Appendix 3 Transport Assessment Addendum (September 2021)

BERKELEY ST JAMES

MILTON KEYNES EAST

Transport Assessment Addendum

TAA
SEPTEMBER 2021

PUBLIC

BERKELEY ST JAMES

MILTON KEYNES EAST

Transport Assessment Addendum

TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70057521

OUR REF. NO. TAA

DATE: SEPTEMBER 2021

WSP

Mountbatten House
Basing View
Basingstoke, Hampshire
RG21 4HJ

Phone: +44 1256 318 800

Fax: +44 1256 318 700

WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Issue			
Date	September 2021			
Prepared by	A Smith			
Signature				
Checked by	A Smith / L Bluh			
Signature				
Authorised by	A Norcutt			
Signature				
Project number	70057521			
Report number				
File reference	\\uk.wspgroup.com\central data\Projects\700575xx\70057521 - MKE - PLANNING APPLICATION\03 WIP\TP Transport Planning\03 Document\2021 TONGWELL ST APPLICATION\20210906_MKE_TAA _Issue.docx			

CONTENTS

TABLES

FIGURES

APPENDICES

APPENDIX B

UPDATED TONGWELL ST SOUTHBOUND AND CARLETON GATE PROPOSALS

APPENDIX C

TAA - UPDATED JUNCTION ASSESSMENT OUTPUTS (JUNCTIONS9 AND LINSIG)

1 INTRODUCTION

1.1 PREAMBLE & BACKGROUND

1.1.1. WSP has been appointed by Berkeley St James to provide transportation and highways advice in respect of the proposed development of land to the northeast of Milton Keynes ('Milton Keynes East' or 'MKE').

1.1.1. A planning application was submitted in March 2021. As part of the suite of information, an Environmental Statement, including a Transport Chapter accompanied the application. A Transport Assessment (TA) formed part of the appendices to that Transport ES Chapter. A minor amendment, resulting in a partial EIA addendum (only selected chapters, with no related transport matters) was also completed in July 2021 however this did not change any proposed infrastructure etc.

1.1.2. As part of the ongoing consultation processed, comments have been received from MKC officers on the supporting TA and associated reports. WSP and the planning team have compiled a response to those comments which has been issued as a separate cover.

1.2 CHANGES TO THE APPLICATION AND PURPOSE OF THIS REPORT

1.2.1. Berkeley St James are continuing to discuss the MKE application with the Council and stakeholders. As a response to those discussions and consultation with residents, Berkeley St James is looking to make a further update and amendment to the MKE application.

1.2.2. Further to this, and in particular following recent discussions with Willen residents and neighbourhood forums, Berkeley St James are seeking to alter the highway arrangements in the area south of the new M1 bridge crossing. The other elements of the proposals remain as per the previous application, as such, the area of focus is on the implications of the highway changes on Tongwell Street and Carleton Gate, which are directly influenced by the altered proposals. Section 2 of this TAA provides a detailed explanation of the proposed changes in the Willen area; no other changes are proposed.

1.3 SCOPING DISCUSSIONS

1.3.1. A TAA Scoping Report (TAASR - attached at Appendix A) was produced and issued to Highways Officers at MKC on 10 August 2021. The Scoping Report was subsequently discussed at a meeting between WSP and MKC Highways Officers (Martin Tate and Nigel Weeks) on the 18 August 2021.

1.3.2. The scope detailed within the Report was agreed in full by all parties, and also confirmed in writing by Martin Tate as per the email correspondence attached at Appendix A.

1.4 REPORT STRUCTURE

1.4.1. This Transport Assessment Addendum (TAA) sets out the appropriate assessment for the updated proposals related to the Berkeley application.

1.4.2. This TAA report is presented in the following chapters:

- Section 2 provides an overview of the updates to the development proposals and infrastructure;
- Section 3 details the modelling approach undertaken;
- Section 4 considers the development impact; and details any changes to the mitigation strategy;
- Section 5 provides a summary and conclusions.

2 PROPOSALS AND UPDATES

2.1 UPDATED DEVELOPMENT PROPOSALS - INTRODUCTION

2.1.1. Following post application consultation events, the Berkeley St James team took on board suggestions in the Willen area. The consultation identified that local residents wanted to limit vehicular access or remove it altogether at the Carleton Gate / Tongwell Street junction.

2.1.2. Further to this, there was an opportunity to review the arrangement for the Tongwell Street southbound link, which is discussed further below.

2.1.3. It should be noted that there is no intention to change or alter the development quantum or land uses assessed as part of the March 2021 TA. It is therefore considered that the vast majority of the material supporting the application remains valid and appropriate for consideration.

2.1.4. The changes relate purely to highway and non-motorised user (NMU) connections and infrastructure amendments on the Tongwell Street corridor near to the new M1 Bridge and adjacent to the Carleton Gate junction.

2.1.5. A summary of the updates are shown in Table 2-1 below, with further information below.

Table 2-1 – Revised application vs March 2021 submission

Element	Changes as a result of revised application	Implications
Development Quantum	No change	None
New M1 Bridge crossing location / design	No change*	None
HIF Infrastructure	No change	None
Carleton Gate / Tongwell St and access near to M1 bridge	Original TA had a full movement access junction. Revised application seeks to close Carleton Gate / Tongwell Street junction to vehicular traffic.	Change in flows – to be assessed in TAA.
Tongwell Street near to M1 Bridge	Original TA - Northern section of Tongwell Street was limited to Northbound only. Revised application - will allow both northbound and southbound movements.	Change in flows – to be assessed in TAA.
Offsite junction mitigation	No expected changes to suggested mitigation strategies set out in Original TA.	Certain junctions to be reviewed in TAA

**No change to Bridge design, but some alterations to NMU and Redway provision and tie ins as shown in WSP Drawing MKE-WSP-ZZ-ZZ-C-SK-0125.*

2.2 HIGHWAY DESIGN UPDATES

CARLETON GATE

2.2.1. Currently, Carleton Gate forms an all movement priority junction with Tongwell Street. This was assessed in the March 2021 TA under existing conditions and future scenarios.

2.2.2. As part of the proposed housing infrastructure fund (HIF) highway elements, Tongwell Street is being upgraded to dual carriageway. Further to this, a new M1 bridge crossing is being

implemented. The March 2021 TA set out the design options considered for the arrangement of Carleton Gate and Tongwell Street under the future scenarios. Due to safety implications and constrained junction options with the new M1 bridge link, it was agreed that the southbound section of the northern link of Tongwell Street would be closed to vehicular traffic.

2.2.3. The arrangement was tested in the March 2021 TA and it was concluded that a new roundabout, replacing the existing priority junction would be required at Carleton Gate; and an appropriate design was assessed and included as part of the infrastructure package.

2.2.4. As part of this revised application, the main proposed amendment is made to the detailed element of the application on Tongwell Street. The revised application seeks to remove the proposed Carleton Gate roundabout (and remove vehicular access to Willen in this location) and to maintain north and southbound lanes along Tongwell Street.

2.2.5. WSP Drawing MKE-WSP-ZZ-ZZ-C-SK-0125 details the proposed amendments to the Tongwell Street Northbound and Southbound links. This drawing is included within Appendix B.

2.2.6. As shown on the drawing, Carleton Gate will be closed off to traffic with a Redway connection provided at its eastern end connecting in with the Redway along the western side of Tongwell Street. This redway connection through to Carleton Gate could also double up as an emergency vehicle access point. A TRO will be required on Carleton Gate preventing vehicular access to Tongwell Street.

2.2.7. It is considered that the removal of the Carleton Gate junction to vehicular will not have a material effect on traffic movements in the locality. The Willen Estate benefits from multiple existing access points on Brickhill Street and Dansteed Way. However, as agreed in the TAASR, an assessment of the implications of this closure has been included in this TAA.

TONGWELL STREET SOUTHBOUND

2.2.8. The March 2021 TA set out that the northern section of Tongwell Street would be northbound only, as the nature of tying in the southbound link to the new M1 bridge link resulted in an unsafe junction arrangement.

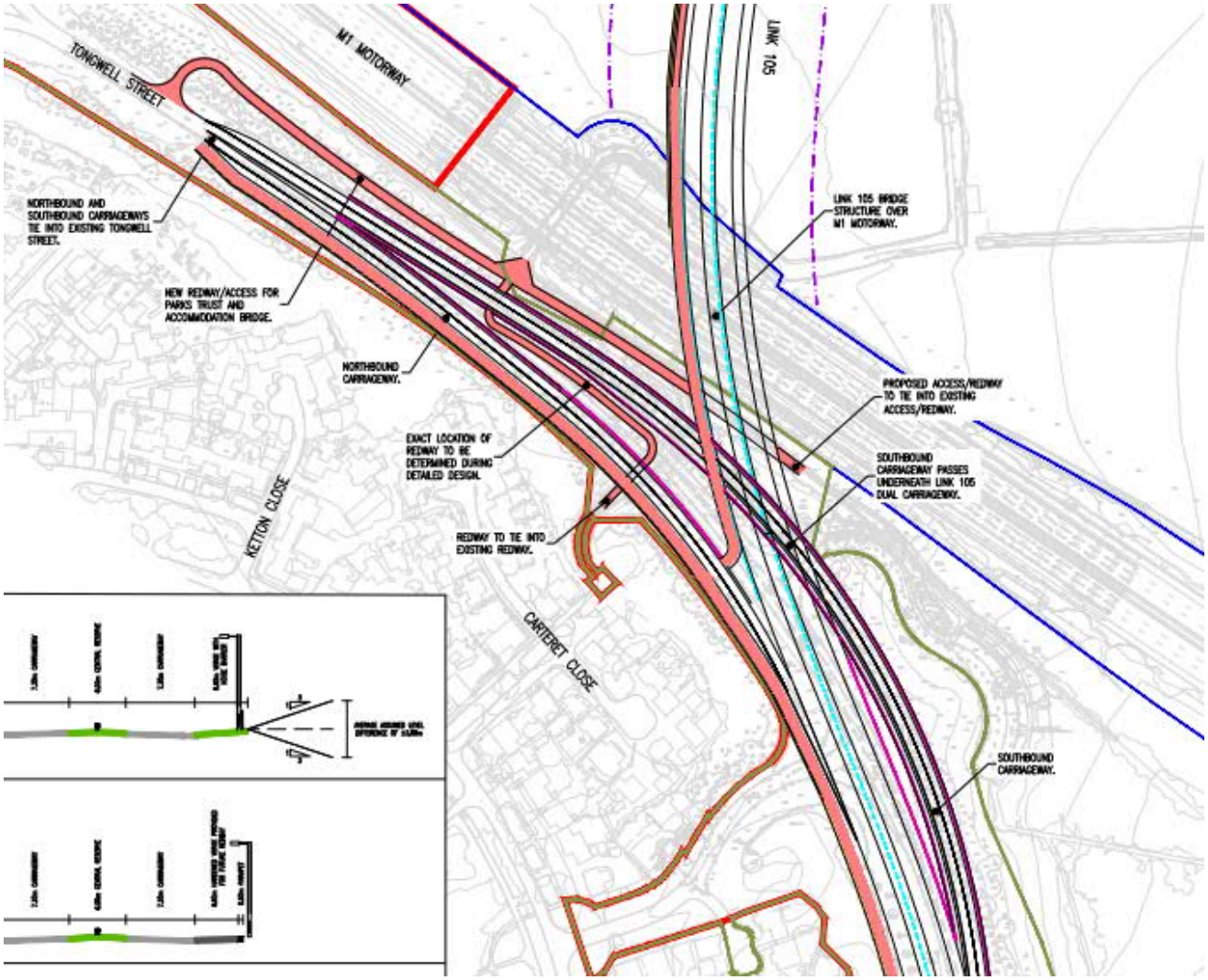
2.2.9. A review of the infrastructure levels has identified an opportunity to re-route the southbound carriageway underneath Link 105 – the new M1 Bridge link.

2.2.10. As shown on the WSP Drawing MKE-WSP-ZZ-ZZ-C-SK-0125, the proposed changes to the Tongwell Street links will result in a different configuration to the existing southbound lane, with the proposals showing the southbound link coming under the new M1 bridge (the design of which remains unchanged) and tying into Tongwell Street further south.

2.2.11. As such, the proposals allow for the continued use of Tongwell Street in both directions. The junction arrangements result in tapered diverges (northbound) and merges (southbound) – negating the need for any independent junction (such as a roundabout).

2.2.12. A snapshot of the drawing is shown in Figure 2-1 below.

Figure 2-1 - Snapshot of WSP Drawing MKE-WSP-ZZ-ZZ-C-SK-0125



SPEED LIMITS

2.2.13. As part of the proposals the northbound and southbound carriageways of Tongwell Street north will be subject to a 40mph speed limit, a reduction from the current national speed limit.

2.2.14. Continuing further south, Tongwell Street (from Pineham Roundabout and up to the new M1 bridge) will be subject to a 50mph speed limit as will all of the new proposed strategic infrastructure across the MKE site including the new M1 bridge, the floodplain link, A509 between the floodplain link and Tickford Roundabout and the Eastern Perimeter Road;

2.2.15. It is envisaged that the Willen link which runs between Willen Road and the new M1 bridge / floodplain link will also be subject to a 30mph speed limit.

2.2.16. Further to the east of MKE, the Cranfield Link which connects the Eastern Perimeter Road (EPR) with Newport Road and eastwards to serve the employment and residential parcels in the south-east of the site will be subject to a 50mph speed limit.

2.3 EXISTING SUBWAYS, NMU CHANGES AND REDWAYS

2.3.1. The existing subway on Tongwell Street which connects the redway link from Carteret Close with the Parkland on the northern side of Tongwell Street is to be closed and stopped up under s247 of the Town and Country Planning Act (TCPA) 1990.

2.3.2. Similarly, the footpath from that subway to the accommodation bridge will be removed as will part of the footpath into the parkland which leads to that subway. In lieu of this, a new subway is to be provided within the vicinity of the closed Carleton Gate which will provide connectivity between the Willen Estate, the redway running along the western side of Tongwell Street and the existing network of paths in the parkland north of Tongwell Street.

2.3.3. A new redway is proposed to run along the northern side of Tongwell Street between Tongwell Roundabout and to a point just east of the new M1 bridge where the redway will pass beneath the M1 bridge via a new subway structure. From here the redway will tie into the existing parkland paths which in turn provide connectivity to the new subway in the vicinity of Carleton Gate thereby providing connectivity back to the continuous redway which runs along the western side of Tongwell Street between the existing redway link from Carteret Close and Pineham Roundabout as well as to the Willen estate. This redway will also tie into the accommodation bridge providing onward foot and cycle connections into MKE.

2.3.4. A vehicle crossover will be provided on to the new redway running along the northern side of Tongwell Street at a point approximately midway between Tongwell Roundabout and the Accommodation Bridge. This is such that Parks Trust maintenance vehicles can access the existing parkland area north of Tongwell Street. Parts Trust maintenance vehicles, which are very infrequent, will therefore drive on this redway and run beneath the new M1 bridge via the new redway subway which will have adequate height to accommodate the 4.3m high Parks Trust maintenance vehicles requiring access. Beyond the subway the Parks Trust maintenance vehicles will be able to drive on to and use the footpath network within the parkland to gain access to areas requiring maintenance as they presently do.

3 TAA – TRAFFIC MODELLING APPROACH

3.1 DEVELOPMENT IMPACT ASSESSMENT METHODOLOGY

3.1.1. It was previously agreed with both MKC and Highways England that the use of a Strategic Transport model, combined with more detailed analysis tools, would be utilised in the assessment of the scheme. As such, the Milton Keynes Multi-Modal Model (MKMMM) was previously used with updated information as the basis for the assessment of the scheme. The MKMMM is held by MKC and managed by AECOM (MKC's consultants) on MKC's behalf.

3.1.2. As part of recent post submission work, WSP has recently, via AECOM (as custodians of the model), modelled a series of network tests that include a southbound Tongwell Street connection and a limited turn junction at Carleton Gate (left in only).

3.1.3. Whilst it was acknowledged that this was not an exact representation of the proposed alterations to Tongwell Street and Carleton Gate, through scoping discussions it was agreed that it was unnecessary to re-run the MKMMM as the changes in flow resulting from the changes are unlikely to warrant a material difference in highway operation.

3.1.4. As such, it was agreed that a viable test to the potential proposals comes from an option of the Tongwell Street southbound modelling assessment already undertaken, which is set out as follows;

- Tongwell Street Southbound Option:
  - Includes the Tongwell St southbound link being coded into Tongwell Street (south of Carleton Gate)
  - The Carleton Gate junction is coded as a left in only

3.1.5. To reflect the proposed vehicular closure of Carleton Gate – manual adjustments have been applied, which are discussed further below.

3.1.6. This assessment has been run within the 2048 Do Something AM and PM models and therefore provides a useful tool in understanding the potential implications of the updated proposals.

SCENARIOS TO BE ASSSESSED

3.1.7. The scenarios to be included in the TAA therefore are as follows;

- **2048 Future year reference case - without Development**
  - Future year test to represent full build out of the development;
  - Built upon the 2031 reference case with additional growth and committed developments up to 2048 applied
  - This includes, where possible[1], strategic sites relevant from other boroughs
- **2048 Future year with Development – w/ alternative Tongwell St Southbound Option**
  - The above scenario, with the full built out development
  - Including Tongwell St Southbound link

[1] The MKMMM is limited to what sites can be explicitly modelled outside of a core modelled area, however a separate TTN (TTN4) on the 2048 growth was issued and agreed with MKC and Highways England. TTN4 is found within Appendix A of the March 2021 TA.

Amendments to Assignment

3.1.8. The post submission modelling has utilised the MKMMM and so picks up re-assignment and changes in travel patterns with the inclusion of a southbound Tongwell Street link.

3.1.9. The ability to access Carleton Gate is likely to have some influence on vehicle assignment and use of Tongwell Street.

3.1.10. It is considered fair to assume that any vehicles travelling Southbound across the new M1 bridge are unlikely to travel along Tongwell Street, perform a U-turn at Pineham Roundabout before accessing the left turn at Carleton Gate. Therefore, no changes to Southbound traffic from the M1 Bridge or Tongwell Street southbound are considered likely.

3.1.11. The northbound direction is likely to represent travel to one of the access point where residents can return to the Willen Estate. As there is no a connection between Carleton Gate through Willen to Dansteed Way within the model, through routing is not considered an issue. If Carleton Gate were to be closed, it is likely that the other zone connectors / accesses[2] would simply see a small increase in movements balanced between them.

3.1.12. In the proposed scenario, no vehicular movements will be possible. As such, in terms of assessing the impacts for this TAA, an assumption is required on where the turning vehicles continue.

3.1.13. As agreed with MKC, for robustness, it was assumed that all of the vehicles turning left at Carleton Gate (under the post submission MKMMM outputs) continue Northbound and then turn left at the Tongwell Roundabout. This would represent the next available route to the access to the Willen Estate.

3.1.14. In reality, vehicles will dissipate and use multiple routes to the various accesses to the residential estate, resulting in less impact overall on the highway network. As such, assuming all vehicles then use the northern section of Tongwell Street represents a robust scenario.

3.1.15. WSP has previously discussed with MKC officers that the junction arrangement at Carleton Gate is not considered to have a material impact of flows at the wider junctions and changes are limited to the immediate local area.

3.1.16. It is considered that the proposed changes set out above would not result in significant differences in the wider highway network but could cause changes on the Tongwell Street corridor. Therefore, the assessment strategy has reviewed the potential changes at nearby junctions. This compares the impacts of the scheme against the Do Minimum (without the development) as well as reviewing what was previously suggested / set out in the Original TA.

[2] Excluding Carleton Gate, the Willen Estate benefits from six vehicular accesses to the wider area from Brickhill Street and Dansteed Way, including an access via Willen Park Ave / Beaufort Dr and multiple NMU access points

ASSESSMENT SUMMARY

3.1.17. Based on the modelling approach outlined above, the agreed assessment strategy adopts the following process:

- Use of MKMMM post submission test, which includes a Tongwell St southbound link;
- Manual re-assignment of left turn only Carleton Gate flows onto the northbound flows and then onto the left turn movement at Tongwell Roundabout (to represent the closure of Carleton Gate).
- Independent junction testing, using industry-standard software at the following link / junction locations:
  - Carleton Gate / Tongwell Street;
  - Tongwell Roundabout;
  - Pineham Roundabout;
  - Tongwell Street corridor (link flow changes)
- Review of junction assessments and review of mitigation strategies (where previously set out in the original TA.
- Updated mitigation strategies (if required).

3.1.18. The review of the link flows has also been considered within a Transport chapter contained in the EIA addendum and should be read in conjunction within this TAA.

4 DEVELOPMENT IMPACT ASSESSMENT

4.1 INTRODUCTION

4.1.1. The MKMMM outputs have been utilised, with appropriate adjustments as set out in Chapter 3 above. As agreed in the Scoping note, a review of certain junctions and the Tongwell Street corridor has been undertaken.

4.1.2. The original TA proposed a mitigation strategy at Pineham Roundabout, which included the introduction of a comprehensive signalisation scheme. It is considered likely that this mitigation would remain appropriate under this infrastructure change, and this has been checked below. The original TA suggested that no mitigation was required at Tongwell Roundabout due to the changes in vehicular flows, which has also been re-run with the new flow groups.

4.2 FLOW CHANGES AND COMMENTARY ON MODELLING OUTPUTS

TONGWELL STREET (at CARLETON GATE) – Link Flows

4.2.1. A review of the turning outputs at the Tongwell Street / Carleton Gate for the AM and PM peaks has been undertaken to understand the link flow changes in this location.

4.2.2. Table 4-1 provides the two way link flows for Tongwell Street and Carleton Gate – both for the modelling contained in the original TA, as well as the updated modelling (including reassignment) undertaken for the revised application.

Table 4-1 Tongwell Street Link Flows – at Carleton Gate – Original TA and Updated modelling

Two way Link Flows (PCU)	ORIGINAL TA (MARCH 2021)								**UPDATED PROPOSALS**	
	2031 DO MINIMUM		2031 DO SOMETHING		2048 DO MINIMUM		2048 DO SOMETHING		**2048 DO SOMETHING***	
	AM	PM	AM	PM	AM	PM	AM	PM	**AM**	**PM**
Tongwell Street N	1824	1724	2267	2369	2690	2676	3299	3036	**2858**	**2541**
Carleton Gate	298	247	363	257	428	616	641	486	**0**	**0**
Tongwell Street S	2123	1972	2417	2487	3052	2816	3193	3026	**2858**	**2541**

**Includes manual re-assignment of Carleton Gate flows*

4.2.3. Within the original TA outputs, due to the closure of Tongwell Street southbound, it was evident that a proportion of traffic utilising the new M1 bridge had re-routed from nearby links to continue travelling southbound.

4.2.4. With the re-introduction of the Tongwell Street Southbound link (which ties in further south of the Carleton Gate junction) – this allows that route to be used and localised traffic patterns have adjusted accordingly. Essentially resulting in a reduction in movements on the M1 new Bridge (that were re-routing from Willen Road) and placing them onto Tongwell Street via Tongwell Roundabout.

4.2.5. As shown in Table 4-1, the MKMMM model suggests that the revised flows along Tongwell Street, with the full development in place would result in a small reduction compared to that that observed in the original TA in the 2048 Do Something.

4.2.6. It is important to note that the Tongwell Street southbound link ties into Tongwell Street further south and as such has separated the traffic in this location – which accounts for a proportion of the observed reduction in flows when comparing the updated proposals versus the Original TA.

4.3 JUNCTION ASSESSMENTS

TONGWELL STREET / CARLETON GATE

ORIGINAL TA OUTPUTS

4.3.1. The existing Carleton Gate/Tongwell priority-controlled T-junction was assessed for both 2031 and 2048 Do Minimum and Do Something scenarios in the March 2021 TA. The results of the AM and PM peak hour assessments were summarised in Table 9-11 of that document.

4.3.2. The modelling suggested that the existing priority junction operates close to its capacity threshold in the 2031 Do Minimum in the AM peak, with the PM peak operating satisfactorily. In the 2031 Do Something scenario, the junction was considered to be over capacity with high RFCs and corresponding high queues recorded in the AM peak. In the PM peak, the RFCs became unstable, suggesting that the junction is beyond a calculable capacity at this point.

4.3.3. Within the original TA, in the 2048 Do Minimum and Do Something results, the priority junction is unable to accommodate the future year demand with or without the introduction of the development.

4.3.4. As set out, the previous proposals indicated that this junction was to be upgraded to a roundabout as part of the works associated with the new M1 bridge and Tongwell Street dualling section.

4.3.5. Due to the closure of Carleton Gate as set out in these proposals, this junction is no longer required. As such, no further assessments have been undertaken.

TONGWELL ROUNDABOUT

ORIGINAL TA OUTPUTS

4.3.6. Tongwell Roundabout was assessed for both 2031 and 2048 Do Minimum and Do Something scenarios. The results of the AM and PM peak hour assessments are summarised in Table 4-2 below.

Table 4-2 – Tongwell Roundabout – AM / PM Peak Hour (Original TA)

Arm	2031: Do Minimum		2048: Do Minimum		2031: Do Something		2048: Do Something	
	RFC	Max Q	RFC	Max Q	RFC	Max Q	RFC	Max Q
AM Peak								
A - Willen Rd	0.87	7	0.86	6	0.44	1	0.33	1
B - Tongwell St	0.71	3	0.83	5	0.51	1	0.62	2
C - Dansteed Way	0.33	1	0.76	3	0.07	0	0.09	0
D - Michigan Dr	0.10	0	0.23	0	0.04	0	0.07	0
PM Peak								
A - Willen Rd	0.44	1	0.63	2	0.07	0	0.14	0
B - Tongwell St	0.38	1	0.82	5	0.04	0	0.01	0
C - Dansteed Way	0.66	2	0.63	2	0.16	0	0.12	0
D - Michigan Dr	0.34	1	0.07	0	0.08	0	0.15	0

Source: Junctions 9 results

4.3.7. Under the 2031 Do Minimum scenario, the junction is forecast to perform within its capacity. In the AM, Willen Road is shown to experience the highest RFC of 0.87, but with relatively low queues.

4.3.8. As the original TA set out previously that the Tongwell Street arm was to become one way (northbound only) it was evident that the introduction of the development combined with the re-routing of traffic and the alterations to the Tongwell Street corridor results in lower demand at the junction.

4.3.9. The original TA concluded that due to the improvements in operation at the junction, no further assessments of the Tongwell Roundabout was required.

UPDATED TAA OUTPUTS

4.3.10. Following the additional MKMMM runs, Tongwell Roundabout was assessed for 2048 Do Something scenarios. The results of the AM and PM peak hour assessments are summarised in Table 4-3 below.

4.3.11. The updated Junction9 files are attached to this TAA within Appendix C.

Table 4-3 – Tongwell Roundabout – AM / PM Peak Hour – TAA updated Scenario

Arm	2048: Do Minimum		2048: Do Something - ALT	
	RFC	MAX Q	RFC	MAX Q
AM Peak				
A - Willen Rd	0.86	6	0.60	2
B - Tongwell St	0.83	5	0.93	11
C - Dansteed Way	0.76	3	0.56	1
D - Michigan Dr	0.23	0	0.14	0
PM Peak				
A - Willen Rd	0.63	2	0.26	0
B - Tongwell St	0.82	5	0.15	0
C - Dansteed Way	0.63	2	0.46	1
D - Michigan Dr	0.07	0	0.34	1

Source: Junctions 9 results

4.3.12. The updated results indicate that the Tongwell Roundabout would still operate within capacity under the 2048 Do Something scenario. The AM peak is observed to result in a slight worsening (compared to the 2048 Do Min) on the Tongwell Street arm.

4.3.13. Preliminary discussions with MKC Officers regarding the results of the assessments have outlined that they consider that as the junction is assessed in 2048, that the increase in RFC and queues is acceptable in principle without the need for mitigation.

4.3.14. As observed in the PM results, the junction is forecast to operate with reduced RFCs compared to the Do Minimum, indicating that on balance the development has a negligible impact on junction operation. As such, no further mitigation is considered necessary at this location.

E10 - PINEHAM ROUNDABOUT

ORIGINAL TA OUTPUTS

4.3.15. As set out in Section 9 of the original TA, Pineham Roundabout was assessed for both 2031 and 2048 Do Minimum and Do Something scenarios. The results of the AM and PM peak hour assessments are summarised in Table 4-4 below. Through discussions with MKC and Ringway, it was confirmed that the part-time signals at the junction were not operational and had not been operational for some time. As such, the junction was assessed using the standard roundabout software, Junctions9.

Table 4-4 – Pineham Roundabout – AM / PM Peak Hour

Arm	2031 Do Minimum		2048 Do Minimum		2031 Do Something		2048 Do Something	
	RFC	MAX Q	RFC	MAX Q	RFC	MAX Q	RFC	MAX Q
AM Peak								
A – Tongwell St (N)	0.49	1	0.84	5	0.64	2	1.00	32
B - A509 Portway (E)	0.85	6	1.03	53	0.87	7	1.08	99
C - Tongwell St (S)	0.76	3	0.84	5	0.81	4	0.84	5
D – A509 Portway (W)	0.57	1	0.37	1	0.68	2	0.67	2
PM Peak								
A – Tongwell St (N)	0.83	5	1.02	34	0.90	8	1.01	32
B - A509 Portway (E)	0.50	1	0.57	1	0.55	1	0.60	2
C - Tongwell St (S)	0.77	3	1.02	39	0.92	10	1.09	82
D – A509 Portway (W)	0.79	4	0.98	20	1.06	69	0.96	16

Source: Junctions 9 results

4.3.16. Pineham Roundabout forms a key junction for the MKE site, as it is located at the southern end of the proposed upgrades to the Tongwell Street corridor and provides a link with the new M1 bridge. As such, a mitigation scheme was considered.

MITIGATION – ORIGINAL TA

4.3.17. As set out in the original TA - given that the existing layout already comprises three-lane entries at all arms, with minimal opportunities to adjust the layout to increase the capacity, and there are constraints in the form of bridge structures to the south and west of the junction, it was deemed appropriate to re-introduce the existing signals and introduce new full-time traffic signals on the remaining arms/circulatory carriageway, except for the southern arm that would remain priority-controlled.

4.3.18. In association with introducing the signals, changes to circulatory carriageway lane markings and northern arm exist are also proposed. The existing two-lane eastern arm exit is proposed to be widened to three lanes tapering down to two lanes further downstream. The proposed mitigation strategy was shown on WSP Drawing 70057521-SK-005-A.

4.3.19. The mitigation was shown to have some benefits and was considered appropriate to allow MKC the flexibility to control junction operation in the future. It was acknowledged that that there is significant uncertainty about the traffic conditions in such a distant future (i.e. in 2048) and that further mitigation may be considered as part of the wider MKC's strategies forming the future Local Plans.

UPDATED TAA OUTPUTS

4.3.20. Using the revised MKMMM flows reflecting the proposed changes at Tongwell Street / Carleton Gate. Pineham Roundabout junction has been re-assessed for the 2048 Do Something AM and PM flows. Given the importance of Pineham Roundabout to MKE and the local area, it is evident that the proposed mitigation, as set out in the Original TA, would remain the preferred junction arrangement. As such, the mitigation proposals have been re-assessed using the new flows, and compared against the unmitigated (and unsignalised) outputs from 2048 Do Minimum, as shown in Table 4-5 below.

Table 4-5 - Pineham Roundabout (mitigation in Do Something scenario only) – TAA outputs

Arm	2048 Do Minimum	2048 Do Something - ALT	
	Max Q	DoS	MMQ
AM Peak			
V11 Tongwell Street (S) Left	5	68.9%	6
V11 Tongwell Street (S) Ahead		87.1%	7
H5 A509 Portway (W) Left/Ahead	1	75.5%	8
H5 A509 Portway (W) Ahead		87.1%	12
V11 Tongwell Street (N) Left/Ahead	5	86.0%	17
V11 Tongwell Street (N) Ahead		56.7%	7
A509 Portway (E) Left/Ahead	53	79.7%	16
A509 Portway (E) Ahead		87.7%	18
PM Peak			
V11 Tongwell Street (S) Left	39	72.6%	7
V11 Tongwell Street (S) Ahead		85.4%	11
H5 A509 Portway (W) Left/Ahead	20	86.1%	15
H5 A509 Portway (W) Ahead		74.6%	12
V11 Tongwell Street (N) Left/Ahead	34	82.1%	14
V11 Tongwell Street (N) Ahead		88.7%	17
A509 Portway (E) Left/Ahead	1	50.2%	7
A509 Portway (E) Ahead		57.8%	8

Source: Junctions 9/LinSig outputs

4.3.21. It should be noted that the full Do Minimum results are not provided in Table 4-5 above, as these (i.e. RFC per arm as calculated by Junctions 9) are not directly comparable to the results from the assessment of traffic signals using LinSig software (i.e. DoS per lane). Instead, the queues calculated by each assessment method are used to illustrate changes in maximum queues resulting from the proposed mitigation compared to the layout prior to mitigation (i.e. Max Q vs MMQ).

4.3.22. The updated results confirm that under the new modelling, the mitigation proposals would result in a benefit to junction operation in both AM and PM peaks. Whilst it is acknowledged that in the AM peak, small increases in queues are observed on V11 Tongwell Street, this is balanced by the significant reduction in forecast queues on the A509 East arm. As such, the junction is better balanced and efficient for all in the AM. In the PM peak, the mitigation results in reduced queues on the majority of approaches. Where queuing does increase, this is considered minimal and counterbalanced by the significant reductions on the other approaches.

4.3.23. The full Linsig outputs are attached to this report within Appendix C. It is therefore considered that the proposed mitigation remains appropriate for this revised application and scenario. It is considered that

the proposals adequately mitigate the MKE allocation impacts at this junction, and that further performance issues are caused primarily by background growth in the area.

4.4 SUMMARY

4.4.1. The revised modelling outputs, reflecting the proposed changes to Tongwell Street and Carleton Gate have been utilised in the junction assessments to ensure that development impacts are considered and mitigated, if required.

4.4.2. As the new proposals result in the closure of Carleton Gate junction to vehicular traffic, the previous design to introduce a new roundabout at this location is no longer required. As such, no further assessments of Carleton Gate / Tongwell Street are required or have been undertaken.

4.4.3. Given the closure to Carleton Gate, this will result in reassignment of traffic flows. This has been captured within the analysis and included in the assessments of Tongwell Roundabout. The results indicate that the junction is forecast to operate within theoretical capacity in 2048. As such, no mitigation is required at this junction.

4.4.4. Pineham Roundabout was also assessed under the revised modelling and proposals. It was evident that the mitigation scheme, previously set out in the original TA would be of benefit and would assist MKC with the flexible and efficient operation of the junction with the development in place in 2048. The junction, including mitigation, was re-run and found to provide betterment compared to the non-mitigated, without development future year flows. As such, the previously identified mitigation scheme remains appropriate.

5 SUMMARY AND CONCLUSIONS

5.1 SUMMARY

5.1.1. WSP has been appointed by Berkeley St James to provide transportation and highways advice in respect of the proposed MKE development of land located 3.5km to the northeast of Central Milton Keynes district, immediately adjacent to the northeast of J14 of the M1 motorway, which sets its southern boundary, the A422 and A509 delineating its western boundary, and open land of predominantly agricultural character that borders the site from the east.

5.2 DEVELOPMENT PROPOSALS

5.2.1. As set out in Chapter 2 of this TAA; following post application consultation events, the Berkeley St James team haven taken on board suggestions in the Willen area. The consultation identified that local residents wanted to limit vehicular access or remove it altogether at the Carleton Gate / Tongwell Street junction. Further to this, there was an opportunity to review the arrangement for the Tongwell Street southbound link.

5.2.2. As such, the revised proposals seek remove the Carleton Gate / Tongwell Street junction and include a realigned Tongwell Street Southbound link. This would allow continued two way directional movement of Tongwell Street, without constrained junctions tying in to the new M1 bridge.

5.2.3. In addition, alterations and improvements to the non-motorised user (NMU) provision in the area around the new M1 bridge and farm accommodation bridge will be included. These additions seek to improve connectivity from existing Redways and links to and from the site, helping to promote non-vehicular modes of travel and allow connections to leisure areas.

5.3 MODELLING METHODOLOGY

5.3.1. The assessment methodology applied uses an appropriate model scenario from the Milton Keynes Multi-Modal Model (MKMMM) outputs to reflect the proposed changes to the highway infrastructure. As such, the modelling used in the assessments accounts for trip diversion and re-assignment which could occur as a result of the proposals. Appropriate manual adjustments were included to ensure that a robust flow dataset was used in the process.

5.4 LOCAL JUNCTION AND MITIGATION STRATEGIES

5.4.1. As set out in the TAA Scoping Report, the following junctions were agreed and identified for assessment:

- Carleton Gate / Tongwell Street
- Tongwell Street Roundabout
- Pineham Roundabout

5.4.2. As the new proposals result in the closure of Carleton Gate junction to vehicular traffic, the previous design to introduce a new roundabout at this location is no longer required. As such, no further assessments of Carleton Gate / Tongwell Street are required or have been undertaken.

5.4.3. Given the closure to Carleton Gate, this will result in reassignment of traffic flows. This has been captured within the analysis and included in the assessments of Tongwell Roundabout. The results

indicate that the junction is forecast to operate within theoretical capacity in 2048. As such, no mitigation is required at this junction.

5.4.4. Pineham Roundabout was also assessed under the revised modelling and proposals. It was evident that the mitigation scheme, previously set out in the original TA would be of benefit and would assist MKC with the flexible and efficient operation of the junction with the development in place in 2048. The junction, including mitigation, was re-run and found to provide betterment compared to the non-mitigated, without development future year flows. As such, the previously identified mitigation scheme remains appropriate.

5.5 CONCLUSIONS

5.5.1. The changes included in this revised application are limited to the area around the Willen residential area, primarily adjacent to the new M1 bridge, Carleton Gate and the Tongwell Street corridor. No other material changes to the application are sought in the revised proposals, such as differences in development quantum, and as such, the vast majority of the previous assessments contained in the Original TA remain valid.

5.5.2. As agreed with MKC, due to the limited changes proposed, the scope of assessment for this TAA is appropriately focused on the Tongwell Street links and junctions at either end of the corridor, namely Tongwell Roundabout to the north and Pineham Roundabout to the south.

5.5.3. The assessment concludes that no mitigation is required at Tongwell Roundabout to cater for the development. The updated assessments set out that the previously identified mitigation at Pineham Roundabout remains appropriate to cater for the development impacts.

5.5.4. The other mitigation strategies, set out in the original TA remain appropriate to the developments impacts. Furthermore, the development continues to support the Transport Strategy, via delivery of a Residential Travel Plan (RTP), Workplace Travel Plan (WTP) and Public Transport Strategy (PTS) – which have been developed to outline measures to influence how and when people will travel to/from the MKE site. They also encompass strategies to monitor the site as it is built out to ensure that it is reactive to how travel patterns materialise over time and to any upcoming and emerging technology of travel trends such that funding collected from the MK Tariff for the site can then be directed appropriately. It can therefore be concluded that the development will remain flexible and able to respond to changes in travel trends and emerging technologies.

5.5.5. The changes to the proposals included in the revised application are limited to a small area and do not alter the over-arching benefits from MKE. As such, overall it is considered that MKE will continue to be highly accessible with the opportunities for many journeys to be made on foot, by cycle or public transport. Furthermore, all highway impacts associated with the new development can be mitigated accordingly through the introduction of new infrastructure, improvements to existing infrastructure (delivered through financial contributions via the MK Tariff) and management plans as appropriate.

5.5.6. Finally, in accordance with NPPF paragraph 111, which states that "*Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe*", it is considered that the revised application for the MKE development this TAA and the Original TA is supporting should not be refused on highways grounds.

Appendix A

TAA SCOPING REPORT AND CORRESPONDENCE

BERKELEY ST JAMES

MILTON KEYNES EAST

Transport Assessment Addendum Scoping Report

TAA-SR
AUGUST 2021

PUBLIC

BERKELEY ST JAMES

MILTON KEYNES EAST

Transport Assessment Addendum Scoping Report

TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70057521

OUR REF. NO. TAA-SR

DATE: AUGUST 2021

WSP

Mountbatten House
Basing View
Basingstoke, Hampshire
RG21 4HJ

Phone: +44 1256 318 800

Fax: +44 1256 318 700

WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Issue			
Date	August 2021			
Prepared by	A Smith			
Signature				
Checked by	A Smith / L Bluh			
Signature				
Authorised by	A Norcutt			
Signature				
Project number	70057521			
Report number				
File reference	\\uk.wspgroup.com\central data\Projects\700575xx\70057521 - MKE - PLANNING APPLICATION\03 WIP\TP Transport Planning\03 Document\2021 TONGWELL ST APPLICATION\20210810_MKE_TAA Scoping Report.docx			

CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

1.1 PREAMBLE & BACKGROUND

1.1.1. WSP has been appointed by Berkeley St James to provide transportation and highways advice in respect of the proposed development of land to the northeast of Milton Keynes ('Milton Keynes East' or 'MKE').

1.1.1. A planning application was submitted in March 2021. As part of the suite of information, an Environmental Statement, including a Transport Chapter accompanied the application. A Transport Assessment (TA) formed part of the appendices to that Transport ES Chapter.

1.1.2. Subsequently, we have received comments from MKC officers on the supporting TA and associated reports. WSP and the planning team have compiled a response to these comments.

1.2 CHANGES TO THE APPLICATION AND PURPOSE OF THIS REPORT

1.2.1. Berkeley St James are continuing to discuss the MKE application with the Council and stakeholders. As a response to those discussions and consultation with residents, Berkeley St James is looking to make a further update and amendment to the MKE application.

1.2.2. This Transport Assessment Addendum (TAA) Scoping Report is therefore intended to aid discussions between WSP and Milton Keynes (MKC) as the local highway authority to agree the appropriate assessment for the updated proposals related to the Berkeley application.

1.3 DEVELOPMENT PROPOSALS & UPDATED ACCESS STRATEGY

1.3.1. It should be noted that there is no intention to change or alter the development quantum or land uses assessed as part of the March 2021 TA. It is therefore considered that the vast majority of the material supporting the application remains valid and appropriate for consideration.

1.3.2. The changes relate purely to highway infrastructure amendments on the Tongwell Street corridor near to the new M1 Bridge and adjacent to the Carleton Gate junction.

1.3.3. The proposed amendment is made to the detailed element of the application on Tongwell Street. The revised application seeks to remove the Carleton Gate roundabout (and remove vehicular access to Willen in this location altogether) and to maintain north and southbound lanes along Tongwell Street. The proposed changes to the Tongwell Street links will result in a different configuration to the existing southbound lane, with the proposals showing the southbound link coming under the new M1 bridge (the design of which remains unchanged) and tying into Tongwell Street further south.

1.3.4. Figure 1-1 below provides more detail on what is proposed in this location and Table 1-1 below provides a comparison against submitted . A larger version of the mark-up is attached to this report in Appendix A. It should be noted that fully updated drawings will be prepared to support the planning application.

Figure 1-1 - Proposed changes to Tongwell Street and Carleton Gate (Indicative)

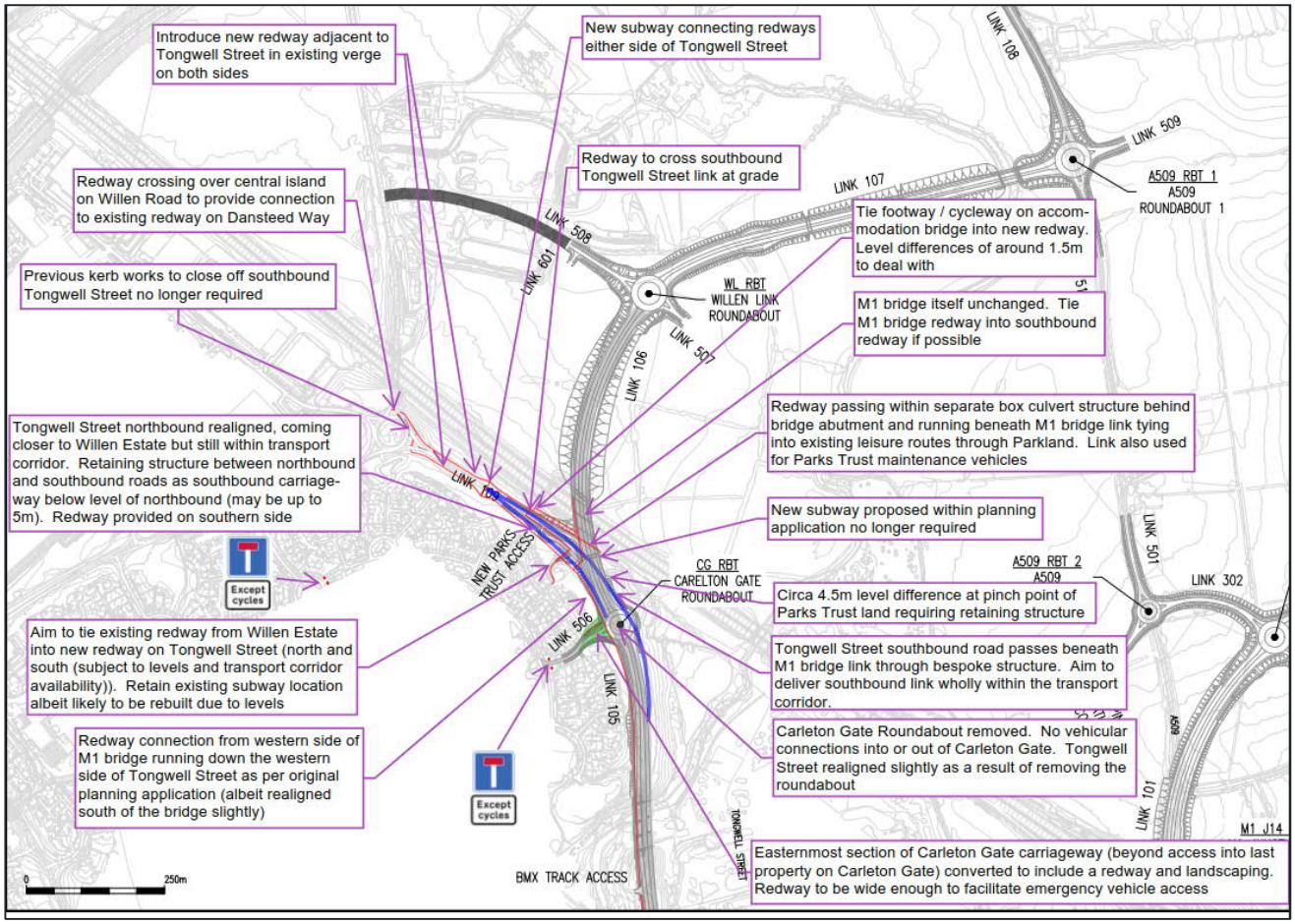


Table 1-1 – Revised application vs March 2021 submission

Element	Changes as a result of revised application	Implications
Development Quantum	No change	None
New M1 Bridge crossing location / design	No change*	None
HIF Infrastructure	No change	None
Carleton Gate / Tongwell St and access near to M1 bridge	Original TA had a full movement access junction. Revised application seeks to close Carleton Gate / Tongwell Street junction to vehicular traffic.	Change in flows – to be assessed in TAA.
Tongwell Street near to M1 Bridge	Original TA - Northern section of Tongwell Street was limited to Northbound only. Revised application - will allow both northbound and southbound movements.	Change in flows – to be assessed in TAA.
Offsite junction mitigation	No expected changes to suggested mitigation strategies set out in Original TA.	Certain junctions to be reviewed in TAA

**No change to Bridge design, but some alterations to NMU and Redway provision and tie ins as shown in Figure 1-1.*

2 TRANSPORT ASSESSMENT ADDENDUM SCOPE

2.1 INTRODUCTION

2.1.1. As noted in Chapter 1, a TA was prepared to support the March 2021 planning application and the elements were discussed and agreed with MKC throughout the process.

2.1.2. To ensure consistency in approach, a TAA will be prepared in support of the updated application, inclusive of the elements set out below.

2.2 ELEMENTS SCOPED OUT

2.2.1. The March 2021 submission is still considered to be relevant and up to date. As such, it is considered that the following elements are scoped out of the TAA;

- Review of relevant National and Local policy.
- Land use audit
- Pedestrians, cycles and public transport; and.
- Personal injury accident record.

TRAVEL PLAN

2.2.2. The revised infrastructure proposals at Carleton Gate do not change the over-arching overall objective of the Travel Plans previously submitted; which will still encourage sustainable travel to the site and to minimise single-occupancy private car journeys. As such, no updates to the Travel Plans are required.

PUBLIC TRANSPORT STRATEGY

2.2.3. As with the Travel Plans, the infrastructure changes do not result in a material impact to the Public Transport Strategy or the proposals. As such the PTS will remain as per the submitted version.

2.3 ITEMS TO BE ASSESSED

2.3.1. Due to the nature of the proposed highway changes, it is proposed that the following elements will be reviewed in detail.

DEVELOPMENT IMPACT ASSESSMENT

2.3.2. It was previously agreed with both MKC and Highways England that the use of a Strategic Transport model, combined with more detailed analysis tools, would be utilised in the assessment of the scheme.

2.3.3. As such, the Milton Keynes Multi-Modal Model (MKMMM) was previously used with updated information as the basis for the assessment of the scheme. The MKMMM is held by MKC and managed by AECOM (MKC's consultants) on MKC's behalf.

2.3.4. As part of recent post submission work, WSP has recently, via AECOM, modelled a series of network tests that include a southbound Tongwell Street connection and a limited turn junction at Carleton Gate (left in only).

2.3.5. Whilst it is acknowledged that this is not an exact representation of the proposed alterations to Tongwell Street and Carleton Gate, it is considered unnecessary to re-run the MKMMM as the changes in flow resulting from the changes are unlikely to warrant a material difference in highway operation.

2.3.6. In WSP's opinion a viable test to the potential proposals comes from an option of the Tongwell Street southbound modelling assessment already undertaken, which is set out as follows;

- Tongwell Street Southbound Option:
  - Includes the Tongwell St southbound link being coded into Tongwell Street (south of Carleton Gate)
  - The Carleton Gate junction is coded as a left in only

2.3.7. This assessment has been run within the 2048 Do Something AM and PM models and therefore provides a useful tool in understanding the potential implications of the updated proposals.

SCENARIOS TO BE ASSSESSED

2.3.8. The scenarios to be included in the TAA therefore are as follows;

- **2048 Future year reference case - without Development**
  - Future year test to represent full build out of the development;
  - Built upon the 2031 reference case with additional growth and committed developments up to 2048 applied
  - This includes, where possible[1], strategic sites relevant from other boroughs
- **2048 Future year with Development – w/ alternative Tongwell St Southbound Option**
  - The above scenario, with the full built out development
  - Including Tongwell St Southbound link

DEVELOPMENT ASSESSMENT STRATEGY

2.3.9. As the additional post submission modelling completed to date includes a Carleton Gate junction that is a left in only; an assumption on the potential re-assignment is required to reflect the proposals set out in Figure 1-1.

Amendments to Assignment

2.3.10. The post submission modelling has utilised the MKMMM and so picks up re-assignment and changes in travel patterns with the inclusion of a southbound Tongwell Street link.

2.3.11. The ability to access Carleton Gate is likely to have some influence on vehicle assignment and use of Tongwell Street.

2.3.12. It is considered fair to assume that any vehicles travelling Southbound across the new M1 bridge are unlikely to travel along Tongwell Street, perform a U-turn at Pineham Roundabout before accessing the left turn at Carleton Gate. Therefore, no changes to Southbound traffic from the M1 Bridge or Tongwell Street southbound are considered likely.

[1] The MKMMM is limited to what sites can be explicitly modelled outside of a core modelled area, however a separate TTN (TTN4) on the 2048 growth was issued and agreed with MKC and Highways England.

2.3.13. The northbound direction is likely to represent travel to one of the access point where residents can return to the Willen Estate. As there is no a connection between Carleton Gate through Willen to Dansteed Way within the model, rat running or through routing is not considered an issue. If Carleton Gate were to be closed, it is likely that the other zone connectors / accesses[2] would simply see a small increase in movements balanced between them.

2.3.14. Reviewing the post submission modelling outputs, there are approximately 275 and 210 PCUs turning left into Carleton Gate from the South in the 2048 AM and PM Peaks respectively.

2.3.15. Compared to the Core DS test which accompanied the March 2021 submission; (which had left turning vehicles (PCUs) of 219 and 172 in the AM and PM respectively), this shows that the post submission tests results in a slightly higher demand trying to access the Willen Estate from the south. It should be noted that a full turning movement junction was included in the original TA outputs, so any vehicles turning into Carleton Gate were largely balanced by those turning out – resulting in a different travel pattern along Tongwell Street.

2.3.16. In the proposed scenario, no vehicular movements will be possible. As such, in terms of assessing the impacts for the TAA, an assumption is required on where the turning vehicles continue.

2.3.17. For simplicity and robustness, it would be sensible to assume all of the vehicles turning left at Carleton Gate (under the post submission outputs) continue Northbound and then turn left at the Tongwell Roundabout. This would represent the next available access to the Willen Estate.

2.3.18. In reality, vehicles will dissipate and use multiple routes to the various accesses to the residential estate, resulting in less impact overall on the highway network. As such, assuming all vehicles then use the northern section of Tongwell Street represents a robust scenario.

2.3.19. WSP has previously discussed with MKC officers that the junction arrangement at Carleton Gate is not considered to be having a material impact of flows at the wider junctions and changes are limited to the immediate local area.

2.3.20. It is considered that the proposed changes set out above would not result in significant differences in the wider highway network but could cause changes on the Tongwell Street corridor. Therefore, the assessment strategy will review the potential changes at nearby junctions. This will compare the impacts of the scheme against the Do Minimum (without the development) as well as reviewing what was previously suggested / set out in the Original TA.

[2] Excluding Carleton Gate, the Willen Estate benefits from six vehicular accesses to the wider area from Brickhill Street and Dansteed Way, including an access via Willen Park Ave / Beaufort Dr and multiple NMU access points

ASSESSMENT SUMMARY

2.3.21. Based on the modelling approach outlined above, the proposed assessment strategy will adopt the following process:

- Use of MKMMM post submission test, which includes a Tongwell St southbound link;
- Manual re-assignment of left turn only Carleton Gate flows onto the northbound flows and then onto the left turn movement at Tongwell Roundabout.
- Independent junction testing, using industry-standard software at the following link / junction locations:
  - Tongwell Roundabout;
  - Carleton Gate / Tongwell Street;
  - Pineham Roundabout;
  - Tongwell Street corridor (link flow changes)
- Review of junction assessments and review of mitigation strategies (where previously set out in the original TA.
- Updated mitigation strategies (if required).

2.3.22. The review of the link flow changes will also enable a comparison against the outcomes of the previously submitted Transport chapter of the Environmental Assessment.

2.3.23. The original TA proposed a mitigation strategy at Pineham Roundabout, which included the introduction of a comprehensive signalisation scheme. It is considered likely that this mitigation would remain appropriate under this infrastructure change, but this will be checked within the TAA.

2.3.24. The original TA suggested that no mitigation was required at Tongwell Roundabout due to the changes in vehicular flows. This will also be checked within the TAA.

2.1 SUMMARY AND CONCLUSIONS

2.1.1. This TAA Scoping Report has set out the intended analysis and information to be provided to complete a Transport Assessment Addendum (TAA) to support an updated planning application for the Proposed Development at the land to the northeast of Milton Keynes (MKE).

2.1.2. The changes are related to the infrastructure around Tongwell Street and Carleton Gate and are indicatively shown in Figure 1-1. No other changes to the development quantum or proposals are suggested at this stage.

2.1.3. The changes are considered to be relatively minor, and modelling already undertaken is suitable and available in assessing the potential changes in traffic patterns that would arise. It is considered likely that any noticeable change would occur in the immediate vicinity and wider junction impacts are unlikely. The assessment approach, including any manual adjustments is set out above.

2.1.4. We trust that the above covers the required analysis and would welcome further discussions and agreement from MKC officers.

Appendix A

UPDATED TONGWELL ST SOUTHBOUND AND CARLETON GATE PROPOSALS

Introduce new redway adjacent to Tongwell Street in existing verge on both sides

New subway connecting redways either side of Tongwell Street

Redway to cross southbound Tongwell Street link at grade

Redway crossing over central island on Willen Road to provide connection to existing redway on Dansteed Way

Tie footway / cycleway on accommodation bridge into new redway. Level differences of around 1.5m to deal with

Previous kerb works to close off southbound Tongwell Street no longer required

M1 bridge itself unchanged. Tie M1 bridge redway into southbound redway if possible

Redway passing within separate box culvert structure behind bridge abutment and running beneath M1 bridge link tying into existing leisure routes through Parkland. Link also used for Parks Trust maintenance vehicles

Tongwell Street northbound realigned, coming closer to Willen Estate but still within transport corridor. Retaining structure between northbound and southbound roads as southbound carriageway below level of northbound (may be up to 5m). Redway provided on southern side

New subway proposed within planning application no longer required

Except cycles

CG RBT
CARELTON GATE ROUNDABOUT

A509 RBT 2
A509

Circa 4.5m level difference at pinch point of Parks Trust land requiring retaining structure

Aim to tie existing redway from Willen Estate into new redway on Tongwell Street (north and south (subject to levels and transport corridor availability)). Retain existing subway location albeit likely to be rebuilt due to levels

Tongwell Street southbound road passes beneath M1 bridge link through bespoke structure. Aim to deliver southbound link wholly within the transport corridor.

Redway connection from western side of M1 bridge running down the western side of Tongwell Street as per original planning application (albeit realigned south of the bridge slightly)

Except cycles

Carleton Gate Roundabout removed. No vehicular connections into or out of Carleton Gate. Tongwell Street realigned slightly as a result of removing the roundabout

Easternmost section of Carleton Gate carriageway (beyond access into last property on Carleton Gate) converted to include a redway and landscaping. Redway to be wide enough to facilitate emergency vehicle access

LINK 108
LINK 509
LINK 107
A509 RBT 1
A509
ROUNDABOUT 1
LINK 508
LINK 601
WL RBT
WILLEN LINK
ROUNDABOUT
LINK 507
LINK 106
LINK 109
NEW PARKS TRUST ACCESS
LINK 506
LINK 105
LINK 501
LINK 302
A509
LINK 101
M1 J14
TONGWELL STREET
BMX TRACK ACCESS

0 250m

Mountbatten House
Basing View
Basingstoke, Hampshire
RG21 4HJ

wsp.com

Smith, Alex

From:	Martin Tate <Martin.Tate@milton-keynes.gov.uk>
Sent:	18 August 2021 12:51
To:	Smith, Alex
Cc:	Norcutt, Allan; Bluh, Laura; Imramovsky, Filip; Nigel Weeks; James Povey; Paul Van Geete
Subject:	RE: [EXT] Scoping opinion request - MKE - revised application - Minor amendments to Tongwell Street and Carleton Gate
Attachments:	20210810_MKE_TAA Scoping Report_Issue.pdf

Hi Alex,
Thanks for the meeting this morning following on from circulating your TAA '20210810_MKE_TAA Scoping Report_Issue.pdf' regarding the scoping of an addition to the planning application TA. This concerned the removal of the originally-proposed Tongwell St roundabout junction with Carleton Gate, together with reinstating Tongwell St southbound and linking it to the new bridge road.
As you know I've discussed this with Nigel and subsequently with you at the meeting, and we confirm we have no issues with the scoping in respect of the modelling and Highways approach and assumptions.
I've re-attached the note and copied this to MKC colleagues for info, and any further comment.
Kind regards,
Martin

Martin Tate
Transport Planner – Multi Modal Model Consultant (Policy & Planning)
M: 07732 741433
W: https://www.milton-keynes.gov.uk/transport-policy
Milton Keynes Council | Civic | 1 Saxon Gate East | Milton Keynes | MK9 3EJ

From: Smith, Alex <Alex.Smith@wsp.com>
Sent: 10 August 2021 12:47
To: Nigel Weeks <nweeks@smtrans.co.uk>; Martin Tate <Martin.Tate@milton-keynes.gov.uk>
Cc: Norcutt, Allan <Allan.Norcutt@wsp.com>; Bluh, Laura <Laura.Bluh@wsp.com>; Imramovsky, Filip <Filip.Imramovsky@wsp.com>
Subject: [EXT] Scoping opinion request - MKE - revised application - Minor amendments to Tongwell Street and Carleton Gate
Importance: High

Hi Nigel, Martin,

I hope you are both well.

Apologies for yet another MKE related email, but I would be most grateful for your views on the attached short TAA scoping note. This is in relation to a forthcoming revised application for MKE. The revisions are focused around the Tongwell Street corridor and arrangement adjacent to the new M1 bridge crossing. I understand that discussions are being held with other MKC officers today as to the wider assessments, but we wanted to ensure that from a Transport / Highways perspective that you were happy with the intended approach.

It may be easier to have a short call / discussion to provide further information and we'd be more than happy to arrange this over the next day or so. Once you've had chance to review the attached, we can also provide some of the MKMMM turning outputs if that would be of use.

To provide context, following ongoing discussions regarding the MKE application with the Council and stakeholders, the team has been reviewing the access strategy around the Willen estate. As a response to those discussions and consultation with residents, St James is looking to make a further update and amendment to the MKE application.

The amendment is focused on the detailed element of the application on Tongwell Street and seeks to remove the Carleton Gate roundabout (and remove vehicular access to Willen in this location altogether). The revised application will also seek to maintain north and southbound lanes along Tongwell Street - although with a different configuration to the existing, with the southbound lane routing under the new M1 bridge (the design of which remains unchanged) before tying in to Tongwell Street further south.

The development proposals in terms of quantum / land use are not changing, and the Bridge design remains as per the original TA, with some minor updates to the adjacent tie in to Redways and NMU connections etc. We are conscious however that the proposed arrangement is different to that assessed and tested within the submitted TA. As such, we propose to undertake a Transport Assessment Addendum (TAA) that focuses on the Tongwell Street corridor and assesses the links and junctions either side of Carleton Gate (Tongwell Roundabout and Pineham Roundabout) to ensure that the revisions are suitable and appropriate to MKC.

The attached note sets out our proposed methodology, including the use of the recent post submission MKMMM modelling completed – I'd be most grateful if you could confirm that MKC are happy with the approach.

We trust that we have covered everything, but as mentioned above – please do let me know if you have any queries or if a call would be of benefit.
I look forward to your response,
Alex

Kind regards,
Alex

Alex Smith
Associate – Development Planning - Transport
BSc, MSc, MCIHT

T+ 44 (0)1256 318633
M+ 44 (0)7980 690627

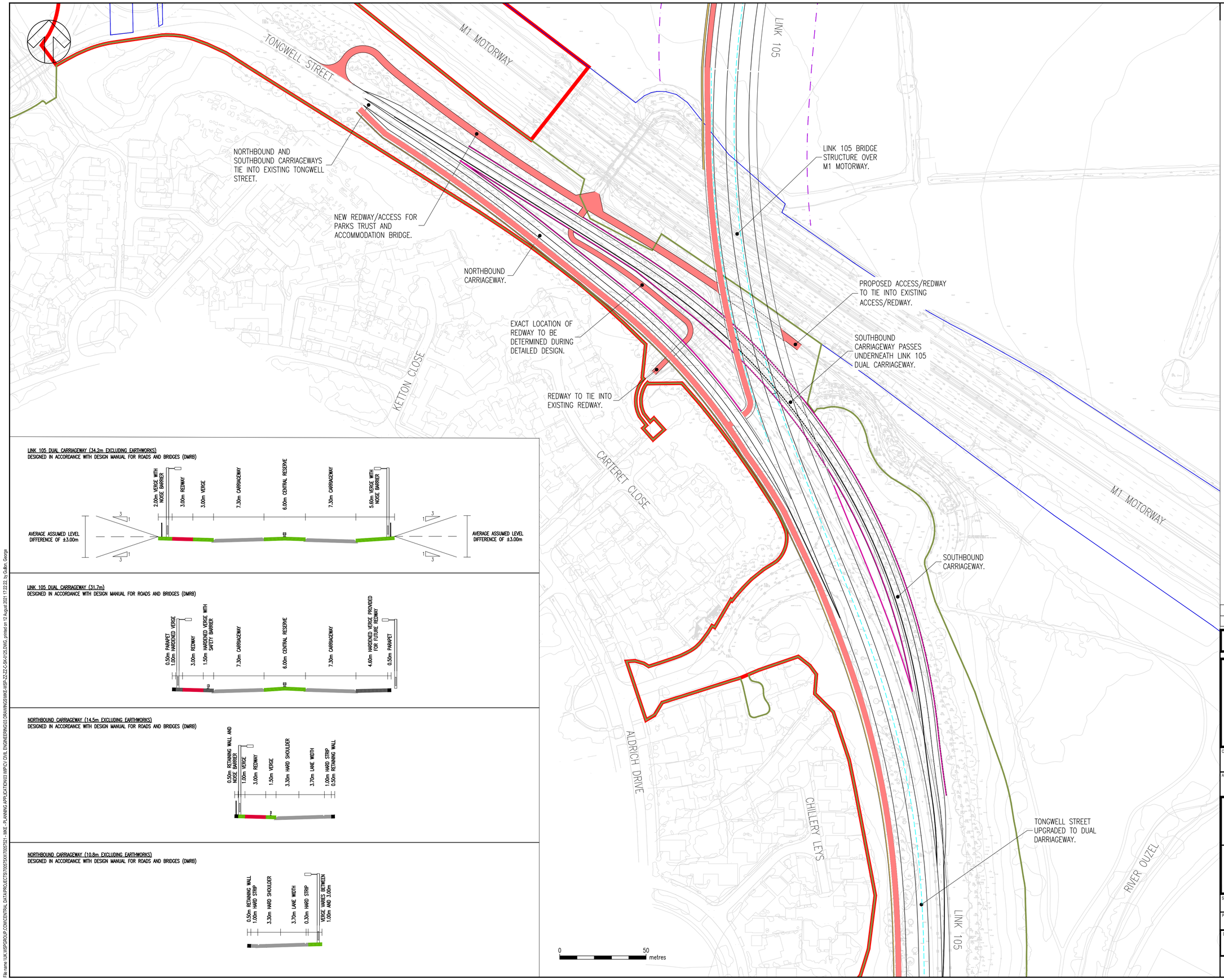
WSP UK Limited.
Mountbatten House, Basing View
Basingstoke, Hampshire
RG21 4HJ, UK

wsp.com

-LAEmHhHzdJzBITWfa4Hgs7pbKI

Appendix B

UPDATED TONGWELL ST SOUTHBOUND AND CARLETON GATE PROPOSALS



LINK 105 DUAL CARRIAGEWAY (34.2m EXCLUDING EARTHWORKS)
DESIGNED IN ACCORDANCE WITH DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB)

LINK 105 DUAL CARRIAGEWAY (31.7m)
DESIGNED IN ACCORDANCE WITH DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB)

NORTHBOUND CARRIAGEWAY (14.5m EXCLUDING EARTHWORKS)
DESIGNED IN ACCORDANCE WITH DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB)

NORTHBOUND CARRIAGEWAY (10.8m EXCLUDING EARTHWORKS)
DESIGNED IN ACCORDANCE WITH DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB)

NOTES:

1. DRAWINGS ARE PREPARED TO SUPPORT DETAILED ELEMENT OF HYBRID PLANNING APPLICATION FOR THE STRATEGIC HIGHWAY INFRASTRUCTURE ASSOCIATED WITH MILTON KEYNES EAST (MKE) DEVELOPMENT.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT DOCUMENTATION, DRAWINGS AND STANDARD DETAILS.
4. THIS DRAWING IS NOT TO BE REPRODUCED IN ANY PART OF FORM WITHOUT PRIOR CONSENT FROM WSP UK LIMITED, ALL COPY RIGHT RESERVED.
5. CONFLICTING INFORMATION SHOWN ON THE ENGINEER'S DRAWINGS OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER AND THAT PROVIDED BY OTHERS MUST BE REFERRED TO THE ENGINEER BEFORE THE WORKS COMMENCE.
6. THE LIGHTING PROPOSALS SHOWN ARE SUBJECT TO CHANGE FOLLOWING FOLLOWING FURTHER DESIGN DEVELOPMENT CONSIDERING SENSITIVE ENVIRONMENTAL CONSTRAINTS AND APPROVAL REQUIREMENTS FROM THE LOCAL AUTHORITY.
7. THE MILTON KEYNES HIGHWAY BOUNDARY IS TAKEN FROM INTERACTIVE HIGHWAY BOUNDARY MAPPING FOUND ON THE MILTON KEYNES COUNCIL'S WEBSITE.
8. TOPOGRAPHICAL INFORMATION PROVIDED BY MK SURVEYS FILE – "28562" ON THE 11/06/2020 AND 3D ENGINEERING SURVEYS FILE – "DES21007_MKE_REV1" ON THE 22/02/2021. WSP CAN NOT ACCEPT RESPONSIBILITY FOR ANY INACCURACIES.
9. ALL REDWAYS DESIGNED IN ACCORDANCE WITH LTN 2/08.
10. EARTHWORKS SHOWN OUTSIDE THE TRANSPORTATION CORRIDOR SHALL BE REVIEWED DURING DETAILED DESIGN STAGE WITH A VIEW TO EITHER LOCALLY STEEPEN OR ADJUSTING EXISTING GROUND LEVELS SO THAT ALL WORKS ARE LOCATED WITHIN THE CORRIDOR.

KEY:

GENERAL

- PLANNING APPLICATION BOUNDARY
- HIGHWAYS ENGLAND HIGHWAY BOUNDARY
- MILTON KEYNES COUNCIL HIGHWAY BOUNDARY
- PROPOSED TRANSPORTATION CORRIDOR
- RETAINING WALL AND NOISE BARRIER
- RETAINING WALL
- PROPOSED VEHICLE RESTRAINT SYSTEM (VRS)
- PROPOSED REDWAY

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	12/08/2021	GLG	FIRST ISSUE	ARP	SAP

DRAWING STATUS: S4 - FOR APPROVAL

wsp
The Mailbox, Level 2, 100 Wharfside Street, Birmingham, B1 1RT, UK
T+ 44 (0) 121 352 4700, F+ 44 (0) 121 352 4701
wsp.com

CLIENT: BERKELEY ST JAMES

ARCHITECT: JTP / STEPHEN GEORGE AND PARTNERS

SITE/PROJECT: MILTON KEYNES EAST

TITLE: TONGWELL STREET NORTHBOUND AND SOUTHBOUND LINKS

SCALE @ A1:	CHECKED:	APPROVED:	
1:1250	ARP	SAP	
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
70075721	ARP	GLG	August 21

DRAWING No: MKE-WSP-ZZ-ZZ-C-SK-0125 REV: P01

Appendix C

TAA - UPDATED JUNCTION ASSESSMENT OUTPUTS (JUNCTIONS9 AND LINSIG)

Junctions 10

ARCADY 10 - Roundabout Module

Filename: 6.Tongwell Roundabout (JCTS10).j10
Path: \\uk.wspgroup.com\central data\Projects\700575xx\70057521 - MKE - PLANNING APPLICATION\03 WIP\TP Transport Planning\05 Analysis\2021 TONGWELL ST ALT
Report generation date: 01/09/2021 17:16:35

»2048 Do Something - Tongwell SB Alt, AM
»2048 Do Something - Tongwell SB Alt, PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2048 Do Something - Tongwell SB Alt									
A - Willen Rd	D13	1.5	5.70	0.60	A	D14	0.4	3.23	0.26	A
B - Tongwell St		11.2	29.93	0.93	D		0.2	2.30	0.15	A
C - Dansteed Way		1.3	6.65	0.56	A		0.9	3.85	0.46	A
D - Michigan Dr		0.2	3.70	0.14	A		0.5	4.62	0.34	A

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

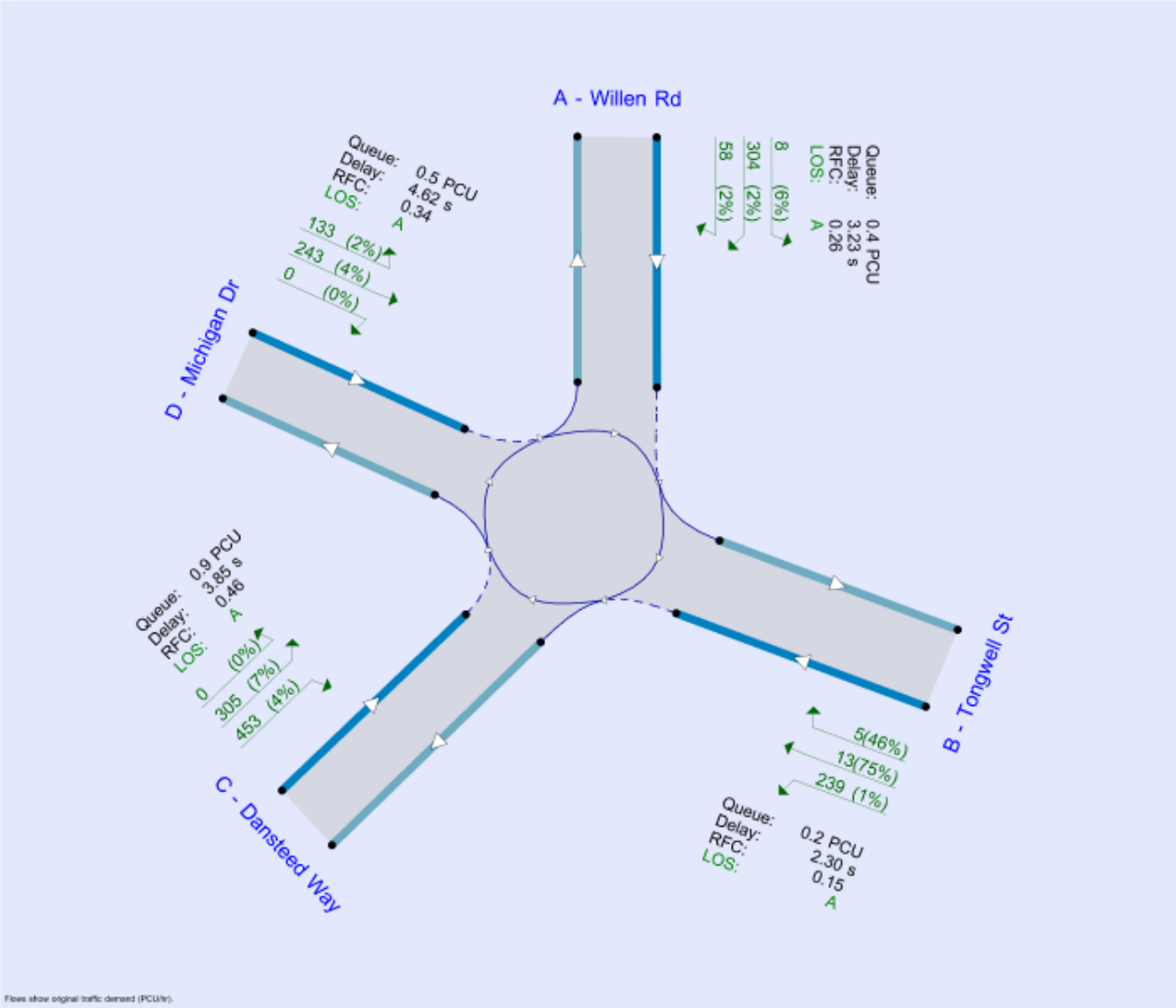
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	18/03/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	CORP\uklew001
Description	

Units

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



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use iterations with HCM roundabouts	Max number of iterations for roundabouts
5.75						0.85	36.00	20.00		500

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2019 Surveyed	AM	ONE HOUR	07:45	09:15	15	✓
D2	2019 Surveyed	PM	ONE HOUR	16:45	18:15	15	✓
D3	2016 MKMMM Base	AM	ONE HOUR	07:45	09:15	15	✓
D4	2016 MKMMM Base	PM	ONE HOUR	16:45	18:15	15	✓
D5	2031 Do Minimum	AM	ONE HOUR	07:45	09:15	15	✓
D6	2031 Do Minimum	PM	ONE HOUR	16:45	18:15	15	✓
D7	2048 Do Minimum	AM	ONE HOUR	07:45	09:15	15	✓
D8	2048 Do Minimum	PM	ONE HOUR	16:45	18:15	15	✓
D9	2031 Do Something	AM	ONE HOUR	07:45	09:15	15	✓
D10	2031 Do Something	PM	ONE HOUR	16:45	18:15	15	✓
D11	2048 Do Something	AM	ONE HOUR	07:45	09:15	15	✓
D12	2048 Do Something	PM	ONE HOUR	16:45	18:15	15	✓
D13	2048 Do Something - Tongwell SB Alt	AM	ONE HOUR	07:45	09:15	15	✓
D14	2048 Do Something - Tongwell SB Alt	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	✓	D13,D14	100.000	100.000

2048 Do Something - Tongwell SB Alt, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Tongwell Roundabout	Standard Roundabout		A, B, C, D	16.36	C

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	16.36	C

Arms

Arms

Arm	Name	Description	No give-way line
A	Willen Rd		
B	Tongwell St		
C	Dansteed Way		
D	Michigan Dr		

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Entry only	Exit only
A - Willen Rd	3.65	7.90	15.2	34.0	66.0	0.0		
B - Tongwell St	3.65	8.50	20.0	62.9	66.0	6.5		
C - Dansteed Way	3.65	8.00	12.4	36.3	66.0	13.0		
D - Michigan Dr	3.65	6.90	9.3	32.0	66.0	17.5		

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A - Willen Rd	0.605	2007
B - Tongwell St	0.627	2156
C - Dansteed Way	0.572	1867
D - Michigan Dr	0.535	1668

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D13	2048 Do Something - Tongwell SB Alt	AM	ONE HOUR	07:45	09:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Willen Rd		ONE HOUR	✓	876	100.000
B - Tongwell St		ONE HOUR	✓	1307	100.000
C - Dansteed Way		ONE HOUR	✓	661	100.000
D - Michigan Dr		ONE HOUR	✓	157	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - Willen Rd	B - Tongwell St	C - Dansteed Way	D - Michigan Dr
From	A - Willen Rd	0	0	579	297
	B - Tongwell St	11	0	685	611
	C - Dansteed Way	188	473	0	0
	D - Michigan Dr	50	107	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - Willen Rd	B - Tongwell St	C - Dansteed Way	D - Michigan Dr
From	A - Willen Rd	0	0	5	2
	B - Tongwell St	19	0	5	7
	C - Dansteed Way	6	3	0	0
	D - Michigan Dr	4	18	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Willen Rd	0.60	5.70	1.5	A	804	1206
B - Tongwell St	0.93	29.93	11.2	D	1199	1799
C - Dansteed Way	0.56	6.65	1.3	A	607	910
D - Michigan Dr	0.14	3.70	0.2	A	144	216

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	659	165	435	1744	0.378	657	187	0.0	0.6	3.436	A
B - Tongwell St	984	246	657	1743	0.564	979	435	0.0	1.4	4.957	A
C - Dansteed Way	498	124	688	1473	0.338	496	947	0.0	0.5	3.816	A
D - Michigan Dr	118	30	504	1398	0.085	118	680	0.0	0.1	3.180	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	788	197	521	1692	0.465	786	224	0.6	0.9	4.127	A
B - Tongwell St	1175	294	786	1662	0.707	1170	521	1.4	2.5	7.691	A
C - Dansteed Way	594	149	824	1396	0.426	593	1133	0.5	0.8	4.652	A
D - Michigan Dr	141	35	603	1345	0.105	141	814	0.1	0.1	3.381	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	964	241	637	1622	0.595	962	273	0.9	1.5	5.653	A
B - Tongwell St	1439	360	962	1552	0.927	1410	637	2.5	9.8	23.193	C
C - Dansteed Way	728	182	997	1297	0.561	726	1375	0.8	1.3	6.522	A
D - Michigan Dr	173	43	737	1274	0.136	173	985	0.1	0.2	3.699	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	964	241	639	1621	0.595	964	274	1.5	1.5	5.701	A
B - Tongwell St	1439	360	964	1551	0.928	1433	639	9.8	11.2	29.930	D
C - Dansteed Way	728	182	1009	1290	0.564	728	1389	1.3	1.3	6.649	A
D - Michigan Dr	173	43	740	1272	0.136	173	997	0.2	0.2	3.703	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	788	197	523	1691	0.466	790	225	1.5	0.9	4.165	A
B - Tongwell St	1175	294	790	1660	0.708	1209	523	11.2	2.6	9.080	A
C - Dansteed Way	594	149	843	1385	0.429	596	1156	1.3	0.8	4.755	A
D - Michigan Dr	141	35	607	1343	0.105	141	833	0.2	0.1	3.387	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	659	165	437	1743	0.378	661	188	0.9	0.6	3.461	A
B - Tongwell St	984	246	661	1741	0.565	989	437	2.6	1.4	5.109	A
C - Dansteed Way	498	124	695	1470	0.339	499	955	0.8	0.5	3.854	A
D - Michigan Dr	118	30	507	1397	0.085	118	686	0.1	0.1	3.188	A

2048 Do Something - Tongwell SB Alt, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Tongwell Roundabout	Standard Roundabout		A, B, C, D	3.66	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.66	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D14	2048 Do Something - Tongwell SB Alt	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Willen Rd		ONE HOUR	✓	370	100.000
B - Tongwell St		ONE HOUR	✓	257	100.000
C - Dansteed Way		ONE HOUR	✓	758	100.000
D - Michigan Dr		ONE HOUR	✓	376	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - Willen Rd	B - Tongwell St	C - Dansteed Way	D - Michigan Dr
From	A - Willen Rd	0	8	304	58
	B - Tongwell St	5	0	239	13
	C - Dansteed Way	305	453	0	0
	D - Michigan Dr	133	243	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - Willen Rd	B - Tongwell St	C - Dansteed Way	D - Michigan Dr
From	A - Willen Rd	0	6	2	2
	B - Tongwell St	46	0	1	75
	C - Dansteed Way	7	4	0	0
	D - Michigan Dr	2	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Willen Rd	0.26	3.23	0.4	A	340	509
B - Tongwell St	0.15	2.30	0.2	A	236	354
C - Dansteed Way	0.46	3.85	0.9	A	696	1043
D - Michigan Dr	0.34	4.62	0.5	A	345	518

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	279	70	522	1691	0.165	278	332	0.0	0.2	2.598	A
B - Tongwell St	193	48	272	1985	0.097	193	528	0.0	0.1	2.086	A
C - Dansteed Way	571	143	57	1834	0.311	569	408	0.0	0.5	2.989	A
D - Michigan Dr	283	71	573	1362	0.208	282	53	0.0	0.3	3.440	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	333	83	625	1629	0.204	332	398	0.2	0.3	2.834	A
B - Tongwell St	231	58	325	1952	0.118	231	632	0.1	0.1	2.172	A
C - Dansteed Way	681	170	68	1828	0.373	681	488	0.5	0.6	3.300	A
D - Michigan Dr	338	85	685	1301	0.260	338	64	0.3	0.4	3.857	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	407	102	765	1544	0.264	407	487	0.3	0.4	3.232	A
B - Tongwell St	283	71	398	1906	0.148	283	774	0.1	0.2	2.303	A
C - Dansteed Way	835	209	84	1819	0.459	834	597	0.6	0.9	3.839	A
D - Michigan Dr	414	103	839	1219	0.340	413	78	0.4	0.5	4.609	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	407	102	766	1543	0.264	407	488	0.4	0.4	3.234	A
B - Tongwell St	283	71	399	1906	0.149	283	775	0.2	0.2	2.303	A
C - Dansteed Way	835	209	84	1819	0.459	835	598	0.9	0.9	3.846	A
D - Michigan Dr	414	103	840	1219	0.340	414	78	0.5	0.5	4.620	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	333	83	627	1628	0.204	333	399	0.4	0.3	2.838	A
B - Tongwell St	231	58	326	1951	0.118	231	634	0.2	0.1	2.175	A
C - Dansteed Way	681	170	68	1828	0.373	682	489	0.9	0.6	3.309	A
D - Michigan Dr	338	85	687	1301	0.260	339	64	0.5	0.4	3.868	A

18:00 - 18:15

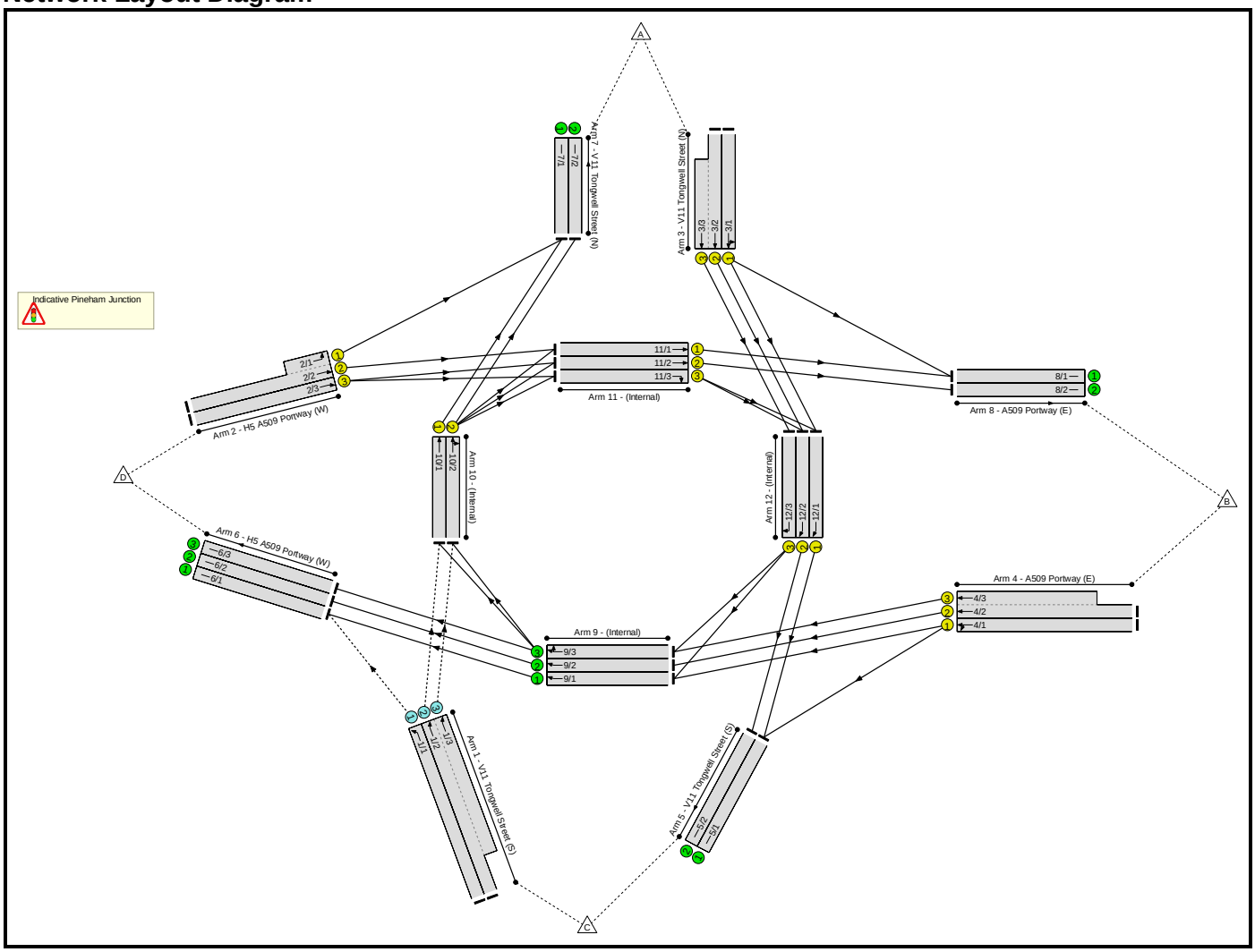
Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
A - Willen Rd	279	70	525	1690	0.165	279	334	0.3	0.2	2.606	A
B - Tongwell St	193	48	273	1984	0.098	194	531	0.1	0.1	2.087	A
C - Dansteed Way	571	143	57	1834	0.311	571	409	0.6	0.5	2.999	A
D - Michigan Dr	283	71	575	1360	0.208	283	53	0.4	0.3	3.455	A

Full Input Data And Results

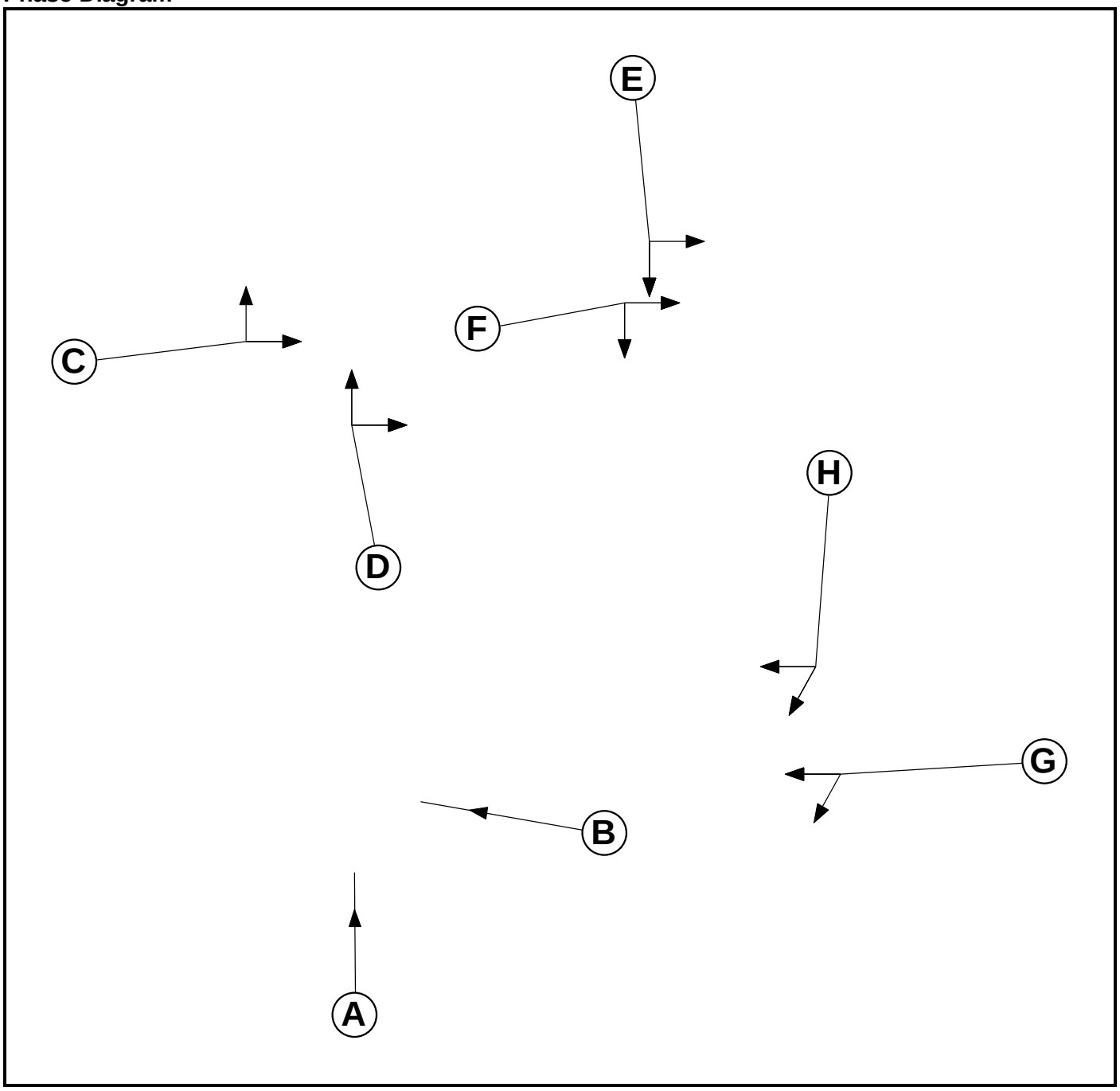
User and Project Details

Project:	**Milton Keynes East**
Title:	**Pineham Roundabout (mitigated)**
Location:	
File name:	20201208_Pineham Rbt Mitigated.lsg3x
Author:	UKAPS008
Company:	WSP
Address:	
Notes:	

Network Layout Diagram



Phase Diagram



Phase Input Data

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

Phase Intergreens Matrix

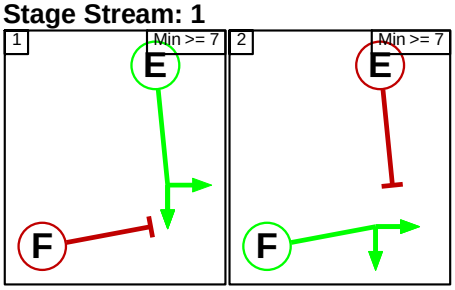
Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H
A		5	-	-	-	-	-	-
B	5		-	-	-	-	-	-
C	-	-		5	-	-	-	-
D	-	-	5		-	-	-	-
E	-	-	-	-		5	-	-
F	-	-	-	-	5		-	-
G	-	-	-	-	-	-		5
H	-	-	-	-	-	-	5	

Phases in Stage

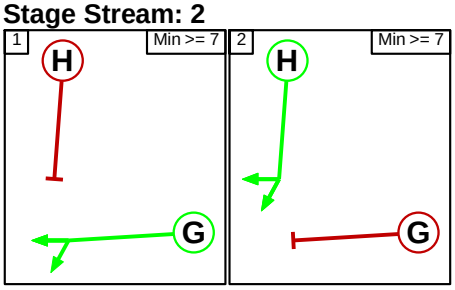
Stream	Stage No.	Phases in Stage
1	1	E
1	2	F
2	1	G
2	2	H
3	1	C
3	2	D

Stage Diagram

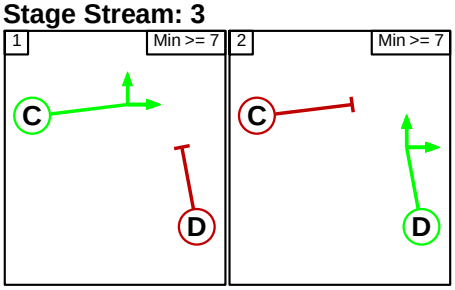
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



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					

Prohibited Stage Change

Stage Stream: 1

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 2

	To Stage		
From Stage		1	2
	1		5
	2	5	

Stage Stream: 3

	To Stage		
From Stage		1	2
	1		5
	2	5	

Give-Way Lane Input Data

Junction: Indicative Pineham Junction

Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
1/1 (V11 Tongwell Street (S))	6/1 (Left)	1439	0	9/1	1.09	All	-	-	-	-	-
1/2 (V11 Tongwell Street (S))	10/1 (Ahead)	1439	0	9/1	1.09	All	-	-	-	-	-
				9/2	1.09	All					
				9/3	1.09	All					
1/3 (V11 Tongwell Street (S))	10/2 (Ahead)	1439	0	9/1	1.09	All	-	-	-	-	-
				9/2	1.09	All					
				9/3	1.09	All					

Lane Input Data

Junction: Indicative Pineham Junction

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 (V11 Tongwell Street (S))	O		2	3	60.0	Geom	-	3.40	0.00	Y	Arm 6 Left	30.00
1/2 (V11 Tongwell Street (S))	O		2	3	60.0	Geom	-	3.40	0.00	Y	Arm 10 Ahead	Inf
1/3 (V11 Tongwell Street (S))	O		2	3	17.4	Geom	-	3.40	0.00	Y	Arm 10 Ahead	Inf
2/1 (H5 A509 Portway (W))	U	C	2	3	5.0	Geom	-	3.30	0.00	Y	Arm 7 Left	Inf
2/2 (H5 A509 Portway (W))	U	C	2	3	60.0	Geom	-	3.30	0.00	N	Arm 11 Ahead	Inf
2/3 (H5 A509 Portway (W))	U	C	2	3	60.0	Geom	-	3.30	0.00	N	Arm 11 Ahead	Inf
3/1 (V11 Tongwell Street (N))	U	E	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Left	40.00
											Arm 12 Ahead	Inf
3/2 (V11 Tongwell Street (N))	U	E	2	3	60.0	Geom	-	3.65	0.00	N	Arm 12 Ahead	Inf
3/3 (V11 Tongwell Street (N))	U	E	2	3	10.0	Geom	-	3.65	0.00	N	Arm 12 Ahead	40.00
4/1 (A509 Portway (E))	U	G	2	3	60.0	Geom	-	4.00	0.00	N	Arm 5 Left	Inf
											Arm 9 Ahead	40.00
4/2 (A509 Portway (E))	U	G	2	3	60.0	Geom	-	4.00	0.00	N	Arm 9 Ahead	Inf
4/3 (A509 Portway (E))	U	G	2	3	17.0	Geom	-	4.00	0.00	Y	Arm 9 Ahead	40.00
5/1 (V11 Tongwell Street (S))	U		2	3	60.0	Inf	-	-	-	-	-	-
5/2 (V11 Tongwell Street (S))	U		2	3	60.0	Inf	-	-	-	-	-	-

6/1 (H5 A509 Portway (W))	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2 (H5 A509 Portway (W))	U		2	3	60.0	Inf	-	-	-	-	-	-
6/3 (H5 A509 Portway (W))	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (V11 Tongwell Street (N))	U		2	3	60.0	Inf	-	-	-	-	-	-
7/2 (V11 Tongwell Street (N))	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1 (A509 Portway (E))	U		2	3	60.0	Inf	-	-	-	-	-	-
8/2 (A509 Portway (E))	U		2	3	60.0	Inf	-	-	-	-	-	-
9/1 ((Internal))	U		2	3	4.0	Geom	-	4.00	0.00	Y	Arm 6 Ahead	Inf
9/2 ((Internal))	U		2	3	4.0	Geom	-	4.00	0.00	Y	Arm 6 Ahead	Inf
9/3 ((Internal))	U		2	3	4.0	Geom	-	4.00	0.00	Y	Arm 6 Ahead Arm 10 Right	Inf Inf
10/1 ((Internal))	U	D	2	3	20.9	Geom	-	3.75	0.00	Y	Arm 7 Ahead	Inf
10/2 ((Internal))	U	D	2	3	60.0	Geom	-	3.75	0.00	N	Arm 7 Ahead Arm 11 Right	Inf Inf
11/1 ((Internal))	U	F	2	3	3.5	Geom	-	3.25	0.00	Y	Arm 8 Ahead	Inf
11/2 ((Internal))	U	F	2	3	3.5	Geom	-	4.00	0.00	N	Arm 8 Ahead	Inf
11/3 ((Internal))	U	F	2	3	3.5	Geom	-	4.00	0.00	N	Arm 12 Right	Inf
12/1 ((Internal))	U	H	2	3	60.0	Geom	-	3.75	0.00	Y	Arm 5 Ahead	Inf
12/2 ((Internal))	U	H	2	3	60.0	Geom	-	3.75	0.00	N	Arm 5 Ahead	Inf
12/3 ((Internal))	U	H	2	3	60.0	Geom	-	3.75	0.00	N	Arm 9 Right	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
5: '2048 Do Something AM - Tongwell St SB Alt'	08:00	09:00	01:00	
6: '2048 Do Something PM - Tongwell St SB Alt'	17:00	18:00	01:00	

Scenario 5: '2048 Do Something AM - Tongwell St SB Alt' (FG5: '2048 Do Something AM - Tongwell St SB Alt', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	579	695	291	1565
	B	867	60	78	1092	2097
	C	462	36	0	346	844
	D	36	814	78	0	928
	Tot.	1365	1489	851	1729	5434

Traffic Lane Flows

Lane	Scenario 5: 2048 Do Something AM - Tongwell St SB Alt
Junction: Indicative Pineham Junction	
1/1	346
1/2 (with short)	498(In) 245(Out)
1/3 (short)	253
2/1 (short)	36
2/2 (with short)	435(In) 399(Out)
2/3	493
3/1	805
3/2 (with short)	760(In) 469(Out)
3/3 (short)	291
4/1	949
4/2 (with short)	1148(In) 221(Out)
4/3 (short)	927
5/1	379
5/2	472
6/1	1390
6/2	221
6/3	118
7/1	714
7/2	651
8/1	1009
8/2	480
9/1	1044
9/2	221
9/3	1045
10/1	678
10/2	747
11/1	430
11/2	480
11/3	78
12/1	301
12/2	472
12/3	291

Lane Saturation Flows

Junction: Indicative Pineham Junction

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 (V11 Tongwell Street (S))	3.40	0.00	Y	Arm 6 Left	30.00	100.0 %	1862	1862
1/2 (V11 Tongwell Street (S))	3.40	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1955	1955
1/3 (V11 Tongwell Street (S))	3.40	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1955	1955
2/1 (H5 A509 Portway (W))	3.30	0.00	Y	Arm 7 Left	Inf	100.0 %	1945	1945
2/2 (H5 A509 Portway (W))	3.30	0.00	N	Arm 11 Ahead	Inf	100.0 %	2085	2085
2/3 (H5 A509 Portway (W))	3.30	0.00	N	Arm 11 Ahead	Inf	100.0 %	2085	2085
3/1 (V11 Tongwell Street (N))	3.65	0.00	Y	Arm 8 Left Arm 12 Ahead	40.00 Inf	71.9 % 28.1 %	1928	1928
3/2 (V11 Tongwell Street (N))	3.65	0.00	N	Arm 12 Ahead	Inf	100.0 %	2120	2120
3/3 (V11 Tongwell Street (N))	3.65	0.00	N	Arm 12 Ahead	40.00	100.0 %	2043	2043
4/1 (A509 Portway (E))	4.00	0.00	N	Arm 5 Left Arm 9 Ahead	Inf 40.00	8.2 % 91.8 %	2083	2083
4/2 (A509 Portway (E))	4.00	0.00	N	Arm 9 Ahead	Inf	100.0 %	2155	2155
4/3 (A509 Portway (E))	4.00	0.00	Y	Arm 9 Ahead	40.00	100.0 %	1942	1942
5/1 (V11 Tongwell Street (S) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (V11 Tongwell Street (S) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (H5 A509 Portway (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
6/2 (H5 A509 Portway (W) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/3 (H5 A509 Portway (W) Lane 3)	Infinite Saturation Flow						Inf	Inf
7/1 (V11 Tongwell Street (N) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/2 (V11 Tongwell Street (N) Lane 2)	Infinite Saturation Flow						Inf	Inf
8/1 (A509 Portway (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/2 (A509 Portway (E) Lane 2)	Infinite Saturation Flow						Inf	Inf

9/1 ((Internal))	4.00	0.00	Y	Arm 6 Ahead	Inf	100.0 %	2015	2015
9/2 ((Internal))	4.00	0.00	Y	Arm 6 Ahead	Inf	100.0 %	2015	2015
9/3 ((Internal))	4.00	0.00	Y	Arm 6 Ahead	Inf	11.3 %	2015	2015
				Arm 10 Right	Inf	88.7 %		
10/1 ((Internal))	3.75	0.00	Y	Arm 7 Ahead	Inf	100.0 %	1990	1990
10/2 ((Internal))	3.75	0.00	N	Arm 7 Ahead	Inf	87.1 %	2130	2130
				Arm 11 Right	Inf	12.9 %		
11/1 ((Internal))	3.25	0.00	Y	Arm 8 Ahead	Inf	100.0 %	1940	1940
11/2 ((Internal))	4.00	0.00	N	Arm 8 Ahead	Inf	100.0 %	2155	2155
11/3 ((Internal))	4.00	0.00	N	Arm 12 Right	Inf	100.0 %	2155	2155
12/1 ((Internal))	3.75	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1990	1990
12/2 ((Internal))	3.75	0.00	N	Arm 5 Ahead	Inf	100.0 %	2130	2130
12/3 ((Internal))	3.75	0.00	N	Arm 9 Right	Inf	100.0 %	2130	2130

Scenario 6: '2048 Do Something PM - Tongwell St SB Alt' (FG6: '2048 Do Something PM - Tongwell St SB Alt', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	541	805	241	1587
	B	190	63	52	1004	1309
	C	647	360	0	651	1658
	D	448	941	195	2	1586
	Tot.	1285	1905	1052	1898	6140

Traffic Lane Flows

Lane	Scenario 6: 2048 Do Something PM - Tongwell St SB Alt
Junction: Indicative Pineham Junction	
1/1	651
1/2 (with short)	1007(In) 485(Out)
1/3 (short)	522
2/1 (short)	448
2/2 (with short)	940(In) 492(Out)
2/3	644
3/1	653
3/2 (with short)	934(In) 693(Out)
3/3 (short)	241
4/1	404
4/2 (with short)	905(In) 472(Out)
4/3 (short)	433
5/1	335
5/2	717
6/1	1194
6/2	472
6/3	230
7/1	1051
7/2	234
8/1	1197
8/2	708
9/1	543
9/2	472
9/3	483
10/1	603
10/2	657
11/1	656
11/2	708
11/3	195
12/1	283
12/2	717
12/3	241

Lane Saturation Flows

Junction: Indicative Pineham Junction

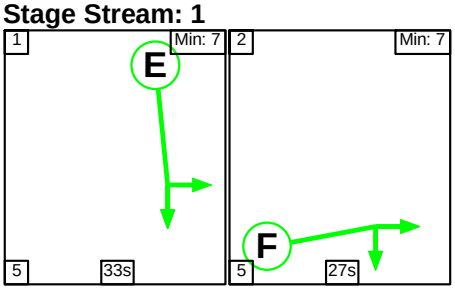
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (V11 Tongwell Street (S))	3.40	0.00	Y	Arm 6 Left	30.00	100.0 %	1862	1862
1/2 (V11 Tongwell Street (S))	3.40	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1955	1955
1/3 (V11 Tongwell Street (S))	3.40	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1955	1955
2/1 (H5 A509 Portway (W))	3.30	0.00	Y	Arm 7 Left	Inf	100.0 %	1945	1945
2/2 (H5 A509 Portway (W))	3.30	0.00	N	Arm 11 Ahead	Inf	100.0 %	2085	2085
2/3 (H5 A509 Portway (W))	3.30	0.00	N	Arm 11 Ahead	Inf	100.0 %	2085	2085
3/1 (V11 Tongwell Street (N))	3.65	0.00	Y	Arm 8 Left Arm 12 Ahead	40.00 Inf	82.8 % 17.2 %	1920	1920
3/2 (V11 Tongwell Street (N))	3.65	0.00	N	Arm 12 Ahead	Inf	100.0 %	2120	2120
3/3 (V11 Tongwell Street (N))	3.65	0.00	N	Arm 12 Ahead	40.00	100.0 %	2043	2043
4/1 (A509 Portway (E))	4.00	0.00	N	Arm 5 Left Arm 9 Ahead	Inf 40.00	12.9 % 87.1 %	2087	2087
4/2 (A509 Portway (E))	4.00	0.00	N	Arm 9 Ahead	Inf	100.0 %	2155	2155
4/3 (A509 Portway (E))	4.00	0.00	Y	Arm 9 Ahead	40.00	100.0 %	1942	1942
5/1 (V11 Tongwell Street (S) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (V11 Tongwell Street (S) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (H5 A509 Portway (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
6/2 (H5 A509 Portway (W) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/3 (H5 A509 Portway (W) Lane 3)	Infinite Saturation Flow						Inf	Inf
7/1 (V11 Tongwell Street (N) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/2 (V11 Tongwell Street (N) Lane 2)	Infinite Saturation Flow						Inf	Inf
8/1 (A509 Portway (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/2 (A509 Portway (E) Lane 2)	Infinite Saturation Flow						Inf	Inf

9/1 ((Internal))	4.00	0.00	Y	Arm 6 Ahead	Inf	100.0 %	2015	2015
9/2 ((Internal))	4.00	0.00	Y	Arm 6 Ahead	Inf	100.0 %	2015	2015
9/3 ((Internal))	4.00	0.00	Y	Arm 6 Ahead	Inf	47.6 %	2015	2015
				Arm 10 Right	Inf	52.4 %		
10/1 ((Internal))	3.75	0.00	Y	Arm 7 Ahead	Inf	100.0 %	1990	1990
10/2 ((Internal))	3.75	0.00	N	Arm 7 Ahead	Inf	35.6 %	2130	2130
				Arm 11 Right	Inf	64.4 %		
11/1 ((Internal))	3.25	0.00	Y	Arm 8 Ahead	Inf	100.0 %	1940	1940
11/2 ((Internal))	4.00	0.00	N	Arm 8 Ahead	Inf	100.0 %	2155	2155
11/3 ((Internal))	4.00	0.00	N	Arm 12 Right	Inf	100.0 %	2155	2155
12/1 ((Internal))	3.75	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1990	1990
12/2 ((Internal))	3.75	0.00	N	Arm 5 Ahead	Inf	100.0 %	2130	2130
12/3 ((Internal))	3.75	0.00	N	Arm 9 Right	Inf	100.0 %	2130	2130

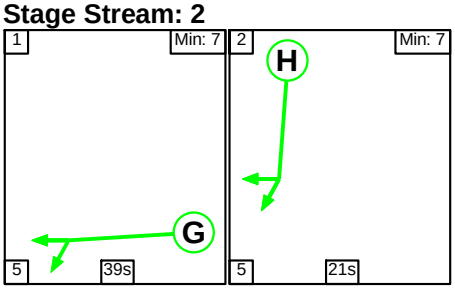
Scenario 5: '2048 Do Something AM - Tongwell St SB Alt' (FG5: '2048 Do Something AM - Tongwell St SB Alt', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

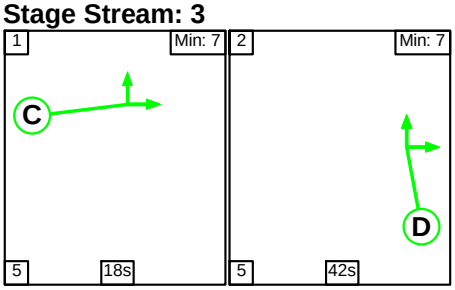
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	33	27
Change Point	41	9

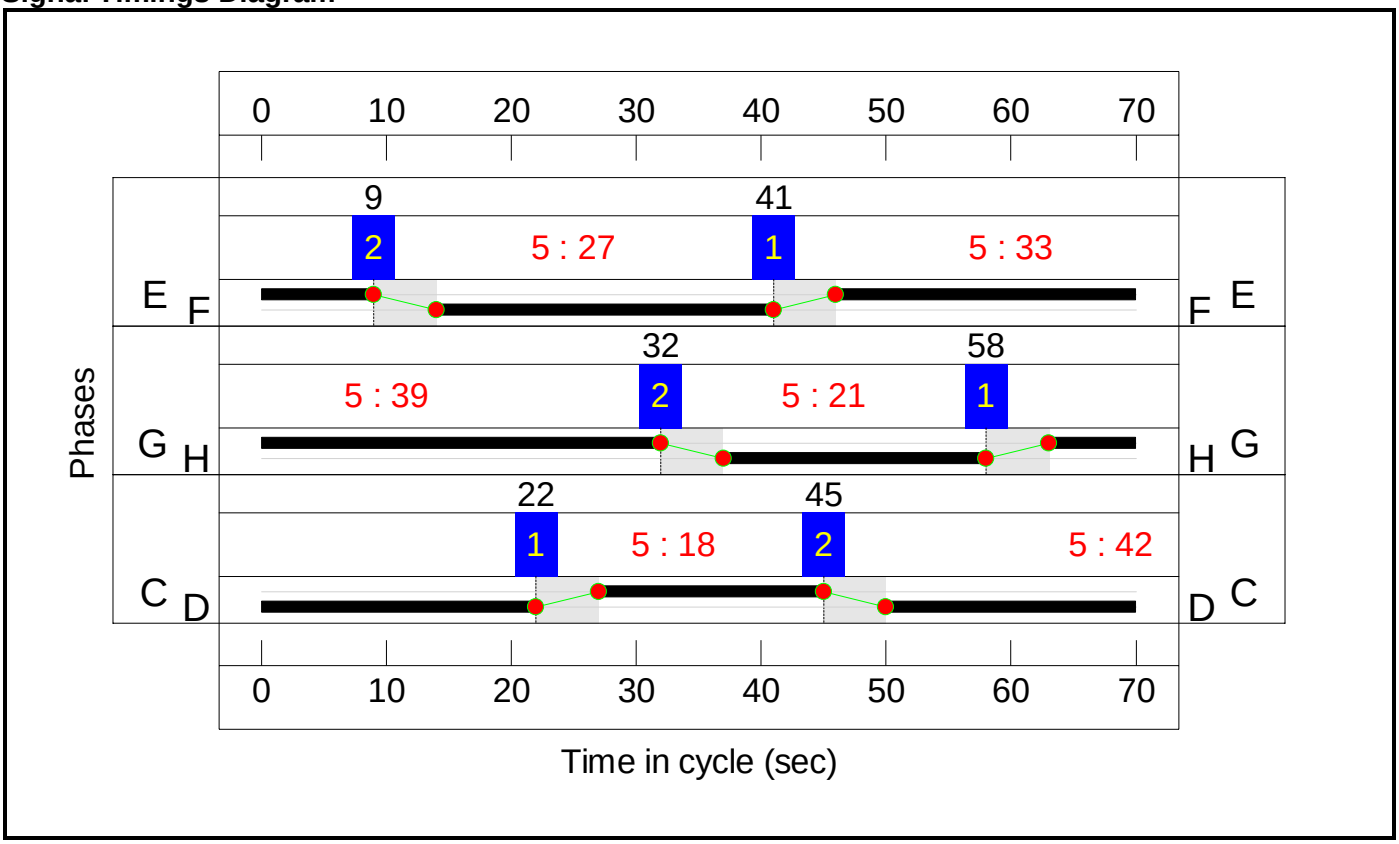
Stage Stream: 2

Stage	1	2
Duration	39	21
Change Point	58	32

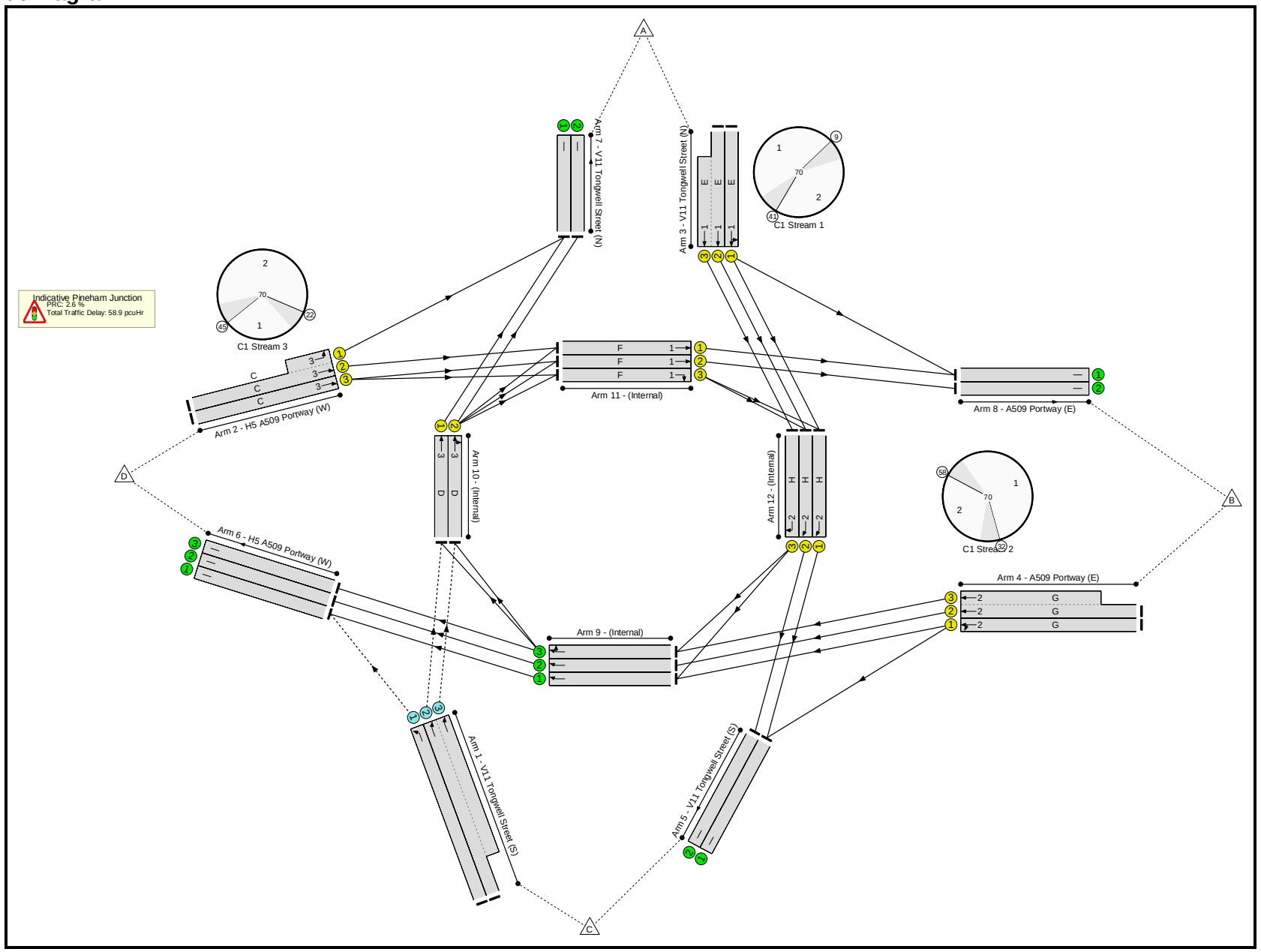
Stage Stream: 3

Stage	1	2
Duration	18	42
Change Point	22	45

Signal Timings Diagram



Network Layout Diagram



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: Pineham Roundabout (mitigated)	-	-	**N/A**	-	-		-	-	-	-	-	-	**87.7%**
Indicative Pineham Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**87.7%**
1/1	V11 Tongwell Street (S) Left	O	N/A	N/A	-		-	-	-	346	1862	502	68.9%
1/2+1/3	V11 Tongwell Street (S) Ahead	O	N/A	N/A	-		-	-	-	498	1955:1955	290+290	84.4 : 87.1%
2/2+2/1	H5 A509 Portway (W) Left Ahead	U	3	N/A	C		1	18	-	435	2085:1945	529+48	75.5 : 75.5%
2/3	H5 A509 Portway (W) Ahead	U	3	N/A	C		1	18	-	493	2085	566	87.1%
3/1	V11 Tongwell Street (N) Left Ahead	U	1	N/A	E		1	33	-	805	1928	936	86.0%
3/2+3/3	V11 Tongwell Street (N) Ahead	U	1	N/A	E		1	33	-	760	2120:2043	827+513	56.7 : 56.7%
4/1	A509 Portway (E) Left Ahead	U	2	N/A	G		1	39	-	949	2083	1190	79.7%
4/2+4/3	A509 Portway (E) Ahead	U	2	N/A	G		1	39	-	1148	2155:1942	252+1057	87.7 : 87.7%
5/1	V11 Tongwell Street (S)	U	N/A	N/A	-		-	-	-	379	Inf	Inf	0.0%
5/2	V11 Tongwell Street (S)	U	N/A	N/A	-		-	-	-	472	Inf	Inf	0.0%
6/1	H5 A509 Portway (W)	U	N/A	N/A	-		-	-	-	1390	Inf	Inf	0.0%
6/2	H5 A509 Portway (W)	U	N/A	N/A	-		-	-	-	221	Inf	Inf	0.0%

6/3	H5 A509 Portway (W)	U	N/A	N/A	-		-	-	-	118	Inf	Inf	0.0%
7/1	V11 Tongwell Street (N)	U	N/A	N/A	-		-	-	-	714	Inf	Inf	0.0%
7/2	V11 Tongwell Street (N)	U	N/A	N/A	-		-	-	-	651	Inf	Inf	0.0%
8/1	A509 Portway (E)	U	N/A	N/A	-		-	-	-	1009	Inf	Inf	0.0%
8/2	A509 Portway (E)	U	N/A	N/A	-		-	-	-	480	Inf	Inf	0.0%
9/1	(Internal) Ahead	U	N/A	N/A	-		-	-	-	1044	2015	2015	51.8%
9/2	(Internal) Ahead	U	N/A	N/A	-		-	-	-	221	2015	2015	11.0%
9/3	(Internal) Ahead Right	U	N/A	N/A	-		-	-	-	1045	2015	2015	51.9%
10/1	(Internal) Ahead	U	3	N/A	D		1	42	-	678	1990	1222	55.5%
10/2	(Internal) Ahead Right	U	3	N/A	D		1	42	-	747	2130	1308	57.1%
11/1	(Internal) Ahead	U	1	N/A	F		1	27	-	430	1940	776	55.4%
11/2	(Internal) Ahead	U	1	N/A	F		1	27	-	480	2155	862	55.7%
11/3	(Internal) Right	U	1	N/A	F		1	27	-	78	2155	862	9.0%
12/1	(Internal) Ahead	U	2	N/A	H		1	21	-	301	1990	625	48.1%
12/2	(Internal) Ahead	U	2	N/A	H		1	21	-	472	2130	669	70.5%
12/3	(Internal) Right	U	2	N/A	H		1	21	-	291	2130	669	43.5%

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: Pineham Roundabout (mitigated)	**-**	**-**	**1342**	**0**	**0**	**35.7**	**23.2**	**0.0**	**58.9**	**-**	**-**	**-**	**-**
Indicative Pineham Junction	**-**	**-**	**1342**	**0**	**0**	**35.7**	**23.2**	**0.0**	**58.9**	**-**	**-**	**-**	**-**
1/1	346	346	346	0	0	1.1	1.1	-	2.2	22.8	4.9	1.1	6.0
1/2+1/3	498	498	996	0	0	2.6	2.8	-	5.4	38.9	4.0	2.8	6.8
2/2+2/1	435	435	-	-	-	2.8	1.5	-	4.3	35.4	7.2	1.5	8.7
2/3	493	493	-	-	-	3.3	3.1	-	6.4	47.1	9.0	3.1	12.2
3/1	805	805	-	-	-	3.6	2.9	-	6.5	29.0	13.6	2.9	16.6
3/2+3/3	760	760	-	-	-	2.4	0.7	-	3.1	14.6	6.0	0.7	6.6
4/1	949	949	-	-	-	3.1	1.9	-	5.0	19.2	14.5	1.9	16.4
4/2+4/3	1148	1148	-	-	-	3.6	3.4	-	7.0	22.0	14.7	3.4	18.1
5/1	379	379	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	472	472	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1390	1390	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	221	221	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/3	118	118	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	714	714	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	651	651	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1009	1009	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	480	480	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	1044	1044	-	-	-	0.0	0.5	-	0.5	1.9	0.0	0.5	0.5
9/2	221	221	-	-	-	0.0	0.1	-	0.1	1.0	0.0	0.1	0.1
9/3	1045	1045	-	-	-	0.0	0.5	-	0.5	1.9	0.0	0.5	0.5
10/1	678	678	-	-	-	1.4	0.6	-	2.0	10.6	7.5	0.6	8.1
10/2	747	747	-	-	-	1.6	0.7	-	2.2	10.7	8.1	0.7	8.7

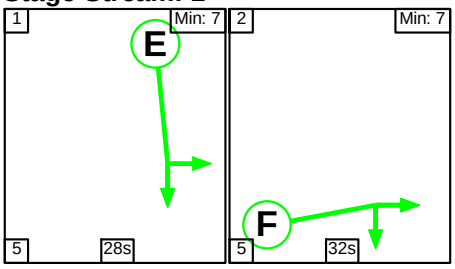
11/1	430	430	-	-	-	1.6	0.6	-	2.2	18.3	2.9	0.6	3.5
11/2	480	480	-	-	-	2.3	0.6	-	2.9	22.1	4.5	0.6	5.1
11/3	78	78	-	-	-	0.4	0.0	-	0.4	18.5	0.6	0.0	0.7
12/1	301	301	-	-	-	2.1	0.5	-	2.5	30.4	4.5	0.5	5.0
12/2	472	472	-	-	-	2.8	1.2	-	3.9	30.1	4.7	1.2	5.9
12/3	291	291	-	-	-	1.2	0.4	-	1.6	19.7	2.3	0.4	2.6

C1	Stream: 1 PRC for Signalled Lanes (%):	4.7	Total Delay for Signalled Lanes (pcuHr):	15.09	Cycle Time (s): 70
C1	Stream: 2 PRC for Signalled Lanes (%):	2.6	Total Delay for Signalled Lanes (pcuHr):	20.16	Cycle Time (s): 70
C1	Stream: 3 PRC for Signalled Lanes (%):	3.3	Total Delay for Signalled Lanes (pcuHr):	14.94	Cycle Time (s): 70
	PRC Over All Lanes (%):	2.6	Total Delay Over All Lanes(pcuHr):	58.88	

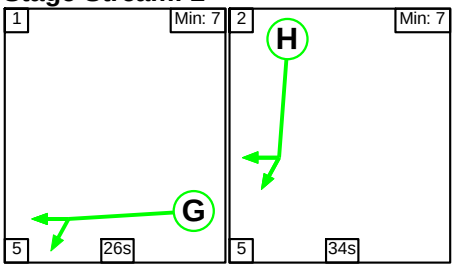
Scenario 6: '2048 Do Something PM - Tongwell St SB Alt' (FG6: '2048 Do Something PM - Tongwell St SB Alt', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

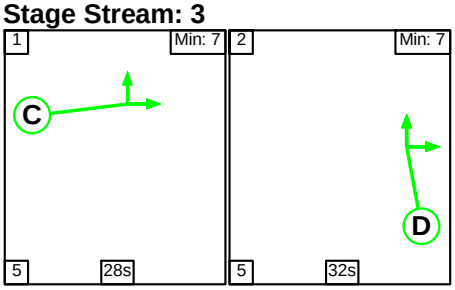
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

Stage	1	2
Duration	28	32
Change Point	7	40

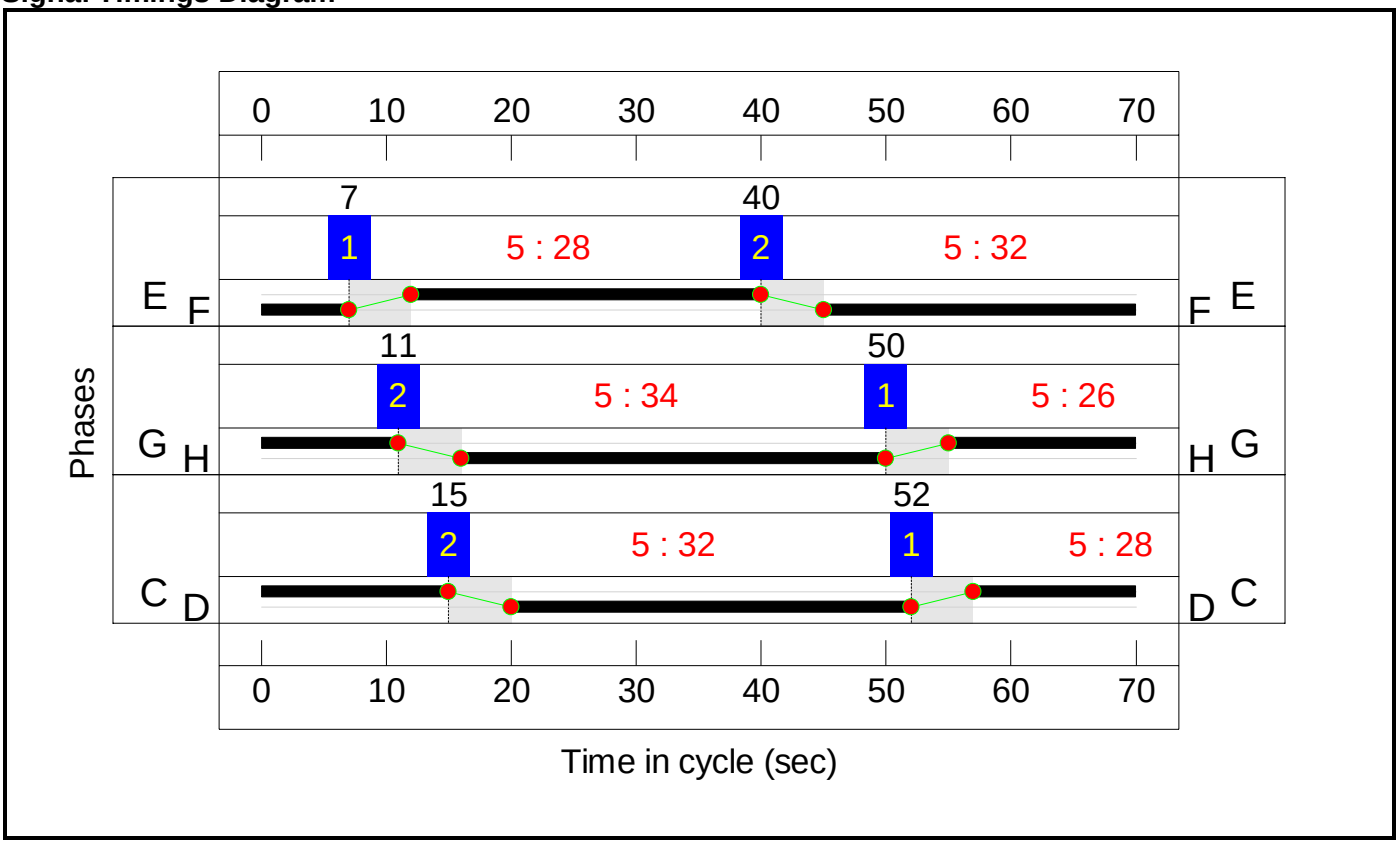
Stage Stream: 2

Stage	1	2
Duration	26	34
Change Point	50	11

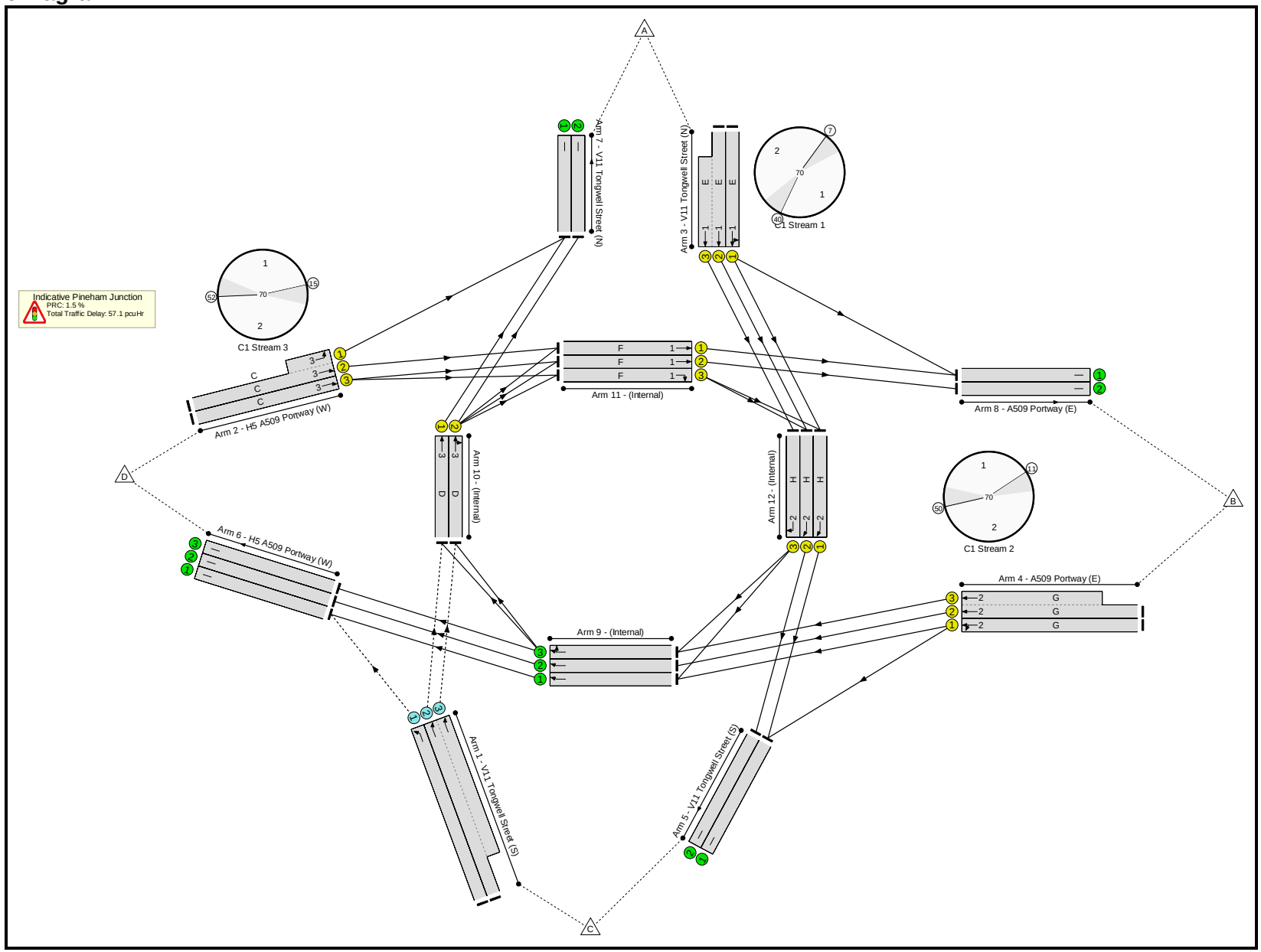
Stage Stream: 3

Stage	1	2
Duration	28	32
Change Point	52	15

Signal Timings Diagram



Network Layout Diagram



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: Pineham Roundabout (mitigated)	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.7%**
Indicative Pineham Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.7%**
1/1	V11 Tongwell Street (S) Left	O	N/A	N/A	-		-	-	-	651	1862	897	72.6%
1/2+1/3	V11 Tongwell Street (S) Ahead	O	N/A	N/A	-		-	-	-	1007	1955:1955	611+611	79.3 : 85.4%
2/2+2/1	H5 A509 Portway (W) Left Ahead	U	3	N/A	C		1	28	-	940	2085:1945	559+509	88.1 : 88.1%
2/3	H5 A509 Portway (W) Ahead	U	3	N/A	C		1	28	-	644	2085	864	74.6%
3/1	V11 Tongwell Street (N) Left Ahead	U	1	N/A	E		1	28	-	653	1920	795	82.1%
3/2+3/3	V11 Tongwell Street (N) Ahead	U	1	N/A	E		1	28	-	934	2120:2043	781+272	88.7 : 88.7%
4/1	A509 Portway (E) Left Ahead	U	2	N/A	G		1	26	-	404	2087	805	50.2%
4/2+4/3	A509 Portway (E) Ahead	U	2	N/A	G		1	26	-	905	2155:1942	831+749	56.8 : 57.8%
5/1	V11 Tongwell Street (S)	U	N/A	N/A	-		-	-	-	335	Inf	Inf	0.0%
5/2	V11 Tongwell Street (S)	U	N/A	N/A	-		-	-	-	717	Inf	Inf	0.0%
6/1	H5 A509 Portway (W)	U	N/A	N/A	-		-	-	-	1194	Inf	Inf	0.0%
6/2	H5 A509 Portway (W)	U	N/A	N/A	-		-	-	-	472	Inf	Inf	0.0%

6/3	H5 A509 Portway (W)	U	N/A	N/A	-		-	-	-	230	Inf	Inf	0.0%
7/1	V11 Tongwell Street (N)	U	N/A	N/A	-		-	-	-	1051	Inf	Inf	0.0%
7/2	V11 Tongwell Street (N)	U	N/A	N/A	-		-	-	-	234	Inf	Inf	0.0%
8/1	A509 Portway (E)	U	N/A	N/A	-		-	-	-	1197	Inf	Inf	0.0%
8/2	A509 Portway (E)	U	N/A	N/A	-		-	-	-	708	Inf	Inf	0.0%
9/1	(Internal) Ahead	U	N/A	N/A	-		-	-	-	543	2015	2015	26.9%
9/2	(Internal) Ahead	U	N/A	N/A	-		-	-	-	472	2015	2015	23.4%
9/3	(Internal) Ahead Right	U	N/A	N/A	-		-	-	-	483	2015	2015	24.0%
10/1	(Internal) Ahead	U	3	N/A	D		1	32	-	603	1990	938	64.3%
10/2	(Internal) Ahead Right	U	3	N/A	D		1	32	-	657	2130	1004	65.4%
11/1	(Internal) Ahead	U	1	N/A	F		1	32	-	656	1940	915	71.7%
11/2	(Internal) Ahead	U	1	N/A	F		1	32	-	708	2155	1016	69.7%
11/3	(Internal) Right	U	1	N/A	F		1	32	-	195	2155	1016	19.2%
12/1	(Internal) Ahead	U	2	N/A	H		1	34	-	283	1990	995	28.4%
12/2	(Internal) Ahead	U	2	N/A	H		1	34	-	717	2130	1065	67.3%
12/3	(Internal) Right	U	2	N/A	H		1	34	-	241	2130	1065	22.6%

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: Pineham Roundabout (mitigated)	**-**	**-**	**2665**	**0**	**0**	**35.3**	**21.8**	**0.0**	**57.1**	**-**	**-**	**-**	**-**
Indicative Pineham Junction	**-**	**-**	**2665**	**0**	**0**	**35.3**	**21.8**	**0.0**	**57.1**	**-**	**-**	**-**	**-**
1/1	651	651	651	0	0	0.5	1.3	-	1.8	10.0	5.2	1.3	6.6
1/2+1/3	1007	1007	2014	0	0	3.9	2.3	-	6.1	21.9	9.0	2.3	11.3
2/2+2/1	940	940	-	-	-	4.3	3.5	-	7.8	29.9	11.4	3.5	14.9
2/3	644	644	-	-	-	3.1	1.4	-	4.6	25.5	10.6	1.4	12.0
3/1	653	653	-	-	-	3.3	2.2	-	5.5	30.5	11.2	2.2	13.5
3/2+3/3	934	934	-	-	-	4.4	3.7	-	8.1	31.2	12.9	3.7	16.5
4/1	404	404	-	-	-	1.8	0.5	-	2.3	20.9	5.9	0.5	6.5
4/2+4/3	905	905	-	-	-	4.3	0.7	-	4.9	19.6	7.2	0.7	7.9
5/1	335	335	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	717	717	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1194	1194	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	472	472	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/3	230	230	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	1051	1051	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/2	234	234	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1197	1197	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	708	708	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	543	543	-	-	-	0.0	0.2	-	0.2	1.2	0.0	0.2	0.2
9/2	472	472	-	-	-	0.0	0.2	-	0.2	1.3	4.5	0.2	4.7
9/3	483	483	-	-	-	0.0	0.2	-	0.2	1.2	0.0	0.2	0.2
10/1	603	603	-	-	-	1.9	0.9	-	2.8	16.9	6.3	0.9	7.2
10/2	657	657	-	-	-	2.5	0.9	-	3.4	18.7	7.4	0.9	8.3

11/1	656	656	-	-	-	1.9	1.3	-	3.2	17.3	5.6	1.3	6.8
11/2	708	708	-	-	-	2.1	1.1	-	3.3	16.6	7.3	1.1	8.4
11/3	195	195	-	-	-	0.5	0.1	-	0.6	11.3	1.1	0.1	1.2
12/1	283	283	-	-	-	0.7	0.2	-	0.9	11.1	3.1	0.2	3.3
12/2	717	717	-	-	-	0.1	1.0	-	1.1	5.6	0.6	1.0	1.7
12/3	241	241	-	-	-	0.0	0.1	-	0.1	2.2	0.0	0.1	0.2

C1	Stream: 1 PRC for Signalled Lanes (%):	1.5	Total Delay for Signalled Lanes (pcuHr):	20.65	Cycle Time (s): 70
C1	Stream: 2 PRC for Signalled Lanes (%):	33.7	Total Delay for Signalled Lanes (pcuHr):	9.40	Cycle Time (s): 70
C1	Stream: 3 PRC for Signalled Lanes (%):	2.2	Total Delay for Signalled Lanes (pcuHr):	18.62	Cycle Time (s): 70
	PRC Over All Lanes (%):	1.5	Total Delay Over All Lanes(pcuHr):	57.12	

Mountbatten House
Basing View
Basingstoke, Hampshire
RG21 4HJ

wsp.com