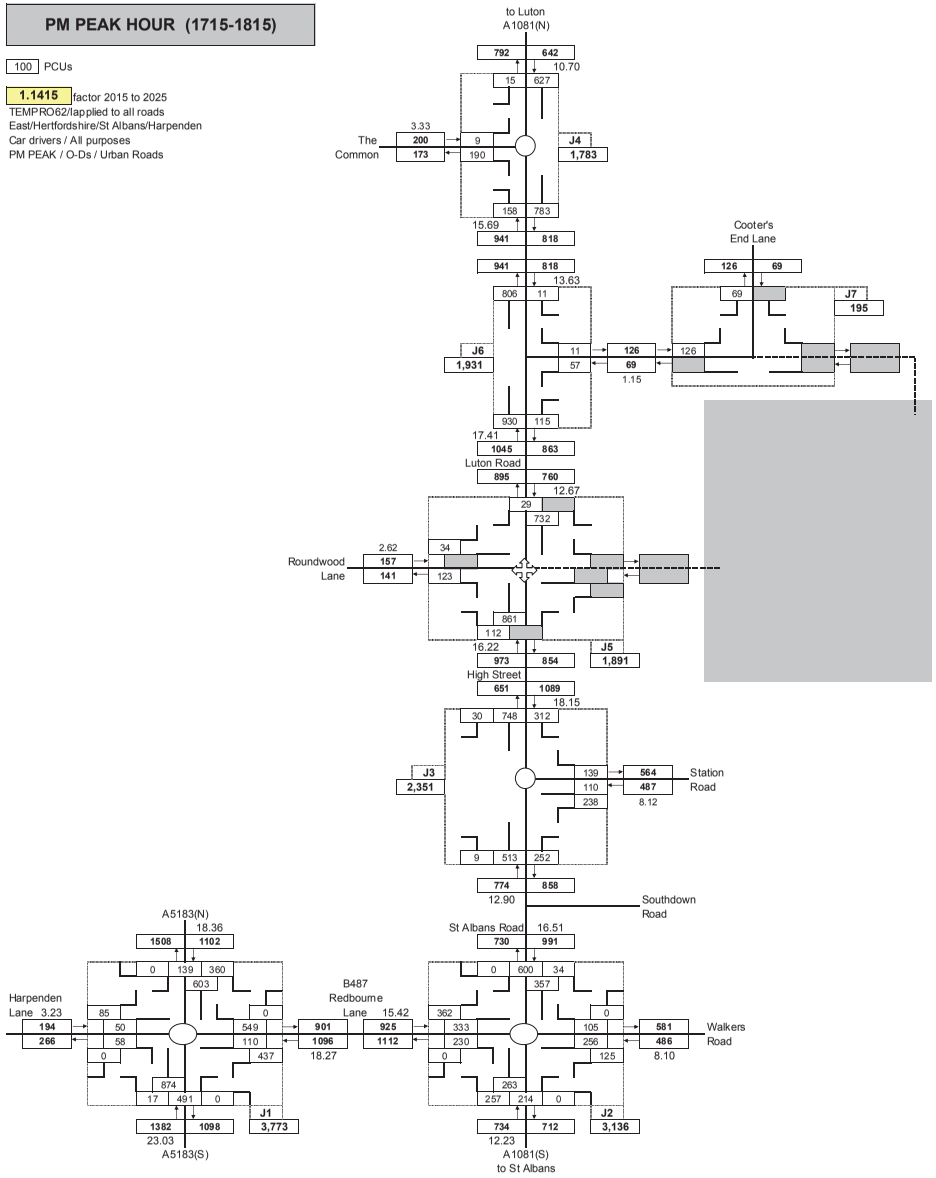
1.1466 factor 2015 to 2025
TEMPRO62/I applied to all roads
East/Hertfordshire/St Albans/Harpenden
Car drivers / All purposes
AM PEAK / O-Ds / Urban Roads



PM PEAK HOUR (1715-1815)

100 PCUs

1.1415 factor 2015 to 2025
TEMPRO62/I applied to all roads
East/Hertfordshire/St Albans/Harpenden
Car drivers / All purposes
PM PEAK / O-Ds / Urban Roads

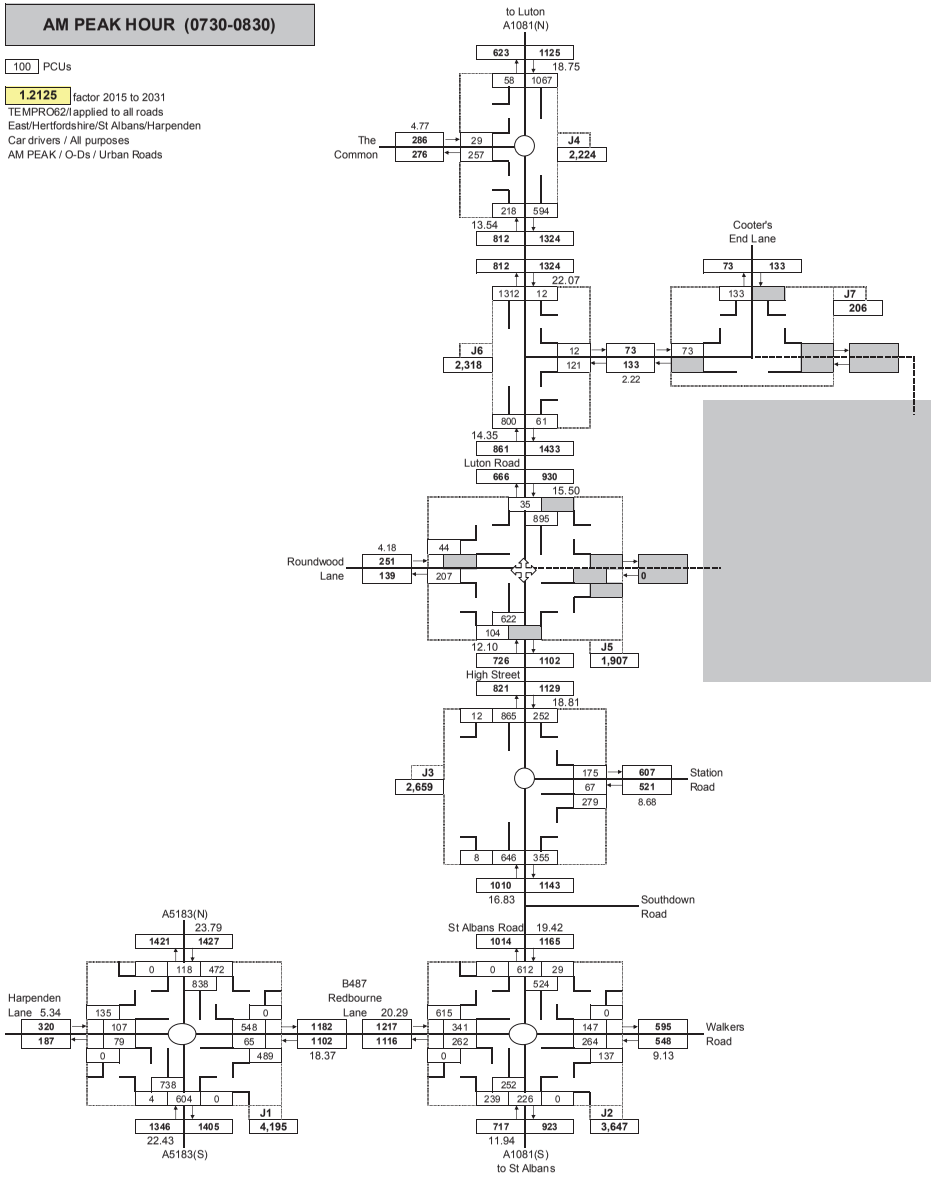


Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2031 Forecast Traffic Flows [PCUs]**	**Figure 5**	

AM PEAK HOUR (0730-0830)

100 PCUs

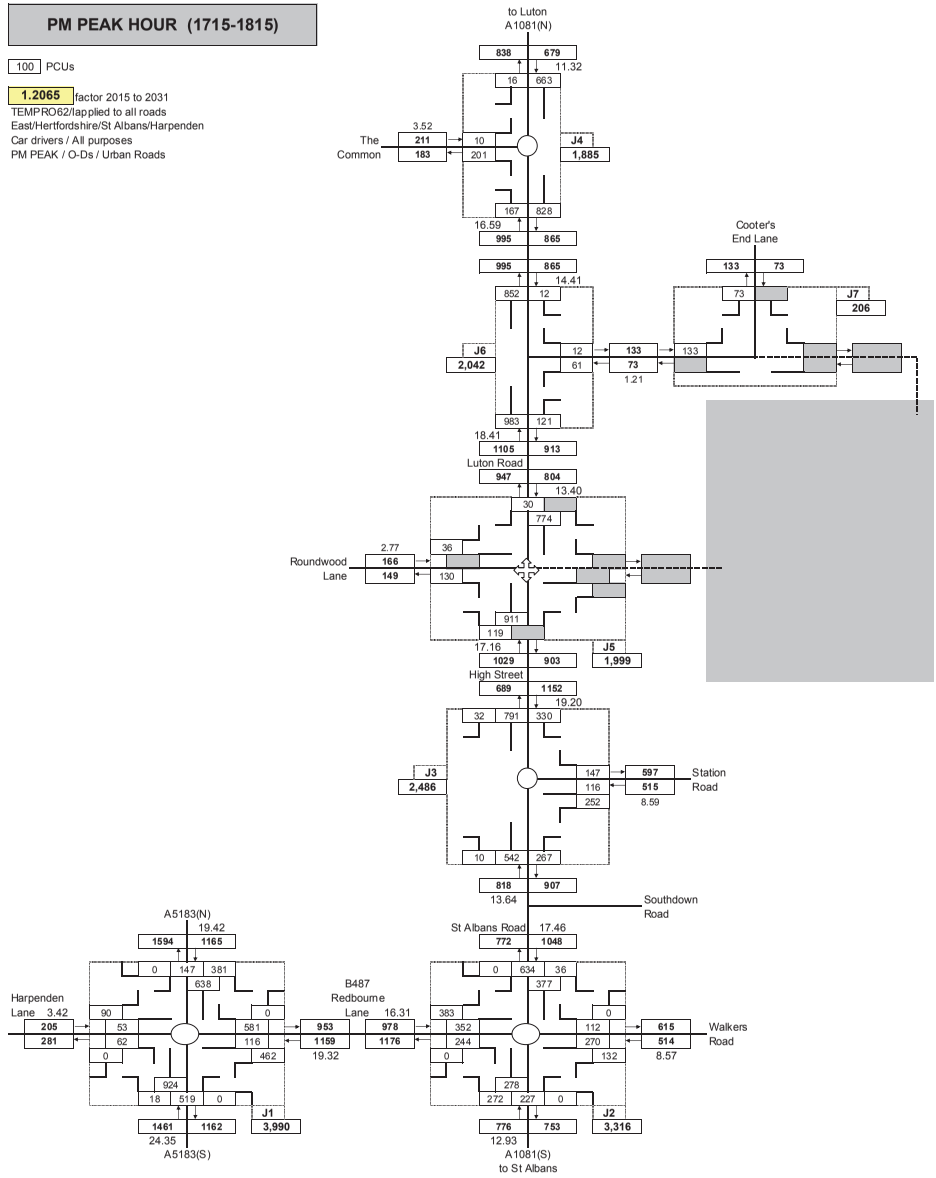
1.2125 factor 2015 to 2031
TEMPRO62/I applied to all roads
East/Hertfordshire/St Albans/Harpenden
Car drivers / All purposes
AM PEAK / O-Ds / Urban Roads



PM PEAK HOUR (1715-1815)

100 PCUs

1.2065 factor 2015 to 2031
TEMPRO62/I applied to all roads
East/Hertfordshire/St Albans/Harpenden
Car drivers / All purposes
PM PEAK / O-Ds / Urban Roads



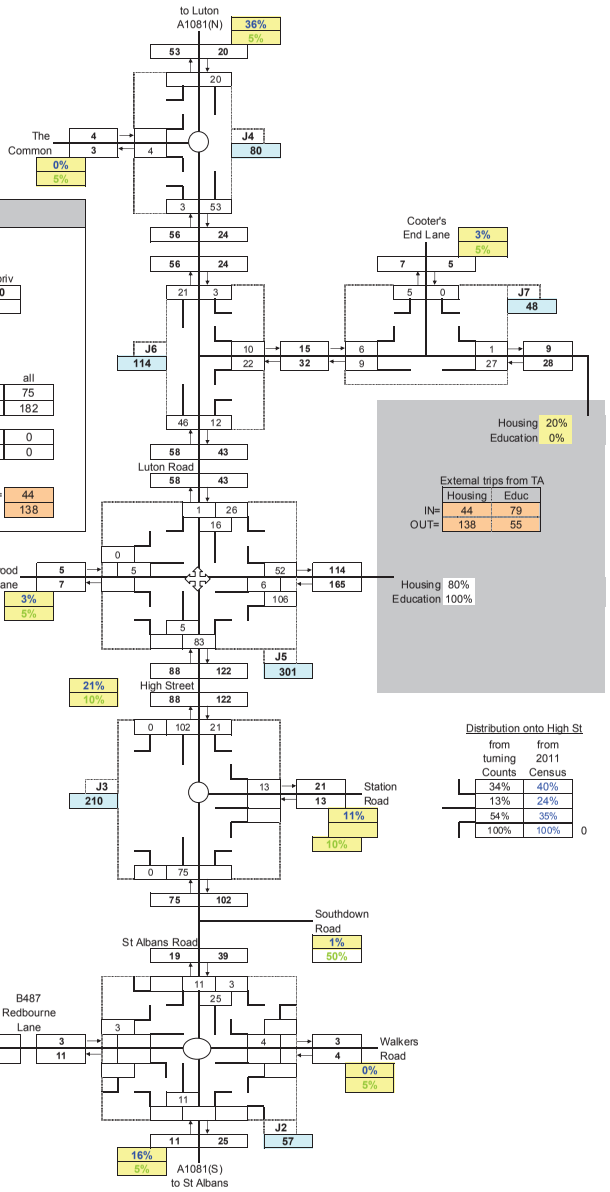
Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**DevelopmentTraffic Flows Rev3 [PCUs]**	**Figure 6**	© Brookbanks Consulting Limited 2016

AM PEAK HOUR (0730-0830)

100 PCUs

Housing distribution taken from 2011 Travel to Work Census Data
100% Housing
100% Education (predominantly local)

30 Total flow through junction >30 PCUs



HOUSING 8-9AM

500 TOTAL housing units

		private	non-priv	private	non-priv
Housing units	100%	80%	20%	400	100
Apartments	0%	80%	20%	0	0

TRICS Trip Rates (per unit)

		private	non-priv	private	non-priv	all
Housing Units	IN=	0.152	0.138	61	14	75
	OUT=	0.391	0.253	156	25	182
Appartments	IN=	0.069	0.071	0	0	0
	OUT=	0.232	0.098	0	0	0
		trips per unit		TRIPS		

Deduct internal trips from School -30
Deduct internal trips to School -44
TOTAL IN= 44
TOTAL OUT= 138

EDUCATION 8-9AM

420 PLACES
150 Internal
270 External

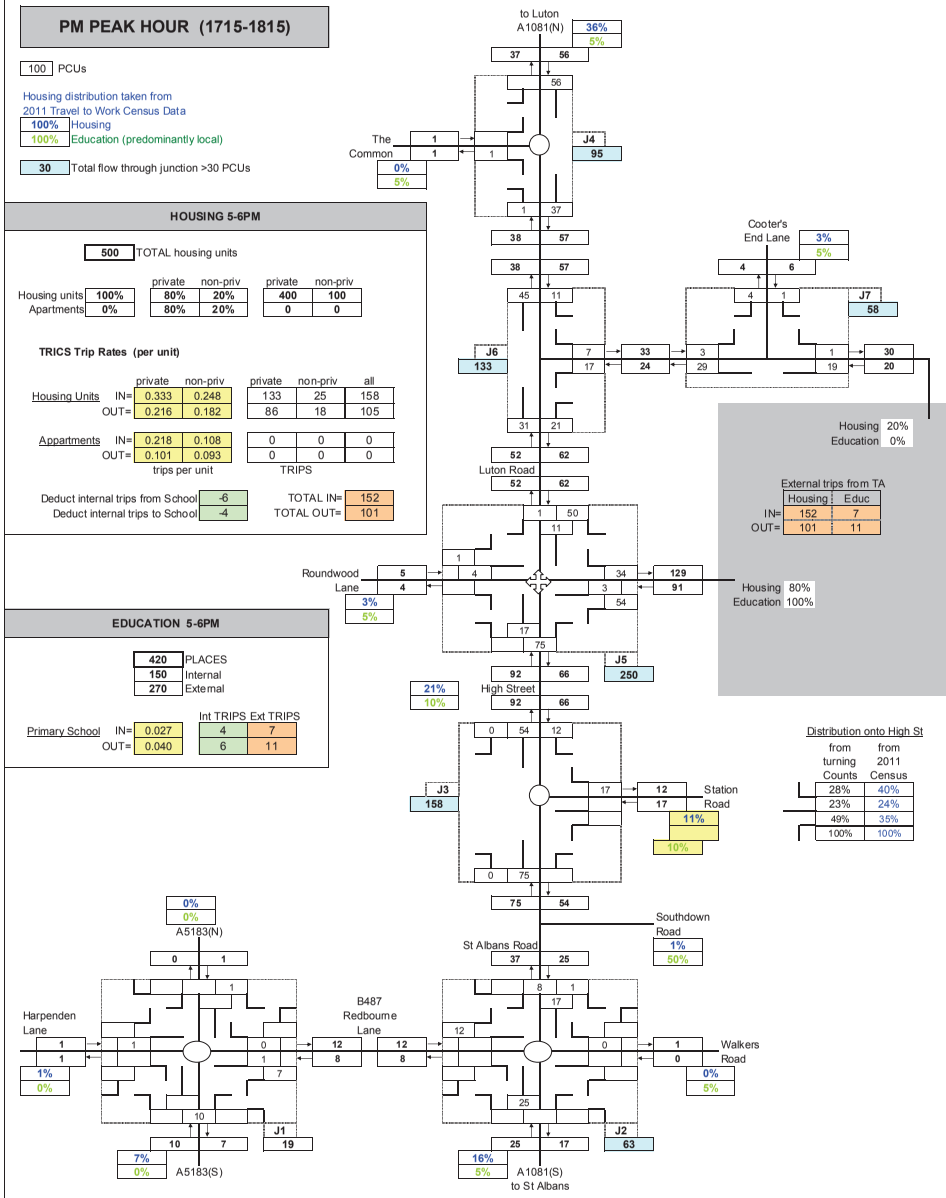
		Int TRIPS	Ext TRIPS
Primary School	IN= 0.291	44	79
	OUT= 0.202	30	55

PM PEAK HOUR (1715-1815)

100 PCUs

Housing distribution taken from 2011 Travel to Work Census Data
100% Housing
100% Education (predominantly local)

30 Total flow through junction >30 PCUs



HOUSING 5-6PM

500 TOTAL housing units

		private	non-priv	private	non-priv
Housing units	100%	80%	20%	400	100
Apartments	0%	80%	20%	0	0

TRICS Trip Rates (per unit)

		private	non-priv	private	non-priv	all
Housing Units	IN=	0.333	0.248	133	25	158
	OUT=	0.216	0.182	86	18	105
Appartments	IN=	0.218	0.108	0	0	0
	OUT=	0.101	0.093	0	0	0
		trips per unit		TRIPS		

Deduct internal trips from School -6
Deduct internal trips to School -4
TOTAL IN= 152
TOTAL OUT= 101

EDUCATION 5-6PM

420 PLACES
150 Internal
270 External

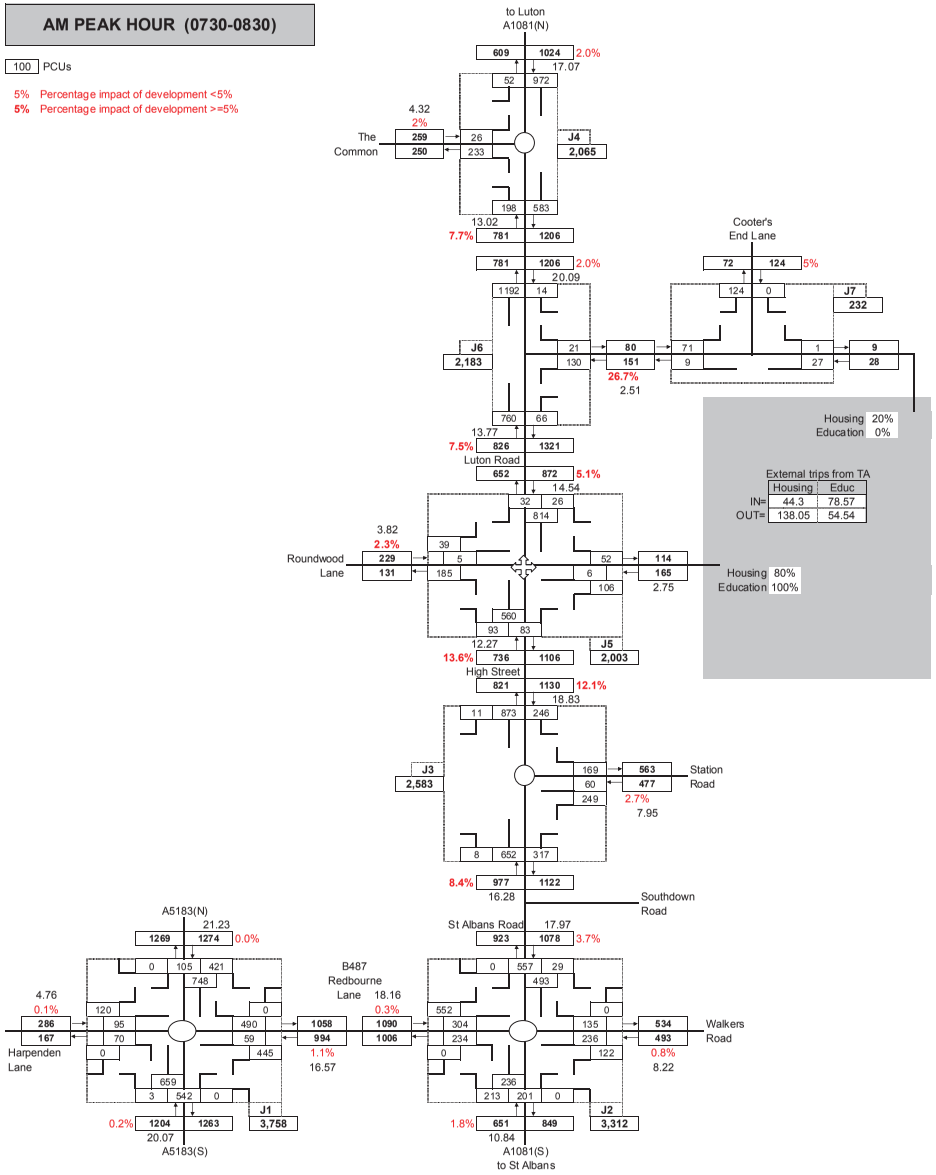
		Int TRIPS	Ext TRIPS
Primary School	IN= 0.027	4	7
	OUT= 0.040	6	11

Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2020 Forecast Traffic Flows with Development [PCUs]**	**Figure 7**	

AM PEAK HOUR (0730-0830)

100 PCUs

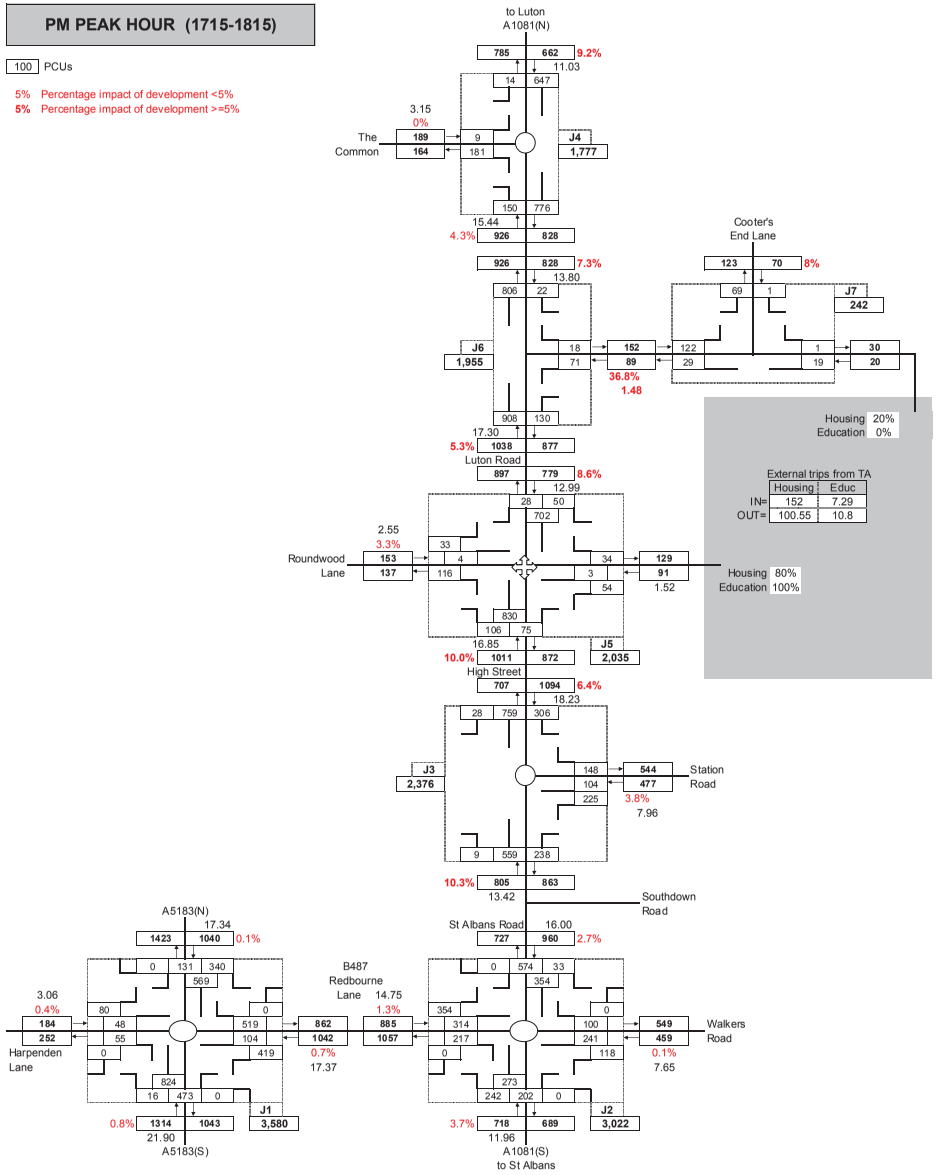
5% Percentage impact of development <5%
5% Percentage impact of development >=5%



PM PEAK HOUR (1715-1815)

100 PCUs

5% Percentage impact of development <5%
5% Percentage impact of development >=5%

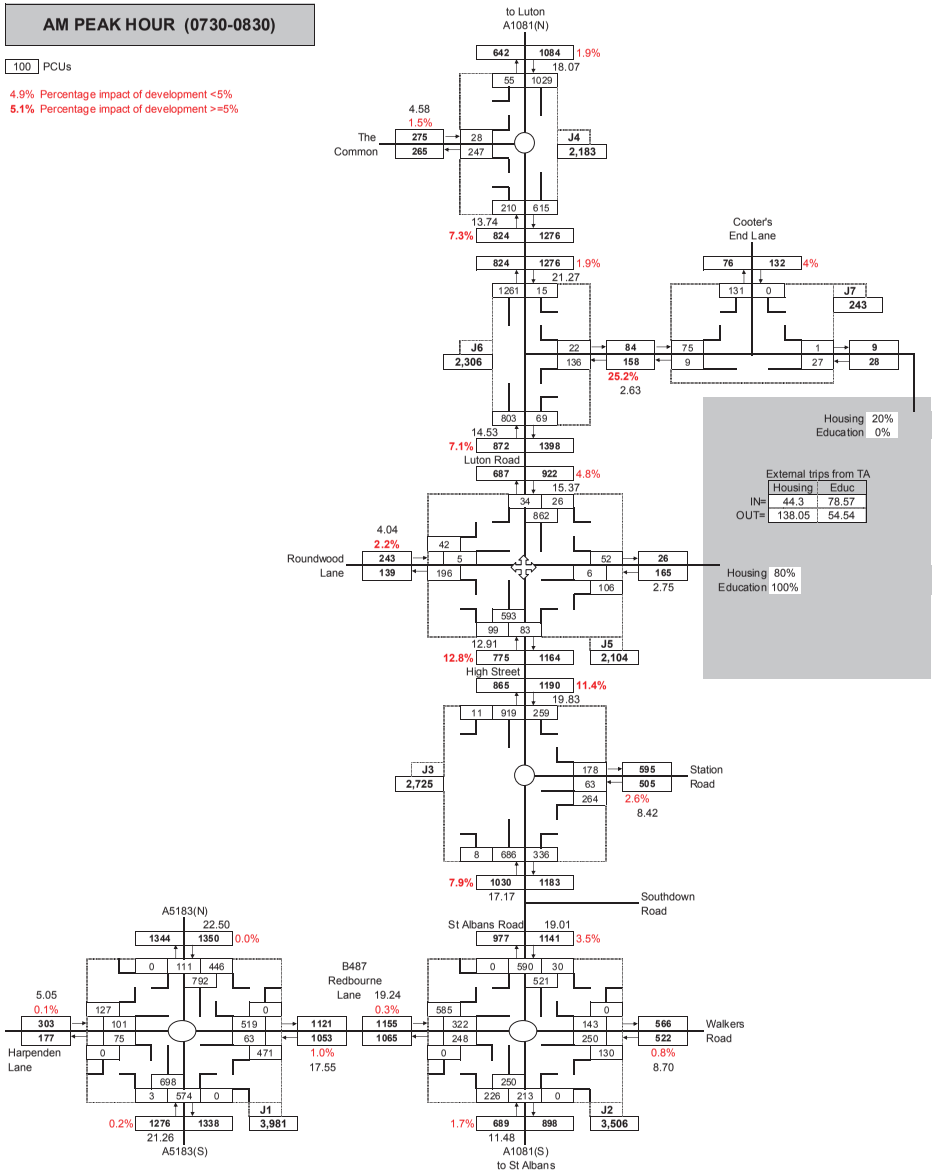


Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2025 Forecast Traffic Flows with Development [PCUs]**	**Figure 8**	© Brookbanks Consulting Limited 2016

AM PEAK HOUR (0730-0830)

100 PCUs

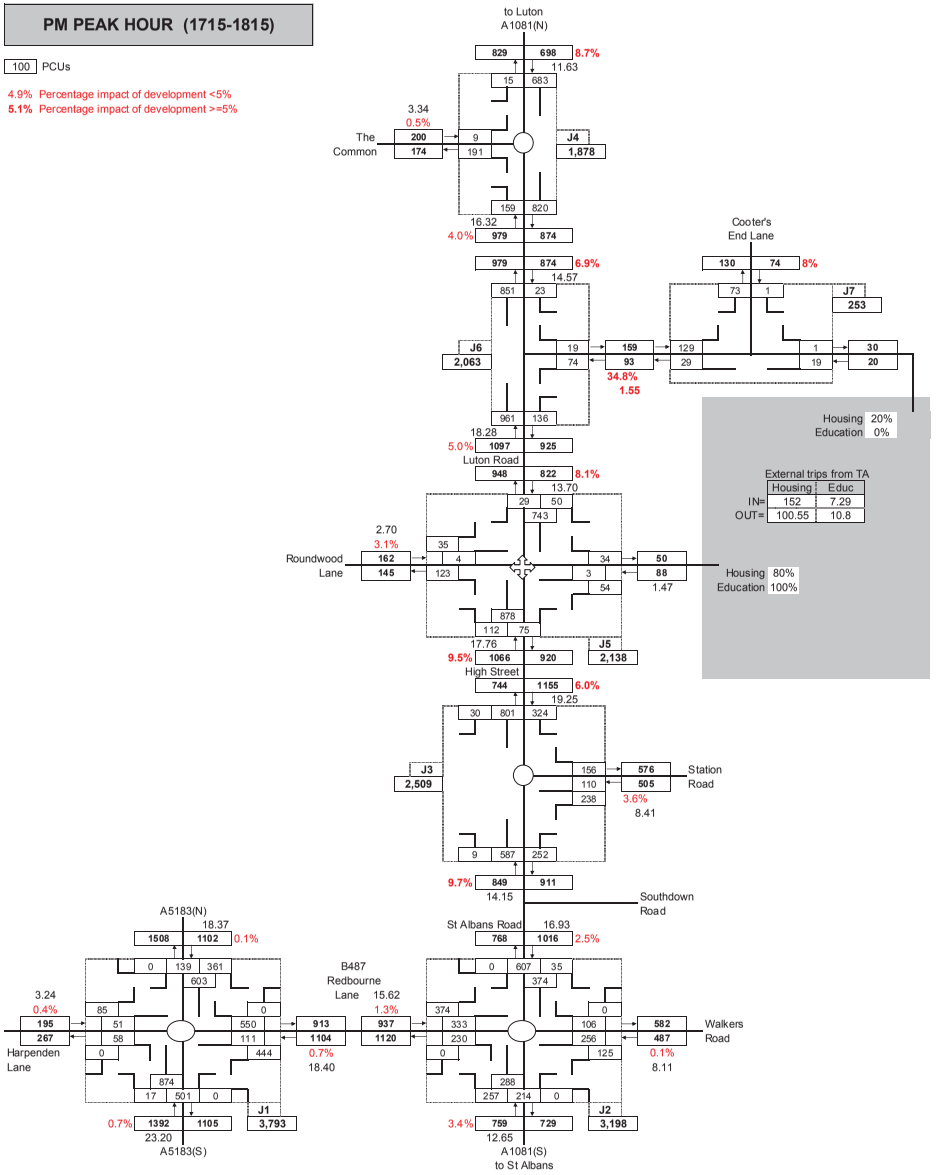
4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%



PM PEAK HOUR (1715-1815)

100 PCUs

4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%

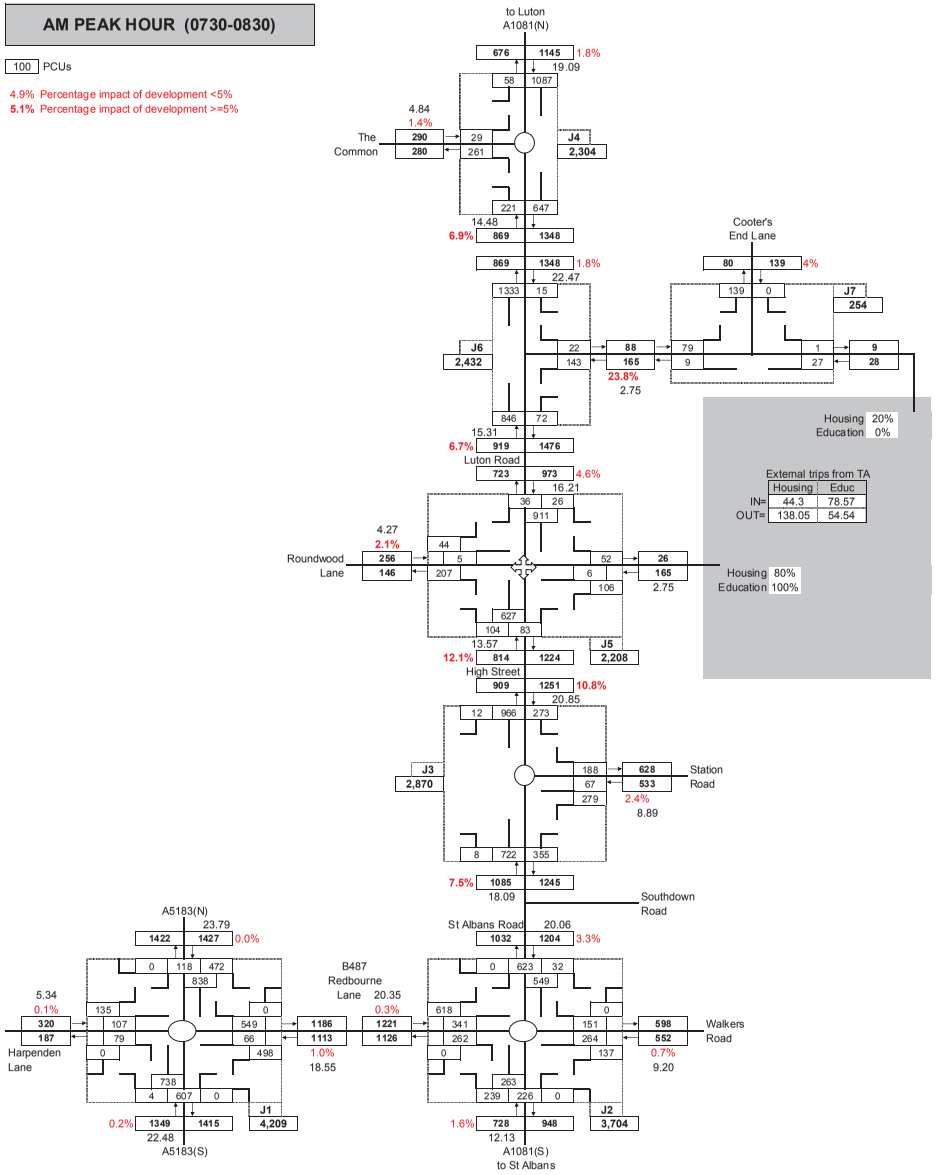


Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2031 Forecast Traffic Flows with Development [PCUs]**	**Figure 8**	

AM PEAK HOUR (0730-0830)

100 PCUs

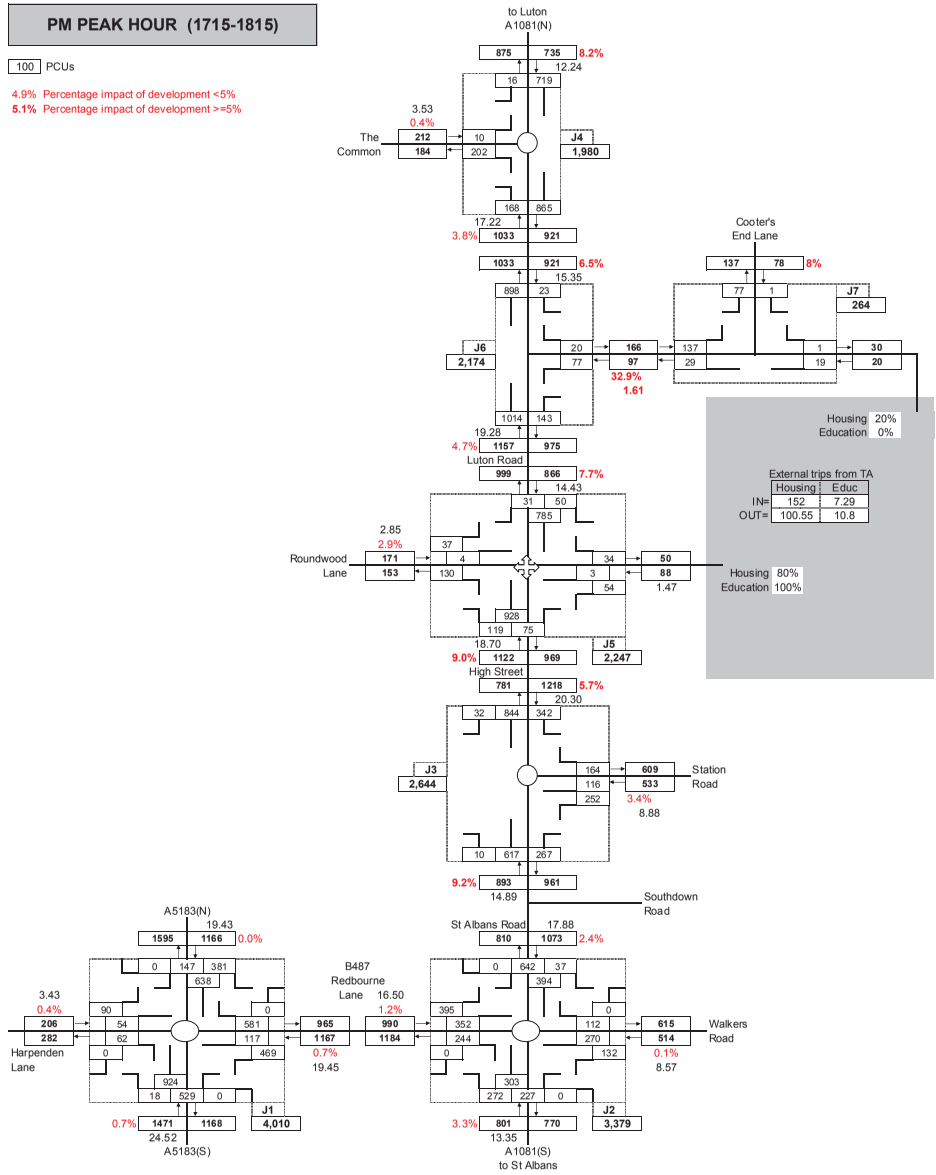
4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%



PM PEAK HOUR (1715-1815)

100 PCUs

4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%

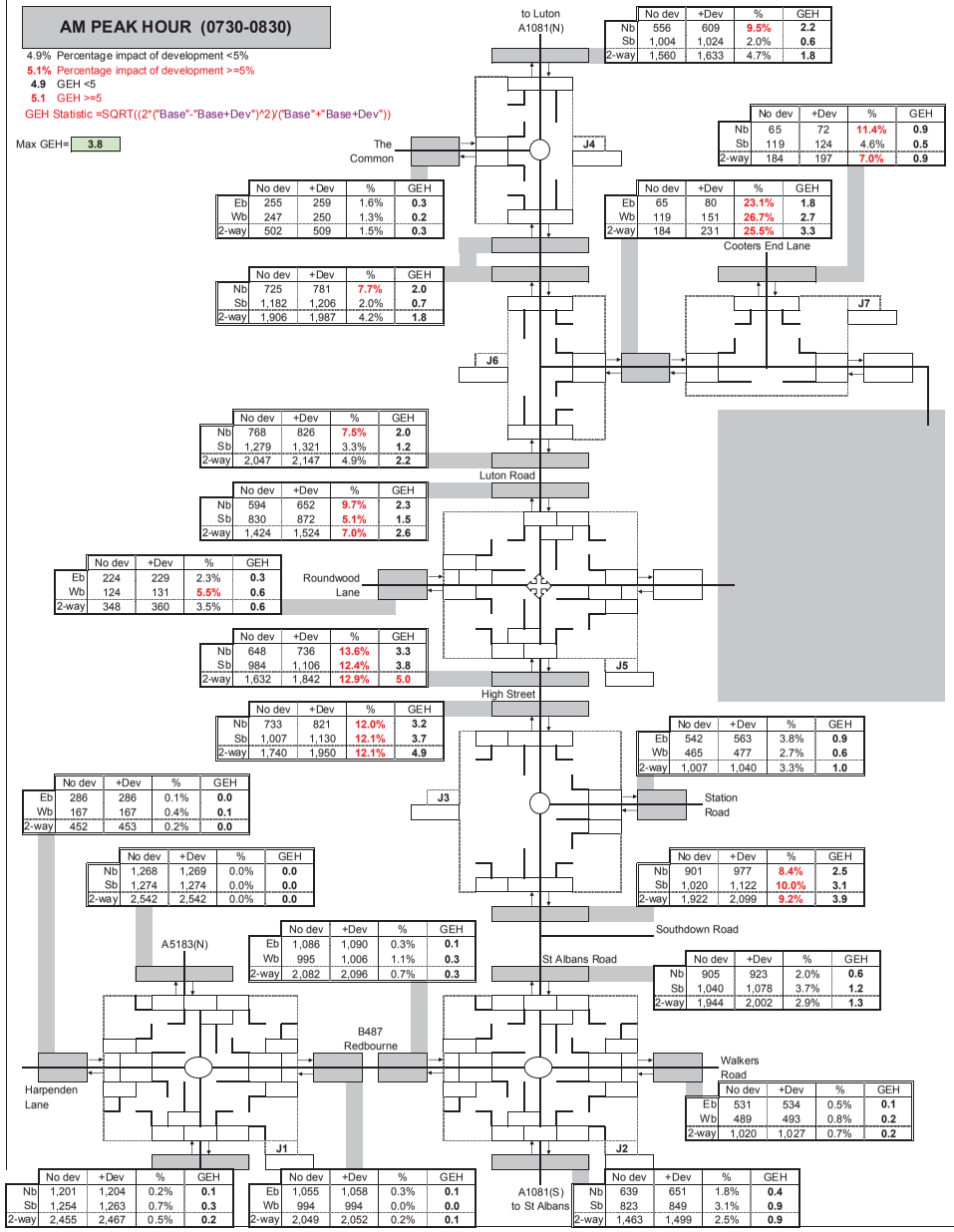


Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2020 Forecast Impact of Development Traffic**	**Figure 9**	

AM PEAK HOUR (0730-0830)

4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%
4.9 GEH <5
5.1 GEH >=5
GEH Statistic =SQRT((2*("Base"-"Base+Dev")^2)/("Base"+"Base+Dev"))

Max GEH= **3.8**



	No dev	+Dev	%	GEH
Nb	556	609	9.5%	2.2
Sb	1,004	1,024	2.0%	0.6
2-way	1,560	1,633	4.7%	1.8

	No dev	+Dev	%	GEH
Nb	65	72	11.4%	0.9
Sb	119	124	4.6%	0.5
2-way	184	197	7.0%	0.9

	No dev	+Dev	%	GEH
Eb	255	259	1.6%	0.3
Wb	247	250	1.3%	0.2
2-way	502	509	1.5%	0.3

	No dev	+Dev	%	GEH
Eb	65	80	23.1%	1.8
Wb	119	151	26.7%	2.7
2-way	184	231	25.5%	3.3

	No dev	+Dev	%	GEH
Nb	725	781	7.7%	2.0
Sb	1,182	1,206	2.0%	0.7
2-way	1,906	1,987	4.2%	1.8

	No dev	+Dev	%	GEH
Nb	768	826	7.5%	2.0
Sb	1,279	1,321	3.3%	1.2
2-way	2,047	2,147	4.9%	2.2

	No dev	+Dev	%	GEH
Nb	594	652	9.7%	2.3
Sb	830	872	5.1%	1.5
2-way	1,424	1,524	7.0%	2.6

	No dev	+Dev	%	GEH
Eb	224	229	2.3%	0.3
Wb	124	131	5.5%	0.6
2-way	348	360	3.5%	0.6

	No dev	+Dev	%	GEH
Nb	648	736	13.6%	3.3
Sb	984	1,106	12.4%	3.8
2-way	1,632	1,842	12.9%	5.0

	No dev	+Dev	%	GEH
Nb	733	821	12.0%	3.2
Sb	1,007	1,130	12.1%	3.7
2-way	1,740	1,950	12.1%	4.9

	No dev	+Dev	%	GEH
Eb	542	563	3.8%	0.9
Wb	465	477	2.7%	0.6
2-way	1,007	1,040	3.3%	1.0

	No dev	+Dev	%	GEH
Eb	286	286	0.1%	0.0
Wb	167	167	0.4%	0.1
2-way	452	453	0.2%	0.0

	No dev	+Dev	%	GEH
Nb	1,268	1,269	0.0%	0.0
Sb	1,274	1,274	0.0%	0.0
2-way	2,542	2,542	0.0%	0.0

	No dev	+Dev	%	GEH
Nb	901	977	8.4%	2.5
Sb	1,020	1,122	10.0%	3.1
2-way	1,922	2,099	9.2%	3.9

	No dev	+Dev	%	GEH
Eb	1,086	1,090	0.3%	0.1
Wb	995	1,006	1.1%	0.3
2-way	2,082	2,096	0.7%	0.3

	No dev	+Dev	%	GEH
Nb	905	923	2.0%	0.6
Sb	1,040	1,078	3.7%	1.2
2-way	1,944	2,002	2.9%	1.3

	No dev	+Dev	%	GEH
Eb	531	534	0.5%	0.1
Wb	489	493	0.8%	0.2
2-way	1,020	1,027	0.7%	0.2

	No dev	+Dev	%	GEH
Nb	1,201	1,204	0.2%	0.1
Sb	1,254	1,263	0.7%	0.3
2-way	2,455	2,467	0.5%	0.2

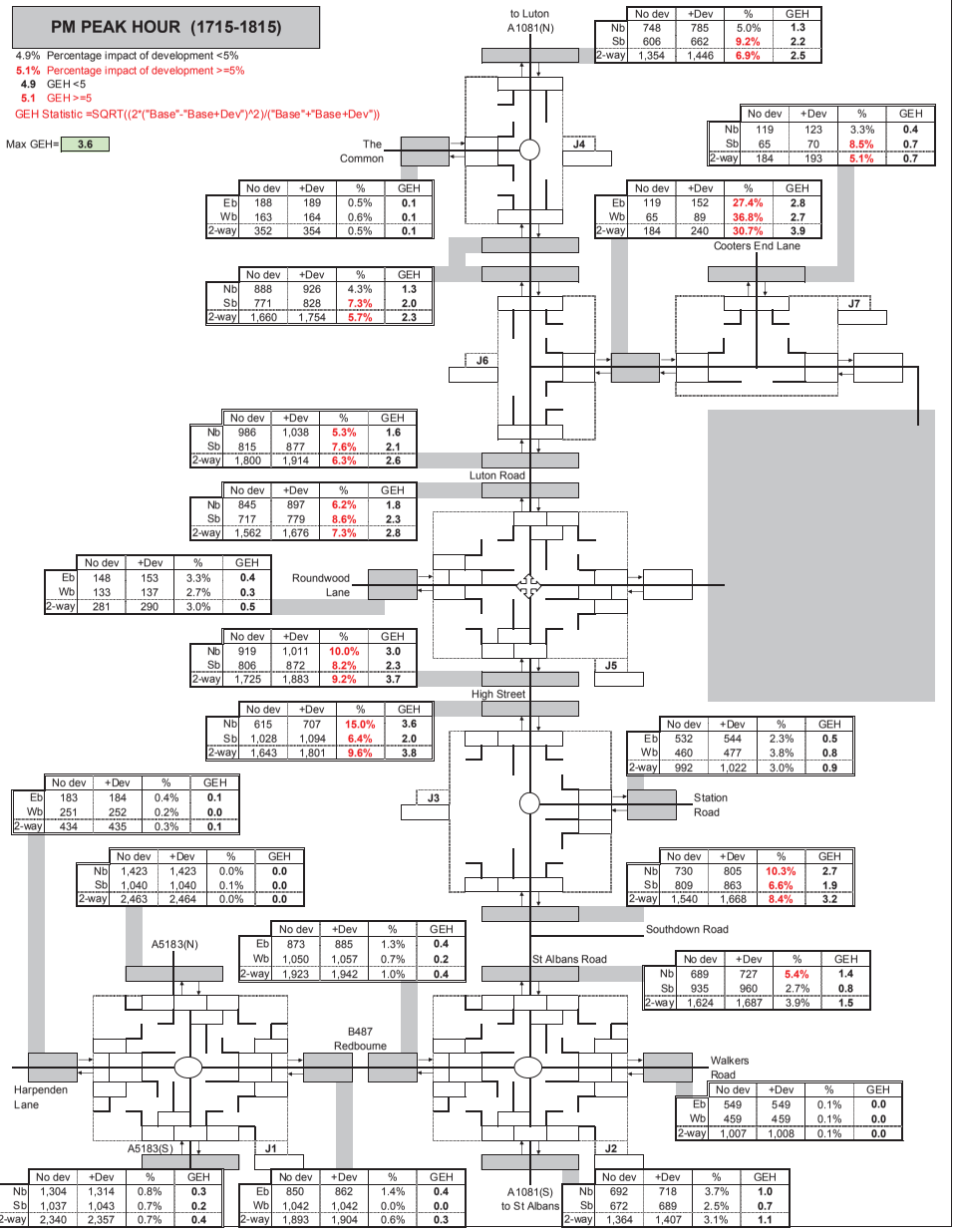
	No dev	+Dev	%	GEH
Eb	1,055	1,058	0.3%	0.1
Wb	994	994	0.0%	0.0
2-way	2,049	2,052	0.2%	0.1

	No dev	+Dev	%	GEH
Nb	639	651	1.8%	0.4
Sb	823	849	3.1%	0.9
2-way	1,463	1,499	2.5%	0.9

PM PEAK HOUR (1715-1815)

4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%
4.9 GEH <5
5.1 GEH >=5
GEH Statistic =SQRT((2*("Base"-"Base+Dev")^2)/("Base"+"Base+Dev"))

Max GEH= **3.6**



	No dev	+Dev	%	GEH
Nb	748	785	5.0%	1.3
Sb	606	662	9.2%	2.2
2-way	1,354	1,446	6.9%	2.5

	No dev	+Dev	%	GEH
Nb	119	123	3.3%	0.4
Sb	65	70	8.5%	0.7
2-way	184	193	5.1%	0.7

	No dev	+Dev	%	GEH
Eb	188	189	0.5%	0.1
Wb	163	164	0.6%	0.1
2-way	352	354	0.5%	0.1

	No dev	+Dev	%	GEH
Eb	119	152	27.4%	2.8
Wb	65	89	36.8%	2.7
2-way	184	240	30.7%	3.9

	No dev	+Dev	%	GEH
Nb	888	926	4.3%	1.3
Sb	771	828	7.3%	2.0
2-way	1,660	1,754	5.7%	2.3

	No dev	+Dev	%	GEH
Nb	986	1,038	5.3%	1.6
Sb	815	877	7.6%	2.1
2-way	1,800	1,914	6.3%	2.6

	No dev	+Dev	%	GEH
Nb	845	897	6.2%	1.8
Sb	717	779	8.6%	2.3
2-way	1,562	1,676	7.3%	2.8

	No dev	+Dev	%	GEH
Eb	148	153	3.3%	0.4
Wb	133	137	2.7%	0.3
2-way	281	290	3.0%	0.5

	No dev	+Dev	%	GEH
Nb	919	1,011	10.0%	3.0
Sb	806	872	8.2%	2.3
2-way	1,725	1,883	9.2%	3.7

	No dev	+Dev	%	GEH
Nb	615	707	15.0%	3.6
Sb	1,028	1,094	6.4%	2.0
2-way	1,643	1,801	9.6%	3.8

	No dev	+Dev	%	GEH
Eb	532	544	2.3%	0.5
Wb	460	477	3.8%	0.8
2-way	992	1,022	3.0%	0.9

	No dev	+Dev	%	GEH
Eb	183	184	0.4%	0.1
Wb	251	252	0.2%	0.0
2-way	434	435	0.3%	0.1

	No dev	+Dev	%	GEH
Nb	1,423	1,423	0.0%	0.0
Sb	1,040	1,040	0.1%	0.0
2-way	2,463	2,464	0.0%	0.0

	No dev	+Dev	%	GEH
Nb	730	805	10.3%	2.7
Sb	809	863	6.6%	1.9
2-way	1,540	1,668	8.4%	3.2

	No dev	+Dev	%	GEH
Eb	873	885	1.3%	0.4
Wb	1,050	1,057	0.7%	0.2
2-way	1,923	1,942	1.0%	0.4

	No dev	+Dev	%	GEH
Nb	689	727	5.4%	1.4
Sb	935	960	2.7%	0.8
2-way	1,624	1,687	3.9%	1.5

	No dev	+Dev	%	GEH
Eb	549	549	0.1%	0.0
Wb	459	459	0.1%	0.0
2-way	1,007	1,008	0.1%	0.0

	No dev	+Dev	%	GEH
Nb	1,304	1,314	0.8%	0.3
Sb	1,037	1,043	0.7%	0.2
2-way	2,340	2,357	0.7%	0.4

	No dev	+Dev	%	GEH
Eb	850	862	1.4%	0.4
Wb	1,042	1,042	0.0%	0.0
2-way	1,893	1,904	0.6%	0.3

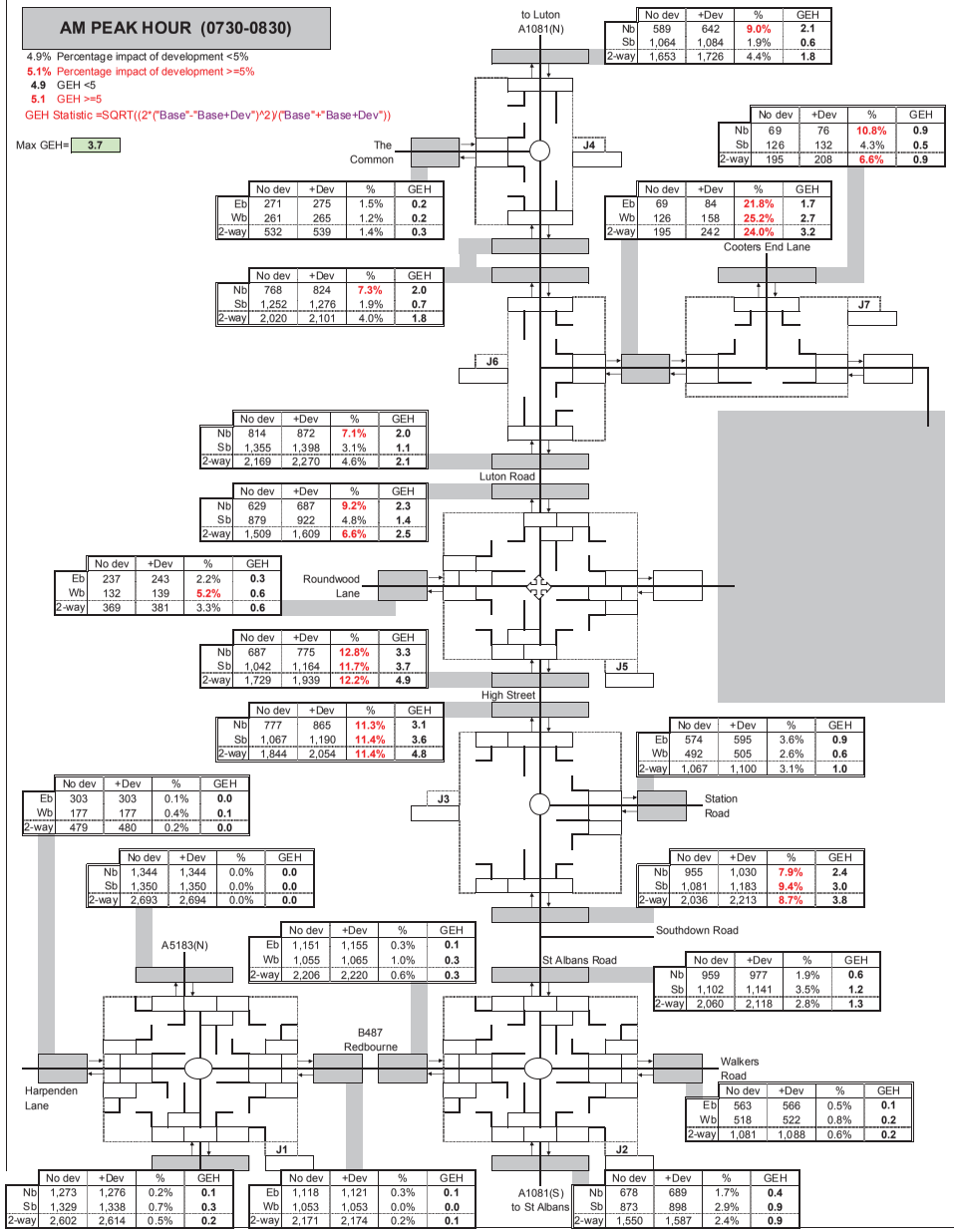
	No dev	+Dev	%	GEH
Nb	692	718	3.7%	1.0
Sb	672	689	2.5%	0.7
2-way	1,364	1,407	3.1%	1.1

Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2025 Forecast Impact of Development Traffic**	**Figure 10**	© Brookbanks Consulting Limited 2016

AM PEAK HOUR (0730-0830)

4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%
4.9 GEH <5
5.1 GEH >=5
GEH Statistic =SQRT((2*("Base"-"Base+Dev")^2)/("Base"+"Base+Dev"))

Max GEH= 3.7



	No dev	+Dev	%	GEH
Nb	589	642	9.0%	2.1
Sb	1,064	1,084	1.9%	0.6
2-way	1,653	1,726	4.4%	1.8

	No dev	+Dev	%	GEH
Nb	69	76	10.8%	0.9
Sb	126	132	4.3%	0.5
2-way	195	208	6.6%	0.9

	No dev	+Dev	%	GEH
Eb	271	275	1.5%	0.2
Wb	261	265	1.2%	0.2
2-way	532	539	1.4%	0.3

	No dev	+Dev	%	GEH
Eb	69	84	21.8%	1.7
Wb	126	158	25.2%	2.7
2-way	195	242	24.0%	3.2

	No dev	+Dev	%	GEH
Nb	768	824	7.3%	2.0
Sb	1,252	1,276	1.9%	0.7
2-way	2,020	2,101	4.0%	1.8

	No dev	+Dev	%	GEH
Nb	814	872	7.1%	2.0
Sb	1,355	1,398	3.1%	1.1
2-way	2,169	2,270	4.6%	2.1

	No dev	+Dev	%	GEH
Nb	629	687	9.2%	2.3
Sb	879	922	4.8%	1.4
2-way	1,509	1,609	6.6%	2.5

	No dev	+Dev	%	GEH
Eb	237	243	2.2%	0.3
Wb	132	139	5.2%	0.6
2-way	369	381	3.3%	0.6

	No dev	+Dev	%	GEH
Nb	687	775	12.8%	3.3
Sb	1,042	1,164	11.7%	3.7
2-way	1,729	1,939	12.2%	4.9

	No dev	+Dev	%	GEH
Nb	777	865	11.3%	3.1
Sb	1,067	1,190	11.4%	3.6
2-way	1,844	2,054	11.4%	4.8

	No dev	+Dev	%	GEH
Eb	574	595	3.6%	0.9
Wb	492	505	2.6%	0.6
2-way	1,067	1,100	3.1%	1.0

	No dev	+Dev	%	GEH
Eb	303	303	0.1%	0.0
Wb	177	177	0.4%	0.1
2-way	479	480	0.2%	0.0

	No dev	+Dev	%	GEH
Nb	1,344	1,344	0.0%	0.0
Sb	1,350	1,350	0.0%	0.0
2-way	2,693	2,694	0.0%	0.0

	No dev	+Dev	%	GEH
Nb	955	1,030	7.9%	2.4
Sb	1,081	1,183	9.4%	3.0
2-way	2,036	2,213	8.7%	3.8

	No dev	+Dev	%	GEH
Eb	1,151	1,155	0.3%	0.1
Wb	1,055	1,065	1.0%	0.3
2-way	2,206	2,220	0.6%	0.3

	No dev	+Dev	%	GEH
Nb	959	977	1.9%	0.6
Sb	1,102	1,141	3.5%	1.2
2-way	2,060	2,118	2.8%	1.3

	No dev	+Dev	%	GEH
Eb	563	566	0.5%	0.1
Wb	518	522	0.8%	0.2
2-way	1,081	1,088	0.6%	0.2

	No dev	+Dev	%	GEH
Nb	1,273	1,276	0.2%	0.1
Sb	1,329	1,338	0.7%	0.3
2-way	2,602	2,614	0.5%	0.2

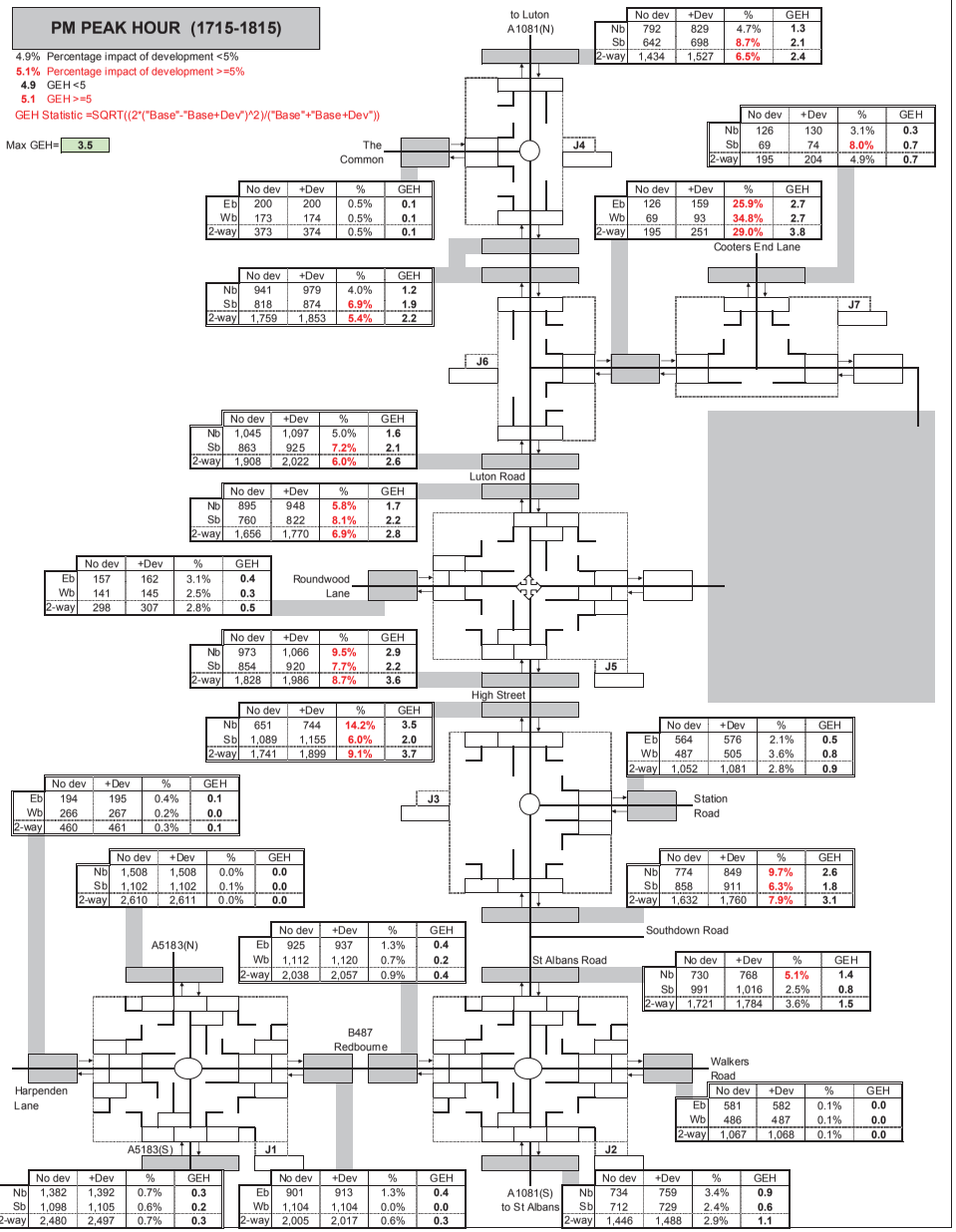
	No dev	+Dev	%	GEH
Eb	1,118	1,121	0.3%	0.1
Wb	1,053	1,053	0.0%	0.0
2-way	2,171	2,174	0.2%	0.1

	No dev	+Dev	%	GEH
Nb	678	689	1.7%	0.4
Sb	873	898	2.9%	0.9
2-way	1,550	1,587	2.4%	0.9

PM PEAK HOUR (1715-1815)

4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%
4.9 GEH <5
5.1 GEH >=5
GEH Statistic =SQRT((2*("Base"-"Base+Dev")^2)/("Base"+"Base+Dev"))

Max GEH= 3.5



	No dev	+Dev	%	GEH
Nb	792	829	4.7%	1.3
Sb	642	698	8.7%	2.1
2-way	1,434	1,527	6.5%	2.4

	No dev	+Dev	%	GEH
Nb	126	130	3.1%	0.3
Sb	69	74	8.0%	0.7
2-way	195	204	4.9%	0.7

	No dev	+Dev	%	GEH
Eb	200	200	0.5%	0.1
Wb	173	174	0.5%	0.1
2-way	373	374	0.5%	0.1

	No dev	+Dev	%	GEH
Eb	126	159	25.9%	2.7
Wb	69	93	34.8%	2.7
2-way	195	251	29.0%	3.8

	No dev	+Dev	%	GEH
Nb	941	979	4.0%	1.2
Sb	818	874	6.9%	1.9
2-way	1,759	1,853	5.4%	2.2

	No dev	+Dev	%	GEH
Nb	1,045	1,097	5.0%	1.6
Sb	863	925	7.2%	2.1
2-way	1,908	2,022	6.0%	2.6

	No dev	+Dev	%	GEH
Nb	895	948	5.8%	1.7
Sb	760	822	8.1%	2.2
2-way	1,656	1,770	6.9%	2.8

	No dev	+Dev	%	GEH
Eb	157	162	3.1%	0.4
Wb	141	145	2.5%	0.3
2-way	298	307	2.8%	0.5

	No dev	+Dev	%	GEH
Nb	973	1,066	9.5%	2.9
Sb	854	920	7.7%	2.2
2-way	1,828	1,986	8.7%	3.6

	No dev	+Dev	%	GEH
Nb	651	744	14.2%	3.5
Sb	1,089	1,155	6.0%	2.0
2-way	1,741	1,899	9.1%	3.7

	No dev	+Dev	%	GEH
Eb	564	576	2.1%	0.5
Wb	487	505	3.6%	0.8
2-way	1,052	1,081	2.8%	0.9

	No dev	+Dev	%	GEH
Eb	194	195	0.4%	0.1
Wb	266	267	0.2%	0.0
2-way	460	461	0.3%	0.1

	No dev	+Dev	%	GEH
Nb	1,508	1,508	0.0%	0.0
Sb	1,102	1,102	0.1%	0.0
2-way	2,610	2,611	0.0%	0.0

	No dev	+Dev	%	GEH
Nb	774	849	9.7%	2.6
Sb	858	911	6.3%	1.8
2-way	1,632	1,760	7.9%	3.1

	No dev	+Dev	%	GEH
Eb	925	937	1.3%	0.4
Wb	1,112	1,120	0.7%	0.2
2-way	2,038	2,057	0.9%	0.4

	No dev	+Dev	%	GEH
Nb	730	768	5.1%	1.4
Sb	991	1,016	2.5%	0.8
2-way	1,721	1,784	3.6%	1.5

	No dev	+Dev	%	GEH
Eb	581	582	0.1%	0.0
Wb	486	487	0.1%	0.0
2-way	1,067	1,068	0.1%	0.0

	No dev	+Dev	%	GEH
Nb	1,382	1,392	0.7%	0.3
Sb	1,098	1,105	0.6%	0.2
2-way	2,480	2,497	0.7%	0.3

	No dev	+Dev	%	GEH
Eb	901	913	1.3%	0.4
Wb	1,104	1,104	0.0%	0.0
2-way	2,005	2,017	0.6%	0.3

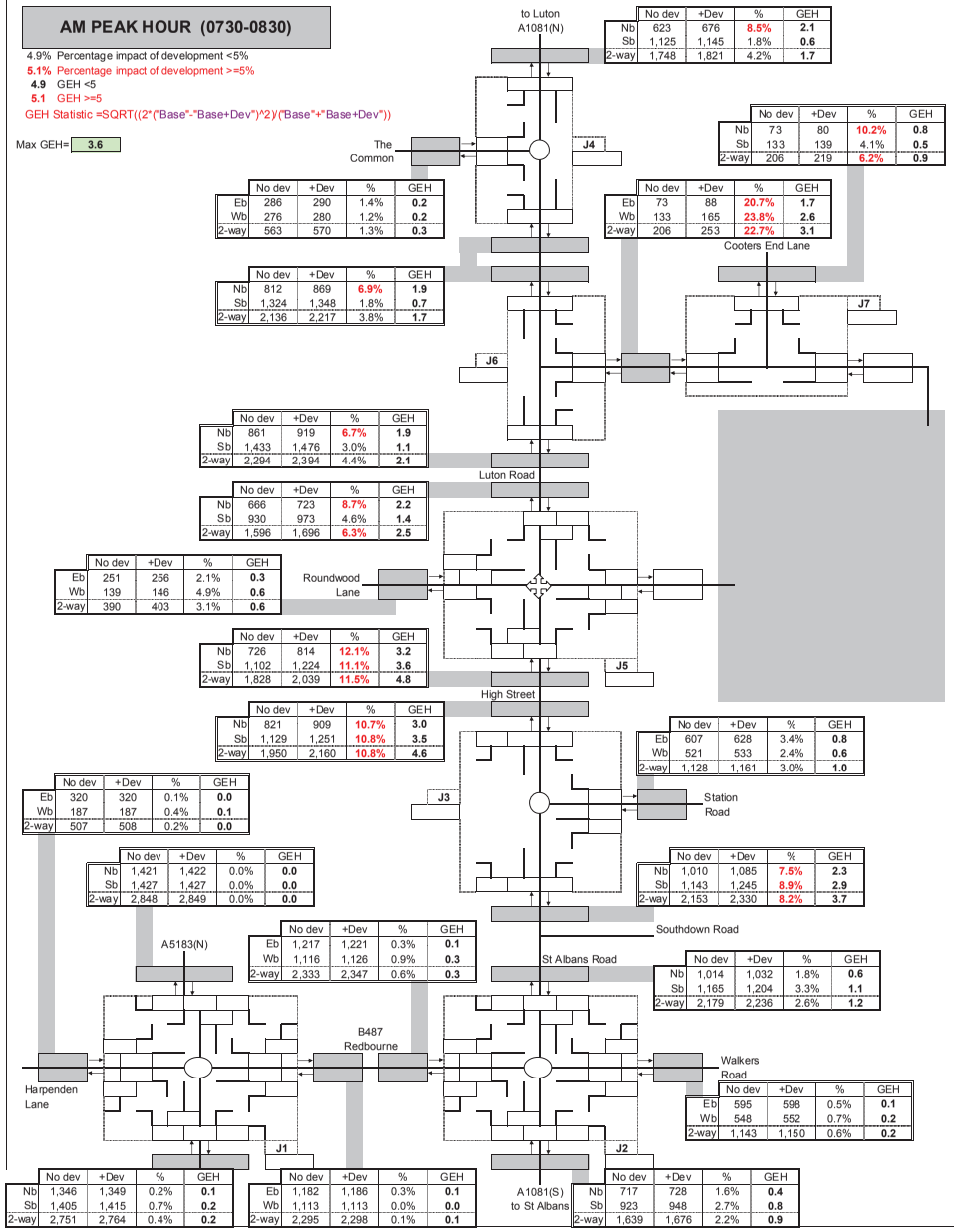
	No dev	+Dev	%	GEH
Nb	734	759	3.4%	0.9
Sb	712	729	2.4%	0.6
2-way	1,446	1,488	2.9%	1.1

Client:	**Commercial Estates Group**	Prepared by: S.M.T.	Brookbanks Consulting
Job:	**10338 Land at Harpenden**	01/06/2016	
Title:	**2031 Forecast Impact of Development Traffic**	**Figure 11**	

AM PEAK HOUR (0730-0830)

4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%
4.9 GEH <5
5.1 GEH >=5
GEH Statistic =SQRT((2*("Base"-"Base+Dev")^2)/("Base"+"Base+Dev"))

Max GEH= 3.6



	No dev	+Dev	%	GEH
Nb	623	676	8.5%	2.1
Sb	1,125	1,145	1.8%	0.6
2-way	1,748	1,821	4.2%	1.7

	No dev	+Dev	%	GEH
Nb	73	80	10.2%	0.8
Sb	133	139	4.1%	0.5
2-way	206	219	6.2%	0.9

	No dev	+Dev	%	GEH
Eb	286	290	1.4%	0.2
Wb	276	280	1.2%	0.2
2-way	563	570	1.3%	0.3

	No dev	+Dev	%	GEH
Eb	73	88	20.7%	1.7
Wb	133	165	23.8%	2.6
2-way	206	253	22.7%	3.1

	No dev	+Dev	%	GEH
Nb	812	869	6.9%	1.9
Sb	1,324	1,348	1.8%	0.7
2-way	2,136	2,217	3.8%	1.7

	No dev	+Dev	%	GEH
Nb	861	919	6.7%	1.9
Sb	1,433	1,476	3.0%	1.1
2-way	2,294	2,394	4.4%	2.1

	No dev	+Dev	%	GEH
Nb	666	723	8.7%	2.2
Sb	930	973	4.6%	1.4
2-way	1,596	1,696	6.3%	2.5

	No dev	+Dev	%	GEH
Eb	251	256	2.1%	0.3
Wb	139	146	4.9%	0.6
2-way	390	403	3.1%	0.6

	No dev	+Dev	%	GEH
Nb	726	814	12.1%	3.2
Sb	1,102	1,224	11.1%	3.6
2-way	1,828	2,039	11.5%	4.8

	No dev	+Dev	%	GEH
Nb	821	909	10.7%	3.0
Sb	1,129	1,251	10.8%	3.5
2-way	1,950	2,160	10.8%	4.6

	No dev	+Dev	%	GEH
Eb	607	628	3.4%	0.8
Wb	521	533	2.4%	0.6
2-way	1,128	1,161	3.0%	1.0

	No dev	+Dev	%	GEH
Eb	320	320	0.1%	0.0
Wb	187	187	0.4%	0.1
2-way	507	508	0.2%	0.0

	No dev	+Dev	%	GEH
Nb	1,421	1,422	0.0%	0.0
Sb	1,427	1,427	0.0%	0.0
2-way	2,848	2,849	0.0%	0.0

	No dev	+Dev	%	GEH
Nb	1,010	1,085	7.5%	2.3
Sb	1,143	1,245	8.9%	2.9
2-way	2,153	2,330	8.2%	3.7

	No dev	+Dev	%	GEH
Eb	1,217	1,221	0.3%	0.1
Wb	1,116	1,126	0.9%	0.3
2-way	2,333	2,347	0.6%	0.3

	No dev	+Dev	%	GEH
Nb	1,014	1,032	1.8%	0.6
Sb	1,165	1,204	3.3%	1.1
2-way	2,179	2,236	2.6%	1.2

	No dev	+Dev	%	GEH
Eb	595	598	0.5%	0.1
Wb	548	552	0.7%	0.2
2-way	1,143	1,150	0.6%	0.2

	No dev	+Dev	%	GEH
Nb	1,346	1,349	0.2%	0.1
Sb	1,405	1,415	0.7%	0.2
2-way	2,751	2,764	0.4%	0.2

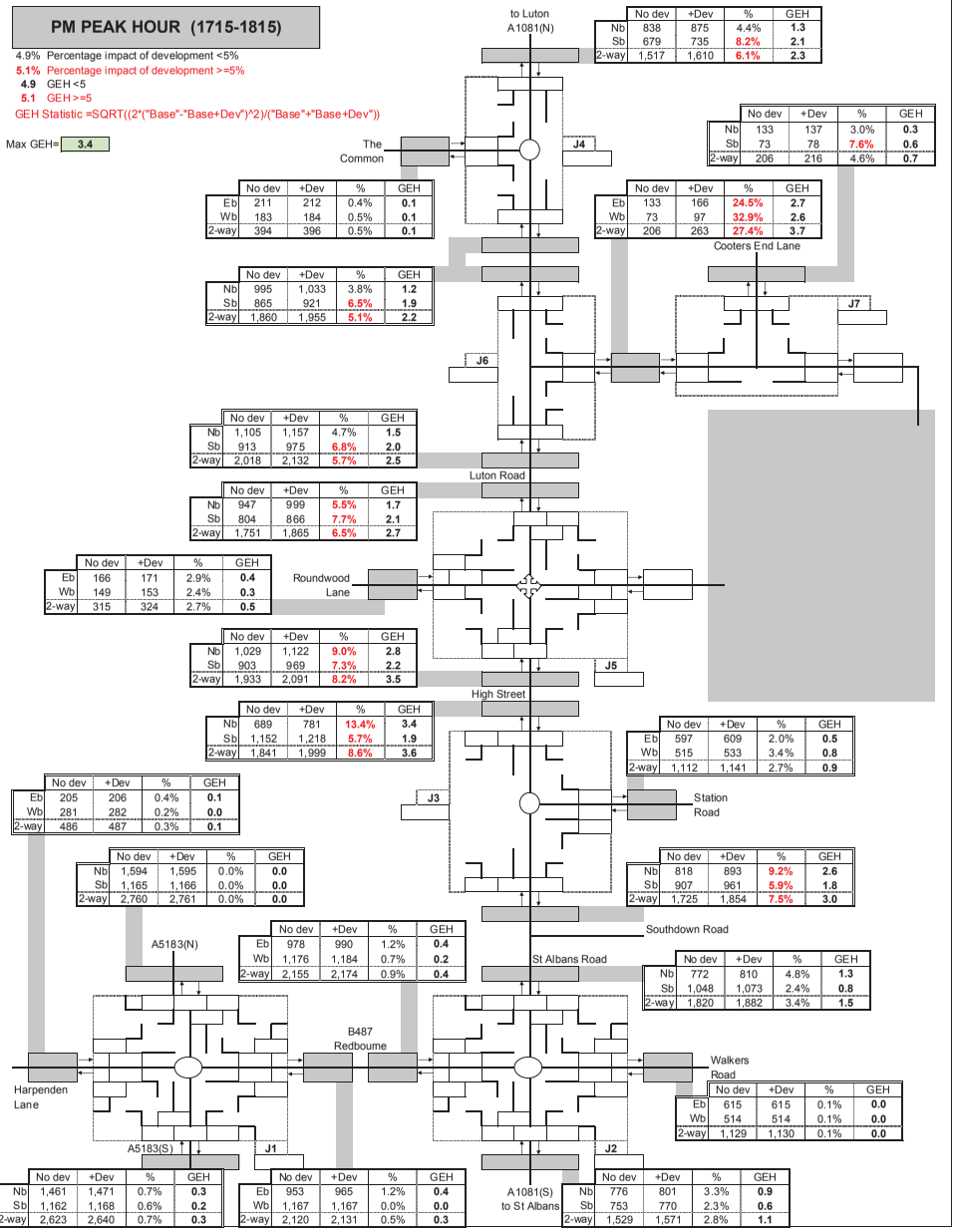
	No dev	+Dev	%	GEH
Eb	1,182	1,186	0.3%	0.1
Wb	1,113	1,113	0.0%	0.0
2-way	2,295	2,298	0.1%	0.1

	No dev	+Dev	%	GEH
Nb	717	728	1.6%	0.4
Sb	923	948	2.7%	0.8
2-way	1,639	1,676	2.2%	0.9

PM PEAK HOUR (1715-1815)

4.9% Percentage impact of development <5%
5.1% Percentage impact of development >=5%
4.9 GEH <5
5.1 GEH >=5
GEH Statistic =SQRT((2*("Base"-"Base+Dev")^2)/("Base"+"Base+Dev"))

Max GEH= 3.4



	No dev	+Dev	%	GEH
Nb	838	875	4.4%	1.3
Sb	679	735	8.2%	2.1
2-way	1,517	1,610	6.1%	2.3

	No dev	+Dev	%	GEH
Nb	133	137	3.0%	0.3
Sb	73	78	7.6%	0.6
2-way	206	216	4.6%	0.7

	No dev	+Dev	%	GEH
Eb	211	212	0.4%	0.1
Wb	183	184	0.5%	0.1
2-way	394	396	0.5%	0.1

	No dev	+Dev	%	GEH
Eb	133	166	24.5%	2.7
Wb	73	97	32.9%	2.6
2-way	206	263	27.4%	3.7

	No dev	+Dev	%	GEH
Nb	995	1,033	3.8%	1.2
Sb	865	921	6.5%	1.9
2-way	1,860	1,955	5.1%	2.2

	No dev	+Dev	%	GEH
Nb	1,105	1,157	4.7%	1.5
Sb	913	975	6.8%	2.0
2-way	2,018	2,132	5.7%	2.5

	No dev	+Dev	%	GEH
Nb	947	999	5.5%	1.7
Sb	804	866	7.7%	2.1
2-way	1,751	1,865	6.5%	2.7

	No dev	+Dev	%	GEH
Eb	166	171	2.9%	0.4
Wb	149	153	2.4%	0.3
2-way	315	324	2.7%	0.5

	No dev	+Dev	%	GEH
Nb	1,029	1,122	9.0%	2.8
Sb	903	969	7.3%	2.2
2-way	1,933	2,091	8.2%	3.5

	No dev	+Dev	%	GEH
Nb	689	781	13.4%	3.4
Sb	1,152	1,218	5.7%	1.9
2-way	1,841	1,999	8.6%	3.6

	No dev	+Dev	%	GEH
Eb	597	609	2.0%	0.5
Wb	515	533	3.4%	0.8
2-way	1,112	1,141	2.7%	0.9

	No dev	+Dev	%	GEH
Eb	205	206	0.4%	0.1
Wb	281	282	0.2%	0.0
2-way	486	487	0.3%	0.1

	No dev	+Dev	%	GEH
Nb	1,594	1,595	0.0%	0.0
Sb	1,165	1,166	0.0%	0.0
2-way	2,760	2,761	0.0%	0.0

	No dev	+Dev	%	GEH
Nb	818	893	9.2%	2.6
Sb	907	961	5.9%	1.8
2-way	1,725	1,854	7.5%	3.0

	No dev	+Dev	%	GEH
Eb	978	990	1.2%	0.4
Wb	1,176	1,184	0.7%	0.2
2-way	2,155	2,174	0.9%	0.4

	No dev	+Dev	%	GEH
Nb	772	810	4.8%	1.3
Sb	1,048	1,073	2.4%	0.8
2-way	1,820	1,882	3.4%	1.5

	No dev	+Dev	%	GEH
Eb	615	615	0.1%	0.0
Wb	514	514	0.1%	0.0
2-way	1,129	1,130	0.1%	0.0

	No dev	+Dev	%	GEH
Nb	1,461	1,471	0.7%	0.3
Sb	1,162	1,168	0.6%	0.2
2-way	2,623	2,640	0.7%	0.3

	No dev	+Dev	%	GEH
Eb	953	965	1.2%	0.4
Wb	1,167	1,167	0.0%	0.0
2-way	2,120	2,131	0.5%	0.3

	No dev	+Dev	%	GEH
Nb	776	801	3.3%	0.9
Sb	753	770	2.3%	0.6
2-way	1,529	1,571	2.8%	1.1

10338 Harpenden

	2-way peak hour link flow [PCUs]									
	2015 counted		2031		2031+dev		% impact of development		GEH value	
Road Link	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
A108 north of The Common	1442	1251	1748	1517	1821	1610	4%	**6%**	1.7	2.3
The Common	464	325	563	394	570	396	1%	0%	0.3	0.1
A108 south of The Common	1762	1534	2136	1860	2217	1955	4%	**5%**	1.7	2.2
Cooters End lane	170	170	206	206	253	263	**23%**	**27%**	3.1	3.7
A108 south of Cooters End lane	1892	1664	2294	2018	2394	2132	4%	**6%**	2.1	2.5
A108 north of Roundwood Lane	1316	1444	1596	1751	1696	1865	**6%**	**7%**	2.5	2.7
Roundwood Lane	322	260	390	315	403	324	3%	3%	0.6	0.5
A108 south of Roundwood Lane	1508	1594	1828	1933	2039	2091	**11%**	**8%**	4.8	3.5
A108 north of Station Road	1608	1518	1950	1841	2160	1999	**11%**	**9%**	4.6	3.6
Station Road	930	917	1128	1112	1161	1141	3%	3%	1.0	0.9
A108 south of Station Road	1776	1423	2153	1725	2330	1854	**8%**	**7%**	3.7	3.0
A108 north of Walkers Road	1797	1501	2179	1820	2236	1882	3%	3%	1.2	1.5
Walkers Road	943	931	1143	1129	1150	1130	1%	0%	0.2	0.0
A108 south of Walkers Road	1352	1261	1639	1529	1676	1571	2%	3%	0.9	1.1
B487 Redbourn Lane	1884	1742	2284	2112	2298	2131	1%	1%	0.3	0.4
A5183 north of B487 Redbourn Lane	2349	2276	2848	2760	2849	2761	0%	0%	0.0	0.0
A108 south of B487 Redbourn Lane	2269	2163	2751	2623	2764	2640	0%	1%	0.2	0.3
Harpenden Lane west of A5183	418	401	507	486	508	487	0%	0%	0.0	0.1
								maximum GEH=	4.8	

	2-way peak hour link flow [Vehicles]										
	2015 counted		2031		2031+dev		% impact of development		GEH value		
Road Link	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	%HGVs
A108 north of The Common	1412	1225	1712	1485	1783	1576	4%	**6%**	1.7	2.3	*2.1%*
The Common	462	324	560	393	568	394	1%	0%	0.3	0.1	*0.4%*
A108 south of The Common	1732	1507	2099	1828	2178	1921	4%	**5%**	1.7	2.1	*1.7%*
Cooters End lane	170	170	206	206	253	263	**23%**	**27%**	3.1	3.7	*0.0%*
A108 south of Cooters End lane	1862	1637	2257	1985	2356	2098	4%	**6%**	2.1	2.5	*1.6%*
A108 north of Roundwood Lane	1295	1421	1570	1722	1669	1835	**6%**	**7%**	2.5	2.7	*1.6%*
Roundwood Lane	320	259	388	314	400	322	3%	3%	0.6	0.5	*0.5%*
A108 south of Roundwood Lane	1488	1573	1804	1907	2011	2063	**11%**	**8%**	4.7	3.5	*1.3%*
A108 north of Station Road	1574	1486	1909	1802	2115	1957	**11%**	**9%**	4.6	3.6	*2.1%*
Station Road	919	906	1115	1099	1148	1128	3%	3%	1.0	0.9	*1.2%*
A108 south of Station Road	1746	1399	2117	1696	2291	1823	**8%**	**7%**	3.7	3.0	*1.7%*
A108 north of Walkers Road	1777	1484	2155	1800	2211	1862	3%	3%	1.2	1.4	*1.1%*
Walkers Road	927	915	1124	1110	1131	1111	1%	0%	0.2	0.0	*1.7%*
A108 south of Walkers Road	1338	1248	1622	1513	1659	1555	2%	3%	0.9	1.1	*1.0%*
B487 Redbourn Lane	1851	1712	2245	2076	2259	2095	1%	1%	0.3	0.4	*1.7%*
A5183 north of B487 Redbourn Lane	2322	2250	2815	2728	2816	2729	0%	0%	0.0	0.0	*1.2%*
A108 south of B487 Redbourn Lane	2243	2138	2719	2592	2731	2609	0%	1%	0.2	0.3	*1.2%*
Harpenden Lane west of A5183	413	396	501	481	502	482	0%	0%	0.0	0.1	*1.2%*
								maximum GEH=	4.7		

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J1-A5183 jw B487 Redbourn Lane\
10338 J1 A5183 jw B487 Redbourn Lane - 2015 AM [flat].vai"
(drive-on-the-left) at 14:32:56 on Thursday, 27 August 2015

FILE PROPERTIES

RUN TITLE: 10338 J1 A5183 jw B487 Redbourn Lane - 2015 AM [flat]
LOCATION: Harpenden
DATE: 27/08/15
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A5183 (N)
ARM B - B487 Redbourne Lane (E)
ARM C - A5183 (S)
ARM D - Harpenden Lane

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.20	7.50	10.00	30.00	52.00	30.0	0.575	25.712
ARM B	3.20	7.50	10.00	20.00	52.00	30.0	0.565	25.299
ARM C	3.60	7.50	10.00	40.00	52.00	40.0	0.578	26.665
ARM D	3.20	7.00	10.00	40.00	52.00	30.0	0.574	25.427

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
08.00 - 09.00	ARM A	0.000	0.331	0.587	0.082
		0.0	389.0	691.0	97.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.497	0.000	0.443	0.059
		452.0	0.0	403.0	54.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.549	0.449	0.000	0.003
		609.0	498.0	0.0	3.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.420	0.333	0.246	0.000
		111.0	88.0	65.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	19.62	19.60	1.001	- - -	0.0	16.8	165.5	-	-0.051
ARM B	15.15	17.69	0.856	- - -	0.0	5.1	64.0	-	0.316
ARM C	18.50	21.02	0.880	- - -	0.0	6.2	75.9	-	0.308
ARM D	4.40	10.85	0.405	- - -	0.0	0.7	9.5	-	0.153

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	19.62	19.49	1.007	- - -	16.8	25.2	318.3	-	1.269
ARM B	15.15	17.47	0.867	- - -	5.1	5.8	83.5	-	0.407
ARM C	18.50	20.90	0.885	- - -	6.2	6.9	98.9	-	0.394
ARM D	4.40	10.56	0.417	- - -	0.7	0.7	10.4	-	0.162

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	19.62	19.48	1.007	- - -	25.2	31.8	429.0	-	1.633
ARM B	15.15	17.43	0.869	- - -	5.8	6.1	90.0	-	0.424
ARM C	18.50	20.89	0.886	- - -	6.9	7.2	105.5	-	0.406
ARM D	4.40	10.53	0.418	- - -	0.7	0.7	10.6	-	0.163

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	19.62	19.48	1.007	- - -	31.8	37.6	521.9	-	1.935
ARM B	15.15	17.41	0.870	- - -	6.1	6.3	93.2	-	0.431
ARM C	18.50	20.88	0.886	- - -	7.2	7.3	108.6	-	0.411
ARM D	4.40	10.53	0.418	- - -	0.7	0.7	10.7	-	0.163

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	16.8	**********
08.30	25.2	**********
08.45	31.8	**********
09.00	37.6	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	5.1	*****
08.30	5.8	******
08.45	6.1	******
09.00	6.3	******

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	6.2	******
08.30	6.9	*******
08.45	7.2	*******
09.00	7.3	*******

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	0.7	*
08.30	0.7	*
08.45	0.7	*
09.00	0.7	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1177.2	1177.2	1434.7	1.22	1471.1	1.25
B	909.0	909.0	330.7	0.36	331.9	0.37
C	1110.0	1110.0	388.8	0.35	390.1	0.35
D	264.0	264.0	41.3	0.16	41.3	0.16
ALL	3460.2	3460.2	2195.5	0.63	2234.3	0.65

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 15:58:58 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
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TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J1-A5183 jw B487 Redbourn Lane\
10338 J1 A5183 jw B487 Redbourn Lane - 2015 PM [flat].vai"
(drive-on-the-left) at 14:33:00 on Thursday, 27 August 2015

FILE PROPERTIES

RUN TITLE: 10338 J1 A5183 jw B487 Redbourn Lane - 2015 PM [flat]
LOCATION: Harpenden
DATE: 27/08/15
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A5183 (N)
ARM B - B487 Redbourne Lane (E)
ARM C - A5183 (S)
ARM D - Harpenden Lane

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.20	7.50	10.00	30.00	52.00	30.0	0.575	25.712
ARM B	3.20	7.50	10.00	20.00	52.00	30.0	0.565	25.299
ARM C	3.60	7.50	10.00	40.00	52.00	40.0	0.578	26.665
ARM D	3.20	7.00	10.00	40.00	52.00	30.0	0.574	25.427

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.00	ARM A	0.000	0.327	0.547	0.126
		0.0	314.0	526.0	121.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.501	0.000	0.399	0.100
		479.0	0.0	381.0	96.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.632	0.355	0.000	0.012
		762.0	428.0	0.0	15.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.438	0.260	0.302	0.000
		74.0	44.0	51.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	16.02	20.94	0.765	- - -	0.0	3.1	41.6	-	0.188
ARM B	15.93	18.80	0.847	- - -	0.0	4.9	61.7	-	0.288
ARM C	20.08	20.09	0.999	- - -	0.0	16.8	165.7	-	0.633
ARM D	2.82	10.20	0.277	- - -	0.0	0.4	5.4	-	0.135

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	16.02	20.82	0.770	- - -	3.1	3.2	47.6	-	0.208
ARM B	15.93	18.72	0.851	- - -	4.9	5.3	76.8	-	0.348
ARM C	20.08	19.97	1.005	- - -	16.8	25.0	317.0	-	1.233
ARM D	2.82	9.79	0.288	- - -	0.4	0.4	5.9	-	0.143

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	16.02	20.79	0.771	- -	-	3.2	3.3	48.9	-	0.209
ARM B	15.93	18.72	0.851	- -	-	5.3	5.4	80.3	-	0.353
ARM C	20.08	19.97	1.006	- -	-	25.0	31.6	426.0	-	1.584
ARM D	2.82	9.72	0.290	- -	-	0.4	0.4	6.1	-	0.145

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	16.02	20.78	0.771	- -	-	3.3	3.3	49.4	-	0.210
ARM B	15.93	18.72	0.851	- -	-	5.4	5.5	81.8	-	0.355
ARM C	20.08	19.96	1.006	- -	-	31.6	37.2	516.6	-	1.878
ARM D	2.82	9.68	0.291	- -	-	0.4	0.4	6.1	-	0.146

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	3.1	***
17.30	3.2	***
17.45	3.3	***
18.00	3.3	***

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	4.9	*****
17.30	5.3	*****
17.45	5.4	*****
18.00	5.5	*****

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	16.8	**********
17.30	25.0	**********
17.45	31.6	**********
18.00	37.2	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.4
17.30	0.4
17.45	0.4
18.00	0.4

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	961.2	961.2	187.5	0.20	187.8	0.20
B	955.8	955.8	300.5	0.31	301.3	0.32
C	1204.8	1204.8	1425.3	1.18	1460.0	1.21
D	169.2	169.2	23.5	0.14	23.5	0.14
ALL	3291.0	3291.0	1936.9	0.59	1972.6	0.60

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* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 15:59:35 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
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Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J1-A5183 jw B487 Redbourn Lane\
10338 J1 A5183 jw B487 Redbourn Lane - 2031 AM [flat].vai"
(drive-on-the-left) at 10:45:41 on Wednesday, 25 May 2016

FILE PROPERTIES

RUN TITLE: 10338 J1 A5183 jw B487 Redbourn Lane - 2031 AM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A5183 (N)
ARM B - B487 Redbourne Lane (E)
ARM C - A5183 (S)
ARM D - Harpenden Lane

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.20	7.50	10.00	30.00	52.00	30.0	0.575	25.712
ARM B	3.20	7.50	10.00	20.00	52.00	30.0	0.565	25.299
ARM C	3.60	7.50	10.00	40.00	52.00	40.0	0.578	26.665
ARM D	3.20	7.00	10.00	40.00	52.00	30.0	0.574	25.427

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
08.00 - 09.00	ARM A	0.000	0.331	0.587	0.083
		0.0	472.0	838.0	118.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.497	0.000	0.444	0.059
		548.0	0.0	489.0	65.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.548	0.449	0.000	0.003
		738.0	604.0	0.0	4.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.421	0.333	0.246	0.000
		135.0	107.0	79.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	23.79	18.84	1.263	- - -	0.0	77.8	604.8	-	2.208
ARM B	18.37	17.53	1.048	- - -	0.0	23.4	211.4	-	0.895
ARM C	22.43	20.37	1.101	- - -	0.0	38.6	323.2	-	1.133
ARM D	5.34	9.27	0.576	- - -	0.0	1.3	17.9	-	0.244

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	23.79	18.74	1.270	- - -	77.8	153.7	1736.4	-	6.294
ARM B	18.37	17.47	1.052	- - -	23.4	39.4	473.1	-	2.001
ARM C	22.43	20.21	1.110	- - -	38.6	72.7	835.3	-	2.913
ARM D	5.34	8.96	0.596	- - -	1.3	1.4	20.9	-	0.275

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	23.79	18.73	1.270	- - -	153.7	229.6	2874.3	-	10.323
ARM B	18.37	17.47	1.052	- - -	39.4	54.3	703.0	-	2.853
ARM C	22.43	20.18	1.111	- - -	72.7	106.7	1345.3	-	4.566
ARM D	5.34	8.93	0.598	- - -	1.4	1.5	21.7	-	0.278

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	23.79	18.73	1.270	- - -	229.6	305.4	4012.2	-	14.365
ARM B	18.37	17.46	1.052	- - -	54.3	68.7	922.4	-	3.674
ARM C	22.43	20.18	1.112	- - -	106.7	140.7	1855.1	-	6.237
ARM D	5.34	8.92	0.598	- - -	1.5	1.5	21.9	-	0.279

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	77.8	**********
08.30	153.7	**********
08.45	229.6	**********
09.00	305.4	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	23.4	**********
08.30	39.4	**********
08.45	54.3	**********
09.00	68.7	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	38.6	**********
08.30	72.7	**********
08.45	106.7	**********
09.00	140.7	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	1.3	*
08.30	1.4	*
08.45	1.5	*
09.00	1.5	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1427.4	1427.4	9227.7	6.46	11717.1	8.21
B	1102.2	1102.2	2309.9	2.10	2444.9	2.22
C	1345.8	1345.8	4358.9	3.24	4849.3	3.60
D	320.4	320.4	82.4	0.26	82.5	0.26
ALL	4195.8	4195.8	15979.0	3.81	19093.9	4.55

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

Printed at 09:18:06 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J1-A5183 jw B487 Redbourn Lane\
10338 J1 A5183 jw B487 Redbourn Lane - 2031 PM [flat].vai"
(drive-on-the-left) at 09:02:02 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338 J1 A5183 jw B487 Redbourn Lane - 2031 PM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A5183 (N)
ARM B - B487 Redbourne Lane (E)
ARM C - A5183 (S)
ARM D - Harpenden Lane

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.20	7.50	10.00	30.00	52.00	30.0	0.575	25.712
ARM B	3.20	7.50	10.00	20.00	52.00	30.0	0.565	25.299
ARM C	3.60	7.50	10.00	40.00	52.00	40.0	0.578	26.665
ARM D	3.20	7.00	10.00	40.00	52.00	30.0	0.574	25.427

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

IARM	I FLOW SCALE(%) I
I A	I 100 I
I B	I 100 I
I C	I 100 I
I D	I 100 I

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.00					
	ARM A	0.000	0.327	0.547	0.126
		0.0	381.0	638.0	147.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.501	0.000	0.399	0.100
		581.0	0.0	462.0	116.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.632	0.355	0.000	0.012
		924.0	519.0	0.0	18.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.439	0.259	0.302	0.000
		90.0	53.0	62.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	19.42	20.72	0.937	- - -	0.0	9.7	108.8	-	0.426
ARM B	19.32	17.57	1.099	- - -	0.0	33.8	285.5	-	1.167
ARM C	24.35	19.37	1.257	- - -	0.0	78.4	609.6	-	2.161
ARM D	3.42	9.68	0.353	- - -	0.0	0.5	7.7	-	0.158

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	19.42	20.68	0.939	- - -	9.7	11.5	160.7	-	0.633
ARM B	19.32	17.37	1.112	- - -	33.8	63.9	733.4	-	2.988
ARM C	24.35	19.24	1.266	- - -	78.4	155.2	1752.0	-	6.186
ARM D	3.42	9.54	0.358	- - -	0.5	0.6	8.2	-	0.163

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	19.42	20.68	0.939	- -	-	11.5	12.4	179.9	-	0.680
ARM B	19.32	17.35	1.114	- -	-	63.9	93.8	1182.7	-	4.688
ARM C	24.35	19.23	1.266	- -	-	155.2	232.0	2903.5	-	10.156
ARM D	3.42	9.54	0.358	- -	-	0.6	0.6	8.3	-	0.163

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	19.42	20.68	0.939	- -	-	12.4	13.0	190.6	-	0.705
ARM B	19.32	17.34	1.114	- -	-	93.8	123.7	1631.5	-	6.390
ARM C	24.35	19.23	1.266	- -	-	232.0	308.7	4055.2	-	14.139
ARM D	3.42	9.54	0.358	- -	-	0.6	0.6	8.3	-	0.163

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	9.7	**********
17.30	11.5	***********
17.45	12.4	************
18.00	13.0	************

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	33.8	**********
17.30	63.9	**********
17.45	93.8	**********
18.00	123.7	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	78.4	**********
17.30	155.2	**********
17.45	232.0	**********
18.00	308.7	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.5	*
17.30	0.6	*
17.45	0.6	*
18.00	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *		T75
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	
A	1165.2	1165.2	639.9	0.55	644.0	0.55	
B	1159.2	1159.2	3833.0	3.31	4274.4	3.69	
C	1461.0	1461.0	9320.3	6.38	11798.5	8.08	
D	205.2	205.2	32.5	0.16	32.5	0.16	
ALL	3990.6	3990.6	13825.8	3.46	16749.4	4.20	

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
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END OF JOB

========== end of file ==========

Printed at 09:18:19 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J1-A5183 jw B487 Redbourn Lane\
10338 J1 A5183 jw B487 Redbourn Lane - 2031+Dev Rev3 AM [flat].vai"
(drive-on-the-left) at 08:53:46 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338 J1 A5183 jw B487 Redbourn Lane - 2031+Dev Rev3 AM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A5183 (N)
ARM B - B487 Redbourne Lane (E)
ARM C - A5183 (S)
ARM D - Harpenden Lane

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.20	7.50	10.00	30.00	52.00	30.0	0.575	25.712
ARM B	3.20	7.50	10.00	20.00	52.00	30.0	0.565	25.299
ARM C	3.60	7.50	10.00	40.00	52.00	40.0	0.578	26.665
ARM D	3.20	7.00	10.00	40.00	52.00	30.0	0.574	25.427

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	I FLOW SCALE(%) I
I A	I 100 I
I B	I 100 I
I C	I 100 I
I D	I 100 I

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
08.00 - 09.00	ARM A	0.000	0.331	0.587	0.083
		0.0	472.0	838.0	118.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.493	0.000	0.447	0.059
		549.0	0.0	498.0	66.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.547	0.450	0.000	0.003
		738.0	607.0	0.0	4.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.421	0.333	0.246	0.000
		135.0	107.0	79.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	23.79	18.82	1.264	- - -	0.0	78.1	606.8	-	2.216
ARM B	18.55	17.53	1.058	- - -	0.0	25.3	224.6	-	0.945
ARM C	22.48	20.39	1.102	- - -	0.0	39.0	326.0	-	1.138
ARM D	5.34	9.28	0.576	- - -	0.0	1.3	17.9	-	0.244
08.15-08.30									
ARM A	23.79	18.72	1.271	- - -	78.1	154.3	1743.1	-	6.322
ARM B	18.55	17.47	1.062	- - -	25.3	43.4	516.6	-	2.168
ARM C	22.48	20.23	1.111	- - -	39.0	73.4	843.9	-	2.936
ARM D	5.34	8.97	0.595	- - -	1.3	1.4	20.8	-	0.274

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	23.79	18.71	1.271	- - -	154.3	230.5	2885.8	-	10.372
ARM B	18.55	17.47	1.062	- - -	43.4	60.5	779.8	-	3.143
ARM C	22.48	20.21	1.112	- - -	73.4	107.7	1358.7	-	4.602
ARM D	5.34	8.95	0.597	- - -	1.4	1.4	21.6	-	0.276

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	23.79	18.71	1.271	- - -	230.5	306.7	4028.7	-	14.433
ARM B	18.55	17.47	1.062	- - -	60.5	77.3	1034.1	-	4.090
ARM C	22.48	20.21	1.113	- - -	107.7	142.0	1872.8	-	6.285
ARM D	5.34	8.94	0.597	- - -	1.4	1.5	21.8	-	0.277

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	78.1	**********
08.30	154.3	**********
08.45	230.5	**********
09.00	306.7	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	25.3	**********
08.30	43.4	**********
08.45	60.5	**********
09.00	77.3	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	39.0	**********
08.30	73.4	**********
08.45	107.7	**********
09.00	142.0	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	1.3	*
08.30	1.4	*
08.45	1.4	*
09.00	1.5	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1427.4	1427.4	9264.4	6.49	11777.5	8.25
B	1113.0	1113.0	2555.2	2.30	2726.3	2.45
C	1348.8	1348.8	4401.4	3.26	4900.3	3.63
D	320.4	320.4	82.1	0.26	82.3	0.26
ALL	4209.6	4209.6	16303.2	3.87	19486.3	4.63

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:18:50 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J1-A5183 jw B487 Redbourn Lane\
10338 J1 A5183 jw B487 Redbourn Lane - 2031+Dev Rev3 PM [flat].vai"
(drive-on-the-left) at 08:53:54 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338 J1 A5183 jw B487 Redbourn Lane - 2031+Dev Rev3 PM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A5183 (N)
ARM B - B487 Redbourne Lane (E)
ARM C - A5183 (S)
ARM D - Harpenden Lane

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.20	7.50	10.00	30.00	52.00	30.0	0.575	25.712
ARM B	3.20	7.50	10.00	20.00	52.00	30.0	0.565	25.299
ARM C	3.60	7.50	10.00	40.00	52.00	40.0	0.578	26.665
ARM D	3.20	7.00	10.00	40.00	52.00	30.0	0.574	25.427

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.00		TURNING PROPORTIONS			
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
	ARM A	0.000	0.327	0.547	0.126
		0.0	381.0	638.0	147.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.498	0.000	0.402	0.100
		581.0	0.0	469.0	117.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.628	0.360	0.000	0.012
		924.0	529.0	0.0	18.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.437	0.262	0.301	0.000
		90.0	54.0	62.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	19.43	20.66	0.941	- -	-	0.0	9.9	111.1	-	0.437
ARM B	19.45	17.58	1.107	- -	-	0.0	35.3	296.6	-	1.213
ARM C	24.52	19.39	1.265	- -	-	0.0	80.5	625.0	-	2.217
ARM D	3.43	9.69	0.354	- -	-	0.0	0.5	7.7	-	0.158

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	19.43	20.62	0.942	- -	-	9.9	11.9	165.9	-	0.652
ARM B	19.45	17.37	1.120	- -	-	35.3	67.3	770.5	-	3.128
ARM C	24.52	19.27	1.272	- -	-	80.5	159.4	1799.2	-	6.331
ARM D	3.43	9.56	0.359	- -	-	0.5	0.6	8.2	-	0.163

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	19.43	20.62	0.942	- -	-	11.9	12.9	186.9	-	0.706
ARM B	19.45	17.35	1.121	- -	-	67.3	99.1	1247.9	-	4.932
ARM C	24.52	19.27	1.273	- -	-	159.4	238.2	2981.8	-	10.411
ARM D	3.43	9.56	0.359	- -	-	0.6	0.6	8.3	-	0.163

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	19.43	20.62	0.942	- -	-	12.9	13.5	198.7	-	0.734
ARM B	19.45	17.34	1.122	- -	-	99.1	131.0	1725.6	-	6.752
ARM C	24.52	19.26	1.273	- -	-	238.2	317.1	4164.6	-	14.494
ARM D	3.43	9.56	0.359	- -	-	0.6	0.6	8.3	-	0.163

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	9.9	**********
17.30	11.9	************
17.45	12.9	*************
18.00	13.5	***************

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	35.3	**********
17.30	67.3	**********
17.45	99.1	**********
18.00	131.0	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	80.5	**********
17.30	159.4	**********
17.45	238.2	**********
18.00	317.1	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.5	*
17.30	0.6	*
17.45	0.6	*
18.00	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1165.8	1165.8	662.6	0.57	667.1	0.57
B	1167.0	1167.0	4040.7	3.46	4535.3	3.89
C	1471.2	1471.2	9570.7	6.51	12180.0	8.28
D	205.8	205.8	32.6	0.16	32.6	0.16
ALL	4009.8	4009.8	14306.6	3.57	17415.0	4.34

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:18:37 on 01/06/2016]

_____ A R C A D Y 6 _____

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

_____

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J1-A5183 jw B487 Redbourn Lane\
10338 J1 A5183 jw B487 Redbourn Lane +Impr - 2031+Dev Rev3 AM [flat].vai"
(drive-on-the-left) at 08:54:00 on Wednesday, 1 June 2016

FILE PROPERTIES
****

RUN TITLE: 10338 J1 A5183 jw B487 Redbourn Lane +Impr - 2031+Dev Rev3 AM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA
****
ARM A - A5183 (N)
ARM B - B487 Redbourne Lane (E)
ARM C - A5183 (S)
ARM D - Harpenden Lane

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.20	8.00	10.00	30.00	52.00	30.0	0.579	26.138
ARM B	3.20	8.00	10.00	20.00	52.00	30.0	0.570	25.718
ARM C	3.60	8.00	10.00	40.00	52.00	40.0	0.583	27.127
ARM D	3.20	7.00	10.00	40.00	52.00	30.0	0.574	25.427

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
08.00 - 09.00		TURNING PROPORTIONS			
	ARM A	0.000	0.331	0.587	0.083
		0.0	472.0	838.0	118.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.493	0.000	0.447	0.059
		549.0	0.0	498.0	66.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.547	0.450	0.000	0.003
		738.0	607.0	0.0	4.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.421	0.333	0.246	0.000
		135.0	107.0	79.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	23.79	19.12	1.244	- -	-	0.0	73.9	576.2	- 2.074
ARM B	18.55	17.78	1.043	- -	-	0.0	22.8	207.0	- 0.866
ARM C	22.48	20.73	1.084	- -	-	0.0	34.9	297.5	- 1.030
ARM D	5.34	9.08	0.588	- -	-	0.0	1.4	18.7	- 0.255
08.15-08.30									
ARM A	23.79	19.01	1.252	- -	-	73.9	145.8	1647.3	- 5.898
ARM B	18.55	17.72	1.047	- -	-	22.8	37.9	457.0	- 1.916
ARM C	22.48	20.56	1.093	- -	-	34.9	64.7	748.6	- 2.585
ARM D	5.34	8.74	0.611	- -	-	1.4	1.5	22.1	- 0.292

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	23.79	19.00	1.252	- - -	145.8	217.7	2725.6	-	9.657
ARM B	18.55	17.72	1.047	- - -	37.9	51.8	673.6	-	2.704
ARM C	22.48	20.54	1.095	- - -	64.7	94.4	1193.7	-	4.003
ARM D	5.34	8.71	0.613	- - -	1.5	1.5	23.0	-	0.296

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	23.79	19.00	1.252	- - -	217.7	289.6	3804.1	-	13.430
ARM B	18.55	17.72	1.047	- - -	51.8	65.3	878.8	-	3.455
ARM C	22.48	20.52	1.095	- - -	94.4	123.9	1637.4	-	5.429
ARM D	5.34	8.70	0.614	- - -	1.5	1.6	23.3	-	0.297

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	73.9	**********
08.30	145.8	**********
08.45	217.7	**********
09.00	289.6	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	22.8	**********
08.30	37.9	**********
08.45	51.8	**********
09.00	65.3	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	34.9	**********
08.30	64.7	**********
08.45	94.4	**********
09.00	123.9	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	1.4	*
08.30	1.5	**
08.45	1.5	**
09.00	1.6	**

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1427.4	1427.4	8753.2	6.13	10959.7	7.68
B	1113.0	1113.0	2216.3	1.99	2336.6	2.10
C	1348.8	1348.8	3877.2	2.87	4251.4	3.15
D	320.4	320.4	87.2	0.27	87.3	0.27
ALL	4209.6	4209.6	14933.8	3.55	17635.0	4.19

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:19:06 on 01/06/2016]

_____ A R C A D Y 6 _____

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
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RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J1-A5183 jw B487 Redbourn Lane\
10338 J1 A5183 jw B487 Redbourn Lane +Impr - 2031+Dev Rev3 PM [flat].vai"
(drive-on-the-left) at 08:54:05 on Wednesday, 1 June 2016

FILE PROPERTIES
****

RUN TITLE: 10338 J1 A5183 jw B487 Redbourn Lane +Impr - 2031+Dev Rev3 PM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA
****
ARM A - A5183 (N)
ARM B - B487 Redbourne Lane (E)
ARM C - A5183 (S)
ARM D - Harpenden Lane

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.20	8.00	10.00	30.00	52.00	30.0	0.579	26.138
ARM B	3.20	8.00	10.00	20.00	52.00	30.0	0.570	25.718
ARM C	3.60	8.00	10.00	40.00	52.00	40.0	0.583	27.127
ARM D	3.20	7.00	10.00	40.00	52.00	30.0	0.574	25.427

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
17.00 - 18.00	ARM A	0.000	0.327	0.547	0.126
		0.0	381.0	638.0	147.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.498	0.000	0.402	0.100
		581.0	0.0	469.0	117.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.628	0.360	0.000	0.012
		924.0	529.0	0.0	18.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.437	0.262	0.301	0.000
		90.0	54.0	62.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	19.43	20.98	0.926	- - -	0.0	8.8	101.3	-	0.396
ARM B	19.45	17.90	1.086	- - -	0.0	31.5	269.4	-	1.088
ARM C	24.52	19.69	1.245	- - -	0.0	76.3	594.2	-	2.075
ARM D	3.43	9.45	0.363	- - -	0.0	0.6	8.0	-	0.164

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	19.43	20.95	0.928	- - -	8.8	10.2	144.4	-	0.563
ARM B	19.45	17.71	1.098	- - -	31.5	58.6	676.9	-	2.726
ARM C	24.52	19.55	1.254	- - -	76.3	150.9	1703.9	-	5.925
ARM D	3.43	9.31	0.368	- - -	0.6	0.6	8.6	-	0.170

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	19.43	20.95	0.928	- -	-	10.2	10.9	158.8	-	0.596
ARM B	19.45	17.69	1.099	- -	-	58.6	85.4	1080.8	-	4.213
ARM C	24.52	19.54	1.255	- -	-	150.9	225.6	2823.9	-	9.726
ARM D	3.43	9.31	0.369	- -	-	0.6	0.6	8.7	-	0.170

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	19.43	20.95	0.928	- -	-	10.9	11.3	166.4	-	0.613
ARM B	19.45	17.68	1.100	- -	-	85.4	112.2	1482.5	-	5.711
ARM C	24.52	19.54	1.255	- -	-	225.6	300.3	3944.7	-	13.538
ARM D	3.43	9.31	0.369	- -	-	0.6	0.6	8.7	-	0.170

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	8.8	*********
17.30	10.2	**********
17.45	10.9	***********
18.00	11.3	***********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	31.5	********************************
17.30	58.6	**********
17.45	85.4	**********
18.00	112.2	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	76.3	**********
17.30	150.9	**********
17.45	225.6	**********
18.00	300.3	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.6	*
17.30	0.6	*
17.45	0.6	*
18.00	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1165.8	1165.8	571.0	0.49	574.0	0.49
B	1167.0	1167.0	3509.6	3.01	3865.6	3.31
C	1471.2	1471.2	9066.7	6.16	11374.9	7.73
D	205.8	205.8	33.9	0.16	33.9	0.16
ALL	4009.8	4009.8	13181.2	3.29	15848.4	3.95

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:19:14 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J2-A1081 jw B487 Redbourn Lane\
10338-J2 A1081 jw B487 Redbourn Lane - 2015 AM [flat].vai"
(drive-on-the-left) at 14:24:24 on Thursday, 27 August 2015

FILE PROPERTIES

RUN TITLE: 10338 J2 A1081 jw B487 Redbourne Lane - 2015 AM [flat]
LOCATION: Harpenden
DATE: 27/08/15
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Walkers Road
ARM C - A1081 (S)
ARM D - B487 Redbourn Lane (W)

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	6.00	10.00	15.00	37.00	40.0	0.592	25.014
ARM B	3.50	7.00	6.00	30.00	37.00	30.0	0.603	24.229
ARM C	4.00	6.00	8.00	25.00	37.00	40.0	0.602	25.168
ARM D	3.20	6.00	6.00	30.00	37.00	40.0	0.559	21.429

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
08.00 - 09.00		TURNING PROPORTIONS			
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
	ARM A	0.000	0.025	0.450	0.525
		0.0	24.0	432.0	505.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.268	0.000	0.250	0.482
		121.0	0.0	113.0	218.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.352	0.315	0.000	0.333
		208.0	186.0	0.0	197.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.505	0.280	0.215	0.000
		507.0	281.0	216.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	16.02	18.60	0.861	- - -	0.0	5.3	66.5	-	0.310
ARM B	7.53	12.98	0.580	- - -	0.0	1.3	18.7	-	0.178
ARM C	9.85	16.85	0.585	- - -	0.0	1.4	19.4	-	0.139
ARM D	16.73	16.68	1.003	- - -	0.0	15.7	153.9	-	-0.060

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	16.02	18.41	0.870	- - -	5.3	6.0	86.2	-	0.396
ARM B	7.53	12.73	0.592	- - -	1.3	1.4	20.9	-	0.192
ARM C	9.85	16.72	0.589	- - -	1.4	1.4	21.0	-	0.145
ARM D	16.73	16.63	1.006	- - -	15.7	23.1	294.1	-	1.377

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	16.02	18.38	0.872	- -	-	6.0	6.3	92.4	-	0.412
ARM B	7.53	12.69	0.593	- -	-	1.4	1.4	21.4	-	0.193
ARM C	9.85	16.71	0.590	- -	-	1.4	1.4	21.3	-	0.146
ARM D	16.73	16.63	1.006	- -	-	23.1	28.9	391.6	-	1.752

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	16.02	18.37	0.872	- -	-	6.3	6.4	95.3	-	0.417
ARM B	7.53	12.68	0.594	- -	-	1.4	1.4	21.6	-	0.194
ARM C	9.85	16.70	0.590	- -	-	1.4	1.4	21.4	-	0.146
ARM D	16.73	16.63	1.006	- -	-	28.9	34.0	472.6	-	2.062

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	5.3	*****
08.30	6.0	******
08.45	6.3	******
09.00	6.4	******

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	1.3	*
08.30	1.4	*
08.45	1.4	*
09.00	1.4	*

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	1.4	*
08.30	1.4	*
08.45	1.4	*
09.00	1.4	*

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	15.7	**********
08.30	23.1	**********
08.45	28.9	**********
09.00	34.0	**********

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	961.2	961.2	340.5	0.35	341.6	0.36
B	451.8	451.8	82.7	0.18	82.8	0.18
C	591.0	591.0	83.1	0.14	83.1	0.14
D	1003.8	1003.8	1312.3	1.31	1347.1	1.34
ALL	3007.8	3007.8	1818.6	0.60	1854.6	0.62

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END OF JOB

========== end of file ==========

Printed at 15:59:58 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J2-A1081 jw B487 Redbourn Lane\
10338-J2 A1081 jw B487 Redbourn Lane - 2015 PM [flat].vai"
(drive-on-the-left) at 14:24:28 on Thursday, 27 August 2015

FILE PROPERTIES

RUN TITLE: 10338 J2 A1081 jw B487 Redbourne Lane - 2015 PM [flat]
LOCATION: Harpenden
DATE: 27/08/15
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Walkers Road
ARM C - A1081 (S)
ARM D - B487 Redbourn Lane (W)

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	6.00	10.00	15.00	37.00	40.0	0.592	25.014
ARM B	3.50	7.00	6.00	30.00	37.00	30.0	0.603	24.229
ARM C	4.00	6.00	8.00	25.00	37.00	40.0	0.602	25.168
ARM D	3.20	6.00	6.00	30.00	37.00	40.0	0.559	21.429

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	I FLOW SCALE(%) I
I A	I 100 I
I B	I 100 I
I C	I 100 I
I D	I 100 I

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.00	ARM A	0.000	0.035	0.360	0.605
		0.0	30.0	311.0	523.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.217	0.000	0.257	0.526
		92.0	0.0	109.0	223.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.358	0.292	0.000	0.350
		229.0	187.0	0.0	224.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.392	0.359	0.249	0.000
		316.0	290.0	201.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	14.42	18.43	0.782	- - -	0.0	3.4	44.4	-	0.225
ARM B	7.07	13.98	0.506	- - -	0.0	1.0	14.2	-	0.142
ARM C	10.67	16.86	0.633	- - -	0.0	1.7	23.4	-	0.156
ARM D	13.45	16.74	0.803	- - -	0.0	3.7	48.4	-	0.266

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	14.42	18.33	0.787	- - -	3.4	3.5	52.0	-	0.254
ARM B	7.07	13.82	0.512	- - -	1.0	1.0	15.4	-	0.148
ARM C	10.67	16.76	0.637	- - -	1.7	1.7	25.6	-	0.164
ARM D	13.45	16.70	0.806	- - -	3.7	3.9	57.8	-	0.304

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	14.42	18.32	0.787	- - -	3.5	3.6	53.5	-	0.255
ARM B	7.07	13.81	0.512	- - -	1.0	1.0	15.6	-	0.148
ARM C	10.67	16.75	0.637	- - -	1.7	1.7	25.9	-	0.164
ARM D	13.45	16.70	0.806	- - -	3.9	4.0	59.5	-	0.306

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	14.42	18.32	0.787	- - -	3.6	3.6	54.1	-	0.256
ARM B	7.07	13.81	0.512	- - -	1.0	1.0	15.6	-	0.148
ARM C	10.67	16.75	0.637	- - -	1.7	1.7	26.1	-	0.164
ARM D	13.45	16.70	0.806	- - -	4.0	4.0	60.3	-	0.307

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	3.4	***
17.30	3.5	****
17.45	3.6	****
18.00	3.6	****

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	1.0	*
17.30	1.0	*
17.45	1.0	*
18.00	1.0	*

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	1.7	**
17.30	1.7	**
17.45	1.7	**
18.00	1.7	**

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	3.7	****
17.30	3.9	****
17.45	4.0	****
18.00	4.0	****

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	865.2	865.2	204.0	0.24	204.4	0.24
B	424.2	424.2	60.8	0.14	60.8	0.14
C	640.2	640.2	101.0	0.16	101.0	0.16
D	807.0	807.0	226.0	0.28	226.5	0.28
ALL	2736.6	2736.6	591.7	0.22	592.7	0.22

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END OF JOB

========== end of file ==========

Printed at 16:00:08 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J2-A1081 jw B487 Redbourn Lane\
10338-J2 A1081 jw B487 Redbourn Lane - 2031 AM [flat].vai"
(drive-on-the-left) at 11:16:30 on Wednesday, 25 May 2016

FILE PROPERTIES

RUN TITLE: 10338 J2 A1081 jw B487 Redbourne Lane - 2031 AM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Walkers Road
ARM C - A1081 (S)
ARM D - B487 Redbourn Lane (W)

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	6.00	10.00	15.00	37.00	40.0	0.592	25.014
ARM B	3.50	7.00	6.00	30.00	37.00	30.0	0.603	24.229
ARM C	4.00	6.00	8.00	25.00	37.00	40.0	0.602	25.168
ARM D	3.20	6.00	6.00	30.00	37.00	40.0	0.559	21.429

V = approach half-width E = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
08.00 - 09.00		TURNING PROPORTIONS			
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
	ARM A	0.000	0.025	0.450	0.525
		0.0	29.0	524.0	612.0
		(0.0)%	(0.0)%	(0.0)%	(0.0)%
	ARM B	0.268	0.000	0.250	0.482
		147.0	0.0	137.0	264.0
		(0.0)%	(0.0)%	(0.0)%	(0.0)%
	ARM C	0.351	0.315	0.000	0.333
		252.0	226.0	0.0	239.0
		(0.0)%	(0.0)%	(0.0)%	(0.0)%
	ARM D	0.505	0.280	0.215	0.000
		615.0	341.0	262.0	0.0
		(0.0)%	(0.0)%	(0.0)%	(0.0)%

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	19.42	18.28	1.063	- - -	0.0	27.0	237.8	-	0.957
ARM B	9.13	11.85	0.771	- - -	0.0	3.1	39.5	-	0.323
ARM C	11.94	15.56	0.767	- - -	0.0	3.1	40.5	-	0.249
ARM D	20.29	15.72	1.291	- - -	0.0	71.8	557.8	-	2.445

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	19.42	18.21	1.067	- - -	27.0	46.9	555.9	-	2.225
ARM B	9.13	11.56	0.790	- - -	3.1	3.5	49.9	-	0.400
ARM C	11.94	15.33	0.779	- - -	3.1	3.3	48.6	-	0.291
ARM D	20.29	15.62	1.299	- - -	71.8	141.9	1603.1	-	6.972

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	19.42	18.21	1.067	- - -	46.9	66.0	847.4	-	3.259
ARM B	9.13	11.52	0.792	- - -	3.5	3.6	53.3	-	0.412
ARM C	11.94	15.31	0.780	- - -	3.3	3.4	50.8	-	0.294
ARM D	20.29	15.62	1.299	- - -	141.9	212.0	2654.6	-	11.436

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	19.42	18.21	1.067	- - -	66.0	84.7	1130.7	-	4.278
ARM B	9.13	11.51	0.793	- - -	3.6	3.7	54.7	-	0.415
ARM C	11.94	15.30	0.781	- - -	3.4	3.5	51.6	-	0.297
ARM D	20.29	15.61	1.299	- - -	212.0	282.2	3706.8	-	15.918

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	27.0	**********
08.30	46.9	**********
08.45	66.0	**********
09.00	84.7	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	3.1	***
08.30	3.5	***
08.45	3.6	****
09.00	3.7	****

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	3.1	***
08.30	3.3	***
08.45	3.4	***
09.00	3.5	***

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	71.8	**********
08.30	141.9	**********
08.45	212.0	**********
09.00	282.2	**********

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1165.2	1165.2	2771.8	2.38	2968.9	2.55
B	547.8	547.8	197.5	0.36	198.1	0.36
C	716.4	716.4	191.5	0.27	191.9	0.27
D	1217.4	1217.4	8522.3	7.00	11072.4	9.10
ALL	3646.8	3646.8	11683.0	3.20	14431.3	3.96

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

Printed at 09:14:47 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J2-A1081 jw B487 Redbourn Lane\
10338-J2 A1081 jw B487 Redbourn Lane - 2031 PM [flat].vai"
(drive-on-the-left) at 11:16:33 on Wednesday, 25 May 2016

FILE PROPERTIES

RUN TITLE: 10338 J2 A1081 jw B487 Redbourne Lane - 2031 PM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Walkers Road
ARM C - A1081 (S)
ARM D - B487 Redbourn Lane (W)

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	6.00	10.00	15.00	37.00	40.0	0.592	25.014
ARM B	3.50	7.00	6.00	30.00	37.00	30.0	0.603	24.229
ARM C	4.00	6.00	8.00	25.00	37.00	40.0	0.602	25.168
ARM D	3.20	6.00	6.00	30.00	37.00	40.0	0.559	21.429

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.00					
	ARM A	0.000	0.034	0.360	0.606
		0.0	36.0	377.0	634.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.218	0.000	0.257	0.525
		112.0	0.0	132.0	270.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.358	0.292	0.000	0.350
		278.0	227.0	0.0	272.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.391	0.360	0.249	0.000
		383.0	352.0	244.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	17.46	17.39	1.004	- - -	0.0	16.2	158.4	-	-0.058
ARM B	8.57	12.41	0.691	- - -	0.0	2.1	28.5	-	0.244
ARM C	12.93	15.42	0.839	- - -	0.0	4.5	56.8	-	0.330
ARM D	16.46	15.82	1.041	- - -	0.0	20.6	189.0	-	0.899

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	17.46	17.18	1.016	- - -	16.2	25.6	316.7	-	1.427
ARM B	8.57	12.08	0.709	- - -	2.1	2.3	34.0	-	0.281
ARM C	12.93	15.20	0.851	- - -	4.5	5.1	73.5	-	0.420
ARM D	16.46	15.70	1.048	- - -	20.6	34.6	416.7	-	1.977

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	17.46	17.15	1.018	- - -	25.6	33.6	445.5	-	1.915
ARM B	8.57	12.01	0.713	- - -	2.3	2.4	35.7	-	0.288
ARM C	12.93	15.16	0.853	- - -	5.1	5.4	79.0	-	0.436
ARM D	16.46	15.70	1.048	- - -	34.6	47.5	616.7	-	2.798

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	17.46	17.14	1.019	- - -	33.6	41.0	560.4	-	2.348
ARM B	8.57	11.99	0.715	- - -	2.4	2.4	36.4	-	0.292
ARM C	12.93	15.14	0.854	- - -	5.4	5.5	81.7	-	0.444
ARM D	16.46	15.70	1.049	- - -	47.5	59.9	806.3	-	3.590

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	16.2	**********
17.30	25.6	**********
17.45	33.6	**********
18.00	41.0	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	2.1	**
17.30	2.3	**
17.45	2.4	**
18.00	2.4	**

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	4.5	*****
17.30	5.1	*****
17.45	5.4	*****
18.00	5.5	******

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	20.6	**********
17.30	34.6	**********
17.45	47.5	**********
18.00	59.9	**********

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1047.6	1047.6	1480.9	1.41	1529.9	1.46
B	514.2	514.2	134.6	0.26	134.9	0.26
C	775.8	775.8	291.0	0.38	292.0	0.38
D	987.6	987.6	2028.7	2.05	2143.2	2.17
ALL	3325.2	3325.2	3935.3	1.18	4100.0	1.23

T75

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END OF JOB

========== end of file ==========

Printed at 09:15:07 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J2-A1081 jw B487 Redbourn Lane\
10338-J2 A1081 jw B487 Redbourn Lane - 2031+Dev Rev3 AM [flat].vai"
(drive-on-the-left) at 09:11:23 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338 J2 A1081 jw B487 Redbourne Lane - 2031+Dev Rev3 AM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Walkers Road
ARM C - A1081 (S)
ARM D - B487 Redbourn Lane (W)

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	6.00	10.00	15.00	37.00	40.0	0.592	25.014
ARM B	3.50	7.00	6.00	30.00	37.00	30.0	0.603	24.229
ARM C	4.00	6.00	8.00	25.00	37.00	40.0	0.602	25.168
ARM D	3.20	6.00	6.00	30.00	37.00	40.0	0.559	21.429

V = approach half-width E = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	I FLOW SCALE(%) I
I A	I 100 I
I B	I 100 I
I C	I 100 I
I D	I 100 I

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
08.00 - 09.00		TURNING PROPORTIONS			
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
	ARM A	0.000	0.027	0.456	0.517
		0.0	32.0	549.0	623.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.274	0.000	0.248	0.478
		151.0	0.0	137.0	264.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.361	0.310	0.000	0.328
		263.0	226.0	0.0	239.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.506	0.279	0.215	0.000
		618.0	341.0	262.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	20.06	18.32	1.095	- - -	0.0	33.9	287.3	-	1.130
ARM B	9.20	11.78	0.781	- - -	0.0	3.2	41.3	-	0.336
ARM C	12.13	15.55	0.780	- - -	0.0	3.3	42.9	-	0.261
ARM D	20.35	15.58	1.306	- - -	0.0	74.6	578.0	-	2.552
08.15-08.30									
ARM A	20.06	18.26	1.099	- - -	33.9	61.9	719.4	-	2.800
ARM B	9.20	11.54	0.798	- - -	3.2	3.6	52.2	-	0.415
ARM C	12.13	15.34	0.791	- - -	3.3	3.6	51.8	-	0.307
ARM D	20.35	15.48	1.314	- - -	74.6	147.7	1667.5	-	7.307

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	20.06	18.26	1.099	- -	-	61.9	89.3	1134.1	-	4.283
ARM B	9.20	11.52	0.799	- -	-	3.6	3.8	55.5	-	0.425
ARM C	12.13	15.32	0.792	- -	-	3.6	3.7	54.2	-	0.312
ARM D	20.35	15.47	1.315	- -	-	147.7	220.9	2764.4	-	12.015

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	20.06	18.26	1.099	- -	-	89.3	116.6	1544.1	-	5.759
ARM B	9.20	11.51	0.799	- -	-	3.8	3.8	56.9	-	0.429
ARM C	12.13	15.32	0.792	- -	-	3.7	3.7	55.1	-	0.313
ARM D	20.35	15.47	1.315	- -	-	220.9	294.1	3862.2	-	16.735

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	33.9	**********
08.30	61.9	**********
08.45	89.3	**********
09.00	116.6	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	3.2	***
08.30	3.6	****
08.45	3.8	****
09.00	3.8	****

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	3.3	***
08.30	3.6	****
08.45	3.7	****
09.00	3.7	****

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	74.6	**********
08.30	147.7	**********
08.45	220.9	**********
09.00	294.1	**********

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1203.6	1203.6	3685.0	3.06	4057.1	3.37
B	552.0	552.0	205.9	0.37	206.5	0.37
C	727.8	727.8	204.1	0.28	204.5	0.28
D	1221.0	1221.0	8872.0	7.27	11666.8	9.56
ALL	3704.4	3704.4	12967.0	3.50	16134.9	4.36

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
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* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:16:01 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J2-A1081 jw B487 Redbourn Lane\
10338-J2 A1081 jw B487 Redbourn Lane - 2031+Dev Rev3 PM [flat].vai"
(drive-on-the-left) at 09:11:35 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338 J2 A1081 jw B487 Redbourne Lane - 2031+Dev Rev3 PM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Walkers Road
ARM C - A1081 (S)
ARM D - B487 Redbourn Lane (W)

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	6.00	10.00	15.00	37.00	40.0	0.592	25.014
ARM B	3.50	7.00	6.00	30.00	37.00	30.0	0.603	24.229
ARM C	4.00	6.00	8.00	25.00	37.00	40.0	0.602	25.168
ARM D	3.20	6.00	6.00	30.00	37.00	40.0	0.559	21.429

V = approach half-width E = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

IARM	I FLOW SCALE(%) I
I A	I 100 I
I B	I 100 I
I C	I 100 I
I D	I 100 I

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.00		TURNING PROPORTIONS			
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
	ARM A	0.000	0.034	0.367	0.598
		0.0	37.0	394.0	642.0
		(0.0)%	(0.0)%	(0.0)%	(0.0)%
	ARM B	0.218	0.000	0.257	0.525
		112.0	0.0	132.0	270.0
		(0.0)%	(0.0)%	(0.0)%	(0.0)%
	ARM C	0.378	0.283	0.000	0.339
		303.0	227.0	0.0	272.0
		(0.0)%	(0.0)%	(0.0)%	(0.0)%
	ARM D	0.399	0.355	0.246	0.000
		395.0	352.0	244.0	0.0
		(0.0)%	(0.0)%	(0.0)%	(0.0)%

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	17.88	17.51	1.021	- - -	0.0	18.8	178.0	-	0.771
ARM B	8.57	12.32	0.696	- - -	0.0	2.2	29.1	-	0.249
ARM C	13.35	15.40	0.867	- - -	0.0	5.4	65.7	-	0.373
ARM D	16.50	15.60	1.057	- - -	0.0	23.1	206.7	-	0.982

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	17.88	17.32	1.033	- - -	18.8	31.0	376.8	-	1.653
ARM B	8.57	12.00	0.714	- - -	2.2	2.4	34.7	-	0.288
ARM C	13.35	15.19	0.879	- - -	5.4	6.3	88.8	-	0.500
ARM D	16.50	15.48	1.066	- - -	23.1	40.4	478.2	-	2.266

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	17.88	17.29	1.034	- - -	31.0	42.1	549.5	-	2.295
ARM B	8.57	11.95	0.717	- - -	2.4	2.5	36.4	-	0.294
ARM C	13.35	15.16	0.881	- - -	6.3	6.6	97.2	-	0.527
ARM D	16.50	15.47	1.067	- - -	40.4	56.8	729.3	-	3.325

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	17.88	17.28	1.035	- - -	42.1	52.6	710.6	-	2.906
ARM B	8.57	11.92	0.719	- - -	2.5	2.5	37.1	-	0.298
ARM C	13.35	15.14	0.882	- - -	6.6	6.9	101.3	-	0.538
ARM D	16.50	15.46	1.067	- - -	56.8	72.9	973.2	-	4.353

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	18.8	******************
17.30	31.0	******************************
17.45	42.1	***
18.00	52.6	***

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	2.2	**
17.30	2.4	**
17.45	2.5	**
18.00	2.5	**

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	5.4	*****
17.30	6.3	******
17.45	6.6	*******
18.00	6.9	*******

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	23.1	**********************
17.30	40.4	**
17.45	56.8	**
18.00	72.9	**

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1072.8	1072.8	1814.8	1.69	1894.7	1.77
B	514.2	514.2	137.4	0.27	137.6	0.27
C	801.0	801.0	353.0	0.44	354.6	0.44
D	990.0	990.0	2387.3	2.41	2559.3	2.59
ALL	3378.0	3378.0	4692.5	1.39	4946.2	1.46

T75

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:15:36 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

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Email: software@trl.co.uk
Web: www.trlsoftware.co.uk

Run with file:-
"p:\10338\Traffic\Junctions\J2-A1081 jw B487 Redbourn Lane\
10338-J2 A1081 jw B487 Redbourn Lane [HL-07] - 2031+Dev Rev3 AM [flat].vai"
(drive-on-the-left) at 09:11:42 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338 J2 A1081 jw B487 Redbourne Lane +Impr HL-07 - 2031+Dev Rev3 AM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Walkers Road
ARM C - A1081 (S)
ARM D - B487 Redbourn Lane (W)

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	7.00	15.00	15.00	37.00	40.0	0.628	27.936
ARM B	3.50	7.00	6.00	30.00	37.00	30.0	0.603	24.229
ARM C	4.00	6.00	8.00	25.00	37.00	40.0	0.602	25.168
ARM D	3.20	7.00	6.00	30.00	37.00	40.0	0.567	22.086

V = approach half-width
E = entry width
L = effective flare length
R = entry radius
D = inscribed circle diameter
PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
08.00 - 09.00	ARM A	0.000	0.027	0.456	0.517
		0.0	32.0	549.0	623.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.274	0.000	0.248	0.478
		151.0	0.0	137.0	264.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.361	0.310	0.000	0.328
		263.0	226.0	0.0	239.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.506	0.279	0.215	0.000
		618.0	341.0	262.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	20.06	20.68	0.970	- - -	0.0	13.0	136.3	-	0.520
ARM B	9.20	10.89	0.845	- - -	0.0	4.5	54.3	-	0.452
ARM C	12.13	15.15	0.800	- - -	0.0	3.6	47.0	-	0.288
ARM D	20.35	16.18	1.258	- - -	0.0	66.2	517.3	-	2.210
08.15-08.30									
ARM A	20.06	20.60	0.974	- - -	13.0	17.1	228.8	-	0.893
ARM B	9.20	10.53	0.874	- - -	4.5	5.7	78.1	-	0.659
ARM C	12.13	14.87	0.816	- - -	3.6	4.1	58.9	-	0.354
ARM D	20.35	16.06	1.267	- - -	66.2	130.6	1476.5	-	6.263

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	20.06	20.60	0.974	- -	-	17.1	19.8	278.2	-	1.035
ARM B	9.20	10.47	0.879	- -	-	5.7	6.2	89.6	-	0.723
ARM C	12.13	14.82	0.818	- -	-	4.1	4.3	62.8	-	0.365
ARM D	20.35	16.05	1.268	- -	-	130.6	195.2	2443.8	-	10.257

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	20.06	20.60	0.974	- -	-	19.8	21.7	311.7	-	1.135
ARM B	9.20	10.44	0.881	- -	-	6.2	6.5	95.7	-	0.752
ARM C	12.13	14.80	0.820	- -	-	4.3	4.3	64.6	-	0.372
ARM D	20.35	16.04	1.268	- -	-	195.2	259.8	3412.5	-	14.275

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	13.0	**********
08.30	17.1	**********
08.45	19.8	**********
09.00	21.7	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	4.5	****
08.30	5.7	******
08.45	6.2	******
09.00	6.5	*******

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	3.6	****
08.30	4.1	****
08.45	4.3	****
09.00	4.3	****

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	66.2	**********
08.30	130.6	**********
08.45	195.2	**********
09.00	259.8	**********

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1203.6	1203.6	955.0	0.79	966.4	0.80
B	552.0	552.0	317.7	0.58	319.7	0.58
C	727.8	727.8	233.3	0.32	234.0	0.32
D	1221.0	1221.0	7850.0	6.43	9953.3	8.15
ALL	3704.4	3704.4	9356.1	2.53	11473.4	3.10

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END OF JOB

========== end of file ==========

Printed at 09:16:27 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

For sales and distribution information,
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Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J2-A1081 jw B487 Redbourn Lane\
10338-J2 A1081 jw B487 Redbourn Lane [HL-07] - 2031+Dev Rev3 PM [flat].vai"
(drive-on-the-left) at 09:11:48 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338 J2 A1081 jw B487 Redbourne Lane +Impr HL-07 - 2031+Dev Rev3 PM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Walkers Road
ARM C - A1081 (S)
ARM D - B487 Redbourn Lane (W)

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	7.00	15.00	15.00	37.00	40.0	0.628	27.936
ARM B	3.50	7.00	6.00	30.00	37.00	30.0	0.603	24.229
ARM C	4.00	6.00	8.00	25.00	37.00	40.0	0.602	25.168
ARM D	3.20	7.00	6.00	30.00	37.00	40.0	0.567	22.086

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
17.00 - 18.00	ARM A	0.000	0.034	0.367	0.598
		0.0	37.0	394.0	642.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.218	0.000	0.257	0.525
		112.0	0.0	132.0	270.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.378	0.283	0.000	0.339
		303.0	227.0	0.0	272.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.399	0.355	0.246	0.000
		395.0	352.0	244.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	17.88	19.85	0.901	- -	-	0.0	7.1	84.8	-	0.359
ARM B	8.57	11.81	0.725	- -	-	0.0	2.5	32.7	-	0.281
ARM C	13.35	15.13	0.882	- -	-	0.0	5.9	71.0	-	0.405
ARM D	16.50	16.19	1.019	- -	-	0.0	17.6	167.6	-	0.791
17.15-17.30									
ARM A	17.88	19.62	0.911	- -	-	7.1	8.5	118.9	-	0.504
ARM B	8.57	11.52	0.744	- -	-	2.5	2.7	39.7	-	0.334
ARM C	13.35	14.93	0.894	- -	-	5.9	7.0	99.0	-	0.562
ARM D	16.50	16.05	1.028	- -	-	17.6	28.3	347.5	-	1.652

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	17.88	19.58	0.913	- -	-	8.5	9.1	132.4	-	0.541
ARM B	8.57	11.48	0.747	- -	-	2.7	2.8	41.9	-	0.341
ARM C	13.35	14.91	0.896	- -	-	7.0	7.5	109.5	-	0.598
ARM D	16.50	16.04	1.029	- -	-	28.3	37.7	496.5	-	2.252

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	17.88	19.56	0.914	- -	-	9.1	9.5	139.6	-	0.558
ARM B	8.57	11.46	0.748	- -	-	2.8	2.9	42.8	-	0.344
ARM C	13.35	14.90	0.896	- -	-	7.5	7.8	114.8	-	0.612
ARM D	16.50	16.03	1.029	- -	-	37.7	46.5	632.6	-	2.799

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	7.1	*******
17.30	8.5	********
17.45	9.1	*********
18.00	9.5	*********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	2.5	**
17.30	2.7	***
17.45	2.8	***
18.00	2.9	***

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	5.9	******
17.30	7.0	*******
17.45	7.5	********
18.00	7.8	********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	17.6	******************
17.30	28.3	****************************
17.45	37.7	************************************
18.00	46.5	**

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1072.8	1072.8	475.7	0.44	478.0	0.45
B	514.2	514.2	157.2	0.31	157.5	0.31
C	801.0	801.0	394.3	0.49	396.4	0.49
D	990.0	990.0	1644.2	1.66	1711.8	1.73
ALL	3378.0	3378.0	2671.5	0.79	2743.7	0.81

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
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* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:16:41 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
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Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J3-A1081 jw Station Road\10338-J3 A1081 jw Station Road - 2015 AM [flat].vai"
(drive-on-the-left) at 12:02:50 on Wednesday, 11 May 2016

FILE PROPERTIES

RUN TITLE: 10338-J3 A1081 jw Station Road - 2015 AM [flat]
LOCATION: Harpenden
DATE: 11/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Station Road
ARM C - A1081 (S)
ARM D - Exit

GEOMETRIC DATA

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

I ARM	I V (M)	I E (M)	I L (M)	I R (M)	I D (M)	I PHI (DEG)	I SLOPE	I INTERCEPT (PCU/MIN)	I
I ARM A	I 3.50	I 6.00	I 20.00	I 15.00	I 17.00	I 40.0	I 0.612	I 25.332	I
I ARM B	I 3.50	I 4.00	I 5.00	I 5.00	I 17.00	I 40.0	I 0.456	I 16.035	I
I ARM C	I 3.50	I 4.00	I 5.00	I 40.00	I 17.00	I 30.0	I 0.570	I 20.067	I
I ARM D	I 3.50	I 4.00	I 5.00	I 30.00	I 17.00	I 30.0	I 0.566	I 19.907	I

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
08.00 - 09.00	ARM A	0.000	0.223	0.766	0.011
		0.0	208.0	713.0	10.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.336	0.000	0.536	0.128
		144.0	0.0	230.0	55.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.640	0.352	0.000	0.008
		533.0	293.0	0.0	7.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.000	0.000	0.000	0.000
		0.0	0.0	0.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

PEDESTRIAN CROSSING DATA
PEDESTRIAN CROSSING FLOW:
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ZEBRA CROSSINGS

T40

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
B	10.00	3.50	5.0	5.0
C	6.00	3.50	4.0	2.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	15.52	22.39	0.693	- -	-	0.0	2.2	30.5	-	0.140
ARM B	7.16	9.75	0.735	- -	0.5	0.0	2.5	33.0	-	0.345
ARM C	13.88	18.12	0.766	- -	0.3	0.0	3.1	41.1	-	0.216
ARM D	0.00	10.91	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	15.52	22.34	0.695	- -	-	2.2	2.2	33.3	-	0.147
ARM B	7.16	9.66	0.741	- -	0.5	2.5	2.7	39.7	-	0.393
ARM C	13.88	18.08	0.768	- -	0.3	3.1	3.2	47.2	-	0.237
ARM D	0.00	10.77	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	15.52	22.34	0.695	- -	-	2.2	2.2	33.7	-	0.147
ARM B	7.16	9.66	0.741	- -	0.5	2.7	2.8	41.1	-	0.397
ARM C	13.88	18.08	0.768	- -	0.3	3.2	3.2	48.2	-	0.238
ARM D	0.00	10.76	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	15.52	22.34	0.695	- -	-	2.2	2.3	33.8	-	0.147
ARM B	7.16	9.66	0.741	- -	0.5	2.8	2.8	41.7	-	0.399
ARM C	13.88	18.08	0.768	- -	0.3	3.2	3.2	48.6	-	0.238
ARM D	0.00	10.76	0.000	- -	-	0.0	0.0	0.0	-	0.000

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	2.2	**
08.30	2.2	**
08.45	2.2	**
09.00	2.3	**

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	2.5	***
08.30	2.7	***
08.45	2.8	***
09.00	2.8	***

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	3.1	***
08.30	3.2	***
08.45	3.2	***
09.00	3.2	***

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	931.2	931.2	131.3	0.14	131.4	0.14
B	429.6	429.6	155.4	0.36	155.8	0.36
C	832.8	832.8	185.0	0.22	185.3	0.22
D	0.0	0.0	0.0	0.00	0.0	0.00
ALL	2193.6	2193.6	471.7	0.22	472.5	0.22

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 16:00:28 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

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Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J3-A1081 jw Station Road\10338-J3 A1081 jw Station Road - 2015 PM [flat].vai"
(drive-on-the-left) at 12:02:54 on Wednesday, 11 May 2016

FILE PROPERTIES

RUN TITLE: 10338-J3 A1081 jw Station Road - 2015 PM [flat]
LOCATION: Harpenden
DATE: 11/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Station Road
ARM C - A1081 (S)
ARM D - Exit

GEOMETRIC DATA

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	6.00	20.00	15.00	17.00	40.0	0.612	25.332
ARM B	3.50	4.00	5.00	5.00	17.00	40.0	0.456	16.035
ARM C	3.50	4.00	5.00	40.00	17.00	30.0	0.570	20.067
ARM D	3.50	4.00	5.00	30.00	17.00	30.0	0.566	19.907

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.00					
	ARM A	0.000	0.286	0.686	0.027
		0.0	272.0	652.0	26.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.285	0.000	0.489	0.226
		121.0	0.0	208.0	96.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.662	0.326	0.000	0.012
		447.0	220.0	0.0	8.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.000	0.000	0.000	0.000
		0.0	0.0	0.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

PEDESTRIAN CROSSING DATA
PEDESTRIAN CROSSING FLOW:
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ZEBRA CROSSINGS

T40

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
B	10.00	3.50	5.0	5.0
C	6.00	3.50	4.0	2.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	15.83	23.11	0.685	- -	-	0.0	2.1	29.5	-	0.132
ARM B	7.08	10.31	0.687	- -	0.5	0.0	2.1	27.5	-	0.287
ARM C	11.25	17.80	0.632	- -	0.3	0.0	1.7	23.4	-	0.148
ARM D	0.00	12.56	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	15.83	23.09	0.686	- -	-	2.1	2.1	32.0	-	0.138
ARM B	7.08	10.24	0.691	- -	0.5	2.1	2.2	31.8	-	0.314
ARM C	11.25	17.76	0.633	- -	0.3	1.7	1.7	25.4	-	0.153
ARM D	0.00	12.48	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	15.83	23.09	0.686	- -	-	2.1	2.2	32.3	-	0.138
ARM B	7.08	10.24	0.691	- -	0.5	2.2	2.2	32.6	-	0.316
ARM C	11.25	17.76	0.634	- -	0.3	1.7	1.7	25.6	-	0.154
ARM D	0.00	12.48	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	15.83	23.09	0.686	- -	-	2.2	2.2	32.4	-	0.138
ARM B	7.08	10.24	0.691	- -	0.5	2.2	2.2	32.9	-	0.316
ARM C	11.25	17.76	0.634	- -	0.3	1.7	1.7	25.7	-	0.154
ARM D	0.00	12.48	0.000	- -	-	0.0	0.0	0.0	-	0.000

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	2.1	**
17.30	2.1	**
17.45	2.2	**
18.00	2.2	**

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	2.1	**
17.30	2.2	**
17.45	2.2	**
18.00	2.2	**

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	1.7	**
17.30	1.7	**
17.45	1.7	**
18.00	1.7	**

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	949.8	949.8	126.4	0.13	126.5	0.13
B	424.8	424.8	124.8	0.29	125.1	0.29
C	675.0	675.0	100.1	0.15	100.2	0.15
D	0.0	0.0	0.0	0.00	0.0	0.00
ALL	2049.6	2049.6	351.3	0.17	351.7	0.17

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 16:00:37 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Web: www.trlsoftware.co.uk

Run with file:-
"p:\10338\Traffic\Junctions\J3-A1081 jw Station Road\10338-J3 A1081 jw Station Road - 2031 AM [flat].vai"
(drive-on-the-left) at 12:06:38 on Wednesday, 25 May 2016

FILE PROPERTIES

RUN TITLE: 10338-J3 A1081 jw Station Road - 2031 AM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Station Road
ARM C - A1081 (S)
ARM D - Exit

GEOMETRIC DATA

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

I ARM	I V (M)	I E (M)	I L (M)	I R (M)	I D (M)	I PHI (DEG)	I SLOPE	I INTERCEPT (PCU/MIN)	I
I ARM A	I 3.50	I 6.00	I 20.00	I 15.00	I 17.00	I 40.0	I 0.612	I 25.332	I
I ARM B	I 3.50	I 4.00	I 5.00	I 5.00	I 17.00	I 40.0	I 0.456	I 16.035	I
I ARM C	I 3.50	I 4.00	I 5.00	I 40.00	I 17.00	I 30.0	I 0.570	I 20.067	I
I ARM D	I 3.50	I 4.00	I 5.00	I 30.00	I 17.00	I 30.0	I 0.566	I 19.907	I

V = approach half-width E = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
08.00 - 09.00					
	ARM A	0.000	0.225	0.764	0.011
		0.0	252.0	856.0	12.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.336	0.000	0.536	0.129
		175.0	0.0	279.0	67.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.640	0.352	0.000	0.008
		646.0	355.0	0.0	8.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.000	0.000	0.000	0.000
		0.0	0.0	0.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

PEDESTRIAN CROSSING DATA
PEDESTRIAN CROSSING FLOW:
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ZEBRA CROSSINGS

T40

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
B	10.00		5.0	5.0
C	6.00	3.50	4.0	2.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	18.81	21.83	0.862	- -	-	0.0	5.5	68.7	-	0.272
ARM B	8.68	8.10	1.072	BB-	0.5	0.0	15.9	142.9	-	1.352
ARM C	16.83	17.94	0.938	- -	0.3	0.0	9.4	104.2	-	0.474
ARM D	0.00	9.36	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	18.81	21.72	0.866	- - -	5.5	5.9	86.2	-	0.333
ARM B	8.68	7.95	1.092	BB- 0.5	15.9	28.4	333.7	-	3.119
ARM C	16.83	17.87	0.942	- - 0.3	9.4	11.4	158.1	-	0.725
ARM D	0.00	9.04	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	18.81	21.71	0.867	- - -	5.9	6.1	90.6	-	0.339
ARM B	8.68	7.94	1.094	BB- 0.5	28.4	40.2	514.8	-	4.614
ARM C	16.83	17.86	0.942	- - 0.3	11.4	12.5	180.4	-	0.791
ARM D	0.00	8.99	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	18.81	21.70	0.867	- - -	6.1	6.2	92.6	-	0.342
ARM B	8.68	7.93	1.094	BB- 0.5	40.2	51.9	690.8	-	6.057
ARM C	16.83	17.86	0.943	- - 0.3	12.5	13.2	193.5	-	0.833
ARM D	0.00	8.98	0.000	- - -	0.0	0.0	0.0	-	0.000

WARNING Entry capacities in certain time segments
(flagged BB in Queue and Delay Table) are restricted due
to traffic queueing to leave the junction on an adjacent arm

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	5.5	*****
08.30	5.9	******
08.45	6.1	******
09.00	6.2	******

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	15.9	****************
08.30	28.4	****************************
08.45	40.2	**
09.00	51.9	***

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	9.4	*********
08.30	11.4	***********
08.45	12.5	************
09.00	13.2	************

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1128.6	1128.6	338.2	0.30	339.1	0.30
B	520.8	520.8	1682.2	3.23	1851.7	3.56
C	1009.8	1009.8	636.2	0.63	641.1	0.63
D	0.0	0.0	0.0	0.00	0.0	0.00
ALL	2659.2	2659.2	2656.6	1.00	2831.9	1.06

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:37:43 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Run with file:-
"p:\10338\Traffic\Junctions\J3-A1081 jw Station Road\10338-J3 A1081 jw Station Road - 2031 PM [flat].vai"
(drive-on-the-left) at 12:06:42 on Wednesday, 25 May 2016

FILE PROPERTIES

RUN TITLE: 10338-J3 A1081 jw Station Road - 2031 PM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Station Road
ARM C - A1081 (S)
ARM D - Exit

GEOMETRIC DATA

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

I ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
I ARM A	3.50	6.00	20.00	15.00	17.00	40.0	0.612	25.332
I ARM B	3.50	4.00	5.00	5.00	17.00	40.0	0.456	16.035
I ARM C	3.50	4.00	5.00	40.00	17.00	30.0	0.570	20.067
I ARM D	3.50	4.00	5.00	30.00	17.00	30.0	0.566	19.907

V = approach half-width E = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
17.00 - 18.00	ARM A	0.000	0.286	0.686	0.028
		0.0	330.0	791.0	32.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.285	0.000	0.489	0.225
		147.0	0.0	252.0	116.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.662	0.326	0.000	0.012
		542.0	267.0	0.0	10.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.000	0.000	0.000	0.000
		0.0	0.0	0.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

PEDESTRIAN CROSSING DATA
PEDESTRIAN CROSSING FLOW:
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ZEBRA CROSSINGS

T40

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
B	10.00		5.0	5.0
C	6.00	3.50	4.0	2.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	19.20	22.64	0.848	- - -	0.0	5.0	64.0	-	0.247
ARM B	8.59	8.76	0.981	BB- 0.5	0.0	9.7	97.9	-	0.911
ARM C	13.64	17.45	0.781	- - 0.3	0.0	3.3	43.9	-	0.236
ARM D	0.00	11.12	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	19.20	22.60	0.850	- - -	-	5.0	5.3	77.7	-	0.289
ARM B	8.59	8.62	0.997	BB-	0.5	9.7	14.5	184.2	-	1.724
ARM C	13.64	17.35	0.786	- - -	0.3	3.3	3.5	51.6	-	0.266
ARM D	0.00	10.95	0.000	- - -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	19.20	22.60	0.850	- - -	-	5.3	5.4	80.5	-	0.292
ARM B	8.59	8.61	0.997	BB-	0.5	14.5	18.1	245.4	-	2.178
ARM C	13.64	17.33	0.787	- - -	0.3	3.5	3.6	53.3	-	0.269
ARM D	0.00	10.94	0.000	- - -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	19.20	22.60	0.850	- - -	-	5.4	5.5	81.7	-	0.293
ARM B	8.59	8.61	0.997	BB-	0.5	18.1	21.0	294.1	-	2.539
ARM C	13.64	17.32	0.788	- - -	0.3	3.6	3.6	54.0	-	0.271
ARM D	0.00	10.93	0.000	- - -	-	0.0	0.0	0.0	-	0.000

WARNING Entry capacities in certain time segments
(flagged BB in Queue and Delay Table) are restricted due
to traffic queueing to leave the junction on an adjacent arm

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	5.0	*****
17.30	5.3	*****
17.45	5.4	*****
18.00	5.5	*****

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	9.7	**********
17.30	14.5	**********
17.45	18.1	**********
18.00	21.0	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	3.3	***
17.30	3.5	****
17.45	3.6	****
18.00	3.6	****

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1152.0	1152.0	303.9	0.26	304.6	0.26
B	515.4	515.4	821.7	1.59	847.4	1.64
C	818.4	818.4	202.8	0.25	203.2	0.25
D	0.0	0.0	0.0	0.00	0.0	0.00
ALL	2485.8	2485.8	1328.3	0.53	1355.1	0.55

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:37:55 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J3-A1081 jw Station Road\
10338-J3 A1081 jw Station Road - 2031+Dev Rev3 AM [flat].vai"
(drive-on-the-left) at 09:30:12 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338-J3 A1081 jw Station Road - 2031+Dev Rev3 AM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Station Road
ARM C - A1081 (S)
ARM D - Exit

GEOMETRIC DATA

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	6.00	20.00	15.00	17.00	40.0	0.612	25.332
ARM B	3.50	4.00	5.00	5.00	17.00	40.0	0.456	16.035
ARM C	3.50	4.00	5.00	40.00	17.00	30.0	0.570	20.067
ARM D	3.50	4.00	5.00	30.00	17.00	30.0	0.566	19.907

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
08.00 - 09.00	ARM A	0.000	0.218	0.772	0.010
		0.0	273.0	966.0	12.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.352	0.000	0.522	0.125
		188.0	0.0	279.0	67.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.665	0.327	0.000	0.007
		722.0	355.0	0.0	8.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.000	0.000	0.000	0.000
		0.0	0.0	0.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

PEDESTRIAN CROSSING DATA
PEDESTRIAN CROSSING FLOW:
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ZEBRA CROSSINGS

T40

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
B	10.00		5.0	5.0
C	6.00	3.50	4.0	2.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	20.85	21.91	0.952	- - -	0.0	11.2	122.4	-	0.449
ARM B	8.89	7.23	1.230	BB- 0.5	0.0	28.6	231.9	-	2.330
ARM C	18.09	18.06	1.002	- - 0.3	0.0	16.2	159.4	-	-0.055
ARM D	0.00	8.96	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	20.85	21.78	0.957	- - -	11.2	14.1	192.4	-	0.718
ARM B	8.89	6.95	1.280	BB- 0.5	28.6	58.0	649.8	-	6.536
ARM C	18.09	18.07	1.001	- - 0.3	16.2	23.2	298.8	-	1.283
ARM D	0.00	8.62	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	20.85	21.76	0.958	- - -	14.1	15.9	226.0	-	0.806
ARM B	8.89	6.91	1.287	BB- 0.5	58.0	87.8	1093.5	-	10.798
ARM C	18.09	18.07	1.001	- - 0.3	23.2	28.6	389.5	-	1.605
ARM D	0.00	8.57	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	20.85	21.75	0.959	- - -	15.9	17.0	247.1	-	0.867
ARM B	8.89	6.90	1.289	BB- 0.5	87.8	117.7	1541.4	-	15.109
ARM C	18.09	18.07	1.001	- - 0.3	28.6	33.1	462.8	-	1.868
ARM D	0.00	8.54	0.000	- - -	0.0	0.0	0.0	-	0.000

WARNING Entry capacities in certain time segments
(flagged BB in Queue and Delay Table) are restricted due
to traffic queueing to leave the junction on an adjacent arm

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	11.2	**********
08.30	14.1	**************
08.45	15.9	*****************
09.00	17.0	*****************

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	28.6	****************************
08.30	58.0	**********
08.45	87.8	**********
09.00	117.7	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	16.2	****************
08.30	23.2	**********
08.45	28.6	****************************
09.00	33.1	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1251.0	1251.0	787.9	0.63	794.6	0.64
B	533.4	533.4	3516.6	6.59	4521.2	8.48
C	1085.4	1085.4	1310.5	1.21	1340.7	1.24
D	0.0	0.0	0.0	0.00	0.0	0.00
ALL	2869.8	2869.8	5615.0	1.96	6656.5	2.32

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:38:31 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J3-A1081 jw Station Road\
10338-J3 A1081 jw Station Road - 2031+Dev Rev3 PM [flat].vai"
(drive-on-the-left) at 09:30:30 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338-J3 A1081 jw Station Road - 2031+Dev Rev3 PM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Station Road
ARM C - A1081 (S)
ARM D - Exit

GEOMETRIC DATA

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	6.00	20.00	15.00	17.00	40.0	0.612	25.332
ARM B	3.50	4.00	5.00	5.00	17.00	40.0	0.456	16.035
ARM C	3.50	4.00	5.00	40.00	17.00	30.0	0.570	20.067
ARM D	3.50	4.00	5.00	30.00	17.00	30.0	0.566	19.907

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
17.00 - 18.00	ARM A	0.000	0.281	0.693	0.026
		0.0	342.0	844.0	32.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.308	0.000	0.474	0.218
		164.0	0.0	252.0	116.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.690	0.299	0.000	0.011
		617.0	267.0	0.0	10.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.000	0.000	0.000	0.000
		0.0	0.0	0.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

PEDESTRIAN CROSSING DATA
PEDESTRIAN CROSSING FLOW:
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ZEBRA CROSSINGS

T40

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
B	10.00		5.0	5.0
C	6.00	3.50	4.0	2.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	20.30	22.66	0.896	- -	-	0.0	7.0	85.1	-	0.315
ARM B	8.88	8.30	1.070	BB-	0.5	0.0	16.0	143.8	-	1.329
ARM C	14.89	17.42	0.855	- -	0.3	0.0	5.1	63.2	-	0.319
ARM D	0.00	10.40	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	20.30	22.60	0.898	- - -	7.0	7.8	112.1	-	0.406
ARM B	8.88	8.12	1.093	BB- 0.5	16.0	28.8	337.6	-	3.091
ARM C	14.89	17.35	0.858	- - 0.3	5.1	5.5	80.2	-	0.391
ARM D	0.00	10.19	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	20.30	22.60	0.898	- - -	7.8	8.1	119.4	-	0.418
ARM B	8.88	8.11	1.095	BB- 0.5	28.8	41.1	524.3	-	4.590
ARM C	14.89	17.34	0.859	- - 0.3	5.5	5.7	84.4	-	0.400
ARM D	0.00	10.17	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	20.30	22.60	0.898	- - -	8.1	8.3	122.8	-	0.423
ARM B	8.88	8.10	1.096	BB- 0.5	41.1	53.1	706.6	-	6.070
ARM C	14.89	17.34	0.859	- - 0.3	5.7	5.8	86.3	-	0.403
ARM D	0.00	10.17	0.000	- - -	0.0	0.0	0.0	-	0.000

WARNING Entry capacities in certain time segments
(flagged BB in Queue and Delay Table) are restricted due
to traffic queueing to leave the junction on an adjacent arm

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	7.0	*******
17.30	7.8	********
17.45	8.1	********
18.00	8.3	********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	16.0	****************
17.30	28.8	****************************
17.45	41.1	**
18.00	53.1	***

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	5.1	*****
17.30	5.5	******
17.45	5.7	******
18.00	5.8	******

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1218.0	1218.0	439.3	0.36	440.8	0.36
B	532.8	532.8	1712.3	3.21	1886.4	3.54
C	893.4	893.4	314.1	0.35	315.0	0.35
D	0.0	0.0	0.0	0.00	0.0	0.00
ALL	2644.2	2644.2	2465.7	0.93	2642.3	1.00

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 09:38:13 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J3-A1081 jw Station Road\
10338-J3 A1081 jw Station Road [HL-08] - 2031+Dev Rev3 AM [flat].vai"
(drive-on-the-left) at 10:19:11 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338-J3 A1081 jw Station Road +[HL-08] - 2031+Dev Rev3 AM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Station Road
ARM C - A1081 (S)
ARM D - Exit

GEOMETRIC DATA

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	7.00	20.00	15.00	17.00	40.0	0.639	27.526
ARM B	3.50	5.70	5.00	5.00	17.00	40.0	0.483	18.246
ARM C	3.50	5.00	5.00	40.00	17.00	30.0	0.595	22.066
ARM D	3.50	4.00	5.00	30.00	17.00	30.0	0.566	19.907

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
08.00 - 09.00	ARM A	0.000	0.218	0.772	0.010
		0.0	273.0	966.0	12.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.352	0.000	0.522	0.125
		188.0	0.0	279.0	67.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.665	0.327	0.000	0.007
		722.0	355.0	0.0	8.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.000	0.000	0.000	0.000
		0.0	0.0	0.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

PEDESTRIAN CROSSING DATA
PEDESTRIAN CROSSING FLOW:
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ZEBRA CROSSINGS

T40

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
B	10.00		5.0	5.0
C	6.00	3.50	4.0	2.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	20.85	23.84	0.875	- -	-	0.0	6.0	75.4	-	0.270
ARM B	8.89	8.34	1.067	BB-	0.5	0.0	15.8	142.1	-	1.312
ARM C	18.09	19.72	0.917	- -	0.3	0.0	8.1	93.9	-	0.394
ARM D	0.00	8.49	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	20.85	23.74	0.878	- - -	6.0	6.6	95.5	-	0.332
ARM B	8.89	8.15	1.091	BB- 0.5	15.8	28.4	332.8	-	3.047
ARM C	18.09	19.66	0.920	- - 0.3	8.1	9.4	132.5	-	0.553
ARM D	0.00	8.19	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	20.85	23.73	0.879	- - -	6.6	6.8	100.6	-	0.341
ARM B	8.89	8.13	1.093	BB- 0.5	28.4	40.5	517.1	-	4.518
ARM C	18.09	19.65	0.921	- - 0.3	9.4	10.0	145.6	-	0.587
ARM D	0.00	8.15	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	20.85	23.73	0.879	- - -	6.8	6.9	102.9	-	0.343
ARM B	8.89	8.13	1.094	BB- 0.5	40.5	52.4	696.7	-	5.964
ARM C	18.09	19.64	0.921	- - 0.3	10.0	10.3	152.5	-	0.602
ARM D	0.00	8.14	0.000	- - -	0.0	0.0	0.0	-	0.000

WARNING Entry capacities in certain time segments
(flagged BB in Queue and Delay Table) are restricted due
to traffic queueing to leave the junction on an adjacent arm

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	6.0	******
08.30	6.6	*******
08.45	6.8	*******
09.00	6.9	*******

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	15.8	****************
08.30	28.4	****************************
08.45	40.5	**
09.00	52.4	***

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	8.1	********
08.30	9.4	*********
08.45	10.0	**********
09.00	10.3	**********

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1251.0	1251.0	374.3	0.30	375.3	0.30
B	533.4	533.4	1688.8	3.17	1857.5	3.48
C	1085.4	1085.4	524.5	0.48	527.2	0.49
D	0.0	0.0	0.0	0.00	0.0	0.00
ALL	2869.8	2869.8	2587.6	0.90	2760.1	0.96

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 10:20:26 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J3-A1081 jw Station Road\
10338-J3 A1081 jw Station Road [HL-08] - 2031+Dev Rev3 PM [flat].vai"
(drive-on-the-left) at 10:18:52 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338-J3 A1081 jw Station Road [HL-08] - 2031+Dev Rev3 PM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - Station Road
ARM C - A1081 (S)
ARM D - Exit

GEOMETRIC DATA

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	7.00	20.00	15.00	17.00	40.0	0.639	27.526
ARM B	3.50	5.70	5.00	5.00	17.00	40.0	0.483	18.246
ARM C	3.50	5.00	5.00	40.00	17.00	30.0	0.595	22.066
ARM D	3.50	4.00	5.00	30.00	17.00	30.0	0.566	19.907

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
17.00 - 18.00	ARM A	0.000	0.281	0.693	0.026
		0.0	342.0	844.0	32.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.308	0.000	0.474	0.218
		164.0	0.0	252.0	116.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.690	0.299	0.000	0.011
		617.0	267.0	0.0	10.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.000	0.000	0.000	0.000
		0.0	0.0	0.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

PEDESTRIAN CROSSING DATA
PEDESTRIAN CROSSING FLOW:
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY
ZEBRA CROSSINGS

T40

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
B	10.00		5.0	5.0
C	6.00	3.50	4.0	2.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	20.30	24.71	0.821	- -	-	0.0	4.3	56.2	-	0.202
ARM B	8.88	9.72	0.913	BB-	0.5	0.0	6.6	73.1	-	0.646
ARM C	14.89	19.11	0.779	- -	0.3	0.0	3.3	44.0	-	0.216
ARM D	0.00	10.22	0.000	- -	-	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	20.30	24.67	0.823	- - -	4.3	4.5	65.7	-	0.227
ARM B	8.88	9.51	0.934	BB- 0.5	6.6	8.8	117.3	-	1.053
ARM C	14.89	19.01	0.783	- - 0.3	3.3	3.5	51.1	-	0.240
ARM D	0.00	10.06	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	20.30	24.67	0.823	- - -	4.5	4.5	67.3	-	0.228
ARM B	8.88	9.49	0.935	BB- 0.5	8.8	10.0	141.2	-	1.202
ARM C	14.89	18.99	0.784	- - 0.3	3.5	3.5	52.6	-	0.243
ARM D	0.00	10.04	0.000	- - -	0.0	0.0	0.0	-	0.000

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	20.30	24.67	0.823	- - -	4.5	4.5	68.0	-	0.228
ARM B	8.88	9.49	0.936	BB- 0.5	10.0	10.7	155.5	-	1.291
ARM C	14.89	18.98	0.784	- - 0.3	3.5	3.6	53.2	-	0.243
ARM D	0.00	10.04	0.000	- - -	0.0	0.0	0.0	-	0.000

WARNING Entry capacities in certain time segments
(flagged BB in Queue and Delay Table) are restricted due
to traffic queueing to leave the junction on an adjacent arm

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	4.3	****
17.30	4.5	****
17.45	4.5	*****
18.00	4.5	*****

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	6.6	*******
17.30	8.8	*********
17.45	10.0	**********
18.00	10.7	**********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	3.3	***
17.30	3.5	***
17.45	3.5	****
18.00	3.6	****

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1218.0	1218.0	257.1	0.21	257.6	0.21
B	532.8	532.8	487.1	0.91	493.2	0.93
C	893.4	893.4	200.8	0.22	201.2	0.23
D	0.0	0.0	0.0	0.00	0.0	0.00
ALL	2644.2	2644.2	945.1	0.36	951.9	0.36

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 10:20:34 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J4-A1081 jw The Common\10338-J4 A1081 jw The Common - 2015 AM [flat].vai"
(drive-on-the-left) at 12:58:52 on Wednesday, 11 May 2016

FILE PROPERTIES

RUN TITLE: 10338-J4 A1081 jw The Common - 2015 AM [flat]
LOCATION: Harpenden
DATE: 11/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - A1081 (S)
ARM C - The Common

MINI-ROUNDABOUT GEOMETRIC DATA

JUNCTION IN LONDON
LIGHTING CONDITIONS : NORMAL
ROAD SURFACE CONDITION: NORMAL

T5

ARM	V (M)	E (M)	Lm(M)	Vm(M)	A (M)	K (M)	G (%)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	4.50	5.00	3.50	16.00	14.00	0.00	0.588	21.253*
ARM B	3.50	4.00	2.00	3.50	10.00	8.00	0.00	0.544	15.311
ARM C	3.00	4.00	2.00	3.00	8.00	6.00	0.00	0.524	11.719

V = approach half-width Lm = effective flare length A = distance between arms
E = entry width Vm = minimum approach half-width K= entry corner kerb line G=gradient over 50 m
WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

T6

ARM	ADJUSTMENT TO INTERCEPT (PCU/MIN)
A	5.000

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/T	ARM A	ARM B	ARM C
08.00 - 09.00	ARM A	0.000	0.948	0.052
		0.0	880.0	48.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.731	0.000	0.269
		490.0	0.0	180.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.102	0.898	0.000
		24.0	212.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	15.47	19.21	0.805	- - -	0.0	3.8	49.9	-	0.237
ARM B	11.17	14.88	0.751	- - -	0.0	2.8	37.4	-	0.246
ARM C	3.93	7.51	0.523	- - -	0.0	1.1	14.5	-	0.269
08.15-08.30									
ARM A	15.47	19.18	0.807	- - -	3.8	4.0	58.7	-	0.267
ARM B	11.17	14.88	0.751	- - -	2.8	2.9	43.1	-	0.268
ARM C	3.93	7.44	0.528	- - -	1.1	1.1	16.2	-	0.285
08.30-08.45									
ARM A	15.47	19.18	0.807	- - -	4.0	4.0	60.3	-	0.269
ARM B	11.17	14.88	0.751	- - -	2.9	2.9	43.9	-	0.269
ARM C	3.93	7.44	0.528	- - -	1.1	1.1	16.5	-	0.285

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00								
ARM A	15.47	19.18	0.807	- - -	4.0	4.1	60.9	0.269
ARM B	11.17	14.88	0.751	- - -	2.9	3.0	44.3	0.269
ARM C	3.93	7.44	0.528	- - -	1.1	1.1	16.6	0.285

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	3.8	****
08.30	4.0	****
08.45	4.0	****
09.00	4.1	****

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	2.8	***
08.30	2.9	***
08.45	2.9	***
09.00	3.0	***

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	1.1	*
08.30	1.1	*
08.45	1.1	*
09.00	1.1	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	928.2	928.2	229.8	0.25	230.2	0.25
B	670.2	670.2	168.8	0.25	169.1	0.25
C	235.8	235.8	63.8	0.27	63.8	0.27
ALL	1834.2	1834.2	462.3	0.25	463.1	0.25

T75

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 16:01:12 on 01/06/2016]

_____ A R C A D Y 6 _____

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

_____

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J4-A1081 jw The Common\10338-J4 A1081 jw The Common - 2015 PM [flat].vai"
(drive-on-the-left) at 12:59:06 on Wednesday, 11 May 2016

FILE PROPERTIES
****

RUN TITLE: 10338-J4 A1081 jw The Common - 2015 PM [flat]
LOCATION: Harpenden
DATE: 11/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA
****
ARM A - A1081 (N)
ARM B - A1081 (S)
ARM C - The Common

MINI-ROUNDABOUT GEOMETRIC DATA

JUNCTION IN LONDON
LIGHTING CONDITIONS : NORMAL
ROAD SURFACE CONDITION: NORMAL

T5

ARM	V (M)	E (M)	Lm(M)	Vm(M)	A (M)	K (M)	G (%)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	4.50	5.00	3.50	16.00	14.00	0.00	0.588	16.253
ARM B	3.50	4.00	2.00	3.50	10.00	8.00	0.00	0.544	20.311*
ARM C	3.00	4.00	2.00	3.00	8.00	6.00	0.00	0.524	11.719

V = approach half-width Lm = effective flare length A = distance between arms
E = entry width Vm = minimum approach half-width K= entry corner kerb line G=gradient over 50 m
WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

T6

ARM	ADJUSTMENT TO INTERCEPT (PCU/MIN)
B	5.000

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C
17.00 - 18.00		TURNING PROPORTIONS		
	ARM A	0.000	0.977	0.023
		TURNING COUNTS		
		0.0	547.0	13.0
		(PERCENTAGE OF H.V.S)		
		(0.0)	(0.0)	(0.0)
	ARM B	0.832	0.000	0.168
		683.0	0.0	138.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.046	0.954	0.000
		8.0	166.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	9.33	14.66	0.636	- -	-	0.0	1.7	23.4	- 0.180
ARM B	13.68	20.19	0.677	- -	-	0.0	2.0	28.3	- 0.147
ARM C	2.90	5.82	0.499	- -	-	0.0	1.0	12.9	- 0.329

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	9.33	14.63	0.638	- -	-	1.7	1.7	25.7	- 0.189
ARM B	13.68	20.19	0.677	- -	-	2.0	2.1	30.8	- 0.153
ARM C	2.90	5.76	0.504	- -	-	1.0	1.0	14.6	- 0.350

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	9.33	14.63	0.638	- -	-	1.7	1.7	26.0	- 0.189
ARM B	13.68	20.19	0.677	- -	-	2.1	2.1	31.1	- 0.153
ARM C	2.90	5.76	0.504	- -	-	1.0	1.0	14.9	- 0.350

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	9.33	14.63	0.638	- -	-	1.7	1.7	26.1	-	0.189
ARM B	13.68	20.19	0.677	- -	-	2.1	2.1	31.2	-	0.153
ARM C	2.90	5.76	0.504	- -	-	1.0	1.0	15.0	-	0.350

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	1.7	**
17.30	1.7	**
17.45	1.7	**
18.00	1.7	**

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	2.0	**
17.30	2.1	**
17.45	2.1	**
18.00	2.1	**

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	1.0	*
17.30	1.0	*
17.45	1.0	*
18.00	1.0	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	559.8	559.8	101.4	0.18	101.5	0.18
B	820.8	820.8	121.5	0.15	121.6	0.15
C	174.0	174.0	57.4	0.33	57.5	0.33
ALL	1554.6	1554.6	280.3	0.18	280.6	0.18

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

_____ A R C A D Y 6 _____

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

_____

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J4-A1081 jw The Common\10338-J4 A1081 jw The Common - 2031 AM [flat].vai"
(drive-on-the-left) at 12:07:50 on Wednesday, 25 May 2016

FILE PROPERTIES

RUN TITLE: 10338-J4 A1081 jw The Common - 2031 AM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - A1081 (S)
ARM C - The Common

MINI-ROUNDABOUT GEOMETRIC DATA

JUNCTION IN LONDON
LIGHTING CONDITIONS : NORMAL
ROAD SURFACE CONDITION: NORMAL

T5

ARM	V (M)	E (M)	Lm(M)	Vm(M)	A (M)	K (M)	G (%)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	4.50	5.00	3.50	16.00	14.00	0.00	0.588	21.253*
ARM B	3.50	4.00	2.00	3.50	10.00	8.00	0.00	0.544	15.311
ARM C	3.00	4.00	2.00	3.00	8.00	6.00	0.00	0.524	11.719

V = approach half-width Lm = effective flare length A = distance between arms
E = entry width Vm = minimum approach half-width K= entry corner kerb line G=gradient over 50 m
WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

T6

ARM	ADJUSTMENT TO INTERCEPT (PCU/MIN)
A	5.000

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/T	ARM A	ARM B	ARM C
08.00 - 09.00				
	ARM A	0.000	0.948	0.052
		0.0	1067.0	58.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.732	0.000	0.268
		594.0	0.0	218.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.101	0.899	0.000
		29.0	257.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	18.75	18.81	0.997	- -	-	0.0	15.9	157.3	- 0.647
ARM B	13.54	14.81	0.914	- -	-	0.0	7.4	84.4	- 0.479
ARM C	4.77	6.72	0.710	- -	-	0.0	2.2	28.2	- 0.451
08.15-08.30									
ARM A	18.75	18.74	1.000	- -	-	15.9	23.0	294.6	- 1.228
ARM B	13.54	14.80	0.915	- -	-	7.4	8.6	121.0	- 0.678
ARM C	4.77	6.56	0.727	- -	-	2.2	2.5	35.5	- 0.544
08.30-08.45									
ARM A	18.75	18.73	1.001	- -	-	23.0	28.5	388.0	- 1.548
ARM B	13.54	14.79	0.915	- -	-	8.6	9.1	133.1	- 0.718
ARM C	4.77	6.55	0.729	- -	-	2.5	2.5	37.7	- 0.557

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00								
ARM A	18.75	18.73	1.001	- - -	28.5	33.2	463.9 -	1.804
ARM B	13.54	14.79	0.915	- - -	9.1	9.5	139.6 -	0.735
ARM C	4.77	6.54	0.729	- - -	2.5	2.6	38.6 -	0.558

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	15.9	**********
08.30	23.0	**********
08.45	28.5	**********
09.00	33.2	**********

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	7.4	*******
08.30	8.6	*********
08.45	9.1	*********
09.00	9.5	*********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	2.2	**
08.30	2.5	**
08.45	2.5	***
09.00	2.6	***

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1125.0	1125.0	1303.8	1.16	1333.3	1.19
B	812.4	812.4	478.1	0.59	481.2	0.59
C	286.2	286.2	140.0	0.49	140.5	0.49
ALL	2223.6	2223.6	1921.9	0.86	1954.9	0.88

T75

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 10:32:36 on 01/06/2016]

_____ A R C A D Y 6 _____

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

_____

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J4-A1081 jw The Common\10338-J4 A1081 jw The Common - 2031 PM [flat].vai"
(drive-on-the-left) at 12:07:55 on Wednesday, 25 May 2016

FILE PROPERTIES
****

RUN TITLE: 10338-J4 A1081 jw The Common - 2031 PM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA
****
ARM A - A1081 (N)
ARM B - A1081 (S)
ARM C - The Common

MINI-ROUNDABOUT GEOMETRIC DATA

JUNCTION IN LONDON
LIGHTING CONDITIONS : NORMAL
ROAD SURFACE CONDITION: NORMAL

T5

ARM	V (M)	E (M)	Lm(M)	Vm(M)	A (M)	K (M)	G (%)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	4.50	5.00	3.50	16.00	14.00	0.00	0.588	16.253
ARM B	3.50	4.00	2.00	3.50	10.00	8.00	0.00	0.544	20.311*
ARM C	3.00	4.00	2.00	3.00	8.00	6.00	0.00	0.524	11.719

V = approach half-width Lm = effective flare length A = distance between arms
E = entry width Vm = minimum approach half-width K= entry corner kerb line G=gradient over 50 m
WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

T6

	ADJUSTMENT TO INTERCEPT (PCU/MIN)
ARM B	5.000

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
17.00 - 18.00	ARM A	0.000	0.976	0.024
		0.0	663.0	16.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.832	0.000	0.168
		828.0	0.0	167.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.047	0.953	0.000
		10.0	201.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	11.32	14.39	0.787	- - -	0.0	3.4	43.8	-	0.287
ARM B	16.59	20.17	0.823	- - -	0.0	4.2	54.8	-	0.244
ARM C	3.52	4.61	0.763	- - -	0.0	2.6	31.7	-	0.715
17.15-17.30									
ARM A	11.32	14.31	0.791	- - -	3.4	3.6	52.5	-	0.330
ARM B	16.59	20.17	0.823	- - -	4.2	4.4	65.1	-	0.276
ARM C	3.52	4.49	0.783	- - -	2.6	3.1	43.8	-	0.944
17.30-17.45									
ARM A	11.32	14.30	0.792	- - -	3.6	3.7	54.4	-	0.334
ARM B	16.59	20.17	0.823	- - -	4.4	4.5	66.8	-	0.278
ARM C	3.52	4.49	0.784	- - -	3.1	3.3	47.9	-	0.986

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	11.32	14.29	0.792	- - -	3.7	3.7	55.2	-	0.335
ARM B	16.59	20.17	0.823	- - -	4.5	4.5	67.6	-	0.279
ARM C	3.52	4.49	0.784	- - -	3.3	3.4	49.7	-	1.003

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	3.4	***
17.30	3.6	****
17.45	3.7	****
18.00	3.7	****

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	4.2	****
17.30	4.4	****
17.45	4.5	****
18.00	4.5	*****

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	2.6	***
17.30	3.1	***
17.45	3.3	***
18.00	3.4	***

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	679.2	679.2	205.9	0.30	206.4	0.30
B	995.4	995.4	254.4	0.26	254.9	0.26
C	211.2	211.2	173.1	0.82	174.3	0.83
ALL	1885.8	1885.8	633.3	0.34	635.6	0.34

T75

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 10:32:47 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J4-A1081 jw The Common\10338-J4 A1081 jw The Common - 2031+Dev AM [flat].vai"
(drive-on-the-left) at 12:14:11 on Wednesday, 25 May 2016

FILE PROPERTIES

RUN TITLE: 10338-J4 A1081 jw The Common - 2031+Dev AM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - A1081 (S)
ARM C - The Common

MINI-ROUNDABOUT GEOMETRIC DATA

JUNCTION IN LONDON
LIGHTING CONDITIONS : NORMAL
ROAD SURFACE CONDITION: NORMAL

T5

ARM	V (M)	E (M)	Lm(M)	Vm(M)	A (M)	K (M)	G (%)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	4.50	5.00	3.50	16.00	14.00	0.00	0.588	21.253*
ARM B	3.50	4.00	2.00	3.50	10.00	8.00	0.00	0.544	15.311
ARM C	3.00	4.00	2.00	3.00	8.00	6.00	0.00	0.524	11.719

V = approach half-width Lm = effective flare length A = distance between arms
E = entry width Vm = minimum approach half-width K= entry corner kerb line G=gradient over 50 m
WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

T6

ARM	ADJUSTMENT TO INTERCEPT (PCU/MIN)
A	5.000

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

IARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/T	ARM A	ARM B	ARM C
08.00 - 09.00	ARM A	0.000	0.949	0.051
		0.0	1080.0	58.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.741	0.000	0.259
		633.0	0.0	221.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.100	0.900	0.000
		29.0	261.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	18.97	18.78	1.010	- - -	0.0	17.8	171.9	-	-0.053
ARM B	14.23	14.82	0.960	- - -	0.0	10.5	111.2	-	0.605
ARM C	4.84	6.47	0.748	- - -	0.0	2.6	32.4	-	0.515
08.15-08.30									
ARM A	18.97	18.71	1.014	- - -	17.8	27.1	339.8	-	1.397
ARM B	14.23	14.80	0.961	- - -	10.5	13.4	181.9	-	0.994
ARM C	4.84	6.27	0.772	- - -	2.6	3.0	42.9	-	0.664
08.30-08.45									
ARM A	18.97	18.70	1.015	- - -	27.1	34.9	466.1	-	1.834
ARM B	14.23	14.80	0.962	- - -	13.4	15.2	216.1	-	1.135
ARM C	4.84	6.24	0.776	- - -	3.0	3.2	46.7	-	0.694

TRL TRL Viewer 3.2 AG P:\.. \J4-A1081 jw The Common\10338-J4 A1081 jw The Common - 2031+Dev AM [flat].vao -

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	18.97	18.69	1.015	- - -	34.9	41.8	576.1	-	2.215
ARM B	14.23	14.80	0.962	- - -	15.2	16.5	238.6	-	1.224
ARM C	4.84	6.23	0.777	- - -	3.2	3.3	48.5	-	0.706

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	17.8	******************
08.30	27.1	***************************
08.45	34.9	**********************************
09.00	41.8	**

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	10.5	**********
08.30	13.4	*************
08.45	15.2	***************
09.00	16.5	*****************

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	2.6	***
08.30	3.0	***
08.45	3.2	***
09.00	3.3	***

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1138.2	1138.2	1553.9	1.37	1600.7	1.41
B	853.8	853.8	747.8	0.88	757.0	0.89
C	290.4	290.4	170.5	0.59	171.4	0.59
ALL	2282.4	2282.4	2472.1	1.08	2529.0	1.11

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
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END OF JOB

========== end of file ==========

Printed at 10:33:19 on 01/06/2016]

_____ A R C A D Y 6 _____

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)
Patch 15 Apr 2011

_____

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J4-A1081 jw The Common\10338-J4 A1081 jw The Common - 2031+Dev PM [flat].vai"
(drive-on-the-left) at 12:08:06 on Wednesday, 25 May 2016

FILE PROPERTIES
****

RUN TITLE: 10338-J4 A1081 jw The Common - 2031+Dev PM [flat]
LOCATION: Harpenden
DATE: 25/05/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA
****
ARM A - A1081 (N)
ARM B - A1081 (S)
ARM C - The Common

MINI-ROUNDABOUT GEOMETRIC DATA

JUNCTION IN LONDON
LIGHTING CONDITIONS : NORMAL
ROAD SURFACE CONDITION: NORMAL

T5

ARM	V (M)	E (M)	Lm(M)	Vm(M)	A (M)	K (M)	G (%)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	4.50	5.00	3.50	16.00	14.00	0.00	0.588	16.253
ARM B	3.50	4.00	2.00	3.50	10.00	8.00	0.00	0.544	20.311*
ARM C	3.00	4.00	2.00	3.00	8.00	6.00	0.00	0.524	11.719

V = approach half-width Lm = effective flare length A = distance between arms
E = entry width Vm = minimum approach half-width K= entry corner kerb line G=gradient over 50 m
WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

T6

	ADJUSTMENT TO INTERCEPT (PCU/MIN)
ARM B	5.000

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	ARM A	ARM B	ARM C
17.00 - 18.00		TURNING PROPORTIONS		
	ARM A	0.000	0.978	0.022
		TURNING COUNTS		
		0.0	708.0	16.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.836	0.000	0.164
		855.0	0.0	168.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.047	0.953	0.000
		10.0	202.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	12.06	14.39	0.838	- -	-	0.0	4.5	55.8	- 0.349
ARM B	17.06	20.17	0.846	- -	-	0.0	4.9	62.0	- 0.270
ARM C	3.53	4.39	0.804	- -	-	0.0	3.1	36.1	- 0.826

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	12.06	14.30	0.843	- -	-	4.5	4.9	71.0	- 0.429
ARM B	17.06	20.17	0.846	- -	-	4.9	5.2	75.6	- 0.316
ARM C	3.53	4.26	0.829	- -	-	3.1	3.8	53.1	- 1.176

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	12.06	14.29	0.844	- -	-	4.9	5.1	75.0	- 0.439
ARM B	17.06	20.17	0.846	- -	-	5.2	5.3	78.2	- 0.319
ARM C	3.53	4.25	0.830	- -	-	3.8	4.1	60.0	- 1.258

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	12.06	14.28	0.844	- - -	5.1	5.2	76.9	-	0.443
ARM B	17.06	20.17	0.846	- - -	5.3	5.3	79.3	-	0.320
ARM C	3.53	4.25	0.830	- - -	4.1	4.3	63.4	-	1.291

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	4.5	****
17.30	4.9	*****
17.45	5.1	*****
18.00	5.2	*****

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	4.9	*****
17.30	5.2	*****
17.45	5.3	*****
18.00	5.3	*****

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	3.1	***
17.30	3.8	****
17.45	4.1	****
18.00	4.3	****

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	723.6	723.6	278.7	0.39	279.7	0.39
B	1023.6	1023.6	295.1	0.29	295.8	0.29
C	211.8	211.8	212.6	1.00	214.7	1.01
ALL	1959.0	1959.0	786.4	0.40	790.2	0.40

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
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* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 10:33:09 on 01/06/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J4-A1081 jw The Common\
10338-J4 A1081 jw The Common [HL-09] - 2031+Dev Rev3 AM [flat].vai"
(drive-on-the-left) at 10:29:50 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338-J4 A1081 jw The Common [HL-09] - 2031+Dev Rev3 AM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - A1081 (S)
ARM C - The Common

MINI-ROUNDABOUT GEOMETRIC DATA

JUNCTION IN LONDON
LIGHTING CONDITIONS : NORMAL
ROAD SURFACE CONDITION: NORMAL

T5

ARM	V (M)	E (M)	Lm(M)	Vm(M)	A (M)	K (M)	G (%)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	5.00	5.00	3.50	16.00	14.00	0.00	0.596	21.800*
ARM B	3.50	6.00	2.00	3.50	10.00	8.00	0.00	0.555	16.092
ARM C	3.00	4.00	2.00	3.00	8.00	6.00	0.00	0.524	11.719

V = approach half-width Lm = effective flare length A = distance between arms
E = entry width Vm = minimum approach half-width K= entry corner kerb line G=gradient over 50 m
WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

T6

	ADJUSTMENT TO INTERCEPT (PCU/MIN)
ARM A	5.000

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS(08.00)AND ENDS(09.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.00		TURNING PROPORTIONS		
		TURNING COUNTS		
		(PERCENTAGE OF H.V.S)		
	ARM A	0.000	0.949	0.051
		0.0	1087.0	58.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.745	0.000	0.255
		647.0	0.0	221.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.100	0.900	0.000
		29.0	261.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	19.09	19.31	0.989	- -	-	0.0	14.9	150.8	- 0.608
ARM B	14.48	15.58	0.929	- -	-	0.0	8.4	93.9	- 0.498
ARM C	4.84	6.28	0.770	- -	-	0.0	2.8	35.0	- 0.561

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	19.09	19.22	0.993	- -	-	14.9	21.2	274.4	- 1.122
ARM B	14.48	15.57	0.930	- -	-	8.4	9.9	139.0	- 0.735
ARM C	4.84	6.11	0.793	- -	-	2.8	3.3	47.3	- 0.736

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	19.09	19.21	0.994	- -	-	21.2	25.9	354.5	- 1.391
ARM B	14.48	15.56	0.930	- -	-	9.9	10.7	155.7	- 0.788
ARM C	4.84	6.09	0.795	- -	-	3.3	3.5	51.8	- 0.769

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	19.09	19.21	0.994	- -	-	25.9	29.7	417.3	- 1.599
ARM B	14.48	15.56	0.930	- -	-	10.7	11.2	165.0	- 0.817
ARM C	4.84	6.08	0.796	- -	-	3.5	3.6	53.8	- 0.784

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	14.9	***************
08.30	21.2	**********************
08.45	25.9	**************************
09.00	29.7	******************************

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	8.4	********
08.30	9.9	**********
08.45	10.7	***********
09.00	11.2	***********

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	2.8	***
08.30	3.3	***
08.45	3.5	****
09.00	3.6	****

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *		T75
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	
A	1145.4	1145.4	1196.9	1.04	1219.8	1.06	
B	868.8	868.8	553.6	0.64	557.7	0.64	
C	290.4	290.4	187.8	0.65	188.9	0.65	
ALL	2304.6	2304.6	1938.3	0.84	1966.3	0.85	

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK

Run with file:-
"p:\10338\Traffic\Junctions\J4-A1081 jw The Common\
10338-J4 A1081 jw The Common [HL-09] - 2031+Dev Rev3 PM [flat].vai"
(drive-on-the-left) at 10:29:56 on Wednesday, 1 June 2016

FILE PROPERTIES

RUN TITLE: 10338-J4 A1081 jw The Common [HL-09] - 2031+Dev Rev3 PM [flat]
LOCATION: Harpenden
DATE: 01/06/16
CLIENT: Commercial Estates Group
ENUMERATOR: sue.tadman [BCL25]
JOB NUMBER: 10338
STATUS: Preliminary
DESCRIPTION: Existing Layout

INPUT DATA

ARM A - A1081 (N)
ARM B - A1081 (S)
ARM C - The Common

MINI-ROUNDABOUT GEOMETRIC DATA

JUNCTION IN LONDON
LIGHTING CONDITIONS : NORMAL
ROAD SURFACE CONDITION: NORMAL

T5

ARM	V (M)	E (M)	Lm(M)	Vm(M)	A (M)	K (M)	G (%)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.50	5.00	5.00	3.50	16.00	14.00	0.00	0.596	16.800
ARM B	3.50	6.00	2.00	3.50	10.00	8.00	0.00	0.555	21.092*
ARM C	3.00	4.00	2.00	3.00	8.00	6.00	0.00	0.524	11.719

V = approach half-width Lm = effective flare length A = distance between arms
E = entry width Vm = minimum approach half-width K= entry corner kerb line G=gradient over 50 m
WARNING One or more intercept values (flagged * in the table)
have been adjusted according to local input values
from a previous run and listed below -

T6

ARM	ADJUSTMENT TO INTERCEPT (PCU/MIN)
B	5.000

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.00)

LENGTH OF TIME PERIOD -(60) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

DEMAND SET TITLE: as above

DEMAND SET TITLE: as above

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
17.00 - 18.00	ARM A	0.000	0.978	0.022
		0.0	719.0	16.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.837	0.000	0.163
		865.0	0.0	168.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.047	0.953	0.000
		10.0	202.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	12.24	14.92	0.820	- - -	0.0	4.1	51.5	-	0.315
ARM B	17.22	20.95	0.822	- - -	0.0	4.2	55.0	-	0.235
ARM C	3.53	4.29	0.823	- - -	0.0	3.4	38.5	-	0.884

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	12.24	14.83	0.826	- - -	4.1	4.4	63.9	-	0.378
ARM B	17.22	20.94	0.822	- - -	4.2	4.4	65.0	-	0.265
ARM C	3.53	4.17	0.846	- - -	3.4	4.2	57.7	-	1.292

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	12.24	14.81	0.827	- -	-	4.4	4.5	66.9	- 0.384
ARM B	17.22	20.94	0.822	- -	-	4.4	4.5	66.7	- 0.267
ARM C	3.53	4.17	0.847	- -	-	4.2	4.5	65.8	- 1.392

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	12.24	14.80	0.827	- -	-	4.5	4.6	68.3	- 0.386
ARM B	17.22	20.94	0.822	- -	-	4.5	4.5	67.4	- 0.267
ARM C	3.53	4.17	0.847	- -	-	4.5	4.8	69.9	- 1.430

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	4.1	****
17.30	4.4	****
17.45	4.5	*****
18.00	4.6	*****

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	4.2	****
17.30	4.4	****
17.45	4.5	****
18.00	4.5	*****

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	3.4	***
17.30	4.2	****
17.45	4.5	*****
18.00	4.8	*****

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *		T75
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	
A	734.4	734.4	250.7	0.34	251.4	0.34	
B	1033.2	1033.2	254.2	0.25	254.7	0.25	
C	211.8	211.8	231.8	1.09	234.5	1.11	
ALL	1979.4	1979.4	736.7	0.37	740.6	0.37	

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

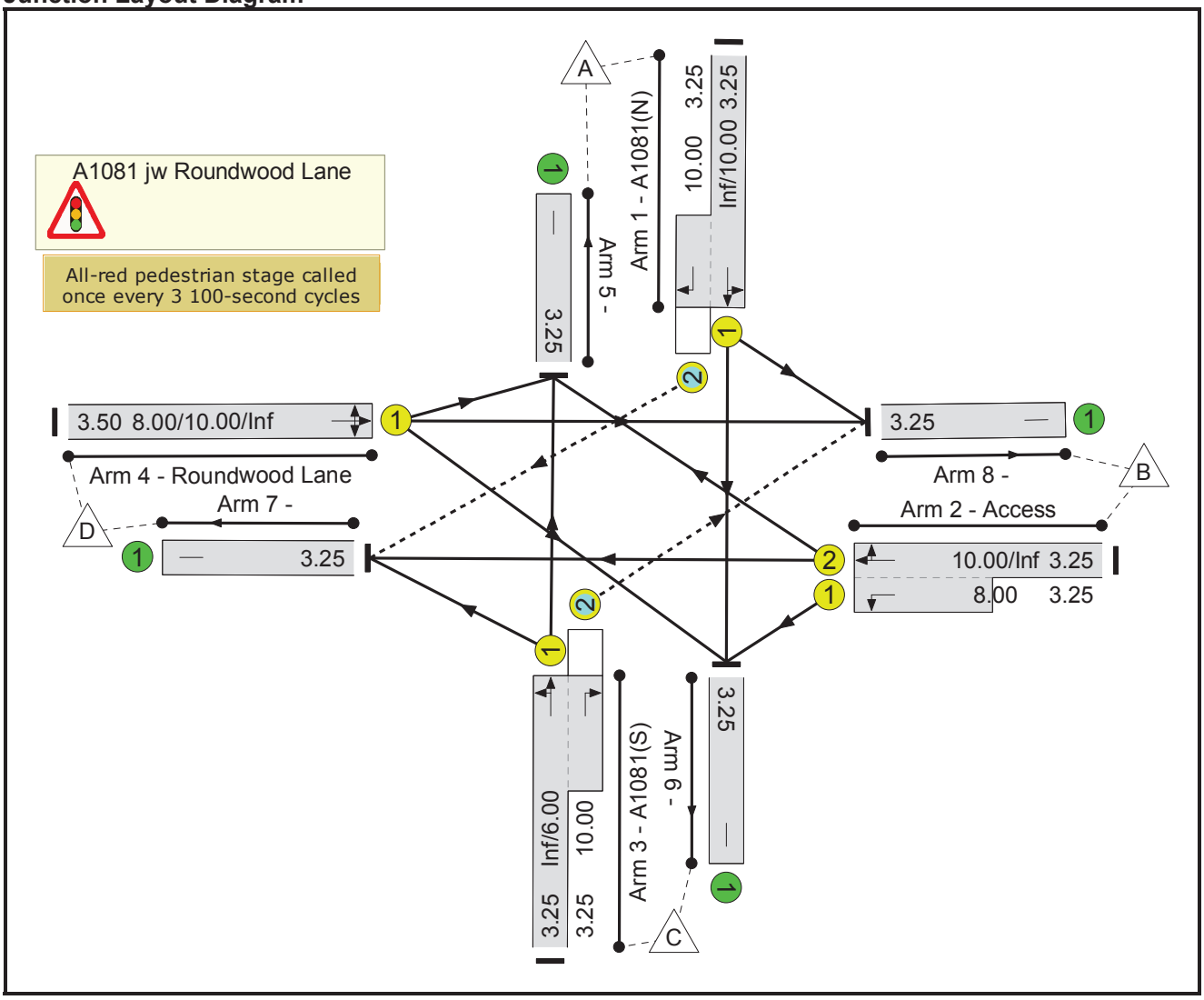
END OF JOB

Linsig Report

User and Project Details

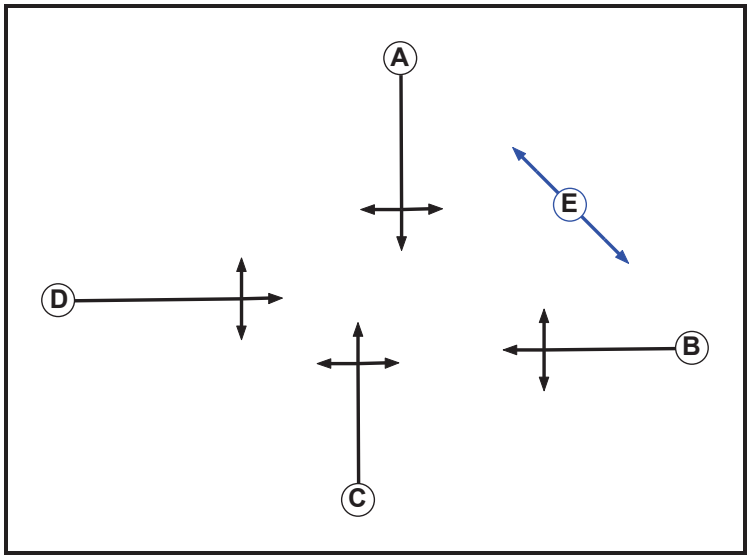
Project:	**Land at Harpenden**
Title:	**Roundwood Lane**
Location:	
File name:	10338-J5 A1081 jw Roundwood Lane and New Access [HL-01].lsg3x
Author:	SMT
Company:	Brookbanks Consulting Ltd

Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J5-A1081 jw Roundwood Lane\10338-J5 A1081 jw Roundwood Lane and New Access [HL-01].lsg3x

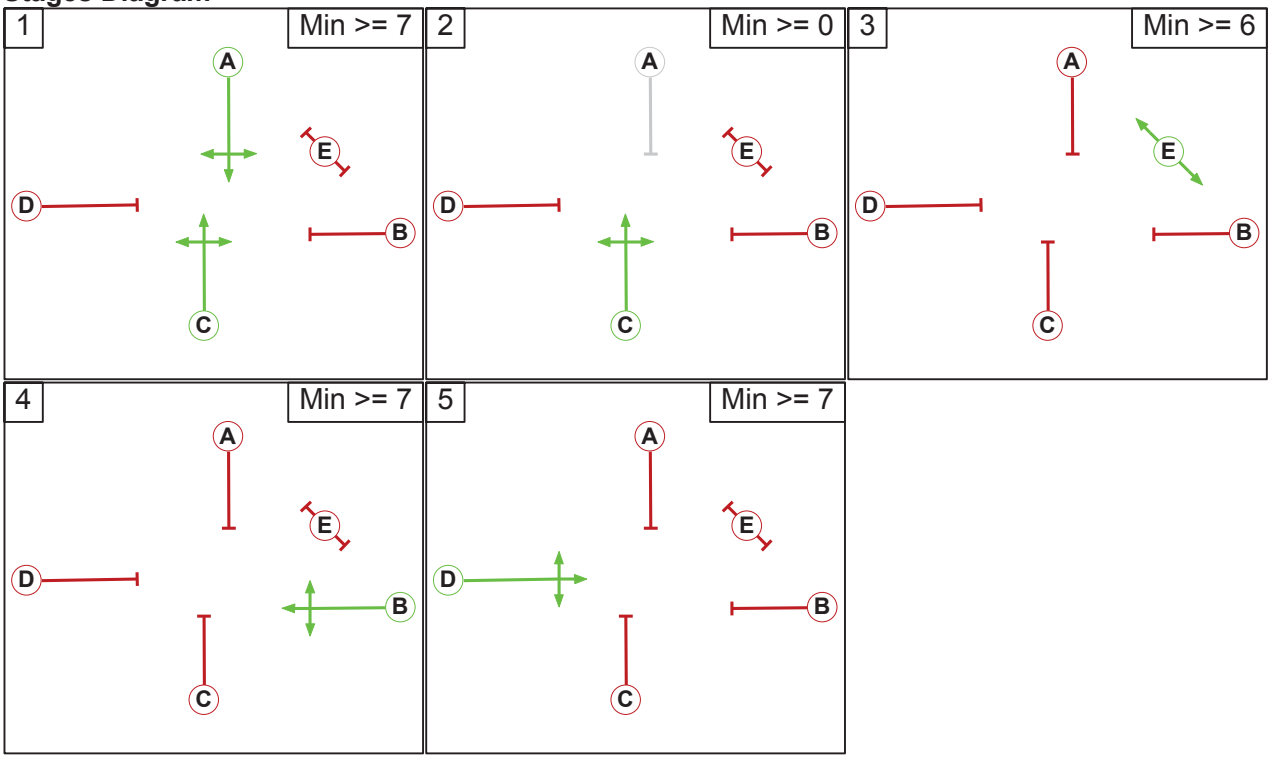
Phase Diagram



Phase Intergreens Matrix

Terminating Phase \ Starting Phase	A	B	C	D	E
A		6	-	5	8
B	5		5	6	8
C	-	5		5	8
D	5	6	5		8
E	8	8	8	8	

Stages Diagram



Linsig Report
P:\10338\Traffic\Junctions\J5-A1081 jw Roundwood Lane\10338-J5 A1081 jw Roundwood Lane and New Access [HL-01].lsg3x

Lane Input Data

Junction: A1081 jw Roundwood Lane

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (A1081(N))	U	A	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Ahead	Inf
											Arm 8 Left	10.00
1/2 (A1081(N))	O	A	2	3	4.0	Geom	-	3.25	0.00	N	Arm 7 Right	10.00
2/1 (Access)	U	B	2	3	6.0	Geom	-	3.25	0.00	Y	Arm 6 Left	8.00
2/2 (Access)	U	B	2	3	60.0	Geom	-	3.25	0.00	N	Arm 5 Right	10.00
											Arm 7 Ahead	Inf
3/1 (A1081(S))	U	C	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 5 Ahead	Inf
											Arm 7 Left	6.00
3/2 (A1081(S))	O	C	2	3	5.0	Geom	-	3.25	0.00	N	Arm 8 Right	10.00
4/1 (Roundwood Lane)	U	D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 5 Left	8.00
											Arm 6 Right	10.00
											Arm 8 Ahead	Inf

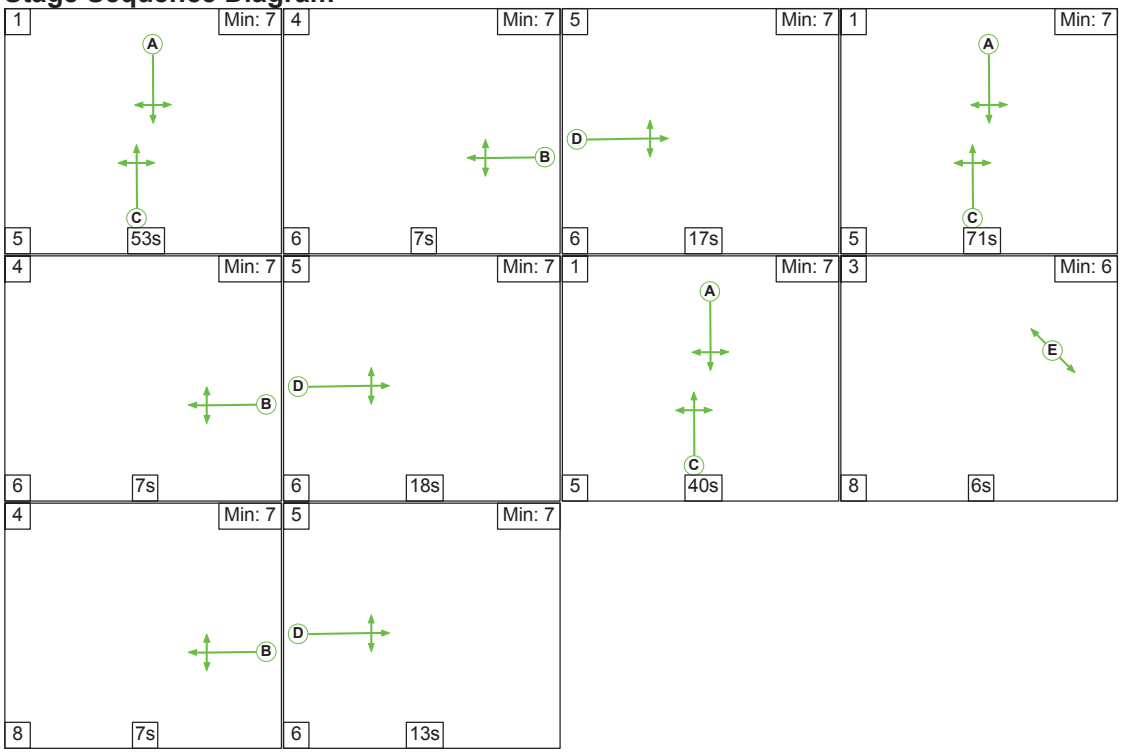
Linsig Report
P:\10338\Traffic\Junctions\J5-A1081 jw Roundwood Lane\10338-J5 A1081 jw Roundwood Lane and New Access [HL-01].lsg3x
Scenario 1: '2031+Dev Rev3 AM' (FG2: '2031+Dev Rev3 PM', Plan 2: 'Proposed AM')

Traffic Flows, Actual

Actual Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	26	911	36	973
	B	52	0	106	6	164
	C	627	83	0	104	814
	D	44	5	207	0	256
	Tot.	723	114	1224	146	2207

Stage Sequence Diagram



Linsig Report
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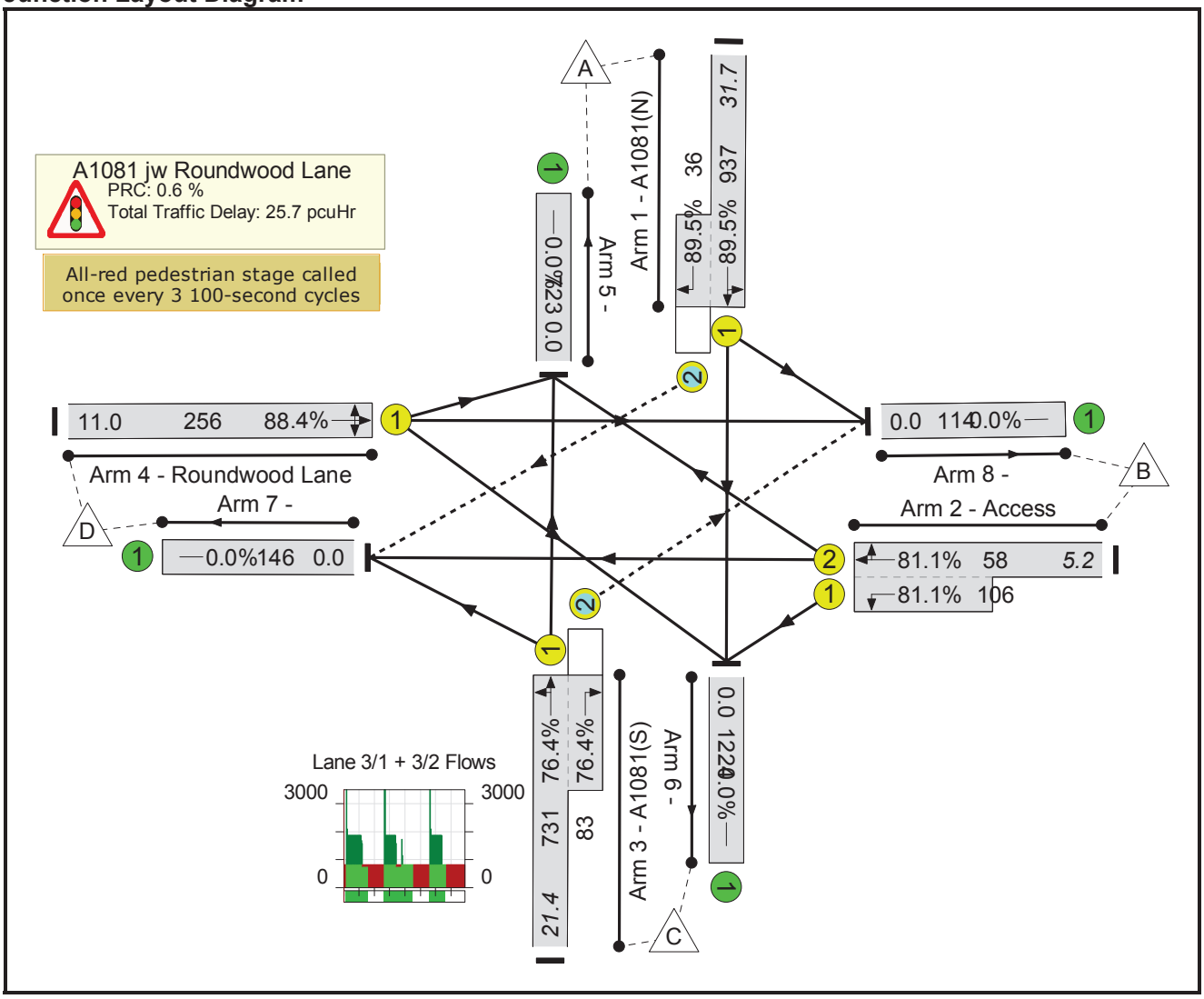
Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J5-A1081 jw Roundwood Lane\10338-J5 A1081 jw Roundwood Lane and New Access [HL-01].lsg3x

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Roundwood Lane	-	-	-		-	-	-	-	-	-	**89.5%**	**76**	**0**	**43**	**25.7**	-	-
A1081 jw Roundwood Lane	-	-	-		-	-	-	-	-	-	**89.5%**	**76**	**0**	**43**	**25.7**	-	-
1/1+1/2	A1081(N) Ahead Right Left	U+O	A		3	164	-	973	1932:1809	1047+40	89.5 : 89.5%	36	0	0	9.4	34.7	31.7
2/2+2/1	Access Right Left Ahead	U	B		3	21	-	164	1833:1634	72+131	81.1 : 81.1%	-	-	-	4.0	87.9	5.2
3/1+3/2	A1081(S) Ahead Left Right	U+O	C		3	166	-	814	1873:1809	957+109	76.4 : 76.4%	40	0	43	6.2	27.2	21.4
4/1	Roundwood Lane Left Right Ahead	U	D		3	48	-	256	1703	290	88.4%	-	-	-	6.1	86.0	11.0

C1 PRC for Signalled Lanes (%): 0.6 Total Delay for Signalled Lanes (pcuHr): 25.66 Cycle Time (s): 300
PRC Over All Lanes (%): 0.6 Total Delay Over All Lanes(pcuHr): 25.66

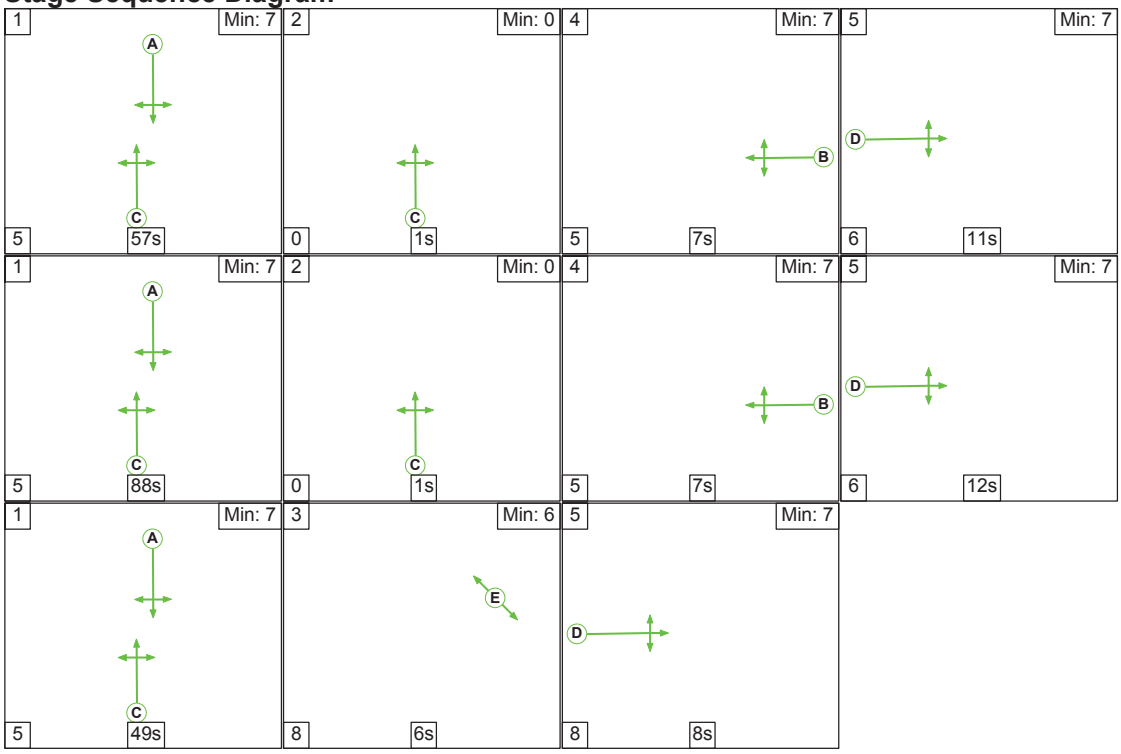
Linsig Report
P:\10338\Traffic\Junctions\J5-A1081 jw Roundwood Lane\10338-J5 A1081 jw Roundwood Lane and New Access [HL-01].lsg3x
Scenario 2: '2031+Dev Rev3 PM' (FG2: '2031+Dev Rev3 PM', Plan 3: 'Proposed PM')

Traffic Flows, Actual

Actual Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	50	785	31	866
	B	34	0	54	3	91
	C	928	75	0	119	1122
	D	37	4	130	0	171
	Tot.	999	129	969	153	2250

Stage Sequence Diagram



Linsig Report
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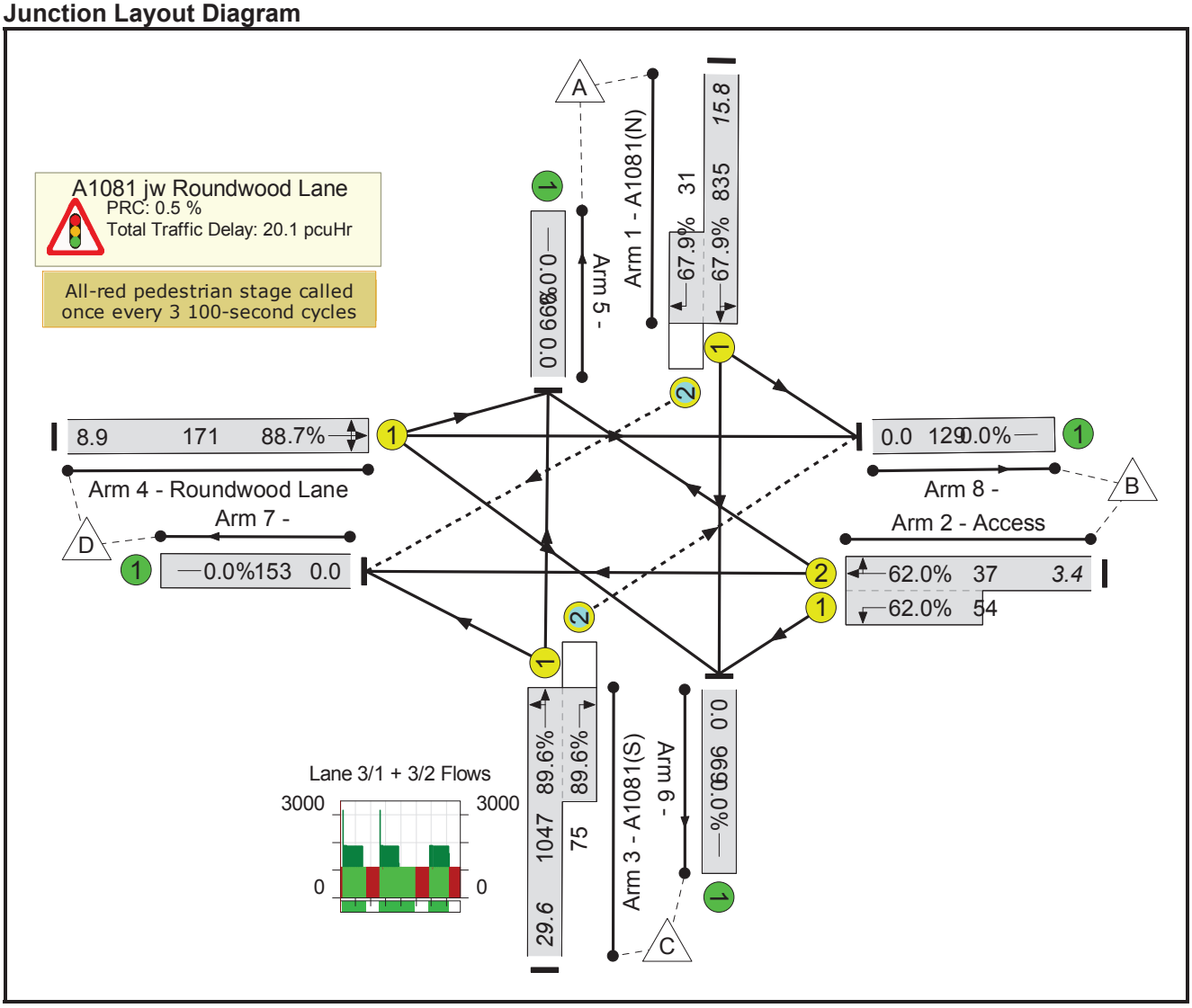
Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J5-A1081 jw Roundwood Lane\10338-J5 A1081 jw Roundwood Lane and New Access [HL-01].lsg3x

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Roundwood Lane	-	-	-		-	-	-	-	-	-	**89.6%**	**98**	**0**	**8**	**20.1**	-	-
A1081 jw Roundwood Lane	-	-	-		-	-	-	-	-	-	**89.6%**	**98**	**0**	**8**	**20.1**	-	-
1/1+1/2	A1081(N) Ahead Right Left	U+O	A		3	194	-	866	1923:1809	1229+46	67.9 : 67.9%	23	0	8	3.8	15.6	15.8
2/2+2/1	Access Right Left Ahead	U	B		2	14	-	91	1828:1634	60+87	62.0 : 62.0%	-	-	-	2.6	103.0	3.4
3/1+3/2	A1081(S) Ahead Left Right	U+O	C		3	196	-	1122	1886:1809	1169+84	89.6 : 89.6%	74	0	0	8.5	27.4	29.6
4/1	Roundwood Lane Left Right Ahead	U	D		3	31	-	171	1702	193	88.7%	-	-	-	5.2	109.4	8.9

C1 PRC for Signalled Lanes (%): 0.5 Total Delay for Signalled Lanes (pcuHr): 20.10 Cycle Time (s): 300
PRC Over All Lanes (%): 0.5 Total Delay Over All Lanes(pcuHr): 20.10

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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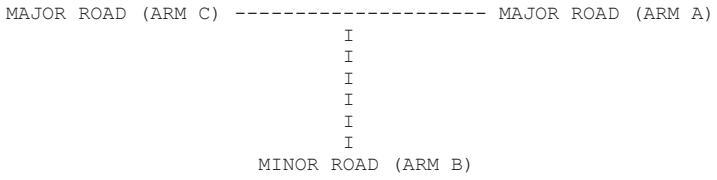
Run with file:-
"C:_SUE\PICADY temp\10338-J6 A1081 jw Cooters End lane - 2015 AM [flat].vpi"
(drive-on-the-left) at 12:29:35 on Thursday, 27 August 2015

RUN INFORMATION

RUN TITLE	: 10338-J6 A1081 jw Cooters End Lane - 2015 AM [flat]
LOCATION	: Harpenden
DATE	: 27/08/15
CLIENT	:
ENUMERATOR	: Sue.tadman [BCL25]
JOB NUMBER	: 10338
STATUS	: Preliminary
DESCRIPTION	: Existing Layout

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS A1081 (N)
ARM B IS Cooters End lane
ARM C IS A1081 (S)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	120.00 M.
- BLOCKS TRAFFIC (SPACES)		NO (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
680.59	0.25	0.10

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
552.17	0.24	0.10	0.15	0.35

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
734.50	0.27	0.27

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: as above

TIME PERIOD BEGINS 08.00 AND ENDS 09.00

LENGTH OF TIME PERIOD - 60 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.
DEMAND FLOW PROFILES ARE INPUT DIRECTLY

Demand set: as above

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
08.00 - 09.00	ARM A	0.000 0.0 (0.0)	0.009 10.0 (0.0)	0.991 1082.0 (0.0)
	ARM B	0.091 10.0 (0.0)	0.000 0.0 (0.0)	0.909 100.0 (0.0)
	ARM C	0.930 660.0 (0.0)	0.070 50.0 (0.0)	0.000 0.0 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	1.83	6.02	0.304		0.00	0.43	6.0		0.24
C-A	11.00								
C-B	0.83	7.29	0.114		0.00	0.13	1.8		0.15
A-B	0.17								
A-C	18.03								
08.15-08.30									
B-AC	1.83	6.01	0.304		0.43	0.43	6.5		0.24
C-A	11.00								
C-B	0.83	7.29	0.114		0.13	0.13	1.9		0.15
A-B	0.17								
A-C	18.03								
08.30-08.45									
B-AC	1.83	6.01	0.304		0.43	0.43	6.5		0.24
C-A	11.00								
C-B	0.83	7.29	0.114		0.13	0.13	1.9		0.15
A-B	0.17								
A-C	18.03								
08.45-09.00									
B-AC	1.83	6.01	0.304		0.43	0.43	6.5		0.24
C-A	11.00								
C-B	0.83	7.29	0.114		0.13	0.13	1.9		0.15
A-B	0.17								
A-C	18.03								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.4
08.30	0.4
08.45	0.4
09.00	0.4

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	109.8	109.8	25.5	0.23	25.5	0.23
C-A	659.8	659.8				
C-B	50.0	50.0	7.6	0.15	7.6	0.15
A-B	10.0	10.0				
A-C	1082.0	1082.0				
ALL	1911.6	1911.6	33.1	0.02	33.1	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

========== end of file ==========

Printed at 16:01:54 on 01/06/2016]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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EMAIL: software@trl.co.uk

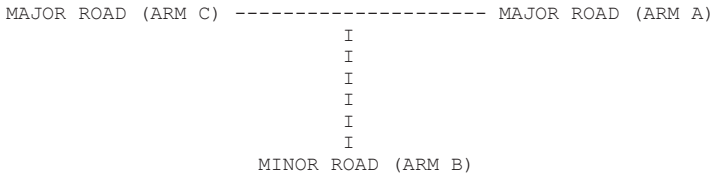
Run with file:-
"C:_SUE\PICADY temp\10338-J6 A1081 jw Cooters End lane - 2015 PM [flat].vpi"
(drive-on-the-left) at 12:30:33 on Thursday, 27 August 2015

RUN INFORMATION

RUN TITLE	: 10338-J6 A1081 jw Cooters End Lane - 2015 PM [flat]
LOCATION	: Harpenden
DATE	: 27/08/15
CLIENT	:
ENUMERATOR	: Sue.tadman [BCL25]
JOB NUMBER	: 10338
STATUS	: Preliminary
DESCRIPTION	: Existing Layout

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS A1081 (N)
ARM B IS Cooters End lane
ARM C IS A1081 (S)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 7.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.50 M.
- VISIBILITY	(VC-B) 120.00 M.
- BLOCKS TRAFFIC (SPACES)	NO (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 90.0 M.
- VISIBILITY TO RIGHT	(VB-A) 90.0 M.
- LANE 1 WIDTH	(WB-C) 3.00 M.
- LANE 2 WIDTH	(WB-A) 0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
680.59	0.25	0.10

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
552.17	0.24	0.10	0.15	0.35

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
734.50	0.27	0.27

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: as above

TIME PERIOD BEGINS 17.00 AND ENDS 18.00

LENGTH OF TIME PERIOD - 60 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.
DEMAND FLOW PROFILES ARE INPUT DIRECTLY

Demand set: as above

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
17.00 - 18.00	ARM A	0.000 0.0 (0.0)	0.014 10.0 (0.0)	0.986 703.0 (0.0)
	ARM B	0.167 10.0 (0.0)	0.000 0.0 (0.0)	0.833 50.0 (0.0)
	ARM C	0.890 811.0 (0.0)	0.110 100.0 (0.0)	0.000 0.0 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-AC	1.00	6.91	0.145		0.00	0.17	2.4		
C-A	13.51								
C-B	1.67	9.01	0.185		0.00	0.22	3.2		
A-B	0.17								
A-C	11.71								
17.15-17.30									
B-AC	1.00	6.91	0.145		0.17	0.17	2.5		
C-A	13.51								
C-B	1.67	9.01	0.185		0.22	0.23	3.4		
A-B	0.17								
A-C	11.71								
17.30-17.45									
B-AC	1.00	6.91	0.145		0.17	0.17	2.5		
C-A	13.51								
C-B	1.67	9.01	0.185		0.23	0.23	3.4		
A-B	0.17								
A-C	11.71								
17.45-18.00									
B-AC	1.00	6.91	0.145		0.17	0.17	2.5		
C-A	13.51								
C-B	1.67	9.01	0.185		0.23	0.23	3.4		
A-B	0.17								
A-C	11.71								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.2
17.30	0.2
17.45	0.2
18.00	0.2

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.2
17.30	0.2
17.45	0.2
18.00	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	60.0	60.0	10.0	0.17	10.0	0.17
C-A	810.8	810.8				
C-B	100.0	100.0	13.4	0.13	13.4	0.13
A-B	10.0	10.0				
A-C	702.8	702.8				
ALL	1683.6	1683.6	23.4	0.01	23.4	0.01

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

****** PICADY 5 run completed.

========== end of file ==========

Printed at 16:02:06 on 01/06/2016]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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EMAIL: software@trl.co.uk

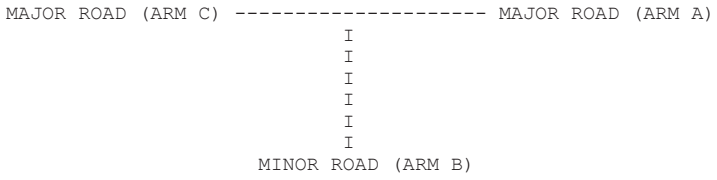
Run with file:-
"C:_SUE\PICADY temp\10338-J6 A1081 jw Cooters End lane - 2031 AM [flat].vpi"
(drive-on-the-left) at 12:26:34 on Wednesday, 25 May 2016

RUN INFORMATION

RUN TITLE	: 10338-J6 A1081 jw Cooters End Lane - 2031 AM [flat]
LOCATION	: Harpenden
DATE	: 25/05/16
CLIENT	:
ENUMERATOR	: Sue.tadman [BCL25]
JOB NUMBER	: 10338
STATUS	: Preliminary
DESCRIPTION	: Existing Layout

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS A1081 (N)
ARM B IS Cooters End lane
ARM C IS A1081 (S)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	120.00 M.
- BLOCKS TRAFFIC (SPACES)		NO (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
680.59	0.25	0.10

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
552.17	0.24	0.10	0.15	0.35

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
734.50	0.27	0.27

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: as above

TIME PERIOD BEGINS 08.00 AND ENDS 09.00

LENGTH OF TIME PERIOD - 60 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.
DEMAND FLOW PROFILES ARE INPUT DIRECTLY

Demand set: as above

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
08.00 - 09.00	ARM A	0.000 0.0 (0.0)	0.009 12.0 (0.0)	0.991 1312.0 (0.0)
	ARM B	0.090 12.0 (0.0)	0.000 0.0 (0.0)	0.910 121.0 (0.0)
	ARM C	0.929 800.0 (0.0)	0.071 61.0 (0.0)	0.000 0.0 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	2.22	4.59	0.484		0.00	0.89	12.0		0.40
C-A	13.33								
C-B	1.02	6.23	0.163		0.00	0.19	2.7		0.19
A-B	0.20								
A-C	21.87								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	2.22	4.59	0.484		0.89	0.91	13.6		0.42
C-A	13.33								
C-B	1.02	6.23	0.163		0.19	0.19	2.9		0.19
A-B	0.20								
A-C	21.87								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	2.22	4.59	0.484		0.91	0.92	13.8		0.42
C-A	13.33								
C-B	1.02	6.23	0.163		0.19	0.19	2.9		0.19
A-B	0.20								
A-C	21.87								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	2.22	4.59	0.484		0.92	0.93	13.9		0.42
C-A	13.33								
C-B	1.02	6.23	0.163		0.19	0.19	2.9		0.19
A-B	0.20								
A-C	21.87								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	0.9	*
08.30	0.9	*
08.45	0.9	*
09.00	0.9	*

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.2
08.30	0.2
08.45	0.2
09.00	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	133.2	133.2	53.2	0.40	53.2	0.40
C-A	800.0	800.0				
C-B	61.0	61.0	11.4	0.19	11.4	0.19
A-B	12.0	12.0				
A-C	1312.2	1312.2				
ALL	2318.4	2318.4	64.6	0.03	64.7	0.03

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

========== end of file ==========

Printed at 11:47:21 on 01/06/2016]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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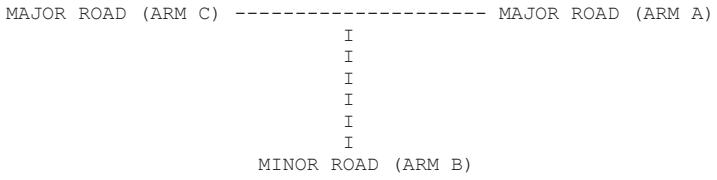
Run with file:-
"C:_SUE\PICADY temp\10338-J6 A1081 jw Cooters End lane - 2031 PM [flat].vpi"
(drive-on-the-left) at 12:26:40 on Wednesday, 25 May 2016

RUN INFORMATION

RUN TITLE	: 10338-J6 A1081 jw Cooters End Lane - 2031 PM [flat]
LOCATION	: Harpenden
DATE	: 25/05/16
CLIENT	:
ENUMERATOR	: Sue.tadman [BCL25]
JOB NUMBER	: 10338
STATUS	: Preliminary
DESCRIPTION	: Existing Layout

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS A1081 (N)
ARM B IS Cooters End lane
ARM C IS A1081 (S)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	120.00 M.
- BLOCKS TRAFFIC (SPACES)		NO (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
680.59	0.25	0.10

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
552.17	0.24	0.10	0.15	0.35

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
734.50	0.27	0.27

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: as above

TIME PERIOD BEGINS 17.00 AND ENDS 18.00

LENGTH OF TIME PERIOD - 60 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.
DEMAND FLOW PROFILES ARE INPUT DIRECTLY

Demand set: as above

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
17.00 - 18.00	ARM A	0.000 0.0 (0.0)	0.014 12.0 (0.0)	0.986 852.0 (0.0)
	ARM B	0.164 12.0 (0.0)	0.000 0.0 (0.0)	0.836 61.0 (0.0)
	ARM C	0.890 983.0 (0.0)	0.110 121.0 (0.0)	0.000 0.0 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-AC	1.21	5.77	0.210		0.00	0.26	3.7		0.22
C-A	16.39								
C-B	2.02	8.32	0.243		0.00	0.32	4.5		0.16
A-B	0.20								
A-C	14.21								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-AC	1.21	5.77	0.210		0.26	0.26	3.9		0.22
C-A	16.39								
C-B	2.02	8.32	0.243		0.32	0.32	4.8		0.16
A-B	0.20								
A-C	14.21								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-AC	1.21	5.77	0.210		0.26	0.26	4.0		0.22
C-A	16.39								
C-B	2.02	8.32	0.243		0.32	0.32	4.8		0.16
A-B	0.20								
A-C	14.21								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-AC	1.21	5.77	0.210		0.26	0.26	4.0		0.22
C-A	16.39								
C-B	2.02	8.32	0.243		0.32	0.32	4.8		0.16
A-B	0.20								
A-C	14.21								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.3
17.30	0.3
17.45	0.3
18.00	0.3

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.3
17.30	0.3
17.45	0.3
18.00	0.3

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	72.6	72.6	15.5	0.21	15.5	0.21
C-A	983.5	983.5				
C-B	121.1	121.1	18.8	0.16	18.8	0.16
A-B	12.0	12.0				
A-C	852.6	852.6				
ALL	2041.8	2041.8	34.4	0.02	34.4	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

========== end of file ==========

Printed at 11:46:56 on 01/06/2016]

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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EMAIL: software@trl.co.uk

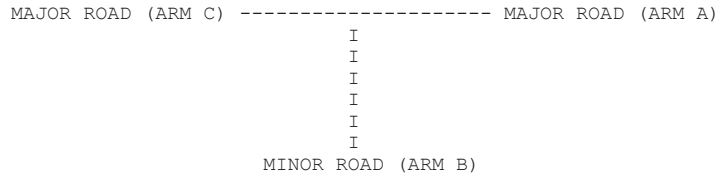
Run with file:-
"C:_SUE\PICADY temp\10338-J6 A1081 jw Cooters End lane - 2031+Dev Rev3 AM [flat].vpi"
(drive-on-the-left) at 10:52:13 on Wednesday, 1 June 2016

RUN INFORMATION

RUN TITLE	: 10338-J6 A1081 jw Cooters End Lane - 2031+Dev AM [flat]
LOCATION	: Harpenden
DATE	: 25/05/16
CLIENT	:
ENUMERATOR	: Sue.tadman [BCL25]
JOB NUMBER	: 10338
STATUS	: Preliminary
DESCRIPTION	: Existing Layout

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS A1081 (N)
ARM B IS Cooters End lane
ARM C IS A1081 (S)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	120.00 M.
- BLOCKS TRAFFIC (SPACES)		NO (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
680.59	0.25	0.10

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
552.17	0.24	0.10	0.15	0.35

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
734.50	0.27	0.27

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: as above

TIME PERIOD BEGINS 08.00 AND ENDS 09.00

LENGTH OF TIME PERIOD - 60 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.
DEMAND FLOW PROFILES ARE INPUT DIRECTLY

Demand set: as above

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
08.00 - 09.00	ARM A	0.000 0.0 (0.0)	0.010 14.0 (0.0)	0.990 1327.0 (0.0)
	ARM B	0.121 19.0 (0.0)	0.000 0.0 (0.0)	0.879 138.0 (0.0)
	ARM C	0.924 835.0 (0.0)	0.076 69.0 (0.0)	0.000 0.0 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	2.62	4.03	0.650		0.00	1.65	20.8		0.62
C-A	13.91								
C-B	1.15	6.16	0.187		0.00	0.23	3.2		0.20
A-B	0.23								
A-C	22.12								
08.15-08.30									
B-AC	2.62	4.03	0.651		1.65	1.75	25.6		0.70
C-A	13.91								
C-B	1.15	6.16	0.187		0.23	0.23	3.4		0.20
A-B	0.23								
A-C	22.12								
08.30-08.45									
B-AC	2.62	4.03	0.651		1.75	1.78	26.5		0.70
C-A	13.91								
C-B	1.15	6.16	0.187		0.23	0.23	3.4		0.20
A-B	0.23								
A-C	22.12								
08.45-09.00									
B-AC	2.62	4.03	0.651		1.78	1.80	26.9		0.71
C-A	13.91								
C-B	1.15	6.16	0.187		0.23	0.23	3.4		0.20
A-B	0.23								
A-C	22.12								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	1.6	**
08.30	1.7	**
08.45	1.8	**
09.00	1.8	**

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.2
08.30	0.2
08.45	0.2
09.00	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	157.2	157.2	99.8	0.63	100.2	0.64
C-A	834.6	834.6				
C-B	69.0	69.0	13.5	0.20	13.5	0.20
A-B	14.0	14.0				
A-C	1327.0	1327.0				
ALL	2401.8	2401.8	113.3	0.05	113.7	0.05

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

========== end of file ==========

Printed at 11:46:15 on 01/06/2016]

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010)

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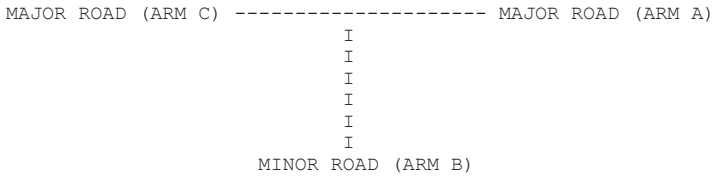
Run with file:-
"C:_SUE\PICADY temp\10338-J6 A1081 jw Cooters End lane - 2031+Dev Rev3 PM [flat].vpi"
(drive-on-the-left) at 10:52:19 on Wednesday, 1 June 2016

RUN INFORMATION

RUN TITLE	: 10338-J6 A1081 jw Cooters End Lane - 2031+Dev PM [flat]
LOCATION	: Harpenden
DATE	: 25/05/16
CLIENT	:
ENUMERATOR	: Sue.tadman [BCL25]
JOB NUMBER	: 10338
STATUS	: Preliminary
DESCRIPTION	: Existing Layout

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS A1081 (N)
ARM B IS Cooters End lane
ARM C IS A1081 (S)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
ETC.

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.00 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	3.50 M.
- VISIBILITY	(VC-B)	120.00 M.
- BLOCKS TRAFFIC (SPACES)		NO (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	90.0 M.
- VISIBILITY TO RIGHT	(VB-A)	90.0 M.
- LANE 1 WIDTH	(WB-C)	3.00 M.
- LANE 2 WIDTH	(WB-A)	0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
680.59	0.25	0.10

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
552.17	0.24	0.10	0.15	0.35

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
734.50	0.27	0.27

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: as above

TIME PERIOD BEGINS 17.00 AND ENDS 18.00

LENGTH OF TIME PERIOD - 60 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.
DEMAND FLOW PROFILES ARE INPUT DIRECTLY

Demand set: as above

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
17.00 - 18.00	ARM A	0.000 0.0 (0.0)	0.023 21.0 (0.0)	0.977 889.0 (0.0)
	ARM B	0.189 17.0 (0.0)	0.000 0.0 (0.0)	0.811 73.0 (0.0)
	ARM C	0.879 1006.0 (0.0)	0.121 138.0 (0.0)	0.000 0.0 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-AC	1.51	5.18	0.291		0.00	0.40	5.6		0.27
C-A	16.77								
C-B	2.30	8.11	0.284		0.00	0.39	5.6		0.17
A-B	0.35								
A-C	14.82								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-AC	1.51	5.17	0.292		0.40	0.41	6.1		0.27
C-A	16.77								
C-B	2.30	8.11	0.284		0.39	0.39	5.9		0.17
A-B	0.35								
A-C	14.82								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-AC	1.51	5.17	0.292		0.41	0.41	6.1		0.27
C-A	16.77								
C-B	2.30	8.11	0.284		0.39	0.39	5.9		0.17
A-B	0.35								
A-C	14.82								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-AC	1.51	5.17	0.292		0.41	0.41	6.1		0.27
C-A	16.77								
C-B	2.30	8.11	0.284		0.39	0.39	5.9		0.17
A-B	0.35								
A-C	14.82								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.4
17.30	0.4
17.45	0.4
18.00	0.4

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.4
17.30	0.4
17.45	0.4
18.00	0.4

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	90.6	90.6	23.9	0.26	23.9	0.26
C-A	1006.2	1006.2				
C-B	138.0	138.0	23.2	0.17	23.2	0.17
A-B	21.0	21.0				
A-C	889.2	889.2				
ALL	2145.0	2145.0	47.2	0.02	47.2	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

========== end of file ==========

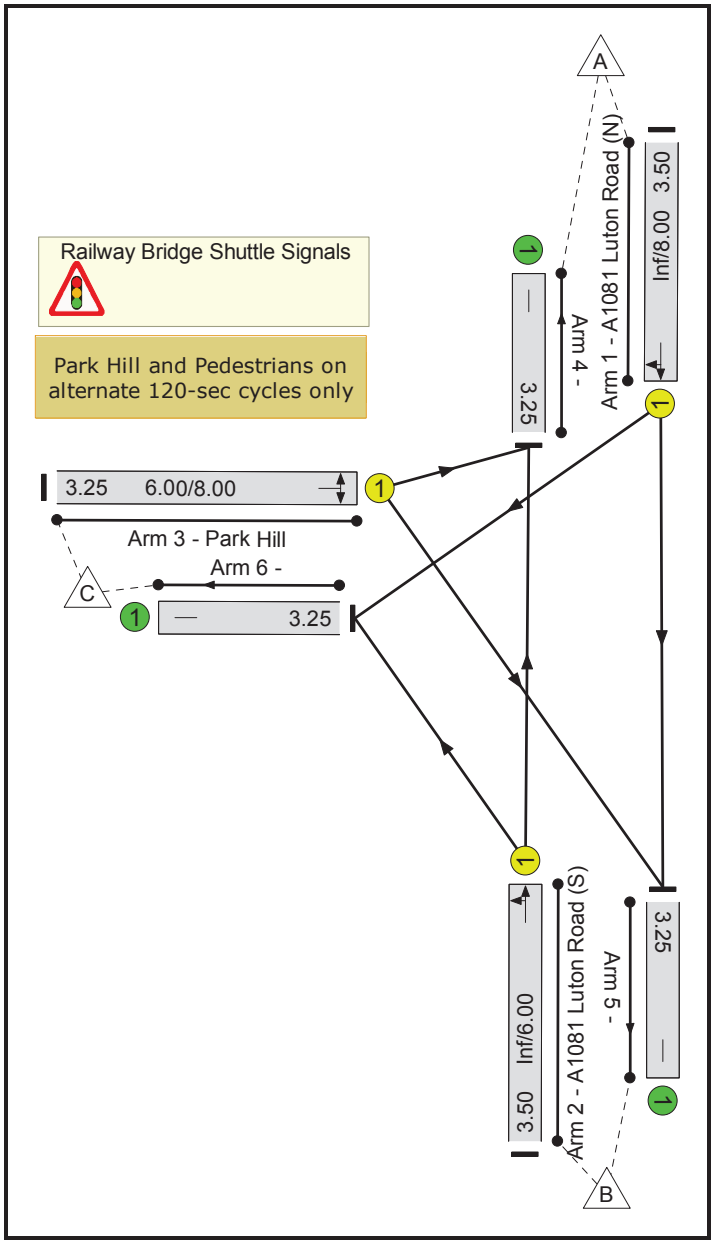
Printed at 11:46:03 on 01/06/2016]

Linsig Report

User and Project Details

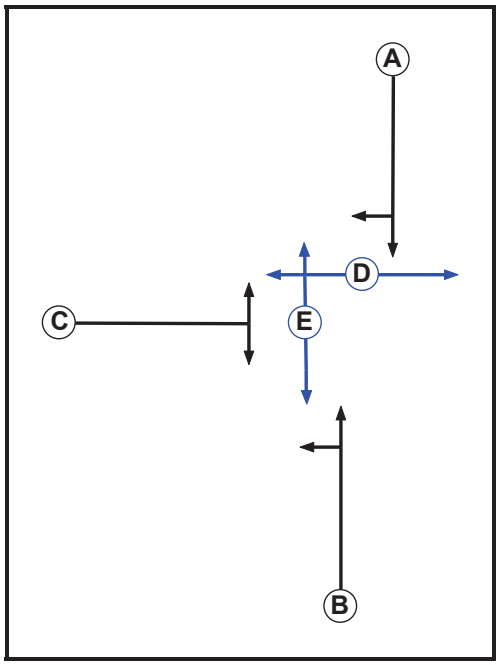
Project:	**Land at Harpenden**
Title:	**A1081 jw Park Hill**
Location:	
File name:	10338-J7 A1081 jw Park Hill.lsg3x
Author:	SMT
Company:	Brookbanks Consulting Ltd

Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

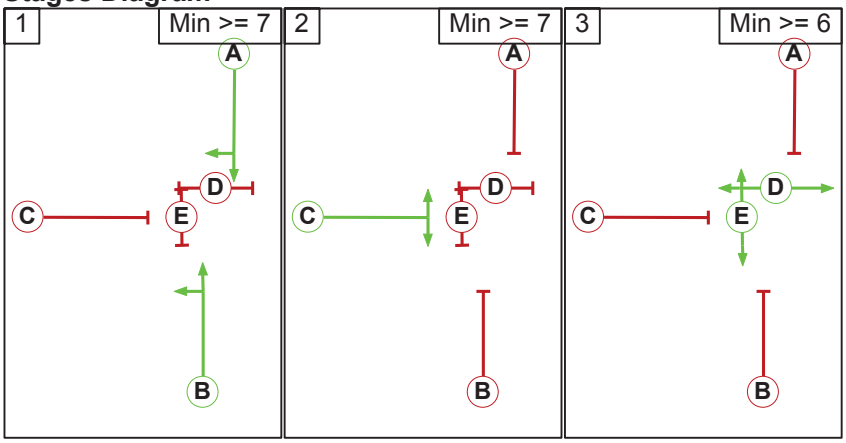
Phase Diagram



Phase Intergreens Matrix

		Starting Phase				
		A	B	C	D	E
Terminating Phase	A		-	5	5	6
	B	-		5	5	5
	C	5	5		6	5
	D	8	8	8		-
	E	8	8	8	-	

Stages Diagram



Linsig Report
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Lane Input Data

Junction: Railway Bridge Shuttle Signals

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (A1081 Luton Road (N))	U	A	2	3	60.0	Geom	-	3.50	0.00	N	Arm 5 Ahead	Inf
											Arm 6 Right	8.00
2/1 (A1081 Luton Road (S))	U	B	2	3	60.0	Geom	-	3.50	0.00	N	Arm 4 Ahead	Inf
											Arm 6 Left	6.00
3/1 (Park Hill)	U	C	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Left	6.00
											Arm 5 Right	8.00

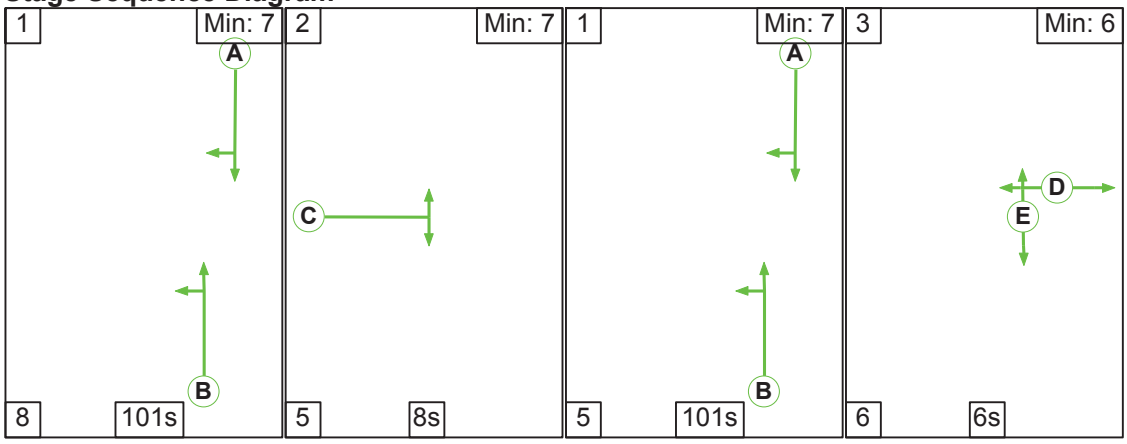
Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x
Scenario 1: '2015 AM' (FG1: '2015 AM', Plan 1: 'Peds Park Hill (+Peds) 1 in 4')

Traffic Flows, Actual

Actual Flow :

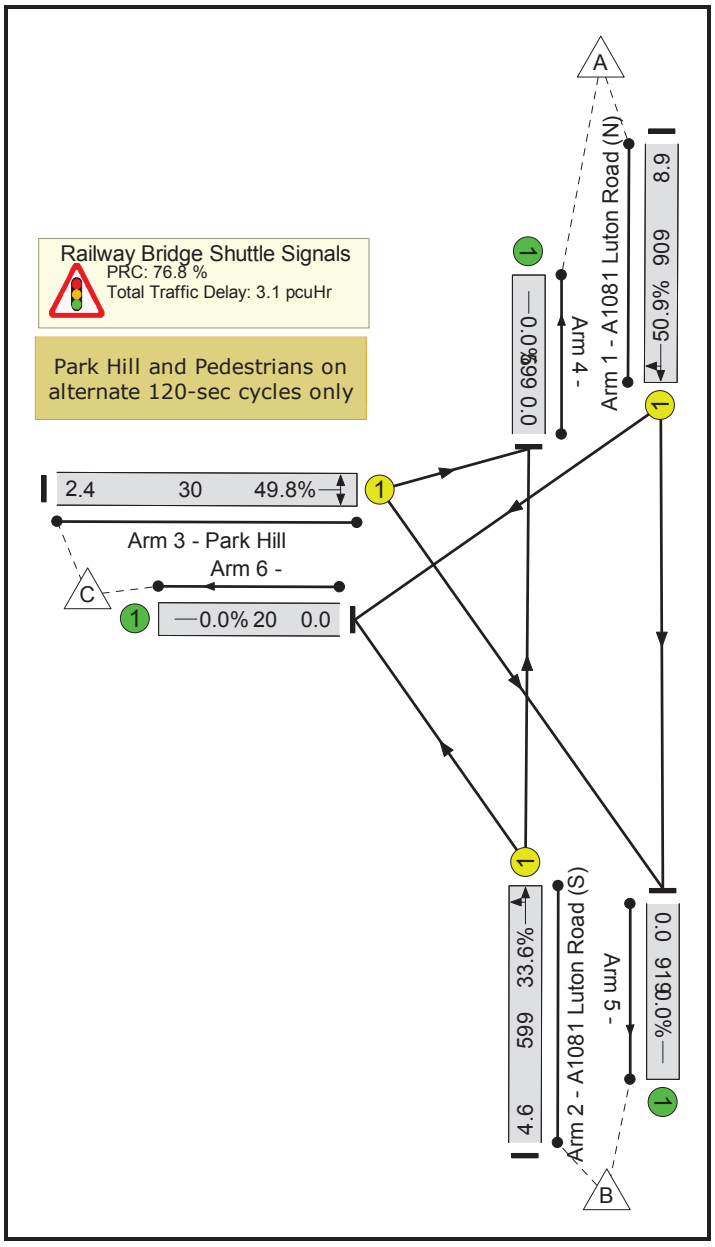
		Destination			
		A	B	C	Tot.
Origin	A	0	899	10	909
	B	589	0	10	599
	C	10	20	0	30
	Tot.	599	919	20	1538

Stage Sequence Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1081 jw Park Hill	-	-	-		-	-	-	-	-	-	**50.9%**	**0**	**0**	**0**	**3.1**	-	-
Railway Bridge Shuttle Signals	-	-	-		-	-	-	-	-	-	**50.9%**	**0**	**0**	**0**	**3.1**	-	-
1/1	A1081 Luton Road (N) Ahead Right	U	A		2	202	-	909	2101	1786	50.9%	-	-	-	1.1	4.4	8.9
2/1	A1081 Luton Road (S) Ahead Left	U	B		2	202	-	599	2096	1782	33.6%	-	-	-	0.6	3.4	4.6
3/1	Park Hill Left Right	U	C		1	8	-	30	1606	60	49.8%	-	-	-	1.4	171.0	2.4

C1 PRC for Signalled Lanes (%): 76.8 Total Delay for Signalled Lanes (pcuHr): 3.11 Cycle Time (s): 240
PRC Over All Lanes (%): 76.8 Total Delay Over All Lanes(pcuHr): 3.11

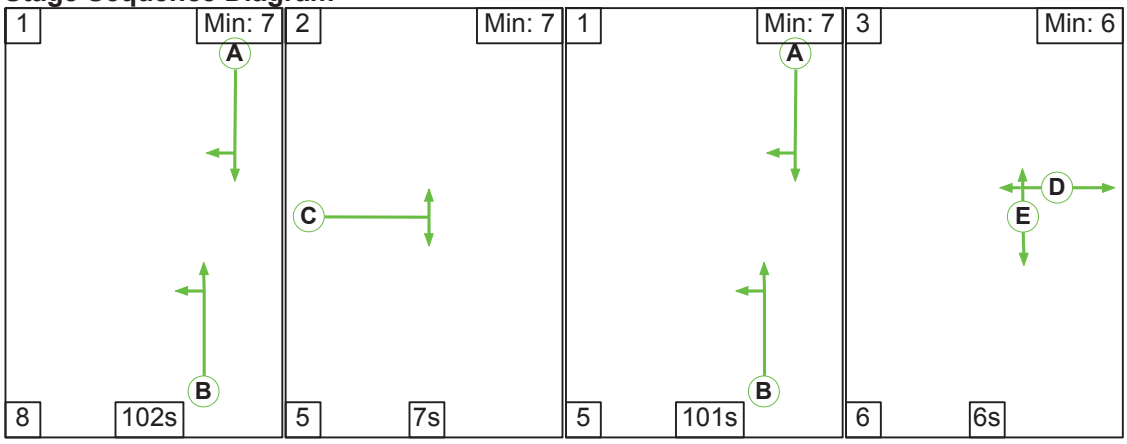
Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x
Scenario 2: '2015 PM' (FG2: '2015 PM', Plan 1: 'Peds Park Hill (+Peds) 1 in 4')

Traffic Flows, Actual

Actual Flow :

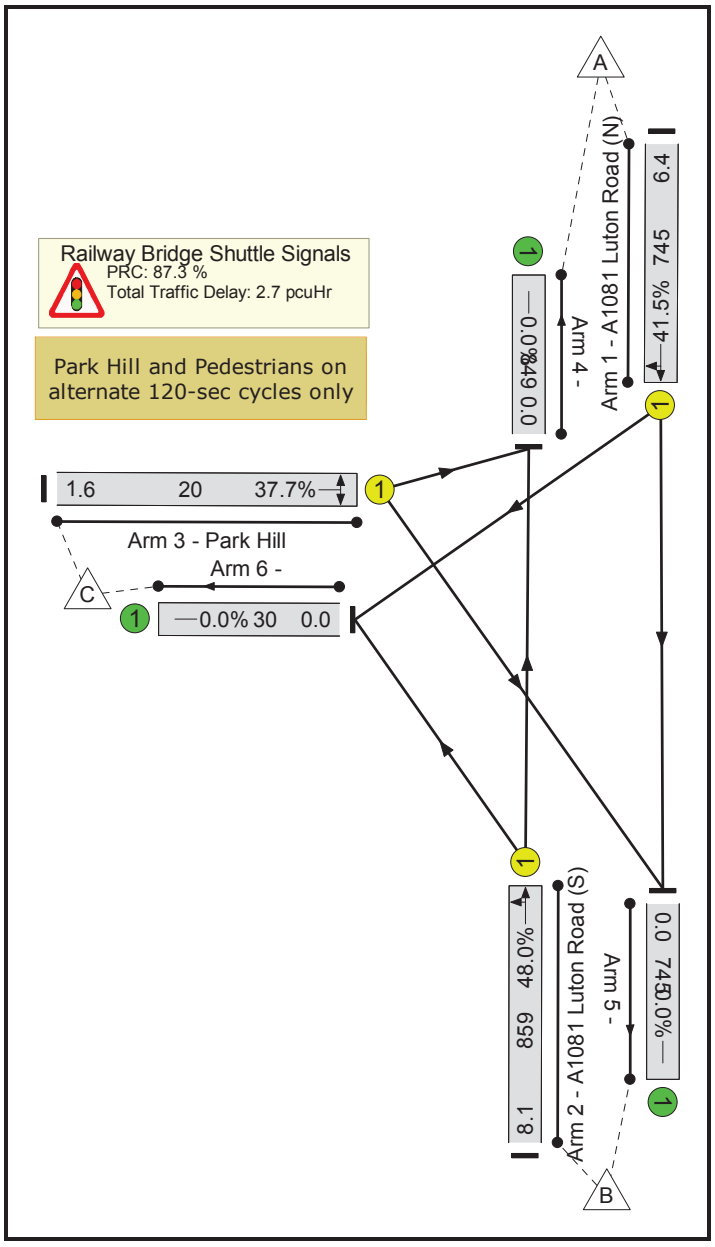
		Destination			
		A	B	C	Tot.
Origin	A	0	735	10	745
	B	839	0	20	859
	C	10	10	0	20
	Tot.	849	745	30	1624

Stage Sequence Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1081 jw Park Hill	-	-	-		-	-	-	-	-	-	**48.0%**	**0**	**0**	**0**	**2.7**	-	-
Railway Bridge Shuttle Signals	-	-	-		-	-	-	-	-	-	**48.0%**	**0**	**0**	**0**	**2.7**	-	-
1/1	A1081 Luton Road (N) Ahead Right	U	A		2	203	-	745	2100	1794	41.5%	-	-	-	0.8	3.7	6.4
2/1	A1081 Luton Road (S) Ahead Left	U	B		2	203	-	859	2093	1788	48.0%	-	-	-	1.0	4.1	8.1
3/1	Park Hill Left Right	U	C		1	7	-	20	1592	53	37.7%	-	-	-	0.9	167.0	1.6

C1 PRC for Signalled Lanes (%): 87.3 Total Delay for Signalled Lanes (pcuHr): 2.68 Cycle Time (s): 240
PRC Over All Lanes (%): 87.3 Total Delay Over All Lanes(pcuHr): 2.68

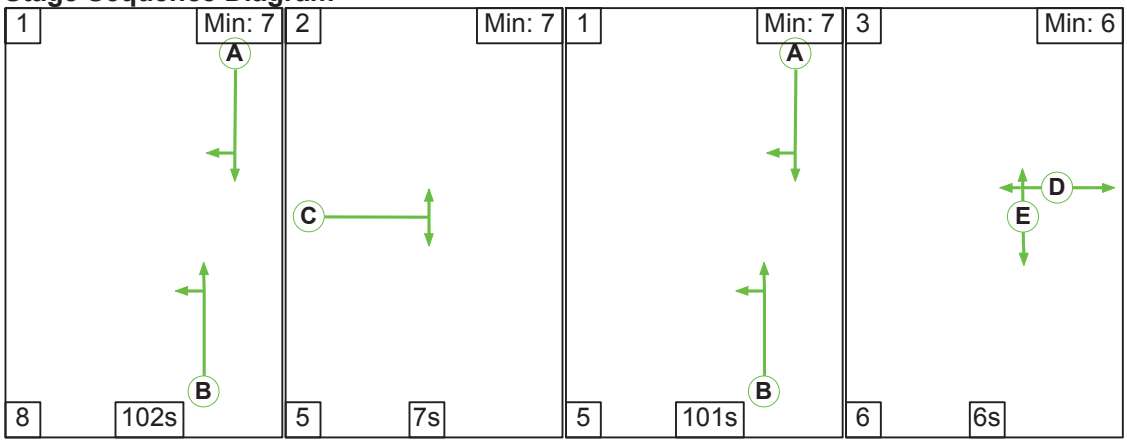
Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x
Scenario 3: '2031 AM' (FG3: '2031 AM', Plan 1: 'Peds Park Hill (+Peds) 1 in 4')

Traffic Flows, Actual

Actual Flow :

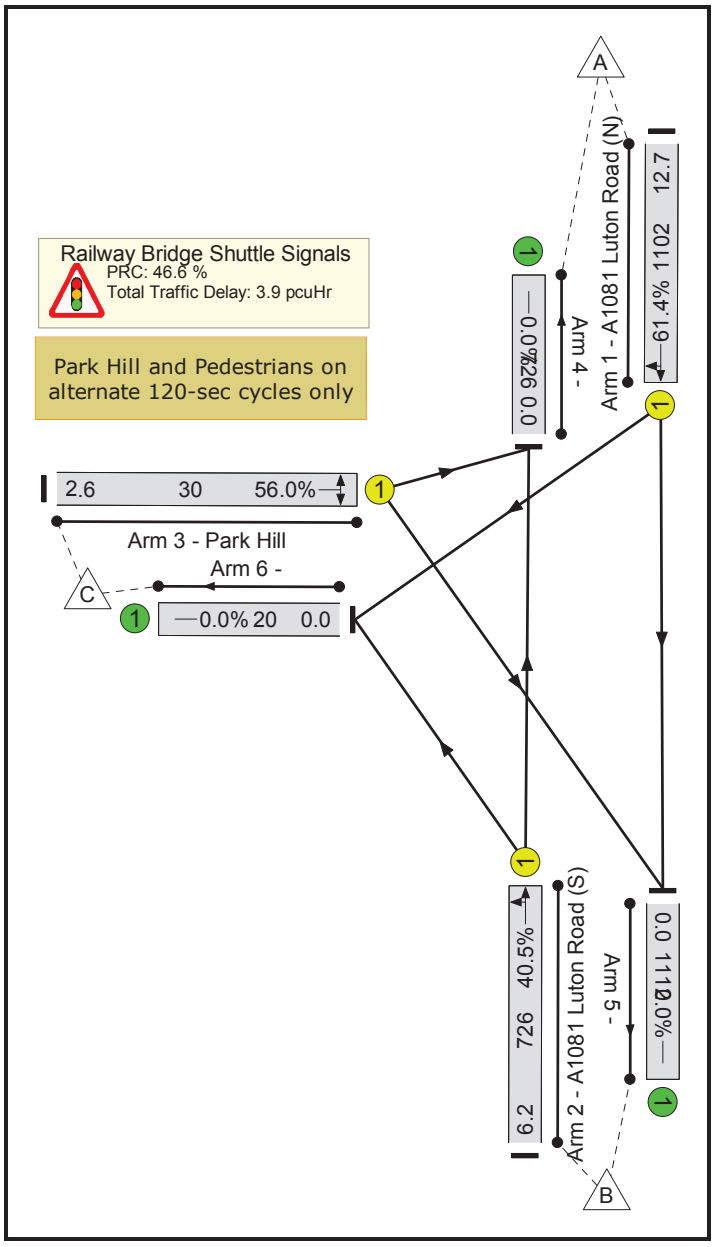
		Destination			
		A	B	C	Tot.
Origin	A	0	1092	10	1102
	B	716	0	10	726
	C	10	20	0	30
	Tot.	726	1112	20	1858

Stage Sequence Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1081 jw Park Hill	-	-	-		-	-	-	-	-	-	**61.4%**	**0**	**0**	**0**	**3.9**	-	-
Railway Bridge Shuttle Signals	-	-	-		-	-	-	-	-	-	**61.4%**	**0**	**0**	**0**	**3.9**	-	-
1/1	A1081 Luton Road (N) Ahead Right	U	A		2	203	-	1102	2101	1795	61.4%	-	-	-	1.6	5.3	12.7
2/1	A1081 Luton Road (S) Ahead Left	U	B		2	203	-	726	2098	1792	40.5%	-	-	-	0.7	3.7	6.2
3/1	Park Hill Left Right	U	C		1	7	-	30	1606	54	56.0%	-	-	-	1.6	187.0	2.6

C1 PRC for Signalled Lanes (%): 46.6 Total Delay for Signalled Lanes (pcuHr): 3.92 Cycle Time (s): 240
PRC Over All Lanes (%): 46.6 Total Delay Over All Lanes(pcuHr): 3.92

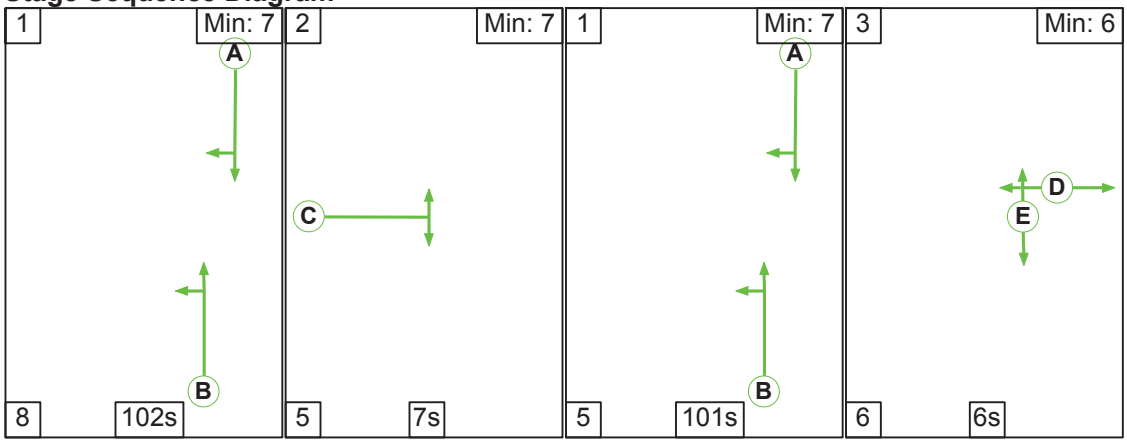
Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x
Scenario 4: '2031 PM' (FG4: '2031 PM', Plan 1: 'Peds Park Hill (+Peds) 1 in 4')

Traffic Flows, Actual

Actual Flow :

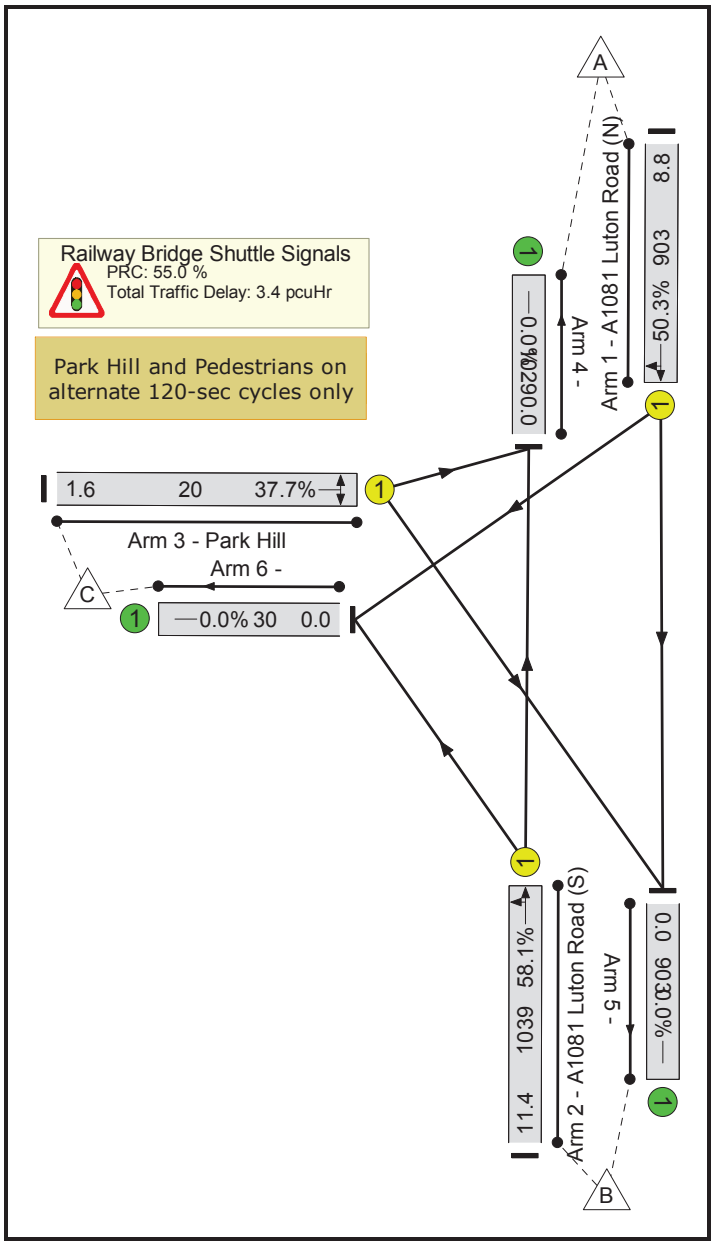
		Destination			
		A	B	C	Tot.
Origin	A	0	893	10	903
	B	1019	0	20	1039
	C	10	10	0	20
	Tot.	1029	903	30	1962

Stage Sequence Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1081 jw Park Hill	-	-	-		-	-	-	-	-	-	**58.1%**	**0**	**0**	**0**	**3.4**	-	-
Railway Bridge Shuttle Signals	-	-	-		-	-	-	-	-	-	**58.1%**	**0**	**0**	**0**	**3.4**	-	-
1/1	A1081 Luton Road (N) Ahead Right	U	A		2	203	-	903	2101	1795	50.3%	-	-	-	1.1	4.3	8.8
2/1	A1081 Luton Road (S) Ahead Left	U	B		2	203	-	1039	2095	1789	58.1%	-	-	-	1.4	4.9	11.4
3/1	Park Hill Left Right	U	C		1	7	-	20	1592	53	37.7%	-	-	-	0.9	167.0	1.6

C1 PRC for Signalled Lanes (%): 55.0 Total Delay for Signalled Lanes (pcuHr): 3.43 Cycle Time (s): 240
PRC Over All Lanes (%): 55.0 Total Delay Over All Lanes(pcuHr): 3.43

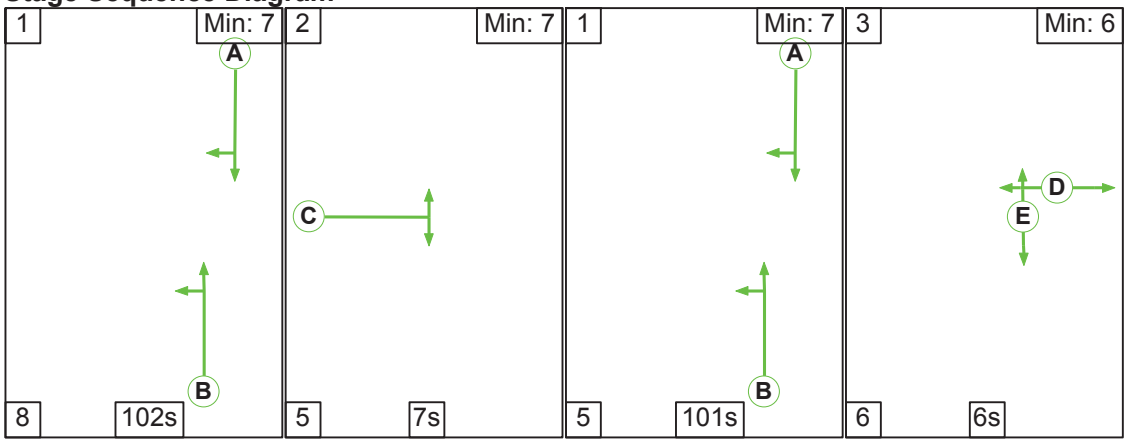
Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x
Scenario 5: '2031+Dev Rev3 AM' (FG5: '2031+Dev Rev3 AM', Plan 1: 'Peds Park Hill (+Peds) 1 in 4')

Traffic Flows, Actual

Actual Flow :

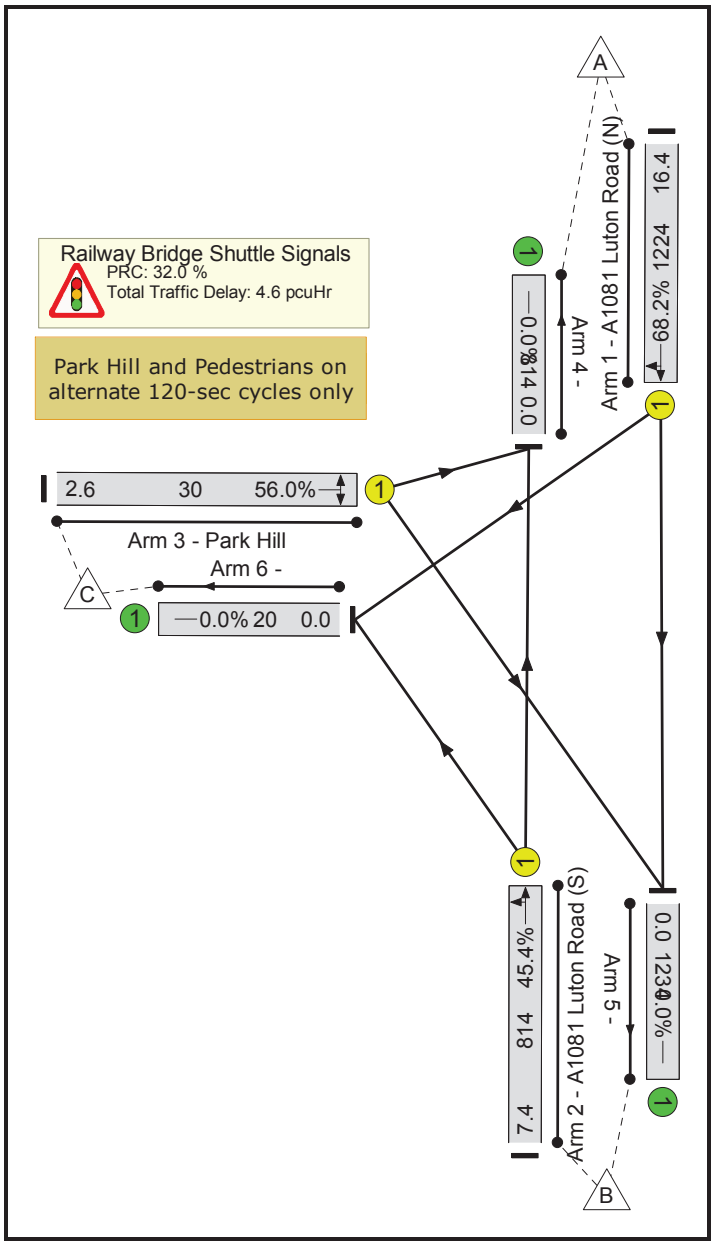
		Destination			
		A	B	C	Tot.
Origin	A	0	1214	10	1224
	B	804	0	10	814
	C	10	20	0	30
	Tot.	814	1234	20	2068

Stage Sequence Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1081 jw Park Hill	-	-	-		-	-	-	-	-	-	**68.2%**	**0**	**0**	**0**	**4.6**	-	-
Railway Bridge Shuttle Signals	-	-	-		-	-	-	-	-	-	**68.2%**	**0**	**0**	**0**	**4.6**	-	-
1/1	A1081 Luton Road (N) Ahead Right	U	A		2	203	-	1224	2102	1795	68.2%	-	-	-	2.1	6.2	16.4
2/1	A1081 Luton Road (S) Ahead Left	U	B		2	203	-	814	2099	1793	45.4%	-	-	-	0.9	3.9	7.4
3/1	Park Hill Left Right	U	C		1	7	-	30	1606	54	56.0%	-	-	-	1.6	187.0	2.6

C1 PRC for Signalled Lanes (%): 32.0 Total Delay for Signalled Lanes (pcuHr): 4.56 Cycle Time (s): 240
PRC Over All Lanes (%): 32.0 Total Delay Over All Lanes(pcuHr): 4.56

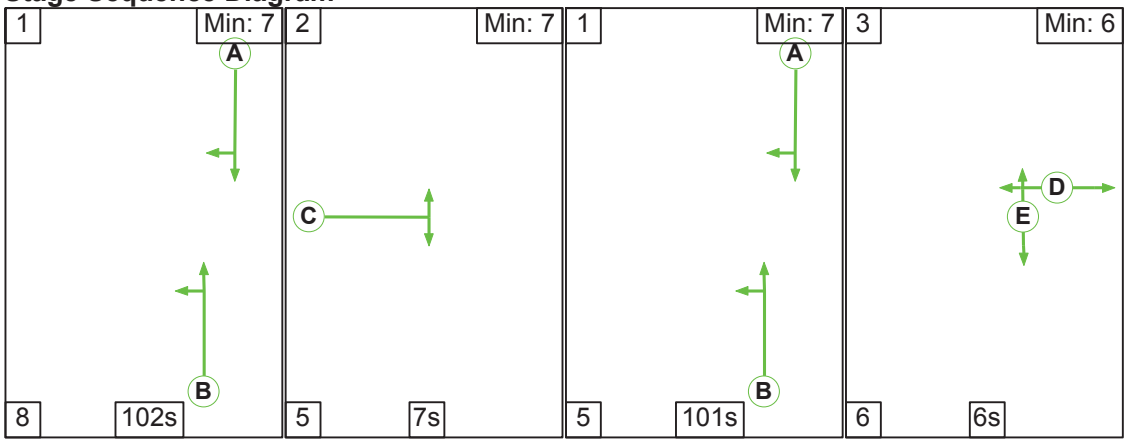
Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x
Scenario 6: '2031+Dev Rev3 PM' (FG6: '2031+Dev Rev3 PM', Plan 1: 'Peds Park Hill (+Peds) 1 in 4')

Traffic Flows, Actual

Actual Flow :

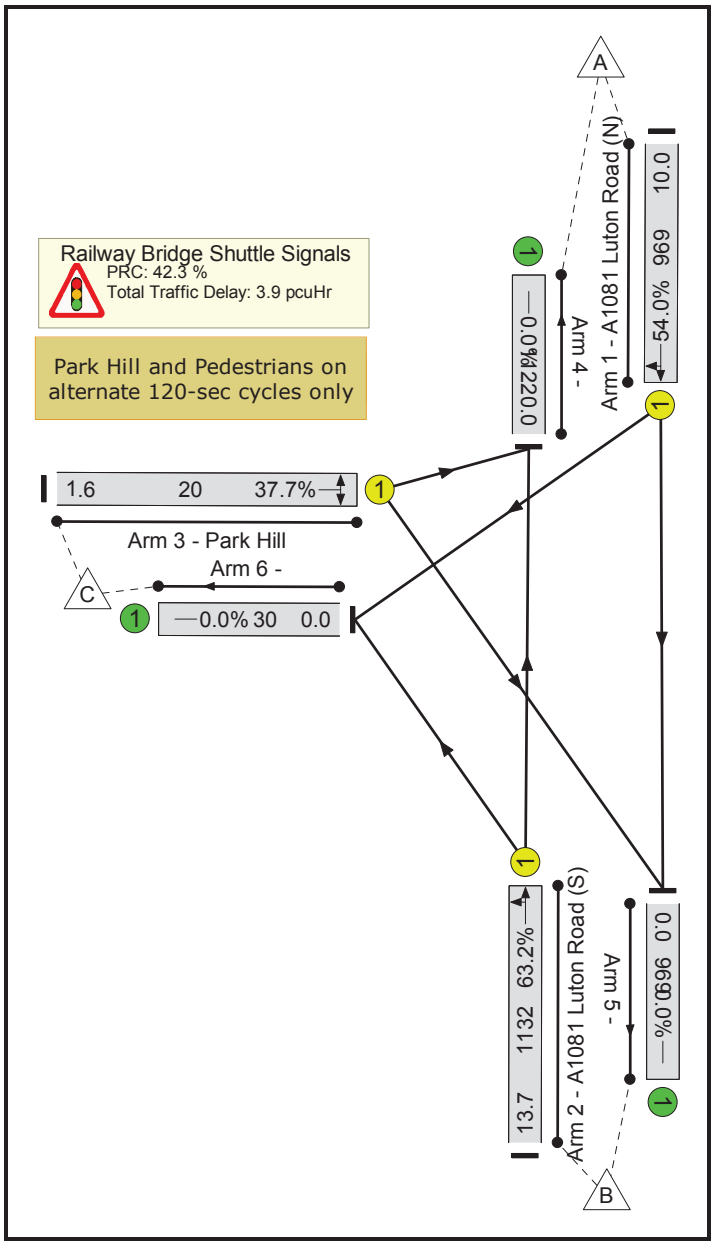
		Destination			
		A	B	C	Tot.
Origin	A	0	959	10	969
	B	1112	0	20	1132
	C	10	10	0	20
	Tot.	1122	969	30	2121

Stage Sequence Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

Junction Layout Diagram



Linsig Report
P:\10338\Traffic\Junctions\J7-Shuttle Signals at Railway Bridge\10338-J7 A1081 jw Park Hill.lsg3x

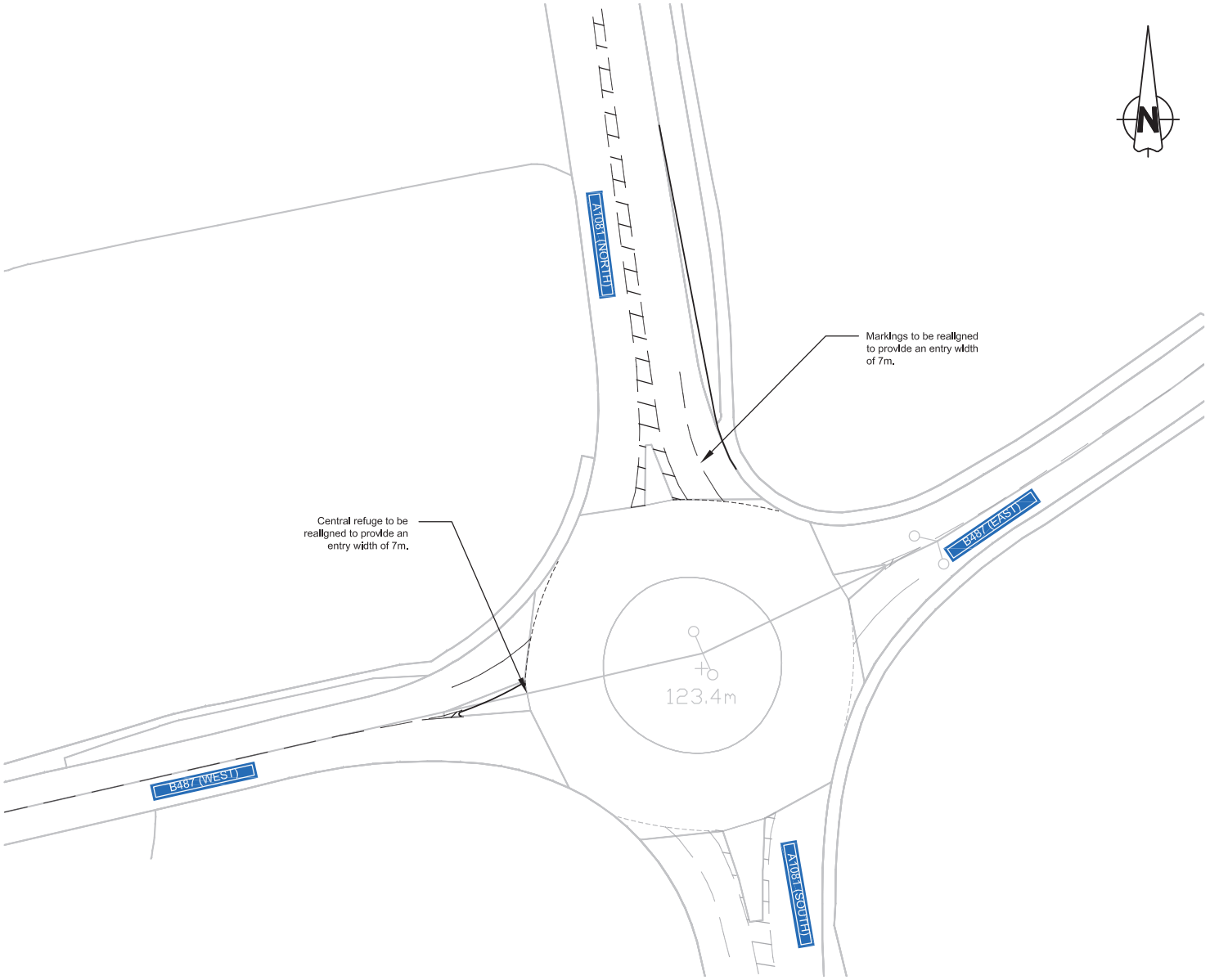
Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1081 jw Park Hill	-	-	-		-	-	-	-	-	-	**63.2%**	**0**	**0**	**0**	**3.9**	-	-
Railway Bridge Shuttle Signals	-	-	-		-	-	-	-	-	-	**63.2%**	**0**	**0**	**0**	**3.9**	-	-
1/1	A1081 Luton Road (N) Ahead Right	U	A		2	203	-	969	2101	1795	54.0%	-	-	-	1.2	4.6	10.0
2/1	A1081 Luton Road (S) Ahead Left	U	B		2	203	-	1132	2096	1790	63.2%	-	-	-	1.7	5.5	13.7
3/1	Park Hill Left Right	U	C		1	7	-	20	1592	53	37.7%	-	-	-	0.9	167.0	1.6

C1 PRC for Signalled Lanes (%): 42.3 Total Delay for Signalled Lanes (pcuHr): 3.89 Cycle Time (s): 240
PRC Over All Lanes (%): 42.3 Total Delay Over All Lanes(pcuHr): 3.89

Appendix D – Highway Improvements

Original Drawing Size A3



0 10 20 30 40

METRES

Construction Design and Management (CDM) Key Residual Risks

Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

NOTES:

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6. The road signs have been designed and positioned in accordance with the Traffic Signs Manual Chapter 3.
7. The alignment has been designed in accordance with the following standards:
   - TD 9/93 Highway Link Design
   - TD 16/07 The Geometric Design of Roundabouts

- First Issue		- - -	10.05.16
Status			Status Date
For Comment			10.05.16
Drawn	Checked		Date
MDM	AE		MAY 2016
Scale	Number		Rev
1:500	10338-HL-07		-

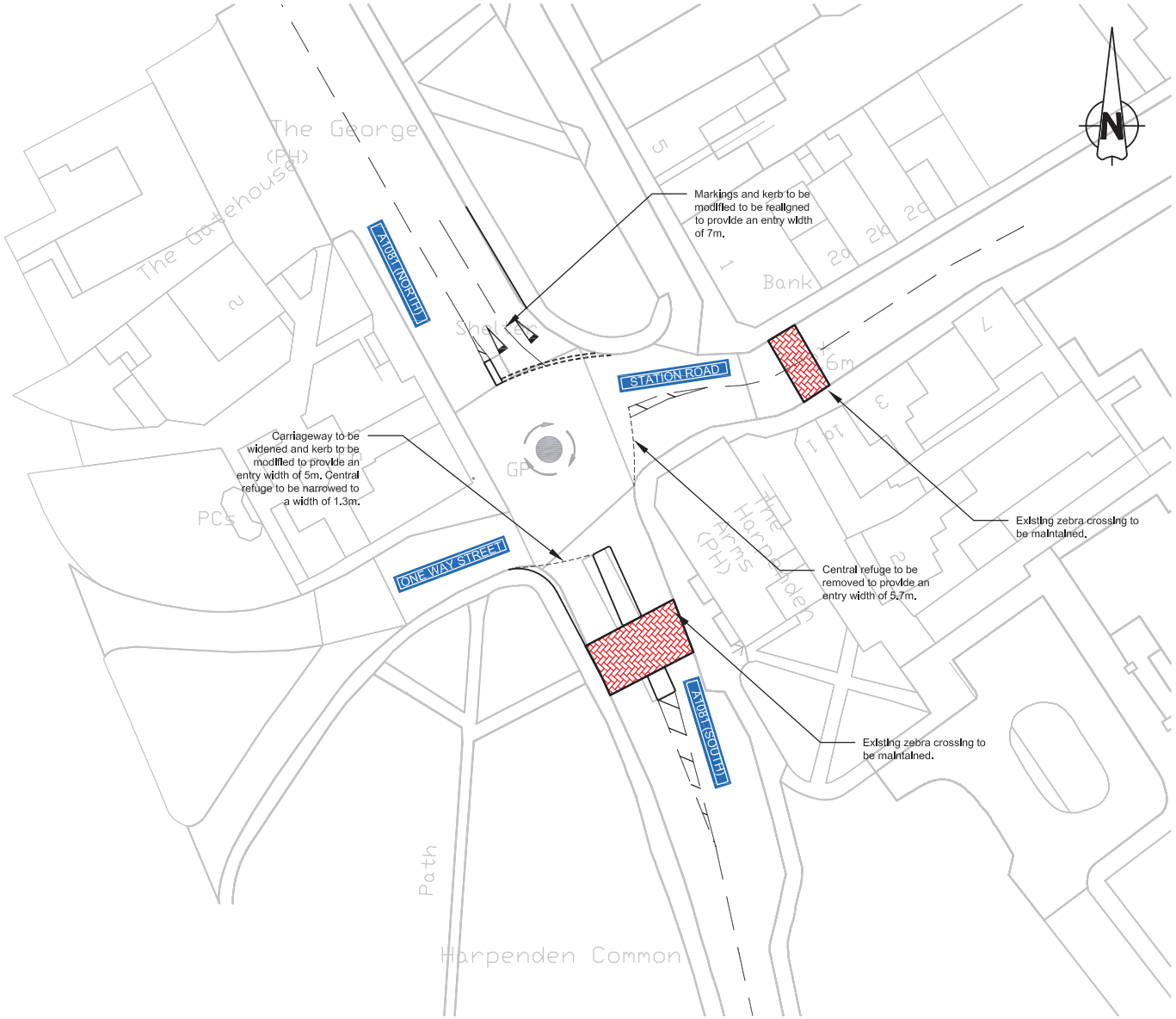
DRAFT

Proposed Development
Luton Road, Harpenden

Off-site Highway Mitigation - Roundabout
between the A1081 and B487

Brookbanks
6150 Knights Court Solihull Parkway Birmingham B37 7WY
Tel (0121) 329 4330 Fax (0121) 329 4331
www.brookbanks.com

Original Drawing Size A3



0 10 20 30 40

METRES

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4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

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   - TD 16/07 The Geometric Design of Roundabouts
   - Manual for Streets

DRAFT

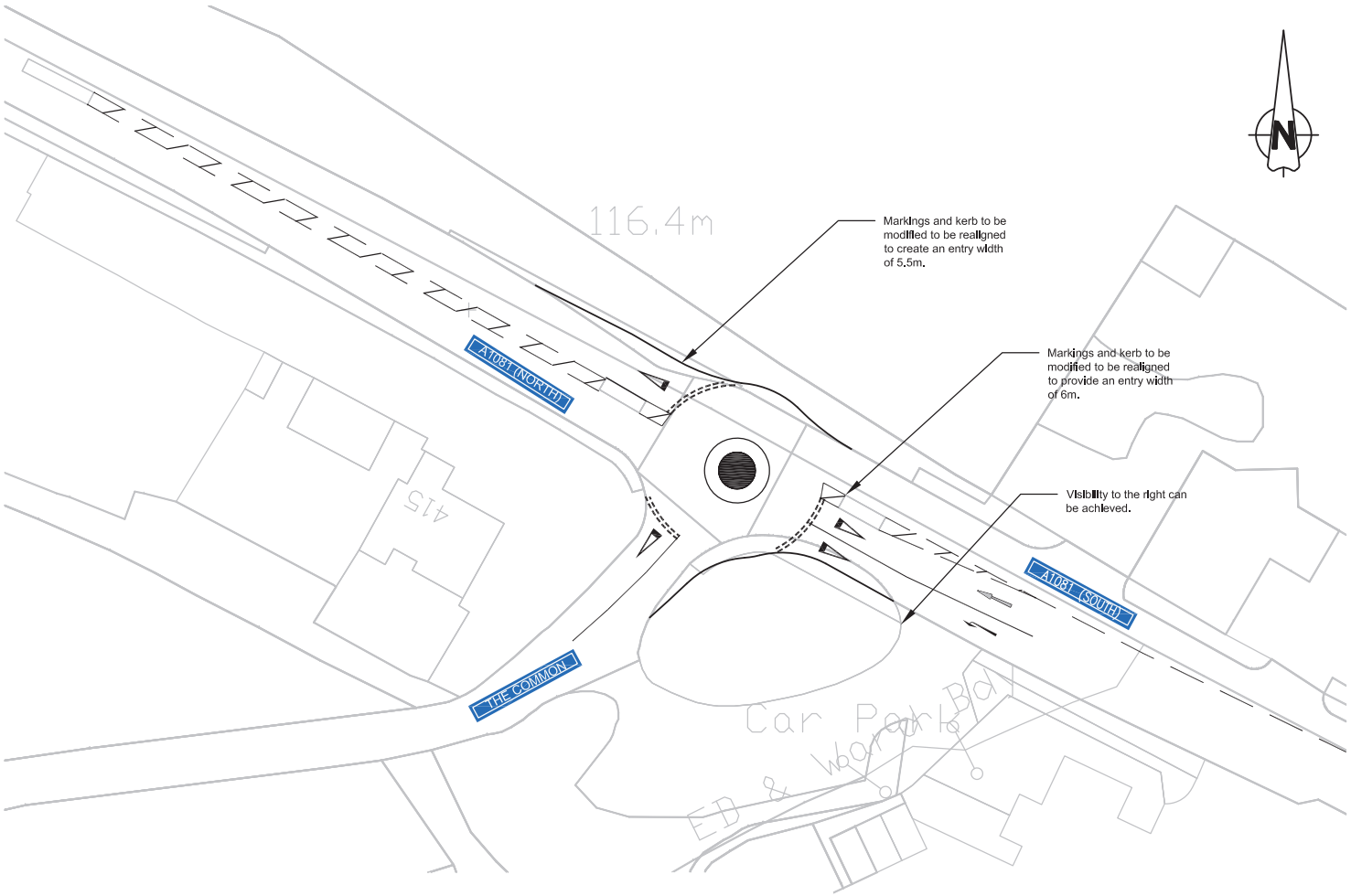
- First Issue		- - -	10.05.16
Status			Status Date
For Comment			10.05.16
Drawn	Checked		Date
MDM	AE		MAY 2016
Scale	Number		Rev
1:500	10338-HL-08		-

Proposed Development
Luton Road, Harpenden

Off-site Highway Mitigation
Mini Roundabout between the A1081 and Station Road

Brookbanks
6150 Knights Court Solihull Parkway Birmingham B37 7WY
Tel (0121) 329 4330 Fax (0121) 329 4331
www.brookbanks.com

Original Drawing Size A3



Arm	PROPOSED MINI ROUNDABOUT: DMRB COMPLIANCE					
	Entry Radius Into Rotary (m)	Exit Radius From Rotary (m)	Stopping Sight Distance (m)	Entry Angle (°)	Exit Design Speed (mph)	Approx ICD Across Arm (m)
A1081 (North)	30	7	80	27	30	20
The Common	7	10	43 (MfS)	37	30	20
A1081 (South)	10	26	80	34	30	20

0 10 20 30 40
METRES

- First Issue		- - -	10.05.16
Status			Status Date
For Comment			10.05.16
Drawn	Checked		Date
MDM	AE		MAY 2016
Scale	Number		Rev
1:500	10338-HL-09		-

Construction Design and Management (CDM) Key Residual Risks

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1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

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6. The road signs have been designed and positioned in accordance with the Traffic Signs Manual Chapter 3.
7. The alignment has been designed in accordance with the following standards:
   - TD 9/93 Highway Link Design
   - TD 16/07 The Geometric Design of Roundabouts
   - Manual for Streets

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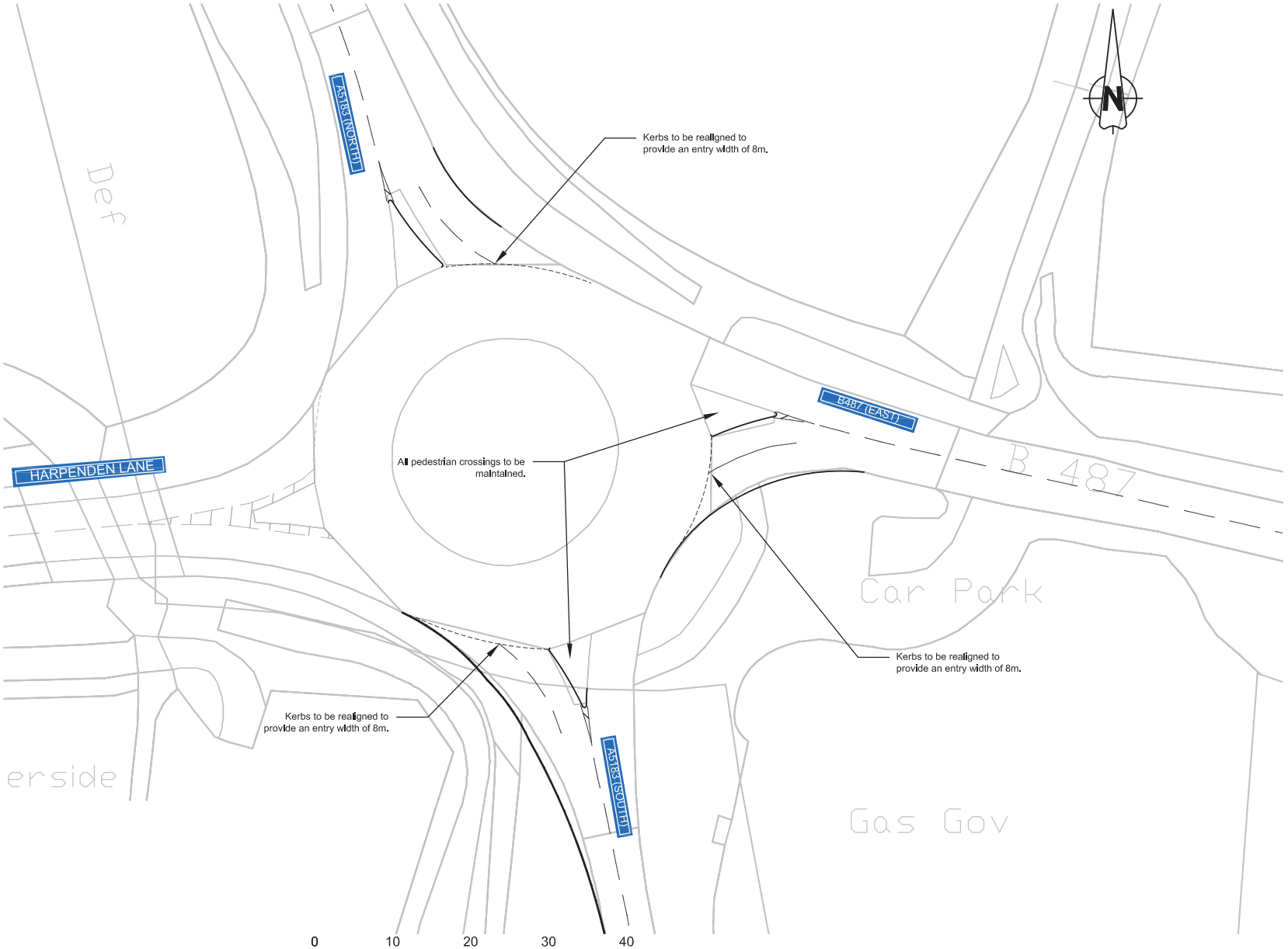
Proposed Development
Luton Road, Harpenden

Off-site Highway Mitigation - T-junction
between the A1081 and The Common

Brookbanks
6150 Knights Court Solihull Parkway Birmingham B37 7WY
Tel (0121) 329 4330 Fax (0121) 329 4331
www.brookbanks.com

Original Drawing Size A3



Construction Design and Management (CDM) Key Residual Risks

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   - TD 16/07 The Geometric Design of Roundabouts

DRAFT

- First Issue		- - -	26.05.16
Status			Status Date
For Comment			26.05.16
Drawn	Checked		Date
MDM	AE		MAY 2016
Scale	Number		Rev
1:500	10338-HL-10		-

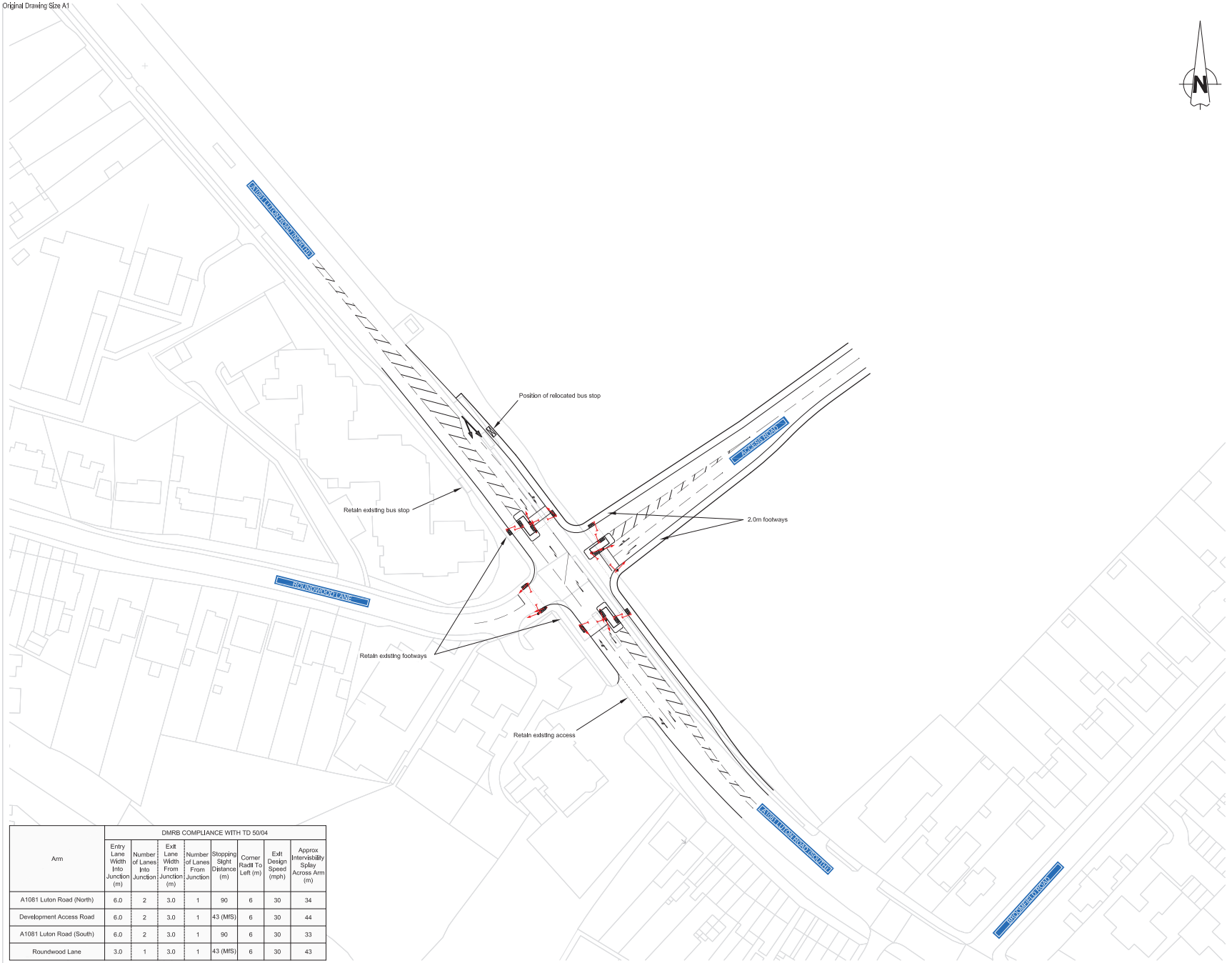
Proposed Development
Luton Road, Harpenden

Off-site Highway Mitigation - Roundabout between the A1583 and B487

Brookbanks
6150 Knights Court Solihull Parkway Birmingham B37 7WY
Tel (0121) 329 4330 Fax (0121) 329 4331
www.brookbanks.com

Appendix E – Access Drawings

Original Drawing Size A1



Arm	DMRB COMPLIANCE WITH TD 50/04							
	Entry Lane Width Into Junction (m)	Number of Lanes Into Junction	Exit Lane Width From Junction (m)	Number of Lanes From Junction	Stopping Sight Distance (m)	Corner Radii To Left (m)	Exit Design Speed (mph)	Approx Intervisibility Splay Across Arm (m)
A1081 Luton Road (North)	6.0	2	3.0	1	90	6	30	34
Development Access Road	6.0	2	3.0	1	43 (MfS)	6	30	44
A1081 Luton Road (South)	6.0	2	3.0	1	90	6	30	33
Roundwood Lane	3.0	1	3.0	1	43 (MfS)	6	30	43

Construction Design and Management (CDM)
Key Residual Risks

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2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
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6) Unchartered services
7) Existing buildings with potential asbestos hazards

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4. No part of this drawing may be copied or duplicated without the express permission of Brookbanks Consulting.
5. The highway alignment has been designed in accordance with Manual for Streets 1 and 2.
6. Earthworks are for indicative purposes only.

A	Improvement to drawing details	MDM	AE PAB 25.05.16
-	First Issue	-	- - 01.11.14

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6150 Knights Court Solihull Parkway Birmingham B37 7WY
Tel (0121) 329 4330 Fax (0121) 329 4331
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ceg

Proposed Development, Luton Road, Harpenden

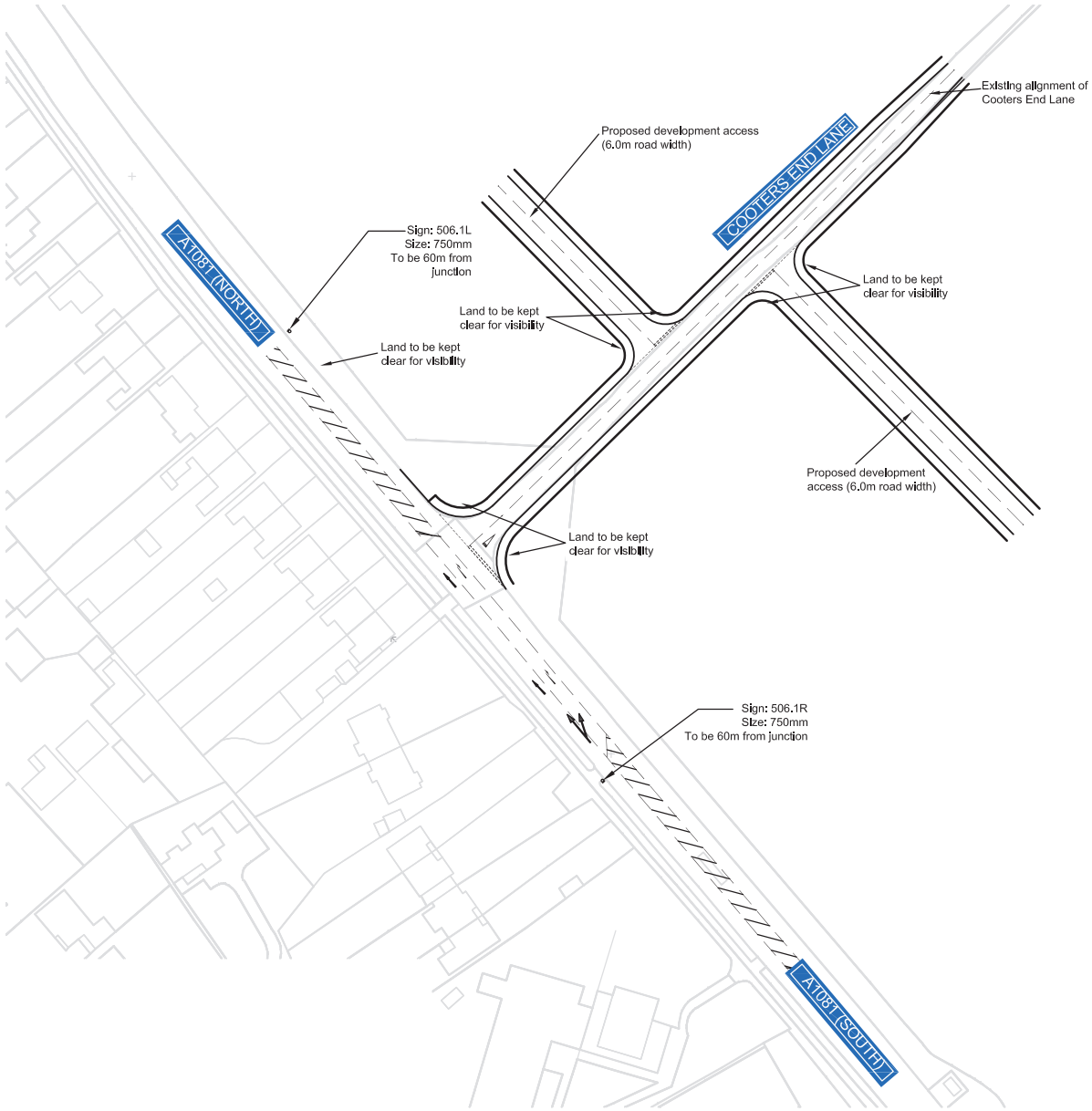
Highway Access Plan
Option 1 (Signalised Junction)

Status			Status Date
For Comment			November 2014
Drawn	Checked		Date
MDM	AE		01.11.2014
Scale	Number		Rev
1:500	10338-HL-01		A

0 10 20 30 40 50
METRES

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.

Original Drawing Size A3



Construction Design and Management (CDM) Key Residual Risks

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NOTES:

1. Do not scale from this drawing
2. All dimensions are in metres unless otherwise stated.
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5. The markings have been designed and positioned in accordance with the Traffic Signs Manual Chapter 5.
6. The road signs have been designed and positioned in accordance with the Traffic Signs Manual Chapter 3.
7. The alignment has been designed in accordance with the following standards:
   - TD 9/93 Highway Link Design
   - TD 42/95 The Geometric Design of Major-Minor Priority Junctions
   - Manual for Streets

DRAFT

- First Issue		- - -	24.05.16
Status			Status Date
For Comment			24.05.16
Drawn	Checked		Date
MDM	AE		MAY 2016
Scale	Number		Rev
1:1000	10338-HL-11		-

Proposed Development
Luton Road, Harpenden

Highway Access Strategy - T-junction
between the A1081 and Cooters End Lane

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Appendix 22: Brookbanks Land at North West Harpenden Transport Position Statement (September 2017)

Land at NW Harpenden: Transport Position Statement
25 September 2017

1.0 Introduction

1.1 CEG has an interest in land at Ambrose Lane, Harpenden, which is owned by Action for Children. The site was identified as the NW Harpenden Broad Location in the submitted Strategic Local Plan (SLP) for green belt release and the delivery of approximately 500 dwellings, a primary school, community facilities, recreation and open space. CEG is working with Legal & General (L&G) (the owner of the neighbouring land including part of the broad location) and St Albans City & District Council (SACDC) to bring forward development.

1.2 Hertfordshire County Council (the Highway Authority) is responsible for producing much of the transport evidence underpinning Local Plan preparation in St Albans. This evidence includes an assessment of the potential transport impacts of the identified Broad Locations through the use of the COMET traffic model. In parallel, HCC have considered a range of highway interventions.

1.3 Supported by a wider professional team, CEG and L&G are actively engaging with SACDC in its plan preparation work. Brookbanks Consulting Limited (BCL) is working with CEG to provide engineering support in relation to the NW Harpenden site. CEG is also working collaboratively with L&G's transport consultants (TPP) and its wider team to ensure a coordinated approach.

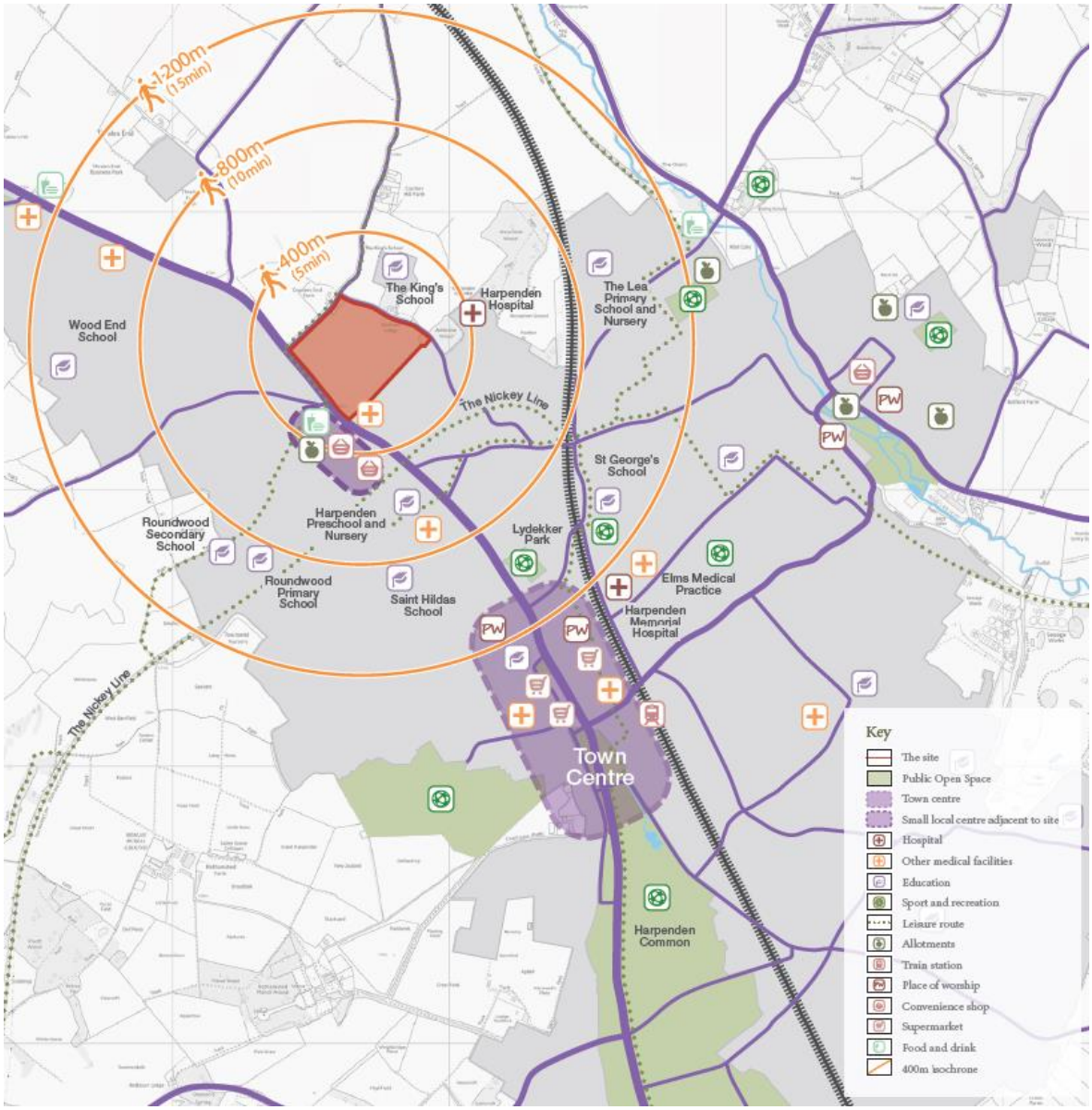
2.0 Improving Sustainable Access Opportunities

2.1 Harpenden has been assessed by SACDC as one of the most sustainable locations for development within the District and was identified in the first tier of the settlement hierarchy within the submitted SLP. The NW Harpenden site provides access to a wide range of services, facilities and employment opportunities as well as sustainable transport options.

2.2 Harpenden town centre is located less than 1km away from the site, with the railway station in close proximity. The town centre offers a range of restaurants, public houses, both independent and national retailers and local amenities, including a sports centre, swimming pool and leisure facilities. The locations of key destinations are indicated below.

2.3 There are a wide range of local amenities within walking / cycling distance, with the site having very good accessibility via both existing and proposed vehicular and non-vehicular links. Figure 1 below illustrates these local amenities.

Figure 1 Key destinations and facilities in Harpenden



Source: CEG North West Harpenden Design Vision Document (June 2014)

Enhanced Pedestrian and Cycle Links

2.4 The emerging transport strategy for the proposed development is aimed at minimising reliance on the private car and promoting healthier, more sustainable travel options. As part of this strategy, the proposed development at NW Harpenden offers an opportunity to improve walking and cycle connections in Harpenden.

2.5 The masterplan will include a new section of footway alongside Luton Road (A1081), connecting the new development to the pedestrian crossing at the junction with Roundwood Lane. A review of the HCC highway ownership plans confirms that the new footway can all be accommodated within the highway authority's land.

Figure 2 Proposed new footway

Source: Brookbanks Consulting Limited

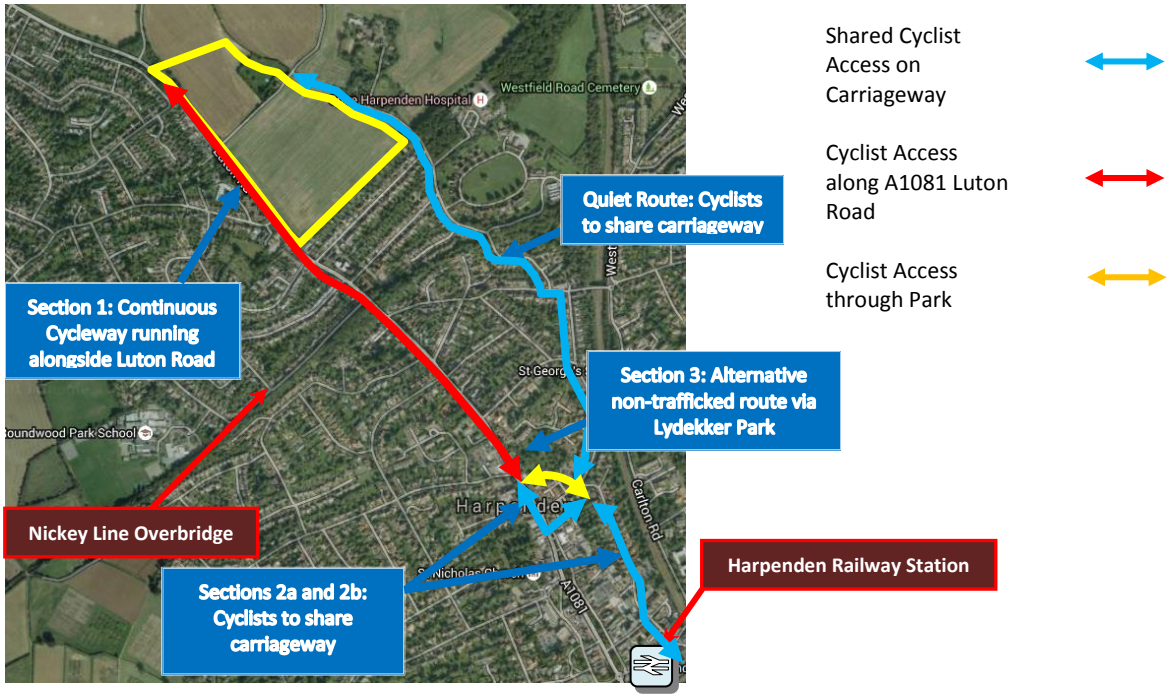
2.6 A Cycle Connection Strategy will be worked up and delivered as part of the ongoing design and development processes in order to promote cycling. Two new sustainable cycle routes have been identified from the proposed development to Harpenden town centre/rail station:

1 A new cycle route via the A1081 Luton Road; and,

2 A "quiet" cycle route via a shared carriageway along the lightly trafficked Ambrose Lane.

2.7 All cycle connection options remain in process of detailing, and will be presented to Hertfordshire County Council for approval in due course.

Figure 3 Proposed cycling routes from the proposed development to Harpenden Town Centre



Source: Brookbanks Consulting Limited

2.8 On site, there will be a comprehensive network of walking and cycling routes that will connect the housing and other areas within the proposed development, ensuring the development is fully accessible.

Better Public Transport Connections

2.9 The NW Harpenden site is already well-served by public transport facilities, providing a sustainable alternative to car travel. Further to this existing provision, the proposed development offers the opportunity to improve road-based public transport provision. Through discussion with the Highway Authority and local operators, viable improvements to public transport will be identified and implemented.

2.10 The closest bus stops to the site are located on Luton Road, adjacent to the site. The bus stops adjacent to Roundwood Lane provide convenient covered seating areas, with additional bus stops located close to Cooters End Lane. These are ideally located to serve the development, ensuring that the new homes will be within 400m of a bus stop.

2.11 The bus services that operate adjacent to the NW Harpenden site are highlighted below:

Table 1 Bus routes closest to the proposed development site

Service	Destination	Frequency
321	**Luton - Harpenden - St. Albans - Watford** **Operator: Arriva**	Monday to Saturday: 20 minute frequency Sunday: 60 minute frequency
366	**Luton - Harpenden - Wheathampstead - Welwyn Garden City - Hatfield** **Operator: Centrebus**	Monday to Friday: 60 minute frequency Saturday and Sunday: No Services
636	**Luton to Harpenden to St. Albans to London Colney** **Operator: Uno**	Monday to Friday: 60 minute frequency Saturday and Sunday: No Services

Source: Brookbanks Consulting Limited

2.12 The proposed development will be served by a total of five bus services per hour to Harpenden, Luton, St Albans and Watford. The journey time between Luton and Harpenden is circa 23 minutes, providing an attractive alternative to the car.

2.13 Brookbanks have consulted with all three bus operators who service the town. All operators have stated their support for this development and are being kept informed of progress. Ultimately, one or more of the suppliers may propose an additional service to accommodate the patronage of this development. Formal consultation on new bus services will be undertaken at the planning application stage.

2.14 Harpenden railway station is located within walking and cycling distance (less than 2km) from the proposed development. The station provides regular connections to numerous destinations, including:

1 Six routes per hour to St Albans – journey time circa 6 minutes;

2 Seven routes per hour to Luton – journey time circa 17 minutes; and,

3 Eight routes per hour to London St. Pancras – journey time circa 26 minutes.

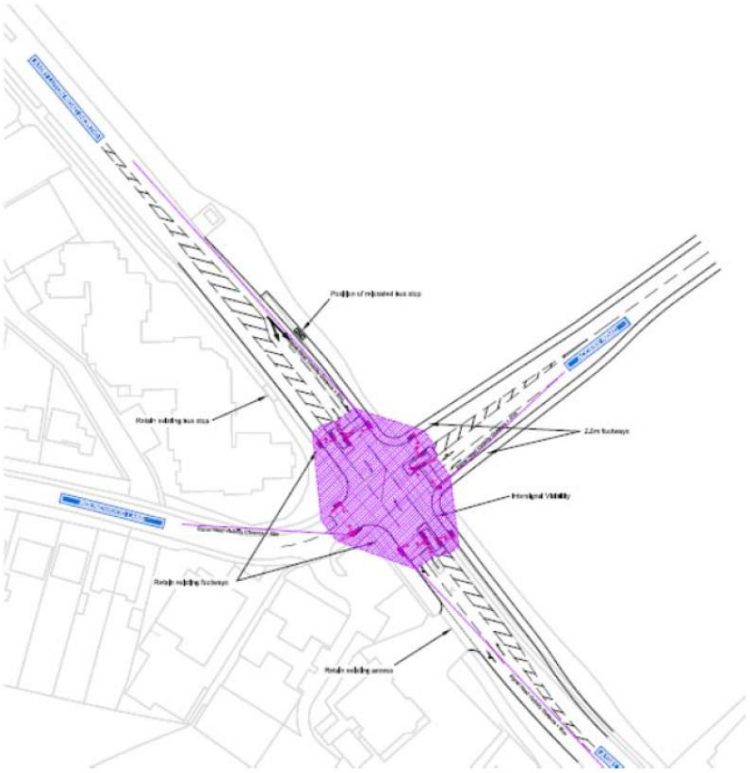
3.0 Proposed Access Arrangements

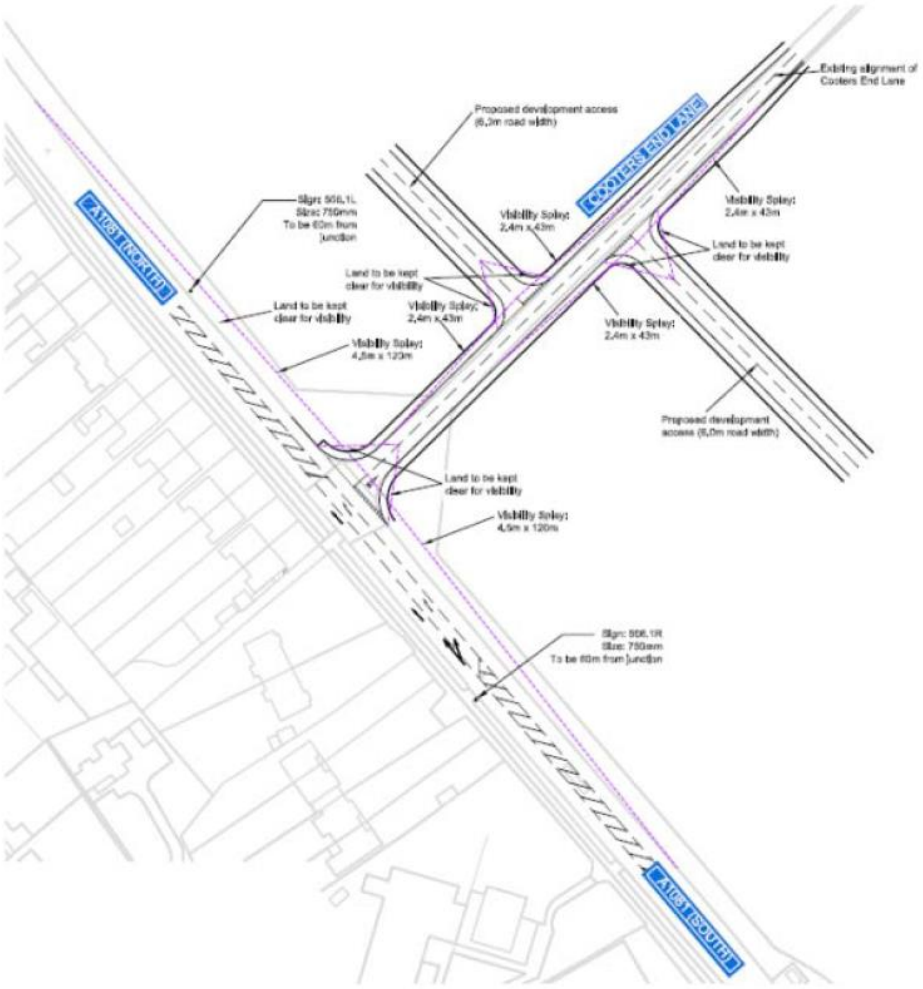
3.1 Two points of access are proposed to serve the site:

1 The main point of access into the site will upgrade the existing A1081 junction with Roundwood Lane, which is presently signal controlled; and,

2 A secondary access point will utilise the junction with Cooters End Lane.

Figure 4: Site access arrangements





Source: Brookbanks Consulting Limited

3.2 The site access points have been reviewed against both national and local design guidance. Both points lie within highway land / land under CEG's control, thus demonstrating that the junctions will be deliverable.

3.3 The access strategy will ensure that traffic generated by the development is more likely to use the A1081, and together with a considered onsite road layout, this will minimise impacts on the local roads including Ambrose Lane.

3.4 Safe access arrangements for the new school will be developed and agreed with SACDC.

4.0 Improving the Local Road Network

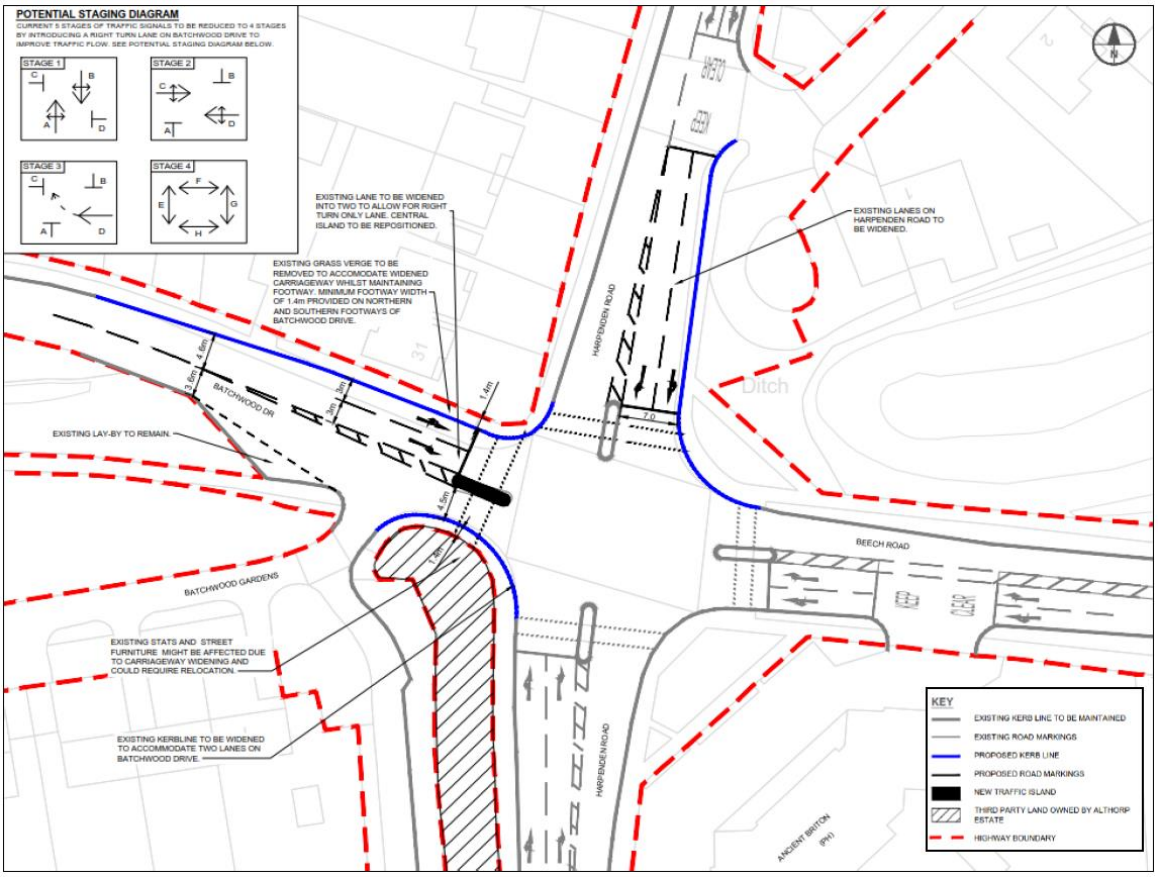
Junction Improvements

4.1 The proposed development offers the opportunity to contribute towards a package of highway improvement works that will improve the operation of the local road network. BCL's assessment work indicates that these works will ensure the junctions can accommodate additional journeys arising from the development as well as existing traffic movements.

4.2 HCC's COMET modelling has identified that the proposed development will only have an impact on the following two junctions. CEG is working together with HCC and SACDC to develop detailed proposals in relation to these junctions and will contribute to these improvements based on the assessed impact of the proposed development:

1 **The Ancient Briton junction (A1081 Harpenden Road / Beech Road / Batchwood Drive**: HCC's COMET modelling indicates that the proposed development will increase the use of this junction by a maximum of 2-3%. The actual impact on the junction will be confirmed through the planning application process. HCC's proposed mitigation scheme includes widening the Batchwood Drive approach in order to provide a separate right-hand turn lane, which would increase junction capacity and reduce delays for motorists.

Figure 4 Proposed improvements to Ancient Briton Junction



Source: SACDC Planning Policy Committee reports pack (11 July 2017), Appendix 3: Further Transport Evidence Base Work, Scheme Pro Forma Site 7, AECOM Extract of the feasibility drawing no. 60534762-SADC-DWG-SITE 7 REV 1

2 **A1081 Luton Rd/ Park Hill**: It is proposed that a Microprocessor Optimised Vehicle Actuation (MOVA) system is installed at this junction, which would adjust the signal timings according to traffic conditions, thereby enabling more efficient movement through the junction.

4.3 The current junction designs have been progressed to a level that demonstrates their deliverability and suitability to meet the appropriate standards. HCC's transport consultants, AECOM, have confirmed that the mitigation schemes proposed by BCL are acceptable for modelling purposes. When carried through to detailed design stage, all junction improvements will be subject to a complete design review and Road Safety Audits.

Influencing Route Choices

4.4 HCC's COMET model indicates that it may be beneficial to apply measures to minimise the potential for additional traffic to use local roads ('rat running') which could arise as a result of the overall quantum of additional development promoted through the local plan. In Harpenden, some vehicles may choose to cut through Cooters End Lane and Ambrose Lane rather than using the A1081. The proposed development at NW Harpenden is well placed to help address these wider effects in the local area.

4.5 There are various options available to discourage the use of local routes and encourage motorists to use the A1081 as the most appropriate route. Some of these are presented below. Any one of, or a combination of, these options could be adopted. Any traffic calming scheme would be discussed with key stakeholders before implementation.

Table 2 Potential traffic measures

Treatment	Description
Cooters End Lane closure	After providing access to the development, close Cooters End Lane to vehicular traffic
Alter the alignment of Cooters End Lane	As the promotors of NW Harpenden control the land adjacent to Cooters End Lane it is possible to alter the alignment to make the route less attractive
Traffic calming on Cooters End Lane	Introduce traffic calming measures that are reflective of the area on Cooters End Lane to make the route less attractive to through traffic

Source: Brookbanks Consulting Limited

4.6 The images below illustrate the type of traffic measures that could be included.

Figure 5 Potential traffic measures

Source: Brookbanks Consulting Limited

Road Safety

4.7 CEG will work with HCC and local stakeholders during the application process to ensure the development will not have a negative impact on road safety.

4.8 To determine if the proposed allocation could affect road safety, BLC conducted a review of historical accidents. A total of 10 personal injury accidents occurred within 500m in either direction of the site entrance area during the last five years.

4.9 BCL's assessment indicates that, whilst the proposed development will add traffic to the network, there is no evidence that it will compromise the relatively safe performance of the existing road system.

5.0 Summary

5.1 The emerging transport and cycle strategies for the proposed development are aimed at minimising reliance on the car and promoting healthier, more sustainable travel options.

5.2 The proposed development offers the following benefits and opportunities:

1 The NW Harpenden site provides access to a wide range of services, facilities and employment opportunities.

2 New and improved walking and cycle connections, linking the site to the pedestrian crossing at Roundwood Lane and to Harpenden town centre.

3 The NW Harpenden site is already well-served by public transport facilities, providing a sustainable alternative to car travel.

4 Opportunity to improve road-based public transport provision through discussion with the Highway Authority and local operators.

5 Safe, deliverable access to the proposed development site, given that the two access points lie within highway land / land under CEG's/L&G's control.

6 A package of junction improvements that will improve the operation of the local road network alongside mitigating the potential impact of additional traffic generated by the scheme.

7 The proposed development will not compromise the relatively safe performance of the existing road system.

5.3 CEG, L&G and their teams conclude that that the NW Harpenden site provides access to a wide range of services, facilities and employment opportunities as well as sustainable transport options. The proposed development also offers opportunities to support a shift towards sustainable travel and to improve local travel conditions, alongside mitigating any impacts of the development on the transport network.

Appendix 23: Transport Extract of North West Harpenden Landowner/Developer Representations Regulation 19 Consultation (October 2018)

17 October 2018
L&G-Covering letter-17.10.18

St Albans Local Plan Consultation
St Albans Council Offices
St Peters Street
St Albans
AL1 3JE

By email to: lp2018@stalbans.gov.uk

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DL:
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Wessex House
Wimborne BH21 1PB
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Dear Sir or Madam,

REPRESENTATIONS ON BEHALF OF LEGAL & GENERAL

ST ALBANS LOCAL PLAN 2020-2036 - REGULATION 19 CONSULTATION

Introduction

The following representations are submitted on behalf of Legal & General (L&G) in respect of their land interests at north west of Harpenden, which forms part of the 'North West Harpenden Broad Location' ('The NWHBL').

L&G control the land to the north west of Cooters End Lane and are working collaboratively with Commercial Estates Group (CEG) who are promoting land south east of Cooters End Lane. Representatives from L&G and CEG presented jointly to the Evaluation Validation Panel on 24 May 2018, and both parties submitted representations to the Council's St Albans Local Plan 2020-2036 Regulation 18 Consultation (February 2018) including a jointly produced site specific Vision Document and indicative masterplan.

L&G are keen to work with St Albans City and District Council (SACDC) to support the plan making process and ensure the range of benefits set to arise from this development are realised through direct delivery via Legal & General Homes Communities, the housebuilding arm of the Legal & General Group.

The North West Harpenden Broad Location

The NWHBL represents an inherently sustainable development well integrated within approximately 1.2km of Harpenden town centre and adjacent to the existing settlement boundary. It is a unique opportunity in a location with access to a wide range of services, facilities and employment opportunities as well as sustainable transport options. Development here offers opportunities to support a shift towards sustainable travel alongside mitigating any impacts of the development on the transport network.

It is also considered to represent an exciting opportunity to deliver a high quality, integrated and inclusive new community which respects its landscape setting, provides new homes to meet the varied needs of the community, includes education and open space facilities, and offers routes to encourage walking, cycling and the use of public transport.

Representations

Overall, L&G welcomes the direction of the emerging Local Plan and considers that this emerging document represents a positive step for planning in St Albans. In particular L&G strongly supports the identification of North West Harpenden as a Broad Location for a housing led development for early delivery in the plan period, based on its ability to promote and deliver homes in a sustainable location, as well as community provision and wider benefits.

Subsequent to the presentation to the Evaluation Validation Panel on 24 May 2018, L&G and CEG completed a proforma confirming to SADC the details of our proposals, including the ability to meet emerging Local Plan policy requirements. Our observations and comments are provided within this context, which include the identification of some areas of the emerging Plan that we suggest should be amended to ensure that the emerging Plan is found sound at Examination.

Our specific responses to each policy are set out on the enclosed representations response forms and cover the following matters:

- Paragraph 1.9 / Evidence Base.
- S1 – Spatial Strategy and Settlement hierarchy.
- S2 – Development.
- S3 – Green Belt.
- S4 - Housing Strategy and Housing Requirement/Target.
- S6 - Broad Locations for Development.
- S6 viii) - North West Harpenden.
- L1 - Housing Size, Type, Mix and Density.
- L3 – Provision of and financial contributions to affordable housing.
- L17 – Infrastructure.
- L18 – Transport Strategy.
- L19 – Highways/Access considerations for new development.
- L20 – New development parking standards and guidance.
- L21 – Education.
- L23 – Urban design and layout of new development.
- L30 – Historic Environment.

We would also add, in general, that throughout the Draft Local Plan there is a need to distinguish between each policy and its reasoned justification through appropriate formatting and wording.

L&G also notes that some background evidence documents have not yet been published, and it might be that we will have further representations once these documents become available. However, it is clear from the discussions at Planning Policy Committee meetings that work is underway and that these documents will be published prior to the submission of the emerging Plan. L&G appreciates that the Council is working to get an up-to-date plan in place as soon as possible and agrees that it is important that this is achieved, given the age of the existing development plan and the scale of need in the area.

We would welcome the opportunity to continue the process of engagement with the Council and to appear at the Examination to inform the Inspector's consideration of the plan.

Yours sincerely

[redacted]

Andrew Fido
Associate Director

cc: Sophie Groves/Lauren Aitchison, LGC
Enc: Completed representation forms
Land at NW Harpenden: Transport Position Statement' (25 September 2017)
North West Harpenden Vision Document (February 2018)
Presentation to SADC Evaluation Panel (May 2018)

NORTH WEST HARPENDEN

VISION DOCUMENT | FEBRUARY 2018

INTRODUCTION

CEG and Legal & General (L&G) have been working with St Albans City & District Council for a number of years to help address the challenges arising from the significant housing need across the District. In 2016, NW Harpenden was found as one of eight broad locations considered to perform least well against the purposes of the Green Belt and was subsequently recognised by St Albans City & District Council as one of four broad locations for strategic greenbelt release in its draft Strategic Local Plan for housing led development.

The latest context for the St Albans Local Plan 2020-2036 is one of increasing housing need, potentially requiring additional strategic Green Belt releases beyond those set out in the draft Strategic Local Plan. CEG and L&G remain committed to delivering new homes in Harpenden by creating a new neighbourhood at North West Harpenden which integrates with the existing community to provide new homes for families, downsizers and first time buyers alongside green infrastructure and community facilities. A 2.5ha school site has been identified as part of the Illustrative Masterplan. CEG and L&G are willing to discuss the most appropriate means for delivery of the school with the local education authority.

OUR SHARED VISION

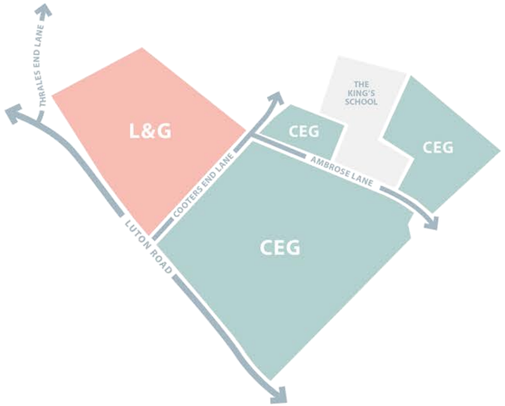
“

To work with the Council, stakeholders and local residents to plan and deliver a high quality, integrated and inclusive new community in a sustainable location in Harpenden which respects its landscape setting, provides new homes to meet the varied needs of the community, includes education and open space facilities, and offers routes to encourage walking, cycling and the use of public transport.

”

This Vision Document is an exploration of the opportunity, its context, the site's current features and form and local design cues. The document demonstrates the application of those principles through the development of an illustrative masterplan that confirms site capacity for circa 545 new homes. It is intended to stimulate a discussion about what this site will do for Harpenden and the quality of design and community commitment that should be expected of any developer in such an interesting location.

The land to the north and south of Cooters End Lane is controlled by L&G and CEG respectively, as demonstrated by the graphic below.



INDICATIVE VIEW OF CENTRAL GREEN

OPPORTUNITIES

Following extensive layering of constraints and the identification of key issues, the design team identified opportunities which would underpin and shape the proposals. These opportunities have helped to form the envelope of the developable area and have been an important element of the design process. A number of the opportunities are set out below and illustrated on the adjacent plan:

- Provide a mix of new homes of different sizes and tenures to meet local need.
- Provide a 2.5 ha school site.
- Provide denser residential development on the most enclosed and contained parts of the site to the south and east.
- Provide amenity spaces towards the edges of the site forming a long-term and robust settlement boundaries.
- Respect the setting of the listed buildings by pulling development back away from these edges of the site.
- Provide vehicular access points off Luton Road, Cooters End Lane and Ambrose Lane.
- Retain and enhance the existing hedgerows, mature trees and woodland within the site.
- Create gateway spaces at key locations to welcome visitors and integrate the site with its surroundings.
- Provide attractive open spaces including a large Central Green that forms part of a network of community facilities including play areas, allotments and orchards.
- Utilise sustainable drainage solutions that are integrated with open spaces.
- Create strong green infrastructure routes and strategic pedestrian footpaths which connect with the existing public rights of way and cycle network.
- Enhance the existing Chiltern Way National Trail route running along Cooters End Lane by providing a dedicated off road footpath.

DESIGN CONCEPT

The developable area has been determined by the constraints analysis and the identification of key opportunities.

The concept has been formed around the desire to create a positive new residential gateway to Harpenden along Luton Road, a main approach into the town. The concept looks to create a great place for people that respects its landscape and heritage assets and is well connected with the town. Key features of the design concept include:

- A new frontage to Luton Road with views of buildings set behind existing trees and formally landscaped green corridor;
- Sensitive treatment of Cooters End Farm, Cooters End Lane and Ambrose Lane with green corridors;
- Varied and multifunctional open spaces forming part of a green infrastructure network linking to the school and wider footway/ road network;
- Western edge of site provides an opportunity to reinstate an historic hedgerow, which along with additional tree planting will soften the appearance of the proposed development. This also provides a defensible edge to the new Green Belt boundary;
- Buffer planting to the south eastern boundary that is shared with residents on Bloomfield Road;
- Routes cross steep slopes rather than running straight up them, thus retaining the natural topography and reducing the level of engineering required;
- Open space west of Cooters End Farm reinterprets the historic land use to create a community orchard whilst also respecting the setting of the listed farm building.

NORTH WEST HARPENDEN
VISION DOCUMENT

ILLUSTRATIVE LAYOUT

The masterplan is developed as an appropriate response to the factors that have influenced the design process.

Above all the design process has focused on creating a place which people will be proud of, a place that will become a community which engenders a sense of civic pride. Paramount in achieving this has been a consideration of how the public realm will be experienced by residents and visitors alike, and how the context of existing landscape and new open spaces will complement the built environment.

The new community is also within walking and cycling distance of a range of facilities and amenity areas. The masterplan has been designed to be highly permeable to afford ample opportunity to walk and cycle along direct routes through the settlement to the wider footpath and road network.

The masterplan demonstrates how the development will provide homes for a wide range of occupiers, from first time buyers and young families through to downsizers. The proposal responds to the variety of local housing needs identified by recent Council studies with a mix of homes, 40% of which will be affordable.

To better understand how the masterplan will deliver the new community, the principal elements are explained below:

- A hierarchy of building types ranging from tall mansion blocks of apartments, to terraces of two and three bed houses and some larger detached dwellings.
- Built form which relates to street types, creating an appropriate form of scale and enclosure, such as two storey terraces in mews, formal semi-detached villas facing entrance streets and larger mansion blocks of apartments enclosing larger spaces and functioning as landmark buildings.
- Streets following the natural contours of the land. Where streets have to cross the contours they have been oriented to positively reduce the requirement for complex road and building design.
- A hierarchy of street types from formal tree-lined entrance avenues, to tertiary streets, mews, formal squares (designed as multi-functional spaces), courtyards and shared surfaces, together with formal and informal edge treatments.
- Street pattern designed to calm traffic naturally with minimal reliance of vertical calming measures.
- A collection of housing typologies reflecting traditional forms through height, massing, fenestration , vertical emphasis, rhythm and architectural detail (either traditional or a modern interpretation).
- Use of key groupings and landmark buildings to create gateways, enclose spaces and aid wayfinding through cognitive recognition.
- Building form enclosing a series of green corridors and streets linking key gateways into the site and through to the proposed new school.
- Open spaces provided around sensitive areas such as Cooters End Farm and Ambrose Lane, creating an appropriate transition to the countryside.
- Provision of amenity areas for community use in the form of green spaces and links, orchard and allotments.

CHARACTER AREAS

The below plan shows the location of the different character areas within the scheme. These areas each have their own attributes, but contribute to a strong overall character. These areas are described in detail with example images.

1. Luton Road Frontage

Combination of tall mansion blocks of apartments up to 3.5 storeys in height, together with 2.5 and 3 storey townhouses set back behind a formal green corridor incorporating sustainable urban drainage. The height of these buildings will make them visible from Luton Road, creating a suitably urbanised context for the entrance to the town from the north-west. Parking will be provided within the street to the rear and within larger courtyards.

2. Central Green

This space is designed as a point of arrival within the eastern parcel and will be framed by a series of tall mansion blocks and 2.5 storey townhouses. The space will balance the built development when viewed from outside the site, and will provide an overlooked amenity space including children's equipped play area. Parking will be located to the rear for the apartment blocks and on-plot for houses.

3. Residential Core

Traditional streets of two and three bed terraced and semi-detached houses terminating in formal squares and courtyards near to the eastern boundary. This fine grained form of development will be higher density than housing on the periphery. Parking will be generally on-street and within the squares/courtyards with some on-plot. Within the western parcel, a wide tree-lined street crosses through the area terminating in a small green overlooked and framed by dwellings. A secondary tree-lined road links this street with the community orchard. Beyond these features, higher density secondary mews streets of terraces and courtyards are designed to a finer grain. Parking will be on plot along the tree-lined street, whilst mews streets will contain a mixture of on-street parking and courtyard parking.

4. Cooters End Lane

The lane is the place where the eastern and western parcels meet, and is an important interface between the two areas of development. A large corner turning apartment block designed as a key building is located next to the Luton Road and Cooters End Lane junction in order to announce the entrance into the western parcel. Above this the built form enclosure opens out into a wider space with vehicle and pedestrian access to both the western and eastern parcels. Parking will be to the rear of the apartment block and generally on-plot for houses.

5. Cooters End Lane/Ambrose Lane Edge

This will be the low density northern edge that sensitively transitions from the adjacent countryside to built form. Detached houses within generous plots will face out towards the lanes, and these will be set behind a wide landscaped edge containing informal pedestrian routes. This will create an appropriate interface between the built edge and the more rural character of the lanes and open countryside beyond. Parking will be on-plot.

6. Woodland Edge

This is the location for lower density housing which has strong visual connections to adjacent woodlands and/or open space along the Green Belt boundary. Housing is primarily detached with generous plots facing out to the new reinstated hedgerow and associated tree planting creating a soft new edge to Harpenden that will also be an attractive and welcoming place for its new residents. Parking will generally be on-plot served from private drives.

A SUSTAINABLE LOCATION

Building new homes on the edge of Harpenden will provide residents with easy access to a range of existing facilities, services and green space by non-car modes. In return, the development will contribute towards meeting local housing needs and provide new facilities, whilst the additional spending and workforce will contribute to the existing local economy.

The site is well-integrated with the town and its development will provide benefits by establishing new social infrastructure, including playing fields, allotments and a community orchard for both the existing and new communities of Harpenden. A 2.5 ha school site has been identified as part of the illustrative masterplan. CEG and L&G are willing to discuss the most appropriate means for delivery of the school with the local education authority.

North West Harpenden's close proximity to the countryside and surrounding green networks presents a clear advantage. The site offers the opportunity to introduce publicly accessible open space and new links as an integral part of the design to ensure those green networks are enhanced and the connections with the surrounding countryside are at the heart of the masterplan.

The development of circa 545 new homes will support the District's economy by ensuring that the workforce are close to enterprise and economic growth opportunities while also creating direct job opportunities including key local employers during construction and through increased resident spending in the town.

PROVIDING TRAVEL CHOICES

CEG and L&G have been advised by a team of professional specialists, including in relation to transport matters. We have discussed our proposals in detail with the County Council as Highway Authority to confirm the local transport network is able to accommodate the proposed new homes. As part of the masterplanning process we have identified opportunities to encourage reduced car use.

ON SITE NETWORK

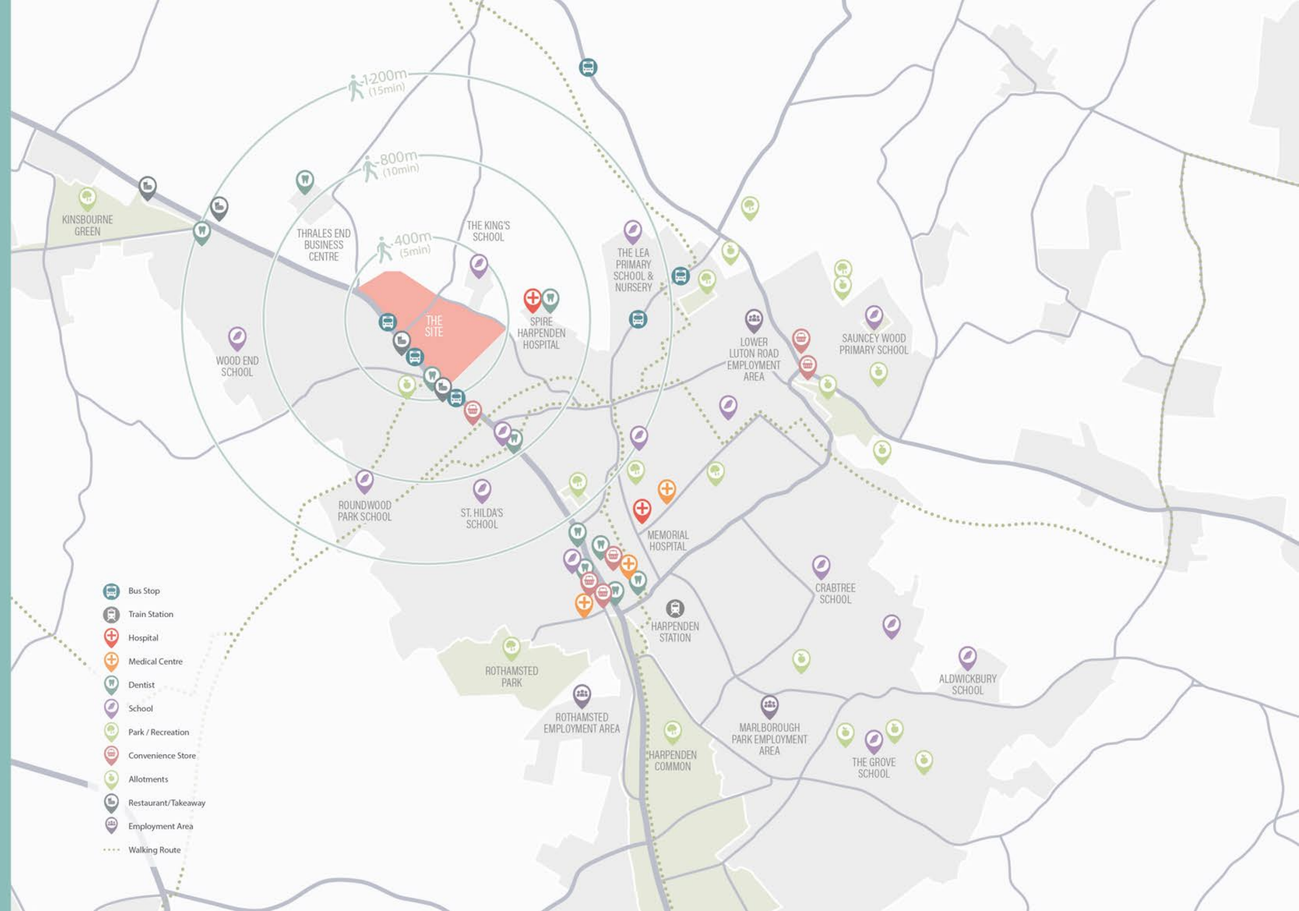
The masterplan for the site will include a comprehensive network of walking and cycling routes that will connect the homes within the proposed development, ensuring that the development is fully accessible. The on site network will be inclusive to all future residents. The masterplan will also include a new section of footway along the site frontage on Luton Road.

OFF SITE CONNECTIONS

The masterplan will include connections into the existing Harpenden network to ensure walking and cycling journeys can be carried out between the site and the local services, amenities and facilities that Harpenden offers. To ensure route choice for sustainable travel several improvements to the walking and cycling network can be considered, including both 'leisure' and 'commuter' cycling routes, taking residents all the way through to Harpenden train station, the town centre and the Rothamsted Campus.

PUBLIC TRANSPORT

The site is supported by the existing public transport services that currently operate along Luton Road, with regular connections between Harpenden and neighbouring towns. The regular 20 minute service is augmented during school time periods. Together with the 366 and 636 supporting services, this demonstrates that the development will be served by five services per hour. Using the 321 service the journey time between Luton and Harpenden is circa 23 minutes, providing an attractive alternative to the motorcar. The closest bus stops to the site are located on Luton Road, adjacent to the site. The bus stops adjacent to Roundwood Lane provide convenient covered seating areas with additional bus stops located close to Cooters End Lane. These are ideally located to serve the development, ensuring that the potential housing will be within 400m of a bus stop.



HIGHWAYS & TRANSPORT

To make sure that the development is fully accessible, four points of access will be delivered. These points have been reviewed against design guidance and lie within highway land / land under the control of CEG and L&G, thus demonstrating that the access junctions will be safe and deliverable.

Four access points will be delivered:

- The main access point will upgrade the existing A1081 junction with Roundwood Lane, which is presently signal controlled. A fourth arm would maintain the current level of control and would include crossing facilities for pedestrians and provision for cyclists.
- Two secondary access points will form a new crossroad with Cooters End Lane.
- A northern access junction will be provided from Ambrose Lane.

The access strategy will ensure that development traffic is more likely to use the A1081 and together with a considered on site road layout will minimise impacts on the local roads including Ambrose Lane.

On a strategic highway level, Hertfordshire County Council's COMET traffic model has identified two junctions where improvements may be needed. These are:

- 'Ancient Briton' junction (A1081 Harpenden Road/Batchwood Drive/Beech Road).
- A1081 Luton Road/Park Hill junction.

The junctions identified above have been reviewed to determine the extent of mitigation required to maintain and improve existing conditions. These interventions include localised widening which does not alter the basic form of the junction. Any junction improvement carried through to detailed design will be subject to a complete design review and full Road Safety Audits. A further local junction assessment, utilising the validated COMET model, will be undertaken as part of the planning application to test, measure and mitigate any further local residual traffic impacts. Contributions to support improvement works to these junctions will be made.

The masterplan for the site will include a comprehensive network of walking and cycling routes ensuring that the development is fully accessible. Several improvements to the walking and cycling network are being considered. These include both a 'leisure' and 'commuter' cycling routes, taking residents all the way through to Harpenden train station.

The site would benefit from the existing bus services on Luton Road with up to 5 buses per hour each way. The development would generate extra patronage on these services improving their viability. Improvements to the existing footways and bus stops would add to the attractiveness of the existing buses.

PROPOSED SITE ACCESS LOCATIONS

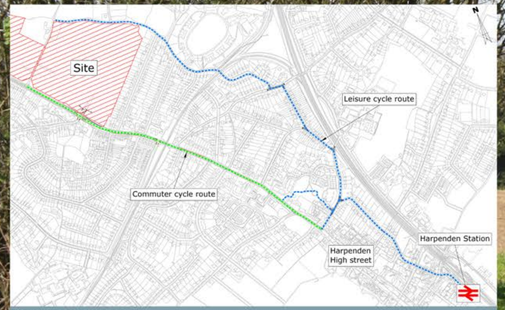
INFLUENCING ROAD CHOICES

HCC's COMET model indicates that it may be beneficial to apply measures to minimise the potential for additional traffic to use local roads ('rat running') which could arise as a result of the overall quantum of additional development promoted through the local plan. In Harpenden, some vehicles may choose to cut through Cooters End Lane and Ambrose Lane rather than using the A1081. The proposed development is well placed to help address these wider effects in the local area.

There are various options available to discourage the use of local routes and encourage motorists to use the A1081 as the most appropriate route. Some of these are presented below. Any one of, or a combination of, these options could be adopted. Any traffic calming scheme would be discussed with key stakeholders before implementation.

Potential calming measures could include:

- Closing Cooters End Lane to vehicular traffic to the north of where development access will occur.
- Altering the alignment of Cooters End Lane from straight to curved in order to dissuade through traffic.
- Introduce traffic calming measures on Cooters End Lane and/or Ambrose Lane to make the route less attractive to through traffic. Measures could include chicanes, raised tables, road narrowing and additional signage/road markings.



OFF SITE CYCLE ROUTES

COMMUNITY INFRASTRUCTURE & FACILITIES

Alongside circa 545 new homes, development at NW Harpenden will deliver:

- Land to accommodate new primary education facilities, including provision to meet the needs arising from the development. A 2.5ha school site to meet the needs of the development and the wider area (which could be delivered by either the County Council or by the developer) and sports pitches with the opportunity for dual usage by the schools and by the community.
- Public open space and outdoor play facilities for the whole community.
- A community orchard and allotments, including associated amenity facilities and parking/servicing provision.
- A community building or service hub through financial contributions to an off-site facility.
- Immediate improvements to pedestrian and cycle routes from the site to Harpenden town centre and Harpenden Railway Station via Ambrose Lane and Sun Lane, and support for longer term improvement schemes on Luton Road.
- Improvements to footpaths and new routes which will improve public access to the surrounding countryside.
- Contributions to deliver highway improvements to existing junctions at A1081 Harpenden Road/Batchwood Drive/Beech Road ('Ancient Briton') and A1081 Luton Road/Park Hill. Contributions for minor improvements to other local junctions will also be made.
- Significant contributions to public transport service improvements.

ECONOMIC BENEFITS

A wide range of social and economic benefits, in addition to those delivered through community infrastructure and funding will be created.

NORTH WEST HARPENDEN

MAY 2018

OUR SHARED VISION

To work with the Council, stakeholders and local residents to plan and deliver a high quality, integrated and inclusive new community in a sustainable location in Harpenden which respects its landscape setting, provides new homes to meet the varied needs of the community, includes education and open space facilities, and offers routes to encourage walking, cycling and the use of public transport.

ILLUSTRATIVE MASTERPLAN

1. 545 homes in a range of types and sizes including mansion block apartments, terraces of two and three bed houses and some larger detached dwellings.
2. Green corridors and streets linking key gateways and the proposed new primary school.
3. Traffic calming by street pattern design.
4. Amenity areas for community use.
5. Open spaces and lower density edges to create transition to the countryside.
6. 2.5ha primary school site.

BENEFITS

- Mix of new homes to meet local needs.
- 40% affordable homes, including for key workers.
- High quality design and sustainable construction.
- Strong green infrastructure network, including existing features, open spaces, boundary and woodland planting.
- 2.5ha site and support for provision of new primary school places.
- Sports pitches for school and community use.
- Open space, orchard and allotments.
- Contribution to a community building or service hub.
- Contributions to public transport improvements.
- Contributions to highway improvements at “Ancient Briton”, Luton Road/Park Hill, and other local junctions.
- Enhanced cycle and pedestrian routes to key local destinations.
- Improved access to the surrounding countryside.

TRANSPORT AND ACCESS

1. Access strategy which directs development traffic to Luton Road and minimises impacts on local roads.
2. Proportionate contributions for improvements to “Ancient Briton” and Luton Road/Park Hill junctions, with additional contributions at local junctions, subject to further assessment.
3. Comprehensive network of walking and cycling routes with enhanced “leisure” and “commuting” cycle routes to the town centre and station, a new footway along Luton Road, and contributions to improve countryside access.
4. Good existing accessibility by bus, with up to five services per hour on Luton Road, and support for service enhancement.
5. Parking provision in accordance with local standards.

DELIVERING THE POLICY REQUIREMENTS

- Masterplanning in partnership with officers already underway.
- A range of housing sizes, types and tenures.
- Community facilities including a 2.5ha school site supported by the County Council.
- Open and green spaces which incorporate and enhance existing landscape features.
- Improvements to existing infrastructure, routes and transport connections.
- High quality design for sustainable construction and occupation.