Technical Note

Project:	NPP - Gartree 2		
Subject:	Technical Response to LCC Application Review by SYSTRA		
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Introduction

Harborough District Council (HDC) has appointed SYSTRA to undertake a review of the Highways Advice provided by Leicestershire County Council (LCC) in relation to the Transport Assessment produced by Atkins in support of the Outline Planning Application (OPA) for a new Prison (referred to as Gartree 2).

The planning reference for the Gartree 2 OPA is: **21/01600/OUT**.

The document reference for the LCC Application Review produced by SYSTRA is: **GB01T22A11-TN001**.

HDC has appointed SYSTRA to review the Highways Advice provided by LCC due to perceived local concerns in relation to the capacity of the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction and the requirement for a pedestrian crossing along the A4304 in Lubenham. HDC has also raised concerns regarding the '*limitations which the application has faced due to the covid pandemic*'.

Mace (on behalf of the Ministry of Justice) has commissioned Atkins to consider the points raised within the LCC Application Review produced by SYSTRA and respond accordingly. A copy of the LCC Application Review is provided in **Appendix A** of this Technical Note.

B6047 Harborough Road / Leicester Lane / Gallow Field Road Junction

The LCC Application Review produced by SYSTRA outlines a series of conclusions regarding the forecast impact of Gartree 2 on the B6047 Harborough Road / Leicester Lane / Gallow Field Road Junction. Atkins has summarised each of the comments below and provided a response.

SYSTRA Conclusion: *The flows considered in the TA are potentially low, when compared to data subsequently available in other applications.*

Atkins Response 1: During the pre-application scoping discussions with Highways Development Management Officers from LCC it was confirmed that the Network Data & Intelligence (NDI) team were undertaking long term monitoring within Leicestershire to determine the appropriateness of undertaking traffic surveys during the COVID-19 pandemic. It was confirmed by the NDI team that traffic surveys were permitted to proceed during June 2021 on the condition that a valid survey permit was obtained by Streetwise Services (the survey company commissioned by Atkins to undertake the required traffic surveys). As part of the permit application process, the NDI team confirmed that Streetwise Services received the appropriate uplift figures to account for the reduction in traffic as a result of COVID-19. Therefore, Atkins undertook the necessary precautions to ensure that the observed traffic data obtained was representative of the pre-pandemic traffic flows within Leicestershire.

As part of the permit application process, the NDI team provided Atkins with a Classified Turning Count (CTC) at the B6047 Harborough Road / Leicester Lane / Gallow Field Road Junction (undertaken in 2017) and an Automatic Traffic Count (ATC) along Gallow Field Road (undertaken in 2018). Atkins used the historic count data provided by the NDI team to validate the traffic surveys undertaken in June 2021.

Figure 1 presents a comparison of the total traffic flows (across all turning movements) at the B6047 Harborough Road / Leicester Lane / Gallow Field Road Junction. The Transport Assessment for Gartree 2 reviewed the development impact during the AM Development Peak (07:00-08:00) and the PM Development Peak (17:00-18:00). During the AM Development Peak, the June 2021 survey flows were 6% higher than the October 2017 survey flows (1,280 compared to 1,202). During the PM Development Peak, the June 2021 survey flows were 5% lower than the October 2017 survey flows (1,342 compared to 1,419). The analysis indicates that the traffic flows in June 2021 were comparable to the traffic flows in October 2017.

Figure 1 – B6047 Harborough Road/ Leicester Lane/ Gallow Field Road Traffic Flow Comparison
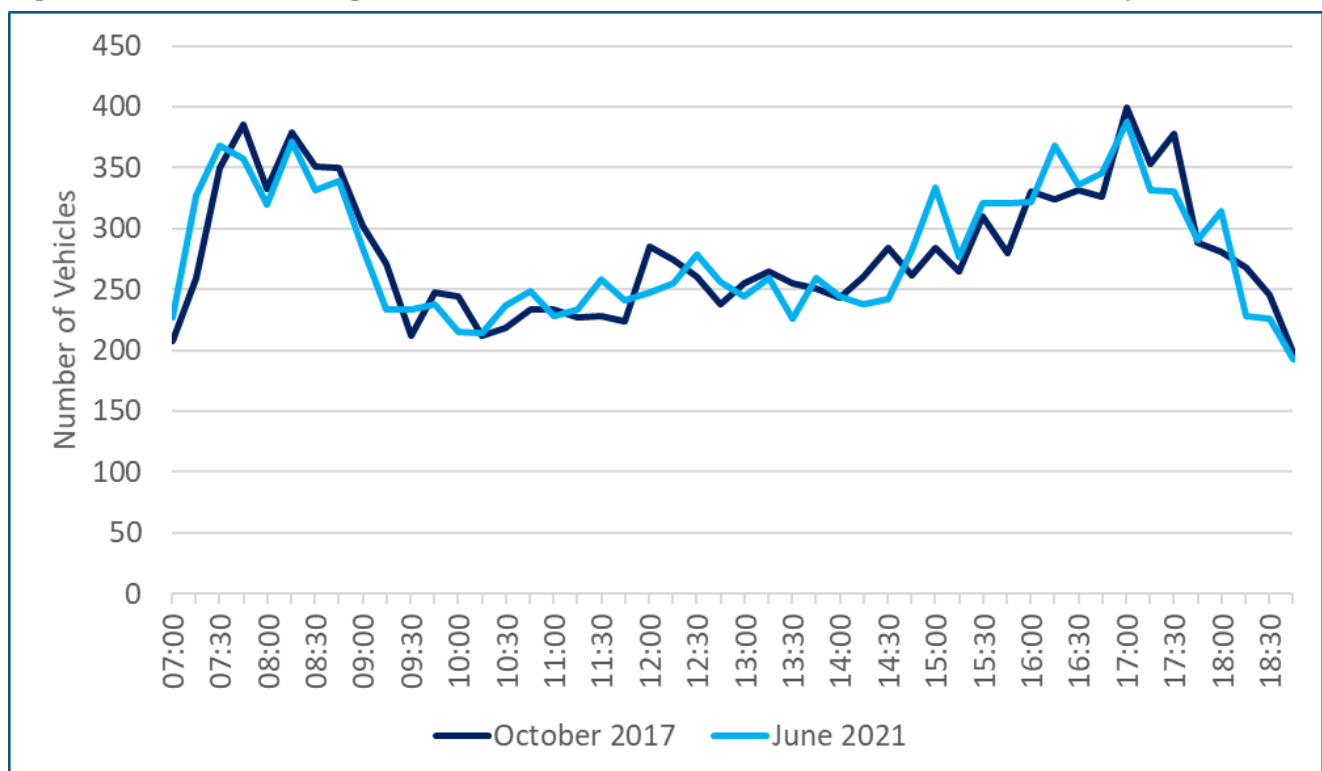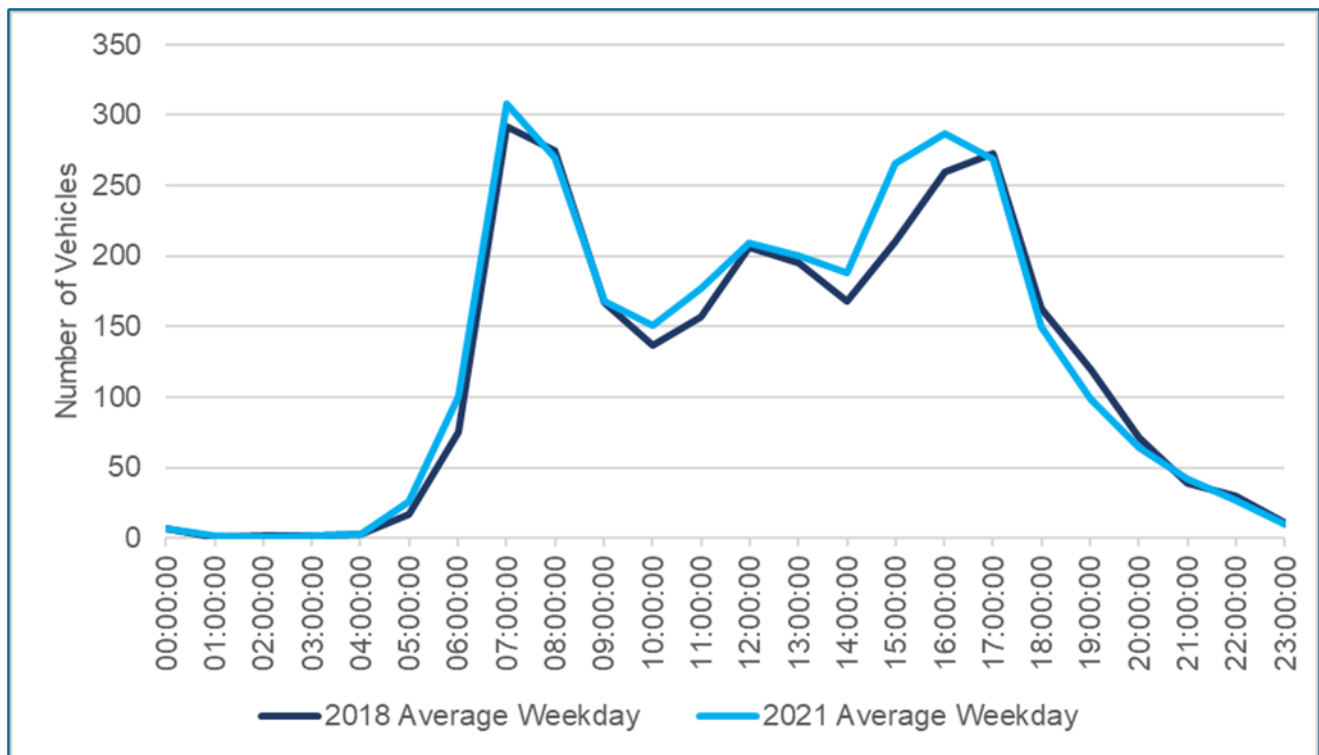

Figure 2 presents a comparison of the traffic flows along Gallow Field Road. The analysis indicates that the traffic flows in June 2021 were comparable to the traffic flows in 2018.

Figure 2 - Gallow Field Road Traffic Flow Comparison

Atkins Response 2: Within the LCC Application Review, SYSTRA question why Leicestershire's Pan Regional Transport Model (PRTM) was not used to evaluate the impact of Gartree 2. During the pre-application scoping discussions with Highways Development Management Officers from LCC, the application of Leicestershire's PRTM was discussed. It was agreed between LCC and Atkins that the PRTM is not appropriate for the scale and location of the proposed development because the PRTM is a strategic transport model which is not validated against turning movements at specific locations. Due to the rural location of Gartree 2, which is proposed to be accessed via an unadopted road (Welland Avenue), the representation of the local highway network within the PRTM is not considered to be as accurate as a first principles approach.

Atkins Response 3: Within the LCC Application Review, SYSTRA also reference traffic flows from the 2010 Airfield Farm Transport Assessment (11-00112-out). This report used observed data from traffic surveys undertaken between 2000 and 2009 to forecast a 2021 baseline. It is generally not considered appropriate to reference historic traffic data which is more than 5 years old because it does not consider the latest travel patterns and trends.

SYSTRA Conclusion: *The level of flows appears low primarily because of the proximity of other committed developments and developments currently in the planning system.*

Atkins Response: During the pre-application scoping discussions with Highways Development Management Officers from LCC it was agreed that the Transport Assessment for Gartree 2 would be prepared in accordance with the 'Travel Plans, Transport Assessments and Statements' guidance from the Ministry of Housing, Communities & Local Government (March 2014).

Within the guidance it states that a Transport Assessment should be based on normal traffic flow and usage conditions (e.g. non-school holiday periods, typical weather conditions) but it may be necessary to consider the implications for any regular peak traffic and usage periods (such as rush hours). Projections should use local traffic forecasts such as TEMPro drawing where necessary on National Road Traffic Forecasts for traffic data. In addition, it states that an assessment of trips should be undertaken from all directly relevant committed development in the area (i.e. development that there is a reasonable degree of certainty will proceed within the next 3 years).

At the time of submitting the Transport Assessment for Gartree 2 it was not considered that there was a reasonable degree of certainty that the Airfield Farm development would proceed within the next 3 years because the Planning Application had not received consent, therefore, the application of TEMPro to account for background traffic growth, specifically Local Plan Allocations is considered appropriate in this instance.

SYSTRA Conclusion: *Using the most recently available data associated with application 21/00545/OUT the Gartree Prison application does not produce capacity results which would be considered over capacity.*

Atkins Response: Agreed

SYSTRA Conclusion: With *a cumulative assessment with applications 21/00545/OUT and 21/01600/OUT, the Gallow Field Road arm of the junction can be expected to be over capacity in the PM peak if both applications are approved.*

Atkins has provided two responses in relation to the SYSTRA Conclusion outlined above. The first response is in relation to the Standalone Junction Capacity Model which SYSTRA has referenced within the LCC Application Review. The second response outlines the additional analysis which Atkins has undertaken in response to the LCC Application Review.

Atkins Response 1: Within the LCC Application Review, SYSTRA has undertaken a standalone junction capacity assessment of the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction using the geometric parameters contained within Appendix O of the Transport Assessment for Gartree 2, the traffic flows within the 2021 Airfield Farm Transport Assessment and the traffic flows from Leicestershire's PRTM.

Atkins has reviewed the model outputs provided by SYSTRA and note the following points:

- SYSTRA has modelled an AM Peak Hour of 08:00-09:00 and a PM Peak Hour of 17:00-18:00 in accordance with the Airfield Farm Transport Assessment (11-00112-out). However, the Transport Assessment for Gartree 2 specifically notes that the AM Development Peak for Gartree 2 is 07:00-08:00 and therefore it is not anticipated that there will be a cumulative impact during the same peak hour.

- In Junctions 10 you are required to input the start and end time of the AM and PM Peak Hours. This includes a 15 minute period before and after the peak periods selected. For example, a 17:00-18:00 peak hour would have a start time of 16:45 and an end time of 18:15. SYSTRA has input the following information which does not accord with either the Atkins model or the peak hours identified within the PRTM:
  - o AM Peak – Start Time 08:00 – End Time 09:30.
  - o PM Peak – Start Time 17:00 – End Time 18:30.

- SYSTRA has input the required visibility for the Major Arms (Arm A and Arm C) incorrectly. They have input the values the opposite way round compared to the Atkins Model.

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Atkins Response 2: In response to the points raised by SYSTRA within the LCC Application Review. Atkins has undertaken two additional assessment scenarios to consider the cumulative impact at the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction.

The two additional assessment scenarios are outlined below. As discussed, the AM Development Peak for Gartree 2 is 07:00-08:00 and the AM Development Peak for Airfield Farm is 08:00-09:00. Therefore, it is not anticipated that there will be a cumulative impact during the same peak hour. However, for the purpose of this assessment, Atkins has applied the Gartree 2 Development Peak flows (07:00-08:00) to the Airfield Farm Development Peak (08:00-09:00) to present a robust assessment.

- 2031 Cumulative with Development
  - 2021 Baseline Flows Factored to 2031 (using TEMPro).
  - Gartree 2 Development Traffic Added (21/01600/OUT application).
  - Airfield Farm Development Traffic Added (21/00545/OUT).

- 2031 Cumulative with Development (Sensitivity Test)
  - 2021 Baseline Flows Factored to 2031 (using TEMPro).
  - Gartree 2 Development Traffic Added (21/01600/OUT application).
  - Airfield Farm Development Traffic Added (21/00545/OUT).
  - Proposed HMP Gartree Expansion Traffic Added.

It is important to note that because Airfield Farm is an allocated site within the Harborough District Local Plan, the above assessment scenarios include an element of double counting because the development trips for 21/00545/OUT will also be included within TEMPro. This is considered robust. In addition, Atkins has included an assessment of the proposed HMP Gartree expansion.

The development flows for the 21/00545/OUT application at the B6047 Harborough Road/ Leicester Lane/ Gallow Field Road junction have been calculated using the PRTM flows provided in Appendix A of the LCC Application Review produced by SYSTRA.

Traffic growth factors have been extracted from TEMPro v7.2 using the rural TEMPro setting and applied to the 2021 traffic count data to establish a 2031 future baseline. A summary of the TEMPro local growth factors for Harborough Local Authority are provided in Table 1.

Table 1 - TEMPro Growth Factors

Peak Hour	2021 – 2031
AM Peak	1.1171
PM Peak	1.1198

Table 2 presents the results of the standalone junction capacity assessment for the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction. The full outputs are provided in **Appendix B**.

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Table 2 - Model Outputs - B6047 Harborough Road / Leicester Lane / Gallow Field Road Junction

Approach Arm		AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
		Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2031 Cumulative with Development							
Leicester Lane	Left Out	0.2	14.22	0.19	0.1	13.73	0.11
	Right Out	0.4	34.16	0.28	0.3	26.70	0.22
B6047 Harborough Road (N)	Right In	0.7	12.12	0.39	0.2	10.39	0.17
Gallow Field Road	Left Out	0.6	17.75	0.37	2.6	35.29	0.74
	Right Out	0.9	36.89	0.47	1.6	55.68	0.64
B6047 Harborough Road (S)	Right In	0.1	11.80	0.04	0.1	8.31	0.10
2031 Cumulative with Development (Sensitivity Test)							
Leicester Lane	Left Out	0.2	14.35	0.19	0.1	13.76	0.12
	Right Out	0.4	34.78	0.28	0.3	27.26	0.23
B6047 Harborough Road (N)	Right In	0.7	12.37	0.41	0.2	10.39	0.17
Gallow Field Road	Left Out	0.6	18.36	0.38	3.3	43.05	0.79
	Right Out	1.0	38.56	0.49	2.0	67.56	0.69
B6047 Harborough Road (S)	Right In	0.1	11.88	0.04	0.1	8.31	0.10

The results from the standalone junction capacity modelling indicate that the B6047 Harborough Road / Leicester Lane/ Gallow Field Road junction is forecast to operate within acceptable thresholds of capacity in all assessment scenarios.

SYSTRA Conclusion: *At the time of submission, the conclusions reached on the application with regards to the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction could be considered correct (noting that the flows tested could be considered low) the cumulative impact assessment undertaken in this report suggests that this junction will be over capacity if both 21/01600/OUT and 21/00545/OUT are approved.*

Atkins Response: As outlined above, the analysis contained within the Transport Assessment for Gartree 2 is considered appropriate and robust. However, in response to the points raised by SYSTRA within the LCC Application Review. Atkins has undertaken two additional assessment scenarios to consider the cumulative impact at the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction.

The results from the standalone junction capacity modelling indicate that the B6047 Harborough Road / Leicester Lane/ Gallow Field Road junction is forecast to operate within acceptable thresholds of capacity in all assessment scenarios.

A4304 Lubenham - Accident and Pedestrian Amenity Review

The LCC Application Review produced by SYSTRA outlines a series of conclusions regarding the forecast impact of Gartree 2 on the A4304 through Lubenham and the requirement for an improved pedestrian crossing facility. Atkins has outlined each of these conclusions below and provided a response.

SYSTRA Conclusion: *The extended accident review within Lubenham suggests that there is no specific accident trend in Lubenham, and the level of accidents is low.*

Atkins Response: Agreed.

SYSTRA Conclusion: *The review of the traffic flow levels along the A4304 suggest the existing pedestrian refuge crossing in Lubenham is insufficient provision for the level of vehicular flows.*

Atkins Response 1: SYSTRA has considered the increase in traffic along the A4304 as a result of Gartree 2 in Table 6 of the LCC Application Review. In Table 6, SYSTRA state that Gartree 2 will generate 168 additional daily trips along the A4304 East and 168 additional daily trips along the A4303 West. This is incorrect. Figure 5-2 within the Gartree 2 Transport Assessment indicates that approximately 25% of the total trip generation associated with Gartree 2 will distribute along the A4304 East and approximately 19% will distribute along the A4304 West. Therefore, Gartree 2 will generate 168 additional daily trips along the A4304 East and 128 additional daily trips along the A4303 West. SYSTRA has stated that Gartree 2 will have a 3.84% daily impact along the A4304 through Lubenham. As highlighted above, this has been incorrectly calculated. The correct value is 3.39%. This is not considered to be a significant increase in traffic.

Atkins Response 2: SYSTRA has stated that the existing pedestrian refuge crossing in Lubenham is insufficient for the level of vehicular flows. Traffic Signs Manual (Chapter 6) - Traffic Control (ISBN 9780115537448) was published in 2019 and provides technical advice on designing traffic light junctions, crossings, and other types of traffic control. It supersedes the advice given in a range of traffic advisory leaflets and local transport notes and should be used when assessing the provision of stand-alone crossings.

Traffic Signs Manual (Chapter 6) states that a site assessment should be carried out by an experienced practitioner (when assessing the provision of stand-alone crossings) and the following information should be obtained/considered:

- **Vehicle Speeds**
  - Vehicle speeds should be recorded at peak and off-peak periods. The measured speed of vehicles in each direction, taken roughly 50 m before the crossing site, should be recorded and the highest 85th percentile speed used in the assessment. The speed limit should also be noted.
- **Crossing Difficulty**
  - Crossing difficulty may be assessed by considering the number of gaps in the traffic flow which are acceptable to pedestrians, and the delay to pedestrians caused by having to wait for an acceptable gap.
- **Pedestrian Demand**
  - Pedestrian flows should be recorded to demonstrate if there is sufficient demand to justify the provision of a stand-alone crossing.
- **Average Crossing Time and Speed**
  - Measuring the average crossing speed for pedestrians may reveal whether there is a large number of people who may be slower, and therefore need extra time to cross.

There is currently not enough evidence to demonstrate that the existing pedestrian refuge crossing in Lubenham is insufficient for the level of vehicular flows. However, the analysis presented above demonstrates that Gartree 2 will not generate a significant increase in traffic along the A4304.

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Atkins Response 3: The Ministry of Justice are willing to consider any transport improvements which may be required to facilitate the proposed development in line with the National Planning Policy Framework (NPPF).

However, in accordance with the NPPF, any planning contributions must be:

- Necessary to make the development acceptable in planning terms;
- Directly related to the development; and
- Fairly and reasonably related in scale and kind to the development.

Table 5-2 and Table 5-3 within the Gartree 2 Transport Assessment outline the Modal Split for Staff and Visitors respectively. The analysis within the Transport Assessment demonstrates that the development proposals will not generate any additional walking trips on the existing transport network. In addition, the analysis presented above demonstrates that Gartree 2 will not generate a significant increase in traffic along the A4304. Therefore, it is not considered that the proposed improvements to the existing pedestrian refuge along the A4304 within Lubenham is necessary to make the development acceptable in planning terms or directly related to the development.

Appendix A. SYSTRA Report

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SYSTRA

TECHNICAL NOTE

Gartree 2 Prison, Market Harborough
LCC APPLICATION REVIEW

IDENTIFICATION TABLE	
Project	Gartree 2 Prison, Market Harborough
Title of Document	LCC Application Review
Document reference	GB01T22A11-TN001.
Type of Document	Technical Note
Date	07/02/2022
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1. INTRODUCTION

1.1 Context

1.1.1 A Transport Assessment (TA) was prepared by Atkins in August 2021 in relation to the proposed prison (referred to as Gartree 2) located adjacent to the existing HMP Gartree, in Leicestershire.

1.1.2 The TA accompanied a planning application (21/01600/OUT) which was submitted in September 2021 to Harborough District Council (HDC):

> *"Outline planning application (All Matters Reserved except for means of access and scale) for the construction of a new Category B prison of up to 82,555sqm within a secure perimeter fence, together with access, parking, landscaping and associated engineering works"*

1.1.3 Leicestershire County Council (LCC) Highways team then provided comments relating to the transport aspects of the proposed development. These are outlined in the comments report issued by LCC on 1st November 2021.

1.1.4 This Technical Note has been produced to provide a review of LLC Highway advice on 21/01600/OUT to assess whether the comments made by the LHA are appropriate, in particular focusing on the following perceived local concerns:

- Capacity of the Gallow Field Road / B6047 junction; and
- Requirement for a pedestrian crossing of the A4304 at Lubenham close to the Foxton Road / A4304 Lubenham junction.

1.1.5 To review how appropriate the testing of Gallow Field Road / B6047 junction is, we have reviewed the trip generation, reviewed the committed developments that also impact this junction, and have reviewed the level of flows tested by these committed developments in context of the limitations that this application faced due to the covid pandemic.

1.1.6 To review the potential requirement for pedestrian crossing provision over the A4304, a consideration of the development flows impacting this area has been undertaken, on top of expected base flows, to allow a judgement to be made as to the appropriateness of linking the implementation of a crossing due to impact of the development.

2. TRANSPORT ASSESSMENT REVIEW

2.1 Trip Rates

2.1.1 The TA provides a trip generation methodology within Appendix F for both staff and visitor trips. Appendix F outlines how a lack of publicly available information resulted in the staff trip generation being based on information used for historic planning applications at three HMP sites elsewhere in the country, including one in Leicester. The TA also states that the Ministry of Justice (MoJ) was also consulted on the proposed trip generation to ensure that it remains robust and up to date.

2.1.2 The Local Highway Authority (LHA) accept that this is a "reasonable, evidence-based approach". SYSTRA agrees with LCC that this approach is acceptable.

2.1.3 The visitor trip generation has been based on an assumption that all visitor / legal trips to the facility will be made using private car, which the LHA consider to be robust. SYSTRA agrees that this is an appropriate assumption to inform the trip generation calculations.

2.1.4 The calculated trip generation provided in Appendix F of the TA is summarised in Table 1 below.

Table 1. Staff and Visitor Trip Generation

	AM PEAK (07:00-08:00)		PM PEAK (17:00-18:00)		DAILY	
	IN	OUT	IN	OUT	IN	OUT
STAFF	205	21	0	240	538	538
VISITORS	0	0	0	17	134	134
TOTAL	205	21	0	257	672	672

2.2 TEMPro Growth Factors

2.2.1 Traffic growth factors were extracted from TEMPro v7.2 and applied to the June 2021 traffic count data to establish a 2025 future baseline within the TA. A summary of the TEMPro local growth factors provided in the TA are shown in Table 2 below.

Table 2. TEMPro Growth Factors

PEAK	2021-2025
AM	1.0721
PM	1.0729

2.2.2 The TA states that any committed development sites in the vicinity of the proposed development have been accounted for within TEMPro v7.2. SYSTRA note that growth within TEMPro is evenly distributed throughout the whole area, and the existence of a significant permitted development in the proximity of Gallow Field Road / B6047 junction is likely to impact the this junction at a higher level than TEMPro suggests.

2.2.3   SYSTRA was able to generate the same TEMPro growth rates outlined in Table 2, using rural TEMPro setting.

2.2.4   A large committed development to the southeast is currently under construction; this development has its own associated Transport Assessment outlining its specific trip impact and mitigation. This was permitted under permission 11/00112/OUT. We also note that application 21/00545/OUT – Airfield Park is currently under consideration for approval, having been submitted at a similar time. This application is located to the south west of the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction.

2.3   Traffic Surveys and Model Data for Capacity Assessments

2.3.1   To establish the baseline position the Applicant undertook traffic surveys (classified turning counts and automatic traffic counters) in June 2021 at the following locations in the vicinity of the proposed development:

1. B6047 Harborough Road / Leicester Lane / Gallow Field Road;
2. Gallow Field Road / Welland Avenue;
3. Gallow Field Road / Foxton Road;
4. Foxton Road / Welland Avenue;
5. A4304 / Foxton Road;
6. Gallow Field Road;
7. Foxton Road;
8. Welland Avenue (North); and
9. Welland Avenue (South).

2.3.2   Due to changes in traffic as a result of the Covid-19 pandemic the LHA advised the Applicant that traffic surveys conducted in June 2021 would need to have a factor applied to increase these flows to pre-pandemic levels. The Applicant confirmed that "Covid factors" have been applied by the survey company prior to submission of the traffic flow data.

2.3.3   It was also agreed with LCC that the 2021 traffic surveys would be validated against historic traffic data provided by LCC. In the context of establishing a base flow position, SYSTRA believe this is a fair methodology, and therefore agrees with the LHA.

2.3.4   However, since that point, additional data has become available, that was collected in 2019, and is associated with other submitted planning applications. There are also predicted flows associated with the historic Airfield Farm permission. For comparison, the traffic surveys and modelling predictions carried out by three other applications within the surrounding area, have been considered:

○ 11/00112/OUT – Airfield Farm
○ 21/00545/OUT – Airfield Park; and
○ 21/01637/FUL – Leicester Road Market Harborough (Travis Perkins)

11/00112-OUT – Land At Airfield Farm Leicester Road Market Harborough Leicestershire

2.3.5   This application undertook classified turning counts undertaken within the area which provided traffic flows for the following junctions on various dates between 2000 and 2009:

1. A6 Harborough Road / B6047 Harborough Road roundabout (9 March 2005);
2. Gallow Field Road / Foxton Road priority junction (7 July 2006);
3. B6047 Harborough Road / Gallow Field Road / Leicester Lane Crossroads
4. (28 April 2009);

5. B6047 Leicester Road / Hillcrest Avenue / Alvington Way roundabout (9 March 2005);
6. B6047 High Street / Fairfield Road priority junction (8 November 2000);
7. A4304 Theddingworth Road / Foxton Road priority junction (7 July 2006);
8. B6047 High Street / A4304 St. Mary's Road / B6047 Northampton Road signal junction (22 April 2009).
9. A14 Junction 3 (ARCADY information and traffic flows, for a base of 2023, obtained from planning application KET/2009/0474: Land South of Harrington Road, Rothwell); and
10. M1 Junction 20 (No data available).

21/00545/OUT - Airfield Park (TA February 2021)

2.3.6 This application undertook manual turning and queue length counts (MCCs) that were conducted in November 2019 between 0700-0900 and 1600-1900, at the following junctions. Data was also collected at the B6047 Harborough Road-Gallow Field Road crossroads junction in June 2019.

1. Site Access / Unnamed Rd (Airfield Farm access road) roundabout;
2. B6047 Harborough Rd / Wellington Way / Airfield Farm Site Access roundabout;
3. B6047 Harborough Rd / Leicester Lane / Gallow Field Rd staggered crossroads;
4. A6 Harborough Rd / Melton Rd / B6047 Harborough Rd roundabout;
5. B6047 Harborough Rd / Alvington Way / Hillcrest Avenue roundabout;
6. B6047 Harborough Rd / Fairfield Rd T-junction;
7. A4304 / Coventry Rd ('The Square') northern signalised T-junction; and
8. A4304 / Coventry Rd ('The Square') southern signalised T-junction.

2.3.7 Additionally, ATC's were conducted on Harborough Road between Gallow Field Road and the canal, and on A6 between the A6 Harborough Rd / Melton Rd / B6047 Harborough Rd roundabout and Langton Road.

2.3.8 This application also commissioned the LCC's Strategic Transport Model – the 'Pan Regional Transport Model' (PRTM) – and specifically, its highway assignment component only (SATURN) to derive the future year traffic flows for the assessment in 2031 without and with the development. This was required by LCC. Relevant details of the model are:

"all committed and proposed housing and employment growth in Market Harborough up to 2031 which reflects the end of the Harborough local plan period"

removal of the full 50,000m2 gross employment floorspace demand and highway network associated with the allocated development at Airfield Park in totality from the Do Minimum network to avoid double-counting, using the 'de-coupling' method in SATURN

inclusion of the committed off-site road safety scheme (traffic calming) through Great Bowden being implemented by the Airfield Farm residential development;

simulation of the 7.5t vehicle weight restriction on Gallow Field Road

inclusion the committed highway infrastructure (local distributor road) through the Market Harborough SDA being implemented by the developers of the SDA to provide a 40mph single carriageway highway link between the B6047 Harborough Road and the A4304.

2.3.9   An ATC was undertaken in May 2021 at the proposed access junction to the site on Leicester Road, to inform the site access design. No Specific junction assessments were undertaken for this application.

2.3.10   To gauge the impact on the immediate network, the development trip impact of applications 21/01600/OUT and 21/00545/OUT are summarised in Table 3.

Table 3.   Development Trip Comparison

	AM			PM		
	IN	**OUT**	**TOTAL**	**IN**	**OUT**	**TOTAL**
GARTREE PRISON	205	21	226	0	257	257
21-00545-OUT	242	52	294	50	220	270

2.3.11   Systra note that while applications 21/01600/OUT and 21/00545/OUT have a similar trip impact on the immediate network, only application 21/00545/OUT appears to have been required by the local highway authority to use the Strategic Transport Model for the area.

2.4   Committed Development

2.4.1   21/01600/OUT used generic TEMPro growth to derive future year flows. This means that the quantum of development yet to be constructed associated with application 11/00112-OUT is not explicitly modelled.

2.4.2   Application 21/00545/OUT has utilised Leicestershire County Council's Strategic Transport Model – the 'Pan Regional Transport Model' to generate future year flows at this junction, as well as traffic counts at specific junctions.

2.4.3   It is worthy of note that both of these applications do not directly consider the others impact, other than as part of generalised network growth, and are both applications are currently under consideration.

2.5   Traffic flow Assessed

2.5.1   As there is specific concern at the B6047 Harborough Rd / Leicester Lane / Gallow Field Rd Junction, the relevant flows used to consider the final impact at this junction for applications 21/01600/OUT, 21/00545/OUT and 11/00112/OUT have been extracted and is summerised in Table 4 . Additionally, the 2019 survey information recorded by application 21/00545-out and the DM scenario from application 21/00545/OUT have been included to aid comparison.

Table 4.   Development Trip Comparison

APPLICATION	SCENARIO STATED	ASSESSMENT YEAR	SOURCE	COMMITTED DEV STATED	UNIT STATED	AM TOTAL JUNCTION FLOWS	PM TOTAL JUNCTION FLOWS
11-00112-out	2021 background plus committed plus dev	2021	TA dated 2010	Considered at point of production	Vehicles	1754	2035
21-01600-out	21-01600-out	2025	TA dated 2021	Yes Growth only	PCU	1602	1572
21-00545-out	2019 Survey	2019	TA dated 2021	No	Vehicles	1404	1423
	2031 DM	2031	TA dated 2021	Yes, growth only	Vehicles	1673	1755
	2031 DS	2031	TA dated 2021	Yes, growth only	Vehicles	1820	1911

2.5.2 It can be seen from Table 4 that the flows used to assess the final impact consideration considerably higher for application 21/00545/OUT compared to application 21/01600/OUT. The historic application for 11/00112/OUT also suggests that further impact above general growth will be experienced at this junction as that site is completed. Systra have therefore further considered the capacity impact at this junction in section 2.6.

2.6 Junction Capacity Modelling

2.6.1 As part of the supporting information for 21/01600/OUT, the following junctions were highlighted in the TA for further detailed assessment using the industry standard junction capacity assessment software Junctions 9:

9. Proposed Site Access/ Welland Avenue junction;
10. B6047 Harborough Road / Leicester Lane / Gallow Field Road junction;
11. A4304 / Foxton Road junction; and
12. Gallow Field Road / Foxton Road junction.

2.6.2 These junctions were modelled in the following scenarios for both the AM (08:00-09:00) and PM (17:00-18:00) peaks:

- 2021 Baseline;
- 2025 Opening Year without development; and
- 2025 Opening Year with development.

2.6.3 The LHA response associated with application 21/01600/OUT state that they have fully reviewed the junction models and results of the assessments, and are satisfied that there are no capacity issues with any of the junctions that would justify a scheme of mitigation in accordance with the tests set out in the NPPF.

2.6.4 Given what has been identified in the review of flows that has been completed in section 2.5, including the potential for cumulative impact of current applications and existing permissions, there is a significant chance that the analysis has underestimated the impact of the development at the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction, due to the combination of the unusual nature of the prison application, which has not been considered through Leicestershire's Strategic Model, the constraints placed by COVID on data collection, and application 21/00545/OUT being submitted for consideration in the same period as application 21/01600/OUT.

2.6.5 We note that the applicant, at the time they undertook the analysis that supports their application, would most likely not have had access to the information that supports application 21/00545/OUT.

2.6.6 SYSTRA has reviewed the Junction 9 model geometry for the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction, which uses acceptable geometric inputs. Systra has then recreated this model in Junctions 10, and created flow profiles based on the data detailed in section 2.5 to create the following scenarios:

- 2031 DM (Sourced from application 21/00545/OUT Transport Assessment)
- 2031 with application 21/01600/OUT
- 2031 with application 21/00545/OUT
- 2031 with application 21/00545/OUT and 21/01600/OUT (Cumulative)

2.6.7   Using the flows as derived above, the capacity results for the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction are reported in Table 5. The turning counts are included in Appendix A, which allow comparison back to the source data.

Table 5.   Capacity results for the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction

SCENARIO	ARM	AM				PM			
		AVE QUEUE	95% QUEUE	DELAY	RFC	AVE QUEUE	95% QUEUE	DELAY	RFC
2031 DM	Leicester Lane	0.3	1.4	29.76	0.23	0.3	1.4	29.74	0.24
	B6047 (N)	0.3	1.2	9.66	0.21	0.2	0.5	9.63	0.16
	Gallow Field Rd	0.5	2	22.65	0.33	0.4	1.5	20.25	0.29
	B6047 (S)	0.2	0.5	10.26	0.17	0.1	0.5	8.97	0.07
2031 21/01600/OUT	Leicester Lane	0.4	1.5	37.85	0.28	0.4	1.1	37.42	0.28
	B6047 (N)	0.7	3.2	12.95	0.4	0.2	0.5	9.63	0.16
	Gallow Field Rd	0.7	3.4	35.04	0.42	2.4	12.3	80.26	0.74
	B6047 (S)	0.2	0.9	11.29	0.18	0.1	0.5	8.87	0.07
2031 21/00545/OUT	Leicester Lane	0.4	1.3	39.75	0.28	0.4	1.5	37.88	0.28
	B6047 (N)	0.3	1.2	9.92	0.21	0.2	0.9	10.9	0.18
	Gallow Field Rd	0.8	3.7	36.74	0.45	0.5	2.1	28.15	0.34
	B6047 (S)	0.2	1.0	11.07	0.19	0.2	0.5	9.6	0.13
2031 Cumulative	Leicester Lane	0.5	1.9	55.65	0.35	0.5	1.8	14.69	0.36
	B6047 (N)	0.7	3.3	13.3	0.41	0.2	0.9	56.94	0.18
	Gallow Field Rd	1.9	9.2	90.35	0.69	14.4	35.4	284.61	1.11
	B6047 (S)	0.3	1.2	12.29	0.2	0.2	0.5	9.6	0.13

2.6.8   The results in table 5 show that the Gartree Prison application impacts Gallow Field Road, and if this is combined with the flows from 21/00545/OUT, Gallow Field Road can be expected to be over capacity in the PM peak. The Junctions 10 output file is shown in Appendix B.

2.7   Personal Injury Accident Data

2.7.1   The Transport Assessment includes Personal Injury Accident (PIA) data from the Department for Transport has been obtained for the latest five-year period available (2016-2020). The study area covered the following roads:

- Welland Avenue;
- Gallow Field Road; and
- Foxton Road.

2.7.2   Collisions were sorted into three categories: slight, serious and fatal. The TA provides a summary table of collisions by year (Table 3.5) and by location (Table 3.6). A total of three slight and one serious were recorded collisions were recorded during the five-year study period between 2016 and 2020.

2.7.3   SYSTRA has cross-referenced the data included within the Transport Assessment with that held in the CrashMap Pro portal, which confirms these results. The full CrashMap report is included as Appendix C of this technical note.

2.7.4   The LHA provides a summary of collisions between 1st January 2016 and 30th August 2021, stating that four slight and two serious collisions were recorded within the study period under consideration, with one in 2016 and 2017, two in 2018 and two in 2021. This demonstrates that within the additional eight months analysed by the LHA (January to August 2021), two collisions were recorded within the study area. Nevertheless, the LHA agrees with the

conclusion of the TA that it cannot be demonstrated that there is an accident pattern which the proposed development could exacerbate.

2.7.5   SYSTRA has taken particular interest in the collision data available for the A4304 / Foxton Road junction to understand whether there is a requirement for a pedestrian crossing at this junction. Within the five-year study period between 2016 and 2020, no collisions were recorded at the A4304 / Foxton Road junction or within 500m of the junction.

2.7.6   This suggests that from a safety standpoint, a pedestrian crossing is not required for the safe movement of pedestrians to the south of the site. In addition, A4304 is subject to a speed limit of 30mph, with school safety zones reducing the speed to 20mph during school peaks between School Lane to the east and Paget Road to the west.

2.8   Lubenham Junctions / A4304 – Accident and Pedestrian Amenity Review

Personal Injury Collision Analysis

2.8.1   An assessment of collisions within the vicinity of the A4304 Lubenham has been undertaken, showing that only one slight collision occurred within the study area, in the most recent 5-year period for which data is available (2016-2020), and no serious or fatal collisions were recorded.

2.8.2   The area for which data was obtained, and the single slight collision is shown in Figure 1 below. The smaller polygon shows the area selected, which included the majority junctions in Lubenham, and the larger polygon shows a buffer of 300m demonstrating that only one slight collision was recorded within 300m of these junctions.

2.8.3   Therefore, with regards to accident analysis, the consideration of the expanded review of Lubenham does not identify any accident issue in the area.

Figure 1. Lubenham Junctions PIC Analysis
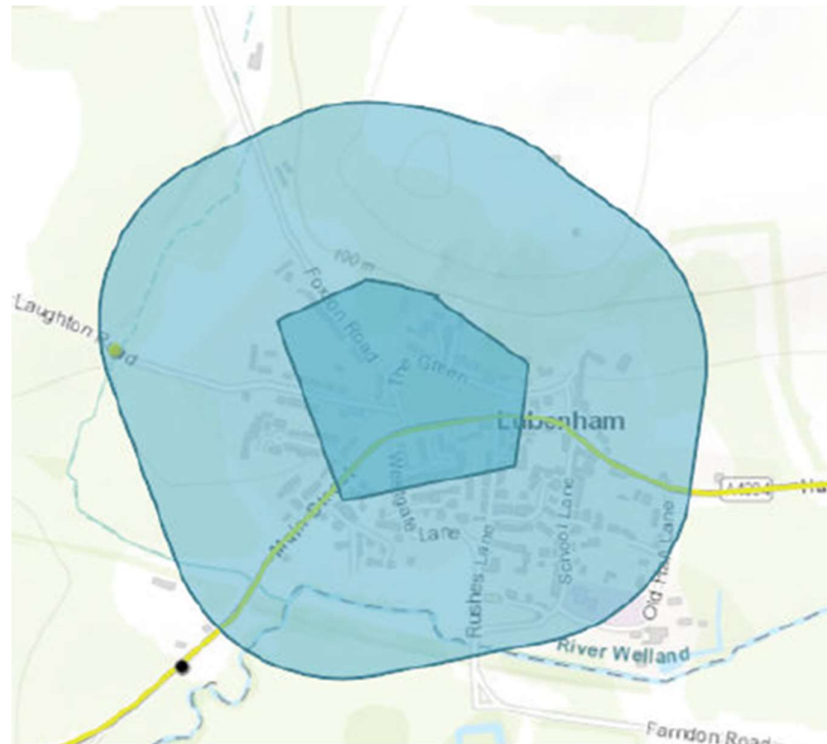
2.8.4 The slight collision involved one car only, which collided on its offside with a pedestrian. The pedestrian received slight injury and no other parties were injured.

2.8.5 As seen in Figure 1, one fatal collision was recorded on the A4304 within the 5-year period between 2016-2020, outside of the study area. This collision occurred in 2017 and involved six vehicles; three cars, two vans or goods vehicles 3.5 tonnes mgw and under, and one other vehicle (unknown).

2.8.6 All six vehicles collided, with none hitting any other objects on or off the carriageway. The driver of one of the cars received fatal injuries when the collision occurred and no other parties were injured.

Traffic Flows

2.8.7 The development flows at the A4304 In Lubenham are provided in Table 6, which include the peak hour and daily movements expected on the A4304 to the east of Foxton Road. Also provided are the total flows on the A4304 in Lubenham, as recorded by the turning count that was collected at the A4304 / Foxton Road junction as part of the application.

Table 6.   Traffic Flows at A4304 / Foxton Road Junction

Data from Transport Assessment		AM Flows			PM Flows			Daily Flows		
		East	West	Total	East	West	Total	East	West	Total
A4304 in Lubenham	Dev	51	5	57	0	64	64	168	168	336
A4304 in Lubenham	24 hr MTC	344	405	749	349	426	775	4149	4590	8739
	Combined Total	395	410	806	349	490	839	4317	4758	9075

2.8.8   The development can be seen to have a 3.84% daily impact on the A4304 road through Lubenham, with this impact focused at the point of staff shift changes.

2.8.9   There is currently a pedestrian refuge crossing around 100m from the A4304 / Foxton Road junction, situated between two bus stops.

2.8.10   While each local highway authority has its own guidance the criteria that pedestrian crossings are installed, 6,000 vehicles per day is often used as the level to trigger signal controlled crossings over principal routes, should pedestrian demand warrant it, with pedestrian refuges considered appropriate for 3,000 vehicles per day or less.

2.8.11   The level of flow on the road suggests that a pedestrian crossing facility over and above what is already there is required when the current flows are considered, and the development increases the total flows at this point.

3.   CONCLUSION

3.1   Introduction

3.1.1   With regards to the transport application, the areas of concern, following review of the application, are associated with the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction, and the flow impact on the A4304 in Lubenham.

3.2   B6047 Harborough Road / Leicester Lane / Gallow Field Road junction

3.2.1   With regards to the impact on this junction, the following conclusions can be made:

- The flows considered in the TA are potentially low, when compared to data subsequently available in other applications.
- The level of flows appears low primarily because of the proximity of other committed developments and developments currently in the planning system.
- Using the most recently available data associated with application 21/00545/OUT the Gartree Prison application does not produce capacity results which would be considered over capacity.
- However, a cumulative assessment with applications 21/00545/OUT and 21/01600/OUT, the Gallow Field Road arm of the junction can be expected to be over capacity in the PM peak if both applications are approved.

3.2.2   Therefore, while at the time of submission, the conclusions reached on the application with regards to the B6047 Harborough Road / Leicester Lane / Gallow Field Road junction could be considered correct (noting that the flows tested could be considered low) the cumulative impact assessment undertaken in this report suggests that this junction will be over capacity if both 21/01600/OUT and 21/00545/OUT are approved.

3.3   Lubenham Junctions / A4304 – Accident and Pedestrian Amenity Review

3.3.1   The extended accident review within Lubenham suggests that there is no specific accident trend in Lubenham, and the level of accidents is low.

3.3.2   The review of the traffic flow levels along the A4304 suggest the existing pedestrian refuge crossing in Lubenham is insufficient provision for the level of vehicular flows.

APPROVAL					
Version	**Name**		**Position**	**Date**	**Modifications**
1	Author	E Howell	Consultant	15/01/2022	Draft (Issue to client for comment)
	Checked by	S Cooper	Principal Consultant	30/01/2022	
	Approved by	A Crawford	Director	01/02/2022	
1	Author	E Howell	Consultant	15/01/2022	Final Issue
	Checked by	S Cooper	Principal Consultant	07/02/2022	
	Approved by	A Crawford	Director	07/02/2022	

Appendix A - B6047 Harborough Road / Leicester Lane / Gallow Field Road junction Assessment Flows

2031 DM Source - Application 21/00545/OUT - Strategic Model Based

AM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd		PM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	
Harborough Rd SB	0	50	639	88		Harborough Rd SB	0	35	662	65	
Leicester Lane	23	0	18	25		Leicester Lane	29	0	51	14	
Harborough Rd NB	606	63	0	0		Harborough Rd NB	691	27	0	47	
Gallow Field Rd	78	52	31	0		Gallow Field Rd	96	38	0	0	
Total	707	165	688	113	1673	Total	816	100	713	126	1755

AM - HGV %	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	PM - HGV %	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd
Harborough Rd SB	0%	4%	4%	0%	Harborough Rd SB	0%	1%	2%	0%
Leicester Lane	3%	0%	3%	0%	Leicester Lane	1%	0%	1%	0%
Harborough Rd NB	5%	2%	0%	0%	Harborough Rd NB	5%	2%	0%	0%
Gallow Field Rd	0%	0%	0%	0%	Gallow Field Rd	0%	0%	0%	0%

2031 with application 21/00545/OUT - Source - Application 21/00545/OUT - Strategic Model Based

AM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd		PM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	
Harborough Rd SB	0	50	713	88		Harborough Rd SB	0	35	673	65	
Leicester Lane	23	0	44	25		Leicester Lane	27	0	56	15	
Harborough Rd NB	626	67	0	1		Harborough Rd NB	764	52	0	84	
Gallow Field Rd	78	49	56	0		Gallow Field Rd	95	39	6	0	
Total	727	166	813	114	1820	Total	886	126	735	164	1911

AM - HGV %	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	PM - HGV %	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd
Harborough Rd SB	0%	4%	4%	0%	Harborough Rd SB	0%	1%	2%	0%
Leicester Lane	3%	0%	1%	0%	Leicester Lane	1%	0%	1%	0%
Harborough Rd NB	6%	2%	0%	0%	Harborough Rd NB	5%	1%	0%	0%
Gallow Field Rd	0%	0%	0%	0%	Gallow Field Rd	0%	0%	0%	0%

Development Flows From application 21/01600/OUT

AM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd		PM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	
Harborough Rd SB	0	0	0	79		Harborough Rd SB	0	0	0	0	
Leicester Lane	0	0	0	0		Leicester Lane	0	0	0	0	
Harborough Rd NB	0	0	0	36		Harborough Rd NB	0	0	0	0	
Gallow Field Rd	4	0	8	0		Gallow Field Rd	45	0	99	0	
Total	4	0	8	115	127	Total	45	0	99	0	144

2031 with application 21/01600/OUT - Source - Application 21/00545/OUT and 21/01600/OUT

AM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd		PM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	
Harborough Rd SB	0	50	639	167		Harborough Rd SB	0	35	662	65	
Leicester Lane	23	0	18	25		Leicester Lane	29	0	51	14	
Harborough Rd NB	606	63	0	36		Harborough Rd NB	691	27	0	47	
Gallow Field Rd	82	52	39	0		Gallow Field Rd	141	38	99	0	
Total	711	165	696	228	1800	Total	861	100	812	126	1899
AM - HGV %	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd		PM - HGV %	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	
Harborough Rd SB	0%	4%	4%	0%		Harborough Rd SB	0%	1%	2%	0%	
Leicester Lane	3%	0%	1%	0%		Leicester Lane	1%	0%	1%	0%	
Harborough Rd NB	6%	2%	0%	0%		Harborough Rd NB	5%	1%	0%	0%	
Gallow Field Rd	0%	0%	0%	0%		Gallow Field Rd	0%	0%	0%	0%	

2031 with application 21/00545/OUT and 21/01600/OUT - Source - Application 21/00545/OUT and 21/01600/OUT

AM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd		PM - vehicles	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	
Harborough Rd SB	0	50	713	167		Harborough Rd SB	0	35	673	65	
Leicester Lane	23	0	44	25		Leicester Lane	27	0	56	15	
Harborough Rd NB	626	67	0	37		Harborough Rd NB	764	52	0	84	
Gallow Field Rd	82	49	64	0		Gallow Field Rd	140	39	105	0	
Total	731	166	821	229	1947	Total	931	126	834	164	2055
AM - HGV %	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd		PM - HGV %	Harborough Rd SB	Leicester Lane	Harborough Rd NB	Gallow Field Rd	
Harborough Rd SB	0%	4%	4%	0%		Harborough Rd SB	0%	1%	2%	0%	
Leicester Lane	3%	0%	1%	0%		Leicester Lane	1%	0%	1%	0%	
Harborough Rd NB	6%	2%	0%	0%		Harborough Rd NB	5%	1%	0%	0%	
Gallow Field Rd	0%	0%	0%	0%		Gallow Field Rd	0%	0%	0%	0%	

Junctions 10
PICADY 10 - Priority Intersection Module
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Filename: Gallow Field Rd - Liecester Rd junction.j10
Path: Y:\## HM Prison Gartree, Welland Avenue\5. Technical\5. Modelling
Report generation date: 01/02/2022 08:58:36

»Cumulative Assessment - 2031 DM, AM
»Cumulative Assessment - 2031 DM, PM
»Cumulative Assessment - 2031 21/01600/OUT, AM
»Cumulative Assessment - 2031 21/01600/OUT, PM
»Cumulative Assessment - 2031 21/00545/OUT, AM
»Cumulative Assessment - 2031 21/00545/OUT, PM
»Cumulative Assessment - 2031 Cumulative, AM
»Cumulative Assessment - 2031 Cumulative, PM

Summary of junction performance

		AM						PM				
	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS
Cumulative Assessment - 2031 DM												
Stream B-CD	D1	0.2	0.5	15.80	0.14	C	D2	0.2	0.8	11.96	0.18	B
Stream B-AD		0.3	1.4	29.76	0.23	D		0.3	1.4	29.74	0.24	D
Stream A-BCD		0.3	1.2	9.66	0.21	A		0.2	0.5	9.63	0.16	A
Stream D-AB		0.5	2.0	14.80	0.33	B		0.4	1.5	11.52	0.29	B
Stream D-BC		0.4	1.0	22.65	0.27	C		0.1	0.5	20.25	0.11	C
Stream C-ABD		0.2	0.5	10.26	0.17	B		0.1	0.5	8.97	0.07	A
Cumulative Assessment - 2031 21/01600/OUT												
Stream B-CD	D3	0.2	0.5	18.57	0.16	C	D4	0.2	0.9	12.38	0.18	B
Stream B-AD		0.4	1.5	37.85	0.28	E		0.4	1.1	37.42	0.28	E
Stream A-BCD		0.7	3.2	12.95	0.40	B		0.2	0.5	9.63	0.16	A
Stream D-AB		0.7	3.4	20.73	0.42	C		2.4	12.3	48.12	0.73	E
Stream D-BC		0.6	2.6	35.04	0.39	E		2.4	12.0	80.26	0.74	F
Stream C-ABD		0.2	0.9	11.29	0.18	B		0.1	0.5	8.87	0.07	A
Cumulative Assessment - 2031 21/00545/OUT												
Stream B-CD	D5	0.3	1.3	16.52	0.23	C	D6	0.3	1.2	13.46	0.21	B
Stream B-AD		0.4	1.2	39.75	0.28	E		0.4	1.5	37.88	0.28	E
Stream A-BCD		0.3	1.2	9.92	0.21	A		0.2	0.9	10.90	0.18	B
Stream D-AB		0.7	3.2	20.71	0.41	C		0.5	2.1	14.42	0.34	B
Stream D-BC		0.8	3.7	36.74	0.45	E		0.2	0.8	28.15	0.17	D
Stream C-ABD		0.2	1.0	11.07	0.19	B		0.2	0.5	9.60	0.13	A
Cumulative Assessment - 2031 Cumulative												
Stream B-CD	D7	0.4	1.5	20.36	0.27	C	D8	0.3	1.3	14.69	0.23	B
Stream B-AD		0.5	1.9	55.65	0.35	F		0.5	1.8	56.94	0.36	F
Stream A-BCD		0.7	3.3	13.30	0.41	B		0.2	0.9	10.90	0.18	B
Stream D-AB		1.8	8.6	51.57	0.66	F		14.4	35.4	251.32	1.11	F
Stream D-BC		1.9	9.2	90.35	0.69	F		9.5	26.5	284.61	1.08	F
Stream C-ABD		0.3	1.2	12.29	0.20	B		0.2	0.5	9.60	0.13	A

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

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

File summary

File Description

Title	
Location	
Site number	
Date	14/01/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ADSYSTRA\ehowell
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
✓		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2031 DM	AM	ONE HOUR	08:00	09:30	15
D2	2031 DM	PM	ONE HOUR	17:00	18:30	15
D3	2031 21/01600/OUT	AM	ONE HOUR	08:00	09:30	15
D4	2031 21/01600/OUT	PM	ONE HOUR	17:00	18:30	15
D5	2031 21/00545/OUT	AM	ONE HOUR	08:00	09:30	15
D6	2031 21/00545/OUT	PM	ONE HOUR	17:00	18:30	15
D7	2031 Cumulative	AM	ONE HOUR	08:00	09:30	15
D8	2031 Cumulative	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Name	Description	Network flow scaling factor (%)
A1	Cumulative Assessment	Application 21/01600/OUT dev traffic added to agreed assessment flows from 21/00545/out application.	100.000

TRL THE FUTURE OF TRANSPORT

Cumulative Assessment - 2031 DM, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue Variations cannot be calculated for crossroads.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		3.38	A

Junction Network

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

Arms

Arms

Arm	Name	Description	Arm type
A	B6047 Harborough Rd (N)		Major
B	Leicester Lane		Minor
C	B6047 Harborough Rd South		Major
D	Gallow Field Rd		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Width for right-turn storage (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	6.00		✓	3.00	91.0	✓	5.00
C	6.00		✓	3.00	72.6	✓	5.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	4.70	3.70	3.30	3.30	✓	1.00	28	30
D	One lane plus flare	10.00	7.40	4.50	3.50	3.50	✓	1.00	190	140

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
A-D	681	-	-	-	-	-	-	0.264	0.377	0.264	-	-	-
B-A	535	0.097	0.246	0.246	-	-	-	0.155	0.352	-	0.246	0.246	0.123
B-C	686	0.105	0.266	-	-	-	-	-	-	-	-	-	-
B-D, nearside lane	535	0.097	0.246	0.246	-	-	-	0.155	0.352	0.155	-	-	-
B-D, offside lane	535	0.097	0.246	0.246	-	-	-	0.155	0.352	0.155	-	-	-
C-B	670	0.259	0.259	0.371	-	-	-	-	-	-	-	-	-
D-A	758	-	-	-	-	-	-	0.294	-	0.116	-	-	-
D-B, nearside lane	654	0.189	0.189	0.430	-	-	-	0.301	0.301	0.119	-	-	-
D-B, offside lane	654	0.189	0.189	0.430	-	-	-	0.301	0.301	0.119	-	-	-
D-C	654	-	0.189	0.430	0.150	0.301	0.301	0.301	0.301	0.119	-	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2031 DM	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	777	100.000
B		✓	66	100.000
C		✓	669	100.000
D		✓	161	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	50	639	88
	B	23	0	18	25
	C	606	63	0	0
	D	78	52	31	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	4	4	0
	B	3	0	3	0
	C	5	2	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS
B-CD	0.14	15.80	0.2	0.5	C
B-AD	0.23	29.76	0.3	1.4	D
A-BCD	0.21	9.66	0.3	1.2	A
A-B					
A-C					
D-AB	0.33	14.80	0.5	2.0	B
D-BC	0.27	22.65	0.4	1.0	C
C-ABD	0.17	10.26	0.2	0.5	B
C-D					
C-A					

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	24	398	0.060	24	0.1	9.777	A
B-AD	27	282	0.095	26	0.1	14.341	B
A-BCD	66	537	0.123	66	0.1	7.634	A
A-B	39			39			
A-C	500			500			
D-AB	80	506	0.157	79	0.2	8.406	A
D-BC	42	360	0.116	41	0.1	11.271	B
C-ABD	48	505	0.096	48	0.1	8.025	A
C-D	0			0			
C-A	479			479			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	29	348	0.083	29	0.1	11.478	B
B-AD	31	232	0.136	31	0.2	18.314	C
A-BCD	79	508	0.156	79	0.2	8.380	A
A-B	47			47			
A-C	597			597			
D-AB	96	452	0.212	95	0.3	10.079	B
D-BC	49	301	0.163	49	0.2	14.245	B
C-ABD	58	473	0.122	58	0.1	8.837	A
C-D	0			0			
C-A	572			572			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	37	269	0.136	36	0.2	15.710	C
B-AD	37	161	0.232	37	0.3	29.391	D
A-BCD	97	470	0.206	97	0.3	9.642	A
A-B	57			57			
A-C	732			732			
D-AB	119	363	0.328	118	0.5	14.644	B
D-BC	58	218	0.268	58	0.4	22.410	C
C-ABD	71	429	0.165	71	0.2	10.241	B
C-D	0			0			
C-A	701			701			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	37	268	0.137	37	0.2	15.796	C
B-AD	37	161	0.233	37	0.3	29.758	D
A-BCD	97	470	0.206	97	0.3	9.659	A
A-B	57			57			
A-C	732			732			
D-AB	119	362	0.329	119	0.5	14.796	B
D-BC	58	217	0.268	58	0.4	22.651	C
C-ABD	71	429	0.165	71	0.2	10.256	B
C-D	0			0			
C-A	701			701			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	29	347	0.084	29	0.1	11.531	B
B-AD	31	231	0.136	32	0.2	18.518	C
A-BCD	79	508	0.156	79	0.2	8.402	A
A-B	47			47			
A-C	597			597			
D-AB	96	451	0.212	97	0.3	10.173	B
D-BC	49	301	0.163	50	0.2	14.381	B
C-ABD	58	473	0.122	58	0.1	8.856	A
C-D	0			0			
C-A	572			572			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	24	397	0.060	24	0.1	9.813	A
B-AD	27	281	0.095	27	0.1	14.452	B
A-BCD	66	536	0.124	66	0.1	7.662	A
A-B	39			39			
A-C	500			500			
D-AB	80	506	0.157	80	0.2	8.462	A
D-BC	42	359	0.116	42	0.1	11.349	B
C-ABD	48	505	0.096	49	0.1	8.048	A
C-D	0			0			
C-A	479			479			

Queue Variation Results for each time segment

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.06	0.00	0.00	0.06	0.06			N/A	N/A
B-AD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
A-BCD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
D-AB	0.18	0.00	0.00	0.18	0.18			N/A	N/A
D-BC	0.13	0.00	0.00	0.13	0.13			N/A	N/A
C-ABD	0.11	0.00	0.00	0.11	0.11			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.09	0.00	0.00	0.09	0.09			N/A	N/A
B-AD	0.16	0.00	0.00	0.16	0.16			N/A	N/A
A-BCD	0.18	0.00	0.00	0.18	0.18			N/A	N/A
D-AB	0.26	0.00	0.00	0.26	0.26			N/A	N/A
D-BC	0.19	0.00	0.00	0.19	0.19			N/A	N/A
C-ABD	0.14	0.00	0.00	0.14	0.14			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.16	0.03	0.27	0.48	0.51			N/A	N/A
B-AD	0.30	0.03	0.27	0.49	0.75			N/A	N/A
A-BCD	0.26	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	0.48	0.03	0.26	0.48	0.49			N/A	N/A
D-BC	0.35	0.03	0.26	0.47	0.50			N/A	N/A
C-ABD	0.20	0.03	0.26	0.47	0.50			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.16	0.03	0.25	0.46	0.48			N/A	N/A
B-AD	0.30	0.03	0.32	1.06	1.35			N/A	N/A
A-BCD	0.26	0.03	0.30	0.88	1.21			N/A	N/A
D-AB	0.48	0.03	0.32	1.45	1.96			N/A	N/A
D-BC	0.36	0.03	0.32	1.00	1.00			N/A	N/A
C-ABD	0.20	0.03	0.27	0.48	0.51			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.09	0.00	0.00	0.09	0.09			N/A	N/A
B-AD	0.16	0.00	0.00	0.16	0.16			N/A	N/A
A-BCD	0.19	0.00	0.00	0.19	0.19			N/A	N/A
D-AB	0.27	0.00	0.00	0.27	0.27			N/A	N/A
D-BC	0.20	0.00	0.00	0.20	0.20			N/A	N/A
C-ABD	0.14	0.00	0.00	0.14	0.14			N/A	N/A

09:15 - 09:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.07	0.00	0.00	0.07	0.07			N/A	N/A
B-AD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
A-BCD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
D-AB	0.19	0.00	0.00	0.19	0.19			N/A	N/A
D-BC	0.13	0.00	0.00	0.13	0.13			N/A	N/A
C-ABD	0.11	0.00	0.00	0.11	0.11			N/A	N/A

Cumulative Assessment - 2031 DM, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue Variations cannot be calculated for crossroads.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		2.41	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	2.41	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2031 DM	PM	ONE HOUR	17:00	18:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	762	100.000
B		✓	94	100.000
C		✓	765	100.000
D		✓	134	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	35	662	65
	B	29	0	51	14
	C	691	27	0	47
	D	96	38	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	1	2	0
	B	1	0	1	0
	C	5	2	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS
B-CD	0.18	11.96	0.2	0.8	B
B-AD	0.24	29.74	0.3	1.4	D
A-BCD	0.16	9.63	0.2	0.5	A
A-B					
A-C					
D-AB	0.29	11.52	0.4	1.5	B
D-BC	0.11	20.25	0.1	0.5	C
C-ABD	0.07	8.97	0.1	0.5	A
C-D					
C-A					

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	44	487	0.091	44	0.1	8.186	A
B-AD	27	279	0.096	26	0.1	14.358	B
A-BCD	49	520	0.094	49	0.1	7.631	A
A-B	27			27			
A-C	508			508			
D-AB	87	567	0.153	86	0.2	7.476	A
D-BC	14	330	0.043	14	0.0	11.389	B
C-ABD	21	513	0.040	21	0.0	7.460	A
C-D	35			35			
C-A	546			546			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	53	444	0.120	53	0.1	9.298	A
B-AD	32	229	0.139	32	0.2	18.337	C
A-BCD	58	489	0.120	58	0.1	8.365	A
A-B	32			32			
A-C	607			607			
D-AB	103	517	0.200	103	0.2	8.697	A
D-BC	17	275	0.062	17	0.1	13.930	B
C-ABD	25	482	0.051	25	0.1	8.027	A
C-D	42			42			
C-A	652			652			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	66	371	0.178	66	0.2	11.898	B
B-AD	38	160	0.239	38	0.3	29.443	D
A-BCD	72	445	0.161	71	0.2	9.620	A
A-B	39			39			
A-C	743			743			
D-AB	127	439	0.288	126	0.4	11.466	B
D-BC	21	199	0.105	21	0.1	20.188	C
C-ABD	30	440	0.069	30	0.1	8.959	A
C-D	52			52			
C-A	799			799			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	66	370	0.179	66	0.2	11.962	B
B-AD	38	160	0.239	38	0.3	29.741	D
A-BCD	72	445	0.161	72	0.2	9.633	A
A-B	39			39			
A-C	743			743			
D-AB	127	439	0.288	127	0.4	11.518	B
D-BC	21	199	0.105	21	0.1	20.248	C
C-ABD	30	440	0.069	30	0.1	8.966	A
C-D	52			52			
C-A	799			799			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	53	443	0.121	54	0.1	9.346	A
B-AD	32	229	0.139	32	0.2	18.506	C
A-BCD	58	488	0.120	59	0.1	8.379	A
A-B	32			32			
A-C	607			607			
D-AB	103	516	0.200	104	0.3	8.740	A
D-BC	17	275	0.062	17	0.1	13.972	B
C-ABD	25	482	0.051	25	0.1	8.033	A
C-D	42			42			
C-A	652			652			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	44	486	0.091	45	0.1	8.221	A
B-AD	27	279	0.097	27	0.1	14.451	B
A-BCD	49	520	0.094	49	0.1	7.651	A
A-B	27			27			
A-C	508			508			
D-AB	87	566	0.153	87	0.2	7.513	A
D-BC	14	330	0.043	14	0.0	11.419	B
C-ABD	21	512	0.040	21	0.0	7.470	A
C-D	35			35			
C-A	546			546			

Queue Variation Results for each time segment

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
B-AD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
A-BCD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
D-AB	0.18	0.00	0.00	0.18	0.18			N/A	N/A
D-BC	0.04	0.00	0.00	0.04	0.04			N/A	N/A
C-ABD	0.04	0.00	0.00	0.04	0.04			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
B-AD	0.16	0.00	0.00	0.16	0.16			N/A	N/A
A-BCD	0.13	0.00	0.00	0.13	0.13			N/A	N/A
D-AB	0.25	0.00	0.00	0.25	0.25			N/A	N/A
D-BC	0.07	0.03	0.26	0.46	0.49			N/A	N/A
C-ABD	0.05	0.03	0.26	0.46	0.49			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.22	0.03	0.26	0.47	0.50			N/A	N/A
B-AD	0.30	0.03	0.27	0.48	0.77			N/A	N/A
A-BCD	0.19	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	0.40	0.03	0.26	0.46	0.49			N/A	N/A
D-BC	0.11	0.03	0.26	0.47	0.50			N/A	N/A
C-ABD	0.07	0.03	0.26	0.48	0.50			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.22	0.03	0.27	0.49	0.82			N/A	N/A
B-AD	0.31	0.03	0.32	1.08	1.37			N/A	N/A
A-BCD	0.19	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	0.40	0.03	0.32	1.31	1.51			N/A	N/A
D-BC	0.12	0.03	0.25	0.45	0.48			N/A	N/A
C-ABD	0.08	0.00	0.00	0.08	0.08			N/A	N/A

18:00 - 18:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
B-AD	0.17	0.00	0.00	0.17	0.17			N/A	N/A
A-BCD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
D-AB	0.25	0.00	0.00	0.25	0.25			N/A	N/A
D-BC	0.07	0.00	0.00	0.07	0.07			N/A	N/A
C-ABD	0.06	0.00	0.00	0.06	0.06			N/A	N/A

18:15 - 18:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
B-AD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
A-BCD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
D-AB	0.18	0.00	0.00	0.18	0.18			N/A	N/A
D-BC	0.05	0.00	0.00	0.05	0.05			N/A	N/A
C-ABD	0.04	0.00	0.00	0.04	0.04			N/A	N/A

TRL THE FUTURE OF TRANSPORT

Cumulative Assessment - 2031 21/01600/OUT, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue Variations cannot be calculated for crossroads.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		4.97	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.97	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2031 21/01600/OUT	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	856	100.000
B		✓	66	100.000
C		✓	705	100.000
D		✓	173	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	50	639	167
	B	23	0	18	25
	C	606	63	0	36
	D	82	52	39	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	4	4	0
	B	3	0	1	0
	C	6	2	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS
B-CD	0.16	18.57	0.2	0.5	C
B-AD	0.28	37.85	0.4	1.5	E
A-BCD	0.40	12.95	0.7	3.2	B
A-B					
A-C					
D-AB	0.42	20.73	0.7	3.4	C
D-BC	0.39	35.04	0.6	2.6	E
C-ABD	0.18	11.29	0.2	0.9	B
C-D					
C-A					

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	24	381	0.062	23	0.1	10.126	B
B-AD	27	264	0.101	26	0.1	15.401	C
A-BCD	126	529	0.238	125	0.3	8.885	A
A-B	39			39			
A-C	500			500			
D-AB	83	485	0.171	82	0.2	8.917	A
D-BC	47	329	0.143	47	0.2	12.704	B
C-ABD	48	483	0.100	48	0.1	8.430	A
C-D	27			27			
C-A	484			484			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	29	324	0.089	29	0.1	12.235	B
B-AD	31	210	0.149	31	0.2	20.476	C
A-BCD	151	500	0.301	150	0.4	10.280	B
A-B	47			47			
A-C	597			597			
D-AB	100	420	0.239	100	0.3	11.227	B
D-BC	55	264	0.210	55	0.3	17.213	C
C-ABD	58	446	0.129	58	0.1	9.437	A
C-D	32			32			
C-A	577			577			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	37	233	0.157	36	0.2	18.363	C
B-AD	37	135	0.274	36	0.4	36.993	E
A-BCD	187	465	0.402	186	0.7	12.858	B
A-B	57			57			
A-C	729			729			
D-AB	126	302	0.417	124	0.7	20.089	C
D-BC	65	168	0.384	63	0.6	33.903	D
C-ABD	71	396	0.179	71	0.2	11.261	B
C-D	40			40			
C-A	707			707			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	37	232	0.159	37	0.2	18.571	C
B-AD	37	134	0.276	37	0.4	37.847	E
A-BCD	187	465	0.402	187	0.7	12.949	B
A-B	57			57			
A-C	729			729			
D-AB	126	299	0.421	126	0.7	20.733	C
D-BC	64	167	0.386	64	0.6	35.043	E
C-ABD	71	396	0.179	71	0.2	11.291	B
C-D	40			40			
C-A	707			707			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	29	323	0.089	29	0.1	12.337	B
B-AD	31	209	0.150	32	0.2	20.855	C
A-BCD	151	500	0.301	152	0.4	10.368	B
A-B	47			47			
A-C	597			597			
D-AB	100	418	0.240	102	0.3	11.454	B
D-BC	55	262	0.210	57	0.3	17.597	C
C-ABD	58	446	0.130	58	0.2	9.475	A
C-D	32			32			
C-A	577			577			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	24	380	0.063	24	0.1	10.176	B
B-AD	27	263	0.101	27	0.1	15.562	C
A-BCD	126	528	0.238	126	0.3	8.965	A
A-B	39			39			
A-C	500			500			
D-AB	83	484	0.172	84	0.2	9.004	A
D-BC	47	328	0.144	48	0.2	12.853	B
C-ABD	48	482	0.100	49	0.1	8.465	A
C-D	27			27			
C-A	484			484			

Queue Variation Results for each time segment

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.07	0.00	0.00	0.07	0.07			N/A	N/A
B-AD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
A-BCD	0.31	0.00	0.00	0.31	0.31			N/A	N/A
D-AB	0.20	0.00	0.00	0.20	0.20			N/A	N/A
D-BC	0.16	0.00	0.00	0.16	0.16			N/A	N/A
C-ABD	0.11	0.00	0.00	0.11	0.11			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
B-AD	0.17	0.00	0.00	0.17	0.17			N/A	N/A
A-BCD	0.43	0.00	0.00	0.43	0.43			N/A	N/A
D-AB	0.31	0.00	0.00	0.31	0.31			N/A	N/A
D-BC	0.26	0.00	0.00	0.26	0.26			N/A	N/A
C-ABD	0.15	0.00	0.00	0.15	0.15			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.18	0.03	0.26	0.48	0.50			N/A	N/A
B-AD	0.37	0.03	0.27	0.49	1.16			N/A	N/A
A-BCD	0.67	0.03	0.26	0.67	0.67			N/A	N/A
D-AB	0.69	0.03	0.26	0.69	0.69			N/A	N/A
D-BC	0.59	0.03	0.27	0.59	1.41			N/A	N/A
C-ABD	0.22	0.03	0.26	0.47	0.50			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.19	0.03	0.26	0.46	0.49			N/A	N/A
B-AD	0.38	0.03	0.33	1.25	1.53			N/A	N/A
A-BCD	0.68	0.03	0.29	1.37	3.15			N/A	N/A
D-AB	0.71	0.03	0.32	1.53	3.38			N/A	N/A
D-BC	0.61	0.03	0.33	1.35	2.63			N/A	N/A
C-ABD	0.22	0.03	0.28	0.50	0.93			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
B-AD	0.18	0.00	0.00	0.18	0.18			N/A	N/A
A-BCD	0.44	0.03	0.33	1.10	1.30			N/A	N/A
D-AB	0.32	0.03	0.26	0.46	0.49			N/A	N/A
D-BC	0.27	0.03	0.25	0.46	0.48			N/A	N/A
C-ABD	0.15	0.00	0.00	0.15	0.15			N/A	N/A

09:15 - 09:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.07	0.00	0.00	0.07	0.07			N/A	N/A
B-AD	0.12	0.03	0.26	0.46	0.48			N/A	N/A
A-BCD	0.32	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	0.21	0.03	0.25	0.45	0.48			N/A	N/A
D-BC	0.17	0.03	0.25	0.45	0.48			N/A	N/A
C-ABD	0.11	0.00	0.00	0.11	0.11			N/A	N/A

Cumulative Assessment - 2031 21/01600/OUT, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue Variations cannot be calculated for crossroads.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		10.19	B

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	10.19	B

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2031 21/01600/OUT	PM	ONE HOUR	17:00	18:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	762	100.000
B		✓	94	100.000
C		✓	765	100.000
D		✓	278	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	35	662	65
	B	29	0	51	14
	C	691	27	0	47
	D	141	38	99	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	1	2	0
	B	1	0	1	0
	C	5	1	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS
B-CD	0.18	12.38	0.2	0.9	B
B-AD	0.28	37.42	0.4	1.1	E
A-BCD	0.16	9.63	0.2	0.5	A
A-B					
A-C					
D-AB	0.73	48.12	2.4	12.3	E
D-BC	0.74	80.26	2.4	12.0	F
C-ABD	0.07	8.87	0.1	0.5	A
C-D					
C-A					

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	44	486	0.092	44	0.1	8.203	A
B-AD	27	264	0.102	26	0.1	15.238	C
A-BCD	49	520	0.094	49	0.1	7.629	A
A-B	27			27			
A-C	508			508			
D-AB	124	502	0.246	122	0.3	9.457	A
D-BC	86	339	0.253	84	0.3	14.091	B
C-ABD	21	513	0.040	20	0.0	7.383	A
C-D	35			35			
C-A	546			546			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	53	441	0.121	53	0.1	9.354	A
B-AD	32	211	0.151	32	0.2	20.176	C
A-BCD	58	489	0.120	58	0.1	8.363	A
A-B	32			32			
A-C	607			607			
D-AB	149	430	0.347	148	0.5	12.764	B
D-BC	101	272	0.370	100	0.6	20.819	C
C-ABD	25	482	0.051	24	0.1	7.944	A
C-D	42			42			
C-A	652			652			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	66	362	0.183	66	0.2	12.248	B
B-AD	38	137	0.278	37	0.4	36.159	E
A-BCD	72	445	0.161	71	0.2	9.617	A
A-B	39			39			
A-C	743			743			
D-AB	188	274	0.686	182	1.9	37.250	E
D-BC	118	164	0.721	112	2.1	63.783	F
C-ABD	30	440	0.068	30	0.1	8.869	A
C-D	52			52			
C-A	799			799			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	66	360	0.185	66	0.2	12.378	B
B-AD	38	135	0.282	38	0.4	37.422	E
A-BCD	72	445	0.161	72	0.2	9.630	A
A-B	39			39			
A-C	743			743			
D-AB	188	259	0.728	187	2.4	48.118	E
D-BC	118	159	0.742	116	2.4	80.258	F
C-ABD	30	440	0.068	30	0.1	8.871	A
C-D	52			52			
C-A	799			799			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	53	440	0.122	54	0.1	9.421	A
B-AD	32	208	0.152	33	0.2	20.723	C
A-BCD	58	489	0.120	59	0.1	8.379	A
A-B	32			32			
A-C	607			607			
D-AB	150	419	0.358	157	0.6	14.114	B
D-BC	100	269	0.373	107	0.6	23.191	C
C-ABD	25	482	0.051	25	0.1	7.950	A
C-D	42			42			
C-A	652			652			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	45	485	0.092	45	0.1	8.243	A
B-AD	27	263	0.102	27	0.1	15.382	C
A-BCD	49	520	0.094	49	0.1	7.650	A
A-B	27			27			
A-C	508			508			
D-AB	124	499	0.248	125	0.3	9.635	A
D-BC	86	338	0.253	87	0.3	14.394	B
C-ABD	21	512	0.040	21	0.0	7.394	A
C-D	35			35			
C-A	546			546			

Queue Variation Results for each time segment

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
B-AD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
A-BCD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
D-AB	0.32	0.00	0.00	0.32	0.32			N/A	N/A
D-BC	0.33	0.00	0.00	0.33	0.33			N/A	N/A
C-ABD	0.04	0.00	0.00	0.04	0.04			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
B-AD	0.17	0.00	0.00	0.17	0.17			N/A	N/A
A-BCD	0.13	0.00	0.00	0.13	0.13			N/A	N/A
D-AB	0.52	0.05	0.48	1.29	1.40			N/A	N/A
D-BC	0.57	0.06	0.60	1.32	1.42			N/A	N/A
C-ABD	0.05	0.03	0.25	0.46	0.48			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.22	0.03	0.26	0.47	0.50			N/A	N/A
B-AD	0.37	0.03	0.27	0.48	1.14			N/A	N/A
A-BCD	0.19	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	1.92	0.03	0.33	4.04	10.16			N/A	N/A
D-BC	2.06	0.04	0.39	5.50	10.20			N/A	N/A
C-ABD	0.07	0.03	0.26	0.47	0.50			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.23	0.03	0.28	0.50	0.92			N/A	N/A
B-AD	0.38	0.03	0.33	1.07	1.07			N/A	N/A
A-BCD	0.19	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	2.36	0.04	0.37	6.08	12.27			N/A	N/A
D-BC	2.41	0.04	0.40	6.55	12.04			N/A	N/A
C-ABD	0.07	0.00	0.00	0.07	0.07			N/A	N/A

18:00 - 18:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
B-AD	0.19	0.00	0.00	0.19	0.19			N/A	N/A
A-BCD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
D-AB	0.57	0.04	0.39	1.49	1.70			N/A	N/A
D-BC	0.62	0.04	0.36	1.36	2.25			N/A	N/A
C-ABD	0.05	0.00	0.00	0.05	0.05			N/A	N/A

18:15 - 18:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
B-AD	0.12	0.03	0.25	0.45	0.48			N/A	N/A
A-BCD	0.10	0.00	0.00	0.10	0.10			N/A	N/A
D-AB	0.33	0.03	0.31	1.08	1.08			N/A	N/A
D-BC	0.35	0.03	0.30	1.12	1.44			N/A	N/A
C-ABD	0.04	0.00	0.00	0.04	0.04			N/A	N/A

Cumulative Assessment - 2031 21/00545/OUT, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue Variations cannot be calculated for crossroads.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		4.74	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.74	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2031 21/00545/OUT	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	851	100.000
B		✓	92	100.000
C		✓	694	100.000
D		✓	183	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	50	713	88
	B	23	0	44	25
	C	626	67	0	1
	D	78	49	56	0

Vehicle Mix

Heavy Vehicle Percentages

From		To			
		A	B	C	D
	A	0	4	4	0
	B	3	0	1	0
	C	6	2	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS
B-CD	0.23	16.52	0.3	1.3	C
B-AD	0.28	39.75	0.4	1.2	E
A-BCD	0.21	9.92	0.3	1.2	A
A-B					
A-C					
D-AB	0.41	20.71	0.7	3.2	C
D-BC	0.45	36.74	0.8	3.7	E
C-ABD	0.19	11.07	0.2	1.0	B
C-D					
C-A					

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	44	431	0.101	43	0.1	9.352	A
B-AD	27	262	0.102	26	0.1	15.558	C
A-BCD	66	530	0.125	66	0.1	7.747	A
A-B	39			39			
A-C	558			558			
D-AB	79	485	0.164	79	0.2	8.848	A
D-BC	58	336	0.173	57	0.2	12.869	B
C-ABD	51	490	0.105	51	0.1	8.354	A
C-D	0.75			0.75			
C-A	500			500			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	52	378	0.139	52	0.2	11.131	B
B-AD	31	207	0.151	31	0.2	20.829	C
A-BCD	79	500	0.158	79	0.2	8.541	A
A-B	47			47			
A-C	667			667			
D-AB	96	419	0.230	96	0.3	11.119	B
D-BC	68	272	0.251	68	0.3	17.563	C
C-ABD	61	455	0.135	61	0.2	9.321	A
C-D	0.90			0.90			
C-A	597			597			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	66	287	0.229	65	0.3	16.318	C
B-AD	37	130	0.284	36	0.4	38.802	E
A-BCD	97	460	0.211	97	0.3	9.904	A
A-B	57			57			
A-C	816			816			
D-AB	122	299	0.408	120	0.7	20.020	C
D-BC	80	178	0.447	78	0.8	35.317	E
C-ABD	75	407	0.185	75	0.2	11.053	B
C-D	1			1			
C-A	731			731			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	66	285	0.231	66	0.3	16.518	C
B-AD	37	129	0.285	37	0.4	39.751	E
A-BCD	97	460	0.211	97	0.3	9.923	A
A-B	57			57			
A-C	816			816			
D-AB	122	296	0.413	122	0.7	20.709	C
D-BC	79	177	0.449	79	0.8	36.738	E
C-ABD	75	407	0.185	75	0.2	11.074	B
C-D	1			1			
C-A	731			731			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	52	377	0.139	53	0.2	11.226	B
B-AD	31	206	0.152	32	0.2	21.217	C
A-BCD	79	500	0.158	79	0.2	8.563	A
A-B	47			47			
A-C	667			667			
D-AB	96	417	0.231	98	0.3	11.348	B
D-BC	68	271	0.251	70	0.3	18.027	C
C-ABD	61	455	0.135	62	0.2	9.347	A
C-D	0.90			0.90			
C-A	597			597			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	44	430	0.101	44	0.1	9.403	A
B-AD	27	261	0.102	27	0.1	15.709	C
A-BCD	66	530	0.125	66	0.1	7.777	A
A-B	39			39			
A-C	558			558			
D-AB	80	484	0.165	80	0.2	8.931	A
D-BC	58	336	0.174	59	0.2	13.029	B
C-ABD	51	490	0.105	52	0.1	8.382	A
C-D	0.75			0.75			
C-A	500			500			

Queue Variation Results for each time segment

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
B-AD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
A-BCD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
D-AB	0.19	0.00	0.00	0.19	0.19			N/A	N/A
D-BC	0.21	0.00	0.00	0.21	0.21			N/A	N/A
C-ABD	0.12	0.00	0.00	0.12	0.12			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.16	0.00	0.00	0.16	0.16			N/A	N/A
B-AD	0.18	0.00	0.00	0.18	0.18			N/A	N/A
A-BCD	0.19	0.00	0.00	0.19	0.19			N/A	N/A
D-AB	0.29	0.00	0.00	0.29	0.29			N/A	N/A
D-BC	0.33	0.00	0.00	0.33	0.33			N/A	N/A
C-ABD	0.16	0.00	0.00	0.16	0.16			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.29	0.03	0.26	0.47	0.50			N/A	N/A
B-AD	0.38	0.03	0.27	0.49	1.24			N/A	N/A
A-BCD	0.26	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	0.66	0.03	0.26	0.66	0.66			N/A	N/A
D-BC	0.76	0.03	0.27	0.76	1.69			N/A	N/A
C-ABD	0.23	0.03	0.26	0.47	0.50			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.30	0.03	0.31	1.02	1.31			N/A	N/A
B-AD	0.39	0.03	0.34	1.16	1.16			N/A	N/A
A-BCD	0.27	0.03	0.30	0.92	1.24			N/A	N/A
D-AB	0.69	0.03	0.32	1.51	3.18			N/A	N/A
D-BC	0.78	0.03	0.33	1.74	3.74			N/A	N/A
C-ABD	0.23	0.03	0.28	0.54	1.04			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.17	0.00	0.00	0.17	0.17			N/A	N/A
B-AD	0.19	0.03	0.26	0.46	0.48			N/A	N/A
A-BCD	0.19	0.00	0.00	0.19	0.19			N/A	N/A
D-AB	0.31	0.03	0.25	0.46	0.48			N/A	N/A
D-BC	0.34	0.03	0.30	0.90	1.20			N/A	N/A
C-ABD	0.16	0.00	0.00	0.16	0.16			N/A	N/A

09:15 - 09:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
B-AD	0.12	0.03	0.26	0.46	0.48			N/A	N/A
A-BCD	0.14	0.00	0.00	0.14	0.14			N/A	N/A
D-AB	0.20	0.03	0.25	0.45	0.48			N/A	N/A
D-BC	0.21	0.03	0.26	0.47	0.53			N/A	N/A
C-ABD	0.12	0.00	0.00	0.12	0.12			N/A	N/A

Cumulative Assessment - 2031 21/00545/OUT, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue Variations cannot be calculated for crossroads.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		2.91	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	2.91	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2031 21/00545/OUT	PM	ONE HOUR	17:00	18:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	773	100.000
B		✓	98	100.000
C		✓	900	100.000
D		✓	140	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	35	673	65
	B	27	0	56	15
	C	764	52	0	84
	D	95	39	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	**A**	0	1	2	0
	B	1	0	1	0
	C	5	1	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS
B-CD	0.21	13.46	0.3	1.2	B
B-AD	0.28	37.88	0.4	1.5	E
A-BCD	0.18	10.90	0.2	0.9	B
A-B					
A-C					
D-AB	0.34	14.42	0.5	2.1	B
D-BC	0.17	28.15	0.2	0.8	D
C-ABD	0.13	9.60	0.2	0.5	A
C-D					
C-A					

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	49	481	0.101	48	0.1	8.376	A
B-AD	26	259	0.099	25	0.1	15.510	C
A-BCD	49	490	0.100	48	0.1	8.140	A
A-B	27			27			
A-C	517			517			
D-AB	86	533	0.162	86	0.2	8.035	A
D-BC	19	302	0.063	19	0.1	12.675	B
C-ABD	40	511	0.077	39	0.1	7.709	A
C-D	63			63			
C-A	604			604			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	58	432	0.135	58	0.2	9.699	A
B-AD	30	206	0.148	30	0.2	20.614	C
A-BCD	58	453	0.129	58	0.1	9.117	A
A-B	32			32			
A-C	617			617			
D-AB	103	474	0.218	103	0.3	9.690	A
D-BC	23	241	0.093	22	0.1	16.428	C
C-ABD	47	479	0.098	47	0.1	8.408	A
C-D	76			76			
C-A	721			721			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	72	344	0.211	72	0.3	13.328	B
B-AD	36	132	0.275	36	0.4	37.240	E
A-BCD	72	402	0.178	71	0.2	10.882	B
A-B	39			39			
A-C	756			756			
D-AB	127	377	0.337	126	0.5	14.286	B
D-BC	27	155	0.175	27	0.2	27.909	D
C-ABD	58	437	0.132	58	0.2	9.587	A
C-D	92			92			
C-A	883			883			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	73	342	0.212	72	0.3	13.455	B
B-AD	36	132	0.275	36	0.4	37.883	E
A-BCD	72	402	0.178	72	0.2	10.901	B
A-B	39			39			
A-C	756			756			
D-AB	127	377	0.337	127	0.5	14.419	B
D-BC	27	155	0.175	27	0.2	28.150	D
C-ABD	58	437	0.132	58	0.2	9.597	A
C-D	92			92			
C-A	883			883			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	58	431	0.136	59	0.2	9.771	A
B-AD	30	206	0.148	31	0.2	20.898	C
A-BCD	58	453	0.129	59	0.1	9.139	A
A-B	32			32			
A-C	617			617			
D-AB	103	474	0.218	104	0.3	9.773	A
D-BC	22	241	0.093	23	0.1	16.537	C
C-ABD	47	479	0.099	47	0.1	8.422	A
C-D	76			76			
C-A	721			721			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	49	480	0.101	49	0.1	8.420	A
B-AD	26	258	0.100	26	0.1	15.634	C
A-BCD	49	490	0.100	49	0.1	8.166	A
A-B	27			27			
A-C	517			517			
D-AB	86	532	0.162	87	0.2	8.085	A
D-BC	19	302	0.063	19	0.1	12.730	B
C-ABD	40	510	0.077	40	0.1	7.727	A
C-D	63			63			
C-A	604			604			

Queue Variation Results for each time segment

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
B-AD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
A-BCD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
D-AB	0.19	0.00	0.00	0.19	0.19			N/A	N/A
D-BC	0.07	0.00	0.00	0.07	0.07			N/A	N/A
C-ABD	0.08	0.00	0.00	0.08	0.08			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.16	0.00	0.00	0.16	0.16			N/A	N/A
B-AD	0.17	0.00	0.00	0.17	0.17			N/A	N/A
A-BCD	0.15	0.00	0.00	0.15	0.15			N/A	N/A
D-AB	0.28	0.00	0.00	0.28	0.28			N/A	N/A
D-BC	0.10	0.00	0.00	0.10	0.10			N/A	N/A
C-ABD	0.11	0.00	0.00	0.11	0.11			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.26	0.03	0.26	0.47	0.50			N/A	N/A
B-AD	0.36	0.03	0.27	0.49	1.17			N/A	N/A
A-BCD	0.21	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	0.50	0.03	0.26	0.50	0.50			N/A	N/A
D-BC	0.20	0.03	0.26	0.48	0.77			N/A	N/A
C-ABD	0.15	0.03	0.26	0.47	0.50			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.27	0.03	0.30	0.88	1.22			N/A	N/A
B-AD	0.37	0.03	0.33	1.23	1.51			N/A	N/A
A-BCD	0.22	0.03	0.27	0.49	0.89			N/A	N/A
D-AB	0.50	0.03	0.32	1.47	2.11			N/A	N/A
D-BC	0.21	0.03	0.27	0.48	0.71			N/A	N/A
C-ABD	0.15	0.03	0.25	0.45	0.48			N/A	N/A

18:00 - 18:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.16	0.00	0.00	0.16	0.16			N/A	N/A
B-AD	0.18	0.00	0.00	0.18	0.18			N/A	N/A
A-BCD	0.15	0.00	0.00	0.15	0.15			N/A	N/A
D-AB	0.28	0.00	0.00	0.28	0.28			N/A	N/A
D-BC	0.11	0.00	0.00	0.11	0.11			N/A	N/A
C-ABD	0.11	0.00	0.00	0.11	0.11			N/A	N/A

18:15 - 18:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
B-AD	0.11	0.03	0.25	0.45	0.48			N/A	N/A
A-BCD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
D-AB	0.20	0.00	0.00	0.20	0.20			N/A	N/A
D-BC	0.07	0.00	0.00	0.07	0.07			N/A	N/A
C-ABD	0.09	0.00	0.00	0.09	0.09			N/A	N/A

TRL THE FUTURE OF TRANSPORT

Cumulative Assessment - 2031 Cumulative, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue Variations cannot be calculated for crossroads.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		9.59	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	9.59	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2031 Cumulative	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	930	100.000
B		✓	92	100.000
C		✓	730	100.000
D		✓	195	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	50	713	167
	B	23	0	44	25
	C	626	67	0	37
	D	82	49	64	0

Vehicle Mix

Heavy Vehicle Percentages

From		To			
		A	B	C	D
	A	0	4	4	0
	B	3	0	1	0
	C	6	2	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS
B-CD	0.27	20.36	0.4	1.5	C
B-AD	0.35	55.65	0.5	1.9	F
A-BCD	0.41	13.30	0.7	3.3	B
A-B					
A-C					
D-AB	0.66	51.57	1.8	8.6	F
D-BC	0.69	90.35	1.9	9.2	F
C-ABD	0.20	12.29	0.3	1.2	B
C-D					
C-A					

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	44	419	0.104	43	0.1	9.652	A
B-AD	27	245	0.108	26	0.1	16.757	C
A-BCD	126	523	0.241	125	0.3	9.007	A
A-B	39			39			
A-C	558			558			
D-AB	83	463	0.180	82	0.2	9.442	A
D-BC	64	307	0.208	63	0.3	14.683	B
C-ABD	51	468	0.110	51	0.1	8.790	A
C-D	28			28			
C-A	500			500			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	53	359	0.146	52	0.2	11.805	B
B-AD	31	187	0.167	31	0.2	23.544	C
A-BCD	151	494	0.305	150	0.4	10.473	B
A-B	47			47			
A-C	666			666			
D-AB	101	382	0.265	101	0.4	12.758	B
D-BC	74	236	0.315	73	0.4	22.079	C
C-ABD	61	428	0.143	61	0.2	9.993	A
C-D	33			33			
C-A	597			597			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	66	249	0.267	66	0.4	19.756	C
B-AD	36	104	0.348	35	0.5	52.458	F
A-BCD	188	459	0.410	187	0.7	13.194	B
A-B	57			57			
A-C	813			813			
D-AB	131	211	0.619	126	1.4	40.538	E
D-BC	84	125	0.673	79	1.6	72.676	F
C-ABD	75	374	0.201	75	0.3	12.247	B
C-D	41			41			
C-A	731			731			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	67	245	0.272	67	0.4	20.360	C
B-AD	36	102	0.353	36	0.5	55.650	F
A-BCD	188	459	0.410	188	0.7	13.296	B
A-B	57			57			
A-C	813			813			
D-AB	132	198	0.664	130	1.8	51.570	F
D-BC	83	120	0.693	82	1.9	90.347	F
C-ABD	75	374	0.201	75	0.3	12.289	B
C-D	41			41			
C-A	731			731			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	53	357	0.148	53	0.2	11.984	B
B-AD	31	184	0.169	32	0.2	24.447	C
A-BCD	151	494	0.305	152	0.4	10.571	B
A-B	47			47			
A-C	666			666			
D-AB	102	373	0.273	107	0.4	13.816	B
D-BC	74	233	0.316	79	0.5	24.240	C
C-ABD	61	428	0.144	62	0.2	10.037	B
C-D	33			33			
C-A	597			597			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	44	417	0.104	44	0.1	9.717	A
B-AD	27	243	0.109	27	0.1	16.981	C
A-BCD	126	523	0.241	126	0.3	9.091	A
A-B	39			39			
A-C	558			558			
D-AB	83	460	0.181	84	0.2	9.576	A
D-BC	64	305	0.208	64	0.3	14.994	B
C-ABD	51	467	0.110	52	0.1	8.837	A
C-D	28			28			
C-A	500			500			

Queue Variation Results for each time segment

08:00 - 08:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.12	0.00	0.00	0.12	0.12			N/A	N/A
B-AD	0.12	0.00	0.00	0.12	0.12			N/A	N/A
A-BCD	0.31	0.00	0.00	0.31	0.31			N/A	N/A
D-AB	0.22	0.00	0.00	0.22	0.22			N/A	N/A
D-BC	0.26	0.00	0.00	0.26	0.26			N/A	N/A
C-ABD	0.12	0.00	0.00	0.12	0.12			N/A	N/A

08:15 - 08:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.17	0.00	0.00	0.17	0.17			N/A	N/A
B-AD	0.20	0.00	0.00	0.20	0.20			N/A	N/A
A-BCD	0.43	0.00	0.00	0.43	0.43			N/A	N/A
D-AB	0.35	0.03	0.26	0.47	0.50			N/A	N/A
D-BC	0.44	0.04	0.36	1.17	1.33			N/A	N/A
C-ABD	0.17	0.00	0.00	0.17	0.17			N/A	N/A

08:30 - 08:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.36	0.03	0.26	0.47	0.50			N/A	N/A
B-AD	0.50	0.03	0.28	0.50	1.49			N/A	N/A
A-BCD	0.69	0.03	0.26	0.69	0.69			N/A	N/A
D-AB	1.45	0.03	0.30	2.06	7.14			N/A	N/A
D-BC	1.64	0.04	0.36	4.14	8.34			N/A	N/A
C-ABD	0.25	0.03	0.26	0.47	0.50			N/A	N/A

08:45 - 09:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.37	0.03	0.33	1.22	1.47			N/A	N/A
B-AD	0.53	0.04	0.36	1.53	1.89			N/A	N/A
A-BCD	0.70	0.03	0.29	1.38	3.27			N/A	N/A
D-AB	1.76	0.04	0.39	4.69	8.57			N/A	N/A
D-BC	1.91	0.04	0.40	5.14	9.21			N/A	N/A
C-ABD	0.26	0.03	0.30	0.83	1.20			N/A	N/A

09:00 - 09:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.18	0.00	0.00	0.18	0.18			N/A	N/A
B-AD	0.21	0.03	0.26	0.46	0.49			N/A	N/A
A-BCD	0.45	0.04	0.35	1.16	1.33			N/A	N/A
D-AB	0.38	0.03	0.34	1.18	1.38			N/A	N/A
D-BC	0.48	0.04	0.35	1.41	1.58			N/A	N/A
C-ABD	0.17	0.00	0.00	0.17	0.17			N/A	N/A

09:15 - 09:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.12	0.00	0.00	0.12	0.12			N/A	N/A
B-AD	0.13	0.03	0.26	0.46	0.48			N/A	N/A
A-BCD	0.32	0.03	0.26	0.47	0.49			N/A	N/A
D-AB	0.22	0.03	0.29	0.78	1.19			N/A	N/A
D-BC	0.27	0.03	0.29	0.94	1.44			N/A	N/A
C-ABD	0.13	0.00	0.00	0.13	0.13			N/A	N/A

TRL THE FUTURE OF TRANSPORT

Cumulative Assessment - 2031 Cumulative, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue Variations cannot be calculated for crossroads.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		37.58	E

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	37.58	E

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	2031 Cumulative	PM	ONE HOUR	17:00	18:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	773	100.000
B		✓	98	100.000
C		✓	900	100.000
D		✓	284	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	35	673	65
	B	27	0	56	15
	C	764	52	0	84
	D	140	39	105	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	1	2	0
	B	1	0	1	0
	C	5	1	0	0
	D	0	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS
B-CD	0.23	14.69	0.3	1.3	B
B-AD	0.36	56.94	0.5	1.8	F
A-BCD	0.18	10.90	0.2	0.9	B
A-B					
A-C					
D-AB	1.11	251.32	14.4	35.4	F
D-BC	1.08	284.61	9.5	26.5	F
C-ABD	0.13	9.60	0.2	0.5	A
C-D					
C-A					

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	49	480	0.101	48	0.1	8.397	A
B-AD	26	245	0.105	25	0.1	16.514	C
A-BCD	49	490	0.100	48	0.1	8.140	A
A-B	27			27			
A-C	517			517			
D-AB	124	468	0.265	122	0.4	10.382	B
D-BC	90	310	0.291	88	0.4	16.172	C
C-ABD	40	511	0.077	39	0.1	7.709	A
C-D	63			63			
C-A	604			604			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	59	430	0.136	58	0.2	9.771	A
B-AD	30	188	0.161	30	0.2	22.910	C
A-BCD	58	453	0.129	58	0.1	9.117	A
A-B	32			32			
A-C	617			617			
D-AB	150	378	0.397	149	0.6	15.648	C
D-BC	105	234	0.449	104	0.8	27.229	D
C-ABD	47	479	0.098	47	0.1	8.408	A
C-D	76			76			
C-A	721			721			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	73	331	0.220	72	0.3	14.018	B
B-AD	36	109	0.330	35	0.5	48.475	E
A-BCD	72	402	0.178	71	0.2	10.882	B
A-B	39			39			
A-C	756			756			
D-AB	192	178	1.077	161	8.4	135.518	F
D-BC	121	114	1.065	100	6.1	170.352	F
C-ABD	58	437	0.132	58	0.2	9.587	A
C-D	92			92			
C-A	883			883			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	73	320	0.229	73	0.3	14.691	B
B-AD	36	99	0.360	35	0.5	56.936	F
A-BCD	72	402	0.178	72	0.2	10.901	B
A-B	39			39			
A-C	756			756			
D-AB	195	176	1.109	171	14.4	251.319	F
D-BC	118	109	1.078	104	9.5	284.610	F
C-ABD	58	437	0.132	58	0.2	9.597	A
C-D	92			92			
C-A	883			883			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	59	424	0.138	59	0.2	9.964	A
B-AD	30	172	0.175	31	0.2	26.036	D
A-BCD	58	453	0.129	59	0.1	9.137	A
A-B	32			32			
A-C	617			617			
D-AB	153	310	0.493	206	1.0	51.709	F
D-BC	103	203	0.506	136	1.1	73.592	F
C-ABD	47	479	0.099	47	0.1	8.422	A
C-D	76			76			
C-A	721			721			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	49	479	0.102	49	0.1	8.449	A
B-AD	26	243	0.106	26	0.1	16.755	C
A-BCD	49	490	0.100	49	0.1	8.167	A
A-B	27			27			
A-C	517			517			
D-AB	124	463	0.268	127	0.4	10.777	B
D-BC	90	308	0.292	93	0.4	16.936	C
C-ABD	40	510	0.077	40	0.1	7.728	A
C-D	63			63			
C-A	604			604			

Queue Variation Results for each time segment

17:00 - 17:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
B-AD	0.12	0.00	0.00	0.12	0.12			N/A	N/A
A-BCD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
D-AB	0.35	0.03	0.26	0.46	0.48			N/A	N/A
D-BC	0.40	0.00	0.00	0.40	0.40			N/A	N/A
C-ABD	0.08	0.00	0.00	0.08	0.08			N/A	N/A

17:15 - 17:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.16	0.00	0.00	0.16	0.16			N/A	N/A
B-AD	0.19	0.00	0.00	0.19	0.19			N/A	N/A
A-BCD	0.15	0.00	0.00	0.15	0.15			N/A	N/A
D-AB	0.64	0.04	0.35	1.47	2.55			N/A	N/A
D-BC	0.77	0.04	0.43	1.68	2.53			N/A	N/A
C-ABD	0.11	0.00	0.00	0.11	0.11			N/A	N/A

17:30 - 17:45

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.28	0.03	0.26	0.47	0.50			N/A	N/A
B-AD	0.46	0.03	0.27	0.49	1.22			N/A	N/A
A-BCD	0.21	0.03	0.26	0.46	0.49			N/A	N/A
D-AB	8.37	0.87	6.02	17.19	21.73			N/A	N/A
D-BC	6.09	0.50	4.04	12.86	16.54			N/A	N/A
C-ABD	0.15	0.03	0.26	0.47	0.50			N/A	N/A

17:45 - 18:00

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.29	0.03	0.31	0.99	1.27			N/A	N/A
B-AD	0.53	0.04	0.36	1.50	1.77			N/A	N/A
A-BCD	0.22	0.03	0.27	0.49	0.89			N/A	N/A
D-AB	14.40	1.56	11.24	28.56	35.41			N/A	N/A
D-BC	9.53	0.71	6.54	20.58	26.47			N/A	N/A
C-ABD	0.15	0.03	0.25	0.45	0.48			N/A	N/A

18:00 - 18:15

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.16	0.00	0.00	0.16	0.16			N/A	N/A
B-AD	0.22	0.03	0.25	0.45	0.48			N/A	N/A
A-BCD	0.15	0.00	0.00	0.15	0.15			N/A	N/A
D-AB	1.04	0.03	0.32	2.12	5.22			N/A	N/A
D-BC	1.14	0.03	0.33	2.50	5.74			N/A	N/A
C-ABD	0.11	0.00	0.00	0.11	0.11			N/A	N/A

18:15 - 18:30

Stream	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-CD	0.12	0.00	0.00	0.12	0.12			N/A	N/A
B-AD	0.12	0.03	0.25	0.45	0.48			N/A	N/A
A-BCD	0.11	0.00	0.00	0.11	0.11			N/A	N/A
D-AB	0.37	0.03	0.26	0.47	0.50			N/A	N/A
D-BC	0.42	0.03	0.27	0.48	0.89			N/A	N/A
C-ABD	0.09	0.00	0.00	0.09	0.09			N/A	N/A

Market Harborough PIA Download

Area of Interest (AOI) Information

Area : 739,893.57 m²

Jan 10 2022 15:03:44 Greenwich Mean Time

Summary

Name	Count	Area(m²)	Length(m)
Crashes	4	N/A	N/A

Crashes

#	Carriageway Hazards	Severity	Officer Attended	Date and Time	Year	Number of Vehicles	Number of Casualties	Highway Authority
1	None	Slight	Police officer attended crash scene	3/10/2017, 5:16 PM	2017	2	1	Leicestershire
2	None	Slight	Police officer attended crash scene	24/6/2018, 4:25 PM	2018	1	1	Leicestershire
3	None	Serious	Police officer attended crash scene	28/5/2018, 4:30 PM	2018	2	1	Leicestershire
4	None	Slight	Police officer attended crash scene	24/12/2016, 4:37 PM	2016	2	1	Leicestershire

#	Road Number	Weather Conditions	Road Type	Road Surface	Speed Limit	Light Conditions	Junction Detail	Pedestrian Crossing
1	B6047	Fine without high winds	Single carriageway	Dry	50	Daylight: regardless of presence of streetlights	Crossroads	No physical crossing facility within 50 metres
2	U0	Fine without high winds	Single carriageway	Dry	60	Daylight: regardless of presence of streetlights	Not at or within 20 metres of junction	No physical crossing facility within 50 metres
3	U0	Fine without high winds	Single carriageway	Dry	60	Daylight: regardless of presence of streetlights	Not at or within 20 metres of junction	No physical crossing facility within 50 metres
4	U0	Fine with high winds	Single carriageway	Dry	60	Darkness: no street lighting	Not at or within 20 metres of junction	No physical crossing facility within 50 metres

#	Local Authority District	Junction Control	Provisional Data	Web Link	Count
1	Harborough District	Give way or uncontrolled	No	https://www.crashmap.co.uk/reports/proreportservice?reportId=2017331701268	1
2	Harborough District	Not Applicable	No	https://www.crashmap.co.uk/reports/proreportservice?reportId=2018331800970	1
3	Harborough District	Not Applicable	No	https://www.crashmap.co.uk/reports/proreportservice?reportId=2018331800541	1
4	Harborough District	Not Applicable	No	https://www.crashmap.co.uk/reports/proreportservice?reportId=2016331602170	1

Report produced from CrashMap Pro

Appendix B. B6047 Harborough Road/ Leicester Lane/ Gallow Field Road Model Outputs

Contains *sensitive* information
Technical Response to LCC Application Review by SYSTRA | 1.0 | February 2022
Atkins | 220218_Atkins_Response_Highways_Gartree 2   Page 10 of 10

Junctions 10
PICADY 10 - Priority Intersection Module
Version: 10.0.1.1519
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Filename: 220215_GallowFieldCrossRoads_2031_v02.j10
Path: \\wsatkins.com\project\GBBMA\HandT\CS\Projects\5200124-MACE_Prisons_ROGE6351
\05_Technical\6_Raven\Junction Models\01_GallowFieldCrossRoads
Report generation date: 17/02/2022 16:31:38

»2031 Cumulative Development, AM
»2031 Cumulative Development, PM
»2031 Cumulative Development (Sensitivity Test), AM
»2031 Cumulative Development (Sensitivity Test), PM

Summary of junction performance

		AM					PM			
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
2031 Cumulative Development										
Stream B-CD	D1	0.2	14.22	0.19	B	D2	0.1	13.73	0.11	B
Stream B-AD		0.4	34.16	0.28	D		0.3	26.70	0.22	D
Stream A-BCD		0.7	12.12	0.39	B		0.2	10.39	0.17	B
Stream D-AB		0.6	17.75	0.37	C		2.6	35.29	0.74	E
Stream D-BC		0.9	36.89	0.47	E		1.6	55.68	0.64	F
Stream C-ABD		0.1	11.80	0.04	B		0.1	8.31	0.10	A
2031 Cumulative Development (Sensitivity Test)										
Stream B-CD	D3	0.2	14.35	0.19	B	D4	0.1	13.76	0.12	B
Stream B-AD		0.4	34.78	0.28	D		0.3	27.26	0.23	D
Stream A-BCD		0.7	12.37	0.41	B		0.2	10.39	0.17	B
Stream D-AB		0.6	18.36	0.38	C		3.3	43.05	0.79	E
Stream D-BC		1.0	38.56	0.49	E		2.0	67.56	0.69	F
Stream C-ABD		0.1	11.88	0.04	B		0.1	8.31	0.10	A

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

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

File summary

File Description

Title	Raven
Location	B6047 Harborough Road / Leicester Lane / Gallow Field Road
Site number	
Date	15/02/2022
Version	V0.1
Status	(new file)
Identifier	CR
Client	MACE (on behalf of MoJ)
Jobnumber	5200124
Enumerator	WSATKINS\CART5172
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2031 Cumulative Development	AM	ONE HOUR	07:45	09:15	15
D2	2031 Cumulative Development	PM	ONE HOUR	16:45	18:15	15
D3	2031 Cumulative Development (Sensitivity Test)	AM	ONE HOUR	07:45	09:15	15
D4	2031 Cumulative Development (Sensitivity Test)	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

T RL THE FUTURE OF TRANSPORT

2031 Cumulative Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Arm D - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		5.08	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.08	A

Arms

Arms

Arm	Name	Description	Arm type
A	B6047 Harborough Road (North)		Major
B	Leicester Lane		Minor
C	B6047 Harborough Road (South)		Major
D	Gallow Field Road		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Width for right-turn storage (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	6.00		✓	3.00	72.6	✓	5.00
C	6.00		✓	3.00	91.0	✓	5.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	4.70	3.70	3.30	3.30	✓	1.00	28	30
D	One lane plus flare	10.00	7.40	4.50	3.50	3.50	✓	1.00	190	140

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-A	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B	Slope for D-C
A-D	670	-	-	-	-	-	-	0.259	0.371	0.259	-	-	-
B-A	535	0.097	0.246	0.246	-	-	-	0.155	0.352	-	0.246	0.246	0.123
B-C	686	0.105	0.266	-	-	-	-	-	-	-	-	-	-
B-D, nearside lane	535	0.097	0.246	0.246	-	-	-	0.155	0.352	0.155	-	-	-
B-D, offside lane	535	0.097	0.246	0.246	-	-	-	0.155	0.352	0.155	-	-	-
C-B	681	0.264	0.264	0.377	-	-	-	-	-	-	-	-	-
D-A	758	-	-	-	-	-	-	0.294	-	0.116	-	-	-
D-B, nearside lane	654	0.189	0.189	0.430	-	-	-	0.301	0.301	0.119	-	-	-
D-B, offside lane	654	0.189	0.189	0.430	-	-	-	0.301	0.301	0.119	-	-	-
D-C	654	-	0.189	0.430	0.150	0.301	0.301	0.301	0.301	0.119	-	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2031 Cumulative Development	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	970	100.000
B		✓	91	100.000
C		✓	621	100.000
D		✓	200	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C	D
A	0	67	728	175
B	31	0	43	17
C	514	15	0	92
D	93	33	74	0

Vehicle Mix

Heavy Vehicle Percentages

From \ To	A	B	C	D
A	0	2	3	2
B	0	0	2	0
C	10	18	0	0
D	6	7	5	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.19	14.22	0.2	B
B-AD	0.28	34.16	0.4	D
A-BCD	0.39	12.12	0.7	B
A-B				
A-C				
D-AB	0.37	17.75	0.6	C
D-BC	0.47	36.89	0.9	E
C-ABD	0.04	11.80	0.1	B
C-D				
C-A				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	39	452	0.087	39	0.1	8.857	A
B-AD	29	272	0.107	29	0.1	14.764	B
A-BCD	132	548	0.241	131	0.3	8.780	A
A-B	50			50			
A-C	548			548			
D-AB	84	530	0.159	84	0.2	8.543	A
D-BC	66	347	0.190	65	0.2	13.396	B
C-ABD	11	474	0.024	11	0.0	9.185	A
C-D	69			69			
C-A	387			387			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	47	402	0.118	47	0.1	10.297	B
B-AD	35	220	0.157	34	0.2	19.369	C
A-BCD	158	525	0.301	157	0.4	9.973	A
A-B	60			60			
A-C	654			654			
D-AB	102	469	0.217	102	0.3	10.396	B
D-BC	78	285	0.273	77	0.4	18.190	C
C-ABD	13	433	0.031	13	0.0	10.130	B
C-D	83			83			
C-A	462			462			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	59	318	0.186	59	0.2	14.100	B
B-AD	41	147	0.280	40	0.4	33.488	D
A-BCD	196	499	0.393	195	0.7	12.046	B
A-B	73			73			
A-C	798			798			
D-AB	128	348	0.368	127	0.6	17.210	C
D-BC	92	196	0.472	90	0.9	35.391	E
C-ABD	17	377	0.044	16	0.1	11.784	B
C-D	101			101			
C-A	566			566			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	59	316	0.187	59	0.2	14.223	B
B-AD	41	146	0.281	41	0.4	34.164	D
A-BCD	196	499	0.393	196	0.7	12.115	B
A-B	73			73			
A-C	798			798			
D-AB	128	343	0.373	128	0.6	17.746	C
D-BC	92	194	0.474	92	0.9	36.892	E
C-ABD	17	377	0.044	17	0.1	11.797	B
C-D	101			101			
C-A	566			566			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	47	401	0.118	48	0.1	10.365	B
B-AD	34	219	0.158	35	0.2	19.691	C
A-BCD	158	525	0.301	159	0.4	10.047	B
A-B	60			60			
A-C	654			654			
D-AB	102	465	0.219	103	0.3	10.593	B
D-BC	78	284	0.274	80	0.4	18.734	C
C-ABD	13	432	0.031	14	0.0	10.148	B
C-D	83			83			
C-A	462			462			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	39	451	0.087	40	0.1	8.898	A
B-AD	29	271	0.108	29	0.1	14.913	B
A-BCD	132	548	0.241	132	0.3	8.855	A
A-B	50			50			
A-C	548			548			
D-AB	84	529	0.160	85	0.2	8.624	A
D-BC	66	346	0.191	67	0.3	13.597	B
C-ABD	11	473	0.024	11	0.0	9.205	A
C-D	69			69			
C-A	387			387			

2031 Cumulative Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Arm D - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		9.39	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	9.39	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2031 Cumulative Development	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	623	100.000
B		✓	66	100.000
C		✓	785	100.000
D		✓	358	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To		A	B	C	D
	A	0	47	507	69
	B	24	0	15	27
From	C	657	45	0	83
	D	233	33	92	0

Vehicle Mix

7

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	2	5
	B	0	0	0	0
	C	2	2	0	0
	D	0	3	1	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.11	13.73	0.1	B
B-AD	0.22	26.70	0.3	D
A-BCD	0.17	10.39	0.2	B
A-B				
A-C				
D-AB	0.74	35.29	2.6	E
D-BC	0.64	55.68	1.6	F
C-ABD	0.10	8.31	0.1	A
C-D				
C-A				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	22	411	0.054	22	0.1	9.259	A
B-AD	28	293	0.094	27	0.1	13.505	B
A-BCD	52	513	0.101	51	0.1	8.190	A
A-B	35			35			
A-C	382			382			
D-AB	190	570	0.334	188	0.5	9.410	A
D-BC	79	347	0.228	78	0.3	13.488	B
C-ABD	34	552	0.061	34	0.1	7.086	A
C-D	62			62			
C-A	495			495			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	27	366	0.073	27	0.1	10.607	B
B-AD	33	244	0.133	32	0.2	16.961	C
A-BCD	62	482	0.129	62	0.2	8.995	A
A-B	42			42			
A-C	456			456			
D-AB	228	509	0.449	227	0.8	12.750	B
D-BC	94	284	0.329	93	0.5	18.943	C
C-ABD	40	526	0.077	40	0.1	7.558	A
C-D	75			75			
C-A	591			591			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	34	297	0.114	34	0.1	13.657	B
B-AD	39	175	0.221	38	0.3	26.167	D
A-BCD	76	440	0.173	76	0.2	10.372	B
A-B	52			52			
A-C	558			558			
D-AB	283	390	0.724	276	2.3	30.152	D
D-BC	112	180	0.619	108	1.4	48.010	E
C-ABD	50	491	0.101	49	0.1	8.307	A
C-D	91			91			
C-A	723			723			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	34	296	0.115	34	0.1	13.728	B
B-AD	39	173	0.223	39	0.3	26.699	D
A-BCD	76	440	0.173	76	0.2	10.387	B
A-B	52			52			
A-C	558			558			
D-AB	283	382	0.741	282	2.6	35.293	E
D-BC	111	175	0.637	111	1.6	55.679	F
C-ABD	50	491	0.101	50	0.1	8.312	A
C-D	91			91			
C-A	723			723			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	27	365	0.073	27	0.1	10.653	B
B-AD	33	242	0.134	33	0.2	17.265	C
A-BCD	62	482	0.129	62	0.2	9.014	A
A-B	42			42			
A-C	456			456			
D-AB	229	502	0.455	236	0.9	13.890	B
D-BC	93	281	0.332	98	0.5	20.329	C
C-ABD	40	526	0.077	41	0.1	7.564	A
C-D	75			75			
C-A	591			591			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	22	410	0.054	22	0.1	9.289	A
B-AD	28	292	0.094	28	0.1	13.626	B
A-BCD	52	512	0.101	52	0.1	8.214	A
A-B	35			35			
A-C	382			382			
D-AB	190	568	0.335	192	0.5	9.627	A
D-BC	79	346	0.229	80	0.3	13.742	B
C-ABD	34	551	0.061	34	0.1	7.097	A
C-D	62			62			
C-A	495			495			

2031 Cumulative Development (Sensitivity Test), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Arm D - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		5.27	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.27	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2031 Cumulative Development (Sensitivity Test)	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	976	100.000
B		✓	91	100.000
C		✓	623	100.000
D		✓	201	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	67	728	181
	B	31	0	43	17
	C	514	15	0	94
	D	93	33	75	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	2	3	2
	B	0	0	2	0
	C	10	18	0	0
	D	6	7	5	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.19	14.35	0.2	B
B-AD	0.28	34.78	0.4	D
A-BCD	0.41	12.37	0.7	B
A-B				
A-C				
D-AB	0.38	18.36	0.6	C
D-BC	0.49	38.56	1.0	E
C-ABD	0.04	11.88	0.1	B
C-D				
C-A				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	39	451	0.087	39	0.1	8.872	A
B-AD	29	271	0.108	29	0.1	14.839	B
A-BCD	136	547	0.249	135	0.3	8.879	A
A-B	50			50			
A-C	548			548			
D-AB	84	528	0.160	84	0.2	8.578	A
D-BC	67	345	0.194	66	0.2	13.531	B
C-ABD	11	472	0.024	11	0.0	9.219	A
C-D	71			71			
C-A	387			387			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	47	401	0.118	47	0.1	10.329	B
B-AD	35	218	0.158	34	0.2	19.523	C
A-BCD	163	525	0.311	163	0.5	10.126	B
A-B	60			60			
A-C	654			654			
D-AB	102	466	0.219	102	0.3	10.482	B
D-BC	79	282	0.279	78	0.4	18.496	C
C-ABD	13	431	0.031	13	0.0	10.180	B
C-D	85			85			
C-A	462			462			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	59	316	0.187	59	0.2	14.217	B
B-AD	41	145	0.283	40	0.4	34.058	D
A-BCD	204	500	0.407	203	0.7	12.258	B
A-B	73			73			
A-C	798			798			
D-AB	128	341	0.376	127	0.6	17.744	C
D-BC	93	192	0.485	91	0.9	36.822	E
C-ABD	17	374	0.044	16	0.1	11.867	B
C-D	103			103			
C-A	566			566			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	59	314	0.188	59	0.2	14.349	B
B-AD	41	144	0.285	41	0.4	34.782	D
A-BCD	204	500	0.407	204	0.7	12.373	B
A-B	73			73			
A-C	798			798			
D-AB	128	336	0.382	128	0.6	18.363	C
D-BC	93	191	0.488	93	1.0	38.557	E
C-ABD	17	374	0.044	17	0.1	11.882	B
C-D	103			103			
C-A	566			566			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	47	400	0.118	48	0.1	10.397	B
B-AD	34	217	0.159	35	0.2	19.864	C
A-BCD	163	525	0.311	164	0.5	10.208	B
A-B	60			60			
A-C	654			654			
D-AB	102	462	0.221	103	0.3	10.694	B
D-BC	79	281	0.279	81	0.4	19.090	C
C-ABD	13	430	0.031	14	0.0	10.199	B
C-D	85			85			
C-A	462			462			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	39	450	0.087	40	0.1	8.913	A
B-AD	29	270	0.108	29	0.1	14.992	B
A-BCD	136	547	0.249	137	0.3	8.961	A
A-B	50			50			
A-C	548			548			
D-AB	85	527	0.160	85	0.2	8.661	A
D-BC	67	344	0.194	67	0.3	13.745	B
C-ABD	11	471	0.024	11	0.0	9.240	A
C-D	71			71			
C-A	387			387			

2031 Cumulative Development (Sensitivity Test), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	Arm B - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Minor arm visibility to right	Arm D - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Arm D Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Crossroads	Two-way	Two-way	Two-way	Two-way		11.41	B

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	11.41	B

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2031 Cumulative Development (Sensitivity Test)	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	623	100.000
B		✓	66	100.000
C		✓	785	100.000
D		✓	370	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	47	507	69
	B	24	0	15	27
	C	657	45	0	83
	D	241	33	96	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	0	2	5
	B	0	0	0	0
	C	2	2	0	0
	D	0	3	1	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.12	13.76	0.1	B
B-AD	0.23	27.26	0.3	D
A-BCD	0.17	10.39	0.2	B
A-B				
A-C				
D-AB	0.79	43.05	3.3	E
D-BC	0.69	67.56	2.0	F
C-ABD	0.10	8.31	0.1	A
C-D				
C-A				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	22	410	0.054	22	0.1	9.260	A
B-AD	28	292	0.094	27	0.1	13.574	B
A-BCD	52	513	0.101	51	0.1	8.190	A
A-B	35			35			
A-C	382			382			
D-AB	196	568	0.345	194	0.5	9.593	A
D-BC	82	346	0.238	81	0.3	13.697	B
C-ABD	34	552	0.061	34	0.1	7.086	A
C-D	62			62			
C-A	495			495			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	27	366	0.073	27	0.1	10.613	B
B-AD	33	243	0.134	32	0.2	17.100	C
A-BCD	62	482	0.129	62	0.2	8.995	A
A-B	42			42			
A-C	456			456			
D-AB	236	506	0.466	234	0.9	13.235	B
D-BC	97	282	0.344	96	0.5	19.554	C
C-ABD	40	526	0.077	40	0.1	7.558	A
C-D	75			75			
C-A	591			591			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	34	297	0.114	34	0.1	13.685	B
B-AD	39	173	0.224	38	0.3	26.616	D
A-BCD	76	440	0.173	76	0.2	10.372	B
A-B	52			52			
A-C	558			558			
D-AB	292	382	0.764	284	2.8	34.506	D
D-BC	116	173	0.667	111	1.7	54.686	F
C-ABD	50	491	0.101	49	0.1	8.307	A
C-D	91			91			
C-A	723			723			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	34	296	0.115	34	0.1	13.764	B
B-AD	39	171	0.227	39	0.3	27.264	D
A-BCD	76	440	0.173	76	0.2	10.387	B
A-B	52			52			
A-C	558			558			
D-AB	292	371	0.788	290	3.3	43.051	E
D-BC	115	166	0.694	114	2.0	67.557	F
C-ABD	50	491	0.101	50	0.1	8.312	A
C-D	91			91			
C-A	723			723			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	27	365	0.074	27	0.1	10.661	B
B-AD	32	240	0.136	33	0.2	17.467	C
A-BCD	62	482	0.129	62	0.2	9.014	A
A-B	42			42			
A-C	456			456			
D-AB	236	497	0.475	245	0.9	14.868	B
D-BC	97	277	0.349	102	0.6	21.528	C
C-ABD	40	526	0.077	41	0.1	7.567	A
C-D	75			75			
C-A	591			591			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	22	410	0.054	22	0.1	9.291	A
B-AD	28	291	0.095	28	0.1	13.701	B
A-BCD	52	512	0.101	52	0.1	8.214	A
A-B	35			35			
A-C	382			382			
D-AB	196	566	0.347	198	0.5	9.844	A
D-BC	82	345	0.238	83	0.3	13.984	B
C-ABD	34	551	0.061	34	0.1	7.097	A
C-D	62			62			
C-A	495			495			