TOWN AND COUNTRY PLANNING ACT 1990

Appeal by South West Milton Keynes Consortium, comprising: Taylor Wimpey UK Ltd, Hallam Land Management Ltd, William Davis Ltd, Bellcross Homes and Connolly Homes

Against the Refusal by Milton Keynes Council of an application for the following proposed development:

Outline planning application for physical improvements to the Bottledump roundabouts and a new access onto the A421 (priority left in only) to accommodate the development of land in Aylesbury Vale District reference 15/00314/AOP (for Outline planning application with all matters reserved except for access for a mixed-use sustainable urban extension on land to the south west of Milton Keynes to provide up to 1,855 mixed tenure dwellings; an employment area (B1); a neighbourhood centre including retail (A1/A2/A3/A4/A5), community (D1/D2) and residential (C3) uses; a primary and a secondary school; a grid road reserve; multi-functional green space; a sustainable drainage system; and associated access, drainage and public transport infrastructure - EIA development)

At

Land At Buckingham Road, Tattenhoe Roundabout Standing Way To Bottle Dump Roundabout Milton Keynes

Planning Inspectorate ref: APP/Y0435/W/20/3252528

Local Planning Authority Ref: 15/00619/FUL

Proof of Evidence of

James Bedingfeld

On behalf of

Buckinghamshire Council

13th April 2021

1. Introduction

1.1 My name is James Bedingfeld. I am a Member of the Chartered Institution of Highways & Transportation (CIHT). I hold a National Certificate and Higher National Certificate for Civil Engineering.

1.2 I am currently a Principal Transport Planner for Jacobs Ltd in the Winnersh Office covering the South East. Jacobs are currently in a framework contract with Buckinghamshire Council for design and consultation services. I have been employed by Buckinghamshire Council (BC) as a Principal Transport Planner in the Highways Development Management team for the past year and half with my role comprising assisting in the assessment of large development applications, focussing on the modelling work performed to support those applications. I have been working as a transport professional for nineteen years with previous employment including ten years at the Transport Research Laboratory where part of my role was the Technical Reviewer and Lead Trainer for the industry standard junction modelling software ARCADY and PICADY.

1.3 The views and judgements expressed in this evidence represent my true and professional assessment of the appeal proposals and their compatibility with policy considering all material considerations. I am familiar with the site and its surroundings, the local and strategic road networks in the vicinity and insofar as they relate to highway matters. Due to the ongoing Covid-19 pandemic a site visit to all junctions has not been possible with a desk-based review of the information being performed.

2. Scope of evidence

2.1 BC is the local planning authority and highway authority for application 15/00314/AOP. MKC is the local planning authority and highway authority for application 15/00619/FUL. Application 15/00619/FUL is the subject of the appeal. This application seeks planning permission for development within MKC's area, not BC's area. The appeal scheme is part of the wider scheme within BC's area.

2.2 There has been significant involvement by the BC highways department ("BC Highways") in the highways implications of both the wider scheme and the appeal scheme, in co-operation with the MKC highways department and the Appellant's consultants.

2.3 This proof of evidence will explain BC's position from a highways point of view on the wider scheme within BC's area and, to the extent that it relates to the wider scheme, the appeal scheme within MKC's area including the analysis of the proposed mitigation within MKC. This will include explanation of highways matters relating to the proposed amendments to the wider scheme which the Appellant submitted in June 2020. I rely on the evidence of Ms Claire Bayley, Associate Planner, in relation to planning matters.

2.4 A Statement of Common Ground ('SoCG') in respect of highway matters has been agreed between the Appellant and BC. This will provide agreed descriptions of the site and study area, identification of relevant policy, movement and access strategy so I do not repeat those matters here but may elaborate where necessary.

3. Scope of assessment, including revised Transport Assessment and TRNs

3.1 The updated Transport Assessment and the TRNs that have been produced between June 2020 and January 2021 have been submitted both for the appeal scheme, and as further documentation in the application in BC's area (i.e. 15/00314/AOP). At present the updated Transport Assessment and TRNs have been assessed by BC officers only. There has been insufficient time ahead of the inquiry to schedule a formal Development Control Committee meeting where members could review the amendments to the application in BC's area. Therefore, all conclusions detailed in this Proof of Evidence are those of BC officers and not of relevant BC Committee members. The amendments to the application in BC's area are explained more fully in the Proof of Evidence of Claire Bayley.

3.2 The scope of the assessment by BC officers has been as follows:

- BC officers have assessed in detail the highway components of the overall scheme within Buckinghamshire.
- BC officers' assessment has been extended to cover the two proposed access junctions within MKC, which are the subject of the appeal, and the Bottledump roundabout. The Bottledump roundabout lies within the MKC boundary but directly abuts the BC road network and as such has a direct impact in terms of queues forming and delays impacting on Whaddon Road and the A421. The two accesses within MK area were also assessed. The proposed roundabout access off Buckingham Road will link into the development and a review of the model and results was required to ensure excessive queuing and delay does

not occur within the site, leading to potential internal movements to the alternative junction option on Whaddon Road. The left-in access only on A421 Standing Way was not assessed in capacity terms. Its unrestricted nature (left-turn deceleration lane with no requirement to give way) does not require a capacity assessment but the access was reviewed in terms of design and potential interaction with the road network. Also, as this links into the internal site, there is the potential interaction with vulnerable road users.

- BC officers have also conducted a full review of the other junctions which fall under the remit of MKC highway authority. This has been undertaken in order to determine the wider impact of the development and that where necessary suitable mitigation is proposed to ensure the development will not have significant impact on MKC network.

3.3 A revised Transport Assessment (TA) (dated May 2020) was submitted with the appeal and as part of the June 2020 amendments to the wider scheme. The scope of the revised TA was discussed and agreed between the Appellants and representatives of both BC and MKC, which consisted of the following main discussions and inputs:

- A meeting was held on the 15th January 2020 to discuss the revised TA scope. Further to this an amended scope was submitted by the Appellant to both Councils for their review and comment. Several queries were raised by BC via email communications with final agreement on 20th February 2020, provided at Appendix A.
- Two Technical Notes were further submitted ahead of submission of the revised TA for Trip Generation and Trip Distribution.
- The Trip Generation Note was submitted for review on the 5th March 2020 with a conference call meeting held to discuss its content on Monday 16th March 2020 with representatives of both BC and MKC. The Technical Note was updated and resubmitted on 20th March 2020 (see Appendix B) for further comment and review. BC confirmed their acceptance of the methodology on 26th March 2020 in an email sent by myself and MKC confirmed acceptance on 7th April 2020 in email sent by Nigel Weeks, provided at Appendix C.
- The Trip Distribution Note was submitted for review on 26th March 2020. MKC emailed acceptance of the methodology via email on 7th April 2020 by Nigel Weeks. BC raised several comments in a series of emails from 6th to 17th April

2020, provided at Appendix C. On review of the revised TA it was noted that some of these comments had not been addressed and are still under consideration and review as part of the initial BC comments provided for the TA submission.

3.4 Further to the submission of the revised Transport Assessment three TRNs have been produced. The main contents of each is summarised below:

- TRN1, dated 15th September 2020, formed part of Martin Paddle's original Proof of Evidence on behalf of the Appellant and provided responses to BC comments on the updated TA (dated May 2020). At the time of production of TRN1 the assessment methodology provided an alternative approach to assessing the impact of the Proposed Development on the local highway network within the BC area. The results shown in TRN1 were then subject of further discussions with BC to agree common ground prior to the inquiry.
- TRN2, dated December 2020, was in response to BC comments dated 2nd October 2020 in relation to TRN1 on junctions within BC. TRN2 provided a response to BC comments including a modified approach to assess the impacts and determine appropriate mitigation on the network. This modified approach superseded elements of the approach detailed in the updated TA.
- TRN3, dated January 2021, was produced to apply the same assessment methodology adopted in TRN2 but for the MKC network. This included response to BC comments previously supplied for J5 – Tattenhoe Roundabout and J6 – Bottledump Roundabout. This modified approach superseded elements of the approach detailed in the updated TA.

4. BC Highways consideration of Milton Keynes application 15/00619/FUL

4.1 During the MKC application (15/00619/FUL) process BC Highways were not a formal consultee, nor did BC provide a formal response as part of the consultation period. Buckinghamshire County Council ("BCC"; the then highway authority) had provided highways comments in respect of BC application 15/00314/AOP. As part of the 7th June 2017 AVDC Development Management Committee BCC highway comments were provided which included reference and comment upon the two development access junctions and the Bottledump roundabout within MK. It is my understanding that BCC highway comments relating to the access points and Bottledump roundabout and

AVDC's resolution were then considered by MKC officers as part of their own Transport Assessment review process.

4.2 A high-level sense check was performed by BC Highways as part of the 15/00314/AOP Transport Assessment review process for the remainder of the junctions within the MK area but detailed analysis (and response in BCC highway comments) was not performed as this was the responsibility of MKC.

4.3 As part of the development of the Transport Assessment which formed part of the submission for both applications the contents of the document, including but not limited to trip generation, distribution, and modelling analysis, were the subject of numerous discussions between the highway engineers at MKC and BCC and the applicant. 17 Technical Notes were submitted for review by both LHAs and commented upon prior to inclusion in the final TA.

5. BC Highways responses to BC application 15/00314/AOP

5.1 Planning application 15/00314/AOP was initially considered at AVDC's Strategic Development Management Committee on 7th June 2017. The report appended in full the detailed highways considerations and conclusions which provided a comprehensive evaluation of the impacts and associated mitigation proposals of the development. The highways response dated 28th April 2017 concluded that the outline application is acceptable to the Highway Authority subject to a Section 106 Agreement to secure required works and contributions to ensure a neutral impact in terms of highway impact.

5.2 Members, at their meeting on 7th June 2017, resolved that the application be deferred and delegated to officers for approval subject to the completion of a legal agreement and appropriate conditions.

5.3 Following the resolution to grant permission made at the Committee meeting, officers engaged in ongoing negotiations in relation to the S106. These discussions included officers from MKC alongside BC, and technical specialists in respect of the BC heads of terms. A draft S106 was published on the Council's website on 12th December 2018. The S106 Agreement is to include obligations concerning highways works and contributions (in BC and MKC). An extract of the latest published draft S106 Agreement (12th November 2019 from the AVDC planning portal) relating to highway impact is

provided at Appendix D. A copy of the CIL Schedule produced at that time is attached at Appendix H of BC's statement of case.

5.4 The application was subsequently reported back to SDMC on 24th April 2019 (report at Appendix C of BC's statement of case) to update members. The update Committee report set out that the Council were satisfied that sufficient justification had now been provided to secure the contribution towards secondary health care at MKUH. The report also set out that the changes in circumstances since the application was considered by Committee could not justifiably alter the conclusion that the proposals constitute a sustainable and acceptable development. In this instance it was considered that the planning balance exercise was not affected by the change in circumstances to arrive at a different conclusion and recommendation to that which the committee previously considered and resolved to agree. That resolution was agreed by Members at the meeting. This updated the resolution (previously taken on 7th June 2017) to include the additional S106 matter and subject to appropriate conditions.

5.5 A further BC Highways response was provided on the 14th November 2019 in relation to the junction modelling performed for the Bletchley Road/Stoke Road/Drayton Road/Whaddon Road junction. As part of a new application within Newton Longville (19/01754/AOP, which was for 58 residential dwellings on Land off Drayton Road in Newton Longville) the developer submitted information in the form of a Technical Note with a revised junction model using the geometries and file set-up options used for the PICADY crossroads model that was developed as part of the SWMK Transport Assessment 2016 for 15/00314/AOP. On detailed review of the new application (and therefore the SWMK) modelling for the junction, and further to a subsequent site visit where on-site measurements were performed, some inconsistencies were identified.

5.6 Following the identification of the inconsistencies, BC Highways commissioned the development of a new and revised PICADY model for this junction only that included the three scenarios as detailed in the amended Transport Assessment (2016) for SWMK. Whilst the change in some of the geometric measurements and options has provided a revised set of results, particularly for Stoke Road in the AM, this did not alter BC's position in terms of mitigation measures proposed for the junction and Newton Longville as a whole.

6. BC Highways current position having regard to the revised Transport Assessment (dated May 2020) and TRNS

6.1 Since the resolutions taken on application 15/00314/AOP set out above, the applicants have submitted a package of updated documents and associated plans proposing amendments to the scheme under a cover letter dated 19th June 2020. These include a new Transport Assessment (dated May 2020). This new TA has also been submitted as part of the evidence of the appeal against the refusal of MKC application 15/00619/FUL.

6.2 The MK model which was used to determine the traffic distribution within Milton Keynes is in the process of being withdrawn and a new strategic model is being developed by MKC. Taking this into account and the age of traffic data it was agreed by BC, MKC and the Appellant that new traffic flow information be gathered to ensure a more up to date traffic impact assessment could be applied.

6.3 The new Transport Assessment produced has updated its traffic impact assessment with the methodology once more agreed between the applicant's transport consultant and officers of both BC and MKC (Nigel Weeks of Stirling Transport was appointed on behalf of MKC and was part of discussions on all the Technical Notes for the new Transport Assessment). In light of this agreement, the methodology outlined in the TA and the TRNs for determining development trips, distribution and measuring the impact on the road network are considered to be fit for purpose.

6.4 The results of the May 2020 Transport Assessment and subsequent TRNs have been reviewed by BC officers. This review process has included discussions between BC Highways and the Appellant's transport consultant, and requests by BC Highways for further information. The list below provides a timeline of the BC review of the 2020 TA:

- Initial comments on the base junction models for BC junctions and the Bottledump roundabout were provided by BC Highways via email on 16th June 2020. A request was also made for the provision of the base observed queue and traffic flow data.
- Initial comments regarding the access junction capacity assessments and mitigation models for BC junctions were provided by BC Highways via email on 17th June 2020.
- An email was sent on 18th June 2020 by BC Highways requesting clarification of the northern boundary extent (response provided on 22nd June 2020). A

further clarification email was sent by BC Highways on 22nd June 2020 in relation to the same issue with reference to the interaction between the new access from A421 Standing Way and the Old Buckingham Road alignment.

- A second request for the base observed queue and flow data was sent by BC Highways via email on 25th June 2020. A phone conversation was held on 26th June 2020 to discuss the data request.
- The observed queue and flow data for the BC junctions, along with the access design and mitigation drawings were provided by the Appellant on 9th July 2020.
- A query was sent by BC Highways on 14th July 2020 in regard to the determination of the observed queues as set out in Table 6.5 of the TA via email. A response was provided on 15th July 2020.
- BC Highways initial comments were then provided to the Appellant on 16th July 2020 via email in tabulated form.
- A telephone conference was held with Appellant on 21st July 2020 to discuss the comments raised. It was agreed that further highway information in relation to the comments would be provided by the Appellant, as detailed in an email 3rd August 2020.
- A further telephone conference was held with the Appellant on 19th August 2020 to discuss the BC requested revisions and how these were being applied.
- BC Highways was advised that they would be in receipt of the additional information requested the week commencing the 24th August 2020. The information was not provided by that date and on 7th September 2020 BC was advised that the Appellant was still finalising their response.
- The Appellant submitted TRN1 appended to Martin Paddle's Proof of Evidence dated 15th September 2020, in which they provided a response to BC comments submitted on 21st July 2020.
- BC Highways provided formal comments on TRN1 by letter to BC development control on 2nd October 2020. The letter was also provided to the Appellant via email on the same day.

6.5 BC Highways have completed its review of the submitted May 2020 Transport Assessment and subsequent TRNs. The outcome of that review is that BC Highways

have concluded that the highway impact assessment is thorough and robust and the mitigation proposed is sufficient to ensure that the residual cumulative impacts on safety and highway capacity are acceptable and not significant and comply with relevant local transport and national planning policies. This is detailed in the following sections.

7. Assessment Methodology

(i) Choice of model

7.1 The traffic impact of the development has been assessed utilising a manual spreadsheet-based assessment approach. This was requested by BC highways. The original 2015 TA used the MKTM strategic model approach, and the 2016 TA used a combined 'hybrid' approach, with the strategic model within Milton Keynes and a manual spreadsheet-based model in Buckinghamshire.

7.2 At the time of the scoping meeting on the 15th January 2020 (minutes of meeting at Appendix E) BC highways raised some concern over the use of updated Milton Keynes Multi-modal Model (MKMMM). On review of the model documentation[1] at the time there were several potential issues that could impact the use of the model to provide a single, unified, assessment methodology, these issues being:

- The key use of the model is identified as to assess the impacts of Plan:MK on the strategic road network and to inform the Local Transport Plan 4 and as a tool to support future transport infrastructure bids. Aecom, on behalf of MKC, indicate that depending on the scheme specific circumstances, including the scale, size and location of the scheme, the model may need to be updated further (particularly on the demand side and in the vicinity of the scheme) to support the economic case for such schemes. This would highlight further enhancement may be needed for the assessment of more local schemes and developments. The MKMMM report[2] states that "*It is important to note that the model was not designed for use in a scheme specific economic assessment for which it is recommended the model would be recalibrated with additional and*

[1] MKMMM Local Model Validation Report V1.4 (AECOM, June 2017)

[2] Milton Keynes Multi-Modal Model Update Highway Model Traffic Forecasting Report (2017), paragraph 1.9.3, page 6

more recent data and targeted to reflect a more specific geographical focus of resources and modelling effort".

- The origin / destination flow data is 7 years old (collected in 2009) for the base model calibration (2016). There was concern that the Origin and Destination data would not be representative of current 2020 travel patterns.
- The Model simulation area has been extended in all directions, but no new data seems to have been collected to further calibrate flows/journey times with the Buckinghamshire area adjacent to Milton Keynes.

7.3 In addition to the MKMMM the Buckinghamshire Countrywide Strategic Model was also considered, but like MKMMM this would not cover all the network within MKC that would need to be modelled to ascertain the impact on the development.

7.4 As such a manual spreadsheet-based approach to assessment was requested to ensure a consistent assessment process was applied across the study area. This was discussed at the scoping meeting and agreed by all parties.

7.5 It is acknowledged that the use of a manual spreadsheet-based approach is unable to account for the benefits of any dynamic reassignment that would arise in a congested urban network. However, the methodology assumes that traffic volumes at a junction would continue to increase even when queues and delay predicted by the model would likely result in drivers seeking alternative routes as they would unlikely to be willing to accept a certain level of queueing and delay. Nor does the methodology consider potential modal choice which may occur on a congested network. As such BC highways consider the manual-spreadsheet based methodology provides a robust 'worst case' assessment of the development impacts on the junction assessed with impact determined when comparing the future year scenarios of with or without development traffic. The extent of the impacts it identifies are unlikely to occur to the same extent.

7.6 Overall, I consider that a manual spreadsheet-based approach as adopted within the updated TA and TRNs provides a suitable and robust methodology when determining impacts on the surrounding wider network. The impacts of the junction assessments are likely to indicate greater impacts at junctions than would be expected from a strategic transport model.

(ii) Trip Generation

7.7 The trip generation methodology used, which was agreed by BC officers, MKC and the Appellant as part of the scoping process, has been to identify person trip rates for each land use and apply appropriate mode shares. The agreed Trip Generation is detailed in TRN2 and incorporated comments received from BC in relation to trip diagram discrepancies and the use of higher employment trip rates to ensure a robust assessment.

7.8 BC highways raised an issue with the projected number of jobs within the development (895 in the May 2020 TA), as this was a change in number of jobs between the previously agreed numbers as part of the scoping process which resulted in significant reduction of employment trips. BC highways requested that the number of jobs assumed in the highway network assessment increased to 1021 on the basis of 929 jobs plus a 10% buffer, which accounts for the smallest floorspace area per employee ratio rather than a median point within the floorspace range within the Employment Assessment, and would provide a robust assessment. The new employment trips were included in the revised assessment as detailed in TRN1.

7.9 The employment trip generation was adjusted to remove the internal employment trips generated by the residential land use. Rather than apply a percentage reduction the actual number of internalised residential trips were subtracted from the gross external employment trip generation. The Census Travel to Work data was then further utilised for the same MSOAs as that of the residential land use to generate an employment mode share.

7.10 The trip generation has been derived using industry standard TRICS database or on previously agreed assumptions that are still considered valid. The overall trip generation methodology is appropriate and thereby provides a robust assessment for determining the development impact.

(iii) Trip distribution

7.11 To distribute and assign the vehicular trips on the highway network trip distributions were derived for the separate land uses:

- Residential
- Employment
- Education

7.12 Two network distributions were utilised for the trip assignments: residential trips (for all journey purposes) were distributed using the residential trip distribution; all other land uses, including servicing trips, were distributed using the employment trip distribution.

7.13 The residential trip distribution was a two-stage process. Firstly, 2011 Census 'Location of usual residence and place of work by method of travel to work' data at the MSOA[3] level (WU02EW) was extracted from Nomis to provide the proportion of trips to each MSOA across the country from the five MSOAs used to derive the mode share for the Site. Data for the mode car driver was used to ensure that trip patterns replicated the mode to be used within the highway network assessment. The destination MSOAs were then ranked by the total number of people making the journey per MSOA and the most popular destinations were analysed.

7.14 An online journey planner was then used to find the quickest route to the destination MSOA from the Site in order to assign the trips to the network. The journey planner was set to a weekday 8am start time to ensure that peak period congestion was accounted for. Where more than one route was identified the trips were split proportionally between those routes. For example, if two routes were identified by the online journey planner with a similar journey time the trips would be split 50% to each route.

7.15 The same methodology that was developed for the residential trip distribution was applied to the employment trip distribution. However, instead of using outgoing trips (workplace trips from the five selected MSOAs to all other MSOAs) incoming trips were selected (trips to the five selected MSOAs from all other MSOAs).

7.16 BC highways requested a change in both employment and residential trip generation to that shown in the May 2020 TA, to better reflect potential trips within Buckinghamshire. This was addressed in TRN1 with a revised distribution assigned to the network. Overall I consider the use of census data to determine travel patterns from the adjacent areas to determine likely movements to and from the development, along with the use of an online journey planner to determine likely routes, is an appropriate and robust methodology for determining distribution. The methodology was agreed by BC highways, MKC and the Appellant.

[3] Middle Super Output Areas – geographical area designed to improve reporting of small area statistics in England and Wales

(iv) Committed developments

7.17 It was agreed with the Appellant that the only committed developments requiring consideration within the core scenarios of this TA are Tattenhoe Park and Kingsmead South. These developments are both currently under construction and are considered certain to take place and are included in the future year scenarios .

7.18 To derive the trip generation for Tattenhoe Park and Kingsmead South the following process was undertaken:

- Vehicular trip rates were extracted from the residential land use person trip rates extracted from TRICS for this development assessment.
- Both Tattenhoe Park and Kingsmead South are currently under construction with a proportion of each development already completed and occupied. The data collection exercise completed in February 2020 is therefore likely to include some existing development traffic and therefore it was agreed that it would not be appropriate to add the full development quantum associated with the developments as this would result in double-counting of trips. To derive an appropriate quantum of development for each, a review of the MKC Housing Trajectory 2019-2024 was undertaken. The number of completions anticipated from April 2020 within the housing trajectory document indicates that there are 178 dwellings at Kingsmead South and 883 dwellings at Tattenhoe Park still to be completed and occupied.

7.19 Relevant trip rates were applied to the outstanding dwellings and distributed across the highway network study area using the same distribution as that derived for the residential land use.

7.20 BC highways are satisfied that this approach adequately captures the major committed developments in the area.

(v) Forecast year

7.21 A future forecast year of 2033 was agreed between Buckinghamshire Council, Milton Keynes Council, and the Appellant as this should coincide with the full occupation and the end of the current VALP assessment period. To assess the impact within Buckinghamshire and Milton Keynes and establish a forecast year, use has been made of the Trip End Model Presentation Programme (TEMPro). The is an industry

standard tool used to estimate traffic growth. The NTM[4] dataset AF09 was used to establish an NTM adjusted local traffic growth factor, between the base year 2020 and the forecast year of 2033. For the purposes of this assessment, the geographic area of Milton Keynes was selected and growth factors for car driver trips selected and agreed with Buckinghamshire Council. The use of Milton Keynes growth factor was considered appropriate to provide a consistent value across the combined authority network, furthermore the growth values are higher than the geographical area of 'rural (Aylesbury Vale)' and provides a robust assessment. Adjustments have been made to take account of local planning assumptions, which were agreed with both Highway Authorities.

7.22 The high growth rate, adjusted for local planning factors, is assumed to accommodate the future developments in the local area over the assessed period. The planning factors have been reviewed and BC highways are satisfied that this adequately captures minor developments in the area.

(vi) Scenario testing

7.23 To determine the impact of the Proposed Development on the highway network, the roads and junctions in the vicinity of the site were tested against three development scenarios.

7.24 BC highways requested the effects of the Framework Travel Plan (FTP) were not considered within the main assessment scenario. Instead the effects of the development including consideration of the targets established in the FTP are established through a separate sensitivity test. In addition, at the request of BC highways, the neighbouring emerging allocation site at Shenley Park was also considered within a separate sensitivity test. This resulted in the following scenarios being used for assessment purposes:

- Do Nothing - base traffic with committed developments but without the Proposed Development
- Do Something – base traffic with committed developments with the Proposed Development
    - 2020 Base Year

[4] National Transport Model, multi-modal model of land-based transport in Great Britain developed by Department for Transport

- 2033 Do Nothing
- 2033 Do Something 1
- 2033 Do Something 2 (Do Something 1 + reduction to account for travel planning at the Proposed Development)
- 2033 Do Something 3 (Do Something 1 + Shenley Park draft allocation)

7.25 These scenarios were agreed with BC and MKC. The exclusion of travel planning measures in the Do Something 1 scenario results in a robust worst-case scenario and BC highways are satisfied that the scenarios tested provide a robust assessment of the impact on the surrounding network.

(vii) Concluding comments

7.26 The manual spreadsheet assessment methodology was agreed by MKC, BC highways and the Appellant when considering the potential limitations of the available Strategic models in being able to provide a unified approach across the whole network. It is considered that the adopted approach within the updated TA and TRNs provides a suitable and robust methodology with the impact on the local junction assessments likely to indicate greater impacts at junctions than would be expected from a strategic transport model.

7.27 The Trip Generation and Distribution were agreed by MKC, BC highways and the Appellant. Overall, I consider the methodologies used to determine the number of trips and travel patterns to determine likely movements to and from the development to be appropriate and robust.

7.28 Overall BC highways consider that, when taking into account the requested revised trip generation, distribution, the use of the MK TEMPRO growth rates and committed developments, the traffic flows used in the DS1 Scenario are robust and likely to be provide a 'worst case' scenario when determining the impact of the development.

8. Network junction impact

8.1 The Updated TA and TRNs outline the results of the assessments completed, determining the impact of the Proposed Development on the transport network prior to and with mitigation. The following sections of my proof provide details of BC officers' review and subsequent conclusions on reviewing the following subjects:

- Base model development (in section 8 below)
- Access Strategy (in section 8 below)
    - Buckingham Road
    - Whaddon Road
    - A421 Standing Way
- Off site impact assessment (junctions) (in section 8 below)
    - Junction 5: Tattenhoe Roundabout
    - Junction 6: Bottle Dump Roundabout
    - Junction 1: Sherwood Drive/Water Eaton Road/B4034 Buckingham Road
    - Junction 2: Shenley Road/Newton Road/B4034 Buckingham Road
    - Junction 3: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road (Newton Longville)
    - Junction 4: Whaddon Road/Westbrook End (Newton Longville)
    - Junction 7: A421/Coddimoor Lane/Whaddon Road (Whaddon Crossroads)
    - Junction 8: A421/Warren Road
    - Junction 9: A421/Shucklow Hill/Little Horwood Road
    - Junction 10: A421/Nash Road/Winslow Road
    - Junction 11: Stock Lane/Shenley Road/Coddimoor Lane (Whaddon)
    - Junction 12: Kingsmead Roundabout
    - Junction 13: Westcroft Roundabout
    - Junction 14: Furzton Roundabout
    - Junction 15: Bleak Hall Roundabout
    - Junction 16: Elfield Park Roundabout
    - Junction 17: Emerson Roundabout
    - Junction 18: Windmill Hill Roundabout
- Network non junction impact (in section 9 below)

BASE MODEL DEVELOPMENT

8.2 The Transport Research Laboratory (TRL) Junctions 9 modelling software (ARCADY and PICADY modules) have been used for determining junction capacity. The geometric parameters and flows used in the static junction models were reviewed with

final agreement with the Appellant outlined in TRN2 and TRN3 which took on board previous formal comments and ongoing discussions with the Appellant regarding the model development. I consider that the geometries and traffic flows used in the modelling are representative of current geometric layouts and current and future year traffic flows for the various scenarios and provide a robust assessment.

8.3 To ensure the base models are representative of existing conditions the models were calibrated against known and established techniques. This included the methodologies shown in priority order below. The final calibration details were provided in TRN2 and TRN3 after comments and discussion with the applicant:

8.4 Where underlying conditions allowed, junctions were calibrated making use of the TRL recommended methodology as detailed in the software user guide.

8.5 Employment of the Barbara Chard methodology at roundabouts where uneven lane usage was identified and validation against observed queue survey data.

8.6 Calibration against queue length surveys. The queue results provided in the Junctions 9 software are typical maximum queues likely to be observed at set times within the modelled period. I.e. if you were to monitor a site over several days the results would represent the average longest queue observed at those set times. To establish observed typical queue lengths for validation purposes the applicant was tasked to obtain three days' worth of data. For site calibration purposes three days of data is considered appropriate to allow model calibration to replicate baseline site conditions.

8.7 I consider that the calibration techniques and methodologies used are robust and therefore provided accurate baseline condition models, which in turn provides confidence that the future year scenario models are also robust and indicate reliable operational results.

ACCESS STRATEGY

8.8 There are three points of access from the development onto the local highway network at the following locations:

- Buckingham Road
- Whaddon Road
- A421 Standing Way

Buckingham Road Access

8.9 The proposed access onto Buckingham Road (i.e. part of the Appeal Development), will be via a new four arm roundabout. The Buckingham Road access junction has been modelled using industry standard software Junctions 9 (ARCADY), as set out in TRN2. The results of the assessment show that the junction operates within capacity in both the AM and PM peaks in the 2033 Do Something 1 and 2033 Do Something 3 scenarios, in particular the current free flowing sections of Buckingham Road are predicted to have at maximum 11 seconds of delay.

8.10 An independent Stage 1 Road Safety Audit has been undertaken and I am satisfied that the problems identified can be resolved during detailed design. The assessment is considered to reflect an accurate representation of the junction operation with minimal queues and delay expected.

Whaddon Road Access

8.11 The proposed access at Whaddon Road is a ghosted right turn priority junction. The Whaddon Road access junction has been modelled using industry standard software Junctions 9 (PICADY), as set out in TRN2. The results of the assessment show that the junction operates within capacity in both the AM and PM peaks for all the modelled scenarios with minimal queuing and delay expected, and significant spare capacity is present to cater for possible increases in flow.

8.12 An independent Stage 1 Road Safety Audit was carried out and did raise concerns regarding the conspicuity of the junction to approaching road users. Whilst the Appellant has demonstrated that the required visibility splays can be achieved both in the horizontal and vertical planes, BC highways is of the view that further design features are necessary including but not limited to, signs, lines and coloured surfacing. A review of the collision record along Whaddon Road has shown that the majority occur within the hours of darkness, as such the provision of lighting on approach and at the junction should be considered. Furthermore, a speed limit reduction on Whaddon Road should be investigated, given the recorded 85th percentile speeds and the change in character that would result from the development. BC highways is content that these can be secured by way of a condition.

A421 Standing Way Access

8.13 The design of the access from A421 Standing Way is in the form of a left in only junction and I consider that there is no requirement to perform a capacity assessment due to the unrestricted nature (left-turn deceleration lane with no requirement to give way). BC highways did raise concern over how the access will interact with the Old Buckingham Road alignment, which is used by pedestrian and cyclists, and potentially the same user groups from the development will also make use of the route. It was considered that measures would be needed to ensure safe crossing movements for non-motorised user with potential high vehicle speeds (relative) on exiting the bend of the new access and restricted intervisibility.

8.14 In TRN1 the Appellant provided an arrangement to manage the potential interaction with Old Buckingham Road. The arrangement would enable pedestrians and cyclists to divert further into the Site and to cross the proposed road access safely. Whilst this design provides a less direct route, it does in principle provide a safer crossing location with likely lower vehicle speeds. The set-back crossing also reduces the potential environmental impact of tree removal to ensure adequate intervisibility for an in-line crossing, the design of which would be finalised as part of reversed matters and provides a proportionate facility when considering possible alternatives may include signal or grade separated facilities.

8.15 Based on the new information provided, BC highways does not have any objections in principle to the proposed access arrangement and I consider the overall junction design to be appropriate, subject to detailed design.

OFF SITE IMPACT ASSESSMENT[5]

8.16 The junctions to be included in the off site assessment were agreed between BC, MKC and the Appellant during scoping and completed using industry standard computer programs:

- Junctions 9 (ARCADY for roundabouts)
- Junctions 9 (PICADY for priority junctions)

[5] J5 Tattenhoe Roundabout and J6 Bottledump roundabout are considered within this off-site impact assessment, even though they are in the application red line, because they are not direct accesses into the development.

- LinSig 3 (for signal control junctions)

8.17 Where mitigation was proposed at a junction the calibration factors, used for the base models, were retained as most of the mitigation proposals included relatively minor kerb or central island amendments which would not constitute significant improvements to warrant removal of the calibration.

8.18 In considering the appropriateness of providing mitigation, I have considered the NPPF, including paragraphs 54-56, and relevant Local Plan policies. In addition, paragraph 108(c) of the NPPF provides that any significant impacts in terms of capacity and congestion or highway safety should be cost effectively mitigated to an acceptable degree. This is reflected in local Policy CT2 of Plan:MK which states that development proposals will be permitted that:

- 'Integrate into our existing sustainable transport networks and do not have an
- inappropriate impact on the operation, safety or accessibility to the local or strategic highway networks.'

8.19 In considering the off-site junction assessments (set out individually below), it is important to understand the current and future year operation of the network without development traffic. An assessment of the junctions has been undertaken to ascertain those junctions that currently, or are predicted, to operate under saturated (congested) conditions (i.e. Ratio to Flow value of 1.0 or above in ARCADY and PICADY results) considering local growth and committed developments only. The results of the assessment are shown in the Table 8-1for the whole network. This indicates that in 2020 no junction operates under fully saturated conditions in both peak periods but J1, J15, and J16 within MKC do so within one peak period. By 2033 the same three junctions will operate under saturated conditions in both peak periods, with a further three junctions (J5, J17 and J18 (MKC)) fully saturated in one peak period. The remaining junctions in MKC by 2033 will have least one arm, but more likely two to three arms, per junction in each peak period operating under saturated conditions. Only one junction (J7) (of seven) within BC operates with an arm operating in saturated conditions in 2020; by 2033 five of the seven junctions will have one or two arms saturated.

Table 8-1: Junction saturated conditions assessment[6]

Junction (number of arms)	2020 part saturated conditions	2020 fully saturated condition	2033 part saturated conditions	2033 fully saturated condition
J1 (4) MKC	3 arms AM	PM	NA	AM and PM
J2 (6) MKC	NA	NA	2 arms AM 1 arm PM	NA
J3 (4) BC	NA	NA	2 arms AM 1 arm PM	NA
J4 (3) BC	NA	NA	NA	NA
J5 (4) MKC	1 arm AM 1 arm PM	NA	3 arms AM	PM
J6 (3) MKC	1 arm AM	NA	2 arms AM 2 arms PM	NA
J7 (4) BC	1 PM	NA	2 arms AM 2 arms PM	NA
J8 (3) BC	NA	NA	1 arm AM 1 arm PM	NA
J9 (4) BC	NA	NA	2 arms AM 1 arm PM	NA
J10 (4) BC	NA	NA	2 arms AM 1 arm PM	NA
J11 (3) BC	NA	NA	NA	NA
J12 (4) MKC	NA	NA	1 arm AM 1 arm PM	NA
J13 (4) MKC	NA	NA	3 arms AM	NA
J14 (4) MKC	1 arm AM	NA	2 arms AM 1 arm PM	NA
J15 (4) MKC	3 arms PM	AM	NA	AM and PM
J16 (4) MKC	2 arms AM	PM	NA	AM and PM
J17 (4) MKC	NA	NA	3 arms AM	PM
J18 (4) MKC	1 arm AM	NA	3 arms PM	AM

8.20 It is evident that parts of the network are predicted to be congested by 2033 without Site development traffic, predominately on the A421 corridor within MKC. This is supported by the evidence base behind Plan:MK and the Draft VALP, which acknowledges[7] the potential congestion issues that would arise on the local road network predicated on unconstrained growth continuing to 2033. LTP Mobility Strategy 2036 acknowledges this with objectives to achieve significant modal shift,

[6] Source data from junction results tables from TRN2 and TRN3
[7] Plan:MK 2016 to 2031, adopted March 2019 paragraphs 4.48, 8.12 and 8.49

which would not be considered in the modelling performed or potential benefits applied to the modal choice for the Site development traffic.

8.21 Firstly, I will consider the operational characteristics of two existing junctions that are in close proximity to the Proposed Development (within MKC) and are contained within the red line application boundary, namely J5 Tattenhoe Roundabout and J6 Bottledump Roundabout. I then consider the other junctions.

Junction 5: Tattenhoe Roundabout

8.22 The Tattenhoe Roundabout junction was assessed using Junctions 9 (ARCADY). A negative capacity correction was applied against observed queue lengths to replicate current patterns and reduce the likelihood of overestimation of capacity for all scenarios modelled, where existing uneven lane use or lane starvation occurs on A421 Standing Way (E), Buckingham Road and A421 Standing Way (W) in the AM and all arms in the PM.

8.23 The results[8] show that in the 2020 Base scenario Snelshall Street operates at/above capacity (RFC of 1.0) in both peak periods, with a longest queue of 24 vehicles and delay of nearly 2 minutes in the AM. The remaining arms operate above practical capacity (RFC of 0.85) in both peak periods, with the longest queue of 10 on A421 Standing Way (E) and the greatest delay of nearly 1 minute on Buckingham Road. Considering local traffic growth, the 2033 Base DN scenario shows all arms are above theoretical capacity (RFC of 1.0) except for A421 (E) in the AM which is 0.99. This would have the greatest impact on Snelshall Street with the queue now over 180 vehicles in the AM extending for over 1 km with delay of 14 minutes. Buckingham Road queue would now extend to, and beyond in the PM, the proposed new access roundabout.

8.24 The inclusion of development traffic in DS1 without mitigation (detailed in paragraphs 8.22 to 8.25 below) would result in further degradation of performance, with all arms above theoretical capacity (RFC of 1.0), with Buckingham Road in the AM showing an RFC of 2.23. The model predicts queues on Snelshall Street of over 425 vehicles in the AM, blocking for over 2.5km with delay at 40 minutes. This is slightly better in the PM but there is still a queue over 2km with delay at 30 minutes. In both peaks this would extend beyond J12. On Buckingham Road the queue would now

[8] Table 4-3 Junction 5 – Tattenhoe Roundabout Junction Capacity Assessment Results, page 18 in TRN3

extend to and beyond J2 in the AM and PM. In the AM a queue of over 3km is possible that would nearly extend to J1. Delay was modelled at 70 and 47 minutes respectively.

8.25 The predicted decrease in capacity due to development traffic would be considered significant and the Appellant has submitted a mitigation scheme[9]. This includes altering the junction to 'part-time' traffic signals that would operate at peak periods with flare extended on Buckingham Road to provide greater stacking space. The central island would also be slightly narrowed to better accommodate two-lane straight-ahead and turning movements.

8.26 The results show that, with change to part-time signal control, all arms would see an improvement considering both peaks when comparing DS1 (2033 with development traffic) to 2033 DN (without development traffic), especially on Buckingham Road where queues would reduce from 50 to 8 in the AM and 59 to 20 in the PM, which would be contained in the link between the junction and the new access on Buckingham Road. Snelshall Street would still experience queues and delay, but these would be less than those predicted for the 2033 DN scenario and would not extend back to J12.

8.27 There are some potential safety concerns over queuing within the internal areas blocking exits, especially in the PM. It is evident that the proposal provides a significantly better option in terms of capacity than the existing layout with no queues blocking back to the site access on Buckingham Road. It is estimated that partial blocking of the exits on some arms may occur every other cycle based on uniform queue lengths. To mitigate against this additional 'Keep Clear' road markings have been included in the design.

8.28 An independent Stage 1 Road Safety Audit has been undertaken and the BC highways is satisfied that the problems identified can be resolved during detailed design. I consider that the mitigation proposal offers a viable alternative and is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF and that the residual impacts after mitigation would not be significant.

[9] Paragraphs 5.2.9 to 5.2.12 of TRN3, scheme layout drawing Appendix D of TRN3.

Junction 6: Bottledump Roundabout

8.29 The Bottledump Roundabout junction was assessed using Junctions 9 (ARCADY). Observation of video survey showed blocking back from the Buckingham Road exit into the roundabout, restricting movements from Whaddon Road. The same survey did not show queues extending back from J7 with no obvious cause for the temporary blocking except for weight of traffic seeking to pass ahead from the two-lane high-speed dual carriageway to a narrow single lane carriageway.

8.30 The junction has been assessed using the 'lane simulation' mode to accurately reflect the existing lane markings, uneven usage of the lanes and the exit restriction. It was agreed with the Appellant that on both Buckingham Road and Whaddon Road the ARCADY geometry approach road half-width be altered to match the respective entry width on each arm. This was requested on the basis that there is a known issue with the lane simulation model where the double counting of flare will negatively impact on the results. JCT Consultancy performed an independent review (Unequal Lane Usage in ARCADY using Junctions 9 – DRAFT 23/08/18) of the lane simulation mode compared to the industry known 'Barbara Chard methodology' detailed in the 1997 paper "ARCADY Health Warning". This identified the negative impact on the 'double counting' of entry flare has on the results and recommended that when accounting for unequal lane usage in the Lane Simulation mode then lane geometry needs to be changed so that the impact of the flare is not double-counted.

8.31 The results[10] show that in the 2020 Base A421 Standing Way in the PM and Whaddon Road in both peaks operate at/above capacity, but with acceptable queues (maximum of 20 vehicles on A421 Standing Way) and greatest delay of just over 1 minute. Considering local traffic growth, the 2033 Base DN scenario shows A421 Standing Way and Whaddon Road would operate above capacity. A421 Standing Way is predicted to experience queues of approximately 30 vehicles in the AM and 100 in the PM which would extend for about 500m, all within the outside lane. This may lead to greater use of the nearside lane to bypass queues with potential for conflict in the circulatory carriageway or exit to A421 Buckingham Road. On Whaddon Road the queue would extend for approximately 250 metres with delay of 6 minutes, increasing by approximately 5.5 minutes.

[10] Table 4-4 – Junction 6 – Bottledump Roundabout Junction Capacity Assessment Results, page 20 of TRN3

8.32 The inclusion of development traffic (without mitigation) in DS1 scenario would result in further degradation of performance, with the A421 Standing Way predicted to experience queues of approximately 40 in the AM and 125 vehicles in the PM which would extend for about 750 m, again all in the outside lane. Whaddon Road queues in the AM are predicted at 109 vehicles which would extend for approximately 530 metres, in the vicinity of the proposed Whaddon Rd access.

8.33 The predicted decrease in capacity due to development traffic would be considered significant for A421 Standing Way and Whaddon Road and the Appellant has submitted a mitigation scheme[11]. This includes widening the Buckingham Road exit to two lanes for an extended length to allow straight ahead movements from both lanes on A421 Standing Way, this would require a reduction of the flare available on A421 Buckingham Road. Furthermore, Whaddon Road would be widened slightly, and the central island narrowed to better accommodate two-lane straight-ahead movement. A new Pegasus crossing is also proposed on Whaddon Road south of the junction.

8.34 The mitigation results show that the A421 Standing Way would no longer suffer from lane starvation and would be well below 2033 DN queues and delay results and operates well within capacity. With the addition of the extended two-lane exit and relocation of the exit restriction Whaddon Road also now operates well within capacity with negligible queues and delay. However, a minor increase in queuing and delay on the Buckingham Road arm results is expected with the reduction flare length. Queuing on Buckingham Road increases from 11 vehicles in the 2033 DN scenario to 28 in DS1, an increase of 17 vehicles. Delay increases from 22 seconds to 49 seconds, an increase of 27 seconds.

8.35 An independent Stage 1 Road Safety Audit has been undertaken and BC highways is satisfied that the problems identified can be resolved during detailed design. Overall, the junction results would see a significant improvement considering both peaks comparing the mitigation layout DS1 scenario to the 2033 DN current layout. The residual impacts after mitigation would not be significant. I consider that the proposed mitigation scheme offers a viable alternative and is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF.

[11] Paragraphs 5.2.13 to 5.2.14 of TRN3, scheme layout drawing Appendix D of TRN3.

Junction 1: Sherwood Drive/Water Eaton Road/B4034 Buckingham Road

8.36 The junction has been assessed using Junctions 9 (ARCADY) in 'lane simulation' mode to accurately reflect the existing lane markings and uneven usage of the lanes. Capacity corrections were applied to all arms for both peaks periods to match observed queue lengths.

8.37 In the 2020 Base scenario the results[12] show that Sherwood Drive, Buckingham Road (W) and Water Eaton Road operate at/above capacity with a LoS of E/F in the AM with queues on Buckingham Road beyond the long flare, and due to unbalanced flows the outside right-turn lane suffers from starvation. In the PM peak all the arms operate at/above capacity with a LoS of E/F with the longest queue on Buckingham Road (E) of 35 vehicles and delay of 85 seconds, with the queue mainly contained in the nearside lane, but no lane blocking occurs.

8.38 In the 2033 DN scenario all arms operate above capacity with LoS of F in both peaks. Queues on Sherwood Drive would extend to Selwyn Close with an approximate 70 seconds of additional delay in each peak. On Buckingham Road (E) the nearside lane holds the majority of queue with the AM queue now extending to the Rail Bridge with an additional minute of delay whilst in the PM queues would block back to and beyond next roundabout with 5 minutes additional delay. On Buckingham Road (W) within each peak the nearside lane queue extends beyond the flared section with approximately 2 minutes more delay in the AM and 3.5 minutes in the PM. On Water Eaton Road within both peaks the nearside lane extends beyond the flare and blocks the outside lane which suffers from starvation, resulting in approximately respectively 6- and 4.5-minute additional delay. The addition of development traffic (DS1) would see further worsening of results with queues on Sherwood Drive extending to the fire station in the AM and in and PM beyond Selwyn Close with near identical delay. Both Buckingham Road approaches would see queues extending significantly further with delay increasing from 6 to 10 minutes in the PM on both arms and from 7.5 to 13 mins on the AM for Buckingham Road (W).

8.39 The predicted decrease in capacity due to development traffic would be considered significant and the Appellant has submitted a mitigation scheme[13]. This

[12] Table 4-1 – Junction 1 - Sherwood Drive/Water Eaton Road/B4034 Buckingham Road Junction Capacity Assessment Results, page 15 of TRN3

[13] Paragraphs 5.2.1 to 5.2.5 of TRN3, scheme layout drawing Appendix D of TRN3

includes providing two straight ahead lanes on the Buckingham Road (B4034) arms of the junction and minor kerb amendments to the Water Eaton Road and Sherwood Drive arms. To allow for the two lane exit on the Buckingham Road (East) the bus stop layby on the north side of road has been replaced with an on-carriageway stop.

8.40 BC highways raised concern over the apparent new footway width on Buckingham Road (E), with the southern side narrowed to accommodate the revised bus stop location. A site visit was performed to measure existing footway widths on the southern side of the road either side of the junction, some discrepancy was noted between the OS plan used as the basis for design and the current layout, with variations between 0.4 and 1.8 metres. This may result in the footway behind the bus stop being in the region of 1.5 metres. This concern was provided as part of ongoing application discussions and the Appellant responded by formal letter dated 7th April 2021 (attached at Appendix F). This concluded that a width of 1.5 metres would be compliant with the Department for Transport's Inclusive Mobility[14] as the minimum acceptable footway width to enable a wheelchair user and a walker to pass one another. The Appellant also stated that further assessment would be completed at the detailed design stage and subject to finalising the s278 agreement. Whilst the actual resultant footway width will not be known until detailed design is performed the potential conflict point is noted for future consideration.

8.41 BC highways also sought clarification on the proposed design in terms of swept path analysis. The Appellant provided swept path analysis on the 7th April 2021 (attached at Appendix G), along with other junctions within Milton Keynes. On review of this information is noted that the two lane movements from Buckingham Road (W) to Buckingham Road (E) are close to touching and the corner kerb line. While the analysis shows the movement is possible it is considered that further minor alteration may be required as part of the detailed design process, however this does not result in the improvement being considered undeliverable as, for example, it is possible that a small amount of additional road space could be taken from the central island to accommodate the movements. Small amendments to design such as this are common as part of the detailed design process.

[14] Department for Transport, Inclusive Mobility (2005) – Section 3.1

8.42 The results show that with the provision of the proposed mitigation, when compared to the 2033 Do Nothing scenario, queueing and delay on Buckingham Road (W) is significantly reduced in the AM and PM peaks with delay now less than 20 seconds (compared to 6 to 7.5 minutes). Buckingham Road (E) would see a slight increase in queues in the AM, but now distributed more evenly across the lanes with no blocking back to the previous roundabout, whilst in the PM the new layout would see a reduction in queue and delay that would still block to the next roundabout but not beyond and is an improvement compared to the DN scenario. There would be slight worsening of results for Sherwood Drive in both peaks, and Water Eaton Road in the PM but overall the junction results would see an improvement considering both peaks compared to 2033 DN with the demand weighted Junction Delay reducing from 250.19 to 84.96 seconds in the AM and from 242.62 to 89.36 seconds in the PM.

8.43 An independent Stage 1 Road Safety Audit has been undertaken and BC highways is satisfied that the problems identified can be resolved during detailed design. It is considered that the proposed mitigation scheme offers a viable alternative and is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF.

Junction 2: Shenley Road/Newton Road/B4034 Buckingham Road

8.44 The junction has been assessed using Junctions 9 (ARCADY). The nearside lane on Buckingham Road (W) junction takes 86% to 92% of movements during the peak periods, which will likely create some unbalanced usage with overestimation of entry capacity and lane starvation. A negative capacity correction was applied against observed queue lengths to replicate current patterns and reduce likelihood of overestimation of capacity for all scenarios modelled.

8.45 The results[15] show that in the 2020 Base, the junction operates satisfactory with all arms operating within capacity (RFC of 1.0) with only Buckingham Road (W) on the western roundabout operating above RFC of 0.85. All queues and delays are short ranging between from 0 to 6 vehicle queue and maximum delay of 23 seconds. Taking into account local traffic growth the 2033 Base DN scenario shows that at the eastern junction Buckingham Road (E) will operate above RFC 1.0 in the PM with queues now

[15] Table 4-2 – Junction 2 - Shenley Road/Newton Road/B4034 Buckingham Road Junction Capacity Assessment Results, page 16 of TRN3

extending 270 m to Milton Grove (47 vehicles). This is due to the storage on the internal arm on entry to the western roundabout creating an exit restriction. On the western roundabout in the AM Newton Road and Buckingham Road (W) are above theoretical capacity (RFC 1.0) with the queue on Buckingham Road (W) extending to Tattenhoe Lane with delay of 7 minutes (from 15 seconds in 2020) and the queue on Newton Road extending to St. Mary's Avenue (56 vehicles) with delay 7 minutes (from 15 seconds in 2020).

8.46 The inclusion of development traffic in DS1 would result in Shenley Road in the PM operating above capacity along with Buckingham Road (E) at the eastern roundabout with Newton Road and Buckingham Road (W) operating further above capacity at the western roundabout. At the eastern roundabout Buckingham Road (E) in the PM the queue now extends to Wilkinson Close (approximately 750m) with delay increasing from 2 to 7.5 minutes. At the western junction in the AM queues are further increased with Newton Road now extending for 500m to St. Aidans Close with delay of 11 minutes. On Buckingham Road (W) the queue extends to Whaddon Road with delay up to 15.5 minutes. The junction would be further detrimentally impacted when considering the Shenley Park development (DS3) but see some improvement when considering the travel planning scenario (DS2), albeit some arms would still perform poorly.

8.47 The predicted decrease in capacity due to development traffic would be considered significant and the Appellant has submitted a mitigation scheme. This includes kerb widening on all arms of the mini roundabout to improve capacity. To allow for two lane entry on Shenley Road the existing lay-by would need to be removed.

8.48 The results[16] show that with the provision of the proposed mitigation that overall, the junction results would see an improvement considering both peaks when comparing the mitigation layout DS1 scenario to the existing layout 2033 DN scenario. At the eastern junction Buckingham Road (E) in the PM queue will still extend to Wilkinson Close (approximately 750m). This is impacted by downstream internal link storage being filled, creating exit restriction. The remaining arms on the eastern roundabout would have improved or similar results compared to 2033 DN. At the western junction in the AM queues and delay are reduced compared to 2033 DN with

[16] Paragraphs 5.2.6 to 5.2.8 of TRN3, scheme layout drawing Appendix D of TRN3.

Buckingham Road (W) seeing queue reductions from 60 to 33 and delay reducing from 7 to 2.5 mins. Newton Road is also expected to see an improvement, with queues and delay reducing by over half compared to DN 2033. A new lane has been formed with the turning proportions unbalanced in both peak periods with the outside lane likely to suffer from some starvation so the benefits on this arm are likely to be overestimated, although overall it is considered that the junctions will see improvement.

8.49 BC highways also sought clarification on the proposed design in terms of swept path analysis. The Appellant provided swept path analysis on the 7th April 2021 (attached at Appendix G), along with other junctions within Milton Keynes. On review of this information no concerns were raised with the major movement considered to be able to be completed satisfactorily.

8.50 An independent Stage 1 Road Safety Audit has been undertaken and BC highways is satisfied that the problems identified can be resolved during detailed design. It is considered that the proposed mitigation scheme offers a viable alternative and is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF. Although it should be noted that widening for the western roundabout on the Buckingham Road (West) arm indicates converting existing footway allocation to carriageway, this is not considered appropriate and as part of detailed design it will need to be shown that at minimum similar level of footway provision is present, with possible conversion of the existing verge (within the highway).

Junction 3: Bletchley Road/Stoke Road/Drayton Road/Whaddon Road

8.51 The junction has been modelled using Junctions 9 (PICADY). There has been some discussion as to whether the junction should be modelled as a staggered crossroads as the two minor roads do not directly align. Whilst this is the case, the actual straight-ahead movements from the minor roads of Stoke Road and Whaddon Road are not performed as two separate turn movements, as would be expected from a true staggered crossroads, rather site visits have shown these movements occur as a diagonal single movement. The junction layout does not conform to typical crossroad or staggered crossroad design and falls somewhere between the two, and as such the modelling results would likewise follow a similar pattern. To ensure that the crossroads model reflects 2020 observations BC highways requested that the geometry of

Whaddon Road was reduced to reflect current queues, with this geometry reduction carried through to the future year scenarios results.

8.52 The results[17] show that in the 2020 Base, the Stoke Road arm is approaching theoretical capacity (RFC of 1.0) in the AM peak and is above practical capacity (RFC of 0.85) in the PM. In the future year of 2033 (Do Nothing) Stoke Road operates at/above capacity in both peak hours with a maximum queue of 47 vehicles and a delay of 6 minutes in the AM peak. Whaddon Road also exceeds theoretical capacity in 2033 (Do nothing) in the AM with a predicted queue of 16 vehicles and delay of 2.5 minutes.

8.53 With the addition of the Proposed Development (DS1), performance of the junction decreases with both Stoke Road and Whaddon Road now both operating above RFC of 1.0 in both peak periods. There is a maximum queue on Stoke Road of 73 vehicles and a delay of 10 minutes: an increase of 26 vehicles and delay of 4 minutes in the AM peak. In the PM peak the delay increases from 3.5 minutes in the 2033 DN scenario to 7 minutes in DS1; an increase of approximately 3.5 minutes. Whaddon Road would see an increase in queues from 16 in the 2033 DN scenario to 46 in the DS1 scenario, an increase of 25 vehicles which would extend beyond Manor Road, with an additional 4.5 minutes of delay in the AM.

8.54 The results for Do Something 2 (DS2) indicate a slight betterment compared to DS1, but still show a material impact on queues and delay compared to 2033 DN. Do something 3 (DS3) which includes potential Shenley Park traffic shows further worsening of results when compared to DS1 with the longest queue on Stoke Road of 80 vehicles in the AM and delay of 11 minutes.

8.55 The modelling exercise has shown that the addition of development traffic would have a material impact on the operation of the junction. The Appellant has however proposed changing the form of the junction from a priority crossroads to a mini roundabout, the results[18] of which predict that the junction would operate within practical capacity (0.85 RFC) for all DS scenarios with maximum queue of 3 vehicles and delay of delay of 20 seconds on Stoke Road. Whilst the change in junction form would improve the capacity operation road safety concerns were raised within the Road

[17] Table 4-1 – Junction 3 - Bletchley Road/Stoke Road/Drayton Road/Whaddon Road, page 15 of TRN2

[18] Paragraphs 5.2.1 to 5.2.3 of TRN2, scheme layout drawing Appendix D of TRN2.

Safety Audit in relation to operation, lack of deflection (due to land constraints) and achievable visibility due to adjacent property lines.

8.56 Initial indications by BC highways on review of the mini-roundabout design against 'CD116 Geometric design of roundabouts' showed less than desirable visibility to the right on Drayton Road and stopping sight distance on three of the arms. Paragraph 2.12.1 of CD116 also states that a 4-arm mini-roundabout should not be used where the sum of the maximum peak hour entry flows for all arms exceeds 500 vehicles per hour, which would be the case in all future year scenarios.

8.57 Furthermore, it was considered that by providing a junction with increased capacity would serve to encourage non-local traffic using Stoke Road and Whaddon Road as a 'Rat-run' between the A4146 to the south-east and the A421 to the north-west.

8.58 The mitigation as proposed by the Appellant shows that the residual impacts would not be significant. However, based on avoiding the use of the village as a rat run, BC highways recommends that the junction is retained as a priority crossroads. A new raised junction table should be provided, as part of a comprehensive traffic calming scheme for Newton Longville. This would act to slow vehicle approach speeds to the junction and make the junction more visible to drivers.

Junction 4: Whaddon Road/Westbrook End

8.59 The results[19] of the assessment show that the junction operates within capacity in both the AM and the PM peak in all scenarios tested. No mitigation is therefore required at this junction.

Junction 7: A421/Coddimoor Lane/Whaddon Road (Whaddon Crossroads)

8.60 The junction has been modelled using Junctions 9 (ARCADY). The results[20] show that in the 2020 AM Base the western arm of A421 along with the Whaddon Road arm are approaching capacity (RFC of 1.0) in the AM. In the 2020 PM Base, the Whaddon Road arm operates above theoretical capacity (RFC of 1.0). In the future year 2033 DN scenario the approaches of A421 and the Whaddon Road arm are operating

[19] Table 4-2 – Junction 4 - Whaddon Road/Westbrook End, page 17 of TRN2
[20] Table 4-3 – Junction 7 – Whaddon Crossroads, page 19 of TRN2

at/above capacity (RFC of 1.0) in both the AM and PM peaks. The worst queuing is on Whaddon Road with a maximum queueing of 72 vehicles with a corresponding delay of 15.5 minutes in the PM peak. The A421 (W) arm would see queues of 57 in the AM but much lower delay of approximately 2 minutes.

8.61 With the addition of the Proposed Development the performance of the junction decreases with both arms of A421 and Whaddon Road operating above capacity (RFC of 1.0) in the AM and PM peaks. Maximum queueing is 112 vehicles on A421 (E) with a corresponding delay of 22 minutes on Whaddon Road in the PM peak representing an increase in queuing of 40 vehicles and delay of 6.5 minutes. The AM also sees significant increases for Whaddon Road along with both A421 arms. Both arms of A421 and Whaddon Road would continue to operate above RFC of 1.0 for both DS2 and DS3 scenarios, which would be considered significant in the context of NPFF.

8.62 The Appellant has proposed alterations to the current layout to improve capacity. This involves realignment of the kerbs on the approaches from the A421 (east) and A421 (west) with associated amendments to the kerb/islands allowing for two lane roundabout entry and short two lane exit. Whaddon Road entry would also be widened with a reduction in the traffic island size.

8.63 The modelling results[21] show that the proposed mitigation package will reduce queueing and delay on the A421 and Whaddon Road arms of the junction below the levels identified in the 2033 DN Scenario. There will be small increases in queuing and delay on the Coddimoor Lane arm, but these are negligible with predicted queues still less than one and maximum delay of less than 20 seconds.

8.64 An independent Stage 1 Road Safety Audit has been undertaken and BC highways is satisfied that the problems identified can be resolved during detailed design. The current design encourages two lanes of through traffic that could increase the risk of side swipe collisions at the A421 exit arms with additional road markings and signing offered as a potential solution. Whilst this may aid in mitigating the potential conflict it may also be necessary to consider lengthening of two lane exit tapers to allow for controlled and safe merging, which could be achieved within the highway boundary and will need to be considered as part of detailed design process.

[21] Paragraphs 5.2.5 to 5.2.6 of TRN2, scheme layout drawing Appendix D of TRN2

8.65 The proposed improvement to this junction should provide a 'nil-detriment' situation, whereby the highway network is 'no worse off' with the proposed development in a future forecast year of 2033. This goes beyond the requirements of the NPPF and therefore is considered acceptable by the Highway Authority

Junction 8: A421/Warren Road

8.66 The junction has been modelled using Junctions 9 (PICADY)[22]. The junction is predicted to operate over capacity (1.0) on the minor road arm (Warren Road) in both the AM and PM peak because of the traffic growth forecast to 2033, without development. This is because of higher traffic flow on the A421 preventing sufficient gaps for turning traffic.

8.67 The Appellant has proposed a mitigation scheme to increase capacity through signalisation of the junction. The proposed improvement to the A421/ Warren Road junction has been modelled using LINSIG 3 and the results[23] indicate significant benefits in terms of queueing and delay on Warren Road in all the modelled scenarios, with the DS3 scenario (which includes both SWMK and projected Shenley Park development traffic) having predicted queues and delay less than the current layout 2020 results on Warren Road. However, the signalisation of the junction would impose queues and delay on the A421 corridor. The overall position on the mitigation for J8 is detailed in paragraph 8.72 below as the junctions are considered collectively.

8.68 An independent Stage 1 Road Safety Audit has been undertaken and BC highways is satisfied that the problems identified can be resolved during detailed design. It may require review of current speed limits to ensure stopping sight distance visibility could be achieved. This would need to be determined if taken forward to detailed design.

Junction 9 A421/Shucklow Hill/Little Horwood Road

8.69 The junction has been modelled using Junctions 9 (PICADY)[24]. The junction currently operates well with all arms less than 0.75 RFC and is predicted to operate over capacity on the minor road arms (Shucklow Hill/ Little Horwood Road) in both the

[22] Table 4-4 – Junction 8 – A421/Warren Road, page 21 of TRN2
[23] Paragraphs 5.2.7 to 5.2.8 of TRN2, scheme layout drawing Appendix D of TRN2
[24] Table 4-5 – Junction 9 – A421/Warren Road, page 23 of TRN2

AM and PM peak due to traffic growth forecast to 2033, without development. This is because of higher traffic flow on the A421 preventing sufficient gaps for turning traffic out of the minor roads.

8.70 The Appellant has proposed a mitigation scheme to increase capacity through signalisation of the junction. The proposed improvement to the A421/Warren Road junction has been modelled using LINSIG and the results[25] indicate significant benefits in terms of queueing and delay on Shucklow Hill and Little Horwood Road in all the modelled scenarios. However, the signalisation of the junction would impose queues and delay on the A421 corridor with a queue of 24 predicted for the western arm of the Little Horwood side of the staggered crossroads.

8.71 An independent Stage 1 Road Safety Audit has been undertaken and the County Council is satisfied that the problems identified can be resolved during detailed design. One problem raised the issue of the close proximity of the two signalised junctions that could cause confusion leading to rear end shunts or side-swipe collisions. Proposed mitigation involved signing and road markings, but if the scheme moved forward to detailed design the use of louvred traffic signal heads would also need to be considered.

8.72 The cumulative residual impact of the development Junctions 8 and 9 cannot be considered 'severe' in the context of paragraph 109 of the NPPF with no delay for any arm of the A421 at J8 or J9/J10 expected to exceed 25 seconds. However, at present the A421 is free flowing along most of its length in Buckinghamshire, with junctions managed through priority junctions or roundabouts. Whilst the introduction of signals would significantly reduce queuing on the side roads, it would also stop the free flow and introduce delays to the primary route and potentially provide a stop / start scenario. In this regard the principle of commuting an equivalent construction cost of the proposed junction improvement into a Section 106 contribution for A421 corridor improvements between the site and Buckingham is preferable.

[25] Paragraphs 5.2.7 to 5.2.8 of TRN2, scheme layout drawing Appendix D of TRN2

Junction 10: A421/Nash Road/Winslow Road

8.73 The junction has been modelled using Junctions 9 (ARCADY)26. Capacity corrections were applied to A421 (West) and Nash Road to match existing observed queues.

8.74 The results of the assessment show that in the 2020 Base scenario A421 (West) is operating close to theoretical capacity (RFC of 1.0) but with relatively small queues and delay of approximately 1 minute in both peaks. Nash Road exceeds RFC 0.85 in the AM, but with small queues and delay of just over a minute, but has no issues in the PM. The remaining arms operate within capacity for both peak periods in the 2020 Base scenario.

8.75 In the 2033 DN scenario, without development, the A421 (E) now operates with an RFC above 0.85 in the AM and PM and is close to theoretical capacity (RFC of 1.0). A421 (W) would exceed theoretical capacity in both peaks with queues of 58 and 88 vehicles respectively with the longest delay of approximately 5 minutes. Nash Road would exceed theoretical capacity in the AM and be close in the PM with predicted queues of respective queues in the AM and PM of 56 and 8 vehicles, with delay of approximately 7.5 minutes in the AM and 1.5 minutes in the PM.

8.76 With the addition of development traffic (DS1) A421 (E) still operates between practical and theoretical capacity with similar levels of queues and delay. A421 (W) would see an increase in queues of 23 vehicles in the PM with an additional delay of nearly 2 minutes. Nash Road would now exceed RFC of 1.0 in both peak periods with increases to queue of 15 vehicles in the AM and additional 2 minutes of delay.

8.77 The predicted decrease in capacity due to development, along with the Shenley Park development on the A421 arms, might not be considered severe in context of the NPPF. However, the Appellant has submitted a mitigation scheme, in recognition that the junction is operating close to theoretical capacity on the A421 eastern arm and now exceeds this on Nash Road in the PM. This includes realignment to the kerb on the A421 (East) and (West) arms to allow for a longer entry flare to the roundabout, with some minor amendments to the traffic island on Nash Road.

8.78 This mitigation improvement[27] shows that in the DS 1 scenario RFC, queuing and delay is reduced to below the 2033 Do Nothing scenario on the two A421 arms.

[26] Table 4-6 – Junction 10 – A421/Nash Road/Winslow Road Roundabout, page 25 of TRN2

[27] Paragraphs 5.2.9 to 5.2.10 of TRN2, scheme layout drawing Appendix D of TRN2.

Nash Road will experience a slight worsening of results, but these would not be considered significant with overall junction improvements.

Junction 11: Stock Lane/Shenley Road/Coddimoor Lane

8.79 The junction has been modelled using Junctions 9 (PICADY). The results of the assessment show that the junction operates within capacity in both the AM and the PM peak in all scenarios tested. No mitigation is therefore required at this junction.

8.80 The accuracy of the traffic flows, and subsequent traffic modelling has been queried on the basis that road closures were in place within north Milton Keynes impacting the potential movements through the junction. A sensitivity test was performed by BC highways where the 2015 data collection was growthed by 40% with along with re-routing development traffic heading north off Milton Keynes included in the assessment as detailed in the development trip distribution. The results of the sensitivity test are detailed below which indicates that even in the worst case (where all northbound movement from both the Whaddon Road and Buckingham Road access) the junction would continue to work well within capacity.

Table 8-2 Junction 11: Stock Lane/Shenley Road/Coddimoor Lane – Sensitivity Testing

Arm Description	AM			PM		
	Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2033 Do Something 1						
Shenley Road left-turn	0.2	7.22	0.16	0.2	6.78	0.15
Shenley Road right-turn	0.2	11.00	0.14	0.3	10.27	0.23
Coddimoor Lane right-turn	0.7	7.79	0.34	0.3	6.43	0.17

Junction 12: Kingsmead Roundabout

8.81 The junction has been modelled using Junctions 9 (ARCADY). The nearside lane on Chaffron Way takes 75 to 85% of movements during the peak periods, which will likely create some unbalanced usage with overestimation of entry capacity and starvation. A negative capacity correction was applied against observed queue lengths to replicate current patterns and reduce likelihood of overestimation of capacity for all scenarios modelled.

8.82 The results[28] show that in the 2020 Base, the junction operates with satisfactory performance with all arms operating within practical capacity (RFC of 0.85) with no queue exceeding 4 vehicles and maximum delay of 27 seconds. Considering local traffic growth the 2033 Base DN scenario shows all arms bar Chaffron Way still operate under practical capacity (0.85). Chaffron Way now operates over theoretical capacity (1.0 RFC) with long queues and delay, especially in the PM where delay is now 9.5 minutes (previously 17 seconds) with queues increasing from 2 to 110 vehicles and extending for of over 500m.

8.83 For all 2033 scenarios the queue on Snelshall Street (N) in the AM and Snelshall Street (S) in the PM may extend beyond the current flare on occasion. This may result in short-term blocking of an entry lane and means the results are slightly optimistic. However, for most of the modelled period this is unlikely to occur and it is anticipated that the results would not alter to a point where significant change would be recorded.

8.84 The inclusion of development traffic in DS1 would result in further queues and delay on Chaffron Way in both peak periods with queues blocking back to Westcroft roundabout (J13) with delay of 15.5 minutes in the PM. Snelshall Street (N) and (S) in the PM operate at or above practical capacity, but still under theoretical capacity, and queues and delay are still small with maximum queue of 10 on Snelshall Street (N) in the AM and delay of 39 seconds. In DS3 (Shenley Park development) the inclusion of Shenley Park link road would see fewer vehicles through the junction and less impact with DS3 providing very similar results to 2033 DN.

8.85 The predicted decrease in capacity due to development traffic would be considered significant for Chaffron Way and the Appellant has submitted a mitigation scheme[29]. This includes kerb widening Chaffron Way to improve capacity.

8.86 The provision of the proposed mitigation means that overall the junction results would see an improvement considering both peaks compared to existing layout 2033 DN results, with the demand weighted Junction Delay reducing in the AM from 113.41 to 101.68 seconds and in the PM from 185.82 to 155.87 seconds. Chaffron Way still operates above theoretical capacity (RFC of 1.0) but has improved compared to the DN scenario with delay reduced from 7.5 to 6.5 minutes in the AM and 9.5 to 8.3 minutes

[28] Table 4-5 – Junction 12 – Kingsmead Roundabout Junction Capacity Assessment Results, page 22 of TRN3

[29] Paragraphs 5.2.15 to 5.2.16 of TRN3, scheme layout drawing Appendix D of TRN3.

in the PM, with the queue in the PM no longer blocking back to Westcroft roundabout (J13). Minor increases in queuing and delay are evident on the other arms of the junction but overall, the mitigation measures would provide an improvement.

8.87 An independent Stage 1 Road Safety Audit has been undertaken and BC highways is satisfied that the problems identified can be resolved during detailed design. It is considered that the proposed mitigation scheme offers a viable alternative, that the residual impacts after mitigation would not be significant and that the mitigation is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF.

Junction 13: Westcroft Roundabout

8.88 The junction has been modelled using Junctions 9 (ARCADY)[30]. A negative capacity correction was applied against Tattenhoe Street (N) and (S) Chaffron Way (E) arms in the AM and for Tattenhoe Street (S) and Chaffron Way (W) in the PM to replicate current patterns and reduce likelihood of overestimation of capacity for all scenarios modelled.

8.89 All arms in both peaks operate under theoretical capacity (1.0 RFC) but Tattenhoe Street (S) in the AM and Chaffron Way (W) in the PM operate at or above practical capacity (0.85 RFC). No queue exceeds 6 vehicles with a maximum delay of 32 seconds. Considering local traffic growth, the 2033 Base DN scenario shows Tattenhoe Street (N) and (S) and Chaffron Way (E) operate above RFC of 1.0 in the AM and Chaffron Way (W) in the PM. This results in long queues in the PM on Chaffron Way (W) of 84 vehicles (from 5) and delay increasing from 32 seconds to 6.5 minutes. In the AM there is significant increase in queues and delay, with the longest delay now at 4.5 minutes compared to 24 seconds and the longest queue is now 57 vehicles compared to 6.

8.90 The inclusion of development traffic would result in only minor increases in results for both AM and PM peaks with queues predicted to stay similar to 2033 DN levels or increase by at worst 6 vehicles and delay by approximately 30 seconds. The residual cumulative impact of the Proposed Development in 2033 at this junction is not considered to be significant and I agree that mitigation is therefore not required.

[30] Table 4-6 – Junction 13 – Westcroft Roundabout Junction Capacity Assessment Results, page 23 of TRN3

Junction 14: Furzton Roundabout

8.91 The junction has been modelled using Junctions 9 (ARCADY). A negative capacity correction was applied against Fulmer Street (S) and Chaffron Way (E) and (W) in the AM, and for Fulmer Street (N) and (S) and Chaffron Way (E) in the PM to replicate current patterns and reduce likelihood of overestimation of capacity for all scenarios modelled.

8.92 The results[31] show that in the 2020 Base Fulmer Street (S) and Chaffron Way (W) are approaching capacity (RFC of 1.0) in the AM peak, but with relatively small queues (maximum 15 vehicles) and delay not exceeding 1 minute. In the PM peak Chaffron Way (E) operates above capacity (RFC of 1.0) with a queue of approximately 30 vehicles and delay of 110 seconds. By the 2033 (Do Nothing) Fulmer Street (S) and Chaffron Way (W) will operate above capacity (RFC of 1.0) in the AM peak with queues now in region of 70 and 260 vehicles respectively, with Chaffron Way (W) likely to block to and beyond J13 (Westcroft roundabout). In the PM Chaffron Way (E) operates above capacity (RFC of 1.0) with a queue of nearly 300 vehicles which would block back to and beyond The Bowl Roundabout.

8.93 With the addition of the development traffic (DS1) those already poorly performing arms would see further increases in queueing and delay, with the largest increase evident on Fulmer Street (S) in the AM peak and Chaffron Way (E) in the PM peak. The predicted decrease in capacity due to development traffic would be considered significant for Chaffron Way (E) and the Appellant has submitted a mitigation scheme[32]. This includes kerb widening on Chaffron Way (E) and (W) and Fulmer Street (S) to improve capacity.

8.94 With the provision of the proposed mitigation overall the junction results would see an improvement considering both peaks compared to current layout 2033 DN with the demand weighted Junction Delay reducing in the AM from 364.45 to 193.91 seconds and in the PM from 389.62 to 143.39 seconds. When comparing DS1 to 2033 DN existing layout both Fulmer Street (S) and Chaffron Way (W) in the AM still operate at or above theoretical capacity (RFC of 1.0) but queues and delay are less with Chaffron Way (W) no longer blocking back to J13 (Westcroft Roundabout). While in the PM

[31] Table 4-7 – Junction 14 – Furzton Roundabout Junction Capacity Assessment Results, page 25 of TRN3

[32] Paragraphs 5.2.17 to 5.2.18 of TRN3, scheme layout drawing Appendix D of TRN3.

Chaffron Way (E) is also still above theoretical capacity (RFC of 1.0) but queues and delay are less and will no longer block back to The Bowl roundabout.

8.95 An independent Stage 1 Road Safety Audit has been undertaken and the BC highways are satisfied that the problems identified can be resolved during detailed design. It is considered that the proposed mitigation scheme offers a viable alternative, that the residual impacts after mitigation would not be significant and that the mitigation is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF with overall improvement in capacity terms.

Junction 15: Bleak Hall Roundabout

8.96 The junction has been modelled using Junctions 9 (ARCADY). A negative capacity correction was applied against all arms in the AM and PM to replicate current patterns and reduce the likelihood of overestimation of capacity for all scenarios modelled.

8.97 The results[33] show that in the 2020 Base all arms operate above theoretical capacity (RFC of 1.0) in both peaks. In the AM A421 Standing Way (E) experiences the longest queue (45 vehicles) and Grafton Street (N) the longest delay at almost 2 minutes. In the PM A421 Standing Way (W) has the longest queue at 46 vehicles and Grafton Street (N) the longest delay once more at just over two minutes. By the 2033 (Do Nothing) all the arms are shown to have queues at or exceeding 100 vehicles in both peak periods, with A421 Standing Way (W) queues extending close to J16 (Elfield Park Roundabout). Maximum delay in the AM is on Grafton Street (N) of just over 7 minutes in the AM and just over 8 minutes in the PM.

8.98 With the addition of the development traffic (DS1) further reduction in capacity is expected with queues now predicted to exceed 300 or close to reaching 400 vehicles with the A421 Standing Way (W) blocking back to J16. The predicted decrease in capacity due to development traffic would be considered significant and the Appellant has submitted a mitigation scheme[34]. This includes kerb widening on all arms to improve capacity.

[33] Table 4-8 – Junction 15 – Bleak Hall Roundabout Junction Capacity Assessment Results, page 26 of TRN3

[34] Paragraphs 5.2.19 to 5.2.24 of TRN3, scheme layout drawing Appendix D of TRN3.

8.99 The proposed mitigation results show that overall the junction would see an improvement considering both peaks compared to existing layout 2033 DN scenario with the demand weighted Junction Delay reducing in the AM from 405.00 to 326.66 seconds and in the PM from 392.55 to 339.20 seconds. When comparing DS1 to the existing layout 2033 DN queuing and delay is reduced on the A421 Standing Way (E) and Grafton Street (N) arms in the AM peak. In the PM peak queueing and delay is reduced on the Grafton Street (S) and Standing Way (W) arms when compared to the 2033 Do Nothing scenario. Increases in queueing and delay are evident on the other arms of the junction when compared to the 2033 Do Nothing scenario but overall junction improvements will be seen, with A421 Standing Way (W) queue no longer expected to block back to J16.

8.100 BC highways also sought clarification on the proposed design in terms of swept path analysis. The Appellant provided swept path analysis on the 7th April 2021 (attached at Appendix G), along with other junctions within Milton Keynes. On review of this information no concerns were raised with the major movement considered to be able to be completed satisfactorily.

8.101 An independent Stage 1 Road Safety Audit has been undertaken and BC highways is satisfied that the problems identified can be resolved during detailed design. It is considered that the proposed mitigation scheme offers a viable alternative, that the residual impacts after mitigation would not be significant and the mitigation is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF with overall improvement in capacity terms. Furthermore, the junction has been identified in two separate Milton Keynes studies (LTP4 Transport Infrastructure Development Plan (TIDP, 2019) and MK Multi Modal Model Impacts of Plan MK report, November 2017) as a site for potential capacity improvements due to known capacity issues.

Junction 16: Elfield Park Roundabout

8.102 The junction has been modelled using Junctions 9 (ARCADY). A negative capacity correction was applied against all arms in the AM and PM to replicate current patterns and reduce likelihood of overestimation of capacity for all scenarios modelled.

8.103 The results[35] show that in the 2020 Base Watling Street (E) and (W) are approaching theoretical capacity (RFC of 1.0) in the AM, while both A421 Standing Way arms operate above theoretical capacity. In the PM all arms operate above theoretical capacity. The longest queue is recorded on A421 Standing Way (S) with nearly 50 vehicles with Watling Street (W) seeing the worst delay at nearly 3 minutes. By the 2033 DN scenario all the arms operate above theoretical capacity with queues on all arms (except Watling Street (W)) exceeding 100 vehicles with the greatest delay experienced on Watling Street (W) in the PM of nearly 10 minutes. The junction has been identified in two separate Milton Keynes studies (LTP4 Transport Infrastructure Development Plan (TIDP) and MK Multi Modal Model Impacts of Plan MK report, November 2017) as a site for potential capacity improvements due to known capacity issues.

8.104 With the addition of the development traffic (DS1) further reduction in capacity is expected with queues on A421 Standing Way (S) and (N) now predicting to exceed 300 or close to reaching 400 vehicles, with A421 Standing Way (N) exceeding 400 vehicles in the PM, which would block back to and beyond Bleak Hall Roundabout (J15). The longest delay would now be found on A421 Standing Way (N) of 16 minutes. Maximum RFC's are lower in the Do Something 2 (travel planning) scenario but indicate similar results to that of the Do Something 1 scenario. In the Do Something 3 (Shenley Park) scenario the results show slightly higher RFCs than the Do Something 1 scenario.

8.105 The predicted decrease in capacity due to development traffic would be considered significant and the Appellant has submitted a mitigation scheme[36]. This includes kerb widening on all arms to improve capacity. The results show, with the provision of the proposed mitigation, that overall the junction results would see an improvement considering both peaks compared to 2033 DN existing layout. The demand weighted Junction Delay reduces in the AM from 327.48 to 310.44 seconds and in the PM from 427.02 to 396.22 seconds. When comparing DS1 to 2033 DN queuing and delay is reduced on the Watling Street (W) and (E) in both peak periods. A421 Standing Way (N) would see reduction in the AM and A421 Standing Way (S) in the PM. A421 Standing Way (N) in the PM and A421 Standing Way (S) in the AM would see increase in queues and delay with A421 Standing Way (N) predicted queues likely

[35] Table 4-9 – Junction 16 – Elfield Park Roundabout Junction Capacity Assessment Results, page 28 of TRN3

[36] Paragraphs 5.2.25 to 5.2.31 of TRN3, scheme layout drawing Appendix D of TRN3.

to extend back to beyond Bleak Hall Roundabout. In DS2 the queues and delay would be reduced while DS3 would see a slight increase in results.

8.106 BC highways registered concern over the potential blocking back to J15 Bleak Hall roundabout. The Appellant provided a response on 7th April 2021 (attached at Appendix H). This highlighted a further review of the junction and the flows used in the model and that only a slight reduction (5%) in network flow would result in no blocking back. It is agreed that a robust growth has been applied to the flows used in the modelling, with TEMPRO growth factor over 15% along with higher banded of employment rates to provide a 'worst case' flow scenario. The Appellant also made reference to the Department for Transport's 'Appraisal and Modelling Strategy – A Route Map For Updating TAG During Uncertain Times' (July 2020) which recommends the use of scenarios to assist with modelling future outcomes. Although the DfT has yet to publish updated forecasts, there is a clear indication of a downward trend in trips to account for the lower economic output.

8.107 BC highways also sought clarification on the proposed design in terms of swept path analysis. The Appellant provided swept path analysis on the 7th April 2021 (attached at Appendix G), along with other junctions within Milton Keynes. On review of this information no concerns were raised with the major movement considered to be able to be completed satisfactorily.

8.108 An independent Stage 1 Road Safety Audit has been undertaken and BC officers are satisfied that the problems identified can be resolved during detailed design. It is considered that the proposed mitigation scheme offers a viable alternative and is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF with overall improvement in capacity terms. The issue of blocking back to J15 Bleak Hall roundabout has been discussed and clarified. It is accepted that flows used are the 'worst case' scenario with current indicators that future growth is likely to be less than used in the model. This, along with the proposed travel planning initiatives that will form part of the development's Travel Plans (along with any wider sustainable travel initiatives implemented as part of Plan:MK) indicates that in actuality blocking may not occur with lower than predicted flows.

Junction 17: Emerson Roundabout

8.109 The junction has been modelled using Junctions 9 (ARCADY). A negative capacity correction was applied to Fulmer Street, A421 Standing Way (N) and Shenley Road in the AM and all arms in the PM to replicate current patterns and reduce likelihood of overestimation of capacity for all scenarios modelled.

8.110 The results[37] show that all arms, except A421 Standing Way (S), operate above practical capacity (RFC of 0.85) in the AM and all arms in the PM. However, only two arms are predicted to encounter delay at or just above a minute and no queue is predicted to extend for 20 vehicles. By the 2033 (Do Nothing) all arms, except A421 Standing Way (S), operate above theoretical capacity (RFC of 1.0) in the AM and all arms in the PM. With the longest queue now at approximately 100 vehicles on A421 Standing Way (N) and delay at approximately 8 minutes on Fulmer Street in the AM. The junction has been identified in two separate Milton Keynes studies (LTP4 Transport Infrastructure Development Plan (TIDP) and MK Multi Modal Model Impacts of Plan MK report, November 2017) as a site for potential capacity improvements due to known capacity issues.

8.111 With the addition of the development traffic (DS1) further reduction in capacity is expected with queues on Fulmer Street predicted to extend for potentially just over 1 km with delay of 25 minutes in the AM. While A421 Standing Way (N) queues could reach approximately 350 vehicles, which if stacked equally on the dual carriageway could extend for just over 1km in the PM. In the Do Something 3 (Shenley Park) scenario the results show slightly higher RFCs than the Do Something 1 scenario while the DS2 travel planning scenario would see a slight improvement compared to DS1.

8.112 The predicted decrease in capacity due to development traffic would be considered significant and the Applicant has submitted a mitigation scheme[38]. This includes kerb or central island widening on all arms to improve capacity. The results show that with the provision of the proposed mitigation that overall the junction results would see a mixed impact, when considering both peaks compared to 2033 DN with the demand weighted Junction Delay reducing in the AM from 186.38 to 169.56 seconds but in the PM increasing from 193.17 to 276.25 seconds. When comparing DS1 to the existing layout 2033 DN scenario queuing and delay is reduced on Fulmer

[37] Table 5-10 – Junction 17 - Emerson Roundabout Additional Mitigation Results, page 51 of TRN3
[38] Paragraphs 5.2.32 to 5.2.36 of TRN3, scheme layout drawing Appendix D of TRN3

Street and Shenley Road in both peak periods. A421 Standing Way (S) would see reduction in the PM. However, A421 Standing Way (N) would see a worsening of results in both peak periods and A421 Standing Way (S) in the AM would see increase in queues and delay. No arm is expected to block back or to inhibit movements from upstream major junctions if queuing is equal between the two lanes where dual carriageway. In DS2 the queues and delay would be reduced while DS3 would see a slight increase in results.

8.113 BC highways raised concern over the predicted negative impact on demand weighted Junction Delay in the PM and the resultant long queues on A421 Standing Way (N). The Appellant provided a response in a letter dated 7th April 2021 (attached at Appendix I). This provided details of potential further mitigation measures that could be deployed at the junction, involving conversion of the junction to part-time signal control. Such a scheme would have positive impact at the junction with Fulmer Street and Shenley Road both operating below 2033 DN existing layout conditions. A421 Standing Way (N) would now also operate better than the projected DN 2033 scenario with queues in the PM of 56 PCU (compared to 240 vehicles in the TRN3 mitigation scheme). A421 Standing Way (S) would perform better in the PM but would see worse results in the AM in the part-time signal control layout, albeit not as significantly as A421 Standing (N) in the TRN3 mitigation scheme with queues of 118 PCU and delay of just over 4 minutes (compared to 20 vehicle queue and delay of 35 seconds compared to DN 2033). The layout of the part-time signal could be relatively easily retrofitted onto the TRN3 mitigation with limited additional alterations to the junction layout.

8.114 The Appellant does not consider that the further mitigation measures are required, with the TRN3 mitigation scheme showing overall junction improvement. The part-time signals are offered on a 'Monitor and Manage' basis and only implemented when considered necessary to do so. The S278 agreement could be developed to allow the flexibility for this approach.

8.115 BC Highways have reviewed the further mitigation scheme and are content that the model has been coded correctly as per the proposed layout. As per the J5 Tattenhoe roundabout there is the potential for the uniform queues within the internal stop lines partially blocking exits, but this is unlikely to occur every cycle. To mitigate against this, 'Keep Clear' marking could be used, and it is acknowledged that during the

detailed design stage, the signals would likely be better optimised. Based on the review of further mitigation proposal BC highways would support the use of the 'Monitor and Manage' approach to implement the design as and only if necessary, with the required trigger point to be determined by the respective parties.

8.116 BC highways also sought clarification on the proposed design in terms of swept path analysis. The Appellant provided swept path analysis on the 7th April 2021 (attached at Appendix G), along with other junctions within Milton Keynes. On review of this information no concerns were raised with the major movement considered to be able to be completed satisfactorily.

8.117 An independent Stage 1 Road Safety Audit has been undertaken on the TRN3 mitigation proposal and BC highways is satisfied that the problems identified can be resolved during detailed design. It is considered that the proposed mitigation scheme offers a viable alternative and is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF. It is noted that the scheme will potentially result in long queues on A421 Standing Way (N) in the PM, with the potential alternative part-time signal control scheme that could be retrofitted into the proposed mitigation layout that would resolve this issue, and provide overall improvement in capacity terms. BC highways consider that this potential alternative is appropriate and could be implemented via the 'Monitor and Manage' arrangement.

Junction 18: Windmill Hill Roundabout

8.118 The junction has been modelled using Junctions 9 (ARCADY). A negative capacity correction was applied against all arms in the AM and PM to replicate current patterns and reduce likelihood of overestimation of capacity for all scenarios modelled.

8.119 The results[39] show that in the 2020 Base AM that all arms operate above practical capacity (RFC of 0.85) with Tattenhoe Street at theoretical capacity (RFC of 1.0). In the PM all arms except for A421 Standing Way (N) operate above practical capacity (RFC of 0.85). The longest queue is 17 vehicles on Tattenhoe Street in the AM and greatest delay is 1.5 minutes on the same arm. By the 2033 (Do Nothing) all the arms in the AM and PM are shown to operate at or above theoretical capacity (RFC of 1.0) except for A421 Standing Way (N) in the PM. The longest queue would form on

[39] Table 4-11 – Junction 18 – Windmill Hill Roundabout Junction Capacity Assessment Results, page 31 of TRN3

A421 Standing Way (S) of nearly 100 vehicles and greatest delay on Tattenhoe Street of nearly 8.5 minutes, an increase of 7 minutes.

8.120 With the addition of the development traffic (DS1) further reduction in capacity is expected with all arms in both peak periods now exceeding RFC of 1.0. Queues are predicted to exceed 100 vehicles in both peaks with A421 Standing Way (N) and in the PM exceeding 200 vehicles and queues on A421 Standing Way (S) in the PM exceeding 360 vehicles. The greatest delay would still be Tattenhoe Street of nearly 14 minutes.

8.121 The predicted decrease in capacity due to development traffic would be considered significant and the Appellant has submitted a mitigation scheme[40]. This includes kerb widening on Tattenhoe Street and A421 Standing Way (N) and (S) arms with amended road markings on Tattenhoe Lane to create longer flares and wider entries, all with the intent of improving capacity.

8.122 The proposed mitigation shows that overall, the junction results would see an improvement considering both peaks compared to existing layout 2033 DN scenario with the demand weighted Junction Delay reducing in the AM from 225.69 to 163.86 seconds and in the PM from 136.59 to 133.11 seconds. When comparing mitigation DS1 to current layout 2033 DN Tattenhoe Street sees a marked improvement with the arm operating under practical capacity (RFC of 0.85) with negligible queue and delay. Tattenhoe Lane would still operate above capacity (RFC of 1.0) but with improvement in capacity operation and reduction in queues and delay. A421 Standing Way (N) would see an increase in queuing and delay, as well as A421 Standing Way (S) in the AM. However, overall junction delay is reduced in both peaks, showing improvements with no blocking of major node junctions.

8.123 An independent Stage 1 Road Safety Audit has been undertaken and the BC highways is satisfied that the problems identified can be resolved during detailed design. It is considered that the proposed mitigation scheme offers a viable alternative, that the residual impacts after mitigation would not be significant and the mitigation is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF with overall improvement in capacity terms.

[40] Paragraphs 5.2.37 to 5.2.41 of TRN3, scheme layout drawing Appendix D of TRN3

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8.124 The network junction assessment has been performed via the use of industry standard modelling software with the base models undergoing a rigorous calibration process and I am confident that the existing layout results are representative of current traffic patterns, thereby providing realistic future year results for the existing network.

8.125 The Appellant has provided a comprehensive mitigation package for the local junctions as detailed in TRN2 and TRN3. In my opinion these will reasonably accommodate the impact of the Proposed Development on the local junction network taking into consideration the flows are considered to be the 'worst case' scenario. The mitigation modelling with development traffic has shown that overall, most junctions will operate at the same level or better than the current layout using the DN scenario, whilst noting that some arms may perform worse but when considering each junction as a whole across both peak periods improvements can be observed.

8.126 Clarity was sought on several junctions, the majority of which were resolved satisfactorily in the Appellant's responses with no further amendments required. The only exception to this would be J17 Emmerson Roundabout, where a possible alterative design could be implemented (making used of the mitigation layout and infrastructure changes) but may not be necessary and could be implemented as a monitor and manage arrangement.

8.127 Furthermore, the mitigation modelling has identified that the blocking back between major junctions (i.e. those that form part of the assessment process), or those bordering the assessment area is unlikely to occur, with the modelling only showing this potential at J16. It is noted that queuing will block various side roads within the wider network, but this occurs in the DN 2033 scenario for the current layout and is not considered that the residual impacts after mitigation would be significant.

8.128 The proposed mitigation package is considered to be deliverable (whilst being subject to detailed design and further Road Safety Audit process), cost effective and proportionately related to the forecast impacts.

9. Network non junction impact

Impact Traffic through the Villages[41]

9.1 Traffic flows through the villages were identified via the traffic flow diagrams developed and agreed as part of the development trip generation and distribution process and provided in TRN2. The traffic flows for 2033 Do Nothing and the three Do Something scenarios have then been compared to identify the forecast percentage increase in traffic.

9.2 The results of this revised assessment indicate that the increase in traffic flow through Nash, Great Horwood, and Mursley are not considered to be significant (do not exceed the 10% traffic growth for sensitive areas) and would not result in a significant impact on the local highway network. Little Horwood does have a conservation area and should therefore be considered 'sensitive' in nature and against the lower GEART[42] threshold (10%) for impact, which is predicted to be 20% increase for both DS1 and D3 scenarios in the PM. However, the actual change in traffic flow in the PM peak is only six vehicles northbound and seven vehicles southbound (a total of 13 vehicles) and BC highways do not consider this to be a significant change in traffic flow and it would not result in a significant impact through the village.

9.3 Newton Longville also has a conservation area and should be considered against the lower GEART threshold (10%) for impact. The assessment has shown there be 10% or more growth through the village in both peak periods for the scenarios which is considered to constitute a significant impact. The Appellant has proposed a traffic calming scheme to mitigate the impact of the development that can be secured in a S106 Agreement.

9.4 Whilst no impact is predicted for Whaddon village the accuracy of the traffic flows, and subsequent traffic impact modelling, may have affected the journey time analysis on the basis that road closures were in place within north Milton Keynes impacting the potential movements through the village. A previous financial contribution to improve road safety and enhance the existing traffic calming was previously agreed, to mitigate against potential redistribution via Whaddon Village and improve road safety through

[41] Results for impact on villages refer to results contained in Section 7 of TRN2

[42] Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment (1993))

the village and BC highways would seek to secure similar agreement to impact potential impact on the village.

Impact on Highway Safety[43]

9.5 The agreed development trip distribution has identified additional trips on the network and the Applicant has utilised the computer programme COBALT (Cost and Benefit to Accidents – Light Touch) developed by the Department of Transport (DfT) to undertake analysis of the impact of the Proposed Development on highway safety.

9.6 The analysis indicates that most links across the study area will see very small changes in 'negative benefits' (as they are described in COBALT), with B4304 Buckingham Road and A421 Standing Way to the east of the site showing the greatest impact of the development traffic. The COBALT analysis also predicts a change in collisions and casualties (over a 60-year period). The results predict that there will be an increase of 140 collisions with 202 casualties because of development traffic over a 60 year period. This equates to on average to 2.4 collisions and 3.4 casualties per year. It should be noted that the analysis does not consider mitigation measures proposed as part of the development application.

9.7 BC highways are satisfied that the development will not have an unacceptable impact on highway safety and that overall does not represent an unacceptable impact.

Impact of Construction Traffic[44]

9.8 The Appellant has produced the following assumptions in relation to construction activity:

Daily HGV Volumes and type of vehicle

- Infrastructure Phase – 20 HGVs per day. NB The Earthworks Strategy is to retain everything on Site, so there will be limited vehicle movements associated with removal of earth.
- Residential development - 15 HGVs per day (based on 5 per day for each build phase with 3 build phases per development phase).
- Local Centre - 5 HGVs per day (in the first phase).

[43] Results for impact on highway safety refer to Section 8 of TRN2 and Section 8.2 of TRN1

[44] Results for impact on construction traffic refers Sections 5.9 and 7.9 of the Updated Transport Assessment and Section 7.3 of TRN1

- Employment Land – 5 HGVs per day (in the second phase).

Number of staff

- Infrastructure Phase – 30 per day.
- Residential development - 195 per day (based on typical 65 per day per build phase).
- Local Centre - 30 per day.
- Employment Land – 30 per day.

Working Hours

- Monday-Friday – 08:00-19:00
- Saturday – 08:00-13:00

9.9 The Appellant has performed analysis of the proposed increase in base traffic because of construction traffic. This shows that the link with the highest anticipated increase is Whaddon Road between the new access and Bottledump roundabout. This will not exceed the 10% GEART threshold that would represent a discernible change in traffic volume given day to day fluctuations in traffic.

9.10 The Appellant has stated the intention to route all construction traffic to and from the site through the Whaddon Road access within Buckinghamshire. BC highways are satisfied with the level construction traffic generation as detailed in the Updated TA and with the arrangement for the use of the Whaddon Road access for the primary construction access and egress point. Relevant constructions plans will need to be agreed prior to construction with a planning condition being applied to negate any potential impact on the surrounding villages and peak hour traffic flows. With these conditions in place I am confident that the construction traffic will not have a significant impact on the surrounding area.

Impact on Public Transport[45]

9.11 To ensure that all new dwellings are within 400m walking distance to a bus stop, it is essential for a bus service to be provided that enters the site. The Appellant has proposed to either enhance an existing bus service or provide a new start up service to operate between the proposed development and Central Milton Keynes (CMK) via the existing rail station. The objective is to provide a high quality, fast, frequent and reliable

[45] Results for impact on public transport refers to Section 7.7 of the Updated Transport Assessment and paragraph 3.16 and Appendix B of TRN1

bus service that serves the social and accessibility needs of those without access to a car. It is also expected that with the effective marketing initiatives included within the Framework Travel Plan, people who would otherwise use a private car will be encouraged to use the proposed bus service for many of their work and leisure-based journeys.

9.12 The Appellant's preferred option would be to start a completely new high frequency service between the Site, CMK, the rail station and key social infrastructure. The target would be to provide a journey time between the Site and CMK of circa 20 minutes.

9.13 The proposed bus service between the Site and Central Milton Keynes is proposed to commence no later than the occupation of the 100th dwelling. BC highways requested that a second trigger be applied to the start of the bus service so the service would start no later than the occupation of the 100th dwelling or 12 months from first occupation which the Appellant agreed to in TRN1. Indicative locations of the bus stops are shown on the illustrative masterplan that was also presented in TRN1 and the majority of residential properties are within 400m walking distance of a bus stop, which is considered appropriate

9.14 BC highways consider that the proposed new bus service will have a positive impact on public transport, not only in creating modal choice within the development, but by creating additional capacity on the wider network.

Impact on Walking and Cycling[46]

9.15 The Site is currently served by a network of existing pedestrian footways and public rights of way predominantly to the north and east of the Site, which provide suitable access from the site to local footway/footpaths and the local cycle network, providing connections to services and facilities within the area.

9.16 National Cycle Route 51 is the nearest cycle route to the A421 corridor; it runs between Bletchley and Winslow, passing to the south of Salden Chase, before continuing to Bicester. The Milton Keynes Cycle Network, known as the Redway System, commences west of the Bottledump roundabout and continues eastbound, north of the

[46] Results for impact on walking and cycling refers to Section 7.7 of Updated Transport Assessment and paragraph 3.17 to 3.18, paragraphs 4.1.1 to 4.1.6 and Appendix D of TRN1

A421 Standing Way. The existing infrastructure provides highway quality routes from the site to both Milton Keynes City Centre and Central Milton Keynes Railway Station.

9.17 Updated walking and cycling isochrones were provided in TRN1 to highlight the range of facilities and amenities accessible within walking and cycling distance of the Site. These indicate that most of the existing amenities and facilities will be within an acceptable cycling distance but fall outside typical pedestrian distances. This is offset by the proposed development providing on-site facilities and amenities which will likely minimise the need for longer walking journeys, with a convenience store, primary and secondary schools, retail space for Café, Pub or Takeaway and community facilities. Furthermore, as part of the S106 agreement the securement of a contribution toward the delivery of healthcare facilities either on or off site has been agreed.

9.18 An updated illustrated masterplan has been submitted in support of the planning application. The masterplan aims to encourage walking and cycling as realistic alternatives to that of the private car, through high quality infrastructure. Pedestrian access to the proposed development will be achieved as follows (with all but the recreational footpaths being available for use by cyclists):

- The old Buckingham Road south of the current A421 dual carriageway
- Whaddon Road - across the A421 close to Bottle Dump Roundabout via the existing subway
- The existing Subway across A421 to Snelshall West
- Buckingham Road – south east of the Tattenhoe Roundabout

9.19 Consideration will need to be paid to pedestrian crossing facilities as part of any future reserved matters application. At this stage the following crossings have been identified:

- A toucan crossing across the Primary Road at Weasel Lane
- A surface crossing to provide safe and convenient access to the secondary school. This should be in the form of a controlled facility
- A Pegasus crossing across Whaddon Road
- Toucan crossings on Buckingham Road East and Buckingham Road West

9.20 The Appellant proposes a new connection for walkers and cyclists between Weasel Lane and the Bottledump roundabout, along a green corridor. This will provide an important strategic connection between NCN 51; the proposed new cycling route along the Old Buckingham Road (A421); and the Redways alongside the new A421.

9.21 It is considered that new residents of the proposed development would have ability to access on-site amenities and facilities on foot or on bike, with external trips being achievable by bike but limited local trips on foot due to distance. However, the new high frequency bus service will provide the opportunity for multi-modal journeys to be performed and I consider the overall the development will have a positive impact on pedestrian and cyclist movements. The provision of the new facilities will also provide benefit to the wider community with enhanced connectivity between local networks.

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9.22 I consider that the proposals for enhancements to the pedestrian and cycle networks around the development site, along with the new high frequency bus service, will provide multi-modal travel choice for residents and employees within the Site and have a positive impact on the surrounding wider network.

9.23 I also consider that the revised Impact on Villages and Highway Safety Impact as detailed in TRN2 is robust methodology and that where impacts have been identified appropriate mitigation has been proposed, such that the development will not have a significant impact.

10. BC highways response to highways objection by MKC

10.1 The planning application made to MKC was refused permission on 7th November 2019 for a single reason, namely:-

"*That in the opinion of the Local Planning Authority there is insufficient evidence to mitigate the harm of this development in terms of increased traffic flow and impact on the highway and Grid Road network, with specific reference to Standing Way and Buckingham Road, thus this will be in contravention of Policies CT1 and CT2 (A1) of Plan:MK.*"

10.2 The Notice of Refusal also referenced six specific drawings, repeated below for reference. All the D0 drawings relate to the two access junctions within MKC boundary (A421 Standing Way and Buckingham Road) and the Bottledump roundabout.

- SWMK03/079/F - South West Milton Keynes Planning Application Boundary
- D015 Rev D – Bottledump Pegasus Crossing
- D017 Rev D – Alternative Junction Arrangements for Proposed Access on Buckingham Road (1:1000 scale)
- D016 Rev B Alternative Junction Arrangements for Proposed Access on Buckingham Road (1:2000 scale)
- D013 Rev A – A421 Proposed Access Only Junction
- D018 Rev A – Bottledump roundabout Potential Mitigation scheme

10.3 The methodology for determining the impact of the development on the local road network was subject to detailed scrutiny and agreement by officers of both Buckinghamshire and Milton Keynes Councils respectively. Various Technical Notes were submitted by the applicant's Transport Consultant and agreed prior to the submission of the 2016 revised Transport Assessment with subsequent further agreements on various transport related issues post Transport Assessment submission.

10.4 BC were aware initial concerns were raised by MKC officers but subsequent negotiations and agreement between MKC and AVDC / BCC officers negated these concerns with the s106 agreement providing financial contributions to mitigate against the impact of the development on facilities within Milton Keynes. The reason for refusal based on insufficient evidence to mitigate the harm of the development in terms of increased traffic flow and impact on the highway and Grid Network, specifically to Standing Way and Buckingham Road, is not supported by previous officer discussions, recommendations and findings of the Transport Assessment 2016.

10.5 Regarding the access from A421 Standing Way, this was altered from a left-in and left-out priority junction to a left-in only priority junction due to discussions with MKC officers primarily over the safety of weaving traffic leaving the development and conflicting with traffic approaching Bottle Dump roundabout from the east. The 'access only' was also moved to avoid the existing pedestrian underpass.

10.6 Milton Keynes Council commissioned Stirling Maynard, an independent transport consultant, to assess the highway and transport impacts of the proposed development on the Milton Keynes network. Their comments are set out in a consultation response dated 18th October 2016 to the application 15/00314/AOP, recommending no objections subject to conditions and a S106 Agreement.

10.7 As part of the Committee Report for 15/00619/FUL MK highway officer comments were provided which stated:

'*Subject to adequately worded conditions (and subsequent details assessed at the reserved matters and s278 stages), the proposed development therefore accords with Policies CT1, CT2 and CT3 of Plan:MK*'.

10.8 In MKC's SoC several issues have been raised. A number of these concern highways matters which are listed below with BC highways' responses:

Paragraph number of MKC SoC	Issue	BC highways response
18.	The Council, having considered the new TA, considers that it proposes a significantly greater list of mitigation schemes than was previously suggested is to be required and that there are differing access arrangements. By way of example, the previously sought physical improvements to the Bottledump roundabout (which form part of the described permissions sought on appeal) are, it appears, no longer sought by the appellant, although they are offered as optional 'if required'. If the physical improvements to the Bottledump roundabout are no longer sought, it follows that they are no longer an integral part of the appeal scheme. As such, a change to the description would be required.	The traffic assessments performed in TRN3 include revised mitigation for Bottledump roundabout considering the more recent traffic flow data. The remainder of the junctions listed in the SoC and relevant s106 contributions are a matter of discussion between the Appellant and MKC as these fall within the remit of MKC and do not refer to the access junctions. TRN3 updated the traffic modelling for all junctions within MKC including proposed mitigation, which have been considered by BC highways and are detailed in Section 8 of this proof of evidence.
32 and 33	Policy CT1 'Sustainable Transport Network' requires the promotion of sustainable patterns of development.	The proposed development is proposing to provide links to local cycling and walking networks, with the provision of controlled crossings on both Whaddon Road and Buckingham Road to manage conflict between vulnerable and motorised users. Both have been Road Safety audited as part of the access junction designs. The development will also provide a link to the existing Redway cycle route on the north side of A412 via use of an existing subway and a toucan crossing on Buckingham Road to connect to the existing cycle provision on the north side of the road. The development is therefore proposing safe and controlled access to existing cycle and pedestrian networks within MK. A new bus service will be provided, initially subsidised by the Appellants with the aim of providing a service every 20 minutes to the centre of Milton Keynes. This level of service would be similar to existing routes 4 (CMK Rail Station to Bletchley) and 7 (Wolverton via Central MK to Bletchley) whose pre-Covid-19 timetables provided peak services every 10 to 15 minutes.

Paragraph number of MKC SoC	Issue	BC highways response
		In terms of junction design both the Standing Way and Buckingham Road access were subject to Road Safety Audits and conform to highway standard design principles with no indication of significant adverse road safety implications. The A421 Standing Way is access only and will therefore have no capacity / congestion issues while Buckingham Road was shown to operate within practical capacity (0.85RFC) for the 2016 TA. BC have provided comments regarding employment trip rates and distribution that may impact on the traffic flows, and subsequent results of the Buckingham Road access which were resolved in TRN2. The Appellant has provided a solution for the crossing of Old Buckingham Road and is detailed in paragraph 8.14 of this Proof of Evidence. Regarding Bottledump roundabout the TRN3 has identified that the roundabout would exceed theoretical capacity (1.0 RFC), for which a mitigation scheme has been developed and is discussed in paragraphs 8.29 to 8.35 of this Proof of Evidence that details the development would not have a significant impact.
34, 35 and 36	**34**. Policy CT2 (A1) 'Movement and Access' states:	As stated above the development will link to existing cycle route facilities on A421 Standing Way and Buckingham Road via separated or controlled crossing facilities. There is no indication or evidence that the proposed measures for walking and cycling will not have an inappropriate impact on the operation, safety or accessibility to the local or strategic highway networks. The new bus service is detailed in the response above which will provide frequent trips into Central MK. The development will include both primary and secondary schools, local retail, leisure facilities, employment and local amenities that will reduce the need for longer journeys outside of the development onto the adjacent networks. A framework Travel Plan has been submitted as part of the 2020 TA. A cost plan was submitted as part of TRN2 and in principle the FTP has been accepted and

Paragraph number of MKC SoC	Issue	BC highways response
		overall BC highways are satisfied that FTP is well thought out with appropriate measures to reduce single occupancy car use.
37	The Council will explain in evidence that many of the RfR matters related to policy CT1 are reinforced by the wider text of policy CT2. Policy CT2 goes on to require the mitigation of development impacts on the highway network; the avoidance of prejudice in terms of the ability of other developments to come forward; provision of safe, suitable and convenient access; suitable onsite layouts; the avoidance of inappropriate traffic generation or compromised highway safety; maximum flexibility in the choice of travel modes; protection/enhancement of Public Rights of Way (PRoW); provision of strong public transport links; and, where possible, the promotion of shared and low-carbon transport modes.	Mitigation has been proposed in TRN2 and TRN3 to several junctions where the capacity assessment has shown there to be a significant impact. These are detailed in paragraphs 8.16 to 8.128 of this Proof of Evidence, where it is concluded that these will reasonably accommodate the impact of the Proposed Development on the local junction network and the mitigation is considered to be deliverable, cost effective and proportionate related to the forecast impacts. The provision of safe, suitable and convenient access has been outlined in the responses above, along with the provision for cyclists and pedestrians.
40	Policy CT3 'Walking and Cycling' states that the 'Council will support developments which enable people to access employment, essential services and community facilities by walking and cycling.' The appeal scheme is for highways improvements to facilitate the development being considered in BC, so in this regard is relevant to the scheme, but also in regard to its wider impacts within MKC boundaries.	See responses to paragraphs 32 to 37.
41	Policy CT5 'Public Transport' development proposals must be designed to meet the needs of public transport operators and users. In terms of its relevance to this appeal, it largely extends the emphasis of Policy CT1 and CT2 of Plan:MK, in terms of ensuring road layouts must	See responses to the paragraphs to 32 to 37 in terms of bus service provision. Within the site the bus route will run on the principal development access roads and be located at appropriate intervals to minimise walk distances and to ensure that where practicable, residential dwellings are no greater than 400 metres from a stop. The walking distance of 400m is typically used for Transport Assessments

Paragraph number of MKC SoC	Issue	BC highways response
	include direct, convenient and safe public transport routes.	and bus stops. Table 4 of the CIHT document 'Buses in Urban Developments', however, would indicate that for the proposed single 20-minute service this should be 300m, which could be addressed in detailed design of the internal layout.
44	Paragraph 102 of the NPPF	The impact of the development has been considered. For the 2016 TA detailed discussions were held between the Appellant, MKC and BCC officers for the consideration of the transport impact. Officers of both Councils were satisfied with the proposal, traffic modelling, impacts and mitigation, as detailed in the BC highway response 28th April 2017 and the MK November 2019 Committee report. The updated TA, TRN1, TRN2 and TRN3 have considered the impact of the development with BC highways conclusions detailed throughout this Proof of Evidence. See response for paragraphs 32 to 37 for proposals for connecting to the existing infrastructure, walking, cycling and public transport. Elements of NPPF 102 refer to the internal site layout which does not form part of this appeal.
45	The NPPF goes on to state (paragraph 108):	See response to paragraphs 34 to 41. A FTP cost plan was submitted for the residential element, which equates to an equivalent Cost Per Dwelling of £449.65 that is considered to be suitable level of funding. See response to paragraphs 34 to 36 for response on provision of safe access for all users. Mitigation measures for the previous 2016 TA were agreed by MKC officers for the affected junctions as detailed in the November 2019 MK committee report, based on the approved methodology. Mitigation has been proposed in TRN2 and TRN3 to several junctions where the capacity assessment has shown there to be a significant impact. These are detailed in paragraphs 8.16 to 8.128 of this Proof of

Paragraph number of MKC SoC	Issue	BC highways response
		Evidence, where it is concluded that that these will reasonably accommodate the impact of the Proposed Development on the local junction network and the mitigation is considered to be deliverable, cost effective and proportionate related to the forecast impacts.
46	The tests of acceptability in transport terms are set out at NPPF paragraph 109:	The 2016 TA detailed appropriate mitigation to ensure nil detriment for those junctions identified to have an adverse impact. The mitigation was agreed with MKC officers at the time and the modelling approach, which was appropriate for the size and scope of the development. Mitigation has been proposed in TRN2 and TRN3 to several junctions where the capacity assessment has shown there to be a significant impact. These are detailed in paragraphs 8.16 to 8.128 of this Proof of Evidence where it is concluded that these will reasonably accommodate the impact of the Proposed Development on the local junction network and the mitigation is considered to be deliverable, cost effective and proportionate related to the forecast impacts.
47	NPPF paragraph 110	See response to paragraphs 32 to 41 above.
48	Paragraph 111 of the NPPF	Transport Assessment and Framework Travel Plans have been produced. The methodology for the traffic impact assessment was agreed by both MKC and BC in discussions with the appellant. See response to paragraph 46 above.
Modelling 54 to 57	56. A high-level comparison of the model referenced in the 2016 TA (MKTM), the subsequent MKMMM and the adjacent (and overlapping) Buckinghamshire County Council (BCC) Countywide Model has been made by the appellant's consultants who reach the conclusion that these models 'correlate reasonably well'. However, as will	56. At the time of 2016 TA development, and the subsequent Model Review Technical Note (Technical Note 18, June 2019) the use of the MKTM model was considered to be acceptable by MKC officers. The officer comments that form part of paragraph 5.14 in the MK Committee report regarding the high-level comparison were '*I would agree therefore with the conclusion that previous work*

Paragraph number of MKC SoC	Issue	BC highways response
	be set out, that conclusion is reached on the assumption that a junction which is 'approaching capacity' in one model is actually operating much the same as in another model which shows it to be 'over capacity' and vice versa. **57**. It will be explained that these are strategic models which cover a wide area across identifying the overall likely consequences of planned development. The Council will explain that it is commonly understood that the use of such models can be more problematic at a localised scale, meaning that they cannot necessarily be taken at face value in assessing development impacts. Furthermore, the exact means by which development traffic is 'loaded' onto or exits from the network is generally necessarily a crude representation and not reflective of actual access proposals. **58**. It will be submitted that there is no detailed technical evidence which would demonstrate that the appellant's assertions about the purported comparability of the models being accurate and there is a gap in the assessment process (especially given that the MKMMM does not include proposed mitigation, meaning that the effects of those measures are untested in the model). Consequently, there is no evidence from the strategic models that the transport impacts of the appeal site would not be 'severe'.	*done on the basis of the Transport Assessment remains valid and there is not a need to rerun the traffic impact assessments'.*
61.	The Council will explain that: (i) The MKTM has a base year of 2009, now 11 years ago and prior to the 2011 Census (data from which would	In response to each numbered item: (i) At the time of producing the initial TA the MKTM data would have been acceptable in terms of age. The use of the MKTM was a requirement of both

Paragraph number of MKC SoC	Issue	BC highways response
	now commonly be used to inform traffic distribution assumptions for example). A future (forecast) year model was produced, representing traffic conditions in 2026 inclusive of planned development growth locally. (ii) Neither the MKTM baseline or forecast year models quite meet Department for Transport (DfT) WebTAG requirements for stability, although they are close to meeting those requirements. Whilst the TA reports that only a few links in the vicinity of the appeal site were outside of DfT stability requirements, the overall model does not meet the required tests. (iii) More fundamentally, the Council will explain that such strategic models can only provide cues for detailed analysis of potential congestion hotspots. They are not generally of a fine enough grain to deal with the detailed impacts of individual developments, meaning that the TA should contain cross-checks against observed flows. This does not appear to have happened at planning application stage, (nor in the subsequent model comparison Technical Note 18), other than for junctions in Buckinghamshire where the Council raised concerns regarding model traffic forecasting and in Bletchley. (iv) The trip generation of the development was derived by Halcrow and input to the MKTM. The model assesses 1,855 new homes and, taking these as an example, the resultant vehicle trip rates are 0.67 (trips per dwelling) in	MKC and Highways England as previously agreed. BCC raised several concerns regarding the validity of the forecast traffic assignment on roads within the County Council's jurisdiction. It was therefore agreed that junction assessments using static models (Junctions 8) would be completed at locations within Buckinghamshire to determine the impact of the proposed development. (ii) I am unaware of the agreements that may or may not have been reached regarding the acceptability of stability. However, MKC officers at the time of the assessment and submission of the TA 2016 accepted the methodology and were aware of the link stability requirements. (iii) The junctions within BC (including Bottledump roundabout) were assessed using static models based on 2015 traffic data. The Buckingham Road access capacity assessment would have used traffic flows obtained from the traffic model. Whilst BCC were not aware of all the specific details for model / observed flows requirements for junctions within MK area (except for Bletchley where a specific request was provided) it is considered that the flows used in the Buckingham Road model were sufficiently robust to provide a set of results that would be representative of the junction operation. One of the main impacts at this junction would be development traffic impeding movement along the Buckingham Road, with the movements to and from the development calculated based on entered land use, not dependent on existing flow data within the model. Furthermore, the results for the Buckingham Road junction indicated spare capacity on all arms (no RFC results exceeding practical capacity of 0.85RFC) and therefore spare capacity to cater for potential slight fluctuations in demand. (iv) Whilst verification of trip rates may not have been performed as part of the 2016 TA, it is not a typical requirement for TAs. Further, the industry standard TRICS database has been utilised for 2020 TA in line with best practice use.

Paragraph number of MKC SoC	Issue	BC highways response
	the AM peak hour and 0.54 in the PM peak hour. The TA does not provide comparator evidence (from the industry standard TRICS database for example) to allow verification of these trip rates. (v) The MKTM was used to distribute and assign trips to the network, albeit the reassignment of trips due to additional demand / queuing / delay was not represented in the TA analyses. The TA states that this represents a 'worst case' but that is not necessarily the case, as there may actually be diversion of existing trips to other locations which become impacted but have not been fully assessed. (vi) Where local junction models have been produced, the TA states that these have been validated by reference to Google Traffic screenshots. That is not a commonly accepted methodology and it will be contended that the models should have been calibrated in line with the manufacturer's instructions, which often relates to the accurate reflection of geometric parameters and the interaction of opposing vehicles. (vii) In terms of the proposed access arrangements, paragraph 8.7 of the TA states that no capacity assessment of the proposed A421 left-in-only access was undertaken as there would be no constraint on the main road as a consequence of the access arrangement. Whilst that may be the case, it will be explained that for a development of this scale and location it would be	(v) At the time of the assessment the level of analysis was deemed to be appropriate by BC and MKC with no further analysis. This position has not altered by BC officers. (vi) It is BC's understanding the Google Maps were not used for calibration purposes, rather as an additional visual aid to check typical queues from this data source were in line with the model outputs. The revised junction models in TRNs 2 and 3 have been subjected to detailed calibration review with the methodologies detailed in paragraph 8.2 to 8.7 of this Proof of Evidence. (vii) The A421 access was designed in accordance with TD 42/95 Geometric Design of Major/Minor Priority Junctions for the respective design speeds, as detailed in the 2016 TA. The direct taper length and auxiliary lane length both still comply with the revised guidance CD123 Geometric design of at-grade priority and signal controlled junctions (Table 5.22) whilst the corner radii at the end of the auxiliary lane is 40m, in line with paragraph 5.6.5. A geometric review would have been performed as part of the design process, and the Road Safety Audit team would have been instructed of any geometric design parameter departures from standard, of which there are none. The Road Safety Audit should have also registered any concerns with regards to safety. Regarding first principles assessment this was not considered a requirement at the time of TA development, with no request from either MKC or BC. It is considered unlikely for there to be any delay to the A421 considering the taper length, deceleration lane and development access road. (viii) Impact on villages is detailed in paragraphs 9.1 to 9.4 of this Proof of Evidence. .

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	commonplace to provide supporting evidence including, for example, a geometric review of the proposed diverge arrangement (against standards), and a modelled and/or first-principles assessment of the geometric delay (deceleration, cornering speeds and potential queuing) associated with the diverge lane and the bend into the site. (viii) The TA provides additional analyses of traffic flows in Bletchley, including a comparison of observed (surveyed) and modelled (MKTM) flows. Per-direction, there are flow differences of up to 27%, with the observed flows being higher than those in the model. This is stated to be within the daily variation in traffic, which is incorrect as the maximum observed daily variation on the link/flow in question is 14%.	
62	In relation to the new 2020 TA the Council will submit: (i) The latest TA post-dates WSP's Technical Note 18 which presented a high-level comparison of the available strategic**15/00314/AOP** traffic models and concludes that 'no further assessments are required to enable MKC to determine the current planning application'. (ii) The new TA adopts a different methodology from the previous iterations, stepping away from direct use of the Council's strategic traffic models and using a TRICS-based trip generation / spreadsheet distribution instead. (iii) The TA identifies locations where the new modelling predicts significant queuing and delay. However, WSP	In response to each numbered item: (i) No comment required. (ii) At the meeting on 15th January 2020, at which Martin Tate of MKC was present, the modelling methodology for the new TA was discussed. It was determined by all those parties present that a cross boundary unified approach should be undertaken, as opposed to a mixture of strategic models and traffic counts. BC expressed concerns over the new MKMMM (which replaced the MKTM) on review of the validation report and appendices provided. There were concerns that the model had been primarily developed for LTP4 assessment and that additional model development may be required. The validation report specified that '*It is important to note that the model was not designed for use in a scheme specific economic assessment for which it is recommended the*

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	argues that some drivers would re-route to avoid those locations. Whilst that may be the case, there is no further detailed assessment of where that re-routing would occur, or what its impacts might be. (iv) New traffic data has been collected during 2020. However, the February data is not a neutral month for data collection according to NPPG, and the TA provides no evidence to indicate whether February data is comparable to that from the usual neutral months. (v) There are several additional concerns. For example, the walking isochrone at Fig 3.4 is misplaced in relation to the site, as is the cycle isochrone at Fig 3.6. This creates a misperception that the walk and cycle catchments are more extensive than is actually the case. It would be normal for the isochrones to be centred on the middle of the site. (vi) The methodology used to calibrate the junction models, involving calibration against queue data, is not entirely in accordance with the software manufacturer's guidance. Further work is required to ensure that these models are valid.	*model would be recalibrated with additional and more recent data and targeted to reflect a more specific geographical focus of resources and modelling effort*'. There were also issues raised about some of the data used in the model, with the key data being collected in 2009 for 2016 base model calibration which is outside WebTag guidelines. This is now 10 years old. Regarding the concerns of the viability of the MKMMM and the Buckingham County model (which does not extend sufficiently into MK's area), it was agreed that a 'typical' TA methodology be employed making use of a TRICS-based trip generation / spreadsheet distribution instead, with subsequent Technical Notes on Trip Generation and Distribution being reviewed and accepted by BC and MK (noting that not all BC comments on distribution had been considered and are being addressed with a revised submission to be provided). It is considered that new methodology provides a robust assessment of the development demand and travel patterns and is fit for purpose. (iii) The use and robustness of the static modelling assessment is detailed in paragraphs 7.1 to 7.6 of this Proof of Evidence. (iv) It is accepted that February is not a usual month for typical data collection as per NPPG guidance, which states that 'recommended periods for data collection are spring and autumn, which include the neutral months of April, May, June, September and October'. However, the data collection occurred within school term time with no significant road works within BC that would impact the results. It should be noted that this is a recommendation only and not a requirement, due to the time that would elapse while awaiting for a neutral month it was agreed that the surveys could be conducted within February and likely dates discussed at the scoping meeting on the 15th January 2020, where Martin Tate was present representing MK who raised no objection at the time of the meeting. Whilst concerns have been raised by objectors regarding the validity of the surveys, including that the surveys were

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		not conducted within neutral months, the Highway Authority is satisfied that surveys have been carried out in accordance with best practice and the 2020 base data is robust. To this end further analysis was conducted of the survey performed in February 2020 and the permanent traffic counter on the A421 to the west of the Bottledump roundabout and one of the new survey ATC sites. The average two-way flow on A421 Standing Way was reviewed for the period from 0800 - 0900 by month for 2017 to 2019 period and this was compared to an average neutral month across the period. The average two-way traffic flow on the A421 between 08:00 and 09:00 across the neutral months (March to November, excluding August) is 2,404 vehicles. In February, the average flow is 2,372, 32 vehicles less than the average for the neutral month. The same exercise has been undertaken for the 17:00-18:00 hour period, this showed that the average two-way traffic flow on the A421 between 17:00 and 18:00 across the neutral months is 2,501 vehicles. In February, the average flow is 2,394, 89 vehicles less than the average for the neutral month. This indicates that traffic through the month of February is comparable to neutral months. (v) Revied isochrones were provided in TRN1 and BC highways consideration on the impact on pedestrian and cycling are detailed in paragraphs 9.15 to 9.21. (vi) It is accepted that not all junctions were calibrated in accordance with Appendix D (Site-specific measurements for capacity correction) of the TRL JUNCTIONS software user guide. This methodology has limitations in that it can only be used in specific circumstances (queuing on the approach should occur continuously for periods of twenty minutes or more during peak periods; the approach queues should be stable for at least five vehicle lengths upstream of any entry widening). Where the requirement was met it was agreed that this method of calibration is performed. If this methodology could not be achieved, then the use of the Barbara Chard methodology or Queue Count data was to

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		be utilised. It was agreed that three days of queue counts be performed to obtain a daily average queue which would be comparable to the model outputs. The use of queue data is an acceptable alternative and detailed in the TRL Training Manual (2019). In this alternative, time segment average of the modelled time segments are collected and averaged over a number of days of observations. This average value is then used for comparison for the model queue outputs, with the intercept corrected to best match the observations. It was agreed that three days of queue counts would be enough to obtain a reflective daily average. It is noted that often TRL will recommend 10 days of queue surveys be performed, however this is excessive in terms of time and costs for junction assessment purposes of this nature. If statistically significant data were required for model research purposes, then the 10 days would be required. As part of the BC response dated 16th July 2020 a discrepancy was noted in how the average queue results from the surveys had been derived. This was rectified for TRN2 and TRN3 and BC highways consider the calibration performed to be robust.
62	**2020 Travel Plan** (x) Table 7.1, now reflecting 2011 Census data, indicates an opening year residential motor vehicle mode share of 75%, with a targeted reduction to 63% after five years - a 16% reduction on baseline figures, equating to the removal of 119 motor vehicle trips. (xi) Table 7.4 indicates a 16% motor vehicle reduction for employment uses over the same period. The TP assumes that all education motor vehicle trips will be associated with other uses, with 24% of such trips being by car/van	(x) No comment required. (xi) Education trips form a small part of the overall trips. However, a modal shift target could be applied and agreed as part of the Framework Travel Plan discussion and future specific Travel Plans developed for the various uses within the development.

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	passengers. No modal shift targets are identified for education trips. (xii) A TPM would be appointed for a 12-month period, but there is no formal commitment to how long the role would persist (a change from the earlier TP). Initial funding would mirror the period of appointment of the TPM, with subsequent funding requirements passing to the Travel Plan Co-ordinators of elements of the appeal site (no specific funding identified).	(xii) In the initial BC response dated 16th July 2020 a request for agreed funding for the promotion of the Travel Plan and sustainable travel has been submitted to ensure sufficient measures are employed as part of the Travel Plan to encourage walking and cycling. A costed residential FTP was provided in TRN2. It is accepted that the site will need careful scrutiny of submitted travel plans but a firm commitment to expenditure will provide reassurance that measures will be implemented that will have an impact.
63	In light of the assessment undertaken the Council will that: (i) The TAs submitted prior to and after determination fail to adequately demonstrate the impact of the development, contrary to NPPF paragraphs 102, 108 and 111, and Plan:MK policies CT1 and CT2. (ii) The TAs and TPs do not fully assess or promote walking and cycling, contrary to NPPF paragraphs 102, 108 and 110 and Plan:MK policy CT1. (iii) The potential environmental impacts of the development's trip generation have not been fully quantified, contrary to NPPF paragraph 102 and Plan:MK policy CT2. (iv) Due to the insufficient evidence, the development may have a 'severe' or 'unacceptable' transport impact, contrary to NPPF paragraph 109.	In response to each numbered item: (i) See response to paragraphs 18 and 19 regarding Plan:MK Policies CT1 and CT2. See response to paragraphs 44, 45 and 47 regarding NPPF paragraphs. (ii) See response to paragraphs 18 and 19 regarding Plan:MK Policies CT1. See response to paragraphs 44, 45 and 46 for NPPF paragraphs. (iii) See response to paragraph 44, part d. (iv) See response to paragraph 44 (v) See response iv to paragraph 62. (vi) The methodology and use of MKTM was agreed as part of the development for the 2016 TA. It is accepted that the traffic data used in the model, and subsequent assessment has aged, hence the agreement for a new 2020 TA making use of new data collection. However, at the time of 2016 TA development, and the subsequent Model Review Technical Note the use of the model was considered to be acceptable. The officer comments in MK Committee report, section 5.14, state that *'I would agree therefore with the*

Paragraph number of MKC SoC	Issue	BC highways response
	(v) Data utilised within the submitted TAs does not meet the requirements of the NPPG in relation to its currency, neutrality (representativeness) and reliability. (vi) The TA upon which the Council relied to inform its decision to refuse the application used now outdated and high-level (strategic) traffic modelling, and the comparison with the Council's latest modelling made by WSP lacks detail. There is no certainty that the earlier modelling remains representative; indeed, it is most-likely out-of-date and unreliable for current assessment purposes. (vii) There is no evidence within the determination-stage TA that the utilised trip generation rates are fully representative of the proposed development. (viii) There is insufficient evidence regarding the re-routing of traffic across the local road network due to increased congestion. It is not possible to know where these vehicles are re-routing, nor has the appellant assessed the impact of that re-routing in sufficient detail. (ix) Local junction models have not been calibrated/validated in line with the manufacturer's guidelines. (x) There is insufficient consideration of the operation and design of the A421 access.	*conclusion that previous work done on the basis of the Transport Assessment remains valid and there is not a need to rerun the traffic impact assessments*'. (vii) The trip generation was performed in accordance with TRICS guidance for residential and employment land use. The appropriate categories were selected '*Private House*' and '*Business Park*' for employment. The trip refinement is appropriate for the development (outside Central London and more than 99 residential units) with those unsuitable removed. This is typical practice when determining trip rates. The use of NTS data to determine journey purpose were used to disaggregate journey purpose, which again is considered acceptable for the purpose of an assessment of this nature. (viii) The use and robustness of the static modelling assessment is detailed in paragraphs 7.1 to 7.6 of this Proof of Evidence. (ix) See response vi to paragraph 62. (x) See response vii of paragraph 61. (xi) Two-week ATC counts were undertaken along with three-day junction counts to ensure representative data was used in the assessment and subsequent traffic models. (xii) See responses to paragraph 62 (part iv for bullet point 1 and part vi for bullet point 3). Revied isochrones were provided in TRN1 and BC highways consideration on the impact on pedestrian and cycling are detailed in paragraphs 9.14 to 9.20. (xiii) A framework Travel Plan has been submitted as part of the 2020 TA. A cost plan was submitted as part of TRN2 and in principle the FTP has been accepted and overall BC highways are satisfied that FTP is well thought out with appropriate measures to reduce single occupancy car use.

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	(xi) Where comparisons have been made between model and observed traffic flows, for example in Bletchley, the comparison is not as strong as the appellant suggests. (xii) The new (2020) TA presents a different picture from earlier iterations, casting further doubt on their conclusions. It utilises a wholly different methodology in assessing the level, distribution and impact of development traffic. It; • Uses traffic data which was not collected in a representative period; • Misrepresents reasonable walking and cycling distances from the site; and, • Has not calibrated traffic models in the approved manner. (xiii) Both the 2016 and 2020 Travel Plans are relatively generic. The latest document contains some additional details, but steps back from earlier commitments in terms of its management and implementation. There are insufficient implementation, financial and mitigation commitments which would enable the TP to be relied up as a mitigator of traffic demand.	

11. BC highways response to highways objection by Newton Longville Parish Council and West Bletchley Town Council as a rule 6 party

11.1 In the SoC by Newton Longville Parish Council and West Bletchley Town Council as a rule 6 party several issues have been raised. A number of these concerns highways matters which are listed below with BC highways' responses:

Section / Paragraph number	Issue	BC highways response
Section 3 1 to 3	**3. POLICY CONTEXT** 1. The relevant development plan for the District against which the appeal is to be considered comprises Plan:MK adopted by Milton Keynes Council on 20th March 2019. 2. Evidence will be produced demonstrating that the appeal proposal is not accord with policies in the Adopted Local Plan. 3. Evidence will be adduced to show that the relevant requirements in the Framework have not been met.	See response to MKC SoC paragraphs 32 to 36.
Section 4 2.	2. It should be noted, however, that the latest Transport Assessment has fundamentally changed from the previous modelling work. In addition IPL have taken the employee numbers to be correct in the absence of any detailed information as to the level of employment work space provided. Should this information be found to be inaccurate then further comment will be made.	The level of employment was raised by BC as a separate comment in the 16th July 2020 response as this varied from the previously agreed Trip Generation. The Appellant provided the document from which the employment trips were derived (Updated Employment Assessment, May 2020). On review of the document an alternative employment trip rate was determined based on the worst-case assumptions. The Appellant amended the employment trip rates for the highest value which was used in the TRN2 and TRN3 modelling.
Section 4 3.	3. WSP has provided the raw data to IPL with regard to the base traffic counts which show little or no queueing on the existing network. IPL find this surprising given the local residents' views and understanding of the network operation. IPL are aware that WSP counts were undertaken at such a time as road works were being undertaken in the general locality which may have affected the result. Again for expediency these counts have been taken as read. However, the Rule 6 reserves the right during the coming months when traffic may begin to return to normal to undertake further observations/counts to better quantify the network operation. This information will be shared as soon as it is available.	A review of the planned roadworks within BC was performed by BC staff with the details provided to the Appellant to ensure all major road works in the County did not conflict with the traffic survey (see Appendix J). An initial check was performed on 16th January 2020 with the details of the planned work provided to the Appellant on the same day. A telephone conference was held on 24th January 2020 to discuss elements of the road works with an update provided on some of the roadworks via email on 27th January 2020. BC are aware that there was a road closure within MK at the time of the survey to the north of the A421 (Calverton Lane within Milton Keynes, but also the V4 Watling Street between Tilers Road and the Crownhill roundabout at H4 Dansteed

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		Way). The diversion route for the road closures are located much further north and not within Whaddon itself or BC area. The extent of the SWMK assessment network is the junction of Coddimoor Lane/Stock Lane/Shenley Road, just to the south of the village of Whaddon itself. To avoid the closure of Calverton Lane the most likely alternative to or from the A421 would be via the Kingsmead area via Shenley Road. Any traffic routing through the Kingsmead development would turn into Shenley Road at that junction rather than continuing into Stock Lane. This would result in additional turning movements to the minor arm (Shenley Road) rather than a continuation on the main road and is much more likely to have greater impact on the capacity analysis at the junction once assessed. On review of the data between the previous 2015 traffic survey and the more recent 2020 traffic surveys it is apparent that the traffic demand has increased for most of the arms at the junction of Coddimoor Lane/Stock Lane/Shenley Road and the Whaddon Crossroads roundabout. In the 2020 data collection the flows on each arm are on average 25% greater compared to the 2015 exercise through the two junctions. Only in the AM peak period was a decrease recorded over the five-year period for one arm at Whaddon Crossroads roundabout and one arm at the Coddimoor Lane/Stock Lane/Shenley Road junction. These are significant increases in demand over a five-year period and indicate that the higher level of data collection has provided robust values to allow sufficient analysis of the projected traffic impact the Salden Chase development will have on the surrounding network.
Section 4 4.	4. Using the flow diagrams contain with the WSP reports, IPL cannot replicate the distribution based on the same methodology as used by WSP. Nevertheless IPL for simplicity have used the WSP data given the results in themselves are troubling (without the need to start debating the background information which leads into these models).	Trip distribution was reviewed with amendments made by the Appellant to various requests by BC. The trip distribution as used in TRN2 and TRN3 is considered to be a robust methodology.

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Section 4 5.	5. It is also clear WSP has used an ordnance survey maps to measure the local junctions which IPL have also currently used for simplicity. However it is apparent on many of the junction arms throughout the network that the effective entry width is considerably less than the kerb to kerb measurements as can be seen by the build up of debris/grit alongside the kerbs.	It is standard practice at Stage 1 design stage to make use of OS CAD tiles for initial design sketches and capacity assessment. In general, topographical surveys are used at a later stage to allow detailed design. Kerb to kerb (median line) measurement are typically used for performing geometric measurements for capacity assessment, especially for new junctions such as the proposed Buckingham Road access as it is assumed that all the available road space will be used in the design. The use of kerb to kerb (median line) measurements are detailed within the JUNCTIONS 9 user guide (Appendix B) which define the methodologies for performing the various measurements. When measuring it is typically the 'usable' road space that is measured, for instance this should not include any central hatching or ghost islands, but the width of the actual lanes used to perform the manoeuvres on approach, and for some junction types through the junction. It is not always necessary to remove sections of road, which are not always overrun by vehicles, and in fact should not be as this is likely to result in a model that underestimates capacity. The best example of this is entry width for roundabouts, a roundabout entry of 4.0 m will have increased capacity if the entry width were increased to 4.5 m. It will not be possible to have two vehicles to queue side-by-side but the research that was performed in determining the empirical mathematical capacity equations showed than increasing entry width will always result in an increased capacity. This is because there is 'greater' space to perform the required movements, the vehicle is less constrained and able to manoeuvre more freely. As such the kerb to kerb (median line) measurement performed for the capacity assessments are acceptable. In any case, if an arm or arms of a junction were over-estimating capacity this should be evidenced by the comparison of the observed average queues and the model predicted queues, with calibration performed to ensure the model is representative of on-site conditions.

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Section 4 6 to 9	6. Fundamentally, using WSP's own flows for the modelling at the site access and adjacent Tattenhow Roundaound, IPL's work suggests extensive queuing and grid lock would occur. Again, for expediency only this main access and local junction has been modelled and it is likely that similar concerns will be raised at the other junctions in the network. 7. But IPL's conclusion is that the proposed development with suggested mitigation would result in a serve impact on the local highway network leading to congestion, increased risk of accidents and increased air pollution. 8. IPL disagrees with how WSP have modelled the Tattenhoe Roundabout. As part of the mitigation package, it is proposed to signalise the standing way (w) arm, with no signalisation on the other three arms. The part-time peak hour signalisation on standing way (w) is apparently proposed in order to allow gaps in the traffic flow for vehicles to exit V1 Snelshall Street. 9. To reiterate IPL remodelled the junction whilst using WSP's geometries and numbers. A diagram of the junction has been extracted from WSPs transport assessment and shown in figure 1 below for reference.	See paragraphs 8.22 to 8.28 of this Proof of Evidence.
Section 4 10 to 15	10. The connectors used in WSPs model would have meant that vehicles cut across one another. Both arms 5 and 9 (both part of the roundabout gyratory) were previously able to exit the roundabout in both lanes as well as turning right in both lanes. If vehicles were able to turn right from the nearside lane it would result in vehicles cutting across those going ahead and exiting the roundabout from the offside lane. Firstly this is not the normal way a junction would operate or should be modelled and more importantly if built and signalised as suggested would create a collision point where accidents would certainly occur. The internal link lengths in the model also appear to be generous in length – the distance of the gyratory links should be the length of the queuing until blocking would occur on the roundabout. WSPs model would not show blocking back on arm 6 and therefore assumes the roundabout would still function once vehicles queue back on this arm.	See paragraphs 8.22 to 8.28 of this Proof of Evidence.

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Section 4 16	16. The proposed site access junction has also not been modelled correctly as lane simulation should have been used due to a two lane approach on Buckingham Road (s). Once lane simulation is applied, it results in vehicle queues of 25 – 53 vehicles in the pm peak which would result in queueing back to windmill hill drive. This impact would be worsened by the fact there is already queueing back from the Tattenhoe Roundabout and is therefore unacceptable. A summary of WSPs results and IPLs are provided in Tables 3 and 4 respectively, with the full output results included in Appendix A3.	The lane simulation tool in ARCADY is a tool. It is not a fully calibrated tool as per the core model. The JUNCTION 9 user guide itself states '*Although Lane Simulation makes use of the core ARCADY/PICADY models, it is not in itself derived from empirical studies. Therefore, you should (as always) apply engineering judgement to both the application of the model and the interpretation of the results*'. It further goes on to state that '*It should not be taken as forecasting junction performance to the same level of accuracy as the main ARCADY model.*' It can be used at roundabouts to test / compare different entry lane configurations or where there is known unequal lane usage. At its core, ARCADY uses empirical models that relate the entry flow on a roundabout arm to the circulating flow past the arm. For a given circulating flow, the entry flow depends on various geometric aspects of the entry arm. One of the most important is the entry width. It was found that capacity increases continuously with entry width, and this was found to be a better indicator of capacity than the discrete number of lanes at the entry. ARCADY, however, does assume that the entire width of the entry is available to all vehicles for most of the time. In many cases, this assumption is valid, because a well-designed roundabout will encourage the use of the entry width to all vehicles. It is also perfectly valid if, for instance, there are lanes marked on the road, but vehicles can use any lane and do so frequently. The assumption becomes less valid if there is ***significant unequal lane usage,*** or if there is regular and ***significant entry starvation***. This is the reason why Bottledump roundabout has been tested using lane simulation due to the known difference in turning movements and the designated marked lane movements. In the case of the Buckingham Road access whilst the turning proportions from Arm 1 to Arms 2 / 3 and Arm 4 are disproportionate, it was felt that there was still sufficient flow that could make use of nearside flare. There is no defined point (level of unequal lane usage) at which lane simulation should be employed assessing a junction within the TRL User Guide. This is to be

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		determined on an individual junction assessment. In the PM scenario, which is shown to result in queuing in the IPL model, the nearside lane would account for 20% of the total arm demand. It is not clear if this is significant in terms of unequal lane usage and was therefore not identified as a specific need for a lane simulation sensitivity test. Furthermore, it is noted that the Rule 6 model has been constructed using PCU and Heavy Mix selected. This varies from the WSP model which makes use of Vehicles and Heavy Mix. By varying the unit input type to PCU this may mean that different demand is used for certain calculations in the model. Ideally the units would be the same between both models to allow for direct comparison.
Section 4 17	17. Accordingly therefore, using WSP's own figures, the proposed development with suggested mitigation would result in a severe impact on the local highway network leading to congestion, increased risk of accidents and increased air pollution, contrary to the terms of the NPPF	On review of the IPL model it has been noted that this uses different demand and turning proportions compared to the WSP flows. The discrepancies do not account for the use of PCU in place of Vehicles as detailed above. It is not clear why there is variation in demand if the WSP flows are being used. The additional 93 PCU for Arm 1 will provide worse results compared to the WSP model by the nature of the model. Without further details of which flows were used it is not possible to comment on the validity of the IPL model.
Section 4 18	18. IPL are also surprised by the lack of current queueing experienced at any of the junctions and will be revisiting this leading up to the inquiry with on site observations.	Specific lane queue counts were requested as part of the Transport Assessment Scoping Note (TASN). In discussion between BC and the Appellant it was stated that queue length surveys should also be provided showing the maximum queue in metres in five-minute intervals and that queue counts should also include slow moving vehicles, not just stationary vehicles.

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		BC are not aware of any issues surrounding the data collection as specified in the survey tender documentation nor have BC been informed that this could not be performed and therefore it has been assumed that the queue counts are accurate. There was a discrepancy noted in how the queue survey data was reported in the Transport Assessment. Subject to further discussions this has been resolved and has been updated for TRN2 and TRN3 and BC highways are confident that these now are representative of observed conditions.
Section 4 19	19. The Rule 6 parties reserves their position as to air quality not yet having had sufficient time to take advice on this aspect of the revised EIA recently submitted to the Planning Inspectorate. This also applies to any other issues that arise from a consideration of that document as they relate to the reasons for refusal.	Air quality is outside the scope of the highway capacity operation on which we are providing comment.
Section 4 20	20. The Rule 6 party will submit that the proposed development with suggested mitigation will result in a severe impact on the local highway network leading to congestion, increased risk of accidents and increased air pollution.	Mitigation has been proposed in TRN2 and TRN3 to several junctions where the capacity assessment has shown there to be a significant impact. These are detailed in paragraphs 8.16 to 8.128 of this Proof of Evidence and that these will reasonably accommodate the impact of the Proposed Development on the local junction network and the mitigation is considered to be deliverable, cost effective and proportionate related to the forecast impacts.

12. Conclusion

12.1 The wider BC application, reference 15/00314/AOP has been considered by the former Strategic Development Management Committee in 2017 and 2019. The resolutions at that Committee were to support the application subject to the satisfactory resolution of a S106 legal agreement.

12.2 As explained above, the refusal by MKC of 15/00619/FUL was contrary to MKC officer recommendations with the modelling and impact assessment being agreed by BC, MKC and the Appellant. Due to the refusal, and considering the age of the traffic data used to inform 2016 TA, it was agreed by BC, MKC and the Appellant that a new transport assessment be developed with new traffic flow information to ensure a more up to date traffic impact assessment could be applied to support the appeal. A review by BC of this new TA is ongoing.

12.3 The updated Transport Assessment and the TRNs that have been produced between June 2020 and January 2021 have been submitted both for the appeal scheme, and as further documentation in the application in BC's area (i.e. 15/00314/AOP). At present the updated Transport Assessment and TRNs have been assessed by BC officers only. There has been insufficient time ahead of the inquiry to schedule a formal Development Control Committee meeting where members could review the amendments to the application in BC's area. Therefore, all conclusions detailed in this Proof of Evidence are those of BC officers and not of relevant BC Committee members.

12.4 I have reviewed the data presented in the Appellant's submissions in terms of the assessment methodology to determine the impact on the highway network. It is my conclusion that the manual spreadsheet assessment methodology, which was agreed by MKC, BC highways and the Appellant, is appropriate when considering the potential limitations of the available Strategic models in being able to provide a unified approach across the whole network. It is considered that the adopted approach within the updated TA and TRNs provides a suitable and robust methodology with the impact on the local junction assessments likely to indicate greater impacts at junctions than would be expected from a strategic transport model.

12.5 The Trip Generation and Distribution were agreed by MKC, BC highways and the Appellant. Overall, I consider the methodologies used to determine the number of trips

and travel patterns to determine likely movements to and from the development to be appropriate and robust.

12.6 Overall I consider that, when taking into account the requested revised trip generation, distribution, the use of the MK TEMPRO growth rates and committed developments, the traffic flows used in the DS1 Scenario are robust and likely to provide a 'worst case' scenario when determining the impact of the development.

12.7 A detailed review of the junction modelling performed at all junctions within the network has been undertaken. The network junction assessment has been performed via the use of industry standard modelling software with the base models undergoing a rigorous calibration process and I am confident that the existing layout results are representative of current traffic patterns, thereby providing realistic future year results for the existing network.

12.8 The Appellant has provided a comprehensive mitigation package for the local junctions as detailed in TRN2 and TRN3. In my opinion these will reasonably accommodate the impact of the Proposed Development on the local junction network taking into consideration the flows are considered to be the 'worst case' scenario. The mitigation modelling with development traffic has shown that overall, most junctions will operate at the same level or better than the current layout using the DN scenario, whilst noting that some arms may perform worse but when considering each junction as a whole across both peak periods improvements can be observed.

12.9 Clarity was sought on several junctions, the majority of which were resolved satisfactorily in the Appellant's responses with no further amendments required. The only exception to this would be J17 Emmerson Roundabout, where a possible alterative design could be implemented (making used of the mitigation layout and infrastructure changes) but may not be necessary and could be implemented as a 'Monitor and Manage arrangement'.

12.10 Furthermore, the mitigation modelling has identified that the blocking back between major junctions (i.e. those that form part of the assessment process), or those bordering the assessment area is unlikely to occur, with the modelling only showing this potential at J16. It is noted that queuing will block various side roads within the wider network, but this occurs in the DN 2033 scenario for the current layout and is not considered that the residual impacts after mitigation would be significant.

12.11 The proposed mitigation package is considered to be deliverable (whilst being subject to detailed design and further Road Safety Audit process), cost effective and proportionately related to the forecast impacts.

12.12 The impact on villages has been analysed. I consider the methodology used to be appropriate and I do not consider the impact through most of the villages would result in significant change in traffic flow and it would not result in a significant impact. The exception is Newton Longville where the Appellant has proposed a traffic calming scheme to mitigate the impact of the development that can be secured in a S106 Agreement.

12.13 The impact on highway safety has been reviewed and I am satisfied that the use of the computer programme COBALT (Cost and Benefit to Accidents – Light Touch) methodology employed to perform the analysis to be appropriate. I am satisfied that the development will not have an unacceptable impact on highway safety and that overall it does not represent an unacceptable impact.

12.14 I have reviewed the data provided to determine the impact of construction traffic. I am satisfied with the level of construction traffic generation as detailed in the Updated TA and with the arrangement for the use of the Whaddon Road access for the primary construction access and egress point. Relevant construction plans will need to be agreed prior to construction with a planning condition being applied to negate any potential impact on the surrounding villages and peak hour traffic flows. With these conditions in place I am confident that the construction traffic will not have a significant impact on the surrounding area.

12.15 The proposed details of the impact on passenger transport, walking and cycling have been considered and I consider that the proposals for enhancements to the pedestrian and cycle networks around the development site, along with the new high frequency bus service, will provide multi-modal travel choice for residents and employees within the Site and have a positive impact on the surrounding wider network.

12.16 Overall, I am satisfied with the various methodologies used to assess the various impacts on the highway network. The assessment is considered to be robust and the overriding conclusion is that the development, along with the proposed mitigation, is acceptable. The residual impacts after mitigation would not be significant and the mitigation is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF.

13. Summary Proof of Evidence

Introduction

13.1 My name is James Bedingfeld, a Member of the Chartered Institution of Highways & Transportation (CIHT). I hold a National Certificate and Higher National Certificate for Civil Engineering.

13.2 I am currently a Principal Transport Planner for Jacobs Ltd in the Winnersh Office covering the South East. Jacobs are currently in a framework contract with Buckinghamshire Council for design and consultation services. I have been employed by Buckinghamshire Council (BC) as a Principal Transport Planner in the Highways Development Management team for the past year and a half with my role comprising assisting in the assessment of large development applications, focussing on the modelling work performed to support those applications.

13.3 BC is the local planning authority and highway authority for application 15/00314/AOP. MKC is the local planning authority and highway authority for application 15/00619/FUL. Application 15/00619/FUL is the subject of the appeal. This application seeks planning permission for development within MKC's area, not BC's area. The appeal scheme is part of the wider scheme within BC's area.

13.4 This summary proof of evidence explains BC's position from a highways point of view on the wider scheme within BC's area and, to the extent that it relates to the wider scheme, the appeal scheme within MKC's area. This will include explanation of highways matters relating to the proposed amendments to the wider scheme which the Appellant submitted in June 2020 and Technical Report Notes (TRNs) in 2020 and 2021. I rely on the evidence of Ms Claire Bailey, Associate Planner, in relation to planning matters.

Scope of assessment, including revised Transport Assessment and TRNs

13.5 The updated Transport Assessment and the TRNs that have been produced between June 2020 and January 2021 have been submitted both for the appeal scheme, and as further documentation in the application in BC's area (i.e. 15/00314/AOP). At present the updated Transport Assessment and TRNs have been assessed by BC officers only. There has been insufficient time ahead of the inquiry to

schedule a formal Development Control Committee meeting where members could review the amendments to the application in BC's area.

13.6 BC officers have assessed in detail the highway components of the overall scheme within Buckinghamshire and extended this to cover a full review of the other junctions which fall under the remit of MKC highway authority. This has been undertaken to determine the wider impact of the development.

13.7 The revised Transport Assessment (TA) (dated May 2020) was submitted with the appeal and as part of the June 2020 amendments to the wider scheme. The scope of the revised TA was discussed and agreed between the Appellants and representatives of both BC and MKC application 15/00619/FUL.

MKC application 15/00619/FUL

13.8 During the MKC application 15/00619/FUL process BC Highways were not a formal consultee, nor did BC provide a formal response as part of the consultation period. Buckinghamshire County Council ("BCC"; the then highway authority) had provided highways comments in respect of BC application 15/00314/AOP which included reference and comment upon the two development access junctions and the Bottledump roundabout within MK area. It is my understanding that BCC highway comments relating to the access points and Bottledump roundabout and AVDC's resolution were then considered by MKC officers as part of their own Transport Assessment review process.

13.9 The contents of the TA, which formed part of the submission for both applications, including but not limited to trip generation, distribution, and modelling analysis, were the subject of numerous discussions between the highway engineers at MKC and BCC and the applicant.

13.10 MKC's reason for refusal based on insufficient evidence to mitigate the harm of the development in terms of increased traffic flow and impact on the highway and Grid Network, specifically to Standing Way and Buckingham Road is not supported by previous officer discussions and recommendations or the findings of the Transport Assessment 2016. As part of the Committee Report for 15/00619/FUL MK highway officer comments were provided which stated: 'Subject to adequately worded conditions (and subsequent details assessed at the reserved matters and s278 stages),

the proposed development therefore accords with Policies CT1, CT2 and CT3 of Plan:MK'. This made clear that the officers considered that the proposals were in accordance with specific policies outlined as part of the reason for refusal.

BC application 15/00314/AOP

13.11 Planning application 15/00314/AOP was initially considered at AVDC's Strategic Development Management Committee on 7th June 2017. The report appended in full the detailed highways considerations and conclusions which provided a comprehensive evaluation of the impacts and associated mitigation proposals of the development. The highways response dated 28th April 2017 concluded that the outline application is acceptable to the Highway Authority subject to a Section 106 Agreement to secure required works and contributions to ensure a neutral impact in terms of highway impact.

13.12 The application was subsequently reported back to SDMC on 24th April 2019 (report at Appendix C of BC's statement of case) to update members. It was considered that the planning balance exercise was not affected by any change in circumstances to arrive at a different conclusion and recommendation to that which the committee previously considered and resolved to agree. That resolution was agreed by Members and this updated the resolution (previously made on 7th June 2017) to include an additional S106 matter relating to health care at MKUH and subject to appropriate conditions.

13.13 Since the resolutions made on application 15/00314/AOP set out above, the applicants have submitted a package of updated documents and associated plans proposing amendments to the scheme under a cover letter dated 19th June 2020. These include a new Transport Assessment (dated May 2020). This new TA has also been submitted as part of the evidence in the appeal against the refusal of MKC application 15/00619/FUL.

13.14 The new TA produced has updated its traffic impact assessment with the methodology once more agreed between the applicant's transport consultant and officers of both BC and MKC (Nigel Weeks of Stirling Transport was appointed on behalf of MKC and was part of discussions on all the Technical Notes for the new TA). In light of this agreement, the methodology outlined in the TA and the Technical Notes for

determining development trips, distribution and measuring the impact on the road network are considered to be fit for purpose.

Response to MKC and R6 party objections

13.15 Within my main proof of evidence, I have responded on the highways matters raised in the Statements of Case on behalf of MKC and the R6 objectors (Newton Longville Parish Council and West Bletchley Town Council). The main matters that I discuss are:

- The appropriateness of the design for the access only junction on the A421 Standing Way.
- The modelling methodology used for the junction capacity models, including the Buckingham Road roundabout access and Bottledump roundabout including the geometric measurement and calibration.
- The acceptance of the modelling approach used within the 2016 Transport Assessment by MKC officers.
- The appropriateness of the methodology used to determine trip generation, distribution and the collection of traffic data for the 2020 TA.
- How the development relates to Policies CT1 and CT2 (A1) of Plan:MK (as cited in the reason for refusal) and policies in the NPPF.

BC highways position on the appeal scheme

13.16 BC highways have completed their review of the submitted May 2020 Transport Assessment and subsequent TRNs. The outcome of that review is that BC highways have concluded that the highway impact assessment is thorough and robust and the mitigation proposed is sufficient to ensure that the residual cumulative impacts on safety and highway capacity are acceptable and not significant and comply with relevant local transport and national planning policies.

13.17 The manual spreadsheet assessment methodology used for modelling TRNs provides a suitable and robust methodology with the impact on the local junction assessments likely to indicate greater impacts at junctions than would be expected from a strategic transport model.

13.18 BC highways do not have any objections in principle to the proposed access arrangements for Buckingham Road, A421 Standing Way and Whaddon Road and I consider the overall junction designs and modelling to be appropriate, subject to detailed design.

13.19 The Appellant has provided a comprehensive mitigation package for the local junctions as detailed in TRN2 and TRN3. In my opinion these will reasonably accommodate the impact of the Proposed Development on the local junction network taking into consideration the flows are the 'worst case' scenario. The mitigation modelling with development traffic has shown that overall, most junctions will operate at the same level or better than the current layout using the DN scenario.

13.20 Furthermore, the mitigation modelling has identified that the blocking back between major junctions (i.e. those that form part of the assessment process), or those bordering the assessment area is unlikely to occur, with the modelling only showing this potential at J16.

13.21 The proposed mitigation package is deliverable (whilst being subject to detailed design and further Road Safety Audit process), cost effective and proportionately related to the forecast impacts.

13.22 Overall, I am satisfied with the various methodologies used to assess the various impacts on the highway network, including impact on villages, pedestrians, cyclists and passenger transport and the resultant mitigation proposals. The assessment is robust and the overriding conclusion that the development, along with the proposed mitigation to be acceptable. The residual impacts after mitigation would not be significant and the mitigation is proportionate and reasonably related in scale to the impact of the development, as required by the NPPF.

14. List of Documents

BCC Highways Response – April 2017

BCC Highways Response – November 2019

Revised Transport Assessment 2016 (Mouchel)

Revised Transport Assessment 2020 (WSP)

MKMMM Local Model Validation Report V1.4 (AECOM, June 2017)

Milton Keynes Multi-Modal Model Update Highway Model Traffic Forecasting Report (2017)

LTP4 Transport Infrastructure Development Plan, MKC (TIDP, 2019)

MK Multi Modal Model Impacts of Plan MK report, November 2017

WSP Transport Assessment Scoping Note, Revision 1 (27th January 2019) (provided in Appendix C of the 2020 TA)

WSP Trip Generation Technical Note, Revision A (20th March 2020) (provided in Appendix C of the 2020 TA)

WSP Trip Distribution Technical Note (26th March 2020) (provided in Appendix C of the 2020 TA)

Buses in Urban Developments, CIHT (2018)

CD123 Geometric design of at-grade priority and signal controlled junctions

Updated Employment Assessment, Carter Jones, May 2020

Junction 9 User Guide, TRL Software 2018

Unequal Lane Usage in ARCADY using Junctions 9 – DRAFT 23/08/18

Appendix A – BC emails regarding acceptance of WSP Traffic Assessment Scoping Note

Bedingfeld, James

From: Bedingfield, James
Sent: 20 February 2020 08:52
To: Sherlock, Justin
Cc: Urry, Christine; Paddle, Martin; Howard, Stephanie; Thornton, Joanna
Subject: RE: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

Hi Justin,

Apologies for missing your call and for the slight delay in responding. Thanks for confirming, I am happy with the numbers and can confirm get the same results and happy to use the methodology and new values detailed in your email dated 7th February.

It would be good to understand your reasoning of providing just LSOAs 003 C / D in the Scoping Note and then the whole MSOA for the later comparison, although it is noted that the variation between the two is very slight.

Happy to discuss over the phone if required. Am around for most of the day.

Thanks

James Bedingfeld

Senior Consultant
Highways Development Management

Tel: 01296 383121
E-mail: c-jbedingfield@buckscc.gov.uk
Buckinghamshire County Council, County Hall, Walton Street, Aylesbury, HP20 1UY

From: Sherlock, Justin [mailto:Justin.Sherlock@wsp.com]
Sent: 17 February 2020 15:30
To: Bedingfield, James
Cc: Urry, Christine; Paddle, Martin; Howard, Stephanie; Thornton, Joanna
Subject: RE: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

James

The MSOA data now used is for the entirety of MSOA 003 which includes all the LSOAs that make up this MSOA.

Taking the numbers from MSOA 003 in isolation I get the following for outgoing trips:

Mode	E02003654 : Aylesbury Vale 003	Mode Share
Underground, metro, light rail, tram	5	0%
Train	158	7%
Bus, minibus or coach	26	1%
Taxi	6	0%
Motorcycle, scooter or moped	13	1%
Driving a car or van	1906	83%
Passenger in a car or van	113	5%
Bicycle	11	0%
On foot	69	3%
Total	2307	100%

This mode share results in a slightly higher car driver mode share than would be the case for LSOAs 003C and D which were presented in the TA scoping note.

I will try to call to discuss.

Justin

From: Bedingfield, James <c-jbedingfield@buckscc.gov.uk>
Sent: 17 February 2020 08:21
To: Sherlock, Justin <Justin.Sherlock@wsp.com>
Cc: Urry, Christine <curry@buckscc.gov.uk>; Paddle, Martin <Martin.Paddle@wsp.com>; Howard, Stephanie
<Stephanie.Howard@wsp.com>; Thornton, Joanna <jthornton@buckscc.gov.uk>
Subject: RE: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

Hi Justin,

Thank you for providing the spreadsheets and I can confirm the errors are due to rounding.

I do note that the values used in the new assessment for Newton Longville MSOA differ from those in the updated scoping document. In the updated scoping document this was based on the full AVDC 003 MOSA but the new assessment would appear to be from only two of the LSOA's that form this MOSA.

Can you provide justification for the emittance of the remaining LOSA's that form AVDC 003?

Best regards

James Bedingfeld

Senior Consultant

Highways Development Management

Tel: 01296 383121
E-mail: c-jbedingfield@buckscc.gov.uk
Buckinghamshire County Council, County Hall, Walton Street, Aylesbury, HP20 1UY

From: Sherlock, Justin [mailto:Justin.Sherlock@wsp.com]
Sent: 11 February 2020 11:40
To: Bedingfield, James
Cc: Urry, Christine; Paddle, Martin; Howard, Stephanie; Thornton, Joanna
Subject: RE: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

James

This will be rounding. I have attached the spreadsheets so you can see how this information has

been calculated, Justin

From: Bedingfield, James <c-jbedingfield@buckscc.gov.uk>
Sent: 11 February 2020 08:39
To: Sherlock, Justin <Justin.Sherlock@wsp.com>
Cc: Urry, Christine <curry@buckscc.gov.uk>; Paddle, Martin <Martin.Paddle@wsp.com>; Howard, Stephanie <Stephanie.Howard@wsp.com>; Thornton, Joanna <jthornton@buckscc.gov.uk> **Subject:** RE: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

Hi Justin,

Thanks for confirming the speed data, much appreciated.

Re the MSOAs I am missing something, for the residential table the AVDC / MK combined has an 2% extra Driving a Car, with all other modes having the same percentage value, but both add up to 100%? Is this a rounding issue?

A similar issue appears in the employment table?

Thanks

James Bedingfeld

Senior Consultant
Highways Development Management

Tel: 01296 383121
E-mail: c-jbedingfield@buckscc.gov.uk
Buckinghamshire County Council, County Hall, Walton Street, Aylesbury, HP20 1UY

From: Sherlock, Justin [mailto:Justin.Sherlock@wsp.com]
Sent: 07 February 2020 16:52
To: Bedingfield, James
Cc: Urry, Christine; Paddle, Martin; Howard, Stephanie; Thornton, Joanna

Subject: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

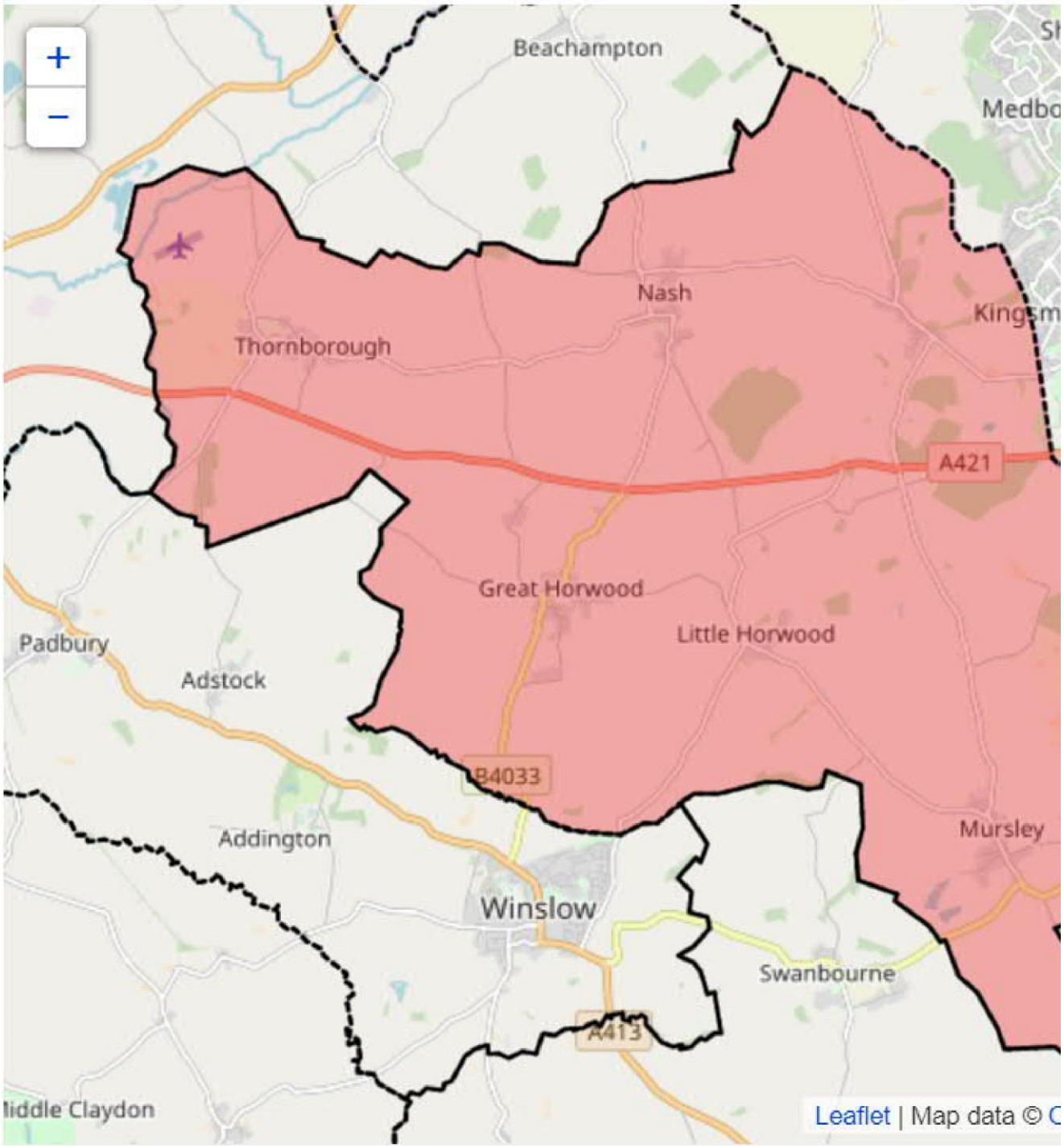
James

Thanks for your comments. I have spoken with the traffic survey company and they are going to process the speed data associated with the Automatic Traffic Counters to provide speeds with a headway of 2 seconds so this will be addressed.

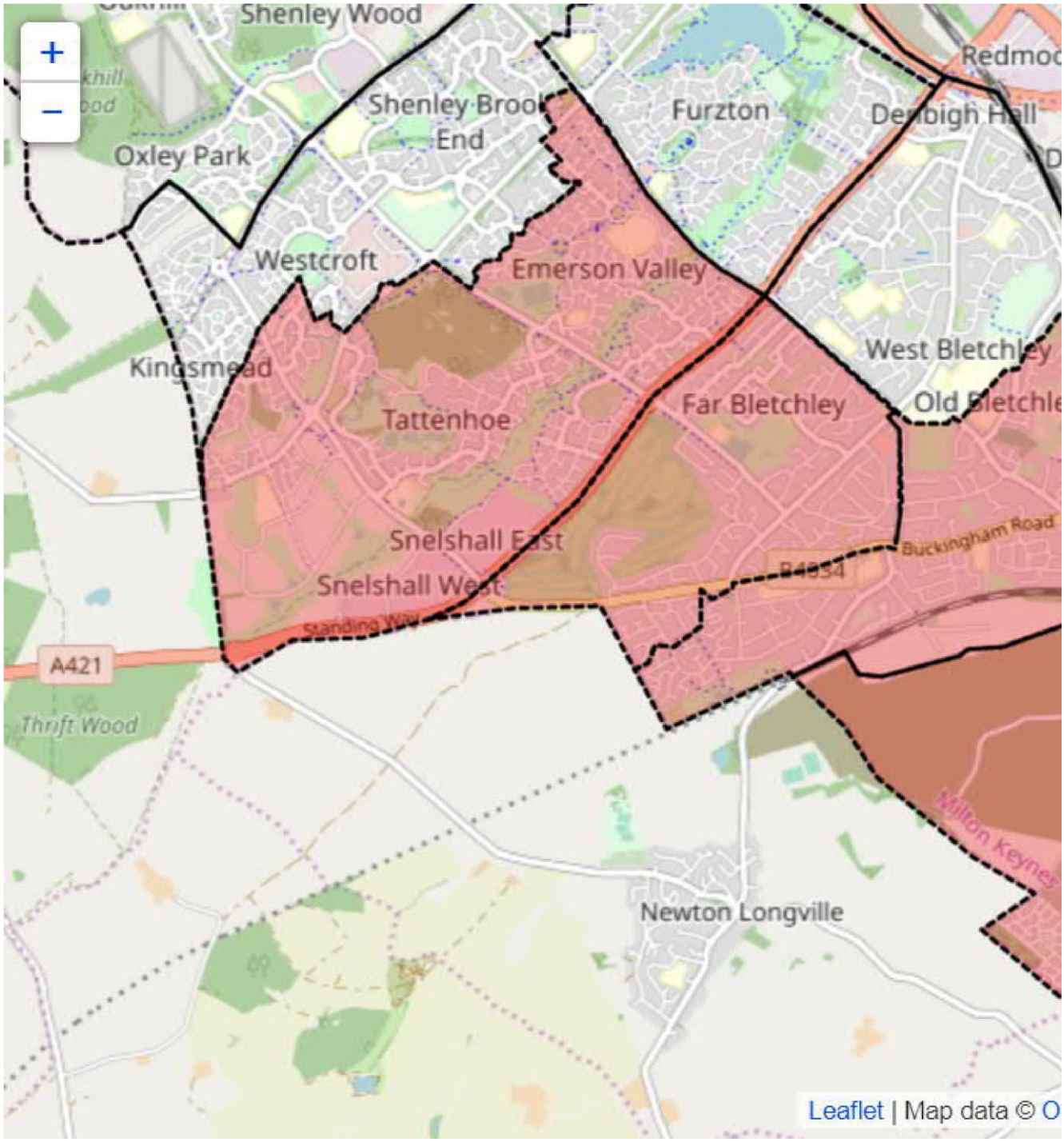
I appreciate your comment about the higher mode share for journeys to work in Newton Longville . Therefore if we incorporate the four MSOAs making up the south-eastern section of Milton Keynes plus Newton Longville (as shown in the figure below) we get the following mode share:

Mode	Mode Share (Combined Trips From AVDC 003 and MK 028,029,031,032 to All MSOAs)	Previous Mode Share (Combined Trips From MK 028,029,031,032 to All MSOAs)
Underground, metro, light rail, tram	0%	0%
Train	5%	5%
Bus, minibus or coach	6%	6%
Taxi	1%	1%
Motorcycle, scooter or moped	1%	1%
Driving a car or van	74%	72%
Passenger in a car or van	7%	7%
Bicycle	2%	2%
On foot	5%	5%
Total	100%	100%

MSOAs included:
Aylesbury Vale 003



Milton Keynes – 028,029,031,032



No comparison was made for employment trips because of the large geographic area that the AVDC MSOA covers and the types of jobs that would be found in these areas compared to the more urban area of Milton
Keynes. However, if we apply the above methodology of selecting five MSOAs (AVDC 003 and MK 028,029,031,032) we would get the following mode share:

Mode	Mode Share (Combined Trips From All MSOAs To AVDC 003 and MK 028,029,031,032)	Mode Share (Combined Trips From All MSOAs To and MK 028,029,031,032)
Underground, metro, light rail, tram	0%	0%
Train	3%	3%
Bus, minibus or coach	4%	4%
Taxi	1%	1%
Motorcycle, scooter or moped	1%	1%
Driving a car or van	75%	73%
Passenger in a car or van	7%	8%
Bicycle	2%	2%
On foot	8%	8%
Total	100%	100%

We are happy to apply these alternative mode shares if you agree?

Regards

Justin Sherlock ***BA(Hons) CTPP MCIHT***
Associate Director

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From: Bedingfield, James <c-jbedingfield@buckscc.gov.uk>
Sent: 05 February 2020 18:25
To: Sherlock, Justin <Justin.Sherlock@wsp.com>; Urry, Christine <curry@buckscc.gov.uk>
Cc: Paddle, Martin <Martin.Paddle@wsp.com>; Howard, Stephanie <Stephanie.Howard@wsp.com>; Thornton, Joanna <jthornton@buckscc.gov.uk>
Subject: RE: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

Hi Justin,

Thank you for the prompt response and confirming the number of routes.

Re the speed survey, I note that the speed surveys are being collected by the ATC counters loop, but from these will it be possible to apply a 2 second headway rule when calculating mean and 85th percentile speeds? As we need to consider free flow speeds, discounting any vehicles that are being 'held up' by vehicles in front.

With regard to the remainder of the methodology we have reviewed this and thank you for amending and taking on board previous comments.

We have the following comments re the methodology:

1. We note that the comparison of the Newton Longville MOSA has been performed against the proposed Milton Keynes (MK) MSOAs for residential trips, and that you are proposing used of the MK MSOAs. In order to ensure a robust assessment, and to take into account potential concerns of Newton Longville based on previous engagement, that we propose:

    a. That the percentage mode share used in the assessment is a split of the difference between MK and Newton Longville i.e. Car Driver would 77%.

2. Was a comparison performed between the Newton Longville and MK MSOA's foremployment or was this just done for the residential trips? It is likely that a similar split between the two areas would be requested.

We are happy with the remainder of the proposed methodology and the survey specification.

Please do not hesitate to contact me if you have any further queries.

Best regards

James Bedingfeld

Senior Consultant
Highways Development Management

Tel: 01296 383121
E-mail: c-jbedingfield@buckscc.gov.uk
Buckinghamshire County Council, County Hall, Walton Street, Aylesbury, HP20 1UY

From: Sherlock, Justin [mailto:Justin.Sherlock@wsp.com]
Sent: 05 February 2020 09:13
To: Bedingfield, James; Urry, Christine
Cc: Paddle, Martin; Howard, Stephanie
Subject: RE: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

James

Thanks for your email. My response below in green.

Justin

From: Bedingfield, James <c-jbedingfield@buckscc.gov.uk>
Sent: 04 February 2020 17:19
To: Sherlock, Justin <Justin.Sherlock@wsp.com>; Urry, Christine <curry@buckscc.gov.uk>; Tate, Martin <Martin.Tate@milton-keynes.gov.uk>
Cc: Paddle, Martin <Martin.Paddle@wsp.com>; TThornewill@hallamland.co.uk; gary.tucker@taylorwimpey.com; Howard, Stephanie <Stephanie.Howard@wsp.com>; 'Mark Hyde' <mark.hyde@carterjonas.co.uk> **Subject:** RE: [EXTERNAL] Pre-App Advice - SWMK - TA Scope

Hi Justin,

Thank you for providing the agreed minutes.

We have reviewed the methodology and just need to confirm one item and will then provide a formal response. In terms of the survey element I am happy with the revised scope and process that matches our discussions.

The only elements that needed confirmation on this side of the methodology are:

1. In the survey proposal submission section (page 1 of Appendix A) it is stated that there are2 Journey Time Routes, but further on there are 3 routes. Can you confirm that there are the 3 routes? There are three routes being collected:
    - A421 from B4043 to V6 Grafton Road
    - Whaddon Road from A421 to Stoke Road
    - Buckingham Road from A421 to Sherwood Drive
2. For the speed surveys will there be a minimum 2 second headway to ensure free flow speed are assessed? The speed surveys are being collected by ATC and as such speeds are those recorded by each vehicle passing over the loop counter.

In relation to use of the County Wide model for Shenley Park initial discussions with Tom have indicated that he thinks that in principle the BCC model would be able to provide the distribution, but this would require an initial review of the modelled scenarios, to then determine if new scenarios would be required to be set-up or the current scenarios updated to take into account any recent data etc. Tom would require detailed request etc. to determine the level of review. I will work up a specification for the model run to be passed to Tom for consideration.

Best regards

James Bedingfeld

Senior Consultant
Highways Development Management

Tel: 01296 383121
E-mail: c-jbedingfield@buckscc.gov.uk

From: Sherlock, Justin [mailto:Justin.Sherlock@wsp.com]
Sent: 03 February 2020 17:04
To: Urry, Christine; Bedingfield, James; Tate, Martin
Cc: Paddle, Martin; TThornewill@hallamland.co.uk; gary.tucker@taylorwimpey.com; Howard, Stephanie; 'Mark Hyde' **Subject:** [EXTERNAL] Pre-App Advice - SWMK - TA Scope

[**BCC** - Please note this has been sent from an **external source** - treat with caution and **do not open** attachments / use links until you are sure this is a trusted communication see intranet/IT for advice.]

All

Following our meeting on the 15th January 2020 please now find attached an agreed set of meeting minutes.

I also attach the updated TA Scope which resulted from the meeting. Please could you confirm that you are happy with the methodology proposed?

We are currently progressing with the traffic surveys and will be shortly issuing a note regarding the methodology we are proposing for the trip generation.

Chrissie and James – one of the actions from the methodology was to discuss with Tom Withey whether we could be provided with traffic flows from the County model regarding the Shenley Park and the grid road. Have you managed to have a conversation with Tom about this?

Martin Tate – I will now remove you from the circulation of these emails and pass these minutes onto Nigel Weeks for information.

Regards

Justin Sherlock ***BA(Hons) CTPP MCIHT***
Associate Director

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From: Howard, Stephanie <Stephanie.Howard@wsp.com>
Sent: 28 January 2020 16:15

To: Christine Urry <curry@buckscc.gov.uk>; Bedingfield, James <c-jbedingfield@buckscc.gov.uk>; Tate, Martin <Martin.Tate@milton-keynes.gov.uk>
Cc: Paddle, Martin <Martin.Paddle@wsp.com>; TThornewill@hallamland.co.uk; gary.tucker@taylorwimpey.com; Sherlock, Justin <Justin.Sherlock@wsp.com>
Subject: Pre-App Advice - SWMK - Meeting Notes

Hi all,
Please find attached a draft meeting note from when we met to discuss the scope/methodology for the updated TA. I would be grateful if you could review and add any tracked changes so that we can agree and finalise the Notes. Many thanks
Steph

Steph Howard ***MSc BSc (Hons) CTPP CMILT MCIHT***
Technical Director – Development Planning
Planning & Advisory Taskforce Member

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Appendix B – BC emails regarding acceptance of WSP Trip Generation Technical Note

Bedingfeld, James

From: Bedingfeld, James <James.Bedingfeld@jacobs.com>
Sent: 26 March 2020 17:49
To: Sherlock, Justin; James Bedingfeld; Jo Thornton; Christine Urry; 'Nigel Weeks'
Cc: Howard, Stephanie; Paddle, Martin
Subject: RE: Pre-app Advice: SWMK Trip Generation

Hi Justin,

Thank you for taking into account our comments and revising the Trip Generation Note as necessary.

I have reviewed the re-submitted note and in general we are in agreement with the overall person and vehicle trip rates.

Whilst the overall rates do vary from the 2016 TA, the variation is reduced compared to the original generation note and the AM and PM total flows are more balanced, in line with expectations.

There are still some minor variations in trip numbers, which is to be expected based with rounding but I would recommend some sanity checking of the numbers, for example in Table 6 AM you have zero motorbike arrivals and departure but a total of 1 for the period. I understand the rounding, perhaps a note could be added stating this for explanation.

One thing that was slightly confusing was the text under Table 28, this states that '*the proposed development is anticipated to generate 2043 person trips in the AM peak and 1924 in the PM'* but these values do not correspond with the Table data?

I note that the distribution note was sent. I will endeavour to review this and respond as soon as possible with any comments.

Best regards

James

James Bedingfeld | Jacobs | Principal Transport Planner
O:+44.118.946.8371 | James.Bedingfeld@jacobs.com
1180 Eskdale Road | Winnersh RG41 5TU | United Kingdom

From: Sherlock, Justin <Justin.Sherlock@wsp.com>
Sent: 20 March 2020 13:07
To: Bedingfield, James <c-jbedingfield@buckscc.gov.uk>; Bedingfeld, James <James.Bedingfeld@jacobs.com>;
Thornton, Joanna <jthornton@buckscc.gov.uk>; Urry, Christine <curry@buckscc.gov.uk>; 'Nigel Weeks' <nweeks@smtrans.co.uk>

Cc: Howard, Stephanie <Stephanie.Howard@wsp.com>; Paddle, Martin <Martin.Paddle@wsp.com> **Subject:** [EXTERNAL] Pre-app Advice: SWMK Trip Generation

All

Following our call on Monday please find attached an updated trip generation paper along with the secondary school trip generation.

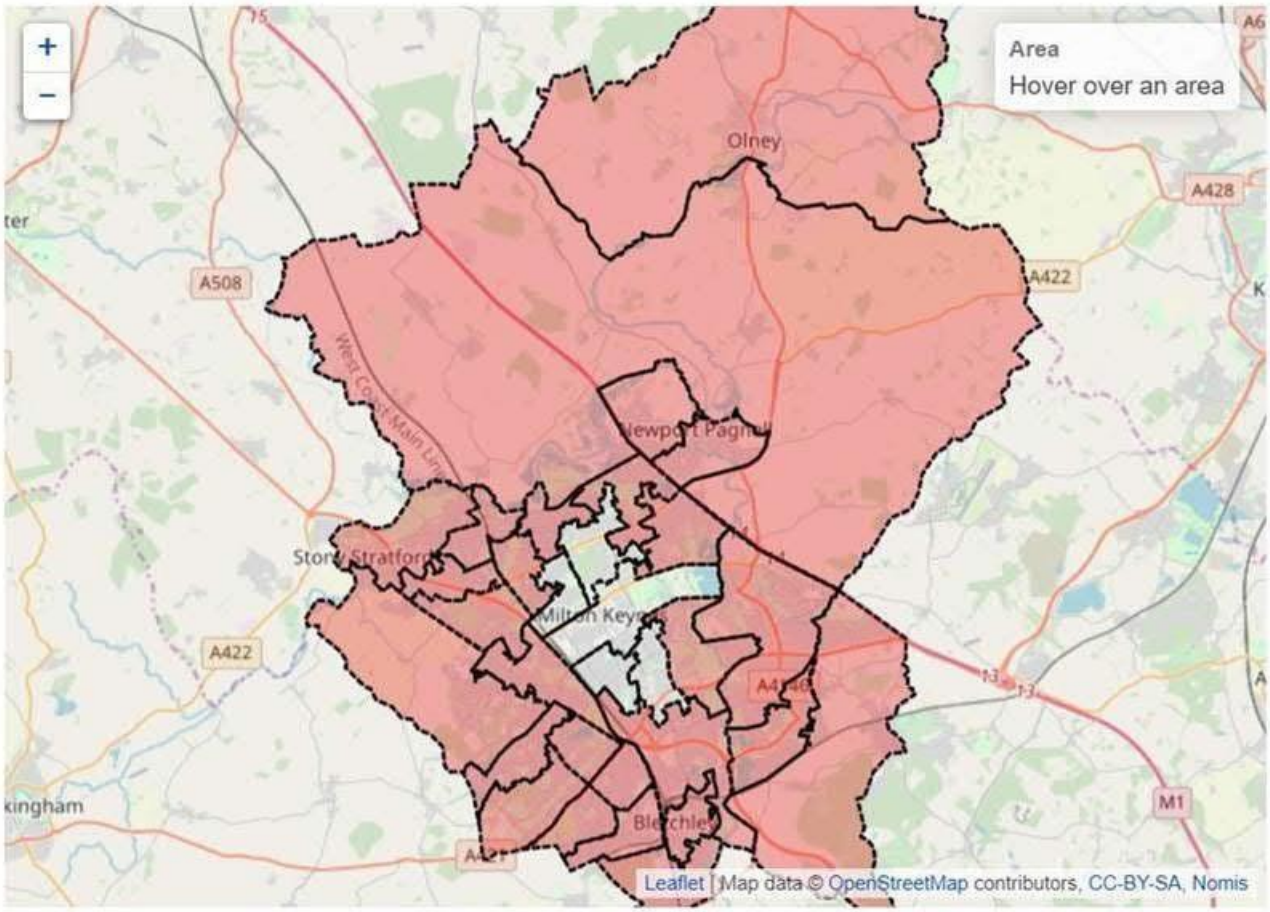
Key revisions as follows:

- **Trip Rates** – there is now a review of sites selected within TRICS and a refined person trip rate. I looked to do a vehicular trip rate comparison with Hampden Fields and Aylesbury Woodlands. However, upon further investigation it appears that Hampden Fields utilises trip rates were derived back in 2011 as part of their

  original planning application and the trip rates for Aylesbury Woodlands are 85th percentile rates. I therefore did not consider the two identified sites to have a comparable trip rate methodology.

- **Employment Internalisation -** I have re-run the distance travelled to work calculation excluding the five central MSOAs in MK. The revised proportion of journeys under 2km is 12%. I therefore consider that our internalisation assumption of 10% is robust. The MSOAs I have excluded can be seen on the screenshot below:

.



- **Residential to Education Trips –** We previously discussed why we had assumed a 10% external and 90% internal rate. The Independent Schools Council suggest that in England 7% of all

school age children attend independent schools. In addition to this you will have a proportion of children attending nursery/preschool, a proportion who attend faith or grammar schools and a proportion in further and higher education. As such I would suggest a 10% allowance for off-site education trips is reasonable.

· **Residential to Education Trips** – The internalisation assumption (that 90% of trips would be contained within the site) has now been applied to both education and education escort trips.

· **Employment Trips –** The employment trip generation has now been based upon 1360 employees.

· **Employment Trip Rates –** I had a look at the Kingbrook TA and the trip rates used for the employment land use date from 2010 and were derived from ALUTS and are therefore not considered comparable.

· **Secondary School** – The secondary school trip generation spreadsheet is now attached for comment.

· **Rail trips** – these have been re-assigned to other modes to reflect the relative remoteness of the rail stations to the site.

· **Travel Planning** – this now includes a 12% point target mode share for employment as well as residential.

We are now at a point in our assessment work where we will need the Shenley Park development flows to be able to complete our assessments. Can you provide a timescale for receipt of this information?

Regards

Justin Sherlock ***BA(Hons) CTPP MCIHT***
Associate
Director

M +44 (0) 7920

247432

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Appendix C – MK emails for acceptance of WSP Trip Generation and Trip Distribution Technical Notes

Bedingfeld, James

Bedingfeld, James

From: Nigel Weeks <nweeks@smtrans.co.uk>
Sent: 07 April 2020 08:49
To: Sherlock, Justin
Cc: Bedingfeld, James; James Bedingfeld; Christine Urry; Jo Thornton; Howard, Stephanie; Paddle, Martin
Subject: [EXTERNAL] RE: Pre-app Advice: SOUTH WEST MILTON KEYNES

Thanks Justin that's fine

Nigel

Sent from my Samsung Galaxy smartphone.

-------- Original message --------
From: "Sherlock, Justin" <Justin.Sherlock@wsp.com>
Date: 07/04/2020 08:43 (GMT+00:00)
To: Nigel Weeks <nweeks@smtrans.co.uk>
Cc: "Bedingfeld, James" <James.Bedingfeld@jacobs.com>, "Bedingfield, James" <c-jbedingfield@buckscc.gov.uk>,
"Urry, Christine" <curry@buckscc.gov.uk>, "Thornton, Joanna" <jthornton@buckscc.gov.uk>, "Howard, Stephanie"
<Stephanie.Howard@wsp.com>, "Paddle, Martin" <Martin.Paddle@wsp.com>
Subject: RE: Pre-app Advice: SOUTH WEST MILTON KEYNES

Nigel

Following our discussion we will take account of the school to work secondary trips by adding a proportion of additional trips taken from the gross primary escort trip generation.

Regards

Justin Sherlock ***BA(Hons) CTPP MCIHT***
Associate
Director

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From: Nigel Weeks <nweeks@smtrans.co.uk>
Sent: 02 April 2020 12:35
To: Sherlock, Justin <Justin.Sherlock@wsp.com>
Cc: Bedingfeld, James <James.Bedingfeld@jacobs.com>; Bedingfield, James <c-jbedingfield@buckscc.gov.uk>; Urry, Christine <curry@buckscc.gov.uk>; Thornton, Joanna <jthornton@buckscc.gov.uk>; Howard, Stephanie <Stephanie.Howard@wsp.com>; Paddle, Martin <Martin.Paddle@wsp.com>
Subject: Re: Pre-app Advice: SOUTH WEST MILTON KEYNES

Hi Justin

6 for you response. Quite happy on the growth factors. I don't accept you comments on the schools trips as there is no guarantee the schools will start at nine and even if they did parents often drop off slightly earlier to get to work. That's before you consider breakfast and preschool clubs etc.

Kind regards

Nigel

Sent from Samsung tablet.

-------- Original message --------
From: "Sherlock, Justin" <Justin.Sherlock@wsp.com>
Date: 02/04/2020 12:07 (GMT+00:00)
To: Nigel Weeks <nweeks@smtrans.co.uk>
Cc: "Bedingfeld, James" <James.Bedingfeld@jacobs.com>, "Bedingfield, James" <c-jbedingfield@buckscc.gov.uk>, "Urry, Christine" <curry@buckscc.gov.uk>, "Thornton, Joanna" <jthornton@buckscc.gov.uk>, "Howard, Stephanie" <Stephanie.Howard@wsp.com>, "Paddle, Martin" <Martin.Paddle@wsp.com> Subject: Pre-app Advice: SOUTH WEST MILTON KEYNES

Nigel

Thanks for your comments on the various matters relating to the Transport Assessment. Our response is provided below in green.

Justin Sherlock ***BA(Hons) CTPP MCIHT***
Associate
Director

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From: Stirling Maynard Transportation <smt@smtrans.co.uk>
Sent: 31 March 2020 16:11
To: Sherlock, Justin <Justin.Sherlock@wsp.com>
Cc: James Bedingfield (c-jbedingfield@buckscc.gov.uk) <c-jbedingfield@buckscc.gov.uk>; Christine Urry (curry@buckscc.gov.uk) <curry@buckscc.gov.uk>; Joanna Thornton (jthornton@buckscc.gov.uk) <jthornton@buckscc.gov.uk>; Paddle, Martin <Martin.Paddle@wsp.com>; Howard, Stephanie <Stephanie.Howard@wsp.com>
Subject: SOUTH WEST MILTON KEYNES

Hi Justin,

I trust you are coping well under the current circumstances. I have now had a chance to review the various papers recently issued and have set out my comments below. I have kept them as brief as possible.

Trip Generation

I note this has been considerably updated since the conference call and thank you for that. In general I am much happier with the trip rates and traffic generations and I note in general they are now slightly higher than before with overall vehicle trips having a slightly better balance. However I still have a niggle over the fact that the treatment of education trips is losing some external traffic. Briefly:

i) Most education trips are internalised. Given the school is on the site, I do not have an issue with this assumption. ii) However this means that all parent trips to school are in practice assumed to return home.

iii) This means there are no "school to work" trips as those linked home to school to work trips will have been treated as educational trips only.

Either some adjustment is needed to reflect this or an explanation as to whether I have misunderstood.

Whilst this point is noted, given that the trip generation is primarily concerned with trips taking place external to the site we do not believe consideration of onward education escort journeys is required. The majority of Parents who drop off their children who then continue in a vehicle would not be accessing the road network external to the site in the 08:00-09:00 hour. Instead they would most likely access the external road network after 09:00 and therefore after the peak hour.

Looking at the nearest primary schools to the site within Aylesbury Vale the Newton Longville CofE
Primary School commences at 08:55 (https://www.newton-longville-school.co.uk/website/school_day/344049) whilst Drayton Parslow School starts at 09:00 (http://www.threeschools.org/school-information/school-day)

The Transport Assessment actually uses traffic flows on the surrounding highway network of 07:45-08:45 as this is the network peak identified from the traffic survey data. This time period would be even less likely to witness onward escort education trips.

We will provide an explanation to this point within the Transport Assessment.

TEMPRO Growth Factors

I can accept the Aylesbury Vale growth factors as calculated. However are you intending to use these factors for the junctions in Milton Keynes? I don't think the factors will be much different but just slightly concerned that some people might pick up on it.

We have undertaken a comparison of the growth factors derived for AVDC and ones derived for MK. To derive the factors for MK we have applied the alternative assumption tool to remove the development associated with Kingsmead South and Tattenhoe Park that is considered as a committed development. The comparison is provided below.

Location	Scenario	AM Peak	PM Peak	Daily	Weekday
AVDC	2020-2026	1.066	1.069	1.075	1.074
AVDC	2020-2033	1.138	1.146	1.16	1.157
MK	2020-2026	1.080	1.082	1.089	1.088
MK	2020-2033	1.147	1.154	1.167	1.169

It is evident from this table that the MK growth factors, even once account is made for Kingsmead South and Tattenhoe Park are higher than those for AVDC. For consistence we would like to use the same growth factors across the network and as such we propose to utilise the MK factors instead within the Transport Assessment. We will agree separately with BCC that this approach is acceptable.

Trip Distribution

Happy with distribution method.

Shenley Park

I will leave the current discussions to you and James.

Please let me know if you need further input on anything at this stage.

Kind regards,

Nigel Weeks

Tel:- 01908 690463

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Appendix D – Highway obligations from draft S106 (November 2019)

SCHEDULE 12

Highway Works

1. **Definitions**

"1980 Act"	the Highways Act 1980
"A421 Corridor Improvements Contribution"	a sum of £1,300,896 (Index Linked) to be identified by the County Council in the A421 Corridor Improvements Notice to be paid to the County Council towards the cost of providing a scheme of capacity improvements to the A421 corridor between Buckingham and Milton Keynes as identified in the A421 Corridor Improvements Notice
"A421 Corridor Improvements Design Contribution"	a sum of £144,544 (Index Linked) to be paid to the County Council towards the cost of designing a scheme of capacity improvements to the A421 corridor between Buckingham and Milton Keynes as identified in the A421 Corridor Improvements Notice
"A421 Corridor Improvements Notice"	the written notice to be served by the County Council on the Owners and the Option Holders calling for payment of the A421 Corridor Improvements Contribution and identifying the requirement for payment of the A421 Corridor Improvements Contribution required, the location and details of the highway improvements to which the A421 Corridor Improvements Contribution is to be applied, the overall costs of the A421 Corridor Works
"A421 Corridor Works"	the provision of junction improvements or other highway improvements to relieve and improve highway circulation within the A421 corridor within the administrative area of Milton Keynes Council
"Bus Service"	the provision a new or improved bus service to serve the Development in accordance with the Passenger Transport Framework attached hereto in Appendix x
"Commercial Travel Plan"	a travel plan or plans prepared by the Owners and to be approved by the County Council in a form broadly consistent with the Residential Travel Plan (or such revised form as may be agreed in writing with the County Council) to be implemented to encourage the occupiers and/or users of one or more (as applicable) Commercial Units within the Development to use sustainable forms of transport whilst travelling to and from those units
"Commercial Travel Plan Further Monitoring Fee"	the additional sum of £1,000 (Index Linked) per annum payable to the County Council in respect of its role in monitoring, reviewing and supervising the implementation of the Commercial Travel Plan
"Commercial Travel Plan	the sum of £5,000 (Index Linked) payable to the

Monitoring Fee"	County Council in respect of its role in monitoring, reviewing and supervising the implementation of the Commercial Travel Plan
"Cycle Parking Contribution"	the sum of £25,000 to be applied to secure the Cycle Parking Provision
"Cycle Parking Provision"	the provision of new or additional cycle parking bays at or within the vicinity of Bletchley Station
"Footpath 19 Off-Site Improvements Contribution"	the sum of £41,800 (Index Linked) to be paid to the County Council towards the cost of the Footpath 19 Off-Site Improvements
"Footpath 19 Off-Site Improvements"	the improvements to that part of the Footpath between the Development and Newton Longville village shown on Plan 3
"Footpath 19 On-Site Improvements"	the dedication by the Owners pursuant to Section 30 of the 1980 Act of a new public bridleway along the alignment of Footpath 19 within the Land the approximate location of which is shown on Plan 3
"Footpath 19"	footpath NL0/19/1 between Weasel Lane and the railway line, under Section 25 of the Highways Act shown on Plan 3
"Grid Road Land"	such part of the Grid Road Reservation Land as shown coloured green and hatched black on Plan 3 required to provide the Grid Road and to enable the construction of a dual carriageway along the length of the Grid Road which shall comprise a width shown indicatively on Plan 3 hatched black and coloured green shall comprise a width between 25m to 30m unless otherwise agreed in writing with the County Council to be transferred to the County Council pursuant to a Section 38 Agreement for the Grid Road which shall include provision for maintenance of the landscaping by the Owners under a cultivation licence
"Grid Road Link Reservation Land"	that part of the Land shown for identification purposes only shaded green and labelled "Grid Road Reserve" on Plan 3 and excluding the Grid Road Land
"Grid Road Link Reservation Notice"	the written notice to be served by the County Council on the Owners calling for the Grid Road Link Reservation Land (or such part or parts thereof as relate to or may be required for the provision of the Grid Road Link) to be transferred to the County Council identifying the location and extent of the land required to be transferred
"Grid Road Link"	a link road between the Development and the A4146 Stoke Hammond Bypass
"Grid Road"	the road comprising part of the On-Site Infrastructure to be provided on the Grid Road Land
"Highway Works Delivery	a programme (or any variation thereof agreed with the County Council) for the phased delivery of the

Programme"	Highway Works which identifies: the stage of the Development by which each individual element of the Highway Works needs to be delivered; and the stage of the Development by which each individual Section 278 Agreement for each individual element of the Highway Works needs to be entered into with the Council (which for the avoidance of doubt shall in each case be accompanied by a Bond/Guarantee)
"Highway Works"	the provision of the off-site highway works shown in the table and in accordance with the specification attached at **Appendix 13**
"Milton Keynes Highway Works Contribution"	the sum of £209,517 (Index Linked) which may be paid to the District Council towards the cost of providing the A421 Corridor Works or any other works (whether within the administrative area of Milton Keynes Council or otherwise) reasonably identified by the District Council (in consultation with Milton Keynes Council) pursuant to **Paragraph 12** of this Schedule
"Newton Longville Traffic Calming Contribution"	the sum of £280,000 (Index Linked) to be paid to the County Council towards the cost of providing a traffic calming scheme through Newton Longville village
"On-Site Infrastructure"	the spine roads and associated drainage, structure and services to be constructed on the Land to service the Development shown indicatively coloured pink on Plan 3
"Residential Travel Plan"	a residential travel plan or plans to be approved by the County Council in a form broadly in accordance with the 'Framework Travel Plan' annexed hereto at **Schedule** Error! Reference source not found. (or such revised form as may be agreed in writing with the County Council) to be implemented to encourage the residents of the Development to use sustainable forms of transport whilst travelling to and from the Development
"Section 278 Agreement"	an agreement (or series of agreement) entered into by the Owners with the County Council (or Milton Keynes Council in respect of the A421 Corridor Works) to secure the Highway Works pursuant to section 278 of the 1980 Act
"Section 38 Agreement"	an agreement (or series of agreement) entered into by the Owners with the County Council to secure the transfer of the Grid Road Land as publically maintained highway pursuant to section 38 of the 1980 Act
"Travel Plan Annual Performance Report"	a written document setting out the results of a review of the operation and effectiveness of a Travel Plan during the previous 12 months and setting out any remedies or measures that are required to be implemented to secure the objectives and targets of

	that Travel Plan
"Travel Plan Coordinator"	an organisation, company or individual appointed or to be appointed who will have responsibility for the implementation, management and co-ordination of the Travel Plans throughout the course of the Development
"Residential Travel Plan Further Monitoring Fee"	the sum of £1,000 (Index Linked) per annum payable to the County Council in respect of its role in monitoring, reviewing and supervising the implementation of each of the Residential Travel Plans
"Residential Travel Plan Monitoring Fee"	the respective sum of £5,000 (Index Linked) payable to the County Council in respect of its role in monitoring, reviewing and supervising the implementation of each of the Residential Travel Plans
"Travel Plan Notice"	a notice in writing by the County Council served on the Owners confirming details of a breach in the implementation or operation of a Travel Plan
"Travel Plans"	together the Residential Travel Plan and the Commercial Travel Plans and "Travel Plan" shall be construed accordingly
"Weasel Lane Contribution"	the sum of £40,000 (Index Linked) to be paid to the County Council towards the cost of the Weasel Lane Off-site Improvements
"Weasel Lane Off-site Improvements"	the resurfacing of the part of Weasel Lane identified with a dashed green line on Plan 3
"Weasel Lane On-site Improvements"	the improvements to the part of Weasel Lane identified with a solid green line on Plan 3
"Whaddon Highway Safety Improvement Scheme Contribution"	the sum of £22,000 (Index Linked) to be paid to the County Council towards the cost of providing a safety scheme through Whaddon village

The Owners hereby covenant with the County Council as follows:

1 TRAVEL PLAN CONTRIBUTIONS

1.1 prior to the Occupation of any of the Dwellings to pay to the County Council the Residential Travel Plan Monitoring Fee

1.2 not to occupy and /or use any Dwelling until the Residential Travel Plan Monitoring Fee has been paid to the County Council

1.3 prior to the Occupation of any of the Commercial Units to pay to the County Council the Commercial Travel Plan Monitoring Fee

1.4 not to Occupy and/or use any Commercial Unit until the Commercial Travel Plan Monitoring Fee has been paid to the County Council

2. TRAVEL PLAN CO-ORDINATOR

2.1 not to Occupy and/or use any Dwelling or any Commercial Unit until a Travel Plan Co-ordinator has been appointed and details of the said appointment have been provided to the County Council and thereafter the Owners shall notify the County Council of any changes to the said appointment

2.2 following the first appointment of a Travel Plan Co-ordinator to continue the appointment of such role until otherwise agreed with the County Council but always for a period of not less than 5 years.

3. **RESIDENTIAL TRAVEL PLAN**

3.1 prior to Commencement of Construction to submit the Residential Travel Plan to the County Council for approval

3.2 not to Commence the Development until the Residential Travel Plan has been submitted to the Council

3.3 not to Occupy and/or use any Dwelling until the Residential Travel Plan has been approved in writing by the County Council ("the Approved Residential Travel Plan")

3.4 to implement the Approved Residential Travel Plan and thereafter continue to implement the Residential Travel Plan unless and until its targets have been reached as agreed in writing with the County Council but always for a period of not less than five years

3.5 to monitor and review the Residential Travel Plan on an annual basis from the Occupation of the 150th Dwelling until otherwise agreed with the County Council but always for a period of not less than 5 years

3.6 to submit a Travel Plan Annual Performance Report in respect of the Approved Residential Travel Plan for the approval of the County Council not later than 12 months and two weeks after the first Occupation of the 150th Dwelling and then annually thereafter (until a reasonable date for cessation of the Residential Travel Plan is agreed in writing with the County Council)

3.7 to review the Travel Plan Annual Performance Report in respect of the Approved Residential Travel Plan with the County Council and if the County Council is of the view that the Travel Plan Annual Performance Report does not or will not achieve the objectives of the Approved Residential Travel Plan it shall notify the Owners to that effect setting out its reasons for holding such opinion and the Owners shall thereafter as soon as reasonably practicable identify reasonable measures for the approval of the County Council to remedy its concerns

3.8 on receipt of written notice from the County Council pursuant to **paragraph 2.6.3** above the Owners shall submit a revised Travel Plan Annual Performance Report in respect of the Approved Residential Travel Plan to the County Council for approval and such further revisions (as appropriate) until such time as the Travel Plan Annual Performance Report in respect of the Approved Residential Travel Plan is approved in writing by the County Council

3.9 as soon as reasonably practicable following the County Council's written approval of the Travel Plan Annual Performance Report in respect of the Approved Residential Travel Plan to implement the measures contained therein

3.10 following receipt of a Travel Plan Notice in respect of the Approved Residential Travel Plan to use reasonable endeavours to meet with the County Council within 30 Working Days of receipt of the relevant Travel Plan Notice to discuss and where possible agree reasonable measures to remedy any failures in respect of the implementation and operation of the Approved Residential Travel Plan identified in the Travel Plan Notice where these have been identified as being within the control of the Owners to remedy or as is practicable to

review the targets of the Approved Residential Travel Plan in light of matters outside the control of the Owners

3.11 as soon as reasonably practicable to implement reasonable measures to remedy failures identified in a Travel Plan Notice as may be agreed with the County Council pursuant to paragraph 3.10 above or as is practicable review the targets of the Residential Travel Plan in light of matters outside the control of the Owners (as may be agreed with the County Council pursuant to paragraph 3.10 above)

4. RESIDENTIAL TRAVEL PLAN FURTHER MONITORING FEE

4.1 Subject to paragraph 3.10 in the event that measures to remedy such failures are ineffective to pay to the County Council the Travel Plan Further Monitoring Fee on each anniversary of the date of the submission of the Travel Plan Notice pursuant to paragraph 3.10 of this Schedule until Completion of the last Dwelling to be provided on the Development has occurred (or for such alternative period as agreed in writing with the County Council but subject to a longstop period of 10 years)

5. COMMERCIAL TRAVEL PLAN

5.1 prior to Commencement of Construction in any Phase comprising the Local Centre or the Employment Land to submit the Commercial Travel Plan to the County Council for approval

5.2 not to Commence the development until the Commercial Travel Plan has been submitted to the Council for approval

5.3 not to Occupy and/or use any Commercial Unit unless and until a Commercial Travel Plan has been submitted to and approved in writing by the County Council which relates to that Commercial Unit (for the avoidance of doubt at the Owners' discretion, a Commercial Travel Plan may relate to more than one Commercial Unit)("the Approved Commercial Travel Plan")

5.4 from the Occupation of any Commercial Unit in respect of that Commercial Unit:

5.5 to implement the relevant Commercial Travel Plan (as approved by the County Council) in so far as it relates to that Commercial Unit and thereafter continue to implement that Travel Plan in respect of that Commercial Unit unless and until its targets have been reached as agreed in writing with the County Council but always for a period of not less than 5 years

5.5.1 to monitor and review that Commercial Travel Plan on an annual basis from the Occupation of the first Commercial Unit which is the subject of that Commercial Travel Plan until otherwise agreed with the County Council but always for a period of not less than 5 years and to submit a Travel Plan Annual Performance Report in respect of that Travel Plan for the approval of the County Council not later than 12 months and two weeks after the first Occupation of the first Commercial Unit which is subject to that Travel Plan and then annually thereafter (until the reasonable date for cessation of that Commercial Travel Plan is agreed in writing with the County Council)

6. to review the Travel Plan Annual Performance Report in respect of that Approved Commercial Travel Plan with the County Council and if the County Council is of the view that the Travel Plan Annual Performance Report does not or will not achieve the objectives of that Approved Commercial Travel Plan it shall notify the Owners to that effect setting out its reasons for holding such opinion and Owners shall as soon as reasonably practicable identify reasonable measures for the approval of the County Council to remedy its concerns

6.1 on receipt of written notice from the County Council pursuant to paragraph 2.7.3 above the Owners shall submit a revised Travel Plan Annual Performance Report in respect of that Approved Commercial Travel Plan to the County Council for approval and such further revisions (as appropriate) until such time as the Travel Plan Annual Performance Report in respect of that Approved Commercial Travel Plan is approved in writing by the County Council

6.2 as soon as reasonably practicable following the County Council's written approval of the Travel Plan Annual Performance Report in respect of that Approved Commercial Travel Plan to implement the measures contained therein

6.3 following receipt of a Travel Plan Notice in respect of that Approved Commercial Travel Plan to use reasonable endeavours to meet with the County Council within 30 Working Days of receipt of the relevant Travel Plan Notice to discuss and where possible agree reasonable measures to remedy any failures in respect of the implementation and operation of that Approved Commercial Travel Plan identified in the Travel Plan Notice where these have been identified as being within the control of the Owners to remedy or as is practicable to review the targets of that Approved Commercial Travel Plan in light of matters outside the control of the Owners

6.4 as soon as reasonably practicable to implement reasonable measures to remedy failures identified in a Travel Plan Notice as may be agreed with the County Council pursuant to paragraph 6.3 above or as is practicable review the targets of that Approved Commercial Travel Plan in light of matters outside the control of the Owners (as may be agreed with the County Council pursuant to paragraph 6.3 above)

7. COMMERCIAL TRAVEL PLAN FURTHER MONITORING FEE

7.1 Subject to **paragraph 6.3** in the event that measures to remedy such failures are ineffective the Owners covenant with the County Council to pay to the County Council the Commercial Travel Plan Further Monitoring Fee on each anniversary of the date of the submission of the Travel Plan Notice pursuant to **paragraph 6.3** of this Schedule until Completion of the last Commercial Unit to be provided on the Development has occurred (or for such alternative period as agreed in writing with the County Council and subject to a longstop period of 10 years)

8. GRID ROAD SECTION 38 AGREEMENT

8.1 following the Commencement of the Development the Owners shall enter into a Section 38 Agreement to secure the public adoption of the Grid Road and Grid Road Land

8.2 not to Occupy and/or use more than 650 Dwellings unless or until the Owners have entered into a Section 38 Agreement to secure the public adoption of the Grid Road and Grid Road Land

8.3 to provide the Grid Road on the Grid Road Land in accordance with the relevant Phase Implementation Plan and the terms of the completed Section 38 Agreement PROVIDED ALWAYS that the Grid Road shall be designed to 'future proof' the expansion of the adopted highway to facilitate the potential future dualling of the Grid Road with minimal abortive works

9. NOTIFICATION

9.1 to give the County Council not less than ten 10 working days prior written notice of the Commencement of Construction of the 1,701th Dwelling

9.2 not to Commence Construction of more than 1,700 Dwellings unless or until they have given the notice pursuant to clause 9.1 above to the County Council

9.3 not to Occupy and/or cause or permit the Occupation of more than 1,700 Dwellings unless or until they have given the notice pursuant to clause 9.1 above to the County Council

9.4 time shall be of the essence in relation to this Notification clause and in the event that the Owners fail to serve the notice required pursuant to clause 9.1 above the County Council shall still be permitted to serve a Grid Road Link Reservation Notice upon the Owners at any time after Commencement of Construction of the 1700th Dwelling and shall not be bound by the restrictions contained in clauses 10.2 and 10.7 below (namely the restrictions on service of notice after Occupation of more than 1,799 Dwellings)

10. GRID ROAD LINK RESERVATION NOTICE

10.1 SUBJECT TO CLAUSE 9 above:

10.2 following Commencement of Development and until the date of service of the Grid Road Link Reservation Notice or prior to the Occupation of the 1,799 Dwelling (whichever is the earlier event) not to develop the Grid Road Link Reservation Land other than for the purposes of the Grid Road including On-Site Infrastructure and landscaping PROVIDED THAT this paragraph shall not prohibit or restrict the ability of the Owners to use the Grid Road Link Reservation Land for the storage of plant or materials during and in connection with the construction of the Development and for the avoidance of any doubt the Grid Road Link Reservation Land may include provision of an access to the Secondary School Site but may not include a vehicular drop-off /pick up area to serve the Secondary School

10.3 Following the Commencement of Development and prior to the Occupation of no more than 1,799 Dwellings the County Council may serve the Grid Road Link Reservation Notice on the Owners and the notice will include the following information:

10.3.1 there is a policy provision for the Grid Road Link in either an adopted local plan or transport strategy; and

10.3.2 the County Council has produced an outline scheme for the provision of the Grid Road Link to determine the extent of the Grid Road Reservation Land required to be transferred to the County Council; or

10.3.3 the County Council has decided that it does not require the Grid Road Reservation Land to be transferred to the County Council

10.4 If the County Council serves a Grid Road Link Reservation Notice on the Owners pursuant to **paragraph 10.3** of this Schedule confirming pursuant to **paragraphs 10.31 and 10.3.2** that the Grid Road Link Reservation Land (or such part or parts thereof as relate to or may be required for the provision of the Grid Road Link) should be transferred to the County Council then the Owners shall not cause or permit the Occupation of more than 1,850 Dwellings until they have either:

10.5 transferred the Unencumbered freehold of the Grid Road Link Reservation Land (or such part or parts thereof as relate to or may be required for the provision of the Grid Road Link and as are identified in the Grid Road Link Reservation Notice) at open market value for agricultural land to the County Council with Title Absolute to the County Council; or

10.6 delivered to the County Council an executed transfer of the Grid Road Link Reservation Land (or such part or parts thereof as relate to or may be required for the provision of the Grid Road Link and as are identified in the Grid Road Link Reservation Notice) with irrevocable authority for the County Council to execute and complete the same

AND FOR THE AVOIDANCE OF DOUBT the Owners agree to pay the County Council 's reasonable and proper legal costs incurred in preparing and completing the transfer of the

Grid Road Link Reservation Land (or relevant part thereof) plus the Land Registry fee for registering the Grid Road Link Reservation Land (or relevant part thereof)

10.7 If the County Council serves a Grid Road Link Reservation Notice on the Owners pursuant to **paragraph 10.3** of this Schedule confirming pursuant to **paragraph 10.3.3** that it does not require the Grid Road Link Reservation Land to be transferred to the County Council, or if the County Council does not serve a Grid Road Link Reservation Notice on the Owners following the Occupation of more than 1,799 Dwellings then **paragraph 10** of this Schedule shall cease to apply and shall no longer be enforceable by the County Council and, in particular, for the avoidance of doubt the Grid Road Link Reservation Land shall no longer be subject to the restriction set out in **paragraph 10.1**

11. A421 CORRIDOR IMPROVEMENTS DESIGN CONTRIBUTION

11.1 to pay the A421 Corridor Improvements Design Contribution to the County Council prior to the Occupation of the 300th Dwelling

11.2 not to cause or permit the Occupation of more than 299 Dwellings until the A421 Corridor Improvements Design Contribution has been paid to the County Council

12. A421 CORRIDOR IMPROVEMENT NOTICE

12.1 to give the County Council not less than ten 10 working days prior written notice of the Commencement of Construction of the 600th Dwelling

12.2 not to Commence Construction of more than 599 Dwellings unless or until they have given the notice pursuant to clause 12.1 above to the County Council

12.3 not to Occupy and/or cause or permit the Occupation of more than 599 Dwellings unless or until they have given the notice pursuant to clause 12.1 above to the County Council

12.4 time shall be of the essence in relation to this Notification clause and in the event that the Owners fail to serve the notice required pursuant to clause 12.1 above the County Council shall still be permitted to serve an A421 Corridor Improvement Notice upon the Owners at any time after Commencement of Construction of the 600th Dwelling and shall not be bound by the restrictions contained in clauses 12.5 and 12.7 below (namely the restrictions on service of notice after Occupation of more than 1,799 Dwellings)

12.5 Following the Occupation of more than 650 Dwellings and prior to the Occupation of no more than 1,799 Dwellings the County Council may serve the A421 Corridor Improvements Notice on the Owners

12.6 If the County Council serves an A421 Corridor Improvements Notice on the Owners pursuant to **paragraph 12.5** of this Schedule then:

12.6.1 the Owners shall pay the A421 Corridor Improvements Contribution within 2 months of receipt of such notice; and

12.6.2 the Owners shall not cause or permit to be Occupied more than 1,799 Dwellings until the A421 Corridor Improvements Contribution identified in the A421 Corridor Improvements Notice(s) issued by the County Council in accordance with this **paragraph 12.6.1** have been paid to the County Council

12.7 If the County Council serves the A421 Corridor Improvements Notice on the Owners pursuant to **paragraph 12.5** of this Schedule that the A421 Corridor Improvements Contribution is not required in connection with the Development, or if the County Council does not serve an A421 Corridor Improvements Notice on the Owners prior to the Occupation of no more than 1,799 Dwellings then **paragraphs 12.6 to 12.7** of this Schedule shall cease to apply and shall no longer be enforceable by the County Council

13. **WEASEL LANE**

13.1 Following the commencement of the Development but prior to the Occupation of the 600th Dwelling the Owners shall enter into a Section 278 Agreement and/or Section 38 Agreement with the County Council for the Weasel Lane On-Site Improvements

13.2 Not to cause or permit to be Occupied more than 599 Dwellings until the Owners have entered into a Section 278 Agreement and /or a Section 38 Agreement with the County Council for the Weasel Lane On-Site Improvements

13.3 to implement the Weasel Lane On-site Improvements in accordance with the relevant Phase Implementation Programme and the Approved Reserved Matters application for the relevant Phase

13.4 to not to occupy or cause or permit the Occupation of more than 599 Dwellings until/unless the Weasel Lane On-Site Improvements have been implemented and completed to the County Council's satisfaction (unless otherwise agreed in writing by the County Council)

13.5 prior to the Occupation of the 600th Dwelling to pay the Weasel Land Off-Site Improvements Contribution to the County Council

13.6 not to Occupy or cause or permit the Occupation of more than 599 Dwellings until/unless the Weasel Land Off-Site Improvements Contribution has been paid to the County Council (unless otherwise agreed in writing by the County Council)

14. **HIGHWAY WORKS**

14.1 to submit the Highway Works Delivery Programme to the Council for approval

14.2 The Owners shall not cause or permit Commencement of Development until the Highway Works Delivery Programme has been submitted to and agreed in writing by the County Council (for the avoidance of doubt at any time during the Development the Owners and Developer shall be entitled to submit for approval by the County Council a varied Highway Works Delivery Programme which if approved shall operate in substitution for the previously approved Highway Works Delivery Programme)("the Approved Highway Works Delivery Programme")

14.3 to implement the Development in accordance with the Approved Highway Works Delivery Programme

14.4 not to occupy any Dwellings or Commercial Units beyond the limitation identified in the Approved Highway Works Delivery Programme until the Section 278 Agreement and/or S38 Agreement has been entered into with the County Council for the relevant part of the Highway Works

14.5 not to occupy any Dwellings or Commercial Units beyond the limitation identified in the Approved Highway Works Delivery Programme until the relevant part of the Highway Works has been delivered

15. **CYCLE PARKING**

15.1 on or before Occupation of the 650th Dwelling to pay the Cycle Parking Contribution to the Council

15.2 not to cause or permit to be Occupied more than 649 Dwellings until the Cycle Parking Contribution has been paid to the County Council (unless otherwise agreed in writing by the County Council)

16. **FOOTPATH 19**

16.1 Following the Commencement of the Development the Owners shall enter into a Section 278 and/or Section 38 Agreement with the County Council for the Footpath 19 On-Site Improvements and where relevant in combination with the Grid Road Link

16.2 to implement the Footpath 19 On-Site Improvements in accordance with the relevant Phase Implementation Programme and the approved Reserved Matters Application for the relevant phase

16.3 To carry out all necessary works required in order to secure the dedication of Footpath 19 as a bridleway

16.4 not to occupy or cause or permit the Occupation of more than 599 Dwellings until/unless the Footpath 19 On-Site Improvements have been implemented and completed to the County Council's satisfaction (unless otherwise agreed in writing by the County Council)

16.5 to pay the Footpath Off-Site Improvements Contribution to the County Council on or before Occupation of the 600th Dwelling

16.6 not to cause or permit to be Occupied more than 599 Dwellings until the Footpath 19 Off-Site Improvements Contribution has been paid to the County Council (unless otherwise agreed in writing by the County Council)

17. NEWTON LONGVILLE TRAFFIC CALMING CONTRIBUTION

17.1 The Owners covenant with the County Council to pay to the County Council:

17.1.1 20% of the Newton Longville Traffic Calming Contribution at the Commencement of Development: and

17.1.2 the residue of the Newton Longville Traffic Calming Contribution prior to the first anniversary of the first payment of part of the Newton Longville Traffic Calming Contribution (unless otherwise agreed in writing by the County Council)

18. WHADDON SAFETY SCHEME CONTRIBUTION

18.1 To pay the Whaddon Highway Safety Improvement Scheme Contribution to the County Council on or before Occupation of the 100th Dwelling

18.2 l not to cause or permit to be Occupied more than 99 Dwellings until the Whaddon Highway Safety Improvement Scheme Contribution has been paid to the County Council (unless otherwise agreed in writing by the County Council)

19. PUBLIC TRANSPORT

19.1 to use reasonable and commercially sensible endeavours to enter into a service level agreement with a bus operator to procure the Bus Service(s) set out in the approved public transport strategy included at Appendix 14 prior to Occupation of the first Dwelling (or such other service as agreed in writing)

19.2 In the event that prior to Occupation of the first Dwelling the Owners cannot secure a service level agreement with a bus operator pursuant to paragraph 19.1 of this Schedule the Owners shall submit and secure the approval of the County Council for an alternative Bus Service scheme and shall not cause or permit to be Occupied more than 100 Dwellings until the approved alternative scheme has been secured in accordance with the approved programme and the Owners shall provide the alternative scheme prior to the of 100th Dwellings (unless otherwise agreed in writing by the County Council)

PROVIDED THAT the financial liability under this clause of the Owners to the bus operator shall be subject to a cap of £2,000,000

20. **A421 CORRIDOR WORKS**

20.1 The Owners covenant with the District Council prior to the Commencement of Development to serve written notice upon Milton Keynes Council indicating their intention to enter into a Section 278 Agreement to secure a financial contribution in the sum of £209,517 towards the A421 Corridor Works

20.2 The Owners covenant with the District Council to use reasonable endeavours to enter into a Section 278 Agreement with Milton Keynes Council to secure a financial contribution in the sum of £209,517 towards the A421 Corridor Works prior to the Occupation of the 740th Dwelling

20.3 The Owners covenant with the District Council that in the event that the Section 278 Agreement to secure a financial contribution in the sum of £209,517 towards the A421 Corridor Works has not been completed prior to the Occupation of the 650th Dwelling the Owners will serve notice upon both the District Council and Milton Keynes Council in confirmation of the prospective period remaining to complete the said highways agreement and indicating at the expiry of the period identified at paragraph 20.2 of this Schedule that the Milton Keynes Highway Works Contribution will be paid to the District Council to secure the A421 Corridor Works

20.4 Where the Section 278 Agreement with Milton Keynes Council to secure a financial contribution in the sum of £209,517 towards the A421 Corridor Works is not completed prior to the Occupation of the 740th Dwelling the Owners covenant with the District Council not to cause or permit to be Occupied more than 750 Dwellings until Milton Keynes Highway Works Contribution is paid to the District Council

20.5 Subject to paragraph 20.4 the Owners further covenant with the District Council that the Owners shall pay the Milton Keynes Highway Works Contribution to the District Council prior to the Occupation of the 749th Dwelling

21. **COUNTY COUNCIL'S COVENANTS**

21.1 The County Council hereby covenants with the Owners:

21.1.1 that it will apply the Travel Plan Monitoring Fee towards the cost of monitoring, reviewing and supervising the implementation of the Travel Plans and for no other purpose

21.1.2 that it will apply the Weasel Lane Off-site Improvements Contribution towards the cost of the Weasel Lane Off-site Improvements and for no other purpose

21.1.3 that it will implement the Weasel Lane Off-Site Improvements within 24 months of receipt of the Weasel Lane Improvements Contribution unless otherwise agreed in writing with the Owners

21.1.4 that it will apply the Footpath 19 Off-site Improvements Contribution towards the cost of the Footpath 19 Off-site Improvements and for no other purpose

21.1.5 that it will implement the Footpath 19 Off-site Improvements within 24 months of receipt of the Footpath 19 Off-site Improvements Contribution unless otherwise agreed in writing with the Owners

21.1.6 that it will apply the Cycle Parking Contribution towards the cost of the Cycle Parking Provision and for no other purpose

21.1.7 that it will secure the Cycle Parking Provision within 24 months of receipt of the Cycle Parking Contribution unless otherwise agreed in writing with the Owners

21.1.8 that it will apply the Newton Longville Traffic Calming Contribution towards the cost of providing a traffic calming scheme through Newton Longville village and for no other purpose

21.1.9 that it will apply the Newton Longville Traffic Calming Contribution within 24 months of receipt of the payment made pursuant to **paragraph 17.12** unless otherwise agreed in writing with the Owners

21.1.10 that it will apply the Whaddon Highway Safety Improvement Safety Scheme Contribution towards the cost of providing a safety scheme through Whaddon village and for no other purpose

21.1.11 that it will apply the Whaddon Highway Safety Improvement Safety Scheme Contribution within 24 months of receipt unless otherwise agreed in writing with the Owners

21.1.12 that it will apply the A421 Corridor Improvements Contribution (or each and every part payment thereof) towards the cost of providing a scheme of improvements to the A421 corridor in the vicinity of the Development as identified in the A421 Corridor Improvements Notice and for no other purpose

21.1.13 that the County Council shall not serve the A421 Corridor Improvements Notice in respect of highway improvements that may be required to the A421 corridor in the vicinity of the Development as a result of the Development which are already funded entirely by other sources other than by means of forward funding

21.1.14 that following the transfer of the Grid Road Link Reservation Land (or relevant part thereof) it shall develop and use the Grid Road Link Reservation Land (or relevant part thereof) solely for the highway purposes of providing a Grid Road Link and other associated works and for no other purpose AND FOR THE AVOIDANCE OF DOUBT the County Council shall maintain and keep the Grid Road Link Reservation Land (or relevant part thereof) in a in accordance with the County Council's statutory duties and responsibilities and safe and secure condition

21.1.15 to use all reasonable endeavours to agree the terms of any transfers to be made pursuant to this Schedule as soon as reasonably practicable and not to unreasonably withhold or delay their consent to the terms of such transfers or the completion thereof

21.1.16 if at any time the County Council determines that it no longer requires the Grid Road Link Reservation Land for the purposes specified in this Agreement it shall as soon as reasonably practicable give notice to the Owners of the same and:

21.1.16.1 if the Grid Road Link Reservation Land (or relevant part thereof) has already been transferred to the County Council the County Council shall (at the written request of the Owners) transfer it back to the Owners (or their nominee) for the same consideration and subject to the same terms (except any restrictions as to the use of the land) as when it was transferred to the County Council together with payment of the Council's reasonable legal surveying and Land Registry fees; and

21.1.16.2 if the Grid Road Link Reservation Land (or relevant part thereof) has not been transferred to the County Council the obligations to do so will no longer apply.

22. DISTRICT COUNCIL'S COVENANTS

22.1 The District Council hereby covenants with the Owners that in the absence of the completion of the Section 278 Agreement between the Owners and Milton Keynes Council in the provision of the A421 Corridor Works the District Council shall at its own discretion identify and agree with the County Council (and in consultation with Milton Keynes Council) an alternative local highway mitigation scheme to which the Milton Keynes Highway Works Contribution may be applied in mitigation of the identified local highway impact of the Development

Appendix E – TA Scoping minutes of the meeting dated 15th January 2020

MEETING NOTES

PROJECT NUMBER	70051442	MEETING DATE	15 January 2020
PROJECT NAME	South West Milton Keynes – Pre-application Advice	VENUE	BCC
CLIENT	SWMK Consortium	RECORDED BY	SH
MEETING SUBJECT	To discuss and agree the scope of an updated Transport Assessment (TA)		

PRESENT	Steph Howard (SH), Justin Sherlock (JS), WSP Christine Urry (CU), James Bedingfield (JB)– BCC Martin Tate (MT) - MKC Tom Thornewill (TH)– Hallam Land Gary Tucker (GT) – Taylor Wimpey
APOLOGIES	Jo Thornton (JT) – BCC Martin Paddle (MP) - WSP
DISTRIBUTION	As above
CONFIDENTIALITY	Confidential

ITEM	SUBJECT	ACTION
1	Milton Keynes Multi Modal Model (MKMMM)	
1.1	CU outlined that BCC consider the MKMMM to be inappropriate for use to test development in Buckinghamshire for a number of reasons. CU to provide a brief written explanation as to why the MKMMM is not appropriate for use within the refreshed TA for SWMK.	CU/BCC
2	Traffic Surveys	

2.1	CU and JB are generally happy with the proposed survey spec, but with the following comments: • Queue counts need to be included at all junctions (JS confirmed that they are included within the scope) • Average peak hour demand on links should be taken from ATCs and then distributed using average turning counts at junctions • Minimum of 3 days data are required. Use an average of the 3-days for demand, turning counts and queue lengths – if typical days they should tie up well • ATCs should be taken upstream of the end of the queue • For certain junctions, lane movement counts should be completed within the MCCs so can tell lane usage rather than just arm counts. Especially at Bottle Dump Roundabout • JT3 should start at Bottle Dump roundabout, not at Tattenhoe as per current scope	WSP
2.2	Where video surveys are used in place of ATCs the refreshed TA needs to be explained that this is for health and safety / best practice / guidance reasons and is an appropriate method of data collection.	WSP
2.3	MT to check with Phil Caves whether traffic survey scope is acceptable to MKC. MT to confirm contact details for Phil Caves and provide a contact at MKC for survey licence applications.	MT/MKC
2.4	CU to make Simon Vale at Transport for Buckinghamshire (TfB) aware that the surveys licence application will be submitted shortly and that it will be large. WSP to issue Simon with an advanced copy of the surveys map as a 'heads up', followed by the licence applications through the survey contractor. (Note – actions completed)	CU/WSP
2.5	Roadworks during the time of surveys should be checked and discussed with BCC if necessary. JB to check with TfB and confirm planned roadworks. (Note – action complete) Roadworks within MK to be checked also.	JB/BCC WSP
3	Modelling Methodology	
3.1	For MKC, a traditional TA methodology should be acceptable, as per the 'alternative method' in the WSP Note, subject to checking with Highways (MT will check with Phil Caves). MT to confirm whether Nigel Weeks will be consultant to MKC and will be the contact on this project.	MT/MKC

3.2	Education trips – primary school trips to be entirely internalised as previously agreed. Secondary school trips to be additional using same method as previously agreed. The same trip numbers are acceptable as method/location of school catchment is unchanged.	WSP
3.3	Neighbourhood centre trips should be all internalised as a service centre for the development. Any specific, isolated employment uses within the neighbourhood centre should be added on to the main employment floor space to ensure it is included.	
3.4	Trip generation for other land uses using TRICS and NTS methodology is acceptable if WSP can show that it is justifiable and accurately represents the local area. WSP to complete a comparison with the previous trip rates and a purely TRICS methodology.	WSP
3.5	Committed developments will need to be taken into account through the use of TEMPRO adjusted by planning assumptions to ensure the correct levels of growth in the local area are accommodated, especially new employment in MK, which is substantially higher than the TEMPRO figure. Check Plan:MK for employment allocations/job numbers and agree amendments to TEMPRO with MKC. Tattenhoe Park should be considered explicitly (and correspondingly removed from TEMPRO if required), along with sites from the emerging Newton Longville Neighbourhood Plan, if they hold sufficient weight to be included. CU/JB to send through a list of schemes to be included as consented/committed development.	JB/BCC WSP
3.6	Shenley Park will need to be included as a sensitivity test. It cannot be included within the core scenario in case it is removed from the emerging Local Plan which is still being scrutinised at the Examination in Public (EiP). . Equally Shenley Park cannot be excluded from the core scenario if it remains as a Local Plan allocation. A sensitivity test is therefore required to ensure all Local Plan outcomes regarding Shenley Park are covered. The proposed Grid Road that extends across the Shenley Park site would encourage the redistribution of traffic. CU to discuss with Tom Withey (i.e: at consultant Jacobs), whether the redistribution from the Shenley Park scenario within the BCC Countywide Model would be an appropriate method to account for the Grid Road redistribution.	CU/BCC
3.7	Distribution of trips will be via Census 2011 journey to work data using mid-layer SOAs for the south west of MK for resident population for residential uses and workplace population for employment uses. A comparison with the Newton Longville SOA should also be completed.	WSP

3.8	Travel planning will be accepted as a sensitivity test, but CU would also like to see the assessments without travel planning. A 12%-point reduction in car drivers in the future year assessment would be acceptable. The Travel Plan will need to be updated to account for new technologies in the coming years to ensure the development can be 'future ready'. CU is interested to see research and new 'tools' by WSP in regard to evidence of travel planning and impact of future mobility schemes.	WSP
3.9	The locations for junction assessments should be as per the previous TA. The junction model geometries and input parameters need to be fully reviewed and updated as appropriate.	WSP
3.10	The peak hours for assessment will need to be considered across the whole network to determine the best fit. WSP to provide peak hour calculations to JB for each junction for information.	WSP
3.11	Within Arcady/Picady, a slow-moving queue is still counted as a queue in the results. The video footage from traffic surveys will need to be reviewed to ensure queues are captured accurately within the junction models.	-
3.12	The future year assessment should be to 2031 or 2033, to match either the Plan:MK or draft VALP time horizons, but also should reflect the full occupation year of the development closely. (Note: A future year assessment year of 2033 will be used to meet the requirements above)	
3.13	The Passenger Transport Strategy will need to be updated to ensure that it is flexible enough to provide the necessary infrastructure at the appropriate time as determined by MKC/BCC. The MKC Mobility Strategy 2050 should be reviewed with regard to strategic connections and Advanced Very Rapid Transport (AVRT).	WSP
3.14	Updated Method Scoping Note to be reissued to BCC and MKC to take account of the discussions within this meeting. (Note: Method re-issued 27/01/2020)	WSP
3.15	If required, a meeting with Phil Caves/Nigel Weeks will be scheduled to discuss and agree the modelling methodology within MKC, although consistency of approach between BCC and MKC is important.	WSP/MKC
4	Development Access	
4.1	The latest access designs should be included within the refreshed TA to release them into the public domain. They can then be included within the s106 Agreement in place of those currently listed.	WSP

5	Impact of Development	
5.1	CU confirmed that the impact of the development would be considered in terms of the severity of the residual cumulative impact, as required by paragraph 109 of the National Planning Policy Framework (NPPF) 2019. The previous 'nil detriment' approach to mitigating impact is no longer applicable.	-
6	Report	
6.1	All tables need to be set out clearly in the refreshed TA to explain the methodology and so that it is easy to follow. Spreadsheet work to be shared with BCC as necessary to aid review of calculations.	WSP
6.2	All appendices previously included within the TA should be updated and reprovided in the refreshed TA, for completeness.	WSP
7	Meeting Notes	
7.1	SH to create a meeting note and circulate to BCC/MKC for agreement.	SH/WSP

NEXT MEETING

An invitation will be issued if an additional meeting is required.

Appendix F – Appellant letter dated 7th April 2021 in response for clarification at J1

James Bedingfeld
Highways Development Management
Planning Growth & Sustainability
Buckinghamshire Council
Walton Street Offices
Walton Street
Aylesbury
HP20 1UA

Our Ref: 70069442

7 April 2021

Dear James,

SWMK: TRN3 – Junction 1 - Matters of Clarification

During discussions on the contents of Transport Response Note 3 (TRN3) you raised a query about the available footway width on the southern side of B4034 once the mitigation proposals outlined on drawing 70069442-001B-P04 have been implemented. You suggested that the footway width behind the westbound bus lay-by may need to be reduced to 1.5m which would potentially reduce the width for pedestrians behind the bay.

We have subsequently reviewed the outline design of the proposed mitigation and are content that should a width restriction of 1.5m be required, this would be compliant with the Department for Transport's Inclusive Mobility[1] as the minimum acceptable footway width to enable a wheelchair user and a walker to pass one another. A further assessment would be completed at the detailed design stage and subject to finalising the s278 agreement.

Yours sincerely

J. Sherlock

Justin Sherlock
Associate Director

[1] Department for Transport, Inclusive Mobility (2005) – Section 3.1

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Appendix G – Appellant letter dated 7th April 2021 in response junction clarifications

James Bedingfeld
Highways Development Management
Planning Growth & Sustainability
Buckinghamshire Council
Walton Street Offices
Walton Street
Aylesbury
HP20 1UA

Our Ref: 70069442
7 April 2021

Dear James,

SWMK: TRN3 – Matters of Clarification

Following discussions on the contents of Transport Response Note 3 (TRN3) please find enclosed the following information as requested to assist your determination of the planning application:

1. Swept Path Drawings for Junctions 1,2,15,16,17 and 18 to provide further clarity on the proposed mitigation package; and

2. Junction Dimension Drawings for Junctions 1,2,6,12,14,15,16,17 and 18; this information replicates in PDF format the junction geometry information already provided to the Council.

Yours sincerely

Justin Sherlock
Associate Director

Enclosure A – Swept Path Drawings
Enclosure B – Junction Dimension Drawings

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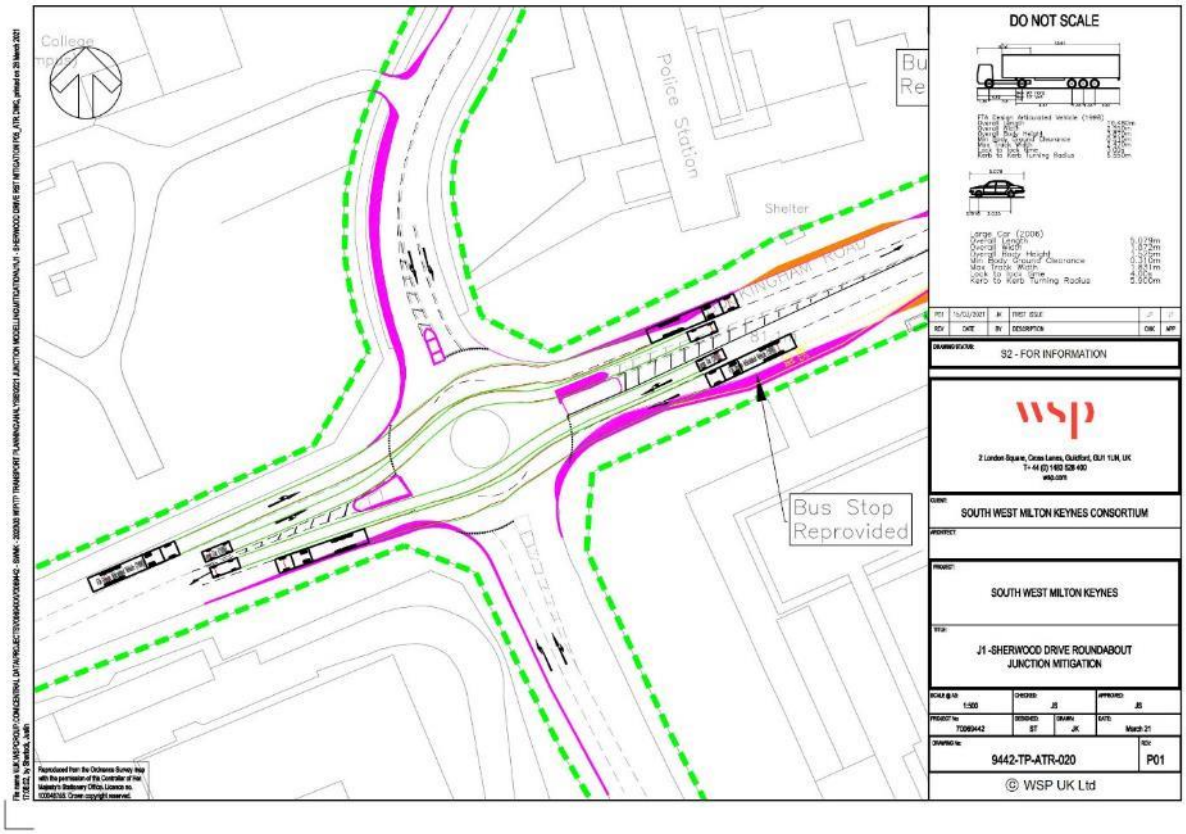
Enclosure A – Swept Path Drawings


College
Police Station
Shelter
Bus Stop
Reprovided
DO NOT SCALE
S2 - FOR INFORMATION
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2 London Square, Cross Lanes, Guildford, GU1 1UN, UK
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SOUTH WEST MILTON KEYNES CONSORTIUM
SOUTH WEST MILTON KEYNES
J1 -SHERWOOD DRIVE ROUNDABOUT
JUNCTION MITIGATION
1:500
JS
JS
70069442
ST
JK
March 21
9442-TP-ATR-020
P01
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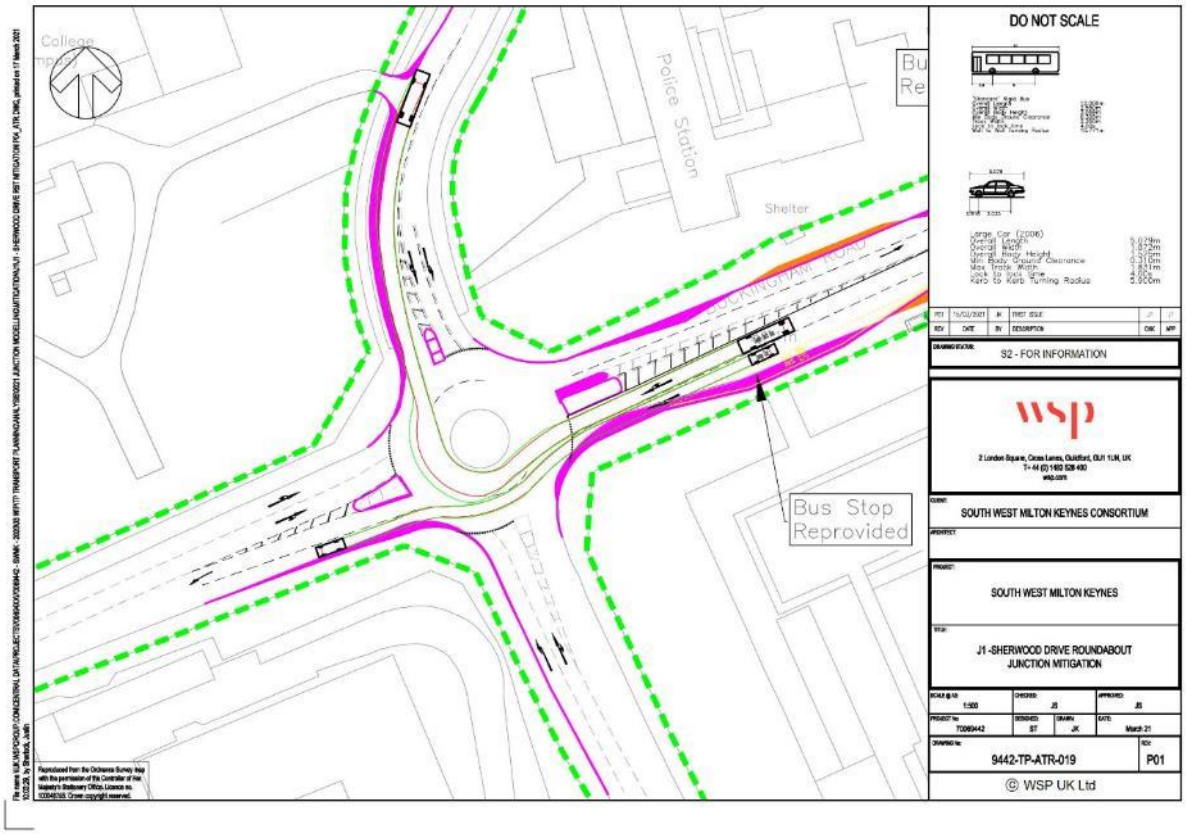
College
Police Station
Shelter
Bus Stop
Reprovided
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SOUTH WEST MILTON KEYNES CONSORTIUM
SOUTH WEST MILTON KEYNES
J1 -SHERWOOD DRIVE ROUNDABOUT
JUNCTION MITIGATION
1:500
JS
JS
70069442
ST
JK
March 21
9442-TP-ATR-019
P01
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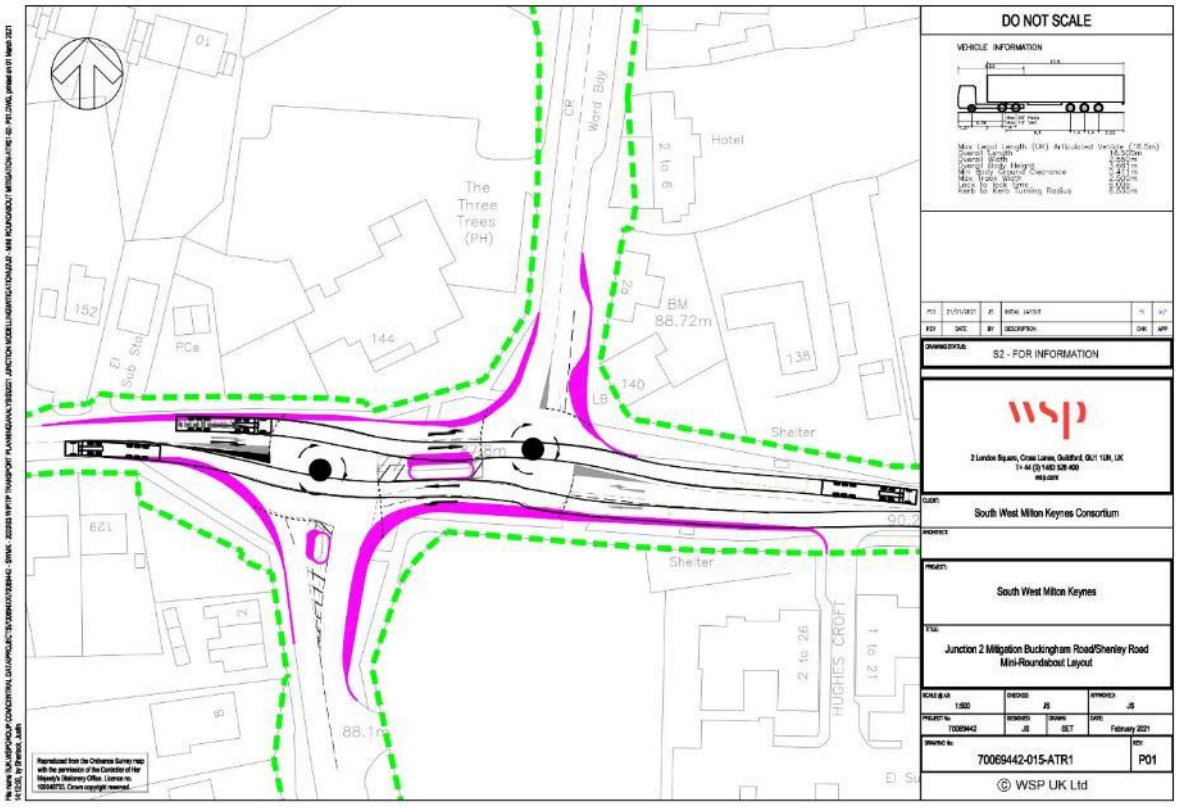
DO NOT SCALE
VEHICLE INFORMATION
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 2 Mitigation Buckingham Road/Shenley Road Mini-Roundabout Layout
70069442-015-ATR1
P01
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The Three Trees (PH)
Hotel
Ward Bdy
CR
BM 88.72m
Shelter
HUGHES CROFT
PCs
Sub Sta
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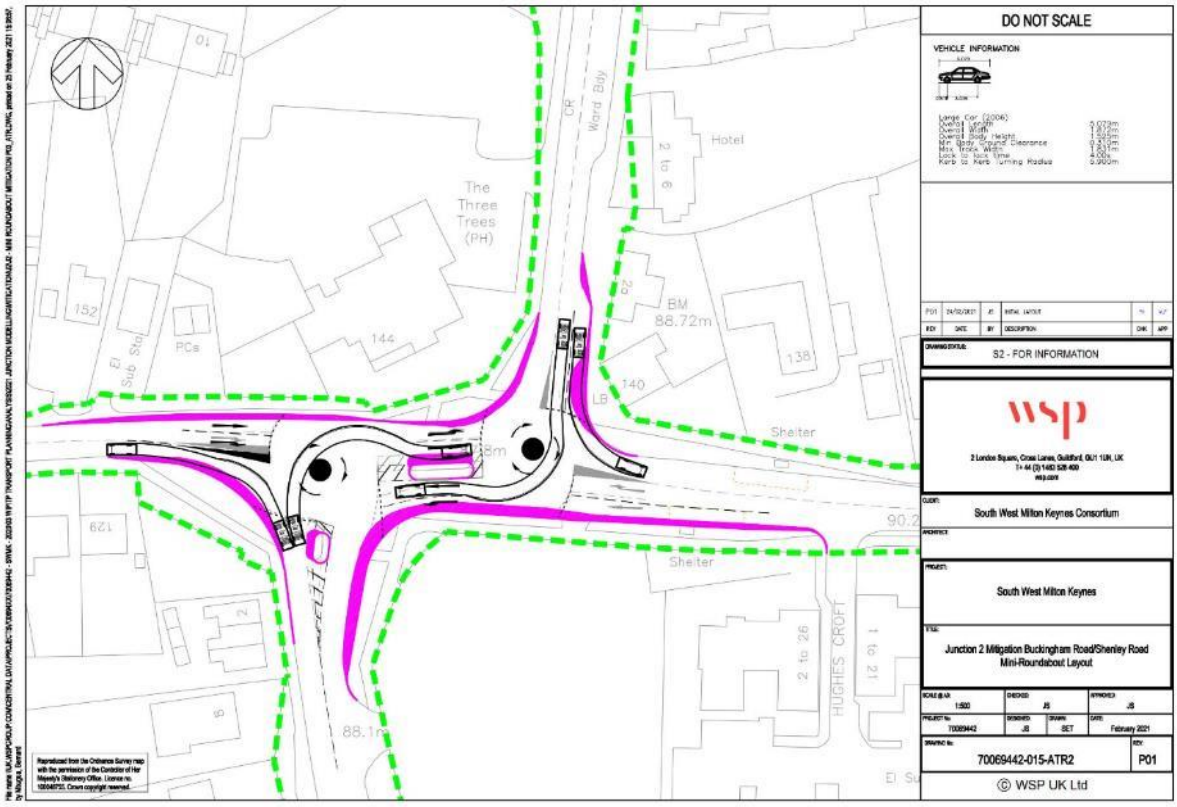
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South West Milton Keynes Consortium
South West Milton Keynes
Junction 2 Mitigation Buckingham Road/Shenley Road Mini-Roundabout Layout
70069442-015-ATR2
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Hotel
Ward Bdy
CR
BM 88.72m
Shelter
HUGHES CROFT
PCs
Sub Sta
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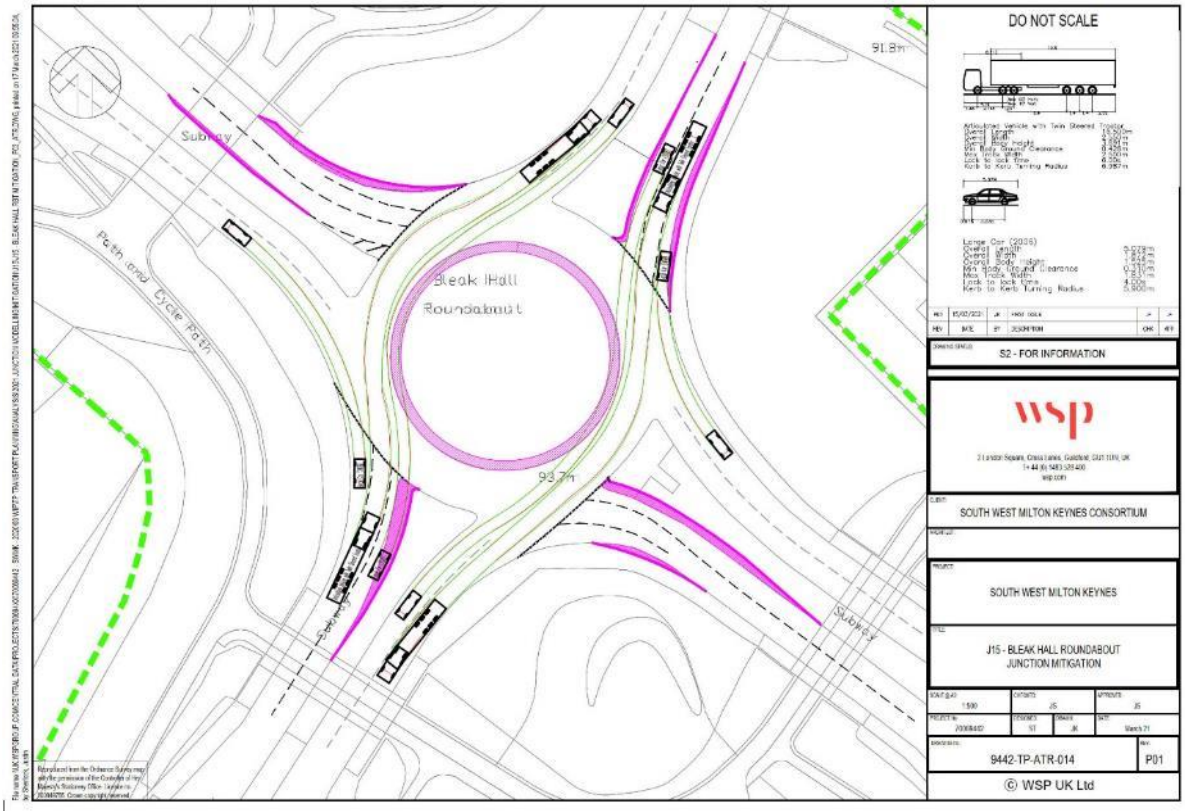
DO NOT SCALE
Subway
Path and Cycle Path
Bleak Hall
Roundabout
91.8m
93.7m
Subway
S2 - FOR INFORMATION
wsp
SOUTH WEST MILTON KEYNES CONSORTIUM
SOUTH WEST MILTON KEYNES
J15 - BLEAK HALL ROUNDABOUT
JUNCTION MITIGATION
9442-TP-ATR-014
P01
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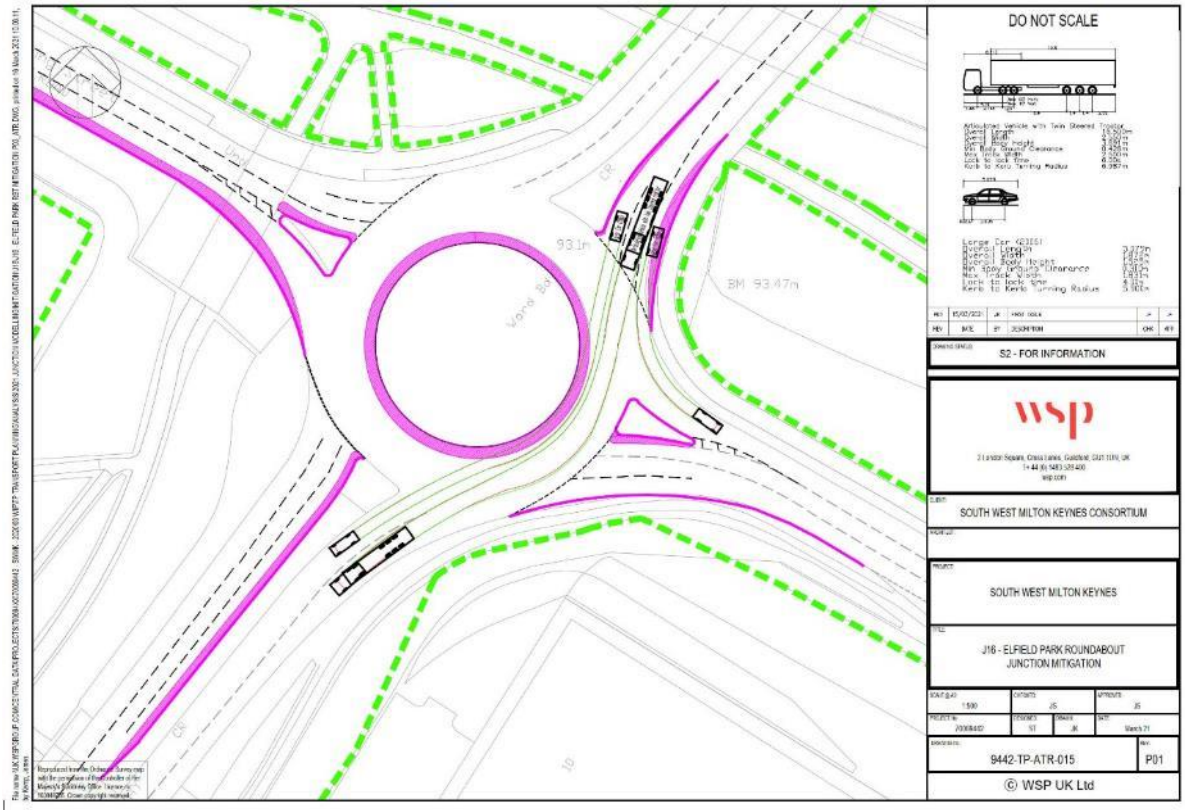
DO NOT SCALE
93m
BM 93.47m
S2 - FOR INFORMATION
wsp
SOUTH WEST MILTON KEYNES CONSORTIUM
SOUTH WEST MILTON KEYNES
J16 - ELFIELD PARK ROUNDABOUT
JUNCTION MITIGATION
9442-TP-ATR-015
P01
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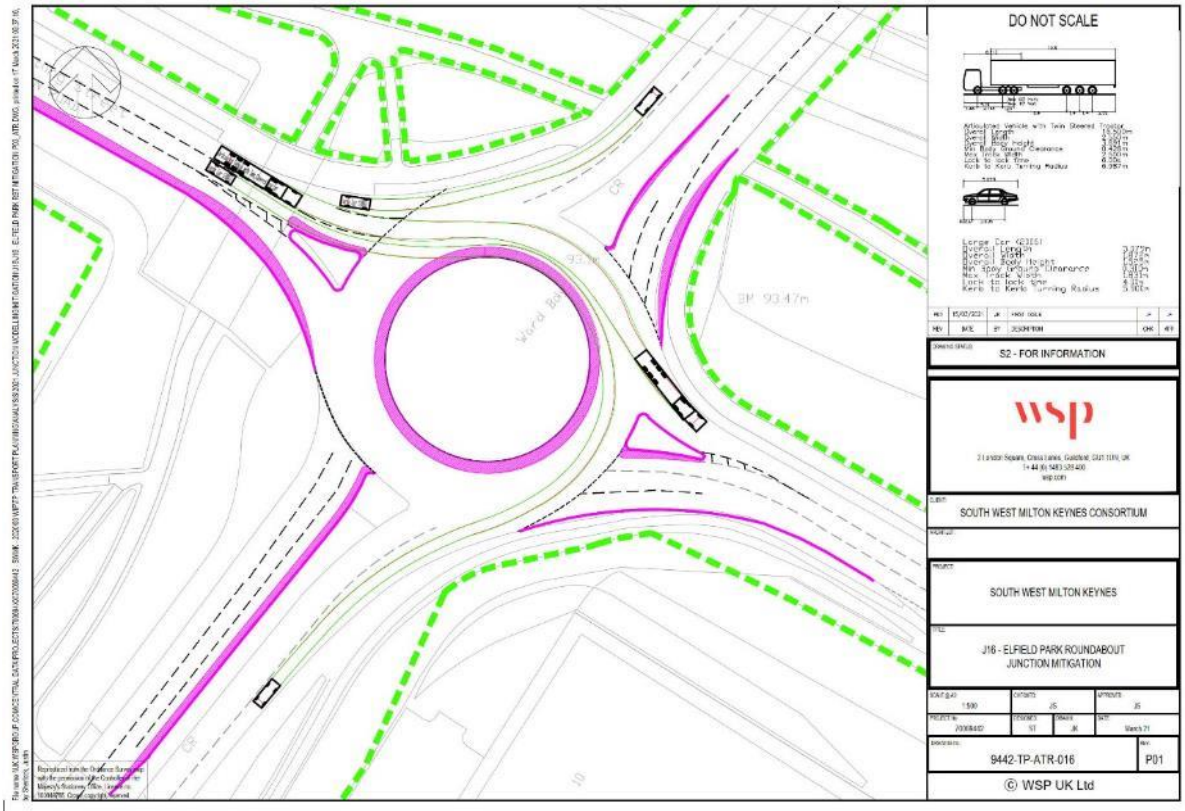
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SOUTH WEST MILTON KEYNES CONSORTIUM
SOUTH WEST MILTON KEYNES
J16 - ELFIELD PARK ROUNDABOUT JUNCTION MITIGATION
9442-TP-ATR-016
P01
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S2 - FOR INFORMATION
SOUTH WEST MILTON KEYNES CONSORTIUM
SOUTH WEST MILTON KEYNES
J17 - EMERSON ROUNDABOUT JUNCTION MITIGATION
9442-TP-ATR-017
P01
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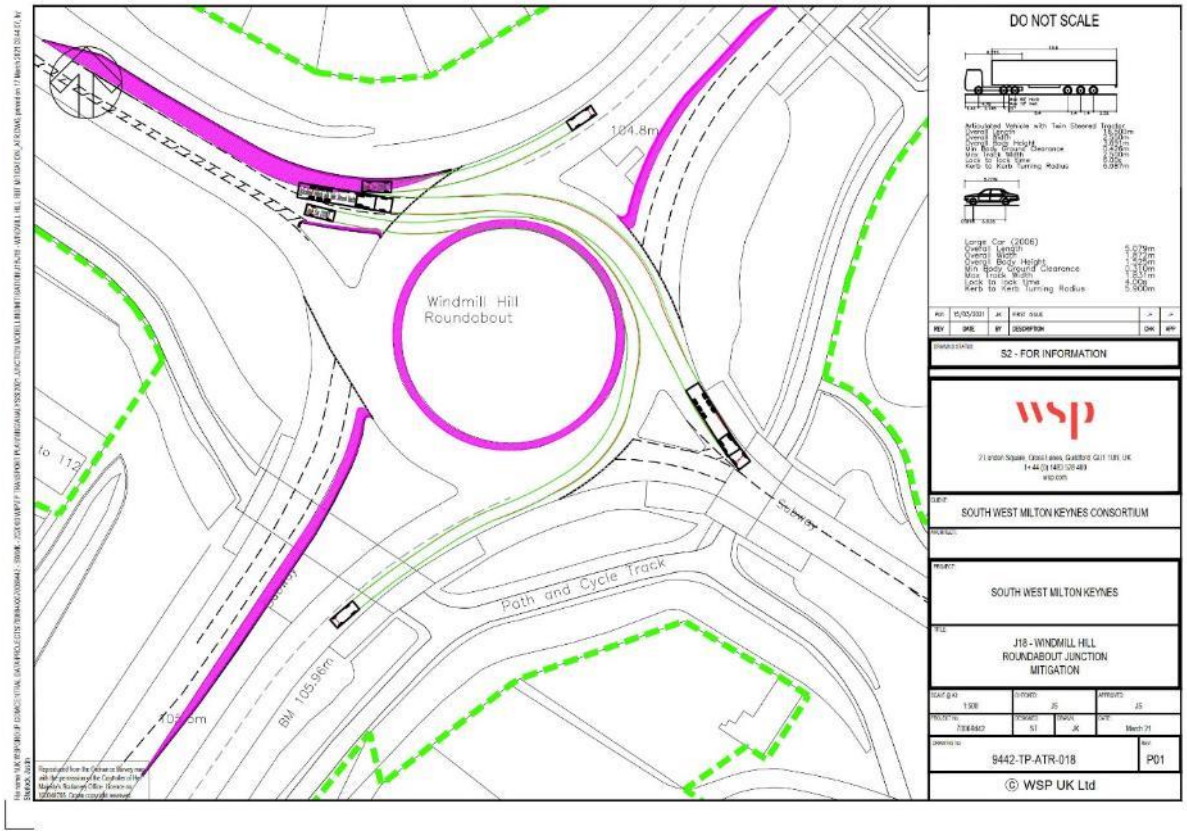
DO NOT SCALE
Windmill Hill
Roundabout
184.8m
Path and Cycle Track
BM 105.96m
105.6m
to 112
S2 - FOR INFORMATION
wsp
SOUTH WEST MILTON KEYNES CONSORTIUM
SOUTH WEST MILTON KEYNES
J18 - WINDMILL HILL
ROUNDABOUT JUNCTION
MITIGATION
9442-TP-ATR-018
P01
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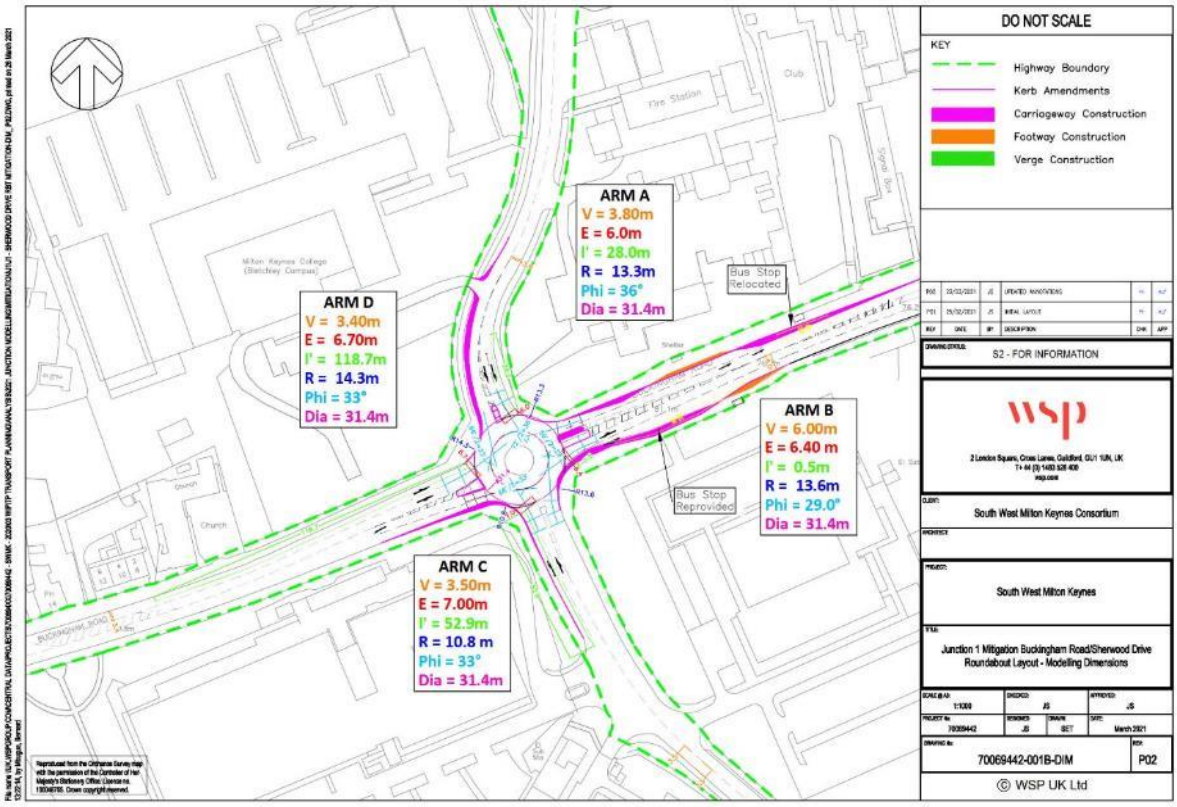
Enclosure B – Junction Dimension Drawings


DO NOT SCALE
KEY
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
ARM A
V = 3.80m
E = 6.0m
I' = 28.0m
R = 13.3m
Phi = 36°
Dia = 31.4m
ARM B
V = 6.00m
E = 6.40 m
I' = 0.5m
R = 13.6m
Phi = 29.0°
Dia = 31.4m
ARM C
V = 3.50m
E = 7.00m
I' = 52.9m
R = 10.8 m
Phi = 33°
Dia = 31.4m
ARM D
V = 3.40m
E = 6.70m
I' = 118.7m
R = 14.3m
Phi = 33°
Dia = 31.4m
Bus Stop Relocated
Bus Stop Reprovided
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 1 Mitigation Buckingham Road/Sherwood Drive Roundabout Layout - Modelling Dimensions
70069442-001B-DIM
P02
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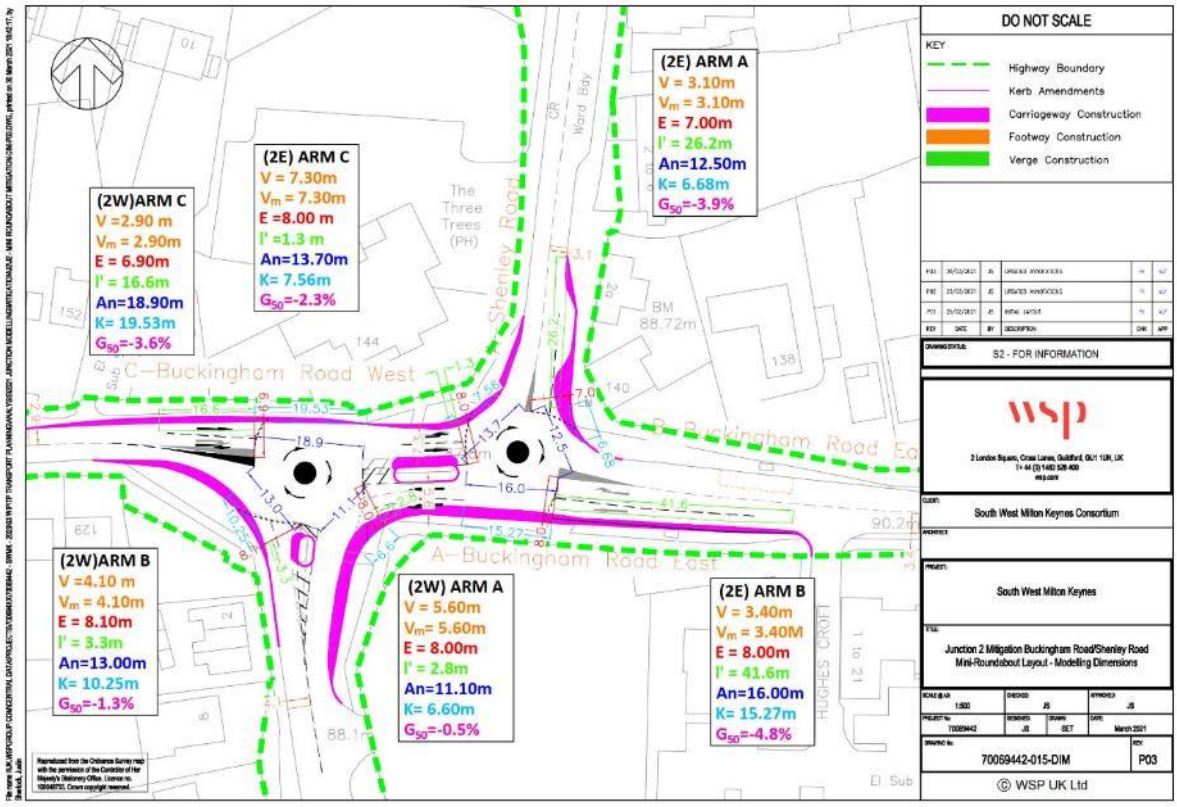
DO NOT SCALE
KEY
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
(2E) ARM A
V = 3.10m
Vm = 3.10m
E = 7.00m
I' = 26.2m
An=12.50m
K= 6.68m
G50=-3.9%
(2E) ARM C
V = 7.30m
Vm = 7.30m
E =8.00 m
I' =1.3 m
An=13.70m
K= 7.56m
G50=-2.3%
(2W)ARM C
V =2.90 m
Vm = 2.90m
E = 6.90m
I' = 16.6m
An=18.90m
K= 19.53m
G50=-3.6%
(2W)ARM B
V =4.10 m
Vm = 4.10m
E = 8.10m
I' = 3.3m
An=13.00m
K= 10.25m
G50=-1.3%
(2W) ARM A
V = 5.60m
Vm= 5.60m
E = 8.00m
I' = 2.8m
An=11.10m
K= 6.60m
G50=-0.5%
(2E) ARM B
V = 3.40m
Vm = 3.40M
E = 8.00m
I' = 41.6m
An=16.00m
K= 15.27m
G50=-4.8%
Shenley Road
A-Buckingham Road West
A-Buckingham Road East
The Three Trees (PH)
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 2 Mitigation Buckingham Road/Shenley Road Mini-Roundabout Layout - Modelling Dimensions
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P03
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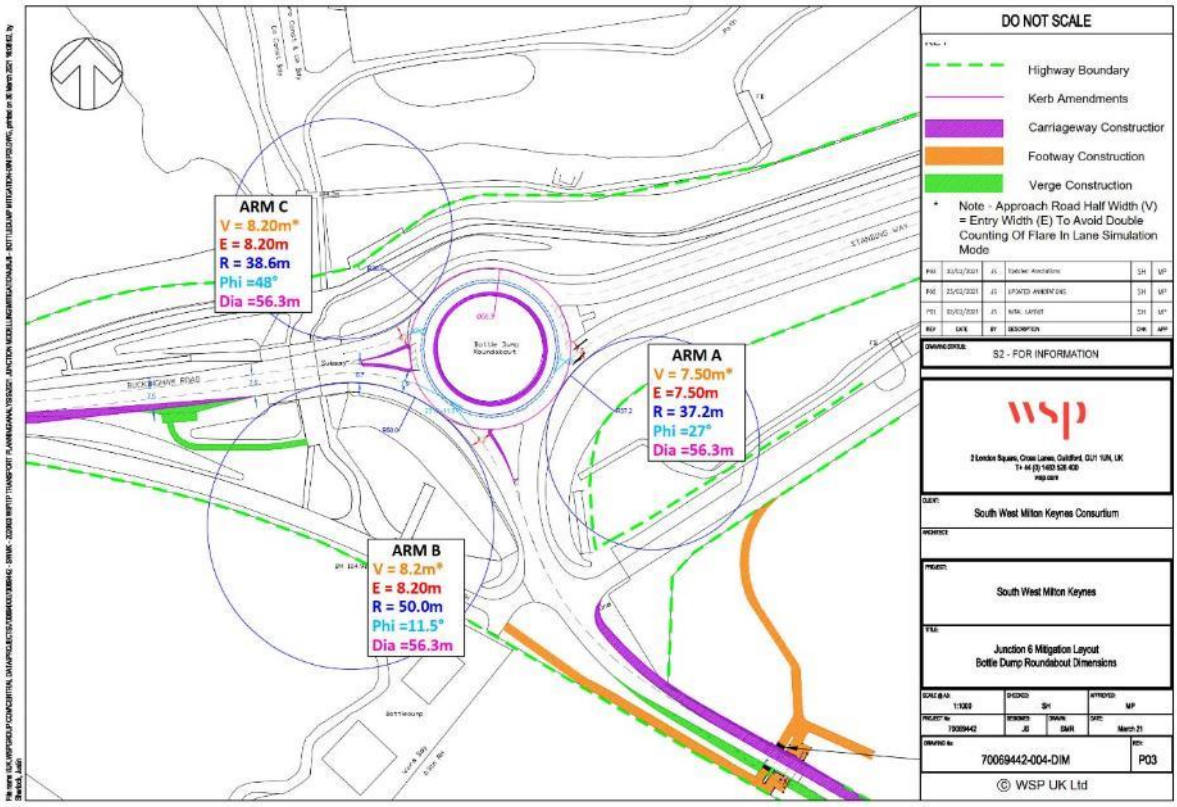
ARM C
V = 8.20m*
E = 8.20m
R = 38.6m
Phi =48°
Dia =56.3m
ARM A
V = 7.50m*
E =7.50m
R = 37.2m
Phi =27°
Dia =56.3m
ARM B
V = 8.2m*
E = 8.20m
R = 50.0m
Phi =11.5°
Dia =56.3m
DO NOT SCALE
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
* Note - Approach Road Half Width (V) = Entry Width (E) To Avoid Double Counting Of Flare In Lane Simulation Mode
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 6 Mitigation Layout
Bottle Dump Roundabout Dimensions
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P03
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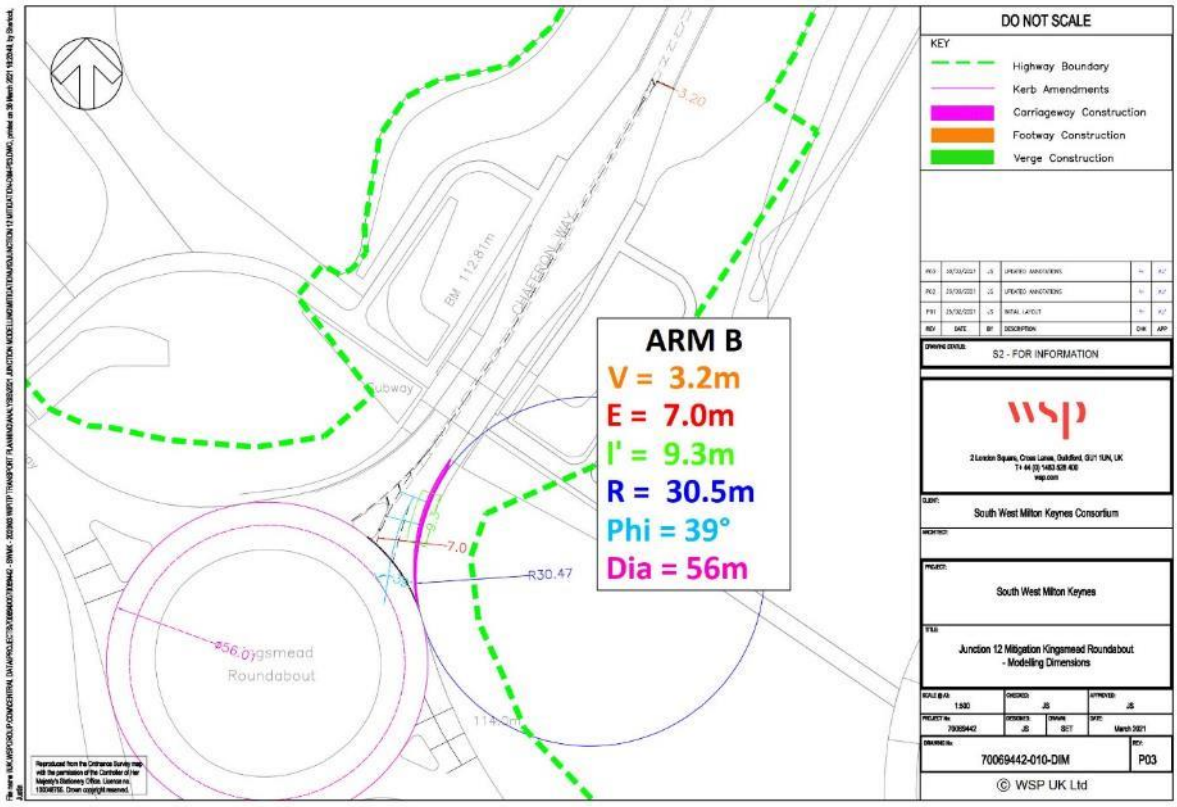
ARM B
V = 3.2m
E = 7.0m
I' = 9.3m
R = 30.5m
Phi = 39°
Dia = 56m
DO NOT SCALE
KEY
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 12 Mitigation Kingsmead Roundabout
- Modelling Dimensions
70069442-010-DIM
P03
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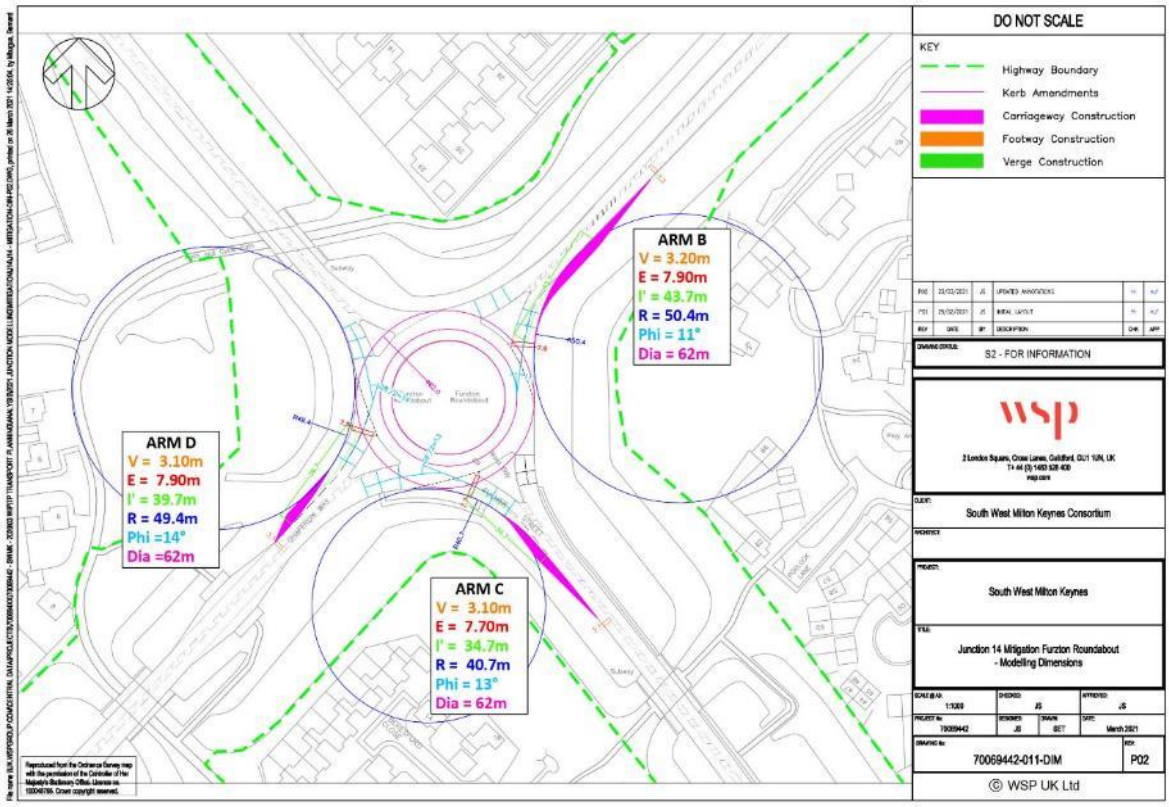
DO NOT SCALE
KEY
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
ARM B
V = 3.20m
E = 7.90m
I' = 43.7m
R = 50.4m
Phi = 11°
Dia = 62m
ARM D
V = 3.10m
E = 7.90m
I' = 39.7m
R = 49.4m
Phi =14°
Dia =62m
ARM C
V = 3.10m
E = 7.70m
I' = 34.7m
R = 40.7m
Phi = 13°
Dia = 62m
S2 - FOR INFORMATION
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South West Milton Keynes Consortium
South West Milton Keynes
Junction 14 Mitigation Furzton Roundabout
- Modelling Dimensions
1:1000
JS
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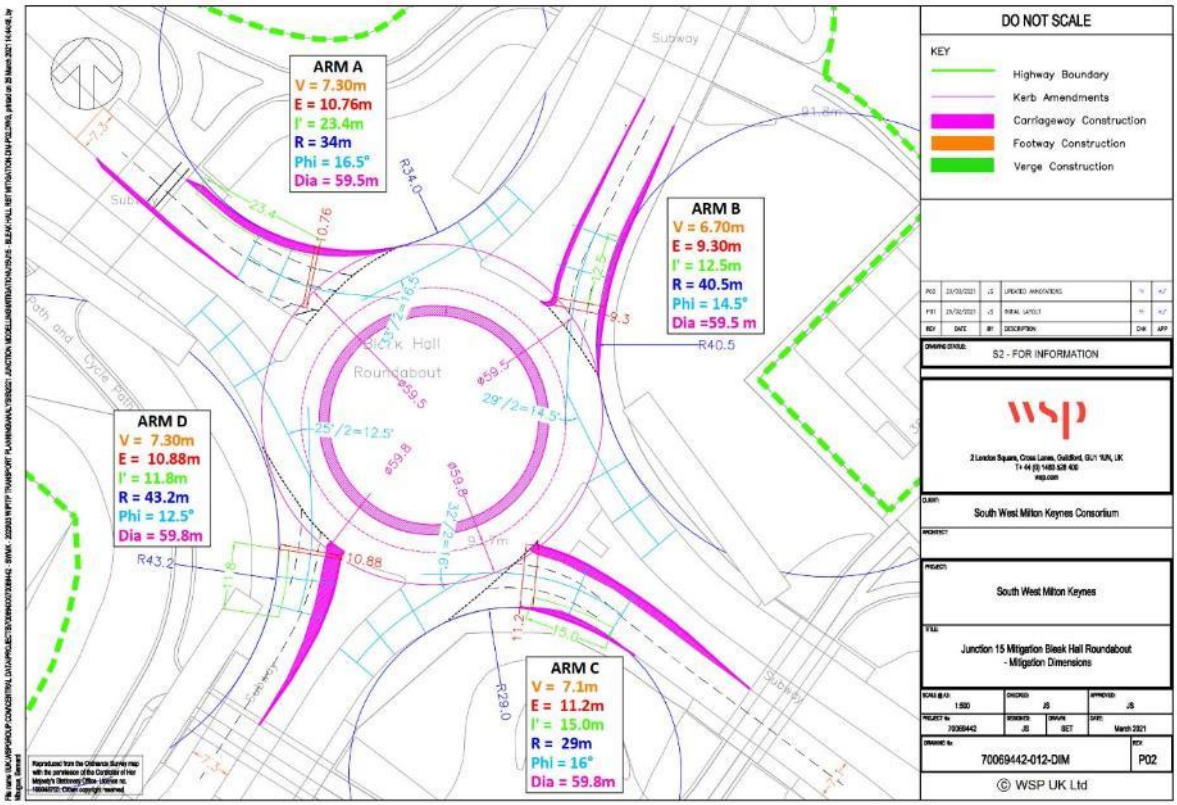
DO NOT SCALE
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Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
ARM A
V = 7.30m
E = 10.76m
I' = 23.4m
R = 34m
Phi = 16.5°
Dia = 59.5m
ARM B
V = 6.70m
E = 9.30m
I' = 12.5m
R = 40.5m
Phi = 14.5°
Dia =59.5 m
ARM D
V = 7.30m
E = 10.88m
I' = 11.8m
R = 43.2m
Phi = 12.5°
Dia = 59.8m
ARM C
V = 7.1m
E = 11.2m
I' = 15.0m
R = 29m
Phi = 16°
Dia = 59.8m
Bleak Hall
Roundabout
S2 - FOR INFORMATION
2 London Square, Cross Lanes, Guildford, GU1 1UN, UK
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South West Milton Keynes Consortium
South West Milton Keynes
Junction 15 Mitigation Bleak Hall Roundabout
- Mitigation Dimensions
1:500
JS
March 2021
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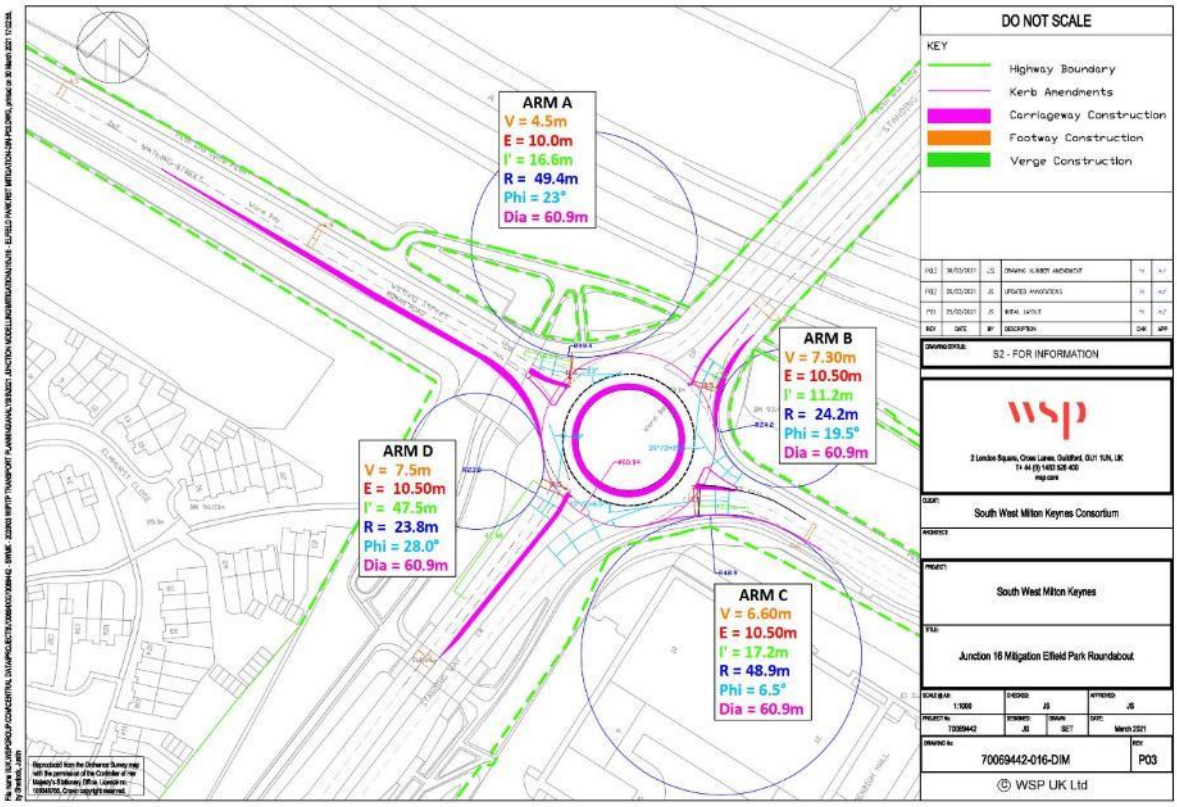
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ARM B
V = 7.30m
E = 10.50m
I' = 11.2m
R = 24.2m
Phi = 19.5°
Dia = 60.9m
ARM C
V = 6.60m
E = 10.50m
I' = 17.2m
R = 48.9m
Phi = 6.5°
Dia = 60.9m
ARM D
V = 7.5m
E = 10.50m
I' = 47.5m
R = 23.8m
Phi = 28.0°
Dia = 60.9m
DO NOT SCALE
KEY
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 16 Mitigation Elfield Park Roundabout
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P03
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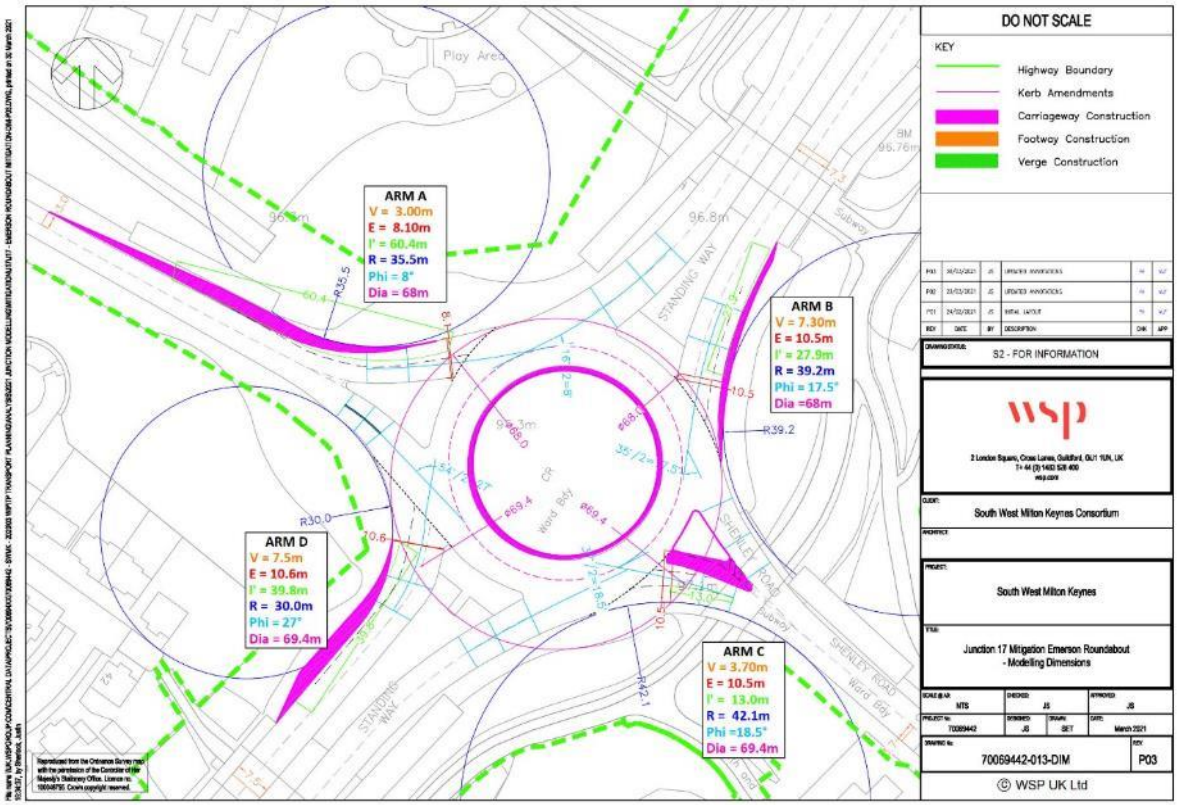
ARM A
V = 3.00m
E = 8.10m
I' = 60.4m
R = 35.5m
Phi = 8°
Dia = 68m
ARM B
V = 7.30m
E = 10.5m
I' = 27.9m
R = 39.2m
Phi = 17.5°
Dia =68m
ARM C
V = 3.70m
E = 10.5m
I' = 13.0m
R = 42.1m
Phi =18.5°
Dia = 69.4m
ARM D
V = 7.5m
E = 10.6m
I' = 39.8m
R = 30.0m
Phi = 27°
Dia = 69.4m
DO NOT SCALE
KEY
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 17 Mitigation Emerson Roundabout - Modelling Dimensions
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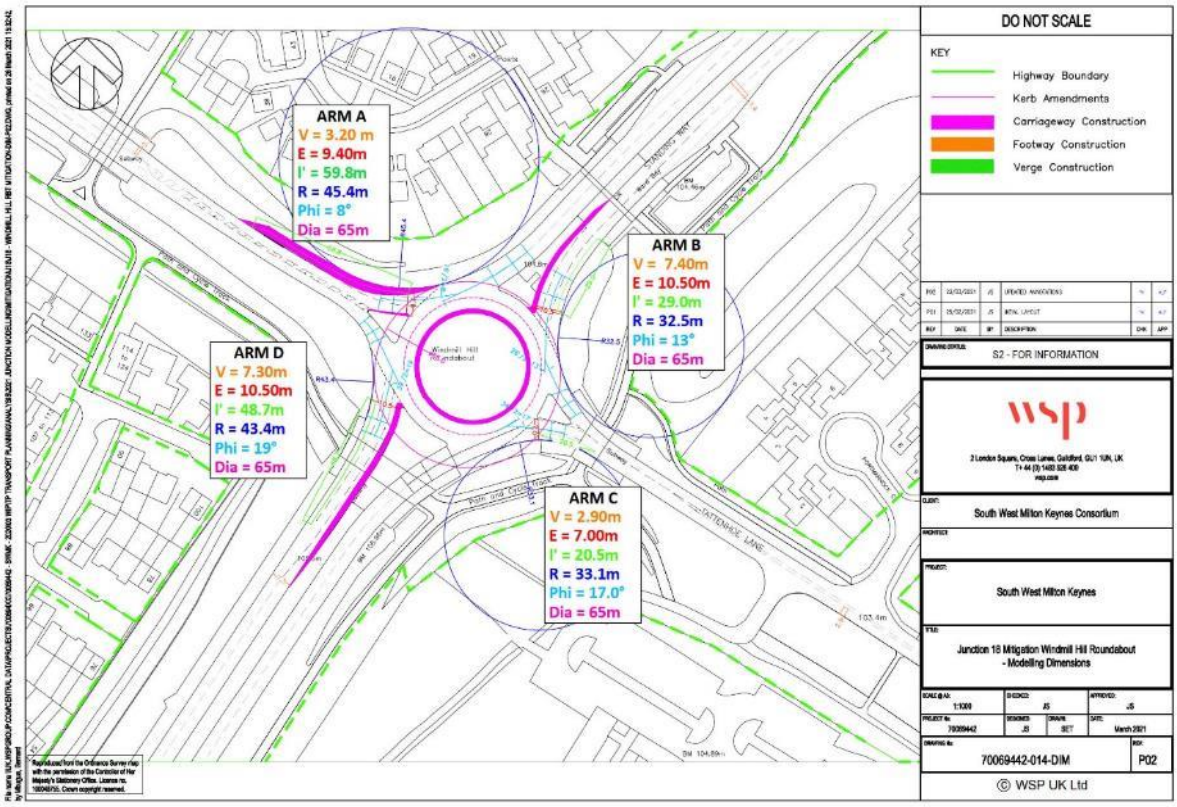
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E = 9.40m
l' = 59.8m
R = 45.4m
Phi = 8°
Dia = 65m
ARM B
V = 7.40m
E = 10.50m
l' = 29.0m
R = 32.5m
Phi = 13°
Dia = 65m
ARM C
V = 2.90m
E = 7.00m
l' = 20.5m
R = 33.1m
Phi = 17.0°
Dia = 65m
ARM D
V = 7.30m
E = 10.50m
l' = 48.7m
R = 43.4m
Phi = 19°
Dia = 65m
DO NOT SCALE
KEY
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 18 Mitigation Windmill Hill Roundabout - Modelling Dimensions
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P02
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Appendix H – Appellant letter dated 7th April 2021 in response for clarification at J16

James Bedingfeld
Highways Development Management
Planning Growth & Sustainability
Buckinghamshire Council
Walton Street Offices
Walton Street
Aylesbury
HP20 1UA

Our Ref: 70069442
7 April 2021

Dear James,

SWMK: TRN3 – Junction 16 - Matters of Clarification

During discussions on the contents of Transport Response Note 3 (TRN3) you raised a query about the mitigation modelling for Junction 16 (Elfield Park Roundabout - A421 junction with Watling Street) which indicates that in the 2033 Do Something 1 PM Peak scenario queueing back on the A421 Standing Way northern arm could potentially reach Junction 15 (Bleak Hall Roundabout – A421 junction with Grafton Street) and therefore interact with the flow of traffic at this location.

Firstly, we consider that Junctions 9 software does not lend itself easily to assessing the potential for queues extending between junctions. Notwithstanding, we have undertaken a further review of the potential for junction interaction and have identified that the storage space on A421 between Junction 16 and Junction 15 is approximately 584 metres.

As A421 is a two-lane dual carriageway, this equates to a storage space of approximately 203 vehicles (assuming a vehicle length of 5.75m). The flow scaling factor and analyser tool have been used in the software package Junctions 9 to explore the change in traffic flow that would be required to accommodate the queue within the storage space and therefore remove the potential for interaction between Junction 15 and Junction 16.

Output from the analyser is presented in **Figure 1**. This indicates that for the 2033 Do Something 1 PM peak scenario, a small reduction in traffic flow of only 5% would result in the queue being able to be accommodated in the stacking space between Junction 15 and Junction 16.

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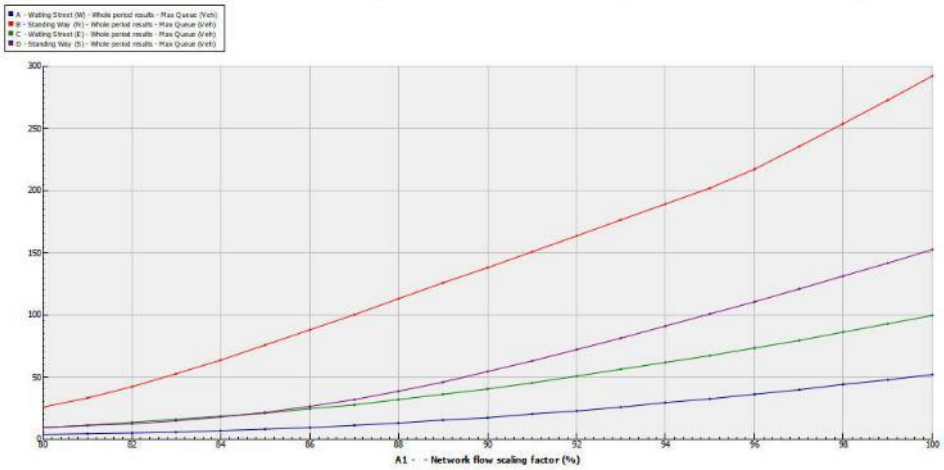
Figure 1: Junction 16 Do Something 1 PM Peak Queue Length VS Network Flow By Arm



You are aware that the 2033 future year scenarios presented within TRN3 include background traffic growth using a TEMPRO derived growth factor which for the PM peak includes 15.4% growth on the 2020 observed traffic flows. An allowance is also made for committed development associated with Kingsmead South and Tattenhoe Park, which is applied in addition to the TEMPRO growth factor and the development trip generation. This results in a very robust estimate of potential future traffic volumes in 2033.

In this regard, the Department for Transport's 'Appraisal and Modelling Strategy – *A Route Map For Updating TAG During Uncertain Times' (July 2020)*[1] recommends the use of scenarios to assist with modelling future outcomes. Although the DfT has yet to publish updated forecasts, there is a clear indication of a downward trend in trips to account for the lower economic output.

The results presented in **Figure 1** above demonstrate that a small change in traffic flow (5%) could result in there being no interaction between Junction 15 and Junction 16. As the long term projection for economic growth (and hence trips) is almost certainly on a downward trend based on the DfT's advice, we consider that the risk of interaction between the junctions in 2033 would be minimal.

Yours sincerely

J. Sherlock

Justin Sherlock
Associate Director

[1] https://www.gov.uk/government/publications/appraisal-and-modelling-strategy-a-route-map-for-updating-tag

Appendix I – Appellant letter dated 7th April 2021 in response for clarification at J17

James Bedingfeld
Highways Development Management
Planning Growth & Sustainability
Buckinghamshire Council
Walton Street Offices
Walton Street
Aylesbury
HP20 1UA

Our Ref: 70069442
7 April 2021

Dear James,

SWMK: TRN3 – Junction 17 - Matters of Clarification

During discussions on the contents of Transport Response Note 3 (TRN3) you raised a query about the mitigation modelling for Junction 17 (Emerson Roundabout - A421 junction with Fulmer Street and Shenley Way) in the 2033 Do Something 1 PM Peak scenario.

To address this matter, we have considered what further mitigation measures could be considered to address any impacts in this location. With the potential impact confined to the PM peak only consideration has been given to a part-time traffic signal junction layout. This provides the benefit of being able to be used only when necessary.

Considering the very robust growth assumptions used in the modelling presented in TRN3 (see separate letter regarding Junction 16) we do not consider the part-time traffic signals layout as being necessary to mitigate the impacts of the Proposed Development and therefore the results of TRN3 remain valid. The proposed part-time traffic signals would therefore be offered on a 'Monitor and Manage' basis whereby they are only implemented at a point in time when it was considered necessary to do so. The S278 agreement can provide the necessary flexibility to allow for this approach.

The results of the junction modelling for the part-time traffic signal layout when compared to the 2033 Do Nothing Scenario and 2033 Do Something 1 Scenario with the TRN3 roundabout mitigation are shown in Table 1. Attached to this letter are the Linsig modelling results and a potential layout plan for the traffic signal layout.

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Table 1: Junction 17 Emerson Roundabout 2033 Do Nothing and 2033 Do Something 1 Mitigation Modelling Results

Arm Description		AM			PM		
		Queue (Veh)	Delay (s)	RFC	Queue (Veh)	Delay (s)	RFC
2033 Nothing (Pre-Mitigation)							
A – V3 Fulmer Street		99.1	482.61	1.38	55.4	282.68	1.17
B – A421 Standing Way (N)		78.4	210.98	1.1	106.8	168.11	1.1
C - Shenley Way		55.2	329.81	1.18	58.2	407.73	1.22
D – A421 Standing Way (S)		20.2	34.61	0.97	49	104.87	1.04
2033 Do Something 1 (TRN3 Post-Mitigation)							
A – V3 Fulmer Street		70.6	313.99	1.23	21.1	95.01	1.02
B – A421 Standing Way (N)		96.0	223.51	1.12	242.5	425.54	1.23
C - Shenley Way		45.8	246.53	1.13	62.9	464.09	1.21
D – A421 Standing Way (S)		59.9	75.68	1.03	52.2	93.74	1.04
Arm & Lane Description		**AM**			**PM**		
		MMQ (PCU)	**Delay (s/PCU)**	**Deg Sat (%)**	**MMQ (PCU)**	**Delay (s/PCU)**	**Deg Sat (%)**
2033 Do Something 1 (Part-time Traffic Signals Post-Mitigation)							
1/2+1/1	A421 Standing Way (W) Left Ahead	64.5	131.4	105.5%	27.0	71.4	99.7%
1/3	A421 Standing Way (W) Ahead	53.6	125.9	104.8%	12.9	71.9	99.3%
4/1	Fulmer Street Left Ahead	3.8	34.4	62.2%	2.5	25.7	40.5%
4/2+4/3	Fulmer Street Ahead	25.4	166.3	105.4%	24.2	134.8	103.3%
5/2+5/1	A421 Standing Way (E) Ahead Left	13.0	24.7	85.9%	28.4	46.8	97.9%
5/3	A421 Standing Way (E) Ahead	12.9	25.7	85.1%	27.5	46.5	97.5%
7/2+7/1	Shenley Road Left Ahead	31.2	219.6	109.3%	11.5	87.7	96.3%
7/3	Shenley Road Ahead	2.5	27.5	42.6%	3.4	32.7	57.3%

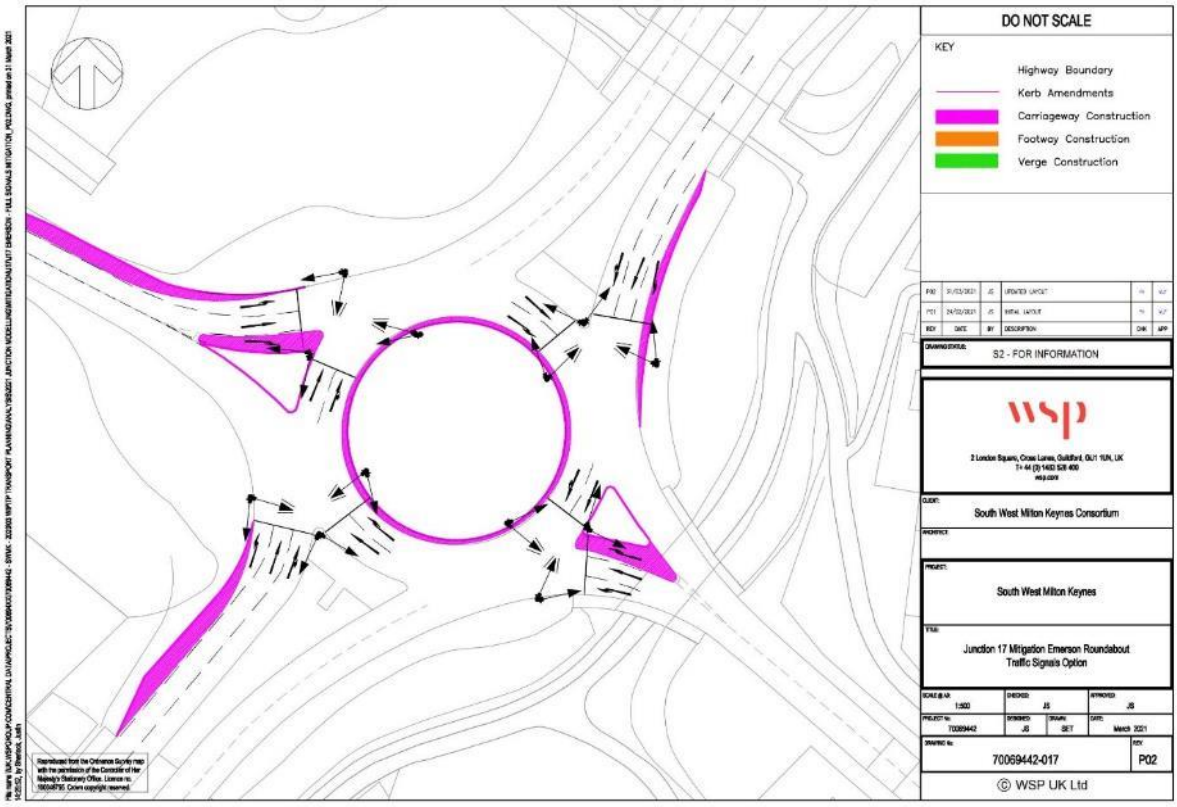
The results in Table 1 indicate that the traffic signals would provide significant benefit and could be used as and when required if part of an Urban Traffic Management Control (UTMC) system.

Yours sincerely

Justin Sherlock
Associate Director

Enclosure A - Junction Layout and Swept Path Drawing
Enclosure B – Linsig Traffic Signal Modelling

Enclosure A : Junction Layout and Swept Path Drawing


DO NOT SCALE
KEY
Highway Boundary
Kerb Amendments
Carriageway Construction
Footway Construction
Verge Construction
S2 - FOR INFORMATION
South West Milton Keynes Consortium
South West Milton Keynes
Junction 17 Mitigation Emerson Roundabout
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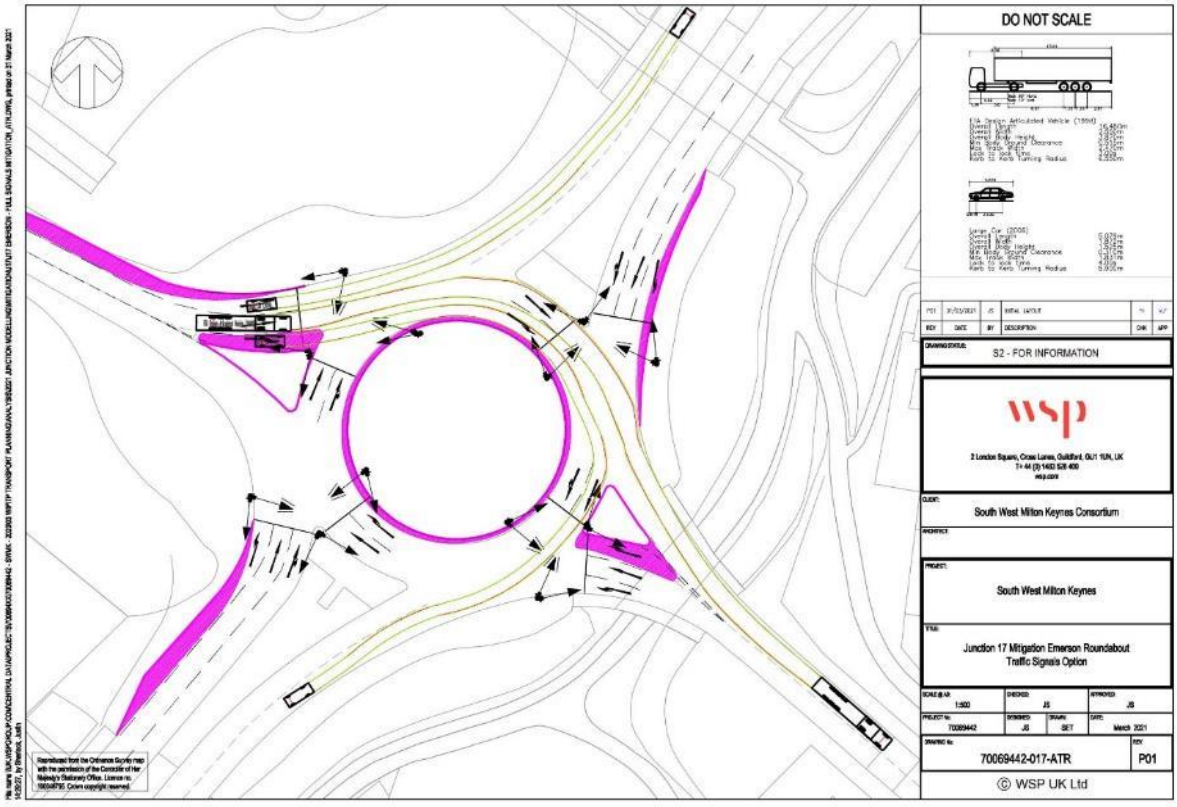
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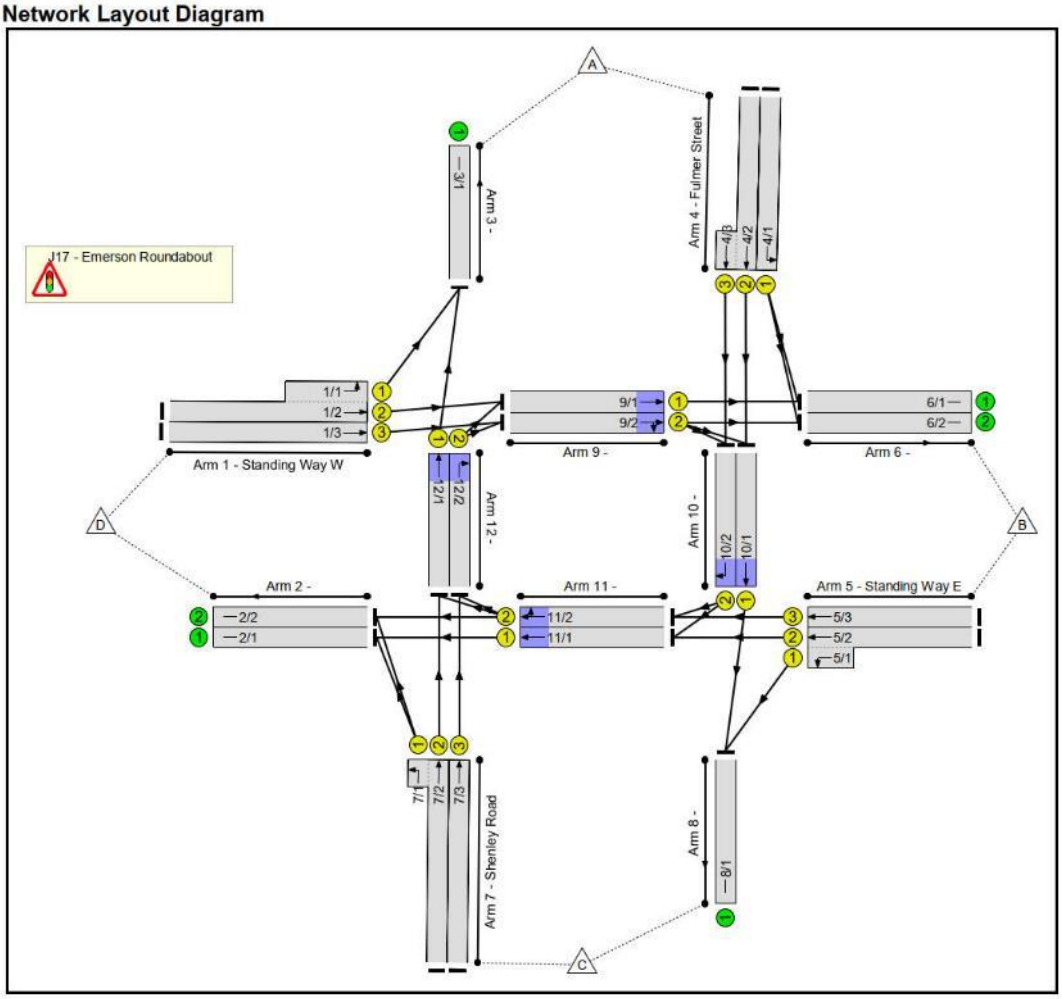
Enclosure B : Linsig Traffic Signal Modelling

Full Input Data And Results

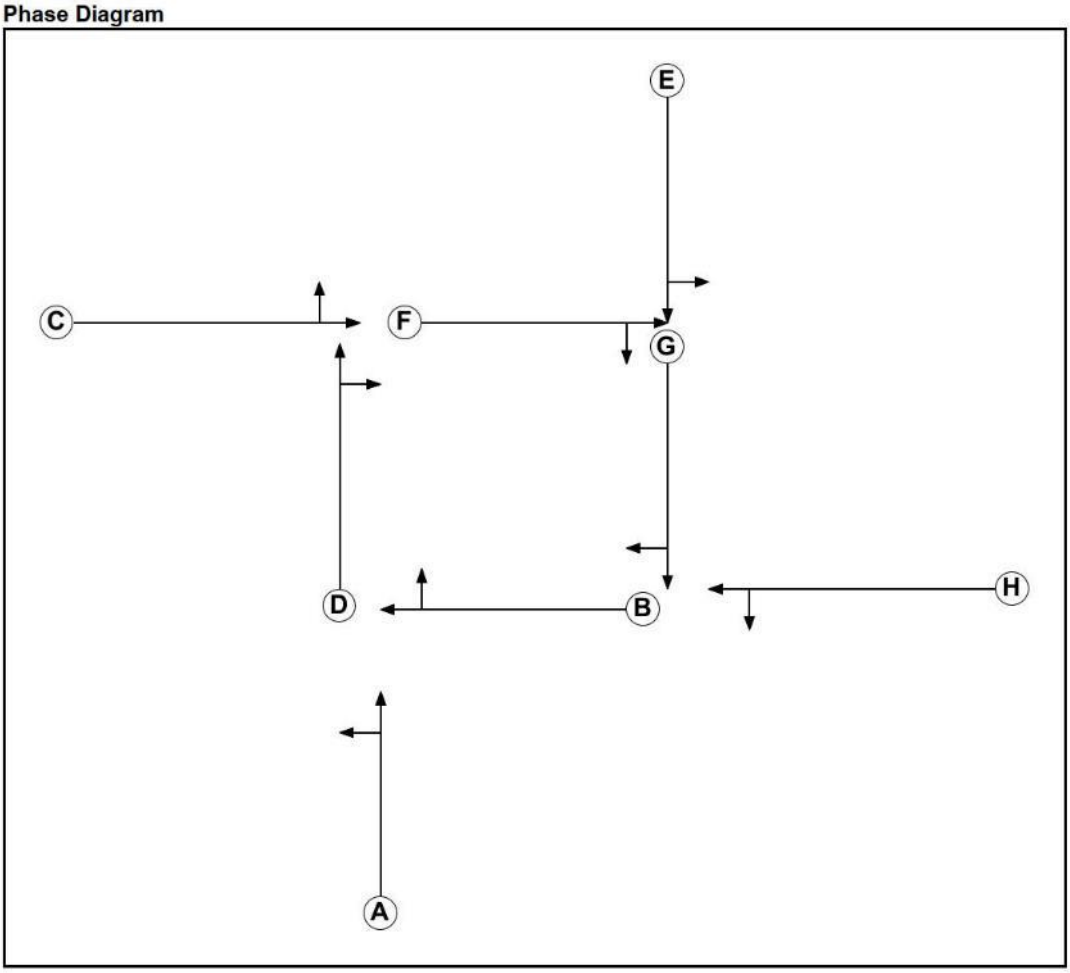
User and Project Details

Project:	
Title:	
Location:	
File name:	Emerson Roundabout Mitigation_Fully Signalised - v2.lsg3x
Author:	
Company:	
Address:	
Notes:	

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	4		7	7
B	Traffic	4		7	7
C	Traffic	1		7	7
D	Traffic	1		7	7
E	Traffic	2		7	7
F	Traffic	2		7	7
G	Traffic	3		7	7
H	Traffic	3		7	7

Phase Intergreens Matrix

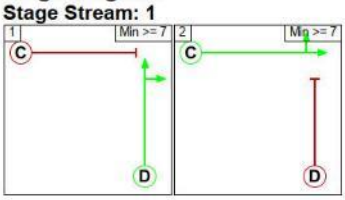
Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H
A		5	-	-	-	-	-	-
B	5		-	-	-	-	-	-
C	-	-		5	-	-	-	-
D	-	-	5		-	-	-	-
E	-	-	-	-		5	-	-
F	-	-	-	-	5		-	-
G	-	-	-	-	-	-		5
H	-	-	-	-	-	-	5	

Phases in Stage

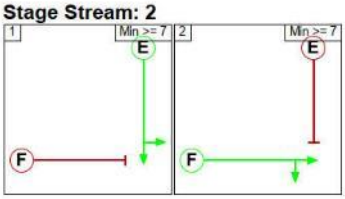
Stream	Stage No.	Phases in Stage
1	1	D
1	2	C
2	1	E
2	2	F
3	1	G
3	2	H
4	1	A
4	2	B

Stage Diagram

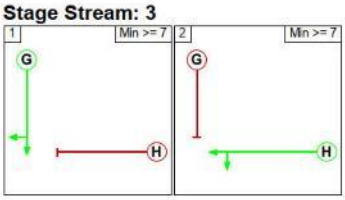
Stage Stream: 1



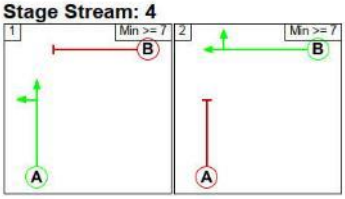
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 2

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 3

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Stage Stream: 4

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

Stage Stream: 1

		To Stage	
		1	2
From Stage	1		5
	2	5	

Stage Stream: 2

		To Stage	
		1	2
From Stage	1		5
	2	5	

Stage Stream: 3

		To Stage	
		1	2
From Stage	1		5
	2	5	

Stage Stream: 4

From Stage \ To Stage		1	2
	1		5
	2	5	

Give-Way Lane Input Data

Junction: J17 - Emerson Roundabout
There are no Opposed Lanes in this Junction

Lane Input Data

Junction: J17 - Emerson Roundabout

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (Standing Way W)	U	C	2	3	6.0	User	1900	-	-	-	-	-
1/2 (Standing Way W)	U	C	2	3	60.0	User	1900	-	-	-	-	-
1/3 (Standing Way W)	U	C	2	3	60.0	User	1900	-	-	-	-	-
2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
2/2	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (Fulmer Street)	U	E	2	3	60.0	User	1900	-	-	-	-	-
4/2 (Fulmer Street)	U	E	2	3	60.0	User	1900	-	-	-	-	-
4/3 (Fulmer Street)	U	E	2	3	2.8	User	1900	-	-	-	-	-
5/1 (Standing Way E)	U	H	2	3	3.4	User	1900	-	-	-	-	-
5/2 (Standing Way E)	U	H	2	3	60.0	User	1900	-	-	-	-	-
5/3 (Standing Way E)	U	H	2	3	60.0	User	1900	-	-	-	-	-
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (Shenley Road)	U	A	2	3	2.0	User	1900	-	-	-	-	-
7/2 (Shenley Road)	U	A	2	3	60.0	User	1900	-	-	-	-	-
7/3 (Shenley Road)	U	A	2	3	1.7	User	1900	-	-	-	-	-
8/1	U		2	3	60.0	Inf	-	-	-	-	-	-
9/1	U	F	2	3	5.1	User	1900	-	-	-	-	-
9/2	U	F	2	3	4.3	User	1900	-	-	-	-	-
10/1	U	G	2	3	8.6	User	1900	-	-	-	-	-
10/2	U	G	2	3	7.2	User	1900	-	-	-	-	-
11/1	U	B	2	3	6.3	User	1900	-	-	-	-	-
11/2	U	B	2	3	5.4	User	1900	-	-	-	-	-
12/1	U	D	2	3	8.1	User	1900	-	-	-	-	-

12/2	U	D	2	3	7.4	User	1900	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2020 AM'	08:00	09:00	01:00	
2: '2020 PM'	17:00	18:00	01:00	
3: '2033 Do Nothing AM'	08:00	09:00	01:00	
4: '2033 Do Nothing PM'	17:00	18:00	01:00	
5: '2033 DS1 AM'	08:00	09:00	01:00	
6: '2033 DS1 PM'	17:00	18:00	01:00	
7: '2033 DS2 AM'	08:00	09:00	01:00	
8: '2033 DS2 PM'	17:00	18:00	01:00	
9: '2033 DS3 AM'	08:00	09:00	01:00	
10: '2033 DS3 PM'	17:00	18:00	01:00	

Scenario 1: '2033 DS1 AM' (FG5: '2033 DS1 AM', Plan 1: 'Network Control Plan 1')
Traffic Flows, Desired
Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	1	215	319	167	702
	B	138	25	182	1247	1592
	C	340	162	0	116	618
	D	400	1972	117	24	2513
	Tot.	879	2374	618	1554	5425

Traffic Lane Flows

Lane	Scenario 1: 2033 DS1 AM
Junction: J17 - Emerson Roundabout	
1/1 (short)	400
1/2 (with short)	1354(In) 954(Out)
1/3	1159
2/1	828
2/2	726
3/1	879
4/1	215
4/2 (with short)	487(In) 319(Out)
4/3 (short)	168
5/1 (short)	182
5/2 (with short)	828(In) 646(Out)
5/3	764
6/1	1223
6/2	1151
7/1 (short)	116
7/2 (with short)	456(In) 340(Out)
7/3	162
8/1	618
9/1	1115
9/2	1185
10/1	436
10/2	192
11/1	770
11/2	832
12/1	479
12/2	187

Lane Saturation Flows

Junction: J17 - Emerson Roundabout								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Standing Way W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (Standing Way W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (Standing Way W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1	Infinite Saturation Flow						Inf	Inf
4/1 (Fulmer Street Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (Fulmer Street Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (Fulmer Street Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1 (Standing Way E Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
5/2 (Standing Way E Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
5/3 (Standing Way E Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1 (Shenley Road Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
7/2 (Shenley Road Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
7/3 (Shenley Road Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
8/1	Infinite Saturation Flow						Inf	Inf
9/1	This lane uses a directly entered Saturation Flow						1900	1900
9/2	This lane uses a directly entered Saturation Flow						1900	1900
10/1	This lane uses a directly entered Saturation Flow						1900	1900
10/2	This lane uses a directly entered Saturation Flow						1900	1900
11/1	This lane uses a directly entered Saturation Flow						1900	1900
11/2	This lane uses a directly entered Saturation Flow						1900	1900
12/1	This lane uses a directly entered Saturation Flow						1900	1900
12/2	This lane uses a directly entered Saturation Flow						1900	1900

Scenario 2: '2033 DS1 PM' (FG6: '2033 DS1 PM', Plan 1: 'Network Control Plan 1')
Traffic Flows, Desired
Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	168	361	185	714
	B	197	30	217	1837	2281
	C	279	198	0	85	562
	D	150	1492	84	13	1739
	Tot.	626	1888	662	2120	5296

Traffic Lane Flows

Lane	Scenario 2: 2033 DS1 PM
Junction: J17 - Emerson Roundabout	
1/1 (short)	150
1/2 (with short)	916(In) 766(Out)
1/3	823
2/1	1149
2/2	971
3/1	626
4/1	168
4/2 (with short)	546(In) 361(Out)
4/3 (short)	185
5/1 (short)	217
5/2 (with short)	1169(In) 952(Out)
5/3	1112
6/1	980
6/2	908
7/1 (short)	85
7/2 (with short)	364(In) 279(Out)
7/3	198
8/1	662
9/1	896
9/2	921
10/1	445
10/2	198
11/1	1107
11/2	1155
12/1	476
12/2	228

Lane Saturation Flows

Junction: J17 - Emerson Roundabout								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Standing Way W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (Standing Way W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (Standing Way W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1	Infinite Saturation Flow						Inf	Inf
4/1 (Fulmer Street Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (Fulmer Street Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (Fulmer Street Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1 (Standing Way E Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
5/2 (Standing Way E Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
5/3 (Standing Way E Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1 (Shenley Road Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
7/2 (Shenley Road Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
7/3 (Shenley Road Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
8/1	Infinite Saturation Flow						Inf	Inf
9/1	This lane uses a directly entered Saturation Flow						1900	1900
9/2	This lane uses a directly entered Saturation Flow						1900	1900
10/1	This lane uses a directly entered Saturation Flow						1900	1900
10/2	This lane uses a directly entered Saturation Flow						1900	1900
11/1	This lane uses a directly entered Saturation Flow						1900	1900
11/2	This lane uses a directly entered Saturation Flow						1900	1900
12/1	This lane uses a directly entered Saturation Flow						1900	1900
12/2	This lane uses a directly entered Saturation Flow						1900	1900

Scenario 3: '2033 DS2 AM' (FG7: '2033 DS2 AM', Plan 1: 'Network Control Plan 1')
Traffic Flows, Desired
Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	1	215	319	163	698
	B	138	25	182	1109	1454
	C	340	162	1	114	617
	D	393	1926	115	24	2458
	Tot.	872	2328	617	1410	5227

Traffic Lane Flows

Lane	Scenario 3: 2033 DS2 AM
Junction: J17 - Emerson Roundabout	
1/1 (short)	393
1/2 (with short)	1301(In) 908(Out)
1/3	1157
2/1	725
2/2	685
3/1	872
4/1	215
4/2 (with short)	483(In) 319(Out)
4/3 (short)	164
5/1 (short)	182
5/2 (with short)	748(In) 566(Out)
5/3	706
6/1	1147
6/2	1181
7/1 (short)	114
7/2 (with short)	454(In) 340(Out)
7/3	163
8/1	617
9/1	1039
9/2	1214
10/1	435
10/2	188
11/1	668
11/2	792
12/1	479
12/2	188

Lane Saturation Flows

Junction: J17 - Emerson Roundabout								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Standing Way W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (Standing Way W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (Standing Way W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1	Infinite Saturation Flow						Inf	Inf
4/1 (Fulmer Street Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (Fulmer Street Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (Fulmer Street Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1 (Standing Way E Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
5/2 (Standing Way E Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
5/3 (Standing Way E Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1 (Shenley Road Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
7/2 (Shenley Road Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
7/3 (Shenley Road Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
8/1	Infinite Saturation Flow						Inf	Inf
9/1	This lane uses a directly entered Saturation Flow						1900	1900
9/2	This lane uses a directly entered Saturation Flow						1900	1900
10/1	This lane uses a directly entered Saturation Flow						1900	1900
10/2	This lane uses a directly entered Saturation Flow						1900	1900
11/1	This lane uses a directly entered Saturation Flow						1900	1900
11/2	This lane uses a directly entered Saturation Flow						1900	1900
12/1	This lane uses a directly entered Saturation Flow						1900	1900
12/2	This lane uses a directly entered Saturation Flow						1900	1900

Scenario 4: '2033 DS2 PM' (FG8: '2033 DS2 PM', Plan 1: 'Network Control Plan 1')
Traffic Flows, Desired
Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	170	361	175	706
	B	197	30	217	1782	2226
	C	279	198	0	83	560
	D	144	1459	82	13	1698
	Tot.	620	1857	660	2053	5190

Traffic Lane Flows

Lane	Scenario 4: 2033 DS2 PM
Junction: J17 - Emerson Roundabout	
1/1 (short)	144
1/2 (with short)	892(In) 748(Out)
1/3	806
2/1	1096
2/2	957
3/1	620
4/1	170
4/2 (with short)	536(In) 361(Out)
4/3 (short)	175
5/1 (short)	217
5/2 (with short)	1136(In) 919(Out)
5/3	1090
6/1	946
6/2	911
7/1 (short)	83
7/2 (with short)	362(In) 279(Out)
7/3	198
8/1	660
9/1	861
9/2	921
10/1	443
10/2	188
11/1	1055
11/2	1142
12/1	476
12/2	228

Lane Saturation Flows

Junction: J17 - Emerson Roundabout								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Standing Way W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (Standing Way W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (Standing Way W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1	Infinite Saturation Flow						Inf	Inf
4/1 (Fulmer Street Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (Fulmer Street Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (Fulmer Street Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1 (Standing Way E Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
5/2 (Standing Way E Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
5/3 (Standing Way E Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1 (Shenley Road Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
7/2 (Shenley Road Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
7/3 (Shenley Road Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
8/1	Infinite Saturation Flow						Inf	Inf
9/1	This lane uses a directly entered Saturation Flow						1900	1900
9/2	This lane uses a directly entered Saturation Flow						1900	1900
10/1	This lane uses a directly entered Saturation Flow						1900	1900
10/2	This lane uses a directly entered Saturation Flow						1900	1900
11/1	This lane uses a directly entered Saturation Flow						1900	1900
11/2	This lane uses a directly entered Saturation Flow						1900	1900
12/1	This lane uses a directly entered Saturation Flow						1900	1900
12/2	This lane uses a directly entered Saturation Flow						1900	1900

Scenario 5: '2033 DS3 AM' (FG9: '2033 DS3 AM', Plan 1: 'Network Control Plan 1')
Traffic Flows, Desired
Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	1	215	323	167	706
	B	138	25	182	1256	1601
	C	342	162	1	118	623
	D	400	1989	121	24	2534
	Tot.	881	2391	627	1565	5464

Traffic Lane Flows

Lane	Scenario 5: 2033 DS3 AM
Junction: J17 - Emerson Roundabout	
1/1 (short)	400
1/2 (with short)	1338(In) 938(Out)
1/3	1196
2/1	815
2/2	750
3/1	881
4/1	215
4/2 (with short)	491(In) 323(Out)
4/3 (short)	168
5/1 (short)	182
5/2 (with short)	822(In) 640(Out)
5/3	779
6/1	1184
6/2	1207
7/1 (short)	118
7/2 (with short)	460(In) 342(Out)
7/3	163
8/1	627
9/1	1076
9/2	1246
10/1	445
10/2	192
11/1	756
11/2	855
12/1	481
12/2	188

Lane Saturation Flows

Junction: J17 - Emerson Roundabout								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Standing Way W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (Standing Way W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (Standing Way W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1	Infinite Saturation Flow						Inf	Inf
4/1 (Fulmer Street Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (Fulmer Street Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (Fulmer Street Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1 (Standing Way E Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
5/2 (Standing Way E Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
5/3 (Standing Way E Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1 (Shenley Road Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
7/2 (Shenley Road Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
7/3 (Shenley Road Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
8/1	Infinite Saturation Flow						Inf	Inf
9/1	This lane uses a directly entered Saturation Flow						1900	1900
9/2	This lane uses a directly entered Saturation Flow						1900	1900
10/1	This lane uses a directly entered Saturation Flow						1900	1900
10/2	This lane uses a directly entered Saturation Flow						1900	1900
11/1	This lane uses a directly entered Saturation Flow						1900	1900
11/2	This lane uses a directly entered Saturation Flow						1900	1900
12/1	This lane uses a directly entered Saturation Flow						1900	1900
12/2	This lane uses a directly entered Saturation Flow						1900	1900

Scenario 6: '2033 DS3 PM' (FG10: '2033 DS3 PM', Plan 1: 'Network Control Plan 1')
Traffic Flows, Desired
Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	170	363	185	718
	B	197	30	217	1792	2236
	C	282	198	0	88	568
	D	151	1498	84	13	1746
	Tot.	630	1896	664	2078	5268

Traffic Lane Flows

Lane	Scenario 6: 2033 DS3 PM
Junction: J17 - Emerson Roundabout	
1/1 (short)	151
1/2 (with short)	913(In) 762(Out)
1/3	833
2/1	1112
2/2	966
3/1	630
4/1	170
4/2 (with short)	548(In) 363(Out)
4/3 (short)	185
5/1 (short)	217
5/2 (with short)	1142(In) 925(Out)
5/3	1094
6/1	962
6/2	934
7/1 (short)	88
7/2 (with short)	370(In) 282(Out)
7/3	198
8/1	664
9/1	877
9/2	946
10/1	447
10/2	198
11/1	1068
11/2	1149
12/1	479
12/2	228

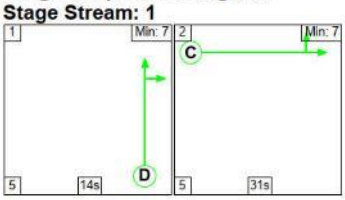
Lane Saturation Flows

Junction: J17 - Emerson Roundabout								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Standing Way W Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
1/2 (Standing Way W Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
1/3 (Standing Way W Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
2/1	Infinite Saturation Flow						Inf	Inf
2/2	Infinite Saturation Flow						Inf	Inf
3/1	Infinite Saturation Flow						Inf	Inf
4/1 (Fulmer Street Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
4/2 (Fulmer Street Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
4/3 (Fulmer Street Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
5/1 (Standing Way E Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
5/2 (Standing Way E Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
5/3 (Standing Way E Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
6/1	Infinite Saturation Flow						Inf	Inf
6/2	Infinite Saturation Flow						Inf	Inf
7/1 (Shenley Road Lane 1)	This lane uses a directly entered Saturation Flow						1900	1900
7/2 (Shenley Road Lane 2)	This lane uses a directly entered Saturation Flow						1900	1900
7/3 (Shenley Road Lane 3)	This lane uses a directly entered Saturation Flow						1900	1900
8/1	Infinite Saturation Flow						Inf	Inf
9/1	This lane uses a directly entered Saturation Flow						1900	1900
9/2	This lane uses a directly entered Saturation Flow						1900	1900
10/1	This lane uses a directly entered Saturation Flow						1900	1900
10/2	This lane uses a directly entered Saturation Flow						1900	1900
11/1	This lane uses a directly entered Saturation Flow						1900	1900
11/2	This lane uses a directly entered Saturation Flow						1900	1900
12/1	This lane uses a directly entered Saturation Flow						1900	1900
12/2	This lane uses a directly entered Saturation Flow						1900	1900

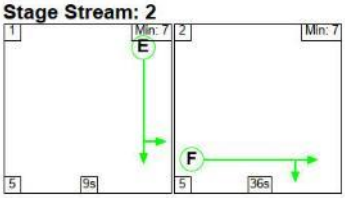
Scenario 1: '2033 DS1 AM' (FG5: '2033 DS1 AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

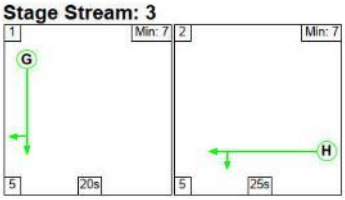
Stage Stream: 1



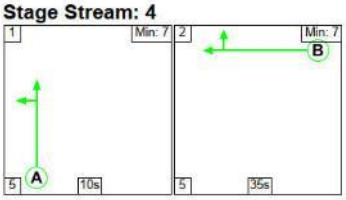
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	14	31
Change Point	4	23

Stage Stream: 2

Stage	1	2
Duration	9	36
Change Point	6	20

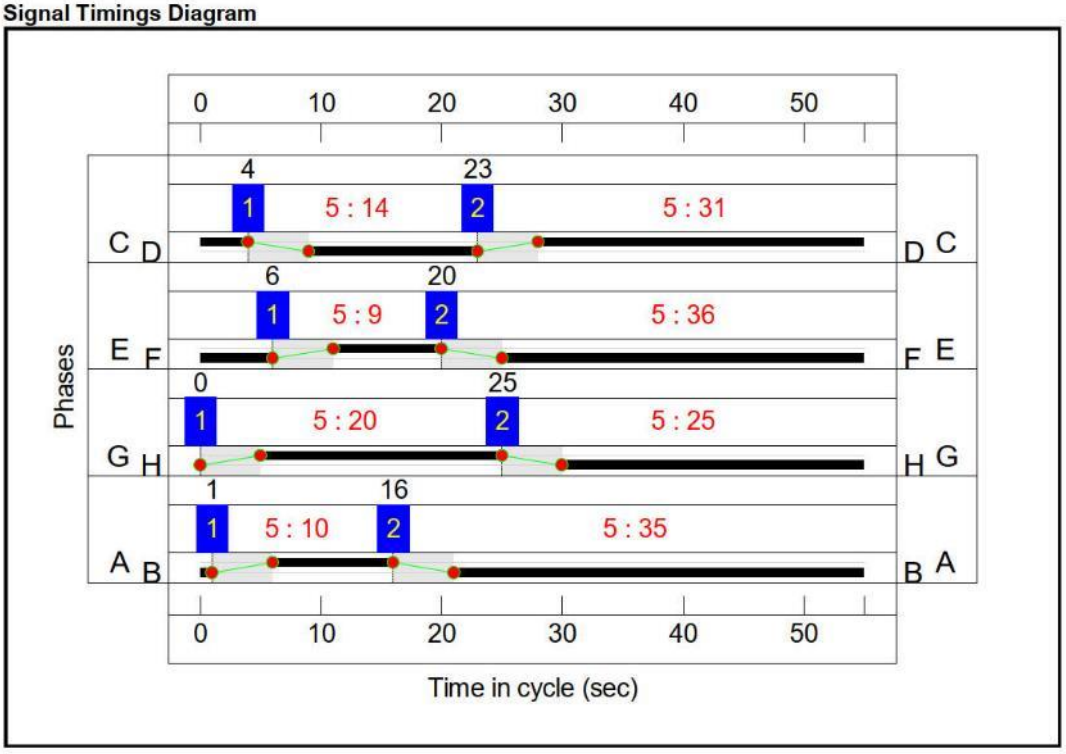
Stage Stream: 3

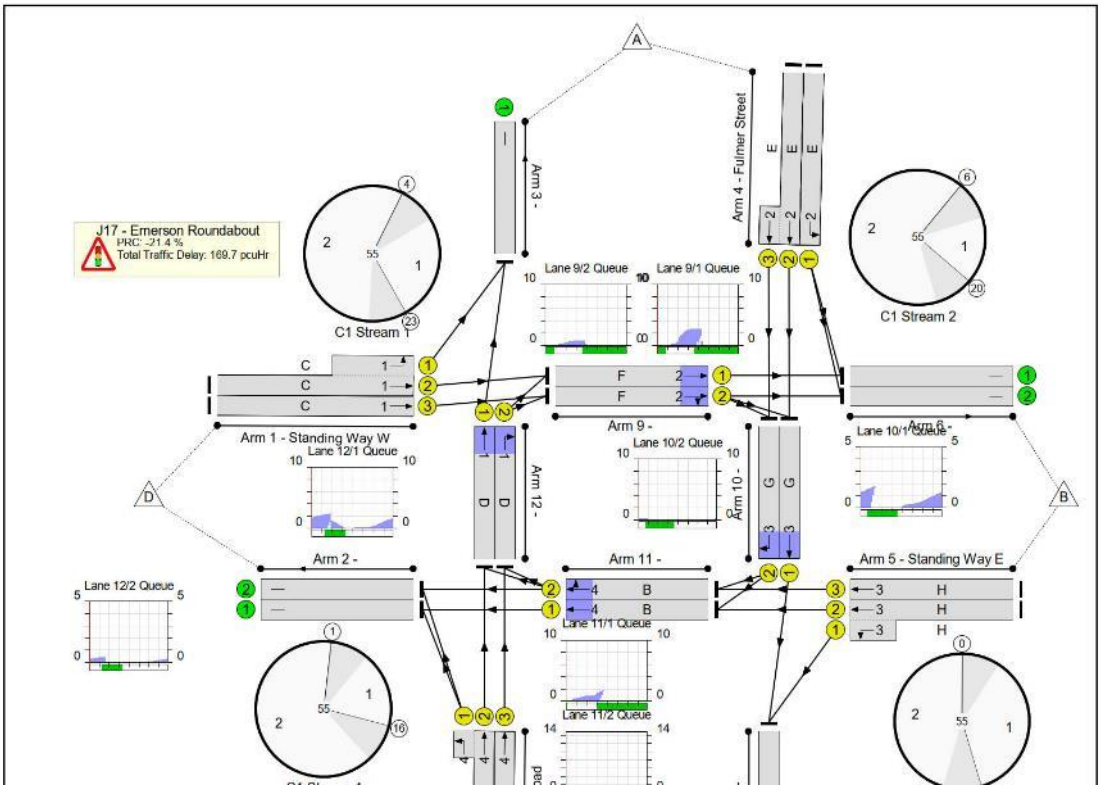
Stage	1	2
Duration	20	25
Change Point	0	25

Stage Stream: 4

Stage	1	2
Duration	10	35
Change Point	1	16

Signal Timings Diagram




J17 - Emerson Roundabout
PRC: -21.4 %
Total Traffic Delay: 169.7 pcuHr
C1 Stream 1
C1 Stream 2
Arm 1 - Standing Way W
Arm 2 -
Arm 3 -
Arm 4 - Fulmer Street
Arm 5 - Standing Way E
Arm 9 -
Arm 10 -
Arm 11 -
Arm 12 -
Lane 9/2 Queue
Lane 9/1 Queue
Lane 12/1 Queue
Lane 10/2 Queue
Lane 12/2 Queue
Lane 11/1 Queue
Lane 11/2 Queue

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.3%**
J17 - Emerson Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.3%**
1/2+1/1	Standing Way W Left Ahead	U	1	N/A	C		1	31	-	1354	1900:1900	904+379	105.5 : 105.5%
1/3	Standing Way W Ahead	U	1	N/A	C		1	31	-	1159	1900	1105	104.8%
2/1		U	N/A	N/A	-		-	-	-	828	Inf	Inf	0.0%
2/2		U	N/A	N/A	-		-	-	-	726	Inf	Inf	0.0%
3/1		U	N/A	N/A	-		-	-	-	879	Inf	Inf	0.0%
4/1	Fulmer Street Left	U	2	N/A	E		1	9	-	215	1900	345	62.2%
4/2+4/3	Fulmer Street Ahead	U	2	N/A	E		1	9	-	487	1900:1900	303+159	105.4 : 105.4%
5/2+5/1	Standing Way E Left Ahead	U	3	N/A	H		1	25	-	828	1900:1900	752+212	85.9 : 85.9%
5/3	Standing Way E Ahead	U	3	N/A	H		1	25	-	764	1900	898	85.1%
6/1		U	N/A	N/A	-		-	-	-	1223	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1151	Inf	Inf	0.0%
7/2+7/1	Shenley Road Left Ahead	U	4	N/A	A		1	10	-	456	1900:1900	311+106	109.3 : 109.3%
7/3	Shenley Road Ahead	U	4	N/A	A		1	10	-	162	1900	380	42.6%
8/1		U	N/A	N/A	-		-	-	-	618	Inf	Inf	0.0%
9/1	Ahead	U	2	N/A	F		1	36	-	1115	1900	1278	83.3%
9/2	Ahead Right	U	2	N/A	F		1	36	-	1185	1900	1278	88.5%
10/1	Ahead	U	3	N/A	G		1	20	-	436	1900	725	57.1%
10/2	Right	U	3	N/A	G		1	20	-	192	1900	725	25.1%
11/1	Ahead	U	4	N/A	B		1	35	-	770	1900	1244	61.4%
11/2	Ahead Right	U	4	N/A	B		1	35	-	832	1900	1244	66.6%

12/1	Ahead	U	1	N/A	D		1	14	-	479	1900	518	86.9%
12/2	Right	U	1	N/A	D		1	14	-	187	1900	518	36.1%

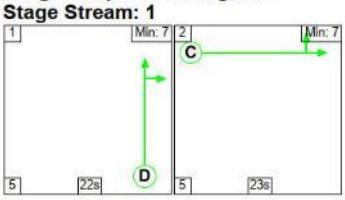
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	**0**	**0**	**0**	**29.4**	**140.3**	**0.0**	**169.7**	-	-	-	-
J17 - Emerson Roundabout	-	-	**0**	**0**	**0**	**29.4**	**140.3**	**0.0**	**169.7**	-	-	-	-
1/2+1/1	1354	1283	-	-	-	6.0	43.4	-	49.4	131.4	21.1	43.4	64.5
1/3	1159	1105	-	-	-	5.5	35.0	-	40.5	125.9	18.5	35.0	53.6
2/1	817	817	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	718	718	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	829	829	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	215	215	-	-	-	1.2	0.8	-	2.1	34.4	3.0	0.8	3.8
4/2+4/3	487	462	-	-	-	3.6	18.9	-	22.5	166.3	6.5	18.9	25.4
5/2+5/1	828	828	-	-	-	2.8	2.9	-	5.7	24.7	10.1	2.9	13.0
5/3	764	764	-	-	-	2.7	2.7	-	5.4	25.7	10.2	2.7	12.9
6/1	1173	1173	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1104	1104	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	456	417	-	-	-	3.8	24.0	-	27.8	219.6	7.1	24.0	31.2
7/3	162	162	-	-	-	0.9	0.4	-	1.2	27.5	2.2	0.4	2.5
8/1	596	596	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	1065	1065	-	-	-	0.7	2.4	-	3.1	10.5	2.7	2.4	5.2
9/2	1131	1131	-	-	-	0.2	3.7	-	3.9	12.3	0.8	3.7	4.4
10/1	414	414	-	-	-	0.5	0.7	-	1.2	10.3	1.8	0.7	2.4
10/2	182	182	-	-	-	0.1	0.2	-	0.3	5.3	0.3	0.2	0.5
11/1	764	764	-	-	-	0.3	0.8	-	1.1	5.2	1.8	0.8	2.6
11/2	829	829	-	-	-	0.2	1.0	-	1.2	5.1	0.9	1.0	1.9
12/1	450	450	-	-	-	0.9	3.0	-	3.9	31.4	2.4	3.0	5.5
12/2	187	187	-	-	-	0.1	0.3	-	0.4	7.9	0.4	0.3	0.7

C1	Stream: 1 PRC for Signalled Lanes (%):	-17.3	Total Delay for Signalled Lanes (pcuHr):	94.29	Cycle Time (s):	55
C1	Stream: 2 PRC for Signalled Lanes (%):	-17.1	Total Delay for Signalled Lanes (pcuHr):	31.51	Cycle Time (s):	55
C1	Stream: 3 PRC for Signalled Lanes (%):	4.8	Total Delay for Signalled Lanes (pcuHr):	12.58	Cycle Time (s):	55
C1	Stream: 4 PRC for Signalled Lanes (%):	-21.4	Total Delay for Signalled Lanes (pcuHr):	31.32	Cycle Time (s):	55
	PRC Over All Lanes (%):	-21.4	Total Delay Over All Lanes(pcuHr):	169.70		

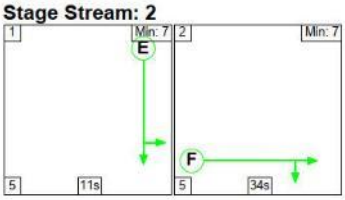
Scenario 2: '2033 DS1 PM' (FG6: '2033 DS1 PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

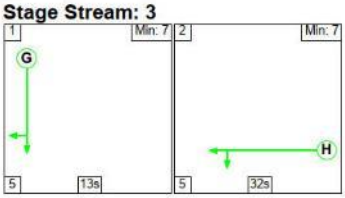
Stage Stream: 1



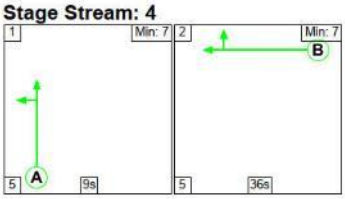
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	22	23
Change Point	2	29

Stage Stream: 2

Stage	1	2
Duration	11	34
Change Point	6	22

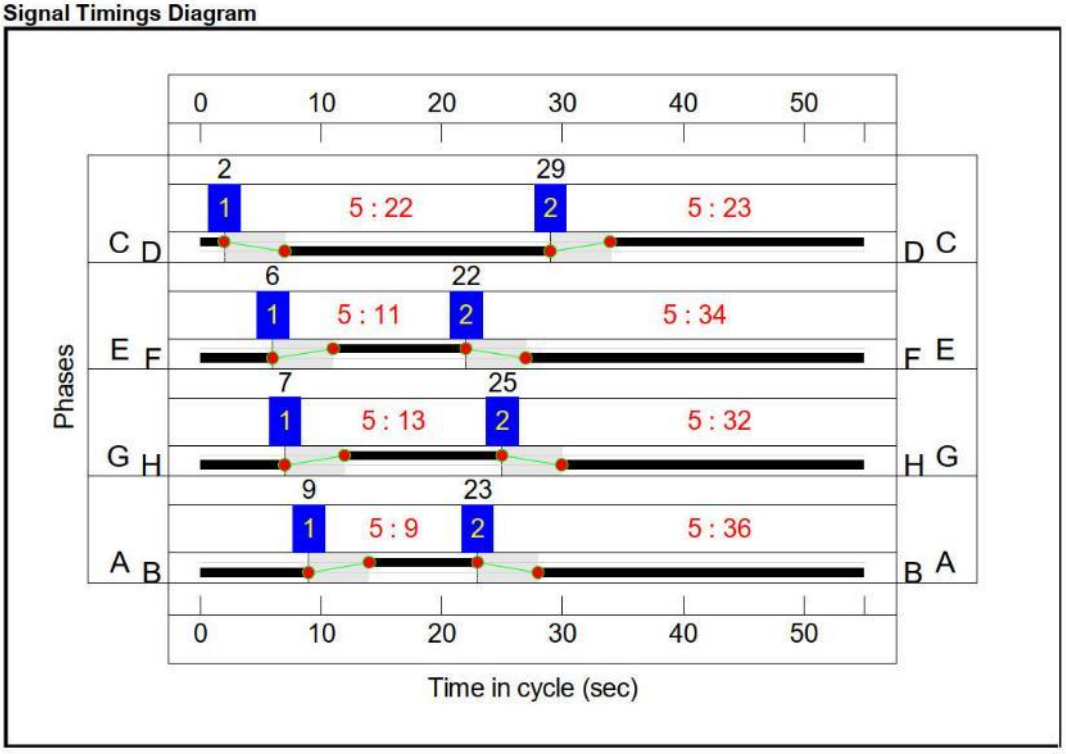
Stage Stream: 3

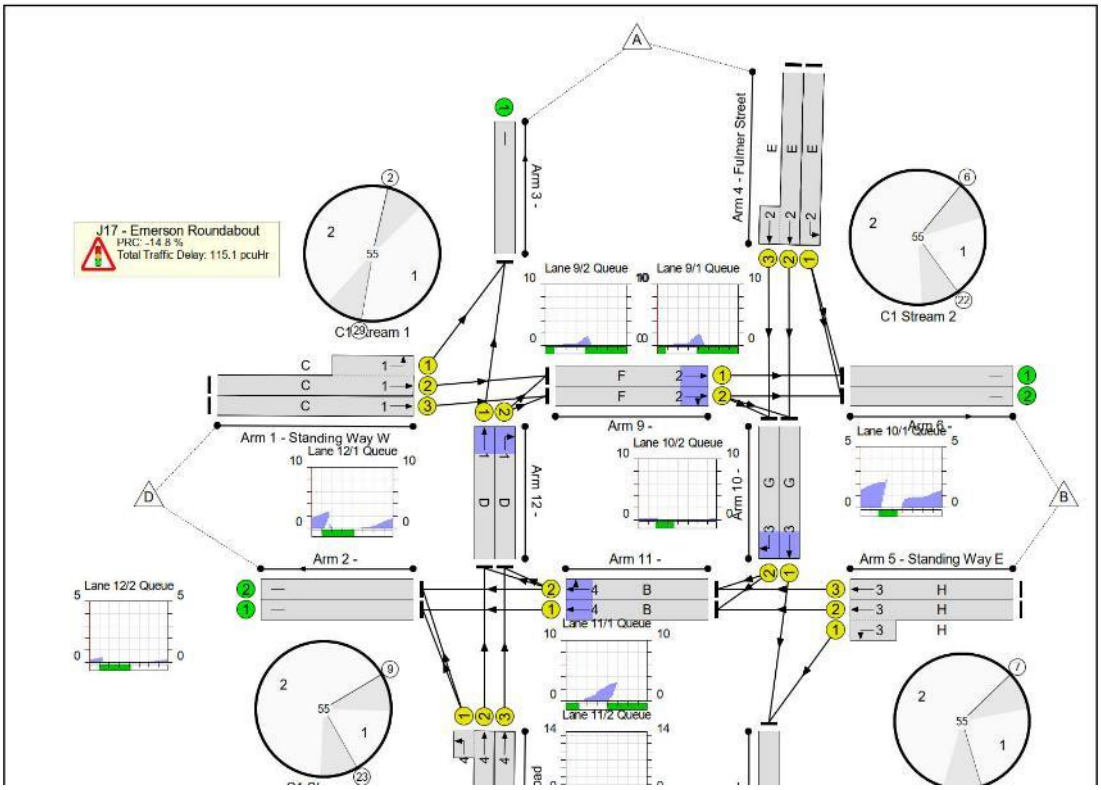
Stage	1	2
Duration	13	32
Change Point	7	25

Stage Stream: 4

Stage	1	2
Duration	9	36
Change Point	9	23

Signal Timings Diagram




J17 - Emerson Roundabout
PRC: -14.8 %
Total Traffic Delay: 115.1 pcuHr
A
B
D
Arm 3 -
Arm 4 - Fulmer Street
C1 Stream 1
C1 Stream 2
Lane 9/2 Queue
Lane 9/1 Queue
Arm 1 - Standing Way W
Lane 12/1 Queue
Arm 12 -
Arm 9 -
Lane 10/2 Queue
Arm 10 -
Arm 6 -
Lane 10/1 Queue
Arm 2 -
Arm 11 -
Arm 5 - Standing Way E
Lane 12/2 Queue
Lane 11/1 Queue
Lane 11/2 Queue

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**103.3%**
J17 - Emerson Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**103.3%**
1/2+1/1	Standing Way W Left Ahead	U	1	N/A	C		1	23	-	916	1900:1900	768+150	99.7 : 99.7%
1/3	Standing Way W Ahead	U	1	N/A	C		1	23	-	823	1900	829	99.3%
2/1		U	N/A	N/A	-		-	-	-	1149	Inf	Inf	0.0%
2/2		U	N/A	N/A	-		-	-	-	971	Inf	Inf	0.0%
3/1		U	N/A	N/A	-		-	-	-	626	Inf	Inf	0.0%
4/1	Fulmer Street Left	U	2	N/A	E		1	11	-	168	1900	415	40.5%
4/2+4/3	Fulmer Street Ahead	U	2	N/A	E		1	11	-	546	1900:1900	349+179	103.3 : 103.3%
5/2+5/1	Standing Way E Left Ahead	U	3	N/A	H		1	32	-	1169	1900:1900	972+222	97.9 : 97.9%
5/3	Standing Way E Ahead	U	3	N/A	H		1	32	-	1112	1900	1140	97.5%
6/1		U	N/A	N/A	-		-	-	-	980	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	908	Inf	Inf	0.0%
7/2+7/1	Shenley Road Left Ahead	U	4	N/A	A		1	9	-	364	1900:1900	290+88	96.3 : 96.3%
7/3	Shenley Road Ahead	U	4	N/A	A		1	9	-	198	1900	345	57.3%
8/1		U	N/A	N/A	-		-	-	-	662	Inf	Inf	0.0%
9/1	Ahead	U	2	N/A	F		1	34	-	896	1900	1209	74.1%
9/2	Ahead Right	U	2	N/A	F		1	34	-	921	1900	1209	76.2%
10/1	Ahead	U	3	N/A	G		1	13	-	445	1900	484	89.6%
10/2	Right	U	3	N/A	G		1	13	-	198	1900	484	39.7%
11/1	Ahead	U	4	N/A	B		1	36	-	1107	1900	1278	86.2%
11/2	Ahead Right	U	4	N/A	B		1	36	-	1155	1900	1278	90.3%

12/1	Ahead	U	1	N/A	D		1	22	-	476	1900	795	59.9%
12/2	Right	U	1	N/A	D		1	22	-	228	1900	795	28.7%

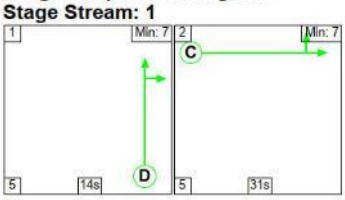
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	**0**	**0**	**0**	**24.8**	**90.3**	**0.0**	**115.1**	-	-	-	-
J17 - Emerson Roundabout	-	-	**0**	**0**	**0**	**24.8**	**90.3**	**0.0**	**115.1**	-	-	-	-
1/2+1/1	916	916	-	-	-	3.7	14.5	-	18.2	71.4	12.6	14.5	27.0
1/3	823	823	-	-	-	3.5	12.9	-	16.4	71.9	12.3	12.9	25.2
2/1	1144	1144	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	970	970	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	626	626	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	168	168	-	-	-	0.9	0.3	-	1.2	25.7	2.2	0.3	2.5
4/2+4/3	546	528	-	-	-	3.6	16.9	-	20.4	134.8	7.3	16.9	24.2
5/2+5/1	1169	1169	-	-	-	3.2	12.0	-	15.2	46.8	16.4	12.0	28.4
5/3	1112	1112	-	-	-	3.3	11.1	-	14.4	46.5	16.4	11.1	27.5
6/1	980	980	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	908	908	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	364	364	-	-	-	2.2	6.7	-	8.9	87.7	4.9	6.7	11.5
7/3	198	198	-	-	-	1.1	0.7	-	1.8	32.7	2.8	0.7	3.4
8/1	650	650	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	896	896	-	-	-	0.3	1.4	-	1.7	6.8	1.8	1.4	3.2
9/2	921	921	-	-	-	0.2	1.6	-	1.8	6.9	1.4	1.6	3.0
10/1	433	433	-	-	-	1.0	3.8	-	4.8	39.5	2.7	3.8	6.5
10/2	192	192	-	-	-	0.2	0.3	-	0.5	9.7	0.4	0.3	0.7
11/1	1102	1102	-	-	-	0.6	3.0	-	3.6	11.8	2.9	3.0	6.0
11/2	1154	1154	-	-	-	0.2	4.3	-	4.5	14.0	0.9	4.3	5.2
12/1	476	476	-	-	-	0.7	0.7	-	1.5	11.1	2.7	0.7	3.5
12/2	228	228	-	-	-	0.1	0.2	-	0.3	4.7	0.4	0.2	0.6

C1	Stream: 1 PRC for Signalled Lanes (%):	-10.8	Total Delay for Signalled Lanes (pcuHr):	36.36	Cycle Time (s):	55
C1	Stream: 2 PRC for Signalled Lanes (%):	-14.8	Total Delay for Signalled Lanes (pcuHr):	25.10	Cycle Time (s):	55
C1	Stream: 3 PRC for Signalled Lanes (%):	-8.8	Total Delay for Signalled Lanes (pcuHr):	34.85	Cycle Time (s):	55
C1	Stream: 4 PRC for Signalled Lanes (%):	-7.0	Total Delay for Signalled Lanes (pcuHr):	18.77	Cycle Time (s):	55
	PRC Over All Lanes (%):	-14.8	Total Delay Over All Lanes(pcuHr):	115.08		

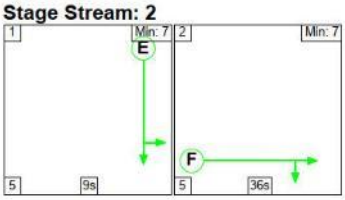
Scenario 3: '2033 DS2 AM' (FG7: '2033 DS2 AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

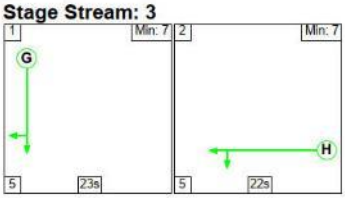
Stage Stream: 1



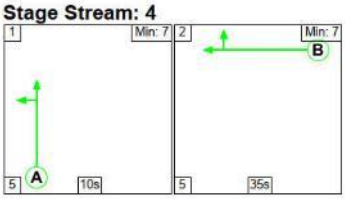
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	14	31
Change Point	22	41

Stage Stream: 2

Stage	1	2
Duration	9	36
Change Point	30	44

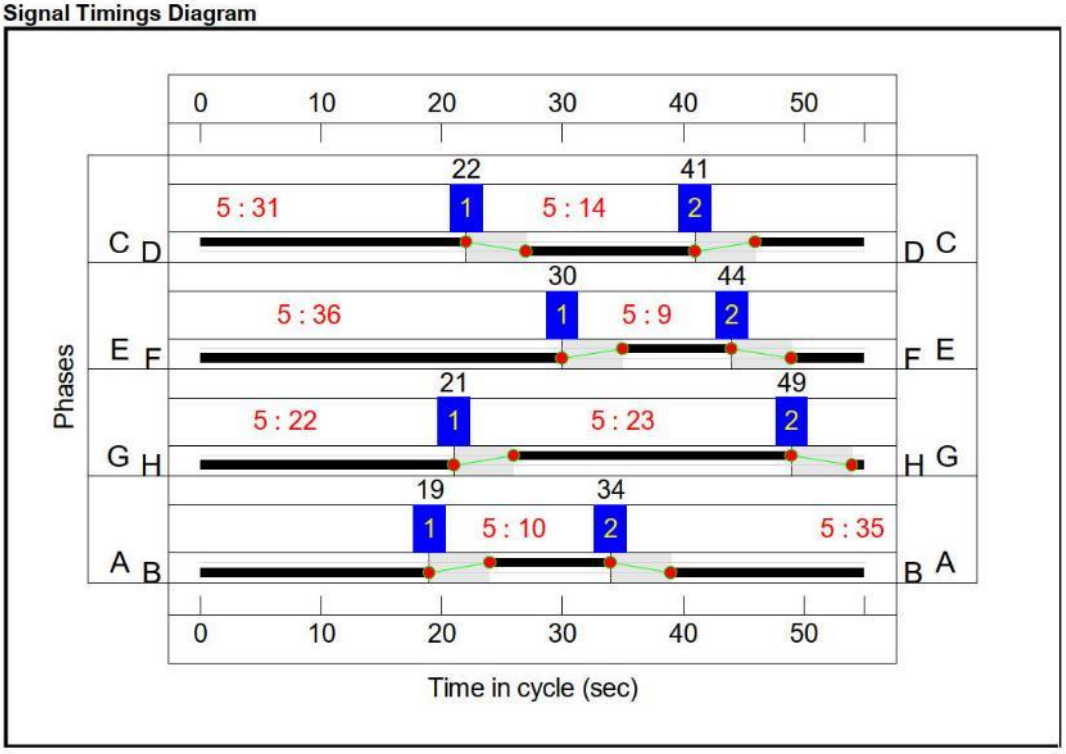
Stage Stream: 3

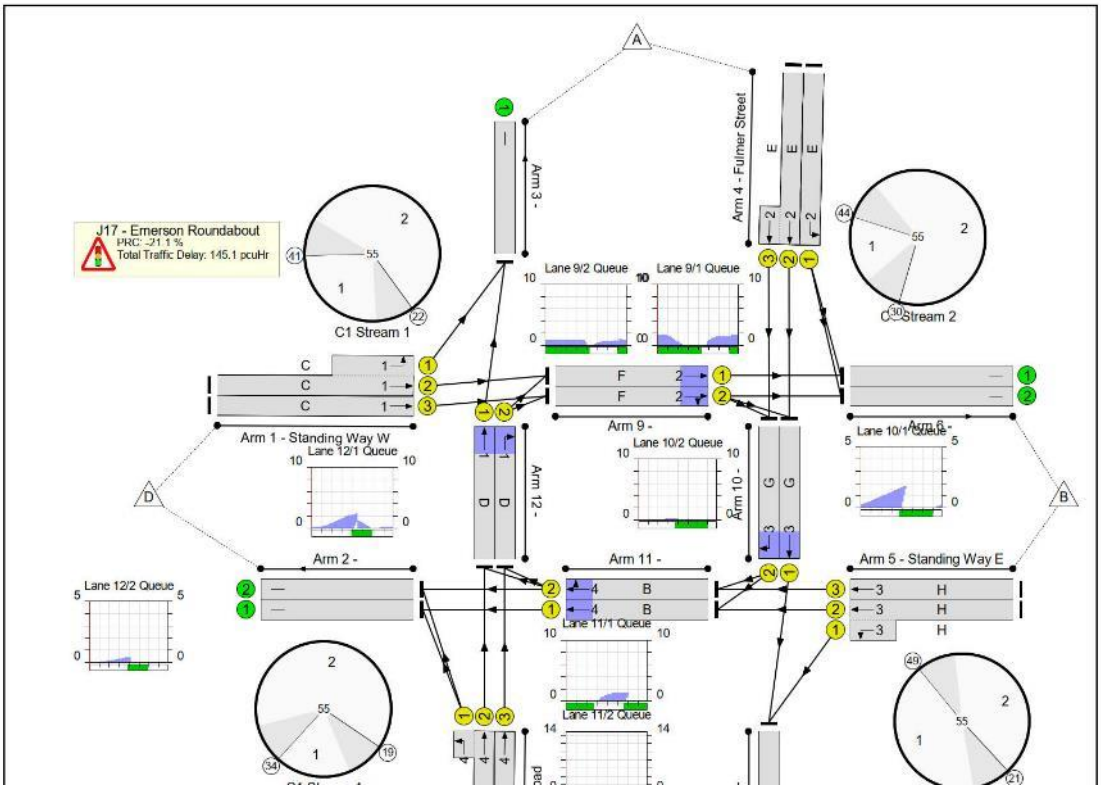
Stage	1	2
Duration	23	22
Change Point	21	49

Stage Stream: 4

Stage	1	2
Duration	10	35
Change Point	19	34

Signal Timings Diagram




J17 - Emerson Roundabout
PRC: -21.1 %
Total Traffic Delay: 145.1 pcuHr
C1 Stream 1
C2 Stream 2
Arm 1 - Standing Way W
Arm 2 -
Arm 3 -
Arm 4 - Fulmer Street
Arm 5 - Standing Way E
Arm 6 -
Arm 9 -
Arm 10 -
Arm 11 -
Arm 12 -
Lane 9/2 Queue
Lane 9/1 Queue
Lane 12/1 Queue
Lane 10/2 Queue
Lane 10/1 Queue
Lane 12/2 Queue
Lane 11/1 Queue
Lane 11/2 Queue

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.0%**
J17 - Emerson Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.0%**
1/2+1/1	Standing Way W Left Ahead	U	1	N/A	C		1	31	-	1301	1900:1900	899+389	101.0 : 101.0%
1/3	Standing Way W Ahead	U	1	N/A	C		1	31	-	1157	1900	1105	104.7%
2/1		U	N/A	N/A	-		-	-	-	725	Inf	Inf	0.0%
2/2		U	N/A	N/A	-		-	-	-	685	Inf	Inf	0.0%
3/1		U	N/A	N/A	-		-	-	-	872	Inf	Inf	0.0%
4/1	Fulmer Street Left	U	2	N/A	E		1	9	-	215	1900	345	62.2%
4/2+4/3	Fulmer Street Ahead	U	2	N/A	E		1	9	-	483	1900:1900	304+156	105.1 : 105.1%
5/2+5/1	Standing Way E Left Ahead	U	3	N/A	H		1	22	-	748	1900:1900	658+212	86.0 : 86.0%
5/3	Standing Way E Ahead	U	3	N/A	H		1	22	-	706	1900	795	88.9%
6/1		U	N/A	N/A	-		-	-	-	1147	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1181	Inf	Inf	0.0%
7/2+7/1	Shenley Road Left Ahead	U	4	N/A	A		1	10	-	454	1900:1900	312+105	109.0 : 109.0%
7/3	Shenley Road Ahead	U	4	N/A	A		1	10	-	163	1900	380	42.9%
8/1		U	N/A	N/A	-		-	-	-	617	Inf	Inf	0.0%
9/1	Ahead	U	2	N/A	F		1	36	-	1039	1900	1278	80.6%
9/2	Ahead Right	U	2	N/A	F		1	36	-	1214	1900	1278	90.9%
10/1	Ahead	U	3	N/A	G		1	23	-	435	1900	829	50.0%
10/2	Right	U	3	N/A	G		1	23	-	188	1900	829	21.6%
11/1	Ahead	U	4	N/A	B		1	35	-	668	1900	1244	53.3%
11/2	Ahead Right	U	4	N/A	B		1	35	-	792	1900	1244	63.4%
12/1	Ahead	U	1	N/A	D		1	14	-	479	1900	518	87.0%
12/2	Right	U	1	N/A	D		1	14	-	188	1900	518	36.3%

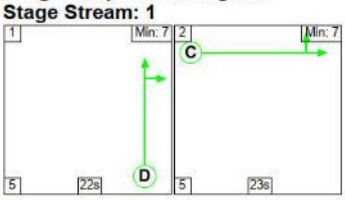
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	**0**	**0**	**0**	**27.7**	**117.4**	**0.0**	**145.1**	-	-	-	-
J17 - Emerson Roundabout	-	-	**0**	**0**	**0**	**27.7**	**117.4**	**0.0**	**145.1**	-	-	-	-
1/2+1/1	1301	1288	-	-	-	3.9	21.5	-	25.4	70.3	18.2	21.5	39.7
1/3	1157	1105	-	-	-	5.1	34.2	-	39.4	122.5	18.5	34.2	52.7
2/1	715	715	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	676	676	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	840	840	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	215	215	-	-	-	1.2	0.8	-	2.1	34.4	3.0	0.8	3.8
4/2+4/3	483	460	-	-	-	3.4	18.3	-	21.6	161.2	6.4	18.3	24.7
5/2+5/1	748	748	-	-	-	2.8	2.9	-	5.8	27.7	9.1	2.9	12.0
5/3	706	706	-	-	-	2.9	3.7	-	6.6	33.6	9.8	3.7	13.5
6/1	1138	1138	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1136	1136	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	454	417	-	-	-	3.5	23.5	-	27.1	214.5	7.1	23.5	30.6
7/3	163	163	-	-	-	0.9	0.4	-	1.2	27.5	2.2	0.4	2.5
8/1	596	596	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	1030	1030	-	-	-	0.9	2.0	-	2.9	10.2	1.8	2.0	3.8
9/2	1162	1162	-	-	-	0.7	4.6	-	5.3	16.5	1.0	4.6	5.7
10/1	414	414	-	-	-	0.5	0.5	-	1.0	8.9	1.8	0.5	2.3
10/2	179	179	-	-	-	0.1	0.1	-	0.2	4.8	0.3	0.1	0.5
11/1	663	663	-	-	-	0.4	0.6	-	1.0	5.3	1.5	0.6	2.0
11/2	788	788	-	-	-	0.4	0.9	-	1.2	5.7	1.2	0.9	2.0
12/1	451	451	-	-	-	0.8	3.1	-	3.9	31.0	2.4	3.1	5.5
12/2	188	188	-	-	-	0.1	0.3	-	0.4	7.6	0.4	0.3	0.7

C1	Stream: 1 PRC for Signalled Lanes (%):	-16.3	Total Delay for Signalled Lanes (pcuHr):	69.04	Cycle Time (s):	55
C1	Stream: 2 PRC for Signalled Lanes (%):	-16.7	Total Delay for Signalled Lanes (pcuHr):	31.96	Cycle Time (s):	55
C1	Stream: 3 PRC for Signalled Lanes (%):	1.3	Total Delay for Signalled Lanes (pcuHr):	13.60	Cycle Time (s):	55
C1	Stream: 4 PRC for Signalled Lanes (%):	-21.1	Total Delay for Signalled Lanes (pcuHr):	30.53	Cycle Time (s):	55
	PRC Over All Lanes (%):	-21.1	Total Delay Over All Lanes(pcuHr):	145.13		

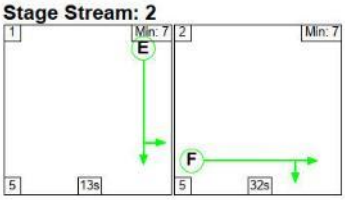
Scenario 4: '2033 DS2 PM' (FG8: '2033 DS2 PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

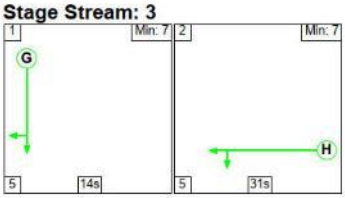
Stage Stream: 1



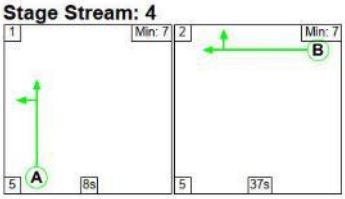
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	22	23
Change Point	52	24

Stage Stream: 2

Stage	1	2
Duration	13	32
Change Point	1	19

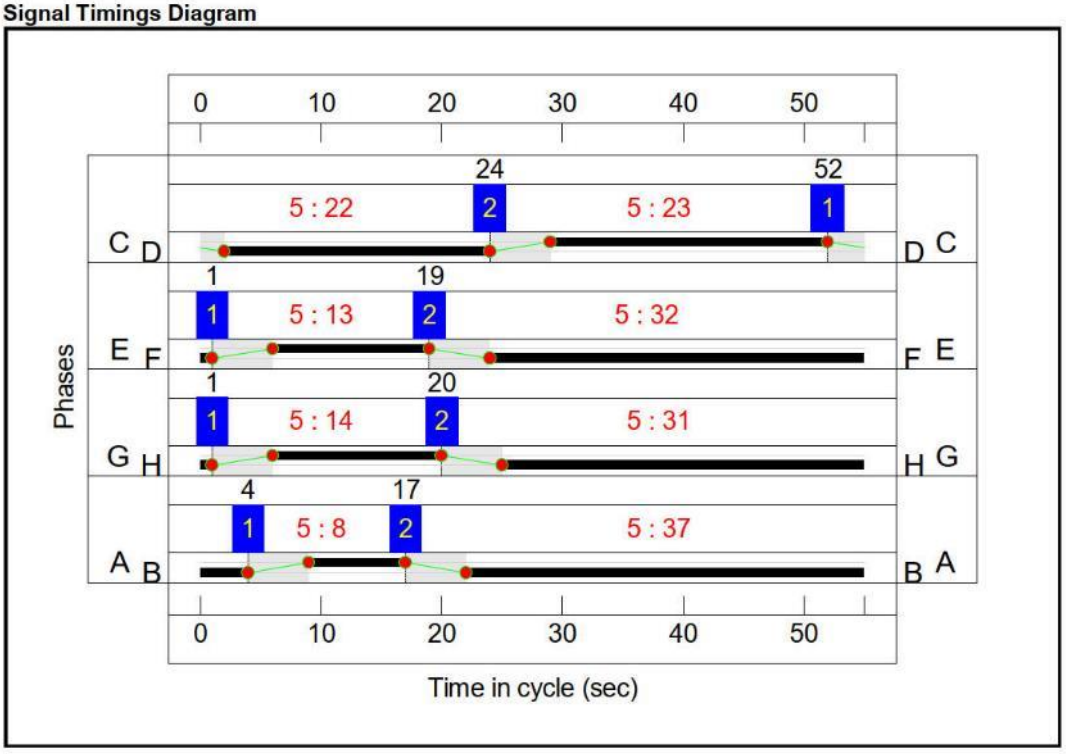
Stage Stream: 3

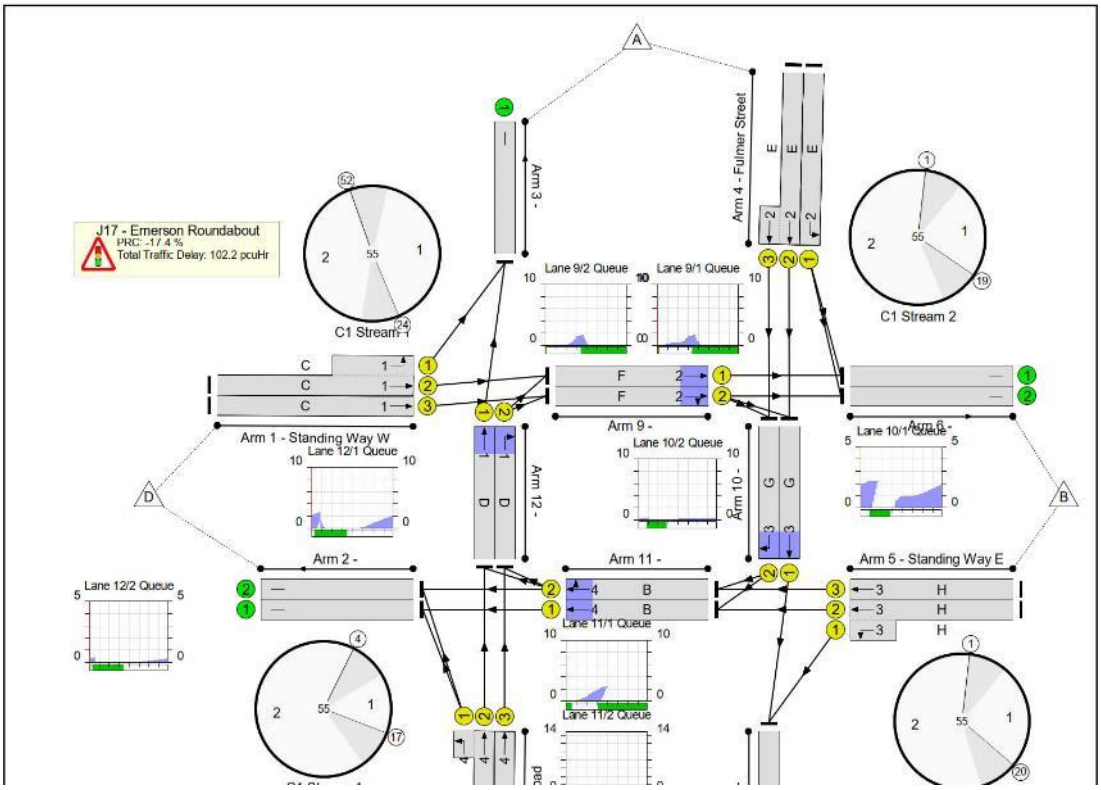
Stage	1	2
Duration	14	31
Change Point	1	20

Stage Stream: 4

Stage	1	2
Duration	8	37
Change Point	4	17

Signal Timings Diagram




J17 - Emerson Roundabout
PRC: -1 / 4 %
Total Traffic Delay: 102.2 pcuHr
A
B
D
Arm 3 -
Arm 4 - Fulmer Street
C1 Stream 1
C1 Stream 2
Lane 9/2 Queue
Lane 9/1 Queue
Arm 1 - Standing Way W
Lane 12/1 Queue
Arm 12 -
Arm 9 -
Lane 10/2 Queue
Arm 10 -
Arm 6 -
Lane 10/1 Queue
Arm 2 -
Arm 11 -
Arm 5 - Standing Way E
Lane 12/2 Queue
Lane 11/1 Queue
Lane 11/2 Queue

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**105.7%**
J17 - Emerson Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**105.7%**
1/2+1/1	Standing Way W Left Ahead	U	1	N/A	C		1	23	-	892	1900:1900	769+148	97.2 : 97.2%
1/3	Standing Way W Ahead	U	1	N/A	C		1	23	-	806	1900	829	97.2%
2/1		U	N/A	N/A	-		-	-	-	1096	Inf	Inf	0.0%
2/2		U	N/A	N/A	-		-	-	-	957	Inf	Inf	0.0%
3/1		U	N/A	N/A	-		-	-	-	620	Inf	Inf	0.0%
4/1	Fulmer Street Left	U	2	N/A	E		1	13	-	170	1900	484	35.2%
4/2+4/3	Fulmer Street Ahead	U	2	N/A	E		1	13	-	536	1900:1900	399+193	90.5 : 90.5%
5/2+5/1	Standing Way E Left Ahead	U	3	N/A	H		1	31	-	1136	1900:1900	939+222	97.8 : 97.8%
5/3	Standing Way E Ahead	U	3	N/A	H		1	31	-	1090	1900	1105	98.6%
6/1		U	N/A	N/A	-		-	-	-	946	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	911	Inf	Inf	0.0%
7/2+7/1	Shenley Road Left Ahead	U	4	N/A	A		1	8	-	362	1900:1900	264+79	105.7 : 105.7%
7/3	Shenley Road Ahead	U	4	N/A	A		1	8	-	198	1900	311	63.7%
8/1		U	N/A	N/A	-		-	-	-	660	Inf	Inf	0.0%
9/1	Ahead	U	2	N/A	F		1	32	-	861	1900	1140	75.5%
9/2	Ahead Right	U	2	N/A	F		1	32	-	921	1900	1140	80.8%
10/1	Ahead	U	3	N/A	G		1	14	-	443	1900	518	85.5%
10/2	Right	U	3	N/A	G		1	14	-	188	1900	518	36.3%
11/1	Ahead	U	4	N/A	B		1	37	-	1055	1900	1313	80.4%
11/2	Ahead Right	U	4	N/A	B		1	37	-	1142	1900	1313	87.0%

12/1	Ahead	U	1	N/A	D		1	22	-	476	1900	795	58.0%
12/2	Right	U	1	N/A	D		1	22	-	228	1900	795	28.7%

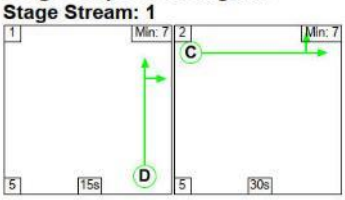
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	**0**	**0**	**0**	**24.4**	**77.8**	**0.0**	**102.2**	-	-	-	-
J17 - Emerson Roundabout	-	-	**0**	**0**	**0**	**24.4**	**77.8**	**0.0**	**102.2**	-	-	-	-
1/2+1/1	892	892	-	-	-	3.5	9.9	-	13.4	54.1	12.0	9.9	21.9
1/3	806	806	-	-	-	3.4	9.6	-	12.9	57.8	11.9	9.6	21.4
2/1	1094	1094	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	955	955	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	605	605	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	170	170	-	-	-	0.8	0.3	-	1.1	22.5	2.1	0.3	2.4
4/2+4/3	536	536	-	-	-	2.8	4.1	-	7.0	46.7	6.4	4.1	10.5
5/2+5/1	1136	1136	-	-	-	3.3	11.7	-	15.0	47.5	15.9	11.7	27.6
5/3	1090	1090	-	-	-	3.4	13.1	-	16.5	54.5	16.0	13.1	29.1
6/1	946	946	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	911	911	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	362	343	-	-	-	2.8	15.5	-	18.3	182.2	5.3	15.5	20.9
7/3	198	198	-	-	-	1.2	0.9	-	2.0	37.2	2.8	0.9	3.7
8/1	660	660	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	861	861	-	-	-	0.3	1.5	-	1.9	7.7	1.7	1.5	3.2
9/2	921	921	-	-	-	0.3	2.1	-	2.3	9.1	1.7	2.1	3.8
10/1	443	443	-	-	-	1.1	2.7	-	3.8	30.9	2.3	2.7	5.0
10/2	188	188	-	-	-	0.2	0.3	-	0.5	9.9	0.5	0.3	0.7
11/1	1055	1055	-	-	-	0.4	2.0	-	2.4	8.2	2.4	2.0	4.4
11/2	1142	1142	-	-	-	0.1	3.2	-	3.4	10.6	0.8	3.2	4.1
12/1	461	461	-	-	-	0.7	0.7	-	1.4	10.8	2.6	0.7	3.3
12/2	228	228	-	-	-	0.1	0.2	-	0.3	4.7	0.4	0.2	0.6

C1	Stream: 1 PRC for Signalled Lanes (%):	-8.0	Total Delay for Signalled Lanes (pcuHr):	28.03	Cycle Time (s):	55
C1	Stream: 2 PRC for Signalled Lanes (%):	-0.5	Total Delay for Signalled Lanes (pcuHr):	12.19	Cycle Time (s):	55
C1	Stream: 3 PRC for Signalled Lanes (%):	-9.6	Total Delay for Signalled Lanes (pcuHr):	35.82	Cycle Time (s):	55
C1	Stream: 4 PRC for Signalled Lanes (%):	-17.4	Total Delay for Signalled Lanes (pcuHr):	26.13	Cycle Time (s):	55
	PRC Over All Lanes (%):	-17.4	Total Delay Over All Lanes(pcuHr):	102.18		

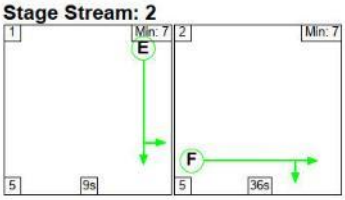
Scenario 5: '2033 DS3 AM' (FG9: '2033 DS3 AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

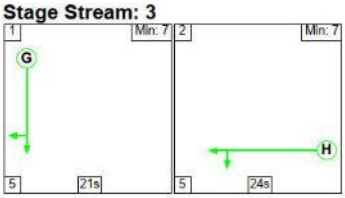
Stage Stream: 1



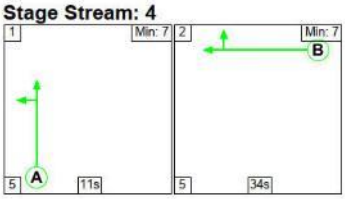
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	15	30
Change Point	5	25

Stage Stream: 2

Stage	1	2
Duration	9	36
Change Point	9	23

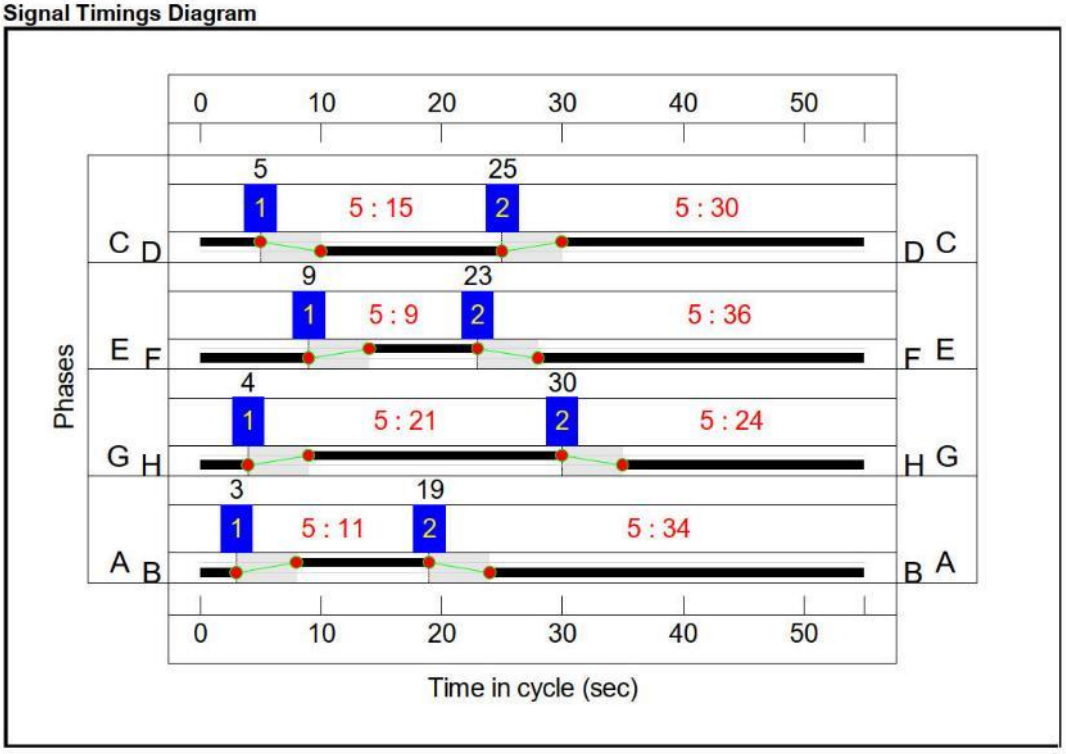
Stage Stream: 3

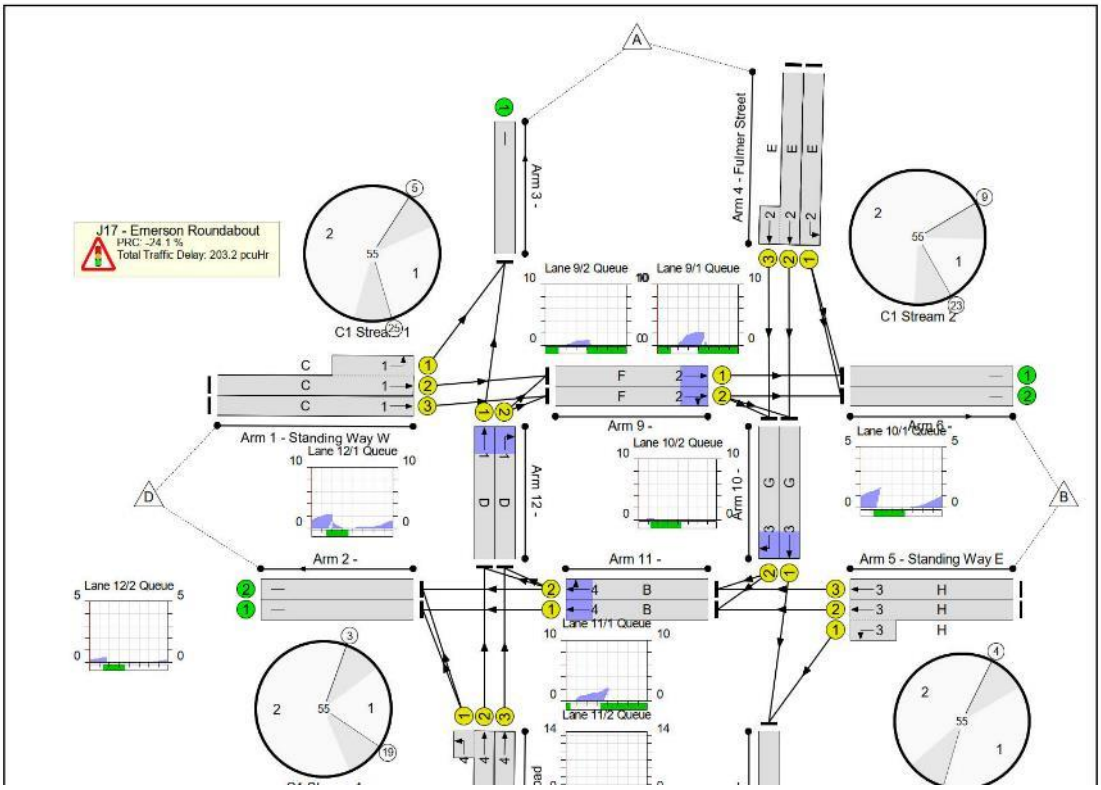
Stage	1	2
Duration	21	24
Change Point	4	30

Stage Stream: 4

Stage	1	2
Duration	11	34
Change Point	3	19

Signal Timings Diagram




J17 - Emerson Roundabout
PRC: -24.1 %
Total Traffic Delay: 203.2 pcuHr
A
B
D
Arm 1 - Standing Way W
Arm 2 -
Arm 3 -
Arm 4 - Fulmer Street
Arm 5 - Standing Way E
Arm 6 -
Arm 9 -
Arm 10 -
Arm 11 -
Arm 12 -
C1 Stream 1
C1 Stream 2
Lane 9/2 Queue
Lane 9/1 Queue
Lane 12/1 Queue
Lane 10/2 Queue
Lane 12/2 Queue
Lane 11/1 Queue
Lane 11/2 Queue

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**111.7%**
J17 - Emerson Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**111.7%**
1/2+1/1	Standing Way W Left Ahead	U	1	N/A	C		1	30	-	1338	1900:1900	877+374	106.9 : 106.9%
1/3	Standing Way W Ahead	U	1	N/A	C		1	30	-	1196	1900	1071	111.7%
2/1		U	N/A	N/A	-		-	-	-	815	Inf	Inf	0.0%
2/2		U	N/A	N/A	-		-	-	-	750	Inf	Inf	0.0%
3/1		U	N/A	N/A	-		-	-	-	881	Inf	Inf	0.0%
4/1	Fulmer Street Left	U	2	N/A	E		1	9	-	215	1900	345	62.2%
4/2+4/3	Fulmer Street Ahead	U	2	N/A	E		1	9	-	491	1900:1900	303+158	106.5 : 106.5%
5/2+5/1	Standing Way E Left Ahead	U	3	N/A	H		1	24	-	822	1900:1900	724+206	88.3 : 88.3%
5/3	Standing Way E Ahead	U	3	N/A	H		1	24	-	779	1900	861	90.2%
6/1		U	N/A	N/A	-		-	-	-	1184	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1207	Inf	Inf	0.0%
7/2+7/1	Shenley Road Left Ahead	U	4	N/A	A		1	11	-	460	1900:1900	336+116	101.7 : 101.7%
7/3	Shenley Road Ahead	U	4	N/A	A		1	11	-	163	1900	415	39.3%
8/1		U	N/A	N/A	-		-	-	-	627	Inf	Inf	0.0%
9/1	Ahead	U	2	N/A	F		1	36	-	1076	1900	1278	79.4%
9/2	Ahead Right	U	2	N/A	F		1	36	-	1246	1900	1278	87.7%
10/1	Ahead	U	3	N/A	G		1	21	-	445	1900	760	54.3%
10/2	Right	U	3	N/A	G		1	21	-	192	1900	760	23.6%
11/1	Ahead	U	4	N/A	B		1	34	-	756	1900	1209	61.9%
11/2	Ahead Right	U	4	N/A	B		1	34	-	855	1900	1209	70.3%
12/1	Ahead	U	1	N/A	D		1	15	-	481	1900	553	86.0%
12/2	Right	U	1	N/A	D		1	15	-	188	1900	553	34.0%

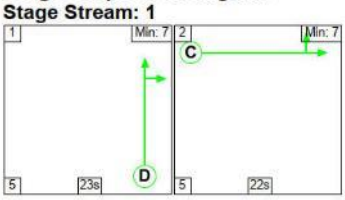
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	**0**	**0**	**0**	**32.3**	**170.9**	**0.0**	**203.2**	-	-	-	-
J17 - Emerson Roundabout	-	-	**0**	**0**	**0**	**32.3**	**170.9**	**0.0**	**203.2**	-	-	-	-
1/2+1/1	1338	1251	-	-	-	6.7	50.1	-	56.8	152.8	21.1	50.1	71.2
1/3	1196	1071	-	-	-	8.1	67.0	-	75.1	226.0	20.2	67.0	87.2
2/1	806	806	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	744	744	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	849	849	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	215	215	-	-	-	1.2	0.8	-	2.1	34.4	3.0	0.8	3.8
4/2+4/3	491	461	-	-	-	3.7	20.9	-	24.7	180.9	6.8	20.9	27.7
5/2+5/1	822	822	-	-	-	2.9	3.6	-	6.5	28.4	10.2	3.6	13.8
5/3	779	779	-	-	-	3.0	4.2	-	7.2	33.2	10.8	4.2	15.0
6/1	1123	1123	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1097	1097	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	460	452	-	-	-	2.9	12.8	-	15.7	122.6	6.5	12.8	19.2
7/3	163	163	-	-	-	0.8	0.3	-	1.2	25.5	2.1	0.3	2.5
8/1	595	595	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	1015	1015	-	-	-	0.5	1.9	-	2.4	8.6	2.2	1.9	4.1
9/2	1121	1121	-	-	-	0.2	3.4	-	3.6	11.5	0.8	3.4	4.2
10/1	413	413	-	-	-	0.4	0.6	-	1.0	9.0	1.7	0.6	2.3
10/2	179	179	-	-	-	0.1	0.2	-	0.2	4.8	0.3	0.2	0.5
11/1	748	748	-	-	-	0.5	0.8	-	1.3	6.1	2.1	0.8	3.0
11/2	850	850	-	-	-	0.4	1.2	-	1.5	6.5	1.5	1.2	2.6
12/1	475	475	-	-	-	0.8	2.9	-	3.6	27.6	2.3	2.9	5.2
12/2	188	188	-	-	-	0.1	0.3	-	0.4	7.0	0.4	0.3	0.6

C1	Stream: 1 PRC for Signalled Lanes (%):	-24.1	Total Delay for Signalled Lanes (pcuHr):	135.91	Cycle Time (s):	55
C1	Stream: 2 PRC for Signalled Lanes (%):	-18.4	Total Delay for Signalled Lanes (pcuHr):	32.74	Cycle Time (s):	55
C1	Stream: 3 PRC for Signalled Lanes (%):	-0.2	Total Delay for Signalled Lanes (pcuHr):	14.94	Cycle Time (s):	55
C1	Stream: 4 PRC for Signalled Lanes (%):	-13.0	Total Delay for Signalled Lanes (pcuHr):	19.63	Cycle Time (s):	55
	PRC Over All Lanes (%):	-24.1	Total Delay Over All Lanes(pcuHr):	203.23		

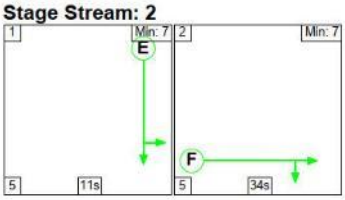
Scenario 6: '2033 DS3 PM' (FG10: '2033 DS3 PM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

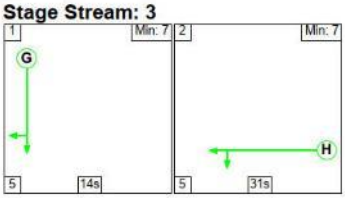
Stage Stream: 1



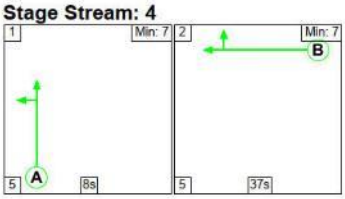
Stage Stream: 2



Stage Stream: 3



Stage Stream: 4



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	23	22
Change Point	54	27

Stage Stream: 2

Stage	1	2
Duration	11	34
Change Point	3	19

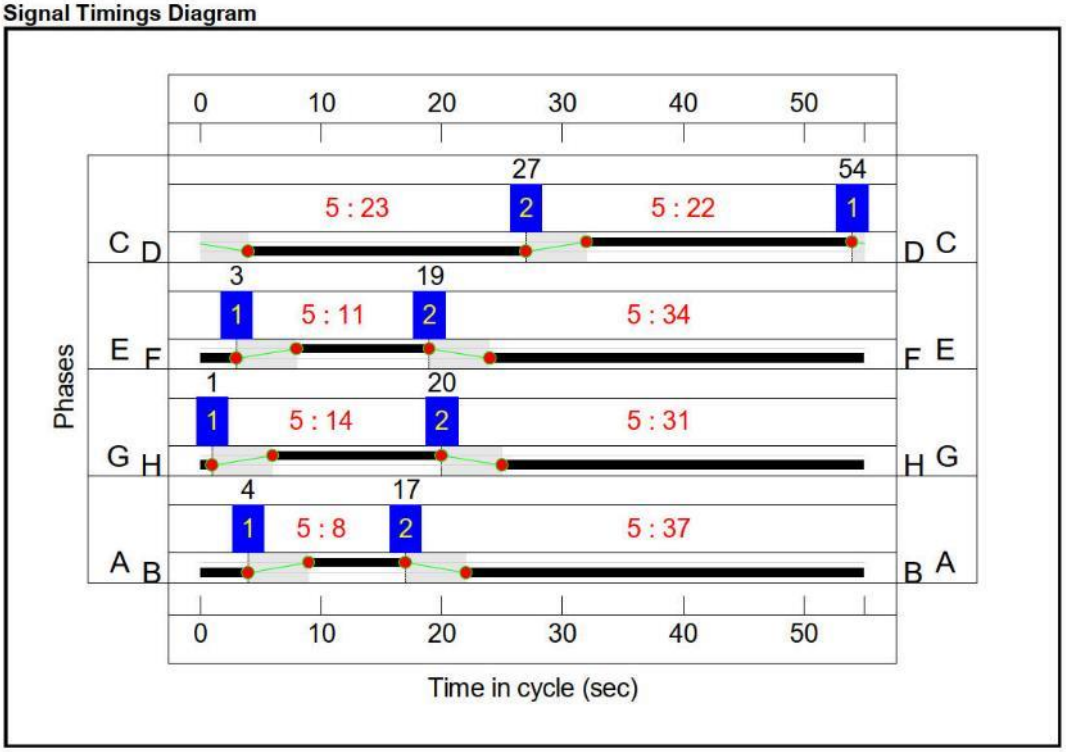
Stage Stream: 3

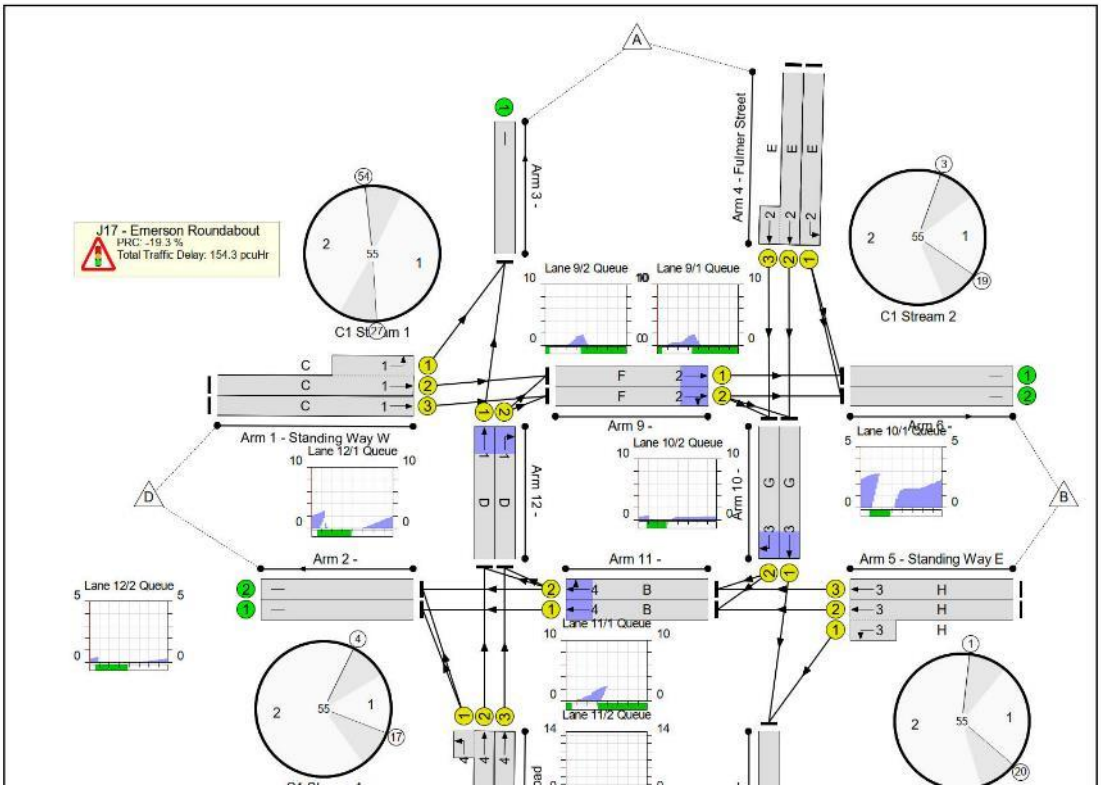
Stage	1	2
Duration	14	31
Change Point	1	20

Stage Stream: 4

Stage	1	2
Duration	8	37
Change Point	4	17

Signal Timings Diagram




J17 - Emerson Roundabout
PRC: -19.3 %
Total Traffic Delay: 154.3 pcuHr
A
B
D
Arm 3 -
Arm 4 - Fulmer Street
C1 Stream 1
C1 Stream 2
Lane 9/2 Queue
Lane 9/1 Queue
Arm 1 - Standing Way W
Lane 12/1 Queue
Arm 12 -
Arm 9 -
Lane 10/2 Queue
Arm 10 -
Arm 6 -
Lane 10/1 Queue
Arm 2 -
Arm 11 -
Arm 5 - Standing Way E
Lane 12/2 Queue
Lane 11/1 Queue
Lane 11/2 Queue

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**107.4%**
J17 - Emerson Roundabout	-	-	**N/A**	-	-		-	-	-	-	-	-	**107.4%**
1/2+1/1	Standing Way W Left Ahead	U	1	N/A	C		1	22	-	913	1900:1900	739+146	103.2 : 103.2%
1/3	Standing Way W Ahead	U	1	N/A	C		1	22	-	833	1900	795	104.8%
2/1		U	N/A	N/A	-		-	-	-	1112	Inf	Inf	0.0%
2/2		U	N/A	N/A	-		-	-	-	966	Inf	Inf	0.0%
3/1		U	N/A	N/A	-		-	-	-	630	Inf	Inf	0.0%
4/1	Fulmer Street Left	U	2	N/A	E		1	11	-	170	1900	415	41.0%
4/2+4/3	Fulmer Street Ahead	U	2	N/A	E		1	11	-	548	1900:1900	350+178	103.8 : 103.8%
5/2+5/1	Standing Way E Left Ahead	U	3	N/A	H		1	31	-	1142	1900:1900	940+221	98.4 : 98.4%
5/3	Standing Way E Ahead	U	3	N/A	H		1	31	-	1094	1900	1105	99.0%
6/1		U	N/A	N/A	-		-	-	-	962	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	934	Inf	Inf	0.0%
7/2+7/1	Shenley Road Left Ahead	U	4	N/A	A		1	8	-	370	1900:1900	263+82	107.4 : 107.4%
7/3	Shenley Road Ahead	U	4	N/A	A		1	8	-	198	1900	311	63.7%
8/1		U	N/A	N/A	-		-	-	-	664	Inf	Inf	0.0%
9/1	Ahead	U	2	N/A	F		1	34	-	877	1900	1209	70.6%
9/2	Ahead Right	U	2	N/A	F		1	34	-	946	1900	1209	75.1%
10/1	Ahead	U	3	N/A	G		1	14	-	447	1900	518	83.0%
10/2	Right	U	3	N/A	G		1	14	-	198	1900	518	36.8%
11/1	Ahead	U	4	N/A	B		1	37	-	1068	1900	1313	81.0%
11/2	Ahead Right	U	4	N/A	B		1	37	-	1149	1900	1313	87.4%

12/1	Ahead	U	1	N/A	D		1	23	-	479	1900	829	55.4%
12/2	Right	U	1	N/A	D		1	23	-	228	1900	829	27.5%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	**0**	**0**	**0**	**28.6**	**125.7**	**0.0**	**154.3**	-	-	-	-
J17 - Emerson Roundabout	-	-	**0**	**0**	**0**	**28.6**	**125.7**	**0.0**	**154.3**	-	-	-	-
1/2+1/1	913	885	-	-	-	4.3	23.6	-	28.0	110.2	13.0	23.6	36.6
1/3	833	795	-	-	-	5.0	27.0	-	31.9	138.0	13.4	27.0	40.4
2/1	1104	1104	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	961	961	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	606	606	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1	170	170	-	-	-	0.9	0.3	-	1.2	25.8	2.2	0.3	2.6
4/2+4/3	548	528	-	-	-	3.7	17.7	-	21.4	140.7	7.4	17.7	25.1
5/2+5/1	1142	1142	-	-	-	3.3	12.8	-	16.2	51.0	16.0	12.8	28.8
5/3	1094	1094	-	-	-	3.4	13.9	-	17.4	57.1	16.4	13.9	30.3
6/1	939	939	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	900	900	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2+7/1	370	344	-	-	-	3.0	17.9	-	20.9	203.5	5.5	17.9	23.4
7/3	198	198	-	-	-	1.2	0.9	-	2.0	37.2	2.8	0.9	3.7
8/1	647	647	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	854	854	-	-	-	0.3	1.2	-	1.5	6.4	1.8	1.2	2.9
9/2	908	908	-	-	-	0.3	1.5	-	1.7	6.9	1.7	1.5	3.2
10/1	430	430	-	-	-	1.4	2.3	-	3.8	31.4	2.8	2.3	5.1
10/2	191	191	-	-	-	0.4	0.3	-	0.7	13.5	0.7	0.3	1.0
11/1	1063	1063	-	-	-	0.4	2.1	-	2.5	8.4	2.4	2.1	4.5
11/2	1147	1147	-	-	-	0.1	3.3	-	3.5	10.9	0.8	3.3	4.2
12/1	460	460	-	-	-	0.7	0.6	-	1.3	10.6	2.8	0.6	3.4
12/2	228	228	-	-	-	0.1	0.2	-	0.3	4.6	0.4	0.2	0.6

C1	Stream: 1 PRC for Signalled Lanes (%):	-16.5	Total Delay for Signalled Lanes (pcuHr):	61.54	Cycle Time (s):	55
C1	Stream: 2 PRC for Signalled Lanes (%):	-15.3	Total Delay for Signalled Lanes (pcuHr):	25.90	Cycle Time (s):	55
C1	Stream: 3 PRC for Signalled Lanes (%):	-10.0	Total Delay for Signalled Lanes (pcuHr):	38.01	Cycle Time (s):	55
C1	Stream: 4 PRC for Signalled Lanes (%):	-19.3	Total Delay for Signalled Lanes (pcuHr):	28.91	Cycle Time (s):	55
	PRC Over All Lanes (%):	-19.3	Total Delay Over All Lanes(pcuHr):	154.35		

Appendix J – BC email dated 27th January 2020 regarding planned road works in the BC area

Bedingfeld, James

From: James Bedingfeld <james.bedingfeld@buckinghamshire.gov.uk>
Sent: 10 September 2020 10:25
To: Bedingfeld, James
Subject: FW: [EXTERNAL] SWMK: Transport Scope

James Bedingfeld

Senior Consultant
Highways Development Management

Tel: 01296 383121
E-mail: James.Bedingfeld@buckinghamshire.gov.uk

Buckinghamshire County Council, County Hall, Walton Street, Aylesbury, HP20 1UY

From: Bedingfield, James
Sent: 27 January 2020 09:15
To: Sherlock, Justin
Subject: RE: [EXTERNAL] SWMK: Transport Scope

Hi Justin,

Following on from the phone call on Friday I have the following updates on the associated roadworks:

- A road closure is in force from 14th January 2019 – 31st March 2020 on Coddimoor Lane Leading into Waddon:
  - There is a Permit logged for the dates of 24th January – 31st January under Multiway lights so the road closure may not be needed. Still awaiting confirmation, will let you know when more information is known.
- Multi-way lights are proposed on 3rd February – 14th February for Anglian Water on the A421
  - These lights aren't 24 hour lights. Their permit state the working times of 07.00 0 19.00.'TM to be manned and manually controlled 0700 - 0900 and 1600 – 1900'.

So it looks like the Coddimor Lane closure may now no longer be an issues, but the multi-way lights through the same time period will be in operation during the peak hours.

Thanks

James

James Bedingfeld

Senior Consultant
Highways Development Management

Tel: 01296 383121
E-mail: c-jbedingfield@buckscc.gov.uk
Buckinghamshire County Council, County Hall, Walton Street, Aylesbury, HP20 1UY

From: Sherlock, Justin [mailto:Justin.Sherlock@wsp.com]
Sent: 24 January 2020 08:52
To: Bedingfield, James
Subject: RE: [EXTERNAL] SWMK: Transport Scope

James

I will give you a call then.

Thanks

Justin

From: Bedingfield, James <c-jbedingfield@buckscc.gov.uk>
Sent: 24 January 2020 08:20
To: Sherlock, Justin <Justin.Sherlock@wsp.com>
Subject: RE: [EXTERNAL] SWMK: Transport Scope

Hi Justin,

Sorry I missed your call, yesterday was very much a bouncing between meetings afternoon.

I am around this morning at 10:00 if that is ok for you?

Thanks

James

James Bedingfeld

Senior Consultant
Highways Development Management

Tel: 01296 383121
E-mail: c-jbedingfield@buckscc.gov.uk
Buckinghamshire County Council, County Hall, Walton Street, Aylesbury, HP20 1UY

From: Sherlock, Justin [mailto:Justin.Sherlock@wsp.com]
Sent: 23 January 2020 15:22
To: Bedingfield, James
Subject: [EXTERNAL] SWMK: Transport Scope

James

I tried to call this afternoon to discuss the scope of transport work for South West Milton Keynes. When you are available it would be good to have a discussion regarding:

- Our programme and upcoming roadworks
- The requirement for coding of junction movements by lane and where this is necessary · The methodology for calibration of the junction models

Justin

Justin Sherlock ***BA(Hons) CTPP MCIHT***
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Director

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