Proof of Evidence Addendum

Land off Pump Lane, Rainham

APP/A2280/W/20/3259868 Prepared by Karl Jarvis

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1 Introduction

1.1 This Addendum Proof of Evidence (PoE) has been prepared by Karl Jarvis of Sweco on behalf of Medway Council (MC) in relation to a planning appeal (ref APP/A2280/W/20/3259868) by A C Goatham & Son pertaining to a site known as Land off Pump Lane, Rainham, Kent, ME8 7TJ.

1.2 I have previously prepared a PoE (CD 10.10) which sets out the background, my role and scope of evidence. Mr James Rand of Paul Basham Associates prepared a PoE (CD 10.9), covering the traffic impact of the proposed development, the appellants transport assessment and general transport planning and policy matters. In response to the appellant's PoE (CD10.4) I prepared a rebuttal PoE (CD10.16).

1.3 The purpose of this Addendum PoE is to set out the Medway Aimsun Modelling (MAM) work undertaken as a result of testing additional mitigations works is set out in section 2 of the Lower Rainham Report Addendum 3 (IDXX) (pp7-9). The additional MAM assessment results are presented in section 3 of the Lower Rainham Report Addendum 3 (IDXX) pp10-43.

1.4 This Addendum PoE also provides a response to Mr Tucker's rebuttal of my proof of evidence (IDXX). In responding to Mr Tucker's rebuttal I (Karl Jarvis) have not sought to provide a comprehensive response to the Appellant's rebuttal but where I have identified points, especially those contained in the rebuttal of Mr Simon Tucker, on which the Inspector may find it helpful to have a written response in advance of the inquiry, I have responded to those. In other instances, I am content I can provide my response in oral evidence in due course. Therefore, if have not responded to or referred to other points in the Appellant's rebuttal, it is not because I have accepted those points.

1.5 In sections of this addendum where I respond to Mr Tucker's rebuttal, I have used the headings of Mr Tuckers rebuttal referencing the relevant paragraphs (in the form STX.X). References to paragraphs in my original proof and rebuttal are in the form KJX.X.

2. Original Mitigation modelled, Additional Mitigation modelled and Process

Original Mitigation modelled

2.1 In all the previous MAM modelling work incorporated the original mitigation proposed by the Appellant. That included:

1) December 2019 assessment using a 2035 forecast year (CD12.10)
2) October 2020 assessment using a 2037 forecast year (CD12.1)
3) December 2020 assessment using a 2037 forecast year and (amongst other scenarios) the appellant's assumptions (CD12.3)
4) January 2021 assessment using a 2028 forecast year and (amongst other scenarios) appellant's assumptions (CD12.2)

2.2 The following 3 original mitigations have been modelled in all scenarios tested, including the latest modelling outlined in the Lower Rainham Report Addendum 3 (IDXX) , with the proposed development:

a. Two approach lanes on the Lower Rainham Road westbound approach (eastern arm) to the Yokusuka Way roundabout with only one lane assumed to turn right onto the A289 northbound (see Figure 1). Currently there is only one approach lane from Lower Rainham Road.
b. Additional eastbound approach lane at the junction of the A2 and Bloors Lane (see Figure 2)
c. Alternate one-way working signal system is proposed at the Pump Lane railway underbridge on a 3-metre carriageway (see Figure 3).

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Figure 1 Lower Rainham Road / Yokosuka Way Roundabout Mitigation

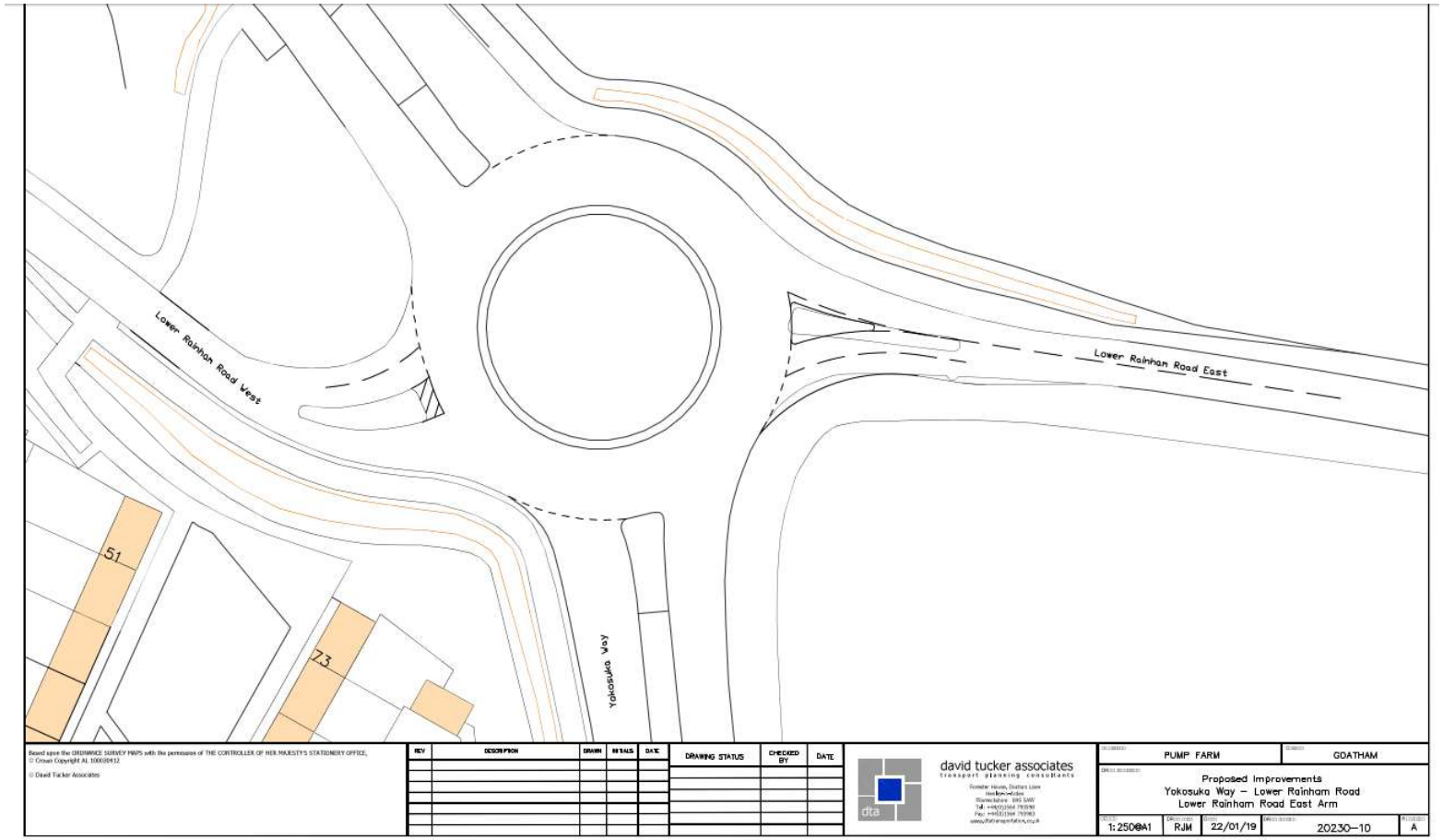

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Figure 2 A2 / Bloors Lane junction Mitigation

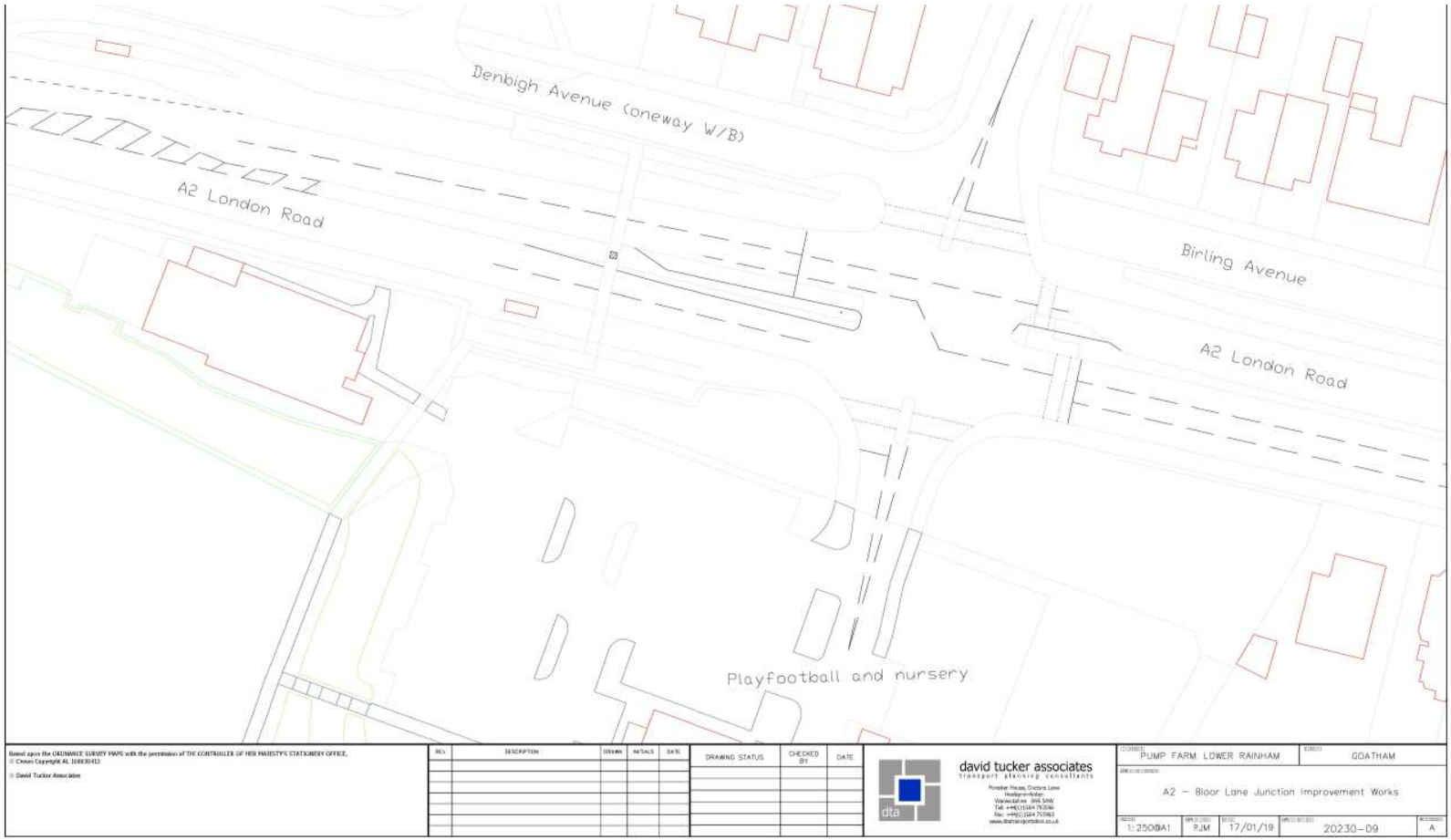

Figure 3 Pump Lane Railway underbridge mitigation

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Additional Mitigation

2.3 The following additional mitigation put forward by the appellant was modelled in the MAM for the latest modelling work outlined in the Lower Rainham Report Addendum 3 (IDXX) in addition to the original mitigation outlined in section 2.2 above.

1. Configuration of the Toucan crossing east of Bowaters Roundabout & additional lane capacity as shown in Figure 4
2. Revised signal timings for the Bowaters Roundabout as provided by the appellant
3. Changes to lane markings and additional lane capacity on the southern section of Will Adams Roundabout as shown in Figure 5
4. Revised signal timings for the A2/ Otterham Quay Lane / Meresborough Road junction as provide by the appellant

Figure 4 Additional Mitigation for the Toucan Crossing east of Bowaters Roundabout and additional lane capacity

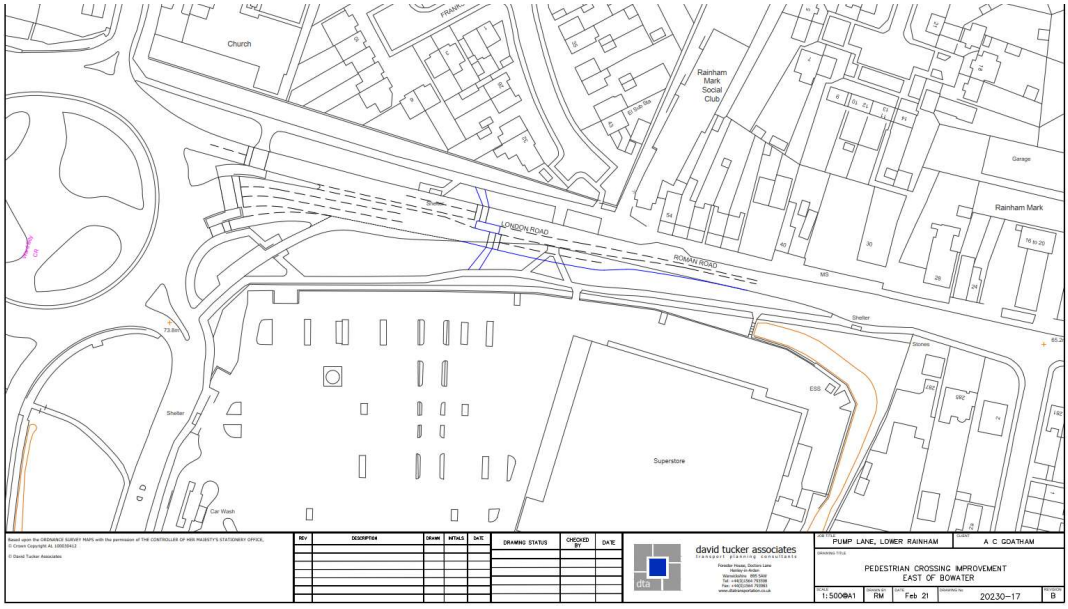
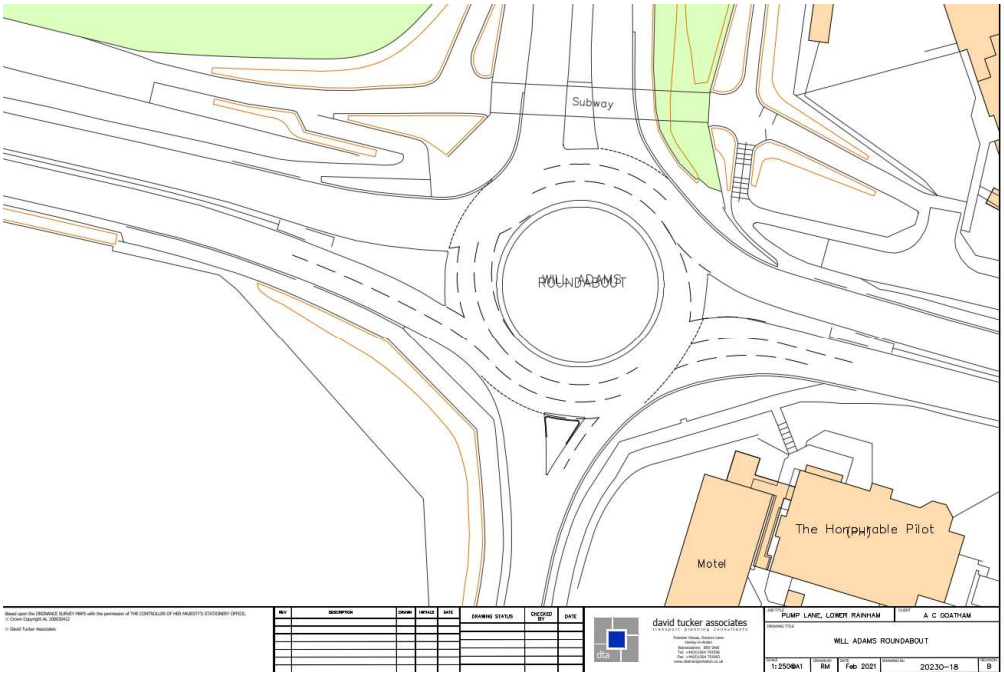


Figure 5 Additional Mitigation for Will Adams Roundabout



Process

2.4 The original mitigation plans were produced by DTA in January 2019 for Lower Rainham Road/Yokosuka Way and Bloors Lane/A2 (see Figures 1 and 2) and the Pump Lane railway underbridge mitigation was produced by DTA in October 2018 (see Figure 3). The plans were received by Sweco from the Council in September 2019 for the initial MAM modelling, when Sweco were commissioned.

2.5 There was no further suggestion of mitigation throughout the application and appeal process before the inquiry commenced.

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2.6 On the 23rd of February, on the second week of the public inquiry, the appellant submitted to the inspector and council a document entitled A2 Junction Operation review (Appendix A) which put forward new mitigation. This resulted in the adjournment of the inquiry in order for the Council to assess using their own tools (the MAM) the effectiveness of the additional A2 mitigation outlined in the review note.

2.7 The A2 junction review note (Appendix A, pp2) acknowledges the issue of blocking back on the A2 as shown in Figure 3 and 4 (pp35 and 36) of my PoE from the toucan crossing through the Bowaters roundabout. The A2 junction review note proposed the following additional mitigation:

- A refuge island for pedestrian for the toucan crossing in order to allow pedestrians to cross in two stages and adjustments to signal timings (see point 7 and 8 in Appendix A and drawing number 20230-16 on page 5 of the note, also shown in my figure 4).
- Widening of the A2 permitting doubling of lane entries to the West of the crossing (see point 9 in Appendix A and shown in my figure 4)
- In addition, the appellant proposed additional mitigation at Will Adams roundabout for the A2 East entry (see point 11 of the review note in Appendix A and shown in my figure 5). This included an additional circulatory lane on the southern section of the roundabout and changes to the lane markings with a proposed left and ahead, ahead only and right only for the eastern arm.

2.8 Following the adjournment of the inquiry and the receipt of the appellants note, a meeting was held on the 24th of February 2021 that took place between David Tucker Associates (DTA) representing the appellant, Medway Council, Paul Basham Associates and Sweco to go through the A2 junction review note and next steps for the MAM modelling. It was agreed that DTA would provide junction files, signal timings and plans of the A2 mitigation. In order to assist DTA in optimising signal timings at Bowaters roundabout the latest turn flows from scenario 3 and 6 from the MAM were provided to DTA by Sweco prior to this.

2.9 Signal optimisation was discussed at Bowaters roundabout where it was agreed that Sweco would provide DTA with turn flows in order for DTA to further optimise their signal timings using their own junction models and provide the revised signal timings back to Sweco. This was duly provided by DTA and the updated signal timings were applied in the MAM assessment undertaken by Sweco.

2.10 No additional mitigation schemes to be modelled were discussed at the meeting. The original meeting notes produced by the Council are provided in Appendix B. It was agreed that the following four scenarios would be modelled in MAM which would include the mitigation outlined above (see section 2.2).

Table 1 MAM Additional Mitigation Scenarios

Scenario	Year of Assessment	Trip Rates	Development zone used	Centroid Configuration
2a	2037	Strategic Model Trip Rates	Standalone development zone	Two access points
3a	2037	Developer Trip Rates	Standalone development zone	Two access points
5a	2028	Strategic Model Trip Rates	Standalone development zone	Two access points
6a	2028	Developer Trip Rates	Standalone development zone	Two access points

2.11 Mr Tucker sent an email on the 28th of February (Appendix C) which provided the requested junction models with the updated signal timings at Bowaters roundabout and a junction model and scheme information for the Will Adams Way roundabout. In addition, and outside the scope of the A2 junction model review note he also provided:

1) A2 / Otterham Quay Lane junction models and associated signal timings
2) Lower Rainham Road shuttle workings by the Mariners (existing mitigation)
3) A2 Bloors Lane junction model and signal timings
4) Revised mitigation for Lower Rainham Road / Yokosuka Way roundabout (see Figure 12 of this PoE addendum)

2.12 None of the above were mentioned in the A2 junction model review note nor were agreed at the meeting as shown by the meeting notes (Appendix B).

2.13 For the Council to be as fair as possible to the appellant, the signal timings at A2/Otterham Quay Lane and the Lower Rainham Road shuttle workings were included in the MAM modelling (points 1 and 2 above). The A2 Bloors Lane timings were not used, as in the MAM this junction is modelled as vehicle actuated signals and it was felt this provided the most optimal signal timings. A vehicle actuated traffic signal is one where a signal controller determines the timing and sequence of traffic movement for each signal phase and cycle based on the numbers of vehicles arriving at the junction from each approach.

2.14 Prior to the email of 28th February, there had been no suggestion that the additional mitigation proposed included any amendments to the mitigation at the Lower Rainham Road / Yokosuka Way roundabout. The A2 junction model review note made no mention of this, nor was this discussed at the meeting on 24th February. Furthermore, the text of Mr Tucker's email of 28th February (Appendix C) did not suggest that any additional or alterative mitigation was proposed at the Lower Rainham Road / Yokosuka Way.

2.15 As is clear from the what I have set out above and from the report itself, Lower Rainham Report Addendum 3, Sweco did not alter the mitigation proposed for the Lower Rainham Road / Yokosuka Way roundabout from that which had originally been proposed (see Figure 1). This is because – as it had not been proposed in the A2 junction model review note, nor discussed at the 24th February meeting, and as it was not raised in Mr Tucker's email of 28th February - we did not realise that the Appellant was suggesting that the mitigation originally proposed at this roundabout was to be altered.

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2.16 Furthermore, Mr Tucker did not highlight any omission in the additional mitigation when the Lower Rainham Report Addendum 3 was provided to him on 31st March 2021. This issue only came to light on the 7th of April during email correspondence on the SoCG, when Mr Tucker amended the draft SoCG to contend that the MAM had not modelled the proposed amendments at the Lower Rainham Road / Yokosuka Way roundabout. It is only then, when comparing the drawing shown in Figure 1 - showing the original mitigation at this roundabout, with the drawing in Figure 12 showing the revised mitigation, that the differences became apparent.

2.17 It is important to be clear what the apparent proposed amendments to the mitigation at the Lower Rainham Road / Yokosuka Way roundabout are and how they differ from the original mitigation proposed at this roundabout. Figure 1 provides the Drawing for the original mitigation. This does not show any arrows, however a standard UK roundabout layout for a two-lane approach would have the left lane for left turning and straight-ahead traffic and the right-hand land for right turning traffic only. This is what has been assumed in the MAM assessments.

2.18 Figure 12 provides the drawings for the revised mitigation. This shows for the Lower Rainham Road eastern approach arm the arrows show one shared left and straight-ahead movement and one straight ahead however the text would suggest that both lanes could be used for the right turn movement from Lower Rainham Road to A289 North.

3. MAM Assessment of the Additional Mitigation

3.1 The Lower Rainham Report addendum 3 and the associated MAM micro-simulation videos were provided to the inspector and appellant on Wednesday 31st March[1] and Thursday 8th April respectively.

3.2 The report which contained the modelling results of the scenarios outlined in Table 1 also included appendices providing MAM plots from the respective MAM scenarios as requested by the appellant. The appendices contained the following:

- **Flow plots** present the assigned volume of vehicles from the macroscopic modelling on each section (or link) in the MAM. The unit of this plot is vehicles per hour.
- **V/C sections** present the volume over capacity ratio from the macroscopic modelling on each section (or link) in the MAM. This metric expresses how close to capacity is the volume assigned on each section.
- **V/C turns** present the volume over capacity ratio from the macroscopic modelling on each turning movement in the MAM. This metric expresses how close to capacity the assigned volume is on each turn.
- **Select Link Analysis plots** presents the distribution of development traffic to and from the proposed development zone from the MAM. The unit for this plot is vehicles per hour.
- **Simulated Delay plots** show the average section delay experienced by each vehicle from the microsimulation model. This metric is expressed in seconds.

[1] A further version of the Lower Rainham Report addendum 3, which simply corrected presentational errors in the first version was supplied on 8th April. No change to the substance of the report was made

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3.3 The following sections summarise the MAM results comparing with and without development scenario regarding junction and journey times for each subnetwork using scenario 6a for the with development scenario. This scenario, as already outlined, is the most favourable to the appellant as it is based on the earlier forecast year of 2028 and uses the appellants trip rates for the proposed development. Screenshots from the micro-simulation videos which have already been sent to the inspector and appellant are then shown to compare the traffic operations between these two scenarios for each sub-network and to provide further explanation and evidence.

Subnetwork 2 results

3.4 The results showed the following junctions reaching a LoS F in the morning peak with the development (including the additional mitigation) resulting in significant queuing and delays as a result of the development. See Table 7, pp18 of the Lower Rainham Report 3 (IDXX)

- A2 (Rotary Gardens / Woodlands Road / Sovereign Boulevard Junction)
- A2 (Bowater Roundabout)
- A289 (Ito Way / Sovereign Boulevard)

And evening peak (See Table 9, pp19 of the Lower Rainham Report 3 (IDXX):

- A289 (Pier Road / Maritime Way Roundabout)
- A289 Pier Road / Gillingham Gate Road West
- A2 (Bowater Roundabout)
- Eastcourt Lane / South Avenue

3.5 The following journey time routes showed a significant increase in travel times with the proposed development in the morning peak (See Table 11, pp22 of the Lower Rainham Report 3 (IDXX):

- The A278 (Hoath Way) to A289 Church Street journey time is 10 minutes and 4 seconds in the Reference Case Scenario. It shows a 38% increase in journey time in scenario 6a which represents an additional 3 minutes and 39 seconds with the development and additional mitigation
- The A2 westbound (Sovereign Boulevard to Watling Street) journey time is 6 minutes and 40 seconds in the reference case. It shows an 80% increase in journey time in scenario 6A which represents more than an additional 5 minutes and 21 seconds
- The A2 eastbound (Watling Street to Sovereign Boulevard) is 11 minutes and 12 seconds in the reference case. It shows an 89% increase in journey time in scenario 6A which represents an increase of 10 minutes.

And evening peak:

- The A278 (Hoath Way) to A289 Church Street is 6 minutes and 42 seconds in the reference case scenario. It shows a 101% increase in journey time which represents more than an additional 6 minutes and 47 seconds with the development and additional mitigation
- The A2 westbound (Sovereign Boulevard to Watling Street) is 6 minutes and 24 seconds in the reference case. It shows an 83% increase in journey time which represents more than an additional 5 minutes and 18 seconds
- The A2 eastbound (Watling Street to Sovereign Boulevard) is 7 minutes and 3 seconds in the reference case scenario. In Scenario 6A, it shows an 119% increase in journey time which represent more than an additional 8 minutes and 23 seconds.

3.6 The conclusions regarding the development impact with the additional mitigations for subnetwork 2 therefore remain more or less the same when compared with the January 2021 modelling work and scenario 6 without the additional mitigations.

3.7 The additional A2 mitigation at Bowaters roundabout makes the impact on the A2 eastbound less severe in the morning peak with the revised timings and extra capacity at the toucan crossing, which is a positive impact. However, despite the improvement of scenario 6a over scenario 6 for this movement, the roundabouts average junction delay is still a LoS F in the morning peak, compared to the Reference Case which is LoS B.

3.8 The optimised signal timings in the PM Peak, as provided by the appellant from their junction models for Bowaters roundabout and as agreed to be applied in MAM, do not to help with the PM peak traffic operations.

3.9 The PM peak signal timings at Bowaters roundabout provided by the appellant provide less green time for the eastbound stream on the roundabout resulting in higher delays and blocking back on the A2 to Ito Way (see pp11 of the Lower Rainham Report Addendum 3 (IDXX).

3.10 Furthermore, the mitigation at Will Adams Way is not proven to be effective for westbound traffic in both time periods as although there are still two through lanes, the left hand through is now a short nearside lane on the eastern approach arm which queued traffic on the middle land cannot reach and fully benefit from resulting in a deterioration of corridor performance.

3.11 Figure 7 compares the Reference Case (without development) scenario with scenario 6a at 8.45am in the morning peak. Figure 7 shows resultant significant queuing along the A2 in both directions, eastbound A2 traffic blocks back over Will Adams roundabout. It can clearly be seen that, notwithstanding the additional mitigation, the traffic operations are far worse in scenario 6a compared to the reference case due to the additional development traffic despite the additional mitigation.

3.12 Figure 8 shows the equivalent comparison for 17:45 in the evening peak. It can be seen that there is significant queue in both directions on the A2 between Bowaters and Will Adams roundabout. The A2 eastbound queuing blocks back through Will Adams roundabout and the next junction which is the A2/Woodlands Road and Rotary Gardens as well as up Ito Way (A289). This has worsened compared to scenario 6 (with the additional mitigation) due to the reduced green time for the eastbound stream at Bowaters roundabout in the evening peak. It can be clearly seen in Figure 8 that the queuing and traffic operational degradation is far worse than the reference case scenario without the proposed development and additional mitigations.

Figure 6 Comparison of Reference Case and Scenario 6A for subnetwork 2 in the morning peak (8.45am)

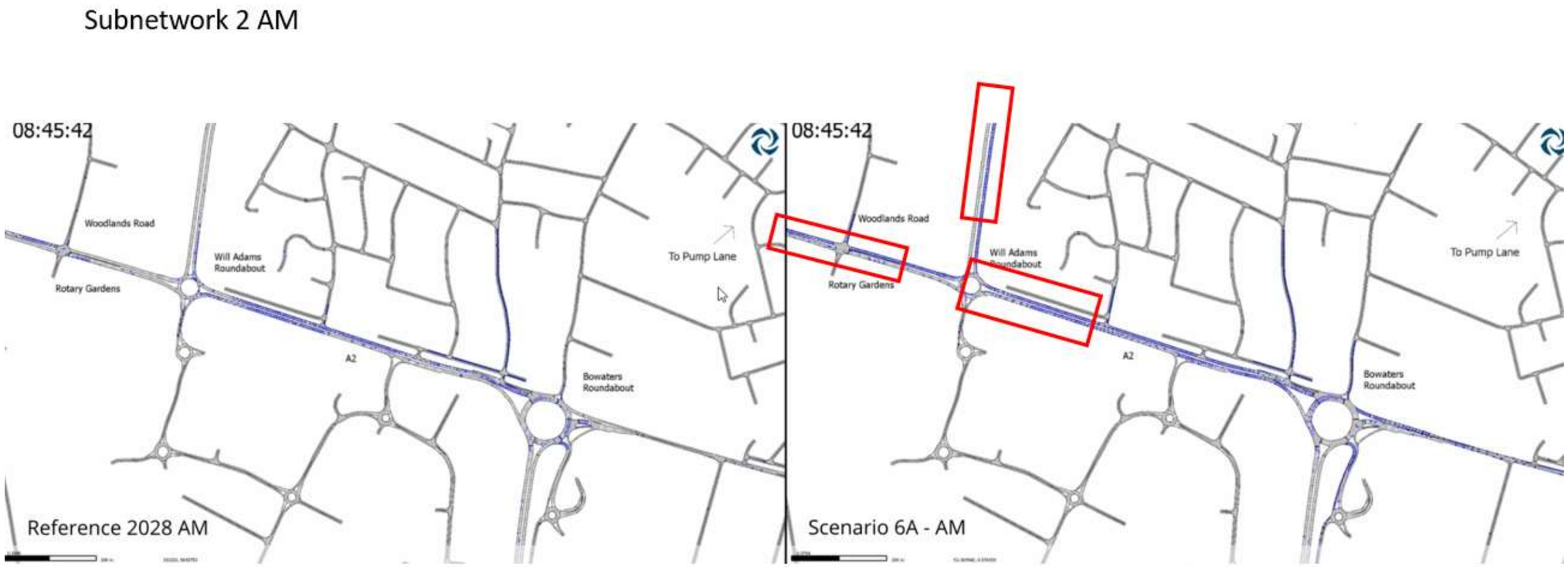

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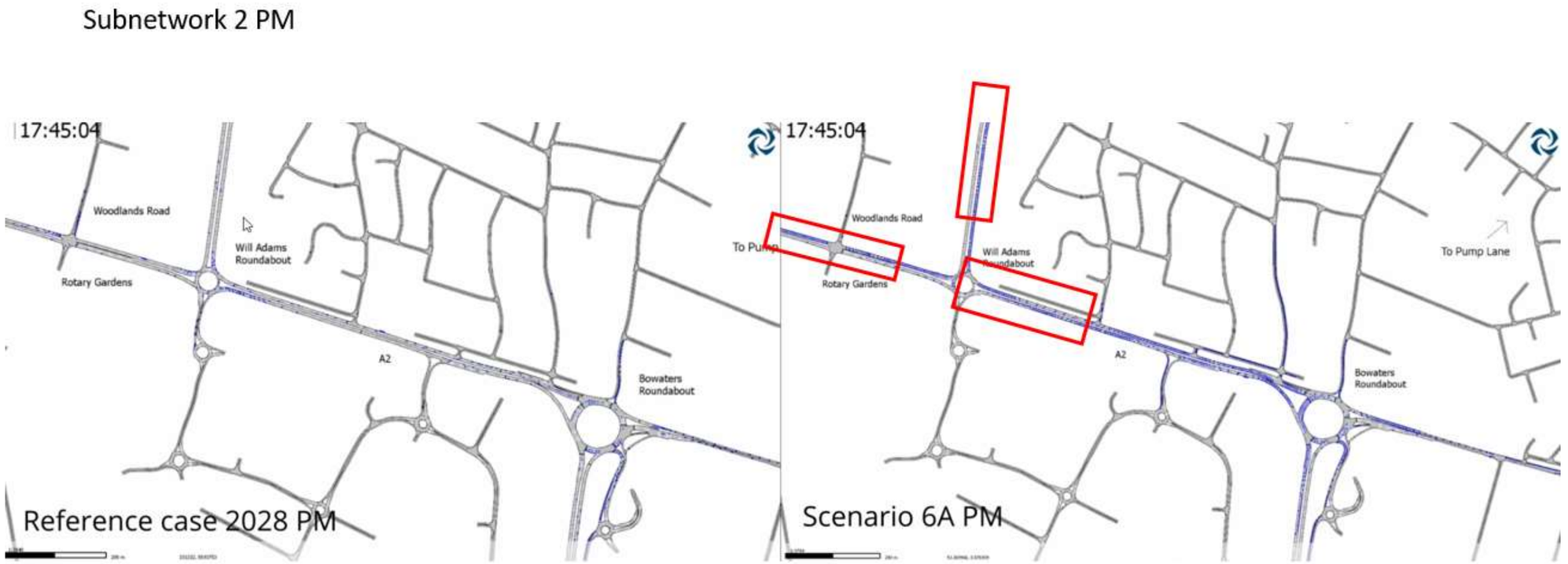
Figure 7 Comparison of Reference Case and Scenario 6A for subnetwork 2 in the evening peak (17.45)



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Subnetwork 3 results

3.13 The results showed the following junction reaching a LoS F in the morning peak and evening peaks with the development and the additional mitigation, resulting in significant queuing and delays as a result of the development (see Table 19 and Table 21 pp28-29 of the Lower Rainham Report Addendum 3 (IDXX):

- A2 (Otterham Quay Lane / Merersborough Road)

3.14 This is the same outcome as the previous January 2021 work without the additional mitigation. This is perhaps not surprising as most of the additional mitigation is focused on subnetwork 2 except for some slight changes to the signal timings at the A2 Otterham Quay Lane / Meresborough Road junction which gives more green time to the A2 at the expense of the side roads (see pp30 of the Lower Rainham Report Addendum 3 (IDXX).

3.15 Figure 9 and 10 show screenshots taken at 8.45am and 17:45 that compare the Reference Case (without development) scenario with scenario 6a. Long queues can be seen on Meresborough Road in both time period which has reduced green time with the revised signal timings provided by the appellant, resulting in queuing back past Moor Park Close in scenario 6a, with a total queue length of some 200 metres.

3.16 In the evening peak it can be seen in Figure 10 that Ivy Street also has extensive queuing in scenario 6a with the development, this is due to traffic diverting to avoid A2 delays to the west, however given the significant eastbound A2 flow which at this point is only one lane in each direction, insufficient traffic is able to exit Ivy street despite the yellow box. This results in the build-up of queues.

3.17 The overall conclusions regarding the development impact plus additional mitigations for subnetwork 3 therefore remain more or less the same when compared with the January 2021 modelling work and scenario 6 without the additional mitigations. It can clearly be seen that traffic operations are far worse in scenario 6a compared to the reference case due to the development traffic despite the additional mitigation.

Figure 8 Comparison of Reference Case and Scenario 6A for subnetwork 3 in the morning peak (8.45am)

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Figure 9 Comparison of Reference Case and Scenario 6A for subnetwork 3 in the evening peak (17.45)

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Subnetwork 7 results

3.18 The scenario 6a MAM results for subnetwork 7 are very similar to the January 2021 MAM results for scenario 6 unsurprisingly given there are no additional mitigation measures that have been modelled in the MAM for this subnetwork. As before, there are no junction performance issues in subnetwork 7 for the junctions that have been assessed nor any significant deterioration as a result of the development and additional mitigation.

3.19 The main impact, as before, is the significant queuing on Lower Rainham Road westbound in the morning peak on the approach to the roundabout with Yokosuka Way. Here the right turning traffic heading northbound struggles to exit given the flows on the A289, with a significant queue forming along Lower Rainham Road past Sharps Green. This can be seen in Figure 11 which shows a screenshot from the micro-simulation video. This results in additional journey times along Lower Rainham Road of over 9 minutes due to the development traffic compared to the Reference Case (was 7 minutes and 9 seconds in the 2028 reference case, and 16 minutes and 16 seconds in Scenario 6A).

3.20 It should be noted that given this subnetwork includes the development zone it is possible to highlight vehicles going to and from the development a different colour (i.e. red) compared to general traffic (i.e. blue) in the micro-simulation video. It is also worth noting that the additional A2 mitigation does remove some traffic from Lower Rainham Road and onto the A2, resulting in a marginal improvement in journey times on Lower Rainham Road westbound compared to the previous scenario 6 without the additional mitigation. It is still however significantly worse when compared to the Reference Case.

3.21 No issues are reported in the evening peak for this sub-network with the development traffic compared to the Reference Case scenario (without development).

Summary

3.22 Overall it is clear that even when using scenario 6a which is most favourable to the appellant (early forecast year, the developers lower trip rates plus the additional mitigation) the proposed development is still forecast to have a significant traffic impact compared to the Reference Case, notably in subnetworks 2, 3 and 7. The overall conclusions even with the additional mitigation are more or less the same therefore as the January 2021 MAM assessment.

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Figure 10 Comparison of Reference Case and Scenario 6A for subnetwork 7 in the morning peak (8.45am)

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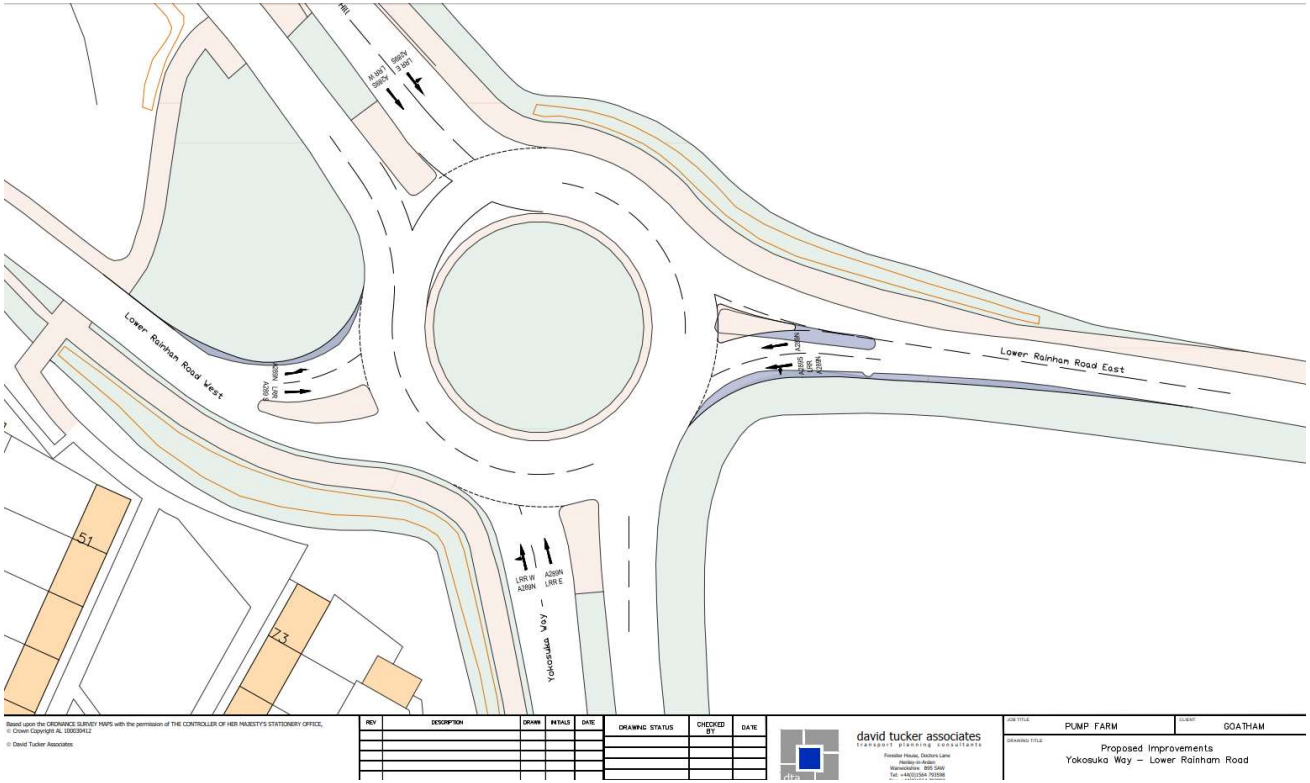
4. Lower Rainham Road and Yokosuka Way Mitigation

4.1 As outlined in section 2.7, the appellant's additional proposed mitigation at Lower Rainham Road / Yokosuka Way which is hypothesised to now include two right turn lanes from the Lower Rainham Road westbound approach to the A289 northbound, had not been tested in the MAM for scenario 6a. This is because it had not been mentioned in the A2 junction review note (Appendix A), nor was it discussed at the meeting between the Council and their transport consultants (Sweco, Paul Basham Associates) and the appellant's transport consultants (DTA) as shown in the meeting notes (Appendix B). It was also not explicitly mentioned in the email provided by Mr Tucker outlining the additional Pump Lane mitigation sent on the 28th of February 2021 (Appendix C) to which the plan was attached. It was therefore not included in the MAM modelling work described in the Lower Rainham Report Addendum 3.

4.2 Figure 12 shows the plan that was attached to Mr Tuckers email on the 28th of February 2021 regarding revised mitigation on Lower Rainham Road and Yokosuka Way. It can be seen that the small text on the Lower Rainham Road westbound approach to the Yokosuka Way roundabout does refers to two right turn lanes to the A289 northbound. There are however clear inconsistencies with the arrow markings, which show two straight ahead movements instead.

4.3 This revised mitigation only came to Sweco's attention following tracked change comments by Mr Tucker in his statement of common ground edits provided on 17:03 on the 7th of April 2021. In his tracked changes Mr Tucker added a mitigation referring to "additional flaring and amended lane markings Yokosuka Way / Lower Rainham Road". He then also states that "the physical mitigation works at Yokosuka Way – Lower Rainham Road is not included in the modelling". This is for the good reasons outlined above, this was the first time we were made aware of the Appellant's further revised and additional mitigation outside the A2 corridor.

Figure 11 Updated Proposed Mitigation for Lower Rainham Road and Yokosuka Way Roundabout



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4.4 A preliminary sensitivity test has however been undertaken using the MAM with this new configuration after the submission of both the Lower Rainham Report Addendum 3 and micro-simulation videos.

4.5 The sensitivity test shows that this change in the mitigation would reduce the queue on Lower Rainham Road westbound. However, it would also result in much greater queues on the southern arm to the roundabout with A289 northbound traffic now giving way to two lanes of turning traffic from Lower Rainham Road resulting in queued northbound traffic.

4.6 Figure 13 shows the extent of queuing and slow-moving traffic on Yokosuka Way northbound in the AM peak at 8.45 with this revised mitigation for the sensitivity test undertaken on scenario 6a. In essence, it pushes the problem to another arm of the roundabout albeit with greater stacking capacity given Yokosuka Way has 2 lanes.

4.7 The morning peak travel times based on the MAM between Hoath Way and Church Street using the A289 Yokosuka Way northbound is 10 minutes and 4 seconds in the 2028 Reference Case. This increases to 13 minutes and 51 seconds with the original scenario 6a mitigation (an additional 3 minutes and 47 seconds compared to the Reference Case). However, with the revised mitigation and the additional queuing on Yokosuka Way northbound in the morning peak, the scenario 6a sensitivity test shows the travel time between Hoath Way and Church Street increasing to 19 minutes and 31 seconds. This is a significant increase of 9 minutes and 27 seconds on the A289 northbound compared to the Reference Case (and an additional 5 minutes and 40 seconds compared with the scenario 6a mitigation). This underlines the point that the revised mitigation just pushes the queuing and travel time degradation to another arm of the roundabout.

4.8 Regarding the junction operational performance in the morning peak it goes from 112.38 seconds of flow weighted average junction delay in 6a (with original mitigation) to 120.73 seconds in the sensitivity test. The junction performance therefore gets slightly worse with the revised mitigation due to the A289 northbound queuing. Both scenarios would be classified as a LoS F.

4.9 Importantly it was also observed in the macroscopic model that the 6a sensitivity test does not change the overall flow between Lower Rainham Road and the A2 corridor with the revised mitigation. The proposed change to the Lower Rainham Road and Yokosuka Way roundabout mitigation therefore has no impact on the MAM assessment outlined in the Lower Rainham Report Addendum 3 along the congested A2 corridor.

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Figure 12 Scenario 6A sensitivity test at Yokosuka Way / Lower Rainham Road in the morning peak (8.45am)

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5. Micro-simulation Videos

5.1 The following micro-simulation videos were provided to the inspector and the appellant on Thursday 8th of April. The videos compare the 2028 Reference Case against scenario 6a considered most favourable to the appellant. This is based on a 2028 forecast year with the developer's trip rates and additional mitigation. They included the following 6 videos:

1. Subnetwork 2 covering traffic simulation on the Will Adam Way roundabout and Bowaters signalised roundabout and toucan crossing mitigation between 8am to 9am
2. Subnetwork 2 covering traffic simulation on the Will Adam Way roundabout and Bowaters signalised roundabout and toucan crossing mitigation between 5pm to 6pm
3. Subnetwork 3 covering traffic simulation on the A2 in Rainham including the A2 junctions with Station Road and also Otterham Quay Lane / Meresborough Road between 8am to 9am
4. Subnetwork 3 covering traffic simulation on the A2 in Rainham including the A2 junctions with Station Road and also Otterham Quay Lane / Meresborough Road between 5pm to 6pm
5. Subnetwork 7 covering traffic simulation on Lower Rainham Road between Yokusuka Way and Sharps Green between 8am and 9am
6. Subnetwork 7 covering traffic simulation on Lower Rainham Road between Yokusuka Way and Sharps Green between 5pm and 6pm

5.2 The following section provide a commentary of the videos for each subnetwork highlighting what to look for and when regarding the breakdown of traffic operations on these key corridors.

1) Subnetwork 2 – Morning Peak

5.3 An increased flow along the A2 can be observed in the Subnetwork 2 video in the morning peak at 8:00 in scenario 6a (with development and additional mitigation) compared to the reference case. This is due to the development traffic and the mitigations which induce traffic into the A2.

5.4 At around 8:15am the queue along the A2 starts to form on the A2 eastbound from Bowaters Roundabout, and on the A2 westbound from Will Adams roundabout. This can be attributed to both the higher flow in scenario 6a and the new lane markings at Will Adams roundabout. The new lane markings effectively remove capacity from the straight-ahead movement.

5.5 At 8:30am the eastbound queue along the A2 has reached Ito Way (A289) and the westbound queue extends to Bowaters roundabout.

5.6 At 8:45 the queues have gotten longer. Notably the eastbound queue now has reached the A2 / Rotary Gardens / Woodlands Road Junction.

2) Subnetwork 2 – Evening Peak

5.7 Similar observations can be made in the Subnetwork 2 evening peak video. However, the difference at 17:15 between the reference case and Scenario 6A in terms of queue on A2 westbound is more apparent in the evening peak. The queue on A2 eastbound is again longer in the Scenario 6A video compared to the reference case.

5.8 By 17:30 the eastbound queue has reached Will Adams roundabout and the westbound queue has reached almost Bowaters Roundabout.

5.9 At 17:45, the A2 eastbound queue has blocked back through the A2 / Ito Way junction and onto the A2/Woodlands Road/Rotary Gardens junction.

3) Subnetwork 3 – Morning Peak

5.10 In the Subnetwork 3 morning peak video, long queues can be observed on Meresborough Road (south arm of A2/Otterham Quay Lane/Meresborough Road) junction between 08:00 am and 09:00am. This is due to the new signal timings provided by the appellants for this junction, prioritising the A2 traffic streams, causing long queues and delays on the side roads such as Meresborough road. This queue remains for the entirety of the AM peak hour.

4) Subnetwork 3 – Evening Peak

5.11 In the evening peak video, in addition to Meresborough road, long queues can be observed on Otterham Quay Lane and Ivy Street (top left corner of the video point of view) after 17:15 which get longer as time passes.

5.12 At 17:45 Otterham Quay Lane and Ivy Street appear to have reached capacity. These queues can be attributed to the rerouting that takes place as drivers attempt to avoid the congestion on the A2 west of Subnetwork 3.

5) Subnetwork 7 – Morning Peak

5.13 The proposed development traffic impact can be observed in the Subnetwork 7 morning peak video. This video colours vehicles red that are either originating from or heading to the proposed development. Even from 8:00am there is a long queue on the A2 westbound.

5.14 After observing the simulation animation for the whole of subnetwork 7 it was observed that this queue at around 8:45am reaches the access of the proposed development on Lower Rainham Road. It should be noted that it would be impossible to show the entire subnetwork 7 in a video as it would be extremely difficult to spot vehicles in such a higher scale. The queue on Lower Rainham Road does not dissipate during the morning peak hour.

6) Subnetwork 7 – Evening Peak

5.15 In the evening peak there are no significant traffic issues shown in Subnetwork 7 around Yokosuka way roundabout and along Lower Rainham Road.

6. Response to Section 3 of Simon Tucker's Rebuttal

6.1 ST 3.3 states that MAM in not suitable for consideration of planning applications referring to paragraph 10.5 of the Model Validation Report (CD 12.4). This likely refers to paragraph 10.3 as there is no 10.5 in the validation report, which is addressed in my rebuttal (KJ 2.32 to 2.33). Mr Tucker is trying to suggest that there is a lack of local model calibration and validation however my rebuttal tables 1 to 6 (pp10, 13 and 17) clearly disprove this.

6.2 Furthermore section 2.1 of the Model Validation Report explicitly lists the proposed uses of the MAM, with the fourth purpose being "the assessment of the impacts of specific development sites and to identify and test possible mitigation measures", this aligns with the MAM modelling work for the site for the land off Pump Lane. Furthermore, the Council provides guidance on MAMs use for this specific purpose (see Appendix A of my original proof).

6.3 ST 3.4 simplifies what the MAM does, with Mr Tucker describing the MAM in terms of distribution/assignment and then forecasting of flow impact. This is overly simplistic, as the MAM includes a number of complexities. This includes lane changing behaviour, acceleration/deceleration, routings, signal optimisation, queue formation and blocking back none of which are allowed for in the appellant simplistic isolated junction modelling.

6.4 Mr Tucker then states that the MAM fails to provide credible outputs on capacity and congestion despite its use for other schemes, developments and the local plan modelling work and the high level of validation achieved and outlined in Tables 1 to 6 (pp10, 13 and 17) of my rebuttal. He provides no evidence as to why it lacks credibility regarding forecasting capacity and congestion.

6.5 ST 3.5 Mr Tucker, in my opinion wrongly, puts forward a transport modelling approach reliant on simplistic isolated junction modelling. This gives no regard to issues such as network-wide impacts, re-routing impacts including to non-development traffic, lane changing issues, blocking back along corridors and across assessed junctions nor signal co-ordination and optimisation.

6.6 Mr Tucker refers to the use of standard industry software, however some of the junction modelling is based purely on geometric parameters for example for roundabouts. This simplistic nature will not allow for some of the important lane changing behaviours for approaching traffic and lane allocations for specific turn movements which can significantly impact on the true junction capacity. In point 2 he also incorrectly states that the appellants junction modelling shows that the scheme has acceptable queuing, or it can be mitigated. The latter was clearly incorrect as the appellant introduced a number of new additional mitigations for the A2 mid-way through the hearing and post his rebuttal.

6.7 Furthermore, in point 4 (ST3.5) Mr Tucker once again erroneously asserts that there are issues with MAM model validation suggesting and I quote “Here the Council is, in effect, wrongly inviting the Inspector to receive all outputs at pure face value, irrespective of the significant and undermining shortcomings of the validation”. I would re-iterate that there are no shortcomings in the MAM validation based on the Department for Transport’s guidance (TAG) as proven in section 2 of my rebuttal (see Tables 1 to 6, pp10, 13 and 17).

6.8 He also repeats the claim that the MAM assessment cannot be made the subject of proper and required interrogation, this is despite the provision of a significant amount of information to the appellant at the appellants request. This includes a powerpoint assessment, a technical report and 3 addendum reports, with each addendum report including detailed subnetwork statistics, information on delays, queues and journey times for each subnetwork, forecast traffic flow plots, select link analysis to shows the distribution of development traffic to and from the proposed development, volume over capacity plots for both links and turns and delay plots.

6.9 I am not aware of any unfulfilled request made by Mr Tucker that would prevent him from undertaking proper interrogation. Mr Tucker suggests, without evidence, that there appears to be no sense checking or signal optimisation. The modelling work was of course checked and so were the modelling reports and addendum reports, each report and addendum report has stated on its second page who prepared, reviewed and approved the report. More importantly, the model has been successfully calibrated and validated against observed traffic flows and journey times.

6.10 Regarding signal optimisation, a lot of the traffic signals in the MAM are vehicle actuated meaning the model automatically re-optimises signal timings based on forecast flows which will vary between the with and without development scenarios and for the different forecast years and time periods. In some instances, along the A2, the appellants own signal timings have now been used at the request of the appellant. Either way, it is not correct to state there has been no optimisation of signal timings.

7. Response to Section 5 of Simon Tucker's Rebuttal

7.1 In ST5.1 Mr Tucker inaccurately describes the MAM as a micro-simulation model referring to Table 1 of my proof of evidence where I compare and contrast the functionality of the MAM against the simplistic isolated junction modelling approach.

7.2 The MAM is not just a micro-simulation model but a macroscopic and microscopic model which has a number of additional benefits over just a micro-simulation model such as:

- network wide assessments
- wider area re-routing and diversionary effects and
- re-distribution forecasting.

7.3 In any event, it is noted that Mr Tucker does not contest the difference in functionality between the two approaches (ST5.2). Mr Tucker does however raise the question that these benefits are only realised if the model is calibrated and validated. As I have previously emphasised the MAM has been demonstrated in section 2 of my rebuttal (Tables 1 to 6, pp 10, 13 and 17) for the local subnetwork validation and the MAM validation report (CD12.4) for details of the calibration and validation of the whole model including the macroscopic model. The summary table comparison between the Council's transport modelling approach and the appellants (Table 1 of my proof) is therefore valid.

7.4 Despite not appearing to dispute the additional benefits of MAM in ST5.2, Mr Tucker asserts in ST5.3 that isolated junction models are more robust for assessing junctions than the MAM, as the latter may divert trips away or throttle traffic upstream. This makes little sense as having the capability to divert traffic would only add to the robustness of the assessment, it of course also ignores the possibility that with added junction capacity more traffic could be induced (diverted) into a mitigated junction for non-development traffic something not allowed for in the appellants approach.

7.5 Similarly, the capability of MAM to throttle traffic upstream would once more only add to the robustness and realism of the assessment, something a standalone junction model cannot do.

7.6 Mr Tucker has however omitted the inability of isolated junction models to allow for traffic blocking back (queuing) from downstream congested junctions, a key issue on congested corridors such as the A2 and A289.

7.7 It should also be noted that isolated junction models take no account of network wide impacts, corridor impacts, other capacity constraints from public transport to parking.

7.8 Furthermore, for assessing non-signalised roundabouts, simplistic isolated junction models as used by the appellant, only assess total approach flow and delay rather than specific turning movements. In instances where there are a number of approach lanes to a congested roundabout it may well be the case that a certain movement (i.e. a left turn) may be much easier to make than other movements (i.e. a right turn movement). Without this level of detail, a junction model will under-estimate the delay and resultant queues for the more difficult movements. There are a number of roundabouts on the A289 and A2 where this will likely be an issue such as the A289 (Yokosuka Way) and Lower Rainham Road. In such instances relying on simple geometric parameters of the roundabout (as per the appellant's modelling approach) is insufficient. A robust assessment should consider lane changing behaviour and lane allocation for specific movements, which only the MAM provides.

7.9 ST5.4 and ST5.5 Mr Tucker again states, wrongly, that the MAM does not validate adequately. To be clear the MAM does validate in accordance with section 3.3 of TAG Unit 3.1 (CD 12.8) requirements regarding traffic flows and journey times for both the macroscopic and microscopic models. This fact is clearly important. Please see section 2 of my rebuttal which shows that Mr Tucker has misunderstood the TAG criteria and Tables 1 to 6 (pp10, 13 and 17) of my rebuttal which shows the MAM is well calibrated and validated locally.

7.10 ST 5.6, Mr Tucker suggests that Table 2 covering the calibration and validation of link, junction and journey time routes in my proof of evidence is misleading. Table 2 is drawn from the Model Validation report as outlined, no evidence is provided for this statement, it is a statement of fact that the base MAM flows and journey times calibrate and validate against observed data in accordance to the TAG criteria as already set out above.

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7.11 In ST 5.7 Mr Tucker goes on to suggest that the delay in the immediate study area is not validated in any detail and relies on very long routes. This is incorrect, Mr Tucker appears to be confusing the macroscopic and microscopic model. In section 2 of my rebuttal (Tables 2, 4 and 6, pp 10, 13 and 17) and also outlined in the Model Validation report, there are some 20 journey time routes covering subnetworks 2, 3 and 7 which form the basis of the MAM assessment. All 20 journey time routes undertaken for both AM and PM peaks capture the time and delay across the 3 subnetworks and none of the 20 routes are beyond 7km's long. None of these routes would be classified as long routes as per TAG Unit 3.1 which states that routes should be below 15km long (CD12.8). Moreover, all the 20 routes pass the TAG criteria for journey time validation when model times are compared to observed data for both modelled peaks.

7.12 Of course, the simplistic isolated junction modelling used by the appellant has not been validated against any journey time, delay data or DfT modelling guidance. Mr Tucker's rebuttal does provide some analysis of modelled queues against observed queues (Table 1 and 2, pp15-16) although it is noted that some of these modelled queues are out by nearly a factor of 4 such as at the critical approach of Lower Rainham Road Eastern arm with the A289. The A2 eastern arm at Will Adams / Ito Way/ A2 is out by a factor of 7 in both instances (which appears a general trend with the junction modelling) the modelled queues are underestimating observed queues. Both these locations are forecast to be problematic with the proposed development and mitigation based on the MAM assessment, raising questions about the veracity of the junction modelling outputs and associated technical notes.

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7.13 In ST5.8 Mr Tucker highlights Appendix REB 1 in an attempt to demonstrate that the MAM validation deviates from the observed for certain journey time routes. There are a number of flaws in what has been presented in his appendix.

1) Mr Tucker has mistakenly shown the macroscopic model journey times rather than the microscopic model journey times for which the MAM journey time and delay assessment is actually based upon. All the subnetwork journey time routes come from the microscopic model which has greater network detail, these routes are shown to be well validated in my rebuttal (Tables 1-6 pp10, 13 and 17).

2) Four macroscopic routes are shown, which cover longer routes, and some sections are a long distance away from the development.

3) Despite this, 3 of the 4 routes identified by Mr Tucker (6A WB PM, 6A EB PM and 7A EB AM) are clearly shown to pass the DfT's TAG criteria which states in TAG Unit 3.1 section 3.3.15 that for journey time validation the percentage difference between modelled and observed journey times should be used. Model journey times along routes should be within 15% of surveyed times or 1 minute if higher than 15%. This is for the whole route not a section of it. The criteria should be met in 85% of cases. For the macro model 93.8% of routes in the AM peak and 100% of routes in the PM peak pass the validation criteria (see 9.3.4 in CD12.4) which exceeds the DfT guidance. In the microscopic model 100% of the routes pass the criteria for subnetworks 2, 3 and 7 for the 20 routes in both modelled peaks.

4) For the one macroscopic journey time route that fails the criteria in the AM peak, namely 6a eastbound, it is clear that the discrepancy is on the western side of Medway far from the scheme. Furthermore, the model and observed times for the remainder of the route from 5kms to 18kms very closely match the observed data. So, this is of little, if any, relevance.

7.14 In ST5-9 to ST5-11 Mr Tucker appears to mis-understand the application of the Level of Service metric. This has not been used in the modelling, it is purely a metric to categorise people's perception of different levels of traffic delays at junctions and along corridors which is used widely around the world This metric has only been applied to categorise model outputs it does not in any way change those outputs. How junctions are modelled in the UK or US is therefore irrelevant, it should be noted that the modelling software that Mr Tucker has used for his simplistic isolated junction modelling work can also output identical LoS metrics for junction delay. This is regardless of what modelling approach is undertaken. LoS is also nothing new, having been around since 2003.

7.15 Regarding Mr Tucker querying whether model parameters are localised to Medway in ST5.11 the MAM has clearly been demonstrated to be calibrated and validated to local observed traffic data as outlined in section 2 of my rebuttal. Moreover, the glossary of my proof of evidence provides a definition of model calibration, which refers to adjusting model parameters such as network detail to ensure the model reflects observed traffic conditions and is fit for purpose. In the MAM this would include for example road widths, link and junction capacities and signal timings.

8. Response to Section 6 of Simon Tucker's Rebuttal

8.1 ST6.1 of Mr Tucker's rebuttal refers to section 7 of my proof of evidence and the provision of new model outputs. It should be noted that this is only true in relation to Figure 3 and 4 in my PoE which are screenshots from the microscopic modelling simulation which were only included in my proof to visualise the issue of blocking back on the A2 corridor between and across junctions and why therefore isolated junction modelling is inappropriate in this context. Mr Tucker has prior to the public inquiry adjournment never requested any simulation video. Furthermore, as outlined in KJ2.4 of my rebuttal and 6.8 of this addendum to my proof, Mr Tucker has received a significant amount of model outputs at his request in addition to a Powerpoint presentation, a full modelling report and 3 modelling report addendums with detailed outputs in the appendices.

8.2 In ST6.2 Mr Tucker suggests that there are often if not always errors in micro-simulation models but provides no evidence of this and again without evidence suggests no investigation of anomalies have been undertaken without even outlining what the anomalies are.

8.3 In ST6.3 Mr Tucker again without any knowledge of either MAM (which the appellant chose not to use) or what signal optimisation may have been undertaken within MAM, incorrectly assumes that no signal optimisation has been undertaken. A lot of the traffic signals in the MAM are vehicle actuated meaning that the model optimises the signal timings based on the changing future flows with each scenario. In any event, the point has become further redundant as for the key signalised junctions such as Bowaters roundabout or the junction of Oterham Quay Lane and the A2, the signal timings provided by Mr Tucker have been used to allay his concerns.

8.4 For ST6.4 to ST6.5 Mr Tucker's points concerning the toucan crossing on the A2 to the east of Bowater Roundabout are addressed in the latest modelling work. This relates to the updated MAM assessment which included the appellant's additional A2 mitigation which included the appellant's signal timings at Bowaters roundabout and a new configuration of the toucan crossing.

Appendix A

LAND OFF PUMP LANE
RAINHAM
KENT
ME8 7TJ

TOWN AND COUNTRY PLANNING ACT 1990
APPEAL REFERENCE: APP/A2280/W/20/3259868

APPEAL BY A C GOATHAM & SON

INQUIRY DOCUMENT: A2 Junction Operation Review

PREPARED BY:

Simon Tucker for the Appellant

23/02/2021

INQUIRY DOCUMENT REF: CD24

1. As discussed in Mr Tucker's Rebuttal at para 6.4, the MAM model output at Figure 3 of Jarvis PoE it appears that there is some blocking back from the pedestrian crossing, circa 150m west of the Bowater Roundabout. This blocking back appears to progress through the Bowater Roundabout along the A2 to the Will Adams Roundabout and manifests in some queuing on the A2 and Ito Way.

2. There are natural gaps in traffic from the signals on the Bowater Roundabout where the A2 eastbound traffic is held so that traffic from Twydall Lane can enter the gyratory.

3. As such the crossing could be called by a pedestrian (i.e. the button pushed) every 60 seconds (corresponding to the cycle time on the Bowater Roundabout) without disrupting traffic patterns more widely. In practice the crossing is called on demand and, most likely, significantly less frequently.

4. It is evident that this synergy between Bowater Roundabout and the crossing whereby there are natural gaps in traffic is not realised within the MAM modelling. This may be due to poor co-ordination of the traffic signals (i.e. the pedestrian crossing is holding the A2 through traffic from the Will Adams Roundabout). It may be due to reduced lane capacity at the crossing (i.e. less than the upstream lane saturation flows).

5. There is no evidence in the observed conditions, including as reported in the DTA traffic surveys, or in the MAM validation as to the causality (i.e. in the reference case the crossing is co-ordinated and/or the level of demand is insufficient to modify the journey times along the link).

6. Should the operation of the crossing become an issue there are interventions that could be readily implemented to overcome this bottleneck. This arrangement is shown on **DTA Drawing 20230-16**.

7. A refuge island would allow pedestrians to cross in two stages. The reduced crossing distances will reduce the time required for pedestrians to cross and therefore reduce the intergreens (i.e. the time lost between the end of the invitation to cross to pedestrians and drivers getting a green light).

8. A reduction in the intergreens by 4 seconds will increase the two-way throughput by up to 270 vehicles per hour; equivalent to a 15% increase in traffic demand.

9. The provision of on-crossing detection will also minimise the number of demands that are no longer required when pedestrians cross when it is safe to do so. A halving in the number of demands at the crossing will increase the two-way throughput by up to 640 vehicles per hour; equivalent to a 35% increase in traffic demand.

10. A more significant increase in capacity would be achieved by doubling the number of lanes entries and taper these down to the west of the crossing. This arrangement is shown on **DTA Drawing 20230-17**. In broad terms doubling the lanes will double the traffic capacity however the intergreens would increase reducing this gain in addition to which the capacity of the funnel would limit any capacity increase to a 50% increase in traffic demand; equivalent to a further 1,000 vehicles per hour.

Will Adams Roundabout

11. The Will Adams Roundabout is a four-arm roundabout. In response to ARCADY modelling and the MAM, to adapt this junction to forecast demand patterns changes to the road markings have been identified. These are to change the A2 East (Sovereign Avenue) entry and circulatory carriageway. Currently the lanes are marked from the nearside as: left only; ahead only; and, ahead and right. The proposed lane markings are: left and ahead; ahead only; and, right only. This requires changes to the circulatory carriageway so that the southern section in the future will mirror the northern section; both with three lanes. These changes are shown on **DTA Drawing 20230-18**.

12. The ARCADY modelling within the Transport Assessment (TA) reports lower levels of queuing on the A2 East entry than evident on the ground during the AM peak. At present the lane markings reflect that the highest demand is the ahead movement (52%) followed by the right turn movement (45%). 97% of the traffic is therefore assigned to two of the three entry lanes but can balance evenly between them. This however means that the available capacity from the nearside flare is not realised; there is a poor correlation between the road markings and the traffic demand overall. The 3% of the peak hour demand which turns left the lane has circa 20% of the entry capacity (i.e. based on the differential in capacity with and without the flare).

13. To realise circa 17% underutilised capacity from the flare the lane markings should be amended so that ahead traffic can use the nearside and middle lane. This in turn will free up right turn capacity by removing ahead traffic from this lane. Operationally the performance will be as reported in the TA (i.e., with reduced existing and future queuing).

14. The ARCADY modelling within the TA forecasts queuing on Will Adams Way which is not evident in the MAM output. Ultimately both models are likely to predict similar levels of entry capacity but with variability in the rate at capacity (slope) decreases with increases in the circulatory flow (i.e., gap acceptance). The revised modelling which is attached maintains the entry capacity but changes the slope in response to the amended circulatory carriageway markings. The result is a significant reduction in the

forecast queuing on Will Adams Way bringing it in line with the Council's expectations from the MAM appraisal.

Simon Tucker
23 February 2021

WILMINGTON WAY
PHILLIPS COURT
FRANKS COURT
LONDON ROAD
ROMAN ROAD
Church
Rainham Mark Social Club
El Sub Sta
Shelter
Shelter
Shelter
Ward Boy
CR
73.8m
MS
ESS

REV	DESCRIPTION	DRAWN	INITIALS	DATE

DRAWING STATUS	CHECKED BY	DATE

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transport planning consultants
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Tel: +44(0)1564 793598
Fax: +44(0)1564 793983
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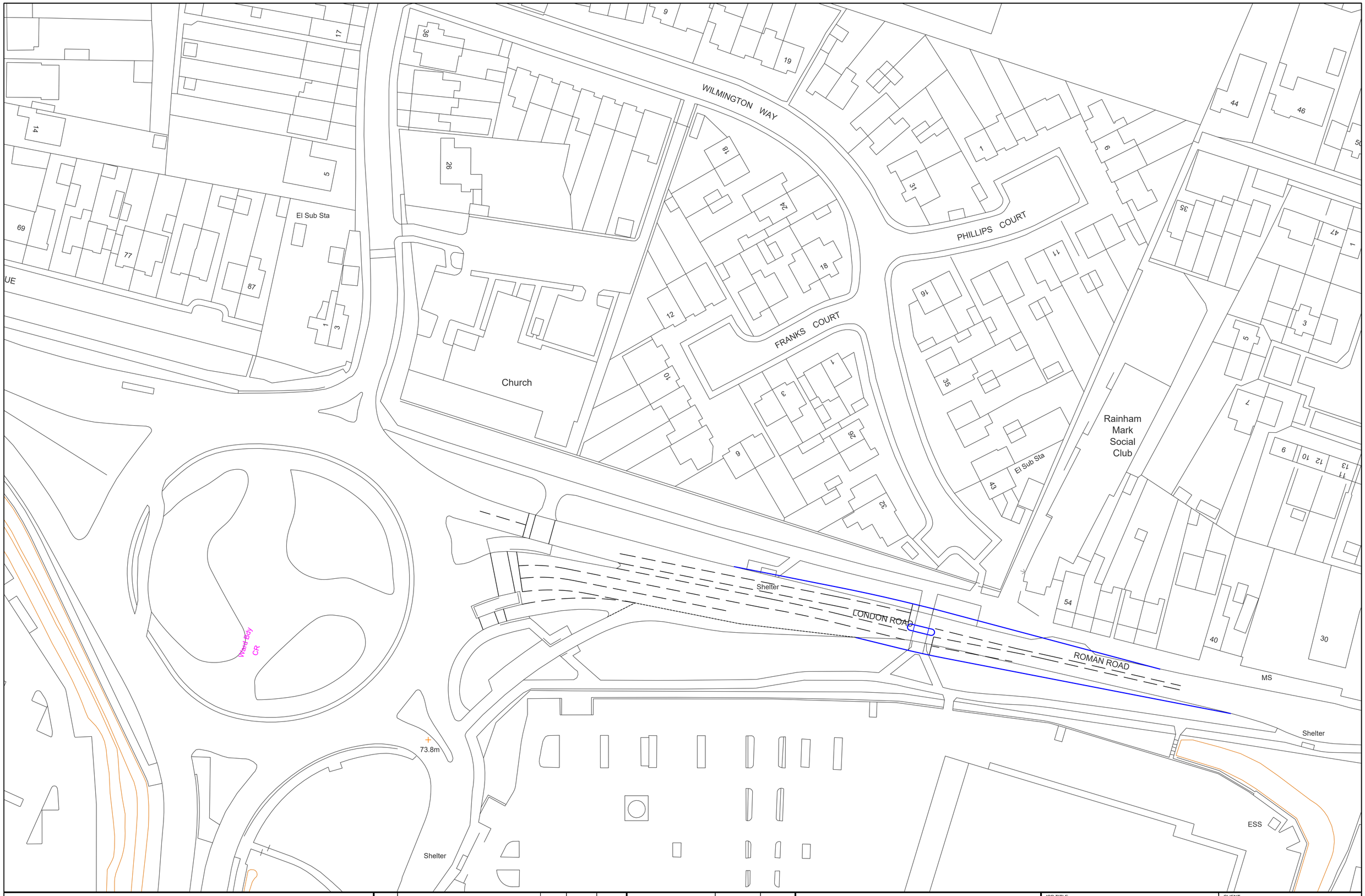
JOB TITLE: PUMP LANE, LOWER RAINHAM
CLIENT: A C GOATHAM

DRAWING TITLE: PEDESTRIAN CROSSING EAST OF BOWATER OPTION 1

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
1: 500@A1	RM	22/02/21	20230–16	



REV	DESCRIPTION	DRAWN	INITIALS	DATE

DRAWING STATUS	CHECKED BY	DATE

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JOB TITLE: PUMP LANE, LOWER RAINHAM

CLIENT: A C GOATHAM

DRAWING TITLE: PEDESTRIAN CROSSING EAST OF BOWATER OPTION 2

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
1: 500@A1	RM	22/02/21	20230–17	

REV	DESCRIPTION	DRAWN	INITIALS	DATE

DRAWING STATUS	CHECKED BY	DATE

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transport planning consultants

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Henley-in-Arden
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JOB TITLE: PUMP LANE, LOWER RAINHAM

CLIENT: A C GOATHAM

DRAWING TITLE: WILL ADAMS ROUNDABOUT

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
1: 250@A1	RM	22/02/21	20230–18	

APPENDIX A

ARCADY Output Reports

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.1.7462

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: A2_Ito Way_Will Adams Way_RevC (Existing A2E Road Markings).j9
Path: P:\20000's\20230\Junction Assessments
Report generation date: 23/02/2021 10:39:26

»2018 Base, AM
»2018 Base , PM
»2018 Base+Dev, AM
»2018 Base+Dev, PM
»2029 Base, AM
»2029 Base , PM
»2029 Base+Dev, AM
»2029 Base+Dev, PM

Summary of junction performance

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018 Base							
1 - Ito Way	D1	1.4	5.53	0.59	D2	1.8	6.32	0.64
2 - A2 East		5.7	14.97	0.86		6.2	14.38	0.87
3 - Will Adams Way		2.8	13.52	0.74		2.8	15.03	0.74
4 - A2 West		2.1	5.75	0.68		1.7	5.00	0.63
	2018 Base+Dev							
1 - Ito Way	D3	1.7	6.20	0.63	D4	2.0	6.77	0.66
2 - A2 East		7.0	18.52	0.88		6.9	15.96	0.88
3 - Will Adams Way		3.3	15.85	0.77		3.5	18.02	0.78
4 - A2 West		2.2	6.08	0.69		1.9	5.52	0.66
	2029 Base							
1 - Ito Way	D5	2.1	7.40	0.68	D6	3.0	9.64	0.75
2 - A2 East		24.3	57.96	0.98		30.8	63.81	0.99
3 - Will Adams Way		5.5	27.24	0.85		6.8	37.42	0.88
4 - A2 West		3.1	8.00	0.76		2.5	6.84	0.72
	2029 Base+Dev							
1 - Ito Way	D7	2.6	8.65	0.73	D8	3.4	10.73	0.78
2 - A2 East		43.3	99.11	1.01		41.4	84.07	1.00
3 - Will Adams Way		6.8	34.09	0.88		10.0	53.66	0.93
4 - A2 West		3.4	8.50	0.77		3.0	7.78	0.75

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

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

File summary

File Description

Title	Will Adams Roundabout
Location	A2 - Ito Way
Site number	
Date	22/02/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	20230
Enumerator	DTA\Arcady (RM)
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2018 Base	AM	FLAT	08:00	09:00	60	15	✓
D2	2018 Base	PM	FLAT	17:00	18:00	60	15	✓
D3	2018 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓
D4	2018 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓
D5	2029 Base	AM	FLAT	08:00	09:00	60	15	✓
D6	2029 Base	PM	FLAT	17:00	18:00	60	15	✓
D7	2029 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓
D8	2029 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2018 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	9.99	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Ito Way	
2	A2 East	
3	Will Adams Way	
4	A2 West	

Roundabout Geometry

Arm	V (m)	E (m)	l' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - Ito Way	7.40	9.06	18.8	20.8	55.0	32.0	
2 - A2 East	7.00	8.50	5.0	19.5	55.0	38.0	
3 - Will Adams Way	3.73	8.92	26.4	20.7	55.0	24.0	
4 - A2 West	7.15	10.48	35.6	16.8	55.0	41.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Ito Way	0.750	2621
2 - A2 East	0.683	2285
3 - Will Adams Way	0.671	2143
4 - A2 West	0.772	2803

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2018 Base	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	936	100.000
2 - A2 East		FLAT	✓	1410	100.000
3 - Will Adams Way		FLAT	✓	755	100.000
4 - A2 West		FLAT	✓	1301	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	439	202	295
	2 - A2 East	706	4	38	662
	3 - Will Adams Way	222	204	0	329
	4 - A2 West	130	737	429	5

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.59	5.53	1.4	A	936	936
2 - A2 East	0.86	14.97	5.7	B	1410	1410
3 - Will Adams Way	0.74	13.52	2.8	B	755	755
4 - A2 West	0.68	5.75	2.1	A	1301	1301

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1369	1594	0.587	930	1044	0.0	1.4	5.382	A
2 - A2 East	1410	353	925	1653	0.853	1389	1374	0.0	5.3	12.772	B
3 - Will Adams Way	755	189	1650	1036	0.729	745	665	0.0	2.6	11.988	B
4 - A2 West	1301	325	1120	1939	0.671	1293	1275	0.0	2.0	5.506	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1587	0.590	936	1057	1.4	1.4	5.530	A
2 - A2 East	1410	353	931	1649	0.855	1409	1384	5.3	5.6	14.797	B
3 - Will Adams Way	755	189	1671	1022	0.739	754	669	2.6	2.7	13.407	B
4 - A2 West	1301	325	1135	1927	0.675	1301	1290	2.0	2.1	5.743	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1586	0.590	936	1058	1.4	1.4	5.534	A
2 - A2 East	1410	353	931	1649	0.855	1410	1384	5.6	5.7	14.921	B
3 - Will Adams Way	755	189	1672	1021	0.739	755	669	2.7	2.8	13.495	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.1	2.1	5.752	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1586	0.590	936	1058	1.4	1.4	5.534	A
2 - A2 East	1410	353	931	1649	0.855	1410	1384	5.7	5.7	14.966	B
3 - Will Adams Way	755	189	1672	1021	0.740	755	669	2.8	2.8	13.515	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.1	2.1	5.753	A

2018 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	10.16	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2018 Base	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1010	100.000
2 - A2 East		FLAT	✓	1601	100.000
3 - Will Adams Way		FLAT	✓	692	100.000
4 - A2 West		FLAT	✓	1212	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	611	142	257
	2 - A2 East	733	2	53	813
	3 - Will Adams Way	120	274	0	298
	4 - A2 West	100	874	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.64	6.32	1.8	A	1010	1010
2 - A2 East	0.87	14.38	6.2	B	1601	1601
3 - Will Adams Way	0.74	15.03	2.8	C	692	692
4 - A2 West	0.63	5.00	1.7	A	1212	1212

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1378	1587	0.636	1003	940	0.0	1.7	6.095	A
2 - A2 East	1601	400	633	1853	0.864	1578	1748	0.0	5.7	12.248	B
3 - Will Adams Way	692	173	1782	947	0.731	682	429	0.0	2.6	13.114	B
4 - A2 West	1212	303	1113	1945	0.623	1205	1351	0.0	1.6	4.829	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	952	1.7	1.8	6.313	A
2 - A2 East	1601	400	637	1850	0.865	1600	1761	5.7	6.1	14.213	B
3 - Will Adams Way	692	173	1805	932	0.743	691	432	2.6	2.8	14.881	B
4 - A2 West	1212	303	1128	1933	0.627	1212	1368	1.6	1.7	4.992	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.8	1.8	6.319	A
2 - A2 East	1601	400	637	1850	0.865	1601	1761	6.1	6.2	14.335	B
3 - Will Adams Way	692	173	1806	931	0.743	692	432	2.8	2.8	15.001	C
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.7	1.7	4.998	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.8	1.8	6.319	A
2 - A2 East	1601	400	637	1850	0.866	1601	1761	6.2	6.2	14.377	B
3 - Will Adams Way	692	173	1806	931	0.743	692	432	2.8	2.8	15.031	C
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.7	1.7	4.999	A

2018 Base+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	11.64	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D3	2018 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1005	100.000
2 - A2 East		FLAT	✓	1410	100.000
3 - Will Adams Way		FLAT	✓	759	100.000
4 - A2 West		FLAT	✓	1332	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	439	218	348
	2 - A2 East	706	4	38	662
	3 - Will Adams Way	226	204	0	329
	4 - A2 West	160	738	429	5

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.63	6.20	1.7	A	1005	1005
2 - A2 East	0.88	18.52	7.0	C	1410	1410
3 - Will Adams Way	0.77	15.85	3.3	C	759	759
4 - A2 West	0.69	6.08	2.2	A	1332	1332

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1369	1594	0.631	998	1075	0.0	1.7	5.981	A
2 - A2 East	1410	353	993	1607	0.878	1385	1374	0.0	6.3	14.895	B
3 - Will Adams Way	759	190	1698	1003	0.757	747	680	0.0	2.9	13.524	B
4 - A2 West	1332	333	1121	1938	0.687	1323	1325	0.0	2.2	5.777	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1379	1586	0.634	1005	1091	1.7	1.7	6.193	A
2 - A2 East	1410	353	1000	1602	0.880	1408	1385	6.3	6.8	18.125	C
3 - Will Adams Way	759	190	1723	987	0.769	758	685	2.9	3.2	15.527	C
4 - A2 West	1332	333	1138	1925	0.692	1332	1343	2.2	2.2	6.066	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.199	A
2 - A2 East	1410	353	1000	1602	0.880	1409	1385	6.8	6.9	18.410	C
3 - Will Adams Way	759	190	1724	986	0.770	759	685	3.2	3.2	15.802	C
4 - A2 West	1332	333	1139	1924	0.692	1332	1344	2.2	2.2	6.079	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.199	A
2 - A2 East	1410	353	1000	1602	0.880	1410	1385	6.9	7.0	18.516	C
3 - Will Adams Way	759	190	1725	985	0.770	759	685	3.2	3.3	15.848	C
4 - A2 West	1332	333	1140	1924	0.692	1332	1344	2.2	2.2	6.084	A

2018 Base+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	11.34	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2018 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1047	100.000
2 - A2 East		FLAT	✓	1601	100.000
3 - Will Adams Way		FLAT	✓	714	100.000
4 - A2 West		FLAT	✓	1263	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	611	152	284
	2 - A2 East	733	2	53	813
	3 - Will Adams Way	142	274	0	298
	4 - A2 West	150	875	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.66	6.77	2.0	A	1047	1047
2 - A2 East	0.88	15.96	6.9	C	1601	1601
3 - Will Adams Way	0.78	18.02	3.5	C	714	714
4 - A2 West	0.66	5.52	1.9	A	1263	1263

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1378	1587	0.660	1039	1010	0.0	1.9	6.485	A
2 - A2 East	1601	400	669	1828	0.876	1576	1748	0.0	6.3	13.219	B
3 - Will Adams Way	714	179	1807	930	0.767	702	439	0.0	3.1	15.036	C
4 - A2 West	1263	316	1132	1929	0.655	1256	1376	0.0	1.9	5.286	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1388	1579	0.663	1047	1024	1.9	1.9	6.757	A
2 - A2 East	1601	400	674	1825	0.877	1599	1761	6.3	6.7	15.707	C
3 - Will Adams Way	714	179	1831	914	0.781	713	442	3.1	3.4	17.713	C
4 - A2 West	1263	316	1150	1916	0.659	1263	1395	1.9	1.9	5.507	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	1.9	2.0	6.764	A
2 - A2 East	1601	400	674	1825	0.877	1600	1762	6.7	6.8	15.890	C
3 - Will Adams Way	714	179	1832	913	0.782	714	442	3.4	3.5	17.953	C
4 - A2 West	1263	316	1151	1915	0.659	1263	1396	1.9	1.9	5.518	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	2.0	2.0	6.767	A
2 - A2 East	1601	400	674	1825	0.877	1601	1762	6.8	6.9	15.957	C
3 - Will Adams Way	714	179	1833	913	0.782	714	442	3.5	3.5	18.018	C
4 - A2 West	1263	316	1151	1915	0.659	1263	1396	1.9	1.9	5.520	A

2029 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	27.47	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2029 Base	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1029	100.000
2 - A2 East		FLAT	✓	1584	100.000
3 - Will Adams Way		FLAT	✓	755	100.000
4 - A2 West		FLAT	✓	1411	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	495	202	332
	2 - A2 East	795	5	38	746
	3 - Will Adams Way	222	204	0	329
	4 - A2 West	146	830	429	6

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.68	7.40	2.1	A	1029	1029
2 - A2 East	0.98	57.96	24.3	F	1584	1584
3 - Will Adams Way	0.85	27.24	5.5	D	755	755
4 - A2 West	0.76	8.00	3.1	A	1411	1411

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1459	1526	0.674	1021	1127	0.0	2.0	7.018	A
2 - A2 East	1584	396	961	1628	0.973	1525	1519	0.0	14.7	26.903	D
3 - Will Adams Way	755	189	1824	919	0.822	739	663	0.0	4.1	18.574	C
4 - A2 West	1411	353	1187	1887	0.748	1400	1375	0.0	2.9	7.222	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1472	1516	0.679	1029	1153	2.0	2.1	7.379	A
2 - A2 East	1584	396	969	1623	0.976	1565	1533	14.7	19.4	45.790	E
3 - Will Adams Way	755	189	1866	891	0.848	752	668	4.1	5.0	24.951	C
4 - A2 West	1411	353	1215	1866	0.756	1410	1403	2.9	3.0	7.886	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1473	1515	0.679	1029	1157	2.1	2.1	7.396	A
2 - A2 East	1584	396	969	1623	0.976	1572	1533	19.4	22.3	53.115	F
3 - Will Adams Way	755	189	1873	886	0.852	754	669	5.0	5.3	26.533	D
4 - A2 West	1411	353	1219	1862	0.758	1411	1407	3.0	3.1	7.967	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1474	1515	0.679	1029	1159	2.1	2.1	7.402	A
2 - A2 East	1584	396	969	1623	0.976	1576	1534	22.3	24.3	57.961	F
3 - Will Adams Way	755	189	1876	884	0.854	754	669	5.3	5.5	27.239	D
4 - A2 West	1411	353	1221	1861	0.758	1411	1409	3.1	3.1	7.999	A

2029 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	32.46	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2029 Base	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1122	100.000
2 - A2 East		FLAT	✓	1801	100.000
3 - Will Adams Way		FLAT	✓	692	100.000
4 - A2 West		FLAT	✓	1338	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	690	142	290
	2 - A2 East	828	2	53	918
	3 - Will Adams Way	120	274	0	298
	4 - A2 West	113	987	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.75	9.64	3.0	A	1122	1122
2 - A2 East	0.99	63.81	30.8	F	1801	1801
3 - Will Adams Way	0.88	37.42	6.8	E	692	692
4 - A2 West	0.72	6.84	2.5	A	1338	1338

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1485	1507	0.745	1111	1025	0.0	2.8	8.859	A
2 - A2 East	1801	450	664	1831	0.983	1732	1932	0.0	17.4	27.119	D
3 - Will Adams Way	692	173	1969	822	0.842	674	427	0.0	4.6	22.198	C
4 - A2 West	1338	335	1182	1891	0.707	1329	1461	0.0	2.4	6.297	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1498	1497	0.750	1122	1049	2.8	2.9	9.572	A
2 - A2 East	1801	450	670	1827	0.986	1776	1950	17.4	23.5	48.082	E
3 - Will Adams Way	692	173	2015	791	0.875	687	431	4.6	5.9	32.422	D
4 - A2 West	1338	335	1210	1870	0.716	1338	1492	2.4	2.5	6.757	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1500	1496	0.750	1122	1053	2.9	3.0	9.621	A
2 - A2 East	1801	450	670	1827	0.986	1784	1952	23.5	27.6	57.242	F
3 - Will Adams Way	692	173	2023	785	0.881	690	431	5.9	6.4	35.745	E
4 - A2 West	1338	335	1215	1865	0.717	1338	1498	2.5	2.5	6.818	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1500	1495	0.750	1122	1055	3.0	3.0	9.635	A
2 - A2 East	1801	450	670	1827	0.986	1788	1952	27.6	30.8	63.805	F
3 - Will Adams Way	692	173	2027	783	0.884	691	432	6.4	6.8	37.417	E
4 - A2 West	1338	335	1217	1864	0.718	1338	1500	2.5	2.5	6.844	A

2029 Base+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	41.90	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D7	2029 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1099	100.000
2 - A2 East		FLAT	✓	1584	100.000
3 - Will Adams Way		FLAT	✓	759	100.000
4 - A2 West		FLAT	✓	1442	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	495	218	386
	2 - A2 East	795	5	38	746
	3 - Will Adams Way	226	204	0	329
	4 - A2 West	176	831	429	6

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.73	8.65	2.6	A	1099	1099
2 - A2 East	1.01	99.11	43.3	F	1584	1584
3 - Will Adams Way	0.88	34.09	6.8	D	759	759
4 - A2 West	0.77	8.50	3.4	A	1442	1442

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1459	1526	0.720	1089	1150	0.0	2.5	8.058	A
2 - A2 East	1584	396	1030	1582	1.001	1505	1518	0.0	19.7	33.511	D
3 - Will Adams Way	759	190	1858	896	0.847	740	677	0.0	4.7	21.039	C
4 - A2 West	1442	361	1179	1893	0.762	1430	1418	0.0	3.1	7.582	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1473	1516	0.725	1099	1176	2.5	2.6	8.614	A
2 - A2 East	1584	396	1039	1576	1.005	1546	1533	19.7	29.2	65.380	F
3 - Will Adams Way	759	190	1901	867	0.875	754	684	4.7	6.0	29.968	D
4 - A2 West	1442	361	1208	1871	0.771	1441	1447	3.1	3.3	8.353	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1474	1515	0.725	1099	1181	2.6	2.6	8.646	A
2 - A2 East	1584	396	1039	1575	1.005	1554	1534	29.2	36.8	83.756	F
3 - Will Adams Way	759	190	1909	862	0.880	757	684	6.0	6.5	32.703	D
4 - A2 West	1442	361	1214	1867	0.773	1442	1452	3.3	3.3	8.459	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1474	1515	0.726	1099	1183	2.6	2.6	8.655	A
2 - A2 East	1584	396	1039	1575	1.005	1558	1534	36.8	43.3	99.109	F
3 - Will Adams Way	759	190	1912	859	0.883	758	684	6.5	6.8	34.088	D
4 - A2 West	1442	361	1216	1865	0.773	1442	1454	3.3	3.4	8.504	A

2029 Base+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	42.06	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D8	2029 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1160	100.000
2 - A2 East		FLAT	✓	1801	100.000
3 - Will Adams Way		FLAT	✓	714	100.000
4 - A2 West		FLAT	✓	1389	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	690	152	318
	2 - A2 East	828	2	53	918
	3 - Will Adams Way	142	274	0	298
	4 - A2 West	163	988	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.78	10.73	3.4	B	1160	1160
2 - A2 East	1.00	84.07	41.4	F	1801	1801
3 - Will Adams Way	0.93	53.66	10.0	F	714	714
4 - A2 West	0.75	7.78	3.0	A	1389	1389

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1483	1508	0.769	1147	1090	0.0	3.2	9.667	A
2 - A2 East	1801	450	701	1806	0.997	1721	1930	0.0	20.1	30.307	D
3 - Will Adams Way	714	179	1985	810	0.881	691	436	0.0	5.8	26.458	D
4 - A2 West	1389	347	1195	1881	0.739	1378	1481	0.0	2.7	7.018	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1498	1497	0.775	1159	1115	3.2	3.3	10.624	B
2 - A2 East	1801	450	708	1802	1.000	1765	1950	20.1	29.0	57.636	F
3 - Will Adams Way	714	179	2032	779	0.917	705	441	5.8	8.0	42.617	E
4 - A2 West	1389	347	1225	1858	0.748	1388	1513	2.7	2.9	7.647	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1500	1496	0.776	1160	1120	3.3	3.4	10.701	B
2 - A2 East	1801	450	708	1801	1.000	1774	1952	29.0	35.8	72.271	F
3 - Will Adams Way	714	179	2041	773	0.923	709	441	8.0	9.2	49.537	E
4 - A2 West	1389	347	1231	1853	0.749	1389	1519	2.9	2.9	7.740	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1501	1495	0.776	1160	1122	3.4	3.4	10.728	B
2 - A2 East	1801	450	708	1801	1.000	1778	1953	35.8	41.4	84.070	F
3 - Will Adams Way	714	179	2045	771	0.927	711	441	9.2	10.0	53.657	F
4 - A2 West	1389	347	1234	1851	0.750	1389	1522	2.9	3.0	7.782	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: A2_Ito Way_Will Adams Way_RevC.j9
Path: P:\20000's\20230\Junction Assessments
Report generation date: 23/02/2021 10:37:13

»2018 Base, AM
»2018 Base , PM
»2018 Base+Dev, AM
»2018 Base+Dev, PM
»2029 Base, AM
»2029 Base , PM
»2029 Base+Dev, AM
»2029 Base+Dev, PM

Summary of junction performance

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018 Base							
1 - Ito Way	D1	1.4	5.53	0.59	D2	1.8	6.32	0.64
2 - A2 East		1.9	4.75	0.65		2.0	4.49	0.67
3 - Will Adams Way		2.8	13.52	0.74		2.8	15.04	0.74
4 - A2 West		2.1	5.75	0.68		1.7	5.00	0.63
	2018 Base+Dev							
1 - Ito Way	D3	1.7	6.20	0.63	D4	2.0	6.77	0.66
2 - A2 East		2.0	5.12	0.67		2.1	4.66	0.67
3 - Will Adams Way		3.3	15.87	0.77		3.5	18.04	0.78
4 - A2 West		2.2	6.09	0.69		1.9	5.52	0.66
	2029 Base							
1 - Ito Way	D5	2.1	7.40	0.68	D6	3.0	9.64	0.75
2 - A2 East		2.8	6.49	0.74		3.1	6.26	0.76
3 - Will Adams Way		5.8	28.57	0.86		7.5	41.30	0.89
4 - A2 West		3.1	8.06	0.76		2.5	6.91	0.72
	2029 Base+Dev							
1 - Ito Way	D7	2.6	8.66	0.73	D8	3.4	10.73	0.78
2 - A2 East		3.1	7.22	0.76		3.3	6.60	0.77
3 - Will Adams Way		8.1	40.70	0.90		12.7	67.86	0.94
4 - A2 West		3.5	8.72	0.78		3.0	7.92	0.75

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

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

File summary

File Description

Title	Will Adams Roundabout
Location	
Site number	
Date	12/02/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DTA\Arcady
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2018 Base	AM	FLAT	08:00	09:00	60	15	✓
D2	2018 Base	PM	FLAT	17:00	18:00	60	15	✓
D3	2018 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓
D4	2018 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓
D5	2029 Base	AM	FLAT	08:00	09:00	60	15	✓
D6	2029 Base	PM	FLAT	17:00	18:00	60	15	✓
D7	2029 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓
D8	2029 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2018 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	6.72	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Ito Way	
2	A2 East	
3	Will Adams Way	
4	A2 West	

Roundabout Geometry

Arm	V (m)	E (m)	l' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - Ito Way	7.40	9.06	18.8	20.8	55.0	32.0	
2 - A2 East	7.00	12.49	19.5	19.5	55.0	38.0	
3 - Will Adams Way	3.73	8.92	26.4	20.7	55.0	24.0	
4 - A2 West	7.15	10.48	35.6	16.8	55.0	41.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Ito Way	0.750	2621
2 - A2 East	0.796	2910
3 - Will Adams Way	0.671	2143
4 - A2 West	0.772	2803

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2018 Base	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	936	100.000
2 - A2 East		FLAT	✓	1410	100.000
3 - Will Adams Way		FLAT	✓	755	100.000
4 - A2 West		FLAT	✓	1301	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	439	202	295
	2 - A2 East	706	4	38	662
	3 - Will Adams Way	222	204	0	329
	4 - A2 West	130	737	429	5

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.59	5.53	1.4	A	936	936
2 - A2 East	0.65	4.75	1.9	A	1410	1410
3 - Will Adams Way	0.74	13.52	2.8	B	755	755
4 - A2 West	0.68	5.75	2.1	A	1301	1301

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1369	1594	0.587	930	1050	0.0	1.4	5.381	A
2 - A2 East	1410	353	925	2173	0.649	1403	1374	0.0	1.8	4.632	A
3 - Will Adams Way	755	189	1663	1027	0.735	744	665	0.0	2.6	12.336	B
4 - A2 West	1301	325	1126	1934	0.673	1293	1281	0.0	2.0	5.549	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1587	0.590	936	1058	1.4	1.4	5.531	A
2 - A2 East	1410	353	931	2168	0.650	1410	1384	1.8	1.8	4.746	A
3 - Will Adams Way	755	189	1672	1021	0.740	755	669	2.6	2.7	13.471	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.0	2.1	5.750	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1586	0.590	936	1058	1.4	1.4	5.534	A
2 - A2 East	1410	353	931	2168	0.650	1410	1384	1.8	1.8	4.746	A
3 - Will Adams Way	755	189	1672	1021	0.740	755	669	2.7	2.8	13.514	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.1	2.1	5.754	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1586	0.590	936	1058	1.4	1.4	5.535	A
2 - A2 East	1410	353	931	2168	0.650	1410	1384	1.8	1.9	4.746	A
3 - Will Adams Way	755	189	1672	1021	0.740	755	669	2.8	2.8	13.525	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.1	2.1	5.754	A

2018 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	6.65	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2018 Base	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1010	100.000
2 - A2 East		FLAT	✓	1601	100.000
3 - Will Adams Way		FLAT	✓	692	100.000
4 - A2 West		FLAT	✓	1212	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	611	142	257
	2 - A2 East	733	2	53	813
	3 - Will Adams Way	120	274	0	298
	4 - A2 West	100	874	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.64	6.32	1.8	A	1010	1010
2 - A2 East	0.67	4.49	2.0	A	1601	1601
3 - Will Adams Way	0.74	15.04	2.8	C	692	692
4 - A2 West	0.63	5.00	1.7	A	1212	1212

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1378	1587	0.636	1003	947	0.0	1.7	6.094	A
2 - A2 East	1601	400	633	2406	0.666	1593	1748	0.0	2.0	4.390	A
3 - Will Adams Way	692	173	1797	937	0.738	681	429	0.0	2.7	13.569	B
4 - A2 West	1212	303	1119	1939	0.625	1205	1359	0.0	1.6	4.863	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.7	1.8	6.315	A
2 - A2 East	1601	400	637	2402	0.666	1601	1761	2.0	2.0	4.491	A
3 - Will Adams Way	692	173	1806	931	0.743	691	432	2.7	2.8	14.965	B
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.6	1.7	4.996	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.8	1.8	6.319	A
2 - A2 East	1601	400	637	2402	0.666	1601	1761	2.0	2.0	4.491	A
3 - Will Adams Way	692	173	1806	931	0.743	692	432	2.8	2.8	15.027	C
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.7	1.7	4.999	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.8	1.8	6.319	A
2 - A2 East	1601	400	637	2402	0.666	1601	1761	2.0	2.0	4.491	A
3 - Will Adams Way	692	173	1806	931	0.743	692	432	2.8	2.8	15.043	C
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.7	1.7	4.999	A

2018 Base+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	7.46	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D3	2018 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1005	100.000
2 - A2 East		FLAT	✓	1410	100.000
3 - Will Adams Way		FLAT	✓	759	100.000
4 - A2 West		FLAT	✓	1332	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	439	218	348
	2 - A2 East	706	4	38	662
	3 - Will Adams Way	226	204	0	329
	4 - A2 West	160	738	429	5

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.63	6.20	1.7	A	1005	1005
2 - A2 East	0.67	5.12	2.0	A	1410	1410
3 - Will Adams Way	0.77	15.87	3.3	C	759	759
4 - A2 West	0.69	6.09	2.2	A	1332	1332

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1369	1594	0.631	998	1083	0.0	1.7	5.979	A
2 - A2 East	1410	353	993	2119	0.666	1402	1374	0.0	2.0	4.972	A
3 - Will Adams Way	759	190	1715	992	0.765	747	681	0.0	3.0	14.070	B
4 - A2 West	1332	333	1129	1932	0.690	1323	1333	0.0	2.2	5.837	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.195	A
2 - A2 East	1410	353	1000	2113	0.667	1410	1385	2.0	2.0	5.114	A
3 - Will Adams Way	759	190	1725	985	0.770	758	685	3.0	3.2	15.762	C
4 - A2 West	1332	333	1140	1924	0.692	1332	1344	2.2	2.2	6.078	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.199	A
2 - A2 East	1410	353	1000	2113	0.667	1410	1385	2.0	2.0	5.117	A
3 - Will Adams Way	759	190	1725	985	0.770	759	685	3.2	3.3	15.846	C
4 - A2 West	1332	333	1140	1924	0.692	1332	1344	2.2	2.2	6.083	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.199	A
2 - A2 East	1410	353	1000	2113	0.667	1410	1385	2.0	2.0	5.117	A
3 - Will Adams Way	759	190	1725	985	0.770	759	685	3.3	3.3	15.872	C
4 - A2 West	1332	333	1140	1923	0.693	1332	1344	2.2	2.2	6.085	A

2018 Base+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	7.44	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2018 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1047	100.000
2 - A2 East		FLAT	✓	1601	100.000
3 - Will Adams Way		FLAT	✓	714	100.000
4 - A2 West		FLAT	✓	1263	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	611	152	284
	2 - A2 East	733	2	53	813
	3 - Will Adams Way	142	274	0	298
	4 - A2 West	150	875	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.66	6.77	2.0	A	1047	1047
2 - A2 East	0.67	4.66	2.1	A	1601	1601
3 - Will Adams Way	0.78	18.04	3.5	C	714	714
4 - A2 West	0.66	5.52	1.9	A	1263	1263

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1377	1587	0.660	1039	1018	0.0	1.9	6.482	A
2 - A2 East	1601	400	669	2377	0.674	1593	1747	0.0	2.0	4.548	A
3 - Will Adams Way	714	179	1823	919	0.777	701	439	0.0	3.2	15.692	C
4 - A2 West	1263	316	1140	1924	0.657	1255	1384	0.0	1.9	5.329	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	1.9	1.9	6.759	A
2 - A2 East	1601	400	674	2373	0.675	1601	1761	2.0	2.1	4.660	A
3 - Will Adams Way	714	179	1833	913	0.782	713	442	3.2	3.4	17.879	C
4 - A2 West	1263	316	1150	1915	0.659	1263	1396	1.9	1.9	5.516	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	1.9	2.0	6.764	A
2 - A2 East	1601	400	674	2373	0.675	1601	1762	2.1	2.1	4.663	A
3 - Will Adams Way	714	179	1833	913	0.782	714	442	3.4	3.5	18.007	C
4 - A2 West	1263	316	1151	1915	0.660	1263	1396	1.9	1.9	5.520	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	2.0	2.0	6.767	A
2 - A2 East	1601	400	674	2373	0.675	1601	1762	2.1	2.1	4.663	A
3 - Will Adams Way	714	179	1833	913	0.782	714	442	3.5	3.5	18.045	C
4 - A2 West	1263	316	1151	1915	0.660	1263	1396	1.9	1.9	5.521	A

2029 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	10.64	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2029 Base	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1029	100.000
2 - A2 East		FLAT	✓	1584	100.000
3 - Will Adams Way		FLAT	✓	755	100.000
4 - A2 West		FLAT	✓	1411	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	495	202	332
	2 - A2 East	795	5	38	746
	3 - Will Adams Way	222	204	0	329
	4 - A2 West	146	830	429	6

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.68	7.40	2.1	A	1029	1029
2 - A2 East	0.74	6.49	2.8	A	1584	1584
3 - Will Adams Way	0.86	28.57	5.8	D	755	755
4 - A2 West	0.76	8.06	3.1	A	1411	1411

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1458	1527	0.674	1021	1151	0.0	2.0	7.008	A
2 - A2 East	1584	396	961	2144	0.739	1573	1518	0.0	2.8	6.188	A
3 - Will Adams Way	755	189	1871	887	0.851	736	664	0.0	4.8	21.558	C
4 - A2 West	1411	353	1210	1870	0.755	1399	1397	0.0	3.0	7.472	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1473	1516	0.679	1029	1162	2.0	2.1	7.385	A
2 - A2 East	1584	396	969	2138	0.741	1584	1533	2.8	2.8	6.486	A
3 - Will Adams Way	755	189	1884	879	0.859	753	669	4.8	5.4	27.540	D
4 - A2 West	1411	353	1225	1858	0.759	1411	1412	3.0	3.1	8.026	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1474	1515	0.679	1029	1163	2.1	2.1	7.399	A
2 - A2 East	1584	396	969	2138	0.741	1584	1534	2.8	2.8	6.493	A
3 - Will Adams Way	755	189	1884	879	0.859	754	669	5.4	5.7	28.300	D
4 - A2 West	1411	353	1225	1857	0.760	1411	1413	3.1	3.1	8.054	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1474	1515	0.679	1029	1163	2.1	2.1	7.404	A
2 - A2 East	1584	396	969	2138	0.741	1584	1534	2.8	2.8	6.493	A
3 - Will Adams Way	755	189	1884	879	0.859	755	669	5.7	5.8	28.572	D
4 - A2 West	1411	353	1226	1857	0.760	1411	1413	3.1	3.1	8.060	A

2029 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	12.09	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2029 Base	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1122	100.000
2 - A2 East		FLAT	✓	1801	100.000
3 - Will Adams Way		FLAT	✓	692	100.000
4 - A2 West		FLAT	✓	1338	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	690	142	290
	2 - A2 East	828	2	53	918
	3 - Will Adams Way	120	274	0	298
	4 - A2 West	113	987	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.75	9.64	3.0	A	1122	1122
2 - A2 East	0.76	6.26	3.1	A	1801	1801
3 - Will Adams Way	0.89	41.30	7.5	E	692	692
4 - A2 West	0.72	6.91	2.5	A	1338	1338

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1483	1508	0.744	1111	1051	0.0	2.8	8.825	A
2 - A2 East	1801	450	664	2381	0.756	1789	1930	0.0	3.0	5.966	A
3 - Will Adams Way	692	173	2024	784	0.882	669	429	0.0	5.8	27.299	D
4 - A2 West	1338	335	1205	1873	0.714	1328	1488	0.0	2.4	6.498	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1499	1496	0.750	1121	1060	2.8	2.9	9.581	A
2 - A2 East	1801	450	670	2376	0.758	1801	1951	3.0	3.1	6.249	A
3 - Will Adams Way	692	173	2039	775	0.893	688	432	5.8	6.9	38.222	E
4 - A2 West	1338	335	1221	1861	0.719	1338	1505	2.4	2.5	6.877	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1500	1495	0.750	1122	1061	2.9	3.0	9.627	A
2 - A2 East	1801	450	670	2376	0.758	1801	1952	3.1	3.1	6.255	A
3 - Will Adams Way	692	173	2039	775	0.893	690	432	6.9	7.3	40.384	E
4 - A2 West	1338	335	1223	1859	0.720	1338	1506	2.5	2.5	6.901	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1501	1495	0.750	1122	1061	3.0	3.0	9.639	A
2 - A2 East	1801	450	670	2376	0.758	1801	1953	3.1	3.1	6.256	A
3 - Will Adams Way	692	173	2039	775	0.893	691	432	7.3	7.5	41.299	E
4 - A2 West	1338	335	1223	1859	0.720	1338	1507	2.5	2.5	6.906	A

2029 Base+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	13.19	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D7	2029 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1099	100.000
2 - A2 East		FLAT	✓	1584	100.000
3 - Will Adams Way		FLAT	✓	759	100.000
4 - A2 West		FLAT	✓	1442	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	495	218	386
	2 - A2 East	795	5	38	746
	3 - Will Adams Way	226	204	0	329
	4 - A2 West	176	831	429	6

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.73	8.66	2.6	A	1099	1099
2 - A2 East	0.76	7.22	3.1	A	1584	1584
3 - Will Adams Way	0.90	40.70	8.1	E	759	759
4 - A2 West	0.78	8.72	3.5	A	1442	1442

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1457	1528	0.719	1089	1182	0.0	2.5	8.033	A
2 - A2 East	1584	396	1030	2090	0.758	1572	1516	0.0	3.0	6.799	A
3 - Will Adams Way	759	190	1923	853	0.890	734	679	0.0	6.2	26.540	D
4 - A2 West	1442	361	1210	1870	0.771	1429	1447	0.0	3.2	7.954	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1473	1516	0.725	1099	1195	2.5	2.6	8.617	A
2 - A2 East	1584	396	1039	2083	0.761	1584	1533	3.0	3.1	7.204	A
3 - Will Adams Way	759	190	1938	843	0.901	754	685	6.2	7.4	37.465	E
4 - A2 West	1442	361	1227	1856	0.777	1441	1465	3.2	3.4	8.656	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1474	1515	0.726	1099	1196	2.6	2.6	8.649	A
2 - A2 East	1584	396	1039	2082	0.761	1584	1534	3.1	3.1	7.216	A
3 - Will Adams Way	759	190	1938	842	0.901	757	685	7.4	7.9	39.723	E
4 - A2 West	1442	361	1229	1855	0.777	1442	1466	3.4	3.4	8.704	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1475	1515	0.726	1099	1197	2.6	2.6	8.657	A
2 - A2 East	1584	396	1039	2082	0.761	1584	1535	3.1	3.1	7.220	A
3 - Will Adams Way	759	190	1938	842	0.901	758	685	7.9	8.1	40.696	E
4 - A2 West	1442	361	1229	1854	0.778	1442	1466	3.4	3.5	8.719	A

2029 Base+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	16.55	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D8	2029 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1160	100.000
2 - A2 East		FLAT	✓	1801	100.000
3 - Will Adams Way		FLAT	✓	714	100.000
4 - A2 West		FLAT	✓	1389	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	690	152	318
	2 - A2 East	828	2	53	918
	3 - Will Adams Way	142	274	0	298
	4 - A2 West	163	988	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.78	10.73	3.4	B	1160	1160
2 - A2 East	0.77	6.60	3.3	A	1801	1801
3 - Will Adams Way	0.94	67.86	12.7	F	714	714
4 - A2 West	0.75	7.92	3.0	A	1389	1389

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1480	1511	0.768	1147	1119	0.0	3.2	9.598	A
2 - A2 East	1801	450	701	2351	0.766	1788	1926	0.0	3.2	6.260	A
3 - Will Adams Way	714	179	2051	766	0.932	682	438	0.0	8.1	34.777	D
4 - A2 West	1389	347	1221	1861	0.747	1378	1512	0.0	2.9	7.292	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1498	1497	0.775	1159	1131	3.2	3.3	10.612	B
2 - A2 East	1801	450	708	2346	0.768	1801	1949	3.2	3.2	6.592	A
3 - Will Adams Way	714	179	2067	756	0.944	704	442	8.1	10.5	56.251	F
4 - A2 West	1389	347	1240	1846	0.752	1389	1531	2.9	3.0	7.852	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1500	1496	0.776	1160	1132	3.3	3.4	10.698	B
2 - A2 East	1801	450	708	2346	0.768	1801	1952	3.2	3.3	6.600	A
3 - Will Adams Way	714	179	2067	756	0.945	709	442	10.5	11.8	63.648	F
4 - A2 West	1389	347	1243	1844	0.753	1389	1533	3.0	3.0	7.902	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1501	1495	0.776	1160	1132	3.4	3.4	10.727	B
2 - A2 East	1801	450	708	2346	0.768	1801	1953	3.3	3.3	6.603	A
3 - Will Adams Way	714	179	2067	756	0.945	711	442	11.8	12.7	67.856	F
4 - A2 West	1389	347	1244	1843	0.754	1389	1534	3.0	3.0	7.920	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.1.7462

For sales and distribution information, program advice and maintenance, contact TRL:
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Filename: A2_Ito Way_Will Adams Way_RevC (Existing A2E Road Markings).j9
Path: P:\20000's\20230\Junction Assessments
Report generation date: 23/02/2021 10:39:26

»2018 Base, AM
»2018 Base , PM
»2018 Base+Dev, AM
»2018 Base+Dev, PM
»2029 Base, AM
»2029 Base , PM
»2029 Base+Dev, AM
»2029 Base+Dev, PM

Summary of junction performance

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018 Base							
1 - Ito Way	D1	1.4	5.53	0.59	D2	1.8	6.32	0.64
2 - A2 East		5.7	14.97	0.86		6.2	14.38	0.87
3 - Will Adams Way		2.8	13.52	0.74		2.8	15.03	0.74
4 - A2 West		2.1	5.75	0.68		1.7	5.00	0.63
	2018 Base+Dev							
1 - Ito Way	D3	1.7	6.20	0.63	D4	2.0	6.77	0.66
2 - A2 East		7.0	18.52	0.88		6.9	15.96	0.88
3 - Will Adams Way		3.3	15.85	0.77		3.5	18.02	0.78
4 - A2 West		2.2	6.08	0.69		1.9	5.52	0.66
	2029 Base							
1 - Ito Way	D5	2.1	7.40	0.68	D6	3.0	9.64	0.75
2 - A2 East		24.3	57.96	0.98		30.8	63.81	0.99
3 - Will Adams Way		5.5	27.24	0.85		6.8	37.42	0.88
4 - A2 West		3.1	8.00	0.76		2.5	6.84	0.72
	2029 Base+Dev							
1 - Ito Way	D7	2.6	8.65	0.73	D8	3.4	10.73	0.78
2 - A2 East		43.3	99.11	1.01		41.4	84.07	1.00
3 - Will Adams Way		6.8	34.09	0.88		10.0	53.66	0.93
4 - A2 West		3.4	8.50	0.77		3.0	7.78	0.75

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

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

File summary

File Description

Title	Will Adams Roundabout
Location	A2 - Ito Way
Site number	
Date	22/02/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	20230
Enumerator	DTA\Arcady (RM)
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2018 Base	AM	FLAT	08:00	09:00	60	15	✓
D2	2018 Base	PM	FLAT	17:00	18:00	60	15	✓
D3	2018 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓
D4	2018 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓
D5	2029 Base	AM	FLAT	08:00	09:00	60	15	✓
D6	2029 Base	PM	FLAT	17:00	18:00	60	15	✓
D7	2029 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓
D8	2029 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2018 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	9.99	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Ito Way	
2	A2 East	
3	Will Adams Way	
4	A2 West	

Roundabout Geometry

Arm	V (m)	E (m)	l' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - Ito Way	7.40	9.06	18.8	20.8	55.0	32.0	
2 - A2 East	7.00	8.50	5.0	19.5	55.0	38.0	
3 - Will Adams Way	3.73	8.92	26.4	20.7	55.0	24.0	
4 - A2 West	7.15	10.48	35.6	16.8	55.0	41.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Ito Way	0.750	2621
2 - A2 East	0.683	2285
3 - Will Adams Way	0.671	2143
4 - A2 West	0.772	2803

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2018 Base	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	936	100.000
2 - A2 East		FLAT	✓	1410	100.000
3 - Will Adams Way		FLAT	✓	755	100.000
4 - A2 West		FLAT	✓	1301	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	439	202	295
	2 - A2 East	706	4	38	662
	3 - Will Adams Way	222	204	0	329
	4 - A2 West	130	737	429	5

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.59	5.53	1.4	A	936	936
2 - A2 East	0.86	14.97	5.7	B	1410	1410
3 - Will Adams Way	0.74	13.52	2.8	B	755	755
4 - A2 West	0.68	5.75	2.1	A	1301	1301

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1369	1594	0.587	930	1044	0.0	1.4	5.382	A
2 - A2 East	1410	353	925	1653	0.853	1389	1374	0.0	5.3	12.772	B
3 - Will Adams Way	755	189	1650	1036	0.729	745	665	0.0	2.6	11.988	B
4 - A2 West	1301	325	1120	1939	0.671	1293	1275	0.0	2.0	5.506	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1587	0.590	936	1057	1.4	1.4	5.530	A
2 - A2 East	1410	353	931	1649	0.855	1409	1384	5.3	5.6	14.797	B
3 - Will Adams Way	755	189	1671	1022	0.739	754	669	2.6	2.7	13.407	B
4 - A2 West	1301	325	1135	1927	0.675	1301	1290	2.0	2.1	5.743	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1586	0.590	936	1058	1.4	1.4	5.534	A
2 - A2 East	1410	353	931	1649	0.855	1410	1384	5.6	5.7	14.921	B
3 - Will Adams Way	755	189	1672	1021	0.739	755	669	2.7	2.8	13.495	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.1	2.1	5.752	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1586	0.590	936	1058	1.4	1.4	5.534	A
2 - A2 East	1410	353	931	1649	0.855	1410	1384	5.7	5.7	14.966	B
3 - Will Adams Way	755	189	1672	1021	0.740	755	669	2.8	2.8	13.515	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.1	2.1	5.753	A

2018 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	10.16	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2018 Base	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1010	100.000
2 - A2 East		FLAT	✓	1601	100.000
3 - Will Adams Way		FLAT	✓	692	100.000
4 - A2 West		FLAT	✓	1212	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	611	142	257
	2 - A2 East	733	2	53	813
	3 - Will Adams Way	120	274	0	298
	4 - A2 West	100	874	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.64	6.32	1.8	A	1010	1010
2 - A2 East	0.87	14.38	6.2	B	1601	1601
3 - Will Adams Way	0.74	15.03	2.8	C	692	692
4 - A2 West	0.63	5.00	1.7	A	1212	1212

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1378	1587	0.636	1003	940	0.0	1.7	6.095	A
2 - A2 East	1601	400	633	1853	0.864	1578	1748	0.0	5.7	12.248	B
3 - Will Adams Way	692	173	1782	947	0.731	682	429	0.0	2.6	13.114	B
4 - A2 West	1212	303	1113	1945	0.623	1205	1351	0.0	1.6	4.829	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	952	1.7	1.8	6.313	A
2 - A2 East	1601	400	637	1850	0.865	1600	1761	5.7	6.1	14.213	B
3 - Will Adams Way	692	173	1805	932	0.743	691	432	2.6	2.8	14.881	B
4 - A2 West	1212	303	1128	1933	0.627	1212	1368	1.6	1.7	4.992	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.8	1.8	6.319	A
2 - A2 East	1601	400	637	1850	0.865	1601	1761	6.1	6.2	14.335	B
3 - Will Adams Way	692	173	1806	931	0.743	692	432	2.8	2.8	15.001	C
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.7	1.7	4.998	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.8	1.8	6.319	A
2 - A2 East	1601	400	637	1850	0.866	1601	1761	6.2	6.2	14.377	B
3 - Will Adams Way	692	173	1806	931	0.743	692	432	2.8	2.8	15.031	C
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.7	1.7	4.999	A

2018 Base+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	11.64	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D3	2018 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1005	100.000
2 - A2 East		FLAT	✓	1410	100.000
3 - Will Adams Way		FLAT	✓	759	100.000
4 - A2 West		FLAT	✓	1332	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	439	218	348
	2 - A2 East	706	4	38	662
	3 - Will Adams Way	226	204	0	329
	4 - A2 West	160	738	429	5

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.63	6.20	1.7	A	1005	1005
2 - A2 East	0.88	18.52	7.0	C	1410	1410
3 - Will Adams Way	0.77	15.85	3.3	C	759	759
4 - A2 West	0.69	6.08	2.2	A	1332	1332

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1369	1594	0.631	998	1075	0.0	1.7	5.981	A
2 - A2 East	1410	353	993	1607	0.878	1385	1374	0.0	6.3	14.895	B
3 - Will Adams Way	759	190	1698	1003	0.757	747	680	0.0	2.9	13.524	B
4 - A2 West	1332	333	1121	1938	0.687	1323	1325	0.0	2.2	5.777	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1379	1586	0.634	1005	1091	1.7	1.7	6.193	A
2 - A2 East	1410	353	1000	1602	0.880	1408	1385	6.3	6.8	18.125	C
3 - Will Adams Way	759	190	1723	987	0.769	758	685	2.9	3.2	15.527	C
4 - A2 West	1332	333	1138	1925	0.692	1332	1343	2.2	2.2	6.066	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.199	A
2 - A2 East	1410	353	1000	1602	0.880	1409	1385	6.8	6.9	18.410	C
3 - Will Adams Way	759	190	1724	986	0.770	759	685	3.2	3.2	15.802	C
4 - A2 West	1332	333	1139	1924	0.692	1332	1344	2.2	2.2	6.079	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.199	A
2 - A2 East	1410	353	1000	1602	0.880	1410	1385	6.9	7.0	18.516	C
3 - Will Adams Way	759	190	1725	985	0.770	759	685	3.2	3.3	15.848	C
4 - A2 West	1332	333	1140	1924	0.692	1332	1344	2.2	2.2	6.084	A

2018 Base+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	11.34	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2018 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1047	100.000
2 - A2 East		FLAT	✓	1601	100.000
3 - Will Adams Way		FLAT	✓	714	100.000
4 - A2 West		FLAT	✓	1263	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	611	152	284
	2 - A2 East	733	2	53	813
	3 - Will Adams Way	142	274	0	298
	4 - A2 West	150	875	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.66	6.77	2.0	A	1047	1047
2 - A2 East	0.88	15.96	6.9	C	1601	1601
3 - Will Adams Way	0.78	18.02	3.5	C	714	714
4 - A2 West	0.66	5.52	1.9	A	1263	1263

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1378	1587	0.660	1039	1010	0.0	1.9	6.485	A
2 - A2 East	1601	400	669	1828	0.876	1576	1748	0.0	6.3	13.219	B
3 - Will Adams Way	714	179	1807	930	0.767	702	439	0.0	3.1	15.036	C
4 - A2 West	1263	316	1132	1929	0.655	1256	1376	0.0	1.9	5.286	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1388	1579	0.663	1047	1024	1.9	1.9	6.757	A
2 - A2 East	1601	400	674	1825	0.877	1599	1761	6.3	6.7	15.707	C
3 - Will Adams Way	714	179	1831	914	0.781	713	442	3.1	3.4	17.713	C
4 - A2 West	1263	316	1150	1916	0.659	1263	1395	1.9	1.9	5.507	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	1.9	2.0	6.764	A
2 - A2 East	1601	400	674	1825	0.877	1600	1762	6.7	6.8	15.890	C
3 - Will Adams Way	714	179	1832	913	0.782	714	442	3.4	3.5	17.953	C
4 - A2 West	1263	316	1151	1915	0.659	1263	1396	1.9	1.9	5.518	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	2.0	2.0	6.767	A
2 - A2 East	1601	400	674	1825	0.877	1601	1762	6.8	6.9	15.957	C
3 - Will Adams Way	714	179	1833	913	0.782	714	442	3.5	3.5	18.018	C
4 - A2 West	1263	316	1151	1915	0.659	1263	1396	1.9	1.9	5.520	A

2029 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	27.47	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2029 Base	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1029	100.000
2 - A2 East		FLAT	✓	1584	100.000
3 - Will Adams Way		FLAT	✓	755	100.000
4 - A2 West		FLAT	✓	1411	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	495	202	332
	2 - A2 East	795	5	38	746
	3 - Will Adams Way	222	204	0	329
	4 - A2 West	146	830	429	6

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.68	7.40	2.1	A	1029	1029
2 - A2 East	0.98	57.96	24.3	F	1584	1584
3 - Will Adams Way	0.85	27.24	5.5	D	755	755
4 - A2 West	0.76	8.00	3.1	A	1411	1411

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1459	1526	0.674	1021	1127	0.0	2.0	7.018	A
2 - A2 East	1584	396	961	1628	0.973	1525	1519	0.0	14.7	26.903	D
3 - Will Adams Way	755	189	1824	919	0.822	739	663	0.0	4.1	18.574	C
4 - A2 West	1411	353	1187	1887	0.748	1400	1375	0.0	2.9	7.222	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1472	1516	0.679	1029	1153	2.0	2.1	7.379	A
2 - A2 East	1584	396	969	1623	0.976	1565	1533	14.7	19.4	45.790	E
3 - Will Adams Way	755	189	1866	891	0.848	752	668	4.1	5.0	24.951	C
4 - A2 West	1411	353	1215	1866	0.756	1410	1403	2.9	3.0	7.886	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1473	1515	0.679	1029	1157	2.1	2.1	7.396	A
2 - A2 East	1584	396	969	1623	0.976	1572	1533	19.4	22.3	53.115	F
3 - Will Adams Way	755	189	1873	886	0.852	754	669	5.0	5.3	26.533	D
4 - A2 West	1411	353	1219	1862	0.758	1411	1407	3.0	3.1	7.967	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1474	1515	0.679	1029	1159	2.1	2.1	7.402	A
2 - A2 East	1584	396	969	1623	0.976	1576	1534	22.3	24.3	57.961	F
3 - Will Adams Way	755	189	1876	884	0.854	754	669	5.3	5.5	27.239	D
4 - A2 West	1411	353	1221	1861	0.758	1411	1409	3.1	3.1	7.999	A

2029 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	32.46	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2029 Base	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1122	100.000
2 - A2 East		FLAT	✓	1801	100.000
3 - Will Adams Way		FLAT	✓	692	100.000
4 - A2 West		FLAT	✓	1338	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	690	142	290
	2 - A2 East	828	2	53	918
	3 - Will Adams Way	120	274	0	298
	4 - A2 West	113	987	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.75	9.64	3.0	A	1122	1122
2 - A2 East	0.99	63.81	30.8	F	1801	1801
3 - Will Adams Way	0.88	37.42	6.8	E	692	692
4 - A2 West	0.72	6.84	2.5	A	1338	1338

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1485	1507	0.745	1111	1025	0.0	2.8	8.859	A
2 - A2 East	1801	450	664	1831	0.983	1732	1932	0.0	17.4	27.119	D
3 - Will Adams Way	692	173	1969	822	0.842	674	427	0.0	4.6	22.198	C
4 - A2 West	1338	335	1182	1891	0.707	1329	1461	0.0	2.4	6.297	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1498	1497	0.750	1122	1049	2.8	2.9	9.572	A
2 - A2 East	1801	450	670	1827	0.986	1776	1950	17.4	23.5	48.082	E
3 - Will Adams Way	692	173	2015	791	0.875	687	431	4.6	5.9	32.422	D
4 - A2 West	1338	335	1210	1870	0.716	1338	1492	2.4	2.5	6.757	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1500	1496	0.750	1122	1053	2.9	3.0	9.621	A
2 - A2 East	1801	450	670	1827	0.986	1784	1952	23.5	27.6	57.242	F
3 - Will Adams Way	692	173	2023	785	0.881	690	431	5.9	6.4	35.745	E
4 - A2 West	1338	335	1215	1865	0.717	1338	1498	2.5	2.5	6.818	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1500	1495	0.750	1122	1055	3.0	3.0	9.635	A
2 - A2 East	1801	450	670	1827	0.986	1788	1952	27.6	30.8	63.805	F
3 - Will Adams Way	692	173	2027	783	0.884	691	432	6.4	6.8	37.417	E
4 - A2 West	1338	335	1217	1864	0.718	1338	1500	2.5	2.5	6.844	A

2029 Base+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	41.90	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D7	2029 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1099	100.000
2 - A2 East		FLAT	✓	1584	100.000
3 - Will Adams Way		FLAT	✓	759	100.000
4 - A2 West		FLAT	✓	1442	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	495	218	386
	2 - A2 East	795	5	38	746
	3 - Will Adams Way	226	204	0	329
	4 - A2 West	176	831	429	6

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.73	8.65	2.6	A	1099	1099
2 - A2 East	1.01	99.11	43.3	F	1584	1584
3 - Will Adams Way	0.88	34.09	6.8	D	759	759
4 - A2 West	0.77	8.50	3.4	A	1442	1442

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1459	1526	0.720	1089	1150	0.0	2.5	8.058	A
2 - A2 East	1584	396	1030	1582	1.001	1505	1518	0.0	19.7	33.511	D
3 - Will Adams Way	759	190	1858	896	0.847	740	677	0.0	4.7	21.039	C
4 - A2 West	1442	361	1179	1893	0.762	1430	1418	0.0	3.1	7.582	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1473	1516	0.725	1099	1176	2.5	2.6	8.614	A
2 - A2 East	1584	396	1039	1576	1.005	1546	1533	19.7	29.2	65.380	F
3 - Will Adams Way	759	190	1901	867	0.875	754	684	4.7	6.0	29.968	D
4 - A2 West	1442	361	1208	1871	0.771	1441	1447	3.1	3.3	8.353	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1474	1515	0.725	1099	1181	2.6	2.6	8.646	A
2 - A2 East	1584	396	1039	1575	1.005	1554	1534	29.2	36.8	83.756	F
3 - Will Adams Way	759	190	1909	862	0.880	757	684	6.0	6.5	32.703	D
4 - A2 West	1442	361	1214	1867	0.773	1442	1452	3.3	3.3	8.459	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1474	1515	0.726	1099	1183	2.6	2.6	8.655	A
2 - A2 East	1584	396	1039	1575	1.005	1558	1534	36.8	43.3	99.109	F
3 - Will Adams Way	759	190	1912	859	0.883	758	684	6.5	6.8	34.088	D
4 - A2 West	1442	361	1216	1865	0.773	1442	1454	3.3	3.4	8.504	A

2029 Base+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	42.06	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D8	2029 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1160	100.000
2 - A2 East		FLAT	✓	1801	100.000
3 - Will Adams Way		FLAT	✓	714	100.000
4 - A2 West		FLAT	✓	1389	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	690	152	318
	2 - A2 East	828	2	53	918
	3 - Will Adams Way	142	274	0	298
	4 - A2 West	163	988	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.78	10.73	3.4	B	1160	1160
2 - A2 East	1.00	84.07	41.4	F	1801	1801
3 - Will Adams Way	0.93	53.66	10.0	F	714	714
4 - A2 West	0.75	7.78	3.0	A	1389	1389

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1483	1508	0.769	1147	1090	0.0	3.2	9.667	A
2 - A2 East	1801	450	701	1806	0.997	1721	1930	0.0	20.1	30.307	D
3 - Will Adams Way	714	179	1985	810	0.881	691	436	0.0	5.8	26.458	D
4 - A2 West	1389	347	1195	1881	0.739	1378	1481	0.0	2.7	7.018	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1498	1497	0.775	1159	1115	3.2	3.3	10.624	B
2 - A2 East	1801	450	708	1802	1.000	1765	1950	20.1	29.0	57.636	F
3 - Will Adams Way	714	179	2032	779	0.917	705	441	5.8	8.0	42.617	E
4 - A2 West	1389	347	1225	1858	0.748	1388	1513	2.7	2.9	7.647	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1500	1496	0.776	1160	1120	3.3	3.4	10.701	B
2 - A2 East	1801	450	708	1801	1.000	1774	1952	29.0	35.8	72.271	F
3 - Will Adams Way	714	179	2041	773	0.923	709	441	8.0	9.2	49.537	E
4 - A2 West	1389	347	1231	1853	0.749	1389	1519	2.9	2.9	7.740	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1501	1495	0.776	1160	1122	3.4	3.4	10.728	B
2 - A2 East	1801	450	708	1801	1.000	1778	1953	35.8	41.4	84.070	F
3 - Will Adams Way	714	179	2045	771	0.927	711	441	9.2	10.0	53.657	F
4 - A2 West	1389	347	1234	1851	0.750	1389	1522	2.9	3.0	7.782	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: A2_Ito Way_Will Adams Way_RevC.j9
Path: P:\20000's\20230\Junction Assessments
Report generation date: 23/02/2021 10:37:13

»2018 Base, AM
»2018 Base , PM
»2018 Base+Dev, AM
»2018 Base+Dev, PM
»2029 Base, AM
»2029 Base , PM
»2029 Base+Dev, AM
»2029 Base+Dev, PM

Summary of junction performance

	AM				PM			
	Set ID	Q (PCU)	Delay (s)	RFC	Set ID	Q (PCU)	Delay (s)	RFC
	2018 Base							
1 - Ito Way	D1	1.4	5.53	0.59	D2	1.8	6.32	0.64
2 - A2 East		1.9	4.75	0.65		2.0	4.49	0.67
3 - Will Adams Way		2.8	13.52	0.74		2.8	15.04	0.74
4 - A2 West		2.1	5.75	0.68		1.7	5.00	0.63
	2018 Base+Dev							
1 - Ito Way	D3	1.7	6.20	0.63	D4	2.0	6.77	0.66
2 - A2 East		2.0	5.12	0.67		2.1	4.66	0.67
3 - Will Adams Way		3.3	15.87	0.77		3.5	18.04	0.78
4 - A2 West		2.2	6.09	0.69		1.9	5.52	0.66
	2029 Base							
1 - Ito Way	D5	2.1	7.40	0.68	D6	3.0	9.64	0.75
2 - A2 East		2.8	6.49	0.74		3.1	6.26	0.76
3 - Will Adams Way		5.8	28.57	0.86		7.5	41.30	0.89
4 - A2 West		3.1	8.06	0.76		2.5	6.91	0.72
	2029 Base+Dev							
1 - Ito Way	D7	2.6	8.66	0.73	D8	3.4	10.73	0.78
2 - A2 East		3.1	7.22	0.76		3.3	6.60	0.77
3 - Will Adams Way		8.1	40.70	0.90		12.7	67.86	0.94
4 - A2 West		3.5	8.72	0.78		3.0	7.92	0.75

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

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

File summary

File Description

Title	Will Adams Roundabout
Location	
Site number	
Date	12/02/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DTA\Arcady
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2018 Base	AM	FLAT	08:00	09:00	60	15	✓
D2	2018 Base	PM	FLAT	17:00	18:00	60	15	✓
D3	2018 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓
D4	2018 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓
D5	2029 Base	AM	FLAT	08:00	09:00	60	15	✓
D6	2029 Base	PM	FLAT	17:00	18:00	60	15	✓
D7	2029 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓
D8	2029 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2018 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	6.72	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Ito Way	
2	A2 East	
3	Will Adams Way	
4	A2 West	

Roundabout Geometry

Arm	V (m)	E (m)	l' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - Ito Way	7.40	9.06	18.8	20.8	55.0	32.0	
2 - A2 East	7.00	12.49	19.5	19.5	55.0	38.0	
3 - Will Adams Way	3.73	8.92	26.4	20.7	55.0	24.0	
4 - A2 West	7.15	10.48	35.6	16.8	55.0	41.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Ito Way	0.750	2621
2 - A2 East	0.796	2910
3 - Will Adams Way	0.671	2143
4 - A2 West	0.772	2803

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2018 Base	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	936	100.000
2 - A2 East		FLAT	✓	1410	100.000
3 - Will Adams Way		FLAT	✓	755	100.000
4 - A2 West		FLAT	✓	1301	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	439	202	295
	2 - A2 East	706	4	38	662
	3 - Will Adams Way	222	204	0	329
	4 - A2 West	130	737	429	5

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.59	5.53	1.4	A	936	936
2 - A2 East	0.65	4.75	1.9	A	1410	1410
3 - Will Adams Way	0.74	13.52	2.8	B	755	755
4 - A2 West	0.68	5.75	2.1	A	1301	1301

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1369	1594	0.587	930	1050	0.0	1.4	5.381	A
2 - A2 East	1410	353	925	2173	0.649	1403	1374	0.0	1.8	4.632	A
3 - Will Adams Way	755	189	1663	1027	0.735	744	665	0.0	2.6	12.336	B
4 - A2 West	1301	325	1126	1934	0.673	1293	1281	0.0	2.0	5.549	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1587	0.590	936	1058	1.4	1.4	5.531	A
2 - A2 East	1410	353	931	2168	0.650	1410	1384	1.8	1.8	4.746	A
3 - Will Adams Way	755	189	1672	1021	0.740	755	669	2.6	2.7	13.471	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.0	2.1	5.750	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1586	0.590	936	1058	1.4	1.4	5.534	A
2 - A2 East	1410	353	931	2168	0.650	1410	1384	1.8	1.8	4.746	A
3 - Will Adams Way	755	189	1672	1021	0.740	755	669	2.7	2.8	13.514	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.1	2.1	5.754	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	936	234	1379	1586	0.590	936	1058	1.4	1.4	5.535	A
2 - A2 East	1410	353	931	2168	0.650	1410	1384	1.8	1.9	4.746	A
3 - Will Adams Way	755	189	1672	1021	0.740	755	669	2.8	2.8	13.525	B
4 - A2 West	1301	325	1136	1927	0.675	1301	1291	2.1	2.1	5.754	A

2018 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	6.65	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2018 Base	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1010	100.000
2 - A2 East		FLAT	✓	1601	100.000
3 - Will Adams Way		FLAT	✓	692	100.000
4 - A2 West		FLAT	✓	1212	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	611	142	257
	2 - A2 East	733	2	53	813
	3 - Will Adams Way	120	274	0	298
	4 - A2 West	100	874	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.64	6.32	1.8	A	1010	1010
2 - A2 East	0.67	4.49	2.0	A	1601	1601
3 - Will Adams Way	0.74	15.04	2.8	C	692	692
4 - A2 West	0.63	5.00	1.7	A	1212	1212

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1378	1587	0.636	1003	947	0.0	1.7	6.094	A
2 - A2 East	1601	400	633	2406	0.666	1593	1748	0.0	2.0	4.390	A
3 - Will Adams Way	692	173	1797	937	0.738	681	429	0.0	2.7	13.569	B
4 - A2 West	1212	303	1119	1939	0.625	1205	1359	0.0	1.6	4.863	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.7	1.8	6.315	A
2 - A2 East	1601	400	637	2402	0.666	1601	1761	2.0	2.0	4.491	A
3 - Will Adams Way	692	173	1806	931	0.743	691	432	2.7	2.8	14.965	B
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.6	1.7	4.996	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.8	1.8	6.319	A
2 - A2 East	1601	400	637	2402	0.666	1601	1761	2.0	2.0	4.491	A
3 - Will Adams Way	692	173	1806	931	0.743	692	432	2.8	2.8	15.027	C
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.7	1.7	4.999	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1010	253	1388	1580	0.639	1010	953	1.8	1.8	6.319	A
2 - A2 East	1601	400	637	2402	0.666	1601	1761	2.0	2.0	4.491	A
3 - Will Adams Way	692	173	1806	931	0.743	692	432	2.8	2.8	15.043	C
4 - A2 West	1212	303	1129	1932	0.627	1212	1369	1.7	1.7	4.999	A

2018 Base+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	7.46	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D3	2018 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1005	100.000
2 - A2 East		FLAT	✓	1410	100.000
3 - Will Adams Way		FLAT	✓	759	100.000
4 - A2 West		FLAT	✓	1332	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	439	218	348
	2 - A2 East	706	4	38	662
	3 - Will Adams Way	226	204	0	329
	4 - A2 West	160	738	429	5

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.63	6.20	1.7	A	1005	1005
2 - A2 East	0.67	5.12	2.0	A	1410	1410
3 - Will Adams Way	0.77	15.87	3.3	C	759	759
4 - A2 West	0.69	6.09	2.2	A	1332	1332

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1369	1594	0.631	998	1083	0.0	1.7	5.979	A
2 - A2 East	1410	353	993	2119	0.666	1402	1374	0.0	2.0	4.972	A
3 - Will Adams Way	759	190	1715	992	0.765	747	681	0.0	3.0	14.070	B
4 - A2 West	1332	333	1129	1932	0.690	1323	1333	0.0	2.2	5.837	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.195	A
2 - A2 East	1410	353	1000	2113	0.667	1410	1385	2.0	2.0	5.114	A
3 - Will Adams Way	759	190	1725	985	0.770	758	685	3.0	3.2	15.762	C
4 - A2 West	1332	333	1140	1924	0.692	1332	1344	2.2	2.2	6.078	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.199	A
2 - A2 East	1410	353	1000	2113	0.667	1410	1385	2.0	2.0	5.117	A
3 - Will Adams Way	759	190	1725	985	0.770	759	685	3.2	3.3	15.846	C
4 - A2 West	1332	333	1140	1924	0.692	1332	1344	2.2	2.2	6.083	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1005	251	1380	1586	0.634	1005	1092	1.7	1.7	6.199	A
2 - A2 East	1410	353	1000	2113	0.667	1410	1385	2.0	2.0	5.117	A
3 - Will Adams Way	759	190	1725	985	0.770	759	685	3.3	3.3	15.872	C
4 - A2 West	1332	333	1140	1923	0.693	1332	1344	2.2	2.2	6.085	A

2018 Base+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	7.44	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2018 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1047	100.000
2 - A2 East		FLAT	✓	1601	100.000
3 - Will Adams Way		FLAT	✓	714	100.000
4 - A2 West		FLAT	✓	1263	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	611	152	284
	2 - A2 East	733	2	53	813
	3 - Will Adams Way	142	274	0	298
	4 - A2 West	150	875	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.66	6.77	2.0	A	1047	1047
2 - A2 East	0.67	4.66	2.1	A	1601	1601
3 - Will Adams Way	0.78	18.04	3.5	C	714	714
4 - A2 West	0.66	5.52	1.9	A	1263	1263

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1377	1587	0.660	1039	1018	0.0	1.9	6.482	A
2 - A2 East	1601	400	669	2377	0.674	1593	1747	0.0	2.0	4.548	A
3 - Will Adams Way	714	179	1823	919	0.777	701	439	0.0	3.2	15.692	C
4 - A2 West	1263	316	1140	1924	0.657	1255	1384	0.0	1.9	5.329	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	1.9	1.9	6.759	A
2 - A2 East	1601	400	674	2373	0.675	1601	1761	2.0	2.1	4.660	A
3 - Will Adams Way	714	179	1833	913	0.782	713	442	3.2	3.4	17.879	C
4 - A2 West	1263	316	1150	1915	0.659	1263	1396	1.9	1.9	5.516	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	1.9	2.0	6.764	A
2 - A2 East	1601	400	674	2373	0.675	1601	1762	2.1	2.1	4.663	A
3 - Will Adams Way	714	179	1833	913	0.782	714	442	3.4	3.5	18.007	C
4 - A2 West	1263	316	1151	1915	0.660	1263	1396	1.9	1.9	5.520	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1047	262	1389	1579	0.663	1047	1025	2.0	2.0	6.767	A
2 - A2 East	1601	400	674	2373	0.675	1601	1762	2.1	2.1	4.663	A
3 - Will Adams Way	714	179	1833	913	0.782	714	442	3.5	3.5	18.045	C
4 - A2 West	1263	316	1151	1915	0.660	1263	1396	1.9	1.9	5.521	A

2029 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	10.64	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2029 Base	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1029	100.000
2 - A2 East		FLAT	✓	1584	100.000
3 - Will Adams Way		FLAT	✓	755	100.000
4 - A2 West		FLAT	✓	1411	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	495	202	332
	2 - A2 East	795	5	38	746
	3 - Will Adams Way	222	204	0	329
	4 - A2 West	146	830	429	6

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.68	7.40	2.1	A	1029	1029
2 - A2 East	0.74	6.49	2.8	A	1584	1584
3 - Will Adams Way	0.86	28.57	5.8	D	755	755
4 - A2 West	0.76	8.06	3.1	A	1411	1411

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1458	1527	0.674	1021	1151	0.0	2.0	7.008	A
2 - A2 East	1584	396	961	2144	0.739	1573	1518	0.0	2.8	6.188	A
3 - Will Adams Way	755	189	1871	887	0.851	736	664	0.0	4.8	21.558	C
4 - A2 West	1411	353	1210	1870	0.755	1399	1397	0.0	3.0	7.472	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1473	1516	0.679	1029	1162	2.0	2.1	7.385	A
2 - A2 East	1584	396	969	2138	0.741	1584	1533	2.8	2.8	6.486	A
3 - Will Adams Way	755	189	1884	879	0.859	753	669	4.8	5.4	27.540	D
4 - A2 West	1411	353	1225	1858	0.759	1411	1412	3.0	3.1	8.026	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1474	1515	0.679	1029	1163	2.1	2.1	7.399	A
2 - A2 East	1584	396	969	2138	0.741	1584	1534	2.8	2.8	6.493	A
3 - Will Adams Way	755	189	1884	879	0.859	754	669	5.4	5.7	28.300	D
4 - A2 West	1411	353	1225	1857	0.760	1411	1413	3.1	3.1	8.054	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1029	257	1474	1515	0.679	1029	1163	2.1	2.1	7.404	A
2 - A2 East	1584	396	969	2138	0.741	1584	1534	2.8	2.8	6.493	A
3 - Will Adams Way	755	189	1884	879	0.859	755	669	5.7	5.8	28.572	D
4 - A2 West	1411	353	1226	1857	0.760	1411	1413	3.1	3.1	8.060	A

2029 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	12.09	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2029 Base	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1122	100.000
2 - A2 East		FLAT	✓	1801	100.000
3 - Will Adams Way		FLAT	✓	692	100.000
4 - A2 West		FLAT	✓	1338	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	690	142	290
	2 - A2 East	828	2	53	918
	3 - Will Adams Way	120	274	0	298
	4 - A2 West	113	987	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.75	9.64	3.0	A	1122	1122
2 - A2 East	0.76	6.26	3.1	A	1801	1801
3 - Will Adams Way	0.89	41.30	7.5	E	692	692
4 - A2 West	0.72	6.91	2.5	A	1338	1338

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1483	1508	0.744	1111	1051	0.0	2.8	8.825	A
2 - A2 East	1801	450	664	2381	0.756	1789	1930	0.0	3.0	5.966	A
3 - Will Adams Way	692	173	2024	784	0.882	669	429	0.0	5.8	27.299	D
4 - A2 West	1338	335	1205	1873	0.714	1328	1488	0.0	2.4	6.498	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1499	1496	0.750	1121	1060	2.8	2.9	9.581	A
2 - A2 East	1801	450	670	2376	0.758	1801	1951	3.0	3.1	6.249	A
3 - Will Adams Way	692	173	2039	775	0.893	688	432	5.8	6.9	38.222	E
4 - A2 West	1338	335	1221	1861	0.719	1338	1505	2.4	2.5	6.877	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1500	1495	0.750	1122	1061	2.9	3.0	9.627	A
2 - A2 East	1801	450	670	2376	0.758	1801	1952	3.1	3.1	6.255	A
3 - Will Adams Way	692	173	2039	775	0.893	690	432	6.9	7.3	40.384	E
4 - A2 West	1338	335	1223	1859	0.720	1338	1506	2.5	2.5	6.901	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1122	281	1501	1495	0.750	1122	1061	3.0	3.0	9.639	A
2 - A2 East	1801	450	670	2376	0.758	1801	1953	3.1	3.1	6.256	A
3 - Will Adams Way	692	173	2039	775	0.893	691	432	7.3	7.5	41.299	E
4 - A2 West	1338	335	1223	1859	0.720	1338	1507	2.5	2.5	6.906	A

2029 Base+Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	13.19	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D7	2029 Base+Dev	AM	FLAT	08:00	09:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1099	100.000
2 - A2 East		FLAT	✓	1584	100.000
3 - Will Adams Way		FLAT	✓	759	100.000
4 - A2 West		FLAT	✓	1442	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	495	218	386
	2 - A2 East	795	5	38	746
	3 - Will Adams Way	226	204	0	329
	4 - A2 West	176	831	429	6

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.73	8.66	2.6	A	1099	1099
2 - A2 East	0.76	7.22	3.1	A	1584	1584
3 - Will Adams Way	0.90	40.70	8.1	E	759	759
4 - A2 West	0.78	8.72	3.5	A	1442	1442

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1457	1528	0.719	1089	1182	0.0	2.5	8.033	A
2 - A2 East	1584	396	1030	2090	0.758	1572	1516	0.0	3.0	6.799	A
3 - Will Adams Way	759	190	1923	853	0.890	734	679	0.0	6.2	26.540	D
4 - A2 West	1442	361	1210	1870	0.771	1429	1447	0.0	3.2	7.954	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1473	1516	0.725	1099	1195	2.5	2.6	8.617	A
2 - A2 East	1584	396	1039	2083	0.761	1584	1533	3.0	3.1	7.204	A
3 - Will Adams Way	759	190	1938	843	0.901	754	685	6.2	7.4	37.465	E
4 - A2 West	1442	361	1227	1856	0.777	1441	1465	3.2	3.4	8.656	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1474	1515	0.726	1099	1196	2.6	2.6	8.649	A
2 - A2 East	1584	396	1039	2082	0.761	1584	1534	3.1	3.1	7.216	A
3 - Will Adams Way	759	190	1938	842	0.901	757	685	7.4	7.9	39.723	E
4 - A2 West	1442	361	1229	1855	0.777	1442	1466	3.4	3.4	8.704	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1099	275	1475	1515	0.726	1099	1197	2.6	2.6	8.657	A
2 - A2 East	1584	396	1039	2082	0.761	1584	1535	3.1	3.1	7.220	A
3 - Will Adams Way	759	190	1938	842	0.901	758	685	7.9	8.1	40.696	E
4 - A2 West	1442	361	1229	1854	0.778	1442	1466	3.4	3.5	8.719	A

2029 Base+Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	4 - A2 West - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Will Adams Roundabout	Standard Roundabout		1, 2, 3, 4	16.55	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D8	2029 Base+Dev	PM	FLAT	17:00	18:00	60	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - Ito Way		FLAT	✓	1160	100.000
2 - A2 East		FLAT	✓	1801	100.000
3 - Will Adams Way		FLAT	✓	714	100.000
4 - A2 West		FLAT	✓	1389	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	690	152	318
	2 - A2 East	828	2	53	918
	3 - Will Adams Way	142	274	0	298
	4 - A2 West	163	988	237	1

Vehicle Mix

HV %s

		To			
		1 - Ito Way	2 - A2 East	3 - Will Adams Way	4 - A2 West
From	1 - Ito Way	0	0	0	0
	2 - A2 East	0	0	0	0
	3 - Will Adams Way	0	0	0	0
	4 - A2 West	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - Ito Way	0.78	10.73	3.4	B	1160	1160
2 - A2 East	0.77	6.60	3.3	A	1801	1801
3 - Will Adams Way	0.94	67.86	12.7	F	714	714
4 - A2 West	0.75	7.92	3.0	A	1389	1389

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1480	1511	0.768	1147	1119	0.0	3.2	9.598	A
2 - A2 East	1801	450	701	2351	0.766	1788	1926	0.0	3.2	6.260	A
3 - Will Adams Way	714	179	2051	766	0.932	682	438	0.0	8.1	34.777	D
4 - A2 West	1389	347	1221	1861	0.747	1378	1512	0.0	2.9	7.292	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1498	1497	0.775	1159	1131	3.2	3.3	10.612	B
2 - A2 East	1801	450	708	2346	0.768	1801	1949	3.2	3.2	6.592	A
3 - Will Adams Way	714	179	2067	756	0.944	704	442	8.1	10.5	56.251	F
4 - A2 West	1389	347	1240	1846	0.752	1389	1531	2.9	3.0	7.852	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1500	1496	0.776	1160	1132	3.3	3.4	10.698	B
2 - A2 East	1801	450	708	2346	0.768	1801	1952	3.2	3.3	6.600	A
3 - Will Adams Way	714	179	2067	756	0.945	709	442	10.5	11.8	63.648	F
4 - A2 West	1389	347	1243	1844	0.753	1389	1533	3.0	3.0	7.902	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Ito Way	1160	290	1501	1495	0.776	1160	1132	3.4	3.4	10.727	B
2 - A2 East	1801	450	708	2346	0.768	1801	1953	3.3	3.3	6.603	A
3 - Will Adams Way	714	179	2067	756	0.945	711	442	11.8	12.7	67.856	F
4 - A2 West	1389	347	1244	1843	0.754	1389	1534	3.0	3.0	7.920	A

Appendix B

Project Name:	Pump Lane, Lower Rainham
Document Reference:	502.0109/MN/1
Document Name:	240221 Meeting Note
Prepared By:	James Rand

1. BACKGROUND

1.1 This Meeting Note has been prepared in relation to a planning appeal (ref APP/A2280/W/20/3259868) by A C Goatham & Son pertaining to the site known as Land off Pump Lane, Rainham, Kent.

1.2 During the planning inquiry, a proposed inquiry document was tabled by the appellants on 23rd February 2021, titled PUMP ID24 – A2 Junction Review. This document contained additional mitigation works put forward by the appellant, and the transport matters relating to the inquiry were adjourned until mid-April, so that the implications could be fully understood and assessed.

1.3 The council have used the Medway Aimsun Model (MAM) to assess the impact of the development. To date, all of the assessments completed in the MAM have incorporated the mitigation works proposed by the appellant in their Transport Assessment (CD5.25), which for clarity includes:

- Alterations to the Lower Rainham Road/Yokosuka Way/Gads Hill roundabout
- Alterations to the Bloors Lane/A2/Playfootball junction; and
- Signalised shuttle working on Pump Lane through the tunnel under the railway

1.4 The additional mitigation works set out in ID24 were first proposed on 23rd February 2021. The additional mitigation works proposed in ID24 relate to the toucan crossing east of Bowaters Roundabout, and Will Adams Roundabout. In order to understand the impact of these additional mitigation works upon the modelling results, the council need to re-run the assessments using the Medway Aimsun Model.

1.5 To that end, a meeting was held on 24th February, to discuss the details of the Appellant's proposed additional mitigation works, so that they can be accurately incorporated into the new assessment in the MAM. In addition to myself, the following attended the meeting:

- Simon Tucker, David Tucker Associates (DTA), acting on behalf of the appellant
- Richard McCulloch, DTA, acting on behalf of the appellant
- Karl Jarvis, SWECO, acting on behalf of the council
- Alkis Papadoulis, SWECO, acting on behalf of the council
- Robert Neave, Medway Council

2. AGREED ITEMS

2.1 The following matters were agreed during the meeting of 24th February.

2.2 The further assessment in the MAM will be undertaken for future years of 2028 & 2037, for consistency with the reports produced to date. Overall, four new scenarios will be tested for the AM and PM peak periods, as set out in Table 1.

Scenario	Year of Assessment	Trip Rates	Development zone used	Centroid Configuration
2a	2037	Strategic Model Trip Rates	Standalone development zone	Two access points
3a	2037	Developer Trip Rates	Standalone development zone	Two access points
5a	2028	Strategic Model Trip Rates	Standalone development zone	Two access points
6a	2028	Developer Trip Rates	Standalone development zone	Two access points

Table 1: Additional Scenarios to be modelled in MAM

2.3 ID24 contains two options for a mitigation scheme at the toucan crossing east of Bowaters roundabout, as shown on drawings 20230-16 and 20230-17. DTA will confirm which of the two options they wish to be incorporated into the revised MAM assessment.

2.4 DTA also wish to revise the traffic signal timings for the Bowaters roundabout itself, which was not mitigation explicitly contained within ID24.

2.5 DTA will provide the proposed signal timings for the toucan crossing east of Bowater roundabout, in the form of a LINSIG model, so that it can be incorporated into the further MAM assessment.

2.6 DTA will provide the Junctions 9 model of the Will Adams Way roundabout, so that the proposed mitigation works can be incorporated into the further MAM assessment.

2.7 DTA will ensure that a Stage 1 Road Safety Audit will be undertaken of the additional mitigation schemes.

2.8 The council will provide the results of the new assessment in the MAM to the appellants when complete.

Appendix C

From: Simon Tucker <SJT@dtatransportation.co.uk>
Sent: 28 February 2021 19:47
To: James Rand
Cc: Jarvis, Karl; Papadoulis, Alkis; neave, robert; Duncan Parr; Richard McCulloch
Subject: RE: Pump Lane - Transport - Mitigation
Attachments: Bowaters Roundabout_RevG - Split Crossing and Flare.lsg3x; A2_Ito Way_Will Adams Way_RevC.j9; Three Mariners Shuttle RevA.lsg3x; Otterham Quay Lane_A2 _RevA.lsg3x; A2_Bloors Lane signals Mit_RevD.lsg3x; 20230-17b.pdf; 20230-10b.pdf; Lower Rainham_A289_Mitigation_20230-10B.j9; 20230-18b.pdf

James,
Thank you for your email.

I will separately forward you a revised version of the meeting note, with track changes, for review, since the first draft received is neither complete nor does it reflect the proposals made to the Council, and questions posed, on behalf of the Appellant.

Model Flows

During our meeting, I confirmed that DTA holds a LINSIG file for the junction. It is attached, as requested. As discussed, the signal timings in the LINSIG have been optimised for the flows that we have, showing the interaction of the pedestrian crossing to the east. These are based on our own survey and growth assumptions and the 2028 flows provided to us by the Council on 26th Feb 2020 (@ 16.53).
Appropriate optimisation of the signal timings *may* change if the revised MAM model runs change the demand flows at the junction. This effect is characterised as an benefit of the Model in Table 1 of Mr Jarvis' evidence. Therefore, it is appropriate that the LINSIG assessment also considers current MAM flows and if appropriate signal timings - for completeness.
During our meeting you declined to confirm how, or indeed, if, the Model has optimised signal timings so far. This information is however critical to understanding the appropriateness of the impacts the Council contends the Model suggests. It would therefore be of particular assistance to the inspector/SoS if those details are made available for all the junctions the Council suggests are affected. Clearly, in the context of the Bowater's Roundabout and signal crossing, this comparison will be essential in presenting our respective positions following the current model run.

Section 106

During our meeting Mr Neave confirmed that the Council has identified a preliminary improvement scheme for Pier Road as an outcome of initial Local plan modelling. He also confirmed that had been tested through other modelling undertaken by the Council.
In the Appellant's response to the first draft of the S106 (in which the Council included a contribution towards Pier Road) it was reciprocally confirmed that the Appellant would be content to make a reasonable contribution towards those works providing it was modelled. This is recorded in Charlotte Lockwood's (of the Appellant) email of 10th February 2021. Therefore, I request that: (a) a copy of that scheme now be provided, and (b) that this be inclusion within the modelling.

Other Mitigation / Optimisation

As discussed during our meeting, establishing the causality of any of the congestion suggested by the MAM model is unclear, particular given that congestion forecast is in clear conflict with the outputs of our own models.
I therefore attach the junction model files for the following junctions so that you can review the optimisation we consider most appropriate for those given flows. This will allow direct comparison between the models, at junction level:

- Will Adams Way / A2 Junction – Arcady model file and Mitigation Scheme (20230-18b).
- A2 Bowaters – Linsig model file to provide signal timings and mitigation scheme (20230-17b).
- Lower Rainham Road / Yokosako Way roundabout - Arcady model file and Mitigation Scheme (20230-10b).
- Lower Rainham Road Shuttle Working by the Mariners - Linsig model file to provide signal timings

- A2 / Otterham Quay Road - Linsig model file to show signal timings
- A2 / Bloors Lane – Linsig model file to show signal timings.

Outputs from the modelling

As I stated during our meeting, it is my view that the Inspector/SoS would be assisted generally if we could provide an agreed statement on specific junction operation and causality of any queue, so that the specific issues of impact (if any) can be properly understood. I therefore require that the outputs include turning movement and details on signal optimisation at each junction for appropriate and comparative review against DTA modelling work, and an arrange of screen shots (in the same format as Mr Jarvis' Figure 3 / 4) across the peak hours. I suggest every 10 minutes would be appropriate intervals.

Kind regards

Simon Tucker
David Tucker Associates
Transport Planning Consultants

Forester House, Doctors Lane, Henley in Arden, Warwickshire B95 5AW
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From: James Rand <james@paulbashamassociates.com>
Sent: 25 February 2021 09:23
To: Simon Tucker <SJT@dtatransportation.co.uk>
Cc: Jarvis, Karl <Karl.Jarvis@sweco.co.uk>; Papadoulis, Alkis <alkis.papadoulis@sweco.co.uk>; neave, robert <robert.neave@medway.gov.uk>
Subject: Pump Lane - Transport - Mitigation

Hello Simon,

Please see attached meeting note outlining the agreed items.

I am afraid I do not have Richard's email address, but I would be grateful if you could please confirm DTA's agreement to these notes.

We also agreed to come back to you on a few matters as set out below, which I have kept separate because they weren't agreed during the meeting.

Model flows
The purpose of the adjournment is so that the council can assess and understand the impact of the mitigation proposed in ID24. I presume that you must have modelled this mitigation before submitting it to the inquiry, so please could you provide your LINSIG model of the Bowater roundabout & crossing with signal timings, as they stand?

You requested MAM turn flows at the Bowaters roundabout for 2028, and if I understood correctly, this is to recalculate the proposed signal timings. We can provide the flows, but it will take us a couple of days to produce

these from the model – I presume you will also want the equivalent for 2037. We will have these across by the end of this week.

However, I must sound a note of caution – the MAM turn flows are those that make it through the junction, and are thus at least in part influenced by the signal timings. Therefore although we can provide the 2028 turn flows, if you then want to change the signal timings this will impact the turn flows, and so on. I should also say this information would be provided without prejudice to our position that the modelling assessments cannot be mixed and matched.

Ultimately, we need certainty from yourselves on the additional mitigation proposed. For now, we will presume that you wish to use your LINSIG model timings as they stand. If you wish to change the timings, given the time pressures to get this work completed before the inquiry resumes, we need to know by the end of Tuesday 2nd March. Provided this is the case, we will have the revised modelling results ready before Easter to give you and ourselves a chance to consider it in advance of the inquiry resumption on 19th April.

S106

The original draft of the S106 included reference to contributions for local network highway improvement works. This was included in error, and has been removed from the S106. As you will be aware the council is currently developing its local plan, and as part of that work is exploring, at a strategic level, what mitigation options may be required for traffic arising from development sites in the local plan.

For the avoidance of doubt there is no local plan development traffic included in the assessments of the impact of the appeal scheme.

As a result of the adjournment, I am now taking annual leave next week so if you could please ensure all those cc'd are copied into any correspondence, I would be grateful.

Kind regards,

James Rand
Principal Transport Planner
BSc (Hons) MSc

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