transport assessment addendum

COUNTRYSIDE PROPERTIES (UK) LIMITED

LAND SOUTH OF SUTTON ROAD, LANGLEY
MBC REF: MBC/15/509015/OUT

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PL/10296

Contents

Appendices

1 Introduction

1.1.1 This Transport Assessment Addendum has been prepared by DHA Transport (DHAT) on behalf of Countryside Properties (UK) Limited, following receipt of comments from Kent County Council Highways and Transportation (KCC H&T) and Maidstone Borough Council (MBC)'s transport consultants, Mott MacDonald, in respect to Planning Application Reference: MBC/15/509015/OUT – Land South of Sutton Road, Langley, Kent. It provides a technical response to the principal issues raised by these parties with a view to resolving their outstanding queries and concerns. KCC H&T's consultation response is replicated in full at **Appendix A**.

1.1.2 A meeting between representatives of KCC H&T, MBC, Mott MacDonald, JCT Consultancy and DHAT was held on Wednesday 3rd February 2016 to discuss DHAT's initial technical response to KCC H&T's comments. During the course of discussions at this meeting, it was possible to resolve a number of the Local Highway Authority's queries and concerns. DHAT's technical response and the agreed meeting notes are also included at **Appendix A**.

1.1.3 The principal issues that remain to be resolved can be summarised as follows:-

- The need for a revised trip generation assessment, based on the trip rates agreed by KCC H&T in respect to the adjacent Langley Park residential development, and assuming the actual number of dwelling units now proposed for Land South of Sutton Road and the surrounding committed and proposed developments;
- The need to take explicit account of the non-residential land uses proposed for Land South of Sutton Road in the revised trip generation assessment;
- The need for further junction capacity modelling, based on the revised trip generation assessment described above, to determine the residual cumulative impact of the proposed development, in combination with the surrounding committed and proposed developments, on the local highway network;
- The need for clarification from KCC H&T officers regarding their view that the LinSig junction capacity software cannot accurately model over-capacity situations, together with guidance as to how this issue can be overcome;
- The need for confirmation of the impact of the revised site masterplan for Land South of Sutton Road on multi-mode accessibility to the proposed development.

1.1.4 Each of these issues shall be addressed in turn in the following sections of this report.

2 Revised Trip Generation Assessment

2.1 Overview

2.1.1 As has been noted, a revised site masterplan has been prepared for Land South of Sutton Road in response to consultee comments on the outline planning application. This has resulted in a reduced development yield of up to 750 dwelling units, rather than the 800 dwelling units for which planning consent was originally sought.

2.1.2 The trip generation assessment presented in the TA accompanying the planning application was based on a residential development of 950 dwelling units, which was considered by DHAT to represent a highly robust position which would also account for the limited trip generation potential of the proposed non-residential on-site uses during the AM and PM network peak hours. However, KCC H&T and Mott MacDonald have requested that a revised trip generation assessment be undertaken, based on the trip rates agreed by KCC H&T in respect to the adjacent Langley Park residential development, and assuming the actual number of dwelling units now proposed for Land South of Sutton Road and the surrounding committed developments. The forecast trip generation of the non-residential on-site uses has also been requested on a standalone basis.

2.1.3 This section outlines the revised methodology employed to calculate the likely vehicle trip generation that would result from the proposed development.

2.2 Residential Uses

2.2.1 The TA accompanying the outline planning application in respect to Land at Langley Park (Reference: MA/13/1149), produced by i-Transport, has been interrogated to identify the residential trip rates applied in the trip generation assessment. These trip rates were sourced from the TRICS 2013(a) database, with sites from all regions of England (excluding Greater London) and all locations except town centres and edge of town centres selected. The average peak hour trip rates for the categories '03-RESIDENTIAL, K-MIXED PRIVATE HOUSING' and '03-RESIDENTIAL, L-MIXED NON PRIVATE HOUSING' are shown in Table 2-1 and Table 2-2 below.

Period	Arrivals	Departures	Total
AM Peak	0.149	0.422	0.571
PM Peak	0.409	0.243	0.652

Table 2-1: Vehicle Trip Rates (veh. Trips/dwelling) for mixed private housing

Period	Arrivals	Departures	Total
AM Peak	0.067	0.230	0.297
PM Peak	0.299	0.184	0.483

Table 2-2: Vehicle Trip Rates (veh. Trips/dwelling) for mixed non-private housing

2.2.2 On the basis of the above analysis, the total peak hour trip generation of the revised development yield of 750 dwelling units – assuming that 30 per cent of the proposed dwelling units would comprise non-private housing, in accordance with Policy DM13 of the Regulation 19 (Publication) Draft Maidstone Local Plan – is shown in Table 2-3 below.

Period	Arrivals	Departures	Total
AM Peak	93	273	367
PM Peak	282	169	451

Table 2-3: Total Vehicle Trips (750 dwellings)

2.2.3 These vehicle trips have been distributed proportionately against the routes taken by journey purpose (as described in detail in the TA accompanying the planning application) and added to the spreadsheet traffic model for the future year 2029 scenarios to re-assess the level of impact on the local highway network.

2.3 Non-Residential Uses

2.3.1 The methodology used by DHAT to forecast the vehicular trip generation and distribution of the proposed 2 Form Entry (2FE) on-site primary school has been accepted by the Local Highway Authority. For completeness, the AM peak hour trip generation of the school used in this assessment is replicated in Table 2-4 below.

Period	Arrivals	Departures	Total
AM Peak	101	88	189

Table 2-4: 2FE Primary School AM Peak Hour Vehicle Trips

2.3.2 Outline planning permission is also sought for an A1 convenience food store (418sqm), two A1 retail units (88sqm each), a C2 residential care facility (60 Units), and a D1 medical (700 sqm) use.

2.3.3 The C2 residential care facility is an 'extra care' type format as opposed to a conventional care home. This part of the scheme would comprise 60 flat type units within a single block, with those residents benefitting from a warden and other care specialists throughout the day. The level of trips expected for this type of use would be very low, particularly in the peak hours. However, full residential trip rates have been assumed for this use (which is included within the 750 dwelling units considered above), thus presenting a robust position.

2.3.4 The TRICS 2015 (v.7.2.4) database has been interrogated to identify the average peak hour trip rates for each of the commercial land uses. Sites from all regions of England (excluding Greater London) and all locations except town centres and edge of town centres have again been selected. The average peak hour trip rates for the categories '01-RETAIL, I-SHOPPING CENTRE – LOCAL SHOPS' and '05-HEALTH, G-GP SURGERIES' are shown in Table 2-5 below. Please note that the trip rates for the doctors surgery have been identified on the assumption that four GPs would operate from this facility, based on discussions with the local NHS Clinical Commissioning Group.

Period	Arrivals	Departures	Total
Convenience Retail Store (veh. trips/100sqm)			
AM Peak	7.561	7.005	14.566
PM Peak	10.156	9.822	19.978
Local Shops (veh. trips/100sqm)			
AM Peak	5.791	5.580	11.371
PM Peak	6.296	6.954	13.250
GP Surgery (veh. trips/doctor)			
AM Peak	4.304	2.391	6.695
PM Peak	2.522	3.435	5.957

Table 2-5: Vehicle Trip Rates for non-residential uses

2.3.5 It is noted that the non-residential uses will primarily serve the residents of the proposed development and those immediately adjacent to it within South East Maidstone. On this basis, appropriate internalisation factors have been applied to the above trip rates, as described in Table 2-6 below.

Land Use	Internalisation Factor	Justification
A1 Retail	75%	Small-scale, convenience uses within 'village centre', set back from site frontage, with limited car parking. Larger-scale retail facilities situated on frontage of adjacent Langley Park development likely to draw majority of pass-by / diverted trips. Justification based on TRICS Research Report 95/2.
D1 Medical	25%	Data from the GP workforce census and patient population data from the Health and Social Care Information Centre indicate that there are approximately 1,700-1,900 patients per GP in Maidstone.[1] On this basis, the proposed development of up to 750 dwelling units would equate to a need for approximately one GP (assuming 2.4 persons per household). It is therefore assumed that the three remaining GPs to be based within the proposed medical centre would receive patients from outside of the development.

Table 2-6: Non-Residential Use Internalisation Factors

2.3.6 Based on these assumptions, the total peak hour trip generation of the proposed non-residential site uses is shown in Table 2-7 below.

[1] See http://www.gponline.com/exclusive-huge-variation-gp-patient-ratio-across-england-revealed/article/1327390

Period	Arrivals	Departures	Total
Convenience Retail Store (veh. trips)			
AM Peak	8	7	15
PM Peak	11	10	21
Local Shops (veh. trips)			
AM Peak	3	2	5
PM Peak	3	3	6
GP Surgery (veh. trips)			
AM Peak	13	7	20
PM Peak	8	10	18

Table 2-7: Total Non-Residential Vehicle Trips

2.3.7 The non-residential trips generated by the proposed development have been distributed via main routes to and from the site based on DHAT's professional judgement and local experience. The distribution of convenience and local shops trips is anticipated to extend to the southern extent of the study network under consideration, while on the northern extent the consideration extends to the A274 Sutton Road / Wallace Avenue / Willington Street junctions and no further. This is on the basis that other convenience and local shop offers are evident in these locations and therefore it is highly unlikely that people would travel to the proposal site from these areas for shopping purposes. The same approach is taken for the GP surgery, given the widely distributed population to the south east and the more dense population to the north.

2.3.8 On the basis of the above analysis, the total forecast trip generation of the revised development masterplan is shown graphically for the AM and PM peaks in **Appendix B**.

2.4 Residual Trip Generation

2.4.1 The residual peak hour trip generation can be calculated by subtracting the total vehicle trip generation presented in the original TA from the revised development masterplan total vehicle trip generation. The outcome of this exercise is shown in Table 2-8 below. A positive figure indicates that the revised development masterplan would generate a greater number of vehicle trips than the previous masterplan, and vice versa.

Period	Arrivals	Departures	Total
AM Peak	-33	+30	+4
PM Peak	+26	+30	+56

Table 2-8: Residual Vehicle Trip Generation

2.4.2 The above table demonstrates that the revised development proposals would generate just four additional trips in the morning peak hour compared to the submitted TA figure. In the evening peak hour the revisions would generate an additional 56 vehicle trips, which equate to approximately one additional vehicle movement per minute. These net impacts are considered to be negligible and not significant in highway capacity terms.

2.5 Committed Development

2.5.1 In the period since the TA accompanying the planning application was prepared, further planning applications for residential development on the adjacent Bicknor Farm and Land North of Bicknor Wood sites have been submitted to MBC. It is noted that the number of dwellings for which planning consent is sought on these sites is different to the numbers which are allowed for in the relevant policies of the Regulation 19 (Publication) Draft Maidstone Local Plan (and which were originally assumed in the TA). It has therefore been agreed with KCC H&T and Mott MacDonald that the application numbers will be assessed in this revised trip generation exercise, based on the vehicle trip rates utilised in their respective TAs. The trip distribution of these sites by journey purpose will remain as presented in the TA accompanying the planning application for Land South of Sutton Road.

2.5.2 With respect to the Bicknor Farm site, MBC Planning Application Reference 14/506264/FULL seeks consent for 272 residential dwelling units, as opposed to the 335 dwelling units provisionally allocated by Policy H1(9) of the Draft Maidstone Local Plan. The forecast trip generation of this development, as presented in the TA accompanying the planning application, is shown in Table 2-9 below.

Period	Arrivals	Departures	Total
AM Peak	34	98	132
PM Peak	83	51	135

Table 2-9: Bicknor Farm – Forecast Vehicle Trip Generation (272 dwellings)

2.5.3 With respect to the Land North of Bicknor Wood site, MBC Planning Application Reference 15/509251/OUT seeks consent for 250 residential dwelling units, as opposed to the 190 dwelling units provisionally allocated by Policy H1 (7) of the Draft Maidstone Local Plan. The forecast trip generation of this development, as presented in the TA accompanying the planning application, is shown in Table 2-10 below.

Period	Arrivals	Departures	Total
AM Peak	19	119	138
PM Peak	88	48	136

Table 2-10: Land North of Bicknor Wood – Forecast Vehicle Trip Generation (250 dwellings)

2.5.4 The vehicular trip generation and distribution associated with the other committed developments considered in the TA accompanying the planning application will remain unaltered.

3 Revised Highway Capacity Assessment

3.1 Overview

3.1.1 Notwithstanding the outcome of the revised development trip generation exercise, a further assessment of traffic capacity has been undertaken for junctions within the TA study area most impacted by the modified spreadsheet flows. Additionally, the A274 Sutton Road / Langley Park / Bicknor Farm roundabout has been included within this assessment, as agreed with KCC H&T and Mott MacDonald.

3.1.2 Junction capacity modelling has been carried out by JCT Consultancy Ltd assuming the 2029 Future Assessment Year only for either the Do Nothing scenario (background traffic growth, plus committed development) and/or either the Do Minimum scenario (committed development, plus the proposed development traffic) or the Do Something scenario (as above, plus mitigation – where proposed). The junction layout plans showing the proposed mitigation package are shown at **Appendix C.**

3.1.3 Junction capacity assessments for the signal junctions have been completed utilising industry-standard LinSig software, based on the signal timing data supplied by KCC and appended to the original TA accompanying the planning application. Capacity assessments for the roundabout junctions have been completed utilising industry-standard ARCADY software and those for the priority junctions have been completed utilising industry-standard PICADY software.

3.1.4 The full data output tables are included within the separate Appendices section of this report. The following summarises the junction performance on the basis of the Practical Reserve Capacity (PRC) unit of measure, which indicates relative performance for the junction as a whole.

3.1.5 Each of the junctions considered is addressed in turn below.

3.2 A274 Sutton Road / Wallis Avenue / Willington Street Signal Junctions

3.2.1 Whilst it is noted that the A274 Sutton Road / Wallis Avenue and A274 Sutton Road / Willington Street junctions are operated as standalone signal junctions by KCC H&T, in view of their close proximity, they have been modelled as one intersection in LinSig.

3.2.2 The results of the additional junction capacity modelling are summarised in Table 3-1 below. The LinSig output data is included at **Appendix D**. The results replicate the operation of the junction as presently managed by KCC.

Period		Comm (Do Nothing)		Comm + Dev (Do Minimum)		Comm+Dev (Do Something)	
		AM	PM	AM	PM	AM	PM
2029	Wallis Avenue	-38.2%	-46.4%	-51.4%	-46.4%	-10.1%	-19.9%
	Willington St	-43.7%	-45.9%	-52.5%	-68.8%	-23.4%	-30.6%
	Avg delay (s/pcu)	425.6	516.9	527.9	614.9	169.8	335.7

Table 3-1: A274 Sutton Road / Wallis Avenue Capacity Modelling Results (PRC%)

3.2.3 In terms of the way that the LinSig model has been constructed, the following sets out the standard approach taken on various input elements:

> *"**Intergreens:** The intergreens are taken from the controller specification form for the base model. Given that stopline and pedestrian crossing locations did not change in the proposed, these remained unchanged.*
>
> ***Link length:** The lane length has no impact in the model, as cruise times were entered directly. If the model used cruise speeds, lane length would be important. Regardless of lane length, the traffic model used in LinSig cannot directly model the impact of underutilised green due to blocking back. This was approximated in the model by adjusting the capacity of upstream lanes to be no more than the capacity + storage length of downstream lanes. This was done manually.*
>
> ***Flare lengths:** J1 1/1 is the left turn into Willington St, which appears to be 5 PCUs from site measurement (just over 30m), J1 3/1 is not a flare.*
>
> ***Proposed crossings:** These have no impact on the junction capacity, as they run in parallel with traffic phases (no additional lost time created by pedestrian intergreens either).*
>
> ***East flare:** The model took into account the presence of hatching on the flare, with anything upstream assumed to turn right into the car park. Both the base and proposed models made the same robust assumption.*
>
> ***Indicative Arrow:** Although an indicative arrow could be used, the current junction runs a fully signalled right turn. Therefore, the proposed model assumed the same. The authority could be reluctant to change this to an indicative arrow, particularly due to safety concerns (drivers now used to this being fully signalled would not expect to be opposed by oncoming traffic if this was changed)".*

3.2.4 It is noted that the provision of the mitigation measures identified in the TA continue to provide for a significant improvement in the operation of the junction relative to both the 2029 Do Nothing and Do Minimum scenarios, with large reductions in average delay per vehicle providing a meaningful degree of planning gain. Indeed, it is evident that KCC H&T is promoting a similar scheme of capacity improvements for the junction as part of the Maidstone Integrated Transport Package for which it has recently secured Local Growth Funding, as will be detailed further in Section 3.6 of this report.

3.3 A274 Sutton Road / Langley Park / Bicknor Farm Roundabout

3.3.1 The results of the junction capacity modelling for this intersection are summarised in Table 3-2 below, based on geometric parameters taken from the TAs accompanying the Langley Park and Bicknor Farm planning applications, the layout for which can be found at **Appendix E**. The ARCADY output data is also included at **Appendix E**.

Year	Junction Arm	Comm+Dev (Do Minimum)			
		AM		PM	
		RFC	Q	RFC	Q
2029	Sutton Road (E)	0.751	3.1	0.696	2.3
	Langley Park	0.551	1.3	0.292	0.4
	Sutton Road (W)	0.722	2.7	0.883	7.2
	Bicknor Farm	0.207	0.3	0.138	0.2
	Avg Delay (s/pcu)	10.11		14.22	

Table 3-2: A274 Sutton Road / Langley Park / Bicknor Farm Rbt Capacity Modelling Results

3.3.2 It is noted that the junction is forecast to operate within capacity on all arms during the 2029 AM and PM peak hours.

3.3.3 It is evident that the Bicknor Farm site enjoys a direct frontage to Sutton Road and therefore there is the potential for the applicant to resize the roundabout accordingly in order to adequately accommodate the forecast vehicle flows arising from the allocated sites in the Draft Maidstone Local Plan.

3.4 A274 Sutton Road / Site Access Roundabout

3.4.1 The results of the additional junction capacity modelling for this intersection are summarised in Table 3-3 below. The ARCADY output data is included at **Appendix F**. Please note that this modelling assumes that all development traffic will utilise this access following the removal of the eastern site access roundabout from the revised development masterplan (see below).

Year	Junction Arm	Comm+Dev (Do Minimum)			
		AM		PM	
		RFC	Q	RFC	Q
2029	Sutton Road (S)	0.835	5.1	0.832	4.9
	Site Access	0.733	2.9	0.747	3.0
	Sutton Road (N)	0.388	0.7	0.200	0.3
	Avg Delay (s/pcu)	13.76		13.30	

Table 3-3: A274 Sutton Road / Site Access Roundabout Capacity Modelling Results

3.4.2 It is noted that the junction is forecast to operate within capacity on all arms during the 2029 AM and PM peak hours, with minimal delay to road users.

3.4.3 In respect of the eastern site access, which is proposed to serve buses only, a PICADY as assessment has been conducted the detailed results for which can be found at **Appendix G**, while a summary is provided at Table 3-4.

Year	Junction Arm	Comm+Dev (Do Minimum)			
		AM		PM	
		RFC	Q	RFC	Q
2029	Sutton Road (N)	0.000	0.00	0.000	0.00
	Site Access	0.007	0.01	0.007	0.01
	Avg Delay (s/pcu)	11.4		11.7	

Table 3-4: A274 Sutton Road / Eastern Site Access Capacity Modelling Results

3.4.4 It is noted that the junction would operate well within its design capacity in view of the very limited demand upon the side road arm from bus services entering and leaving the proposal site. The model output indicates that the average delay to buses exiting the site would be 22.8 seconds in the AM peak hour and 23.4 seconds in the PM peak hour, which is not considered to represent a significant delay.

3.4.5 It is further reiterated that DHAT's discussions with Arriva have confirmed that would be prepared for the Route 12 bus service (Maidstone to Tenterden via Headcorn) to utilise this junction.

3.5 A274 Sutton Road / Horseshoes Lane Priority Junction

3.5.1 The results of the additional junction capacity modelling for this intersection are summarised in Table 3-5 below. The calculated adjustments to input parameters are set out in **Appendix H** along with the full PICADY outputs.

Year	Junction Arm	Comm (Do Nothing)				Comm+Dev (Do Minimum)			
		AM		PM		AM		PM	
		RFC	Q	RFC	Q	RFC	Q	RFC	Q
2029	Horseshoes Lane	0.973	9.34	0.687	2.05	1.104	18.96	0.863	4.68
	Sutton Road (N)	0.035	0.05	0.082	0.15	0.037	0.05	0.087	0.17
	Avg Delay (s/pcu)	128.33		33.81		233.96		69.30	

Table 3-5: A274 Sutton Road / Horseshoes Lane Capacity Modelling Results

3.5.2 Please note that the traffic modelling for this junction uses Passenger Car Units (PCU) rather than total vehicles and HGV proportions. The two different methods of calculation yield insignificant difference when reviewing modelling results.

3.5.3 The modelling demonstrates that the proposed development would slightly exacerbate the over-capacity situation in the 2029 AM peak hour scenario on the Horseshoes Lane arm of the junction. On this basis, and in response to a request from KCC H&T, a potential scheme of mitigation involving the localised widening of the Horseshoes Lane arm of the junction to separate right and left turning vehicles has been subjected to further capacity analysis.

3.5.4 A feasibility design of these layout modifications, which are fully achievable within land under the control of the Local Highway Authority, is included at **Appendix I**.

3.5.5 The results of this further analysis are summarised in Table 3-6 below for the Do Something scenario.

Year	Junction Arm	Comm+Dev (Do Something)			
		AM		PM	
		RFC	Q	RFC	Q
2029	Horseshoes Lane	0.872	5.01	0.685	2.02
	Sutton Road (N)	0.037	0.05	0.087	0.17
	Avg Delay (s/pcu)	73.90		30.98	

Table 3-6: A274 Sutton Road / Horseshoes Lane Capacity Modelling Results

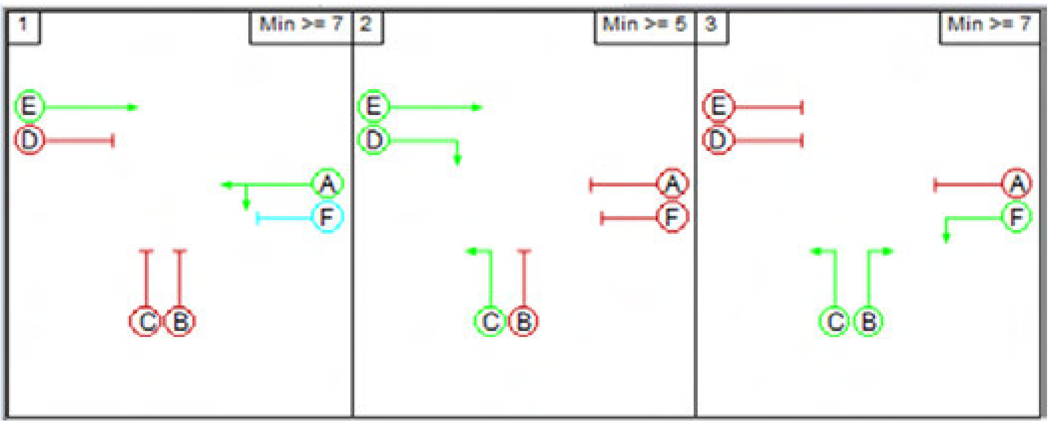
3.5.6 Whilst it is evident that this scheme of mitigation would fully address the effects of the proposed development traffic on this junction, it should be noted that DHAT's overarching approach with respect to the highway network to the south and east of the site has been to 'lock in' the established desire lines towards Maidstone Town Centre and M20 Junction 7 by concentrating highway and public transport mitigation measures on these corridors, which are of a more appropriate standard to cater for increased demand.

3.5.7 It has been established that there is limited demand for travel to the south and east of the proposed development in the AM and PM peak hours, and strong resistance from the residents of Leeds and Langley to measures that might increase the attractiveness of the B2163 corridor. As such, there is a risk that the proposed scheme of mitigation for the A274 Sutton Road / Horseshoes Lane junction could lead to induced demand for travel through these villages, as well as a degree of trip reassignment from the B2163 Leeds Road at the Five Wents junction to Horseshoes Lane, which is a less suitable route for through traffic due to its restricted width and residential character.

3.6 Willington Street / A20 Ashford Road

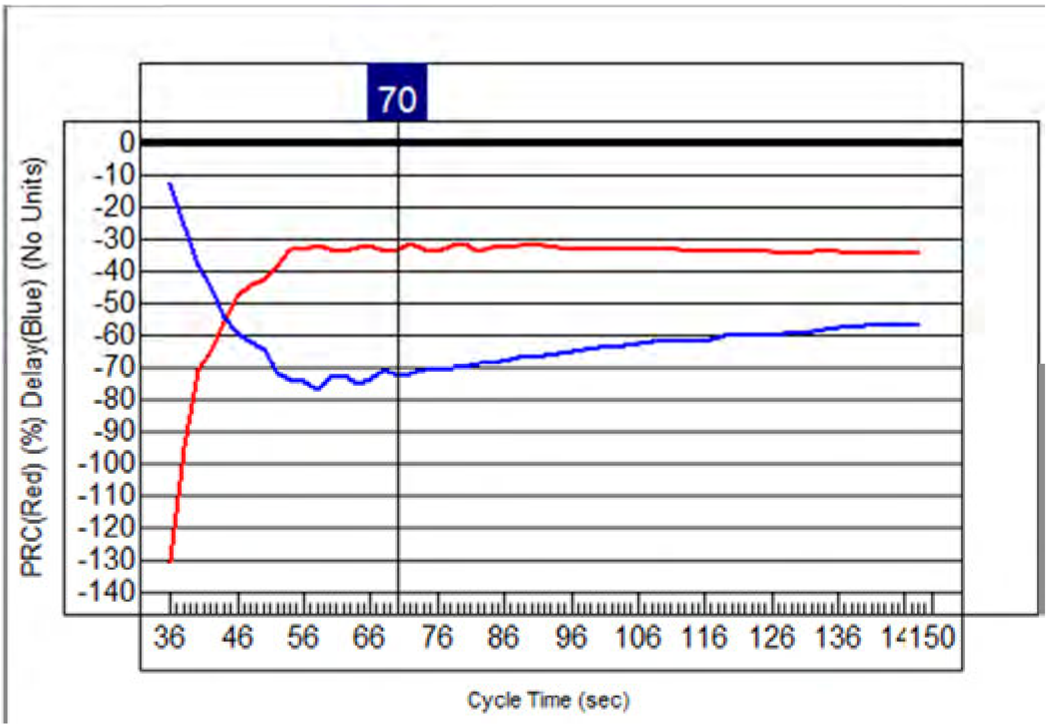
3.6.1 The LinSig output data for the A20 Ashford Road / Willington Street junction are included at **Appendix J.**

3.6.2 Please note there is no intergreen value shown in the model for Phase F to D, as this is not required by the model. Phase F is a filter phase. Although a D-F intergreen is normally required, the reverse in this case is true, and therefore LinSig does not request this is entered. The reason for this is that, Filter Phase F MUST always be followed by its associated Phase A (Stage 3 below must always be followed by Stage 1) as described in the stage diagram below.



3.6.3 Therefore, the intergreen that protects the left-turning traffic from the east is the one that follows Phase A. It is true that controllers may require an intergreen to be entered, as they expect a symmetrical intergreen matrix, but for the sake of the modelling, this is never entered for a proposed model as it won't be required.

3.6.4 Clarification is also given as to the notes within the model output stating that a 150 second cycle time is used, but 70 seconds is then used within the model input parameters. It is confirmed that the cycle time optimisation view from LinSig shows how the PRC changed with cycle time (red line) for the AM. The cycle time of 150" was considered to be the upper limit, but the lower cycle time was used in the model run as the higher cycle produced less capacity (Note, a more specific cycle time, say 72", could have produced a better PRC, but a more generic value was shown to approximate the region in which capacity is improved, so that comparison between AM scenarios was easier).



3.6.5 In terms of input flows used within the original TA and those in the latest update spreadsheet modelling the variation in flow is plus 14 PCUs in the morning peak hour and plus 18 PCUs in the evening peak hour. These represent a change of less than half a per cent in total flow terms, which would not give rise to any measurable or significant change to the traffic modelling results. The LinSig modelling has not therefore been re-run for this junction.

<u>*Summary*</u>

3.6.6 The above analysis confirms that the revised development trip generation exercise has an immaterial impact on the operation of the junctions within the study network most impacted by the modified vehicular flows, relative to the conclusions presented in the TA accompanying the planning application for Land South of Sutton Road.

3.7 Suitability of Junction Capacity Models

3.7.1 As has been noted, in KCC H&T's consultation response to Planning Application Reference: MBC/15/509015/OUT, the following statement was made:-

"Mitigation in the form of junction improvements has been proposed in most cases. These would not enable the junctions to operate within capacity and, as the modelling outputs are likely to have been distorted by the extent to which capacity is exceeded, there is no certainty that the improvements can achieve the minimum requirement of mitigating the impact of the additional development traffic. This results in a level of impact that is unacceptably severe and KCC Highways strongly object to the development proposals on this basis".

3.7.2 DHAT subsequently discussed these statements with colleagues at JCT Consultancy Ltd, who undertook the junction capacity modelling informing the TA and who provide the LinSig modelling software. JCT's Director provided the following response:-

"*It is over generalised to say that model results will always be unacceptably distorted in cases where the highway network being modelled is over capacity. In some cases, high levels of congestion in traffic models can distort results if not suitably identified and addressed; however, in most cases a well constructed traffic model should be capable of forecasting the relative performance of development and highway mitigation options even where oversaturation occurs. In any event, it would not be correct to dismiss modelling as flawed simply because over capacity exists without identifying specific issues with the model and demonstrating that any issue will actually lead to distortions in the comparison of options. Depending on the circumstances, in many cases a model operating over capacity will be more stable than a model operating at capacity as the random effect of arriving traffic will have less of an effect*".

3.7.3 Further clarification as to whether it is considered by the Local Highway Authority that there are specific issues with the modelling presented that could have led to distortions in the comparison of options was sought at the meeting between KCC H&T, MBC, Mott MacDonald, JCT Consultancy and DHAT on Wednesday 3rd February 2016. It was agreed that KCC Development Planning officers would use best endeavours to liaise with their colleagues in the County Council's Traffic Systems Team to provide technical guidance on this matter within two weeks of the meeting. To date, however, this information has not been forthcoming.

3.7.4 DHAT has nevertheless sourced a copy of KCC's recent Local Growth Fund business case submission to the South East Local Enterprise Partnership (SELEP) in respect to Phase 1 of the Maidstone Integrated Transport Package, which would appear to provide a contradictory view from the Local Highway Authority as to the ability of the LinSig software programme to accurately model over-capacity situations within the TA study area. The full business case submission is included at **Appendix K** and relates to the 2016/17 element of the Integrated Transport Package, which includes junction capacity improvements at the A274 Sutton Road / Willington Street and A20 Ashford Road / Willington Street signal junctions that are similar to those being promoted by DHAT in respect to the proposed development at Land South of Sutton Road.

3.7.5 KCC's business case submission includes a number of statements which are considered to be highly significant, both in relation to DHAT's approach to the off-site junction capacity modelling presented in the TA and the County Council's wider 'in principle' objection to further development in South East Maidstone:-

- "*A main objective of the Willington Street junction improvements is to reduce delay and congestion on the A274 and A20 corridors and on Willington Street. This will allow the existing network to operate more efficiently and also present some potential capacity to accommodate the future trip growth arising from new development in and around Maidstone*" (Page 22);

- "*LinSig is assumed to be a robust tool for this assessment*" (Page 27);

- "*The wider ITP for Maidstone is currently being finalised in association with the local plan process, which will build on and lock in the benefits gained from the Phase 1 schemes. The strategy, which takes into account the location and quantum of development included in the local plan, will include a package of measures aimed at demand management and further improvement of network efficiency*" (Page 33).

3.7.6 In light of KCC H&T's stated view that LinSig is a robust tool for assessing the operational capacity of key junctions within the TA study area for Land South of Sutton Road – including those which are currently operating over their design capacity during peak periods – together with its failure to provide DHAT with further clarification on the statement that LinSig outputs can become distorted in over-capacity conditions, it is considered unreasonable for the Local Highway Authority to maintain such a contradictory position in respect to individual planning applications.

3.8 KCC VISUM Modelling

3.8.1 Further to the above, KCC H&T presented a report to the 22nd February 2016 meeting of the Maidstone Joint Transportation Board (JTB) which provided Members with an update on further VISUM modelling undertaken in respect to the Local Plan and Integrated Transport Strategy (ITS). The report is included at **Appendix L**. The further modelling concerned an additional future year scenario (to 2022) that had been requested by Members at a previous meeting of the Board.

3.8.2 Since 2022 is an interim year within the new Local Plan (which will run to 2031), KCC H&T agreed with MBC's Spatial Planning officers that the overall Objectively Assessed Housing Need figure of 18,560 dwelling units could be deducted to 14,034 dwelling units for this model run. As such, the strategic sites at Lenham, Invicta Barracks and Maidstone Town Centre were removed from the VISUM model; however it is apparent that the proposed residential site allocations in South East Maidstone, including Land South of Sutton Road, were included in this exercise.

3.8.3 The '2022 Do Something' model run assumed that the transport mitigation measures previously approved by the JTB for inclusion in the ITS will be implemented within this timescale, with the exception of the Leeds Langley Relief Road. These measures include highway capacity improvements at the following junctions within the TA study area for Land South of Sutton Road, which are similar – and in two cases, identical – to those being promoted by DHAT:-

- A229 Loose Road / A274 Sutton Road / Cranborne Avenue ('Wheatsheaf');

- A274 Sutton Road / Wallis Avenue;

- A274 Sutton Road / Willington Street;

- A20 Ashford Road / Willington Street.

3.8.4 KCC's report noted that the results of this model run (which forecasted an 8% increase in travel distance and a 10% increase in travel time across the Maidstone urban area, relative to the baseline scenario) compared favourably with the '2022 Do Minimum' scenario. On this basis, it was concluded that:-

"*The findings of the 2022 modelling are commended to Members on the basis that they demonstrate a level of impact on the highway network that is not regarded as severe in the context of the National Planning Policy Framework*" (Paragraph 5.1).

3.8.5 It is contended that this statement, taken in combination with the contents of the Local Growth Fund business case submission for the Maidstone Integrated Transport Package, serve to fundamentally undermine the position taken in KCC H&T's response to Planning Application Reference: MBC/15/509015/OUT that the impact of development traffic on the local highway network is "unacceptably severe" with the identified mitigation measures in place.

3.9 Wheatsheaf Junction

3.9.1 KCC has previously suggested to the Maidstone Joint Transportation Board that the closure of the Cranborne Avenue entry to the Wheatsheaf junction (i.e. the west bound Cranborne Avenue approach) would benefit the other arms of the junction by around 300 extra vehicle movements per hour. DHA has undertaken its own calculation of the net benefit that this closure would give.

3.9.2 It is possible to calculate the effect of closing the single lane Cranborne Avenue junction entry and what additional capacity this would give to other arms of the junction that would run within the period of time used by that arm. Given that the other arms of the junction all contain more than one lane, it is found that the junction benefit would be greater than that suggested by KCC.

3.9.3 It is possible to use the LinSig3 output data for 2029 scenarios in the Do Minimum and Do Something scenarios to judge the additional capacity given over to the A229 and A274 arms of the junction. Within the data output tables for these scenarios use is made of the 'Capacity (PCU' column on the first of the two tables for each scenario, adding these values up for the main road arms to show the total possible capacity throughput for each arm in the hour. A summary of the result for each hour are shown in the table below:

Scenario	AM Peak Hour	PM Peak Hour
2029 + C	3604	3426
2029 + C + D	4173	3996
Difference	+569	+570

Table 3-7: Wheatsheaf Junction – Total Junction Capacity (PCU from LinSig outputs)

3.9.4 The above table indicates that the closure of the Cranborne Avenue entry arm increases capacity at the junction as a whole by 569 PCUs per hour in the morning peak hour and 570 PCUs in the evening peak hour. Given that the junction is forecast to only provide for a flow of 162 vehicles in the morning peak hour, and 172 vehicles in the evening peak hour in 2029 (taking into account traffic growth and all development) it is clear that the

Cranborne Avenue entry offers very little traffic amenity but penalises the remainder of the junction significantly. Whilst it is acknowledged that the Cranborne Avenue traffic would to some degree redistribute elsewhere, and that some may still travel through the Wheatsheaf junction further reducing the benefit highlighted above, given our local knowledge it is likely that the benefit would be over 500 vehicles per hour and furthermore a reduction in rat running through the adjacent housing area would be reduced.

3.10 Changes to layout - Overview

3.10.1 As has been noted, a revised development masterplan has been prepared for Land South of Sutton Road in response to consultee comments on the outline planning application. The revised masterplan is included at **Appendix M**. The principal amendments to the masterplan originally submitted as part of Planning Application Reference: MBC/15/509015/OUT are as follows:-

- The removal of built development to the east of Public Footpath KH369;
- The relocation of the proposed on-site primary school to the centre of the development;
- The conversion of the eastern site access roundabout to a simple priority junction;
- The installation of a 'bus gate' to the west of the priority junction to restrict the use of this access to buses only.

3.10.2 This section briefly outlines the impact of these revisions on multi-mode accessibility to the proposed development.

3.11 Vehicular Access

3.11.1 With the conversion of the eastern site access roundabout to a simple priority junction for buses only, all other vehicular access to the site will be via the western site access roundabout. As has been reported in Section 3.9 above, the roundabout continues to operate well within its design capacity in this scenario.

3.11.2 The eastern priority junction design has been subject to vehicle swept path analysis, which demonstrates that buses can safely and efficiently negotiate this intersection. The swept path analysis drawings are included at **Appendix N**. A turning head will be provided to the west of the junction and ahead of the 'bus gate' to enable vehicle types other than buses that mistakenly enter the site at this location to return to the A274 Sutton Road.

3.12 Pedestrian and Cycle Access

3.12.1 Pedestrian and cycle access to the site will remain largely as per the previous development masterplan. It should be noted that the application is in outline and therefore the pedestrian and cycle access routes within the site are entirely indicative and will be subject to reserved matters applications to fix routes and geometry at a later date. This will include details of points of cycle routes crossing internal roads and the bus only link to the east.

3.12.2 The site access roundabout will incorporate pedestrian crossing facilities within the splitter islands on all arms, which will enable pedestrians and cyclists travelling to/from the Maidstone urban area to link in to the shared use route that is proposed to run along the frontage of Site H1(9) – Bicknor Farm – which will in itself connect to the pedestrian and cycle infrastructure being provided in relation to the consented development of Sites H1(6) – North of Sutton Road – and H1(7) – North of Bicknor Wood – and onwards towards Maidstone Town Centre.

3.12.3 Provision has also been made within the revised development masterplan for pedestrian and cycle connections to the adjacent Langley Park residential development. Countryside Properties (UK) Ltd will continue to use best endeavours to work with MBC and Taylor Wimpey to secure these connections going forward. It is noted in this respect that Item 6 of Policy H1(5) of the Regulation 19 (Publication) Draft Maidstone Local Plan, which concerns the Langley Park site, requires that:-

"*A separate cycle and pedestrian access will be provided to site H1(10) South of Sutton Road subject to agreement with the highways authority and the Borough Council*".

3.12.4 The revised masterplan continues to incorporate a high quality shared use route across the site, set back from Sutton Road and taking advantage of the proposed area of parkland and common to the east of Public Footpath KH369. This will have a beneficial effect on pedestrians and cyclists and enhance amenity by enabling residents of the site, as well as the adjacent residential developments to the north and west, to access Langley village and the surrounding Public Rights of Way (PRoW) network within a semi-rural setting away from the A274.

3.12.5 The crossing of Public Footpath KH369 from north to south across Sutton Road will be enhanced through the proposed reduction of the speed limit from 40mph to 30mph, as well as the installation of dropped kerbs and tactile paving. Similar improvements are proposed on Sutton Road to the south of the Site, where Public Footpath KH365 crosses the A274. This latter enhancement will facilitate pedestrian trips between Langley village and the on-site services.

3.13 Bus Access

3.13.1 The revised development masterplan has been discussed with Arriva, who have confirmed that it would have no implications for the servicing of the site by the enhanced Route 82 to/from Maidstone Town Centre. Countryside Properties (UK) Ltd remains committed to the provision of appropriate financial contributions to the extension of this service, together with complementary passenger waiting and boarding facilities.

3.13.2 Whilst it is acknowledged that right turning buses from the eastern priority junction will be subject to slight delays whilst waiting to join the A274 Sutton Road southbound, DHAT's discussions with Arriva have confirmed that they would be prepared for the Route 12 service (Maidstone to Tenterden via Headcorn) to utilise this junction, thereby providing a strategically important public transport link between the local villages to the south east of the development and the on-site services and facilities.

4 Boughton Lane Appeal Decision

4.1 Overview

4.1.1 On 4th March 2016, the Secretary of State for Communities and Local Government issued a Decision Letter and Inspector's Report in respect to recovered appeal reference: APP/U2235/A/14/2227839 – Land at Boughton Lane, Loose, Maidstone. The appeal was made by BDW Trading Ltd, KCC and Future Schools Trust against the refusal of planning permission by MBC for the erection of 220 residential dwellings.

4.1.2 The Secretary of State upheld the appointed Inspector's recommendation that the appeal be dismissed and, in doing so, concurred with his view that the proposed development would have a severe adverse impact on the highway network, contrary to Paragraph 32 of the National Planning Policy Framework (NPPF).

4.2 Relevance to Land South of Sutton Road

4.2.1 In his report, the Inspector described the traffic congestion on the local highway network surrounding the proposal site as "quite heavy" and continued to note that:-

"*That in itself is not an uncommon situation in an urban area, but even by those standards it seems to me, from my observations, that the level of regularly occurring congestion in this part of the town is more than usually severe*" (Paragraph 222).

4.2.2 A Section 106 undertaking entered into by the appellants provided for a contribution of £660,000 to off-site highway improvements. These works were not specified, as it was stated by the Local Highway Authority that they would arise from an A229 corridor study being pursued jointly by the Borough and County Councils. This was a matter of concern to the Inspector, who stated that:-

"*… it* (the corridor study) *has yet to produce any recommendations or proposals, and there is no certainty that it will deliver a solution. Whilst the Highway Authority does not object to the proposed development, subject to receiving the agreed financial contribution, all of the evidence points to the fact that the Authority has not been able to identify any effective means of mitigating the development's impact*" (Paragraphs 235-236).

4.2.3 Turning to the wider transport planning context, the Inspector further noted:-

"*I acknowledge the frustration of holding back development when housing is clearly needed. But the transport situation in Maidstone clearly cries out for a coordinated approach to housing and infrastructure. In this case, piecemeal development on the appeal site, exacerbating existing problems rather than contributing to a workable solution, could adversely affect the delivery of a successful plan-led development and infrastructure strategy*".

4.2.4 As has been identified within this TA Addendum, in the period since this Inquiry was held (July 2015), significant progress has been made with the Draft Local Plan and Integrated Transport Strategy, which now identifies practical and deliverable mitigation measures for a number of junctions on the A229 corridor to the south of Maidstone Town Centre, including the A229 / A274 / Cranborne Avenue ('Wheatsheaf') junction. These measures closely reflect those being promoted by DHAT and Countryside Properties (UK) Ltd in respect to Land South of Sutton Road and on this basis, it is contended that the above appeal decision is of limited relevance to this case.

5 Summary and Conclusion

5.1.1 This Transport Assessment Addendum has been prepared by DHA Transport (DHAT) on behalf of Countryside Properties (UK) Limited, following receipt of comments from Kent County Council Highways and Transportation (KCC H&T) and Maidstone Borough Council (MBC)'s transport consultants, Mott MacDonald, in respect to Planning Application Reference: MBC/15/509015/OUT – Land South of Sutton Road, Langley, Kent. It provides a technical response to the principal issues raised by these parties with a view to resolving their outstanding queries and concerns

5.1.2 On the basis of the preceding analysis, it has been demonstrated that the highway capacity assessments presented within the TA accompanying the planning application remain robust with the application of alternative trip rates and that the Local Highway Authority's comments regarding the ability of the LinSig junction capacity software to accurately model over-capacity situations cannot be considered credible in this case. It has further been demonstrated that the revised site masterplan continues to provide for a permeable and accessible development with an emphasis on walking, cycling and public transport.

5.1.3 It is therefore maintained that the proposals should not result in significant detrimental impacts in transport terms and that there should be no sound transport based objections to the proposals.

A

APPENDIX

ACTIONS OF MEETING

PROJECT Land South of Sutton Road	**REF NO.** 10296
SUBJECT OF MEETING DHA technical response to KCC Highways and Transportation comments on TA	**MEETING NO.** 2
DATE OF MEETING 3rd February 2016	**TIME OF MEETING** 14.00
VENUE Sessions House, County Hall, Maidstone	**RECORDED BY** Paul Lulham
PRESENT Tim Chapman – Maidstone Borough Council Martina Olley – Mott MacDonald David Joyner – Kent County Council Brendan Wright – Kent County Council Jamie Hare – Kent County Council Paul Moore – JCT Consultancy Simon Swanston – JCT Consultancy Paul Lulham – DHA Transport	
APOLOGIES Chris Hawkins – DHA Planning	
DISTRIBUTION As above plus Rosa Etherington – Countryside	

ITEM		ACTION
1	**DHA Transport response to KCC H&T comments on TA**	
1.1	BW confirmed that KCC H&T is content with the swept path drawings submitted by DHA in respect to the site access roundabouts.	
1.2	BW confirmed that KCC H&T is content that Countryside Properties would be prepared to fund and manage the application for the necessary Traffic Regulation Order to extend the 30mph zone on Sutton Road.	
1.3	TC confirmed that MBC will continue to work with Taylor Wimpey to secure adequate pedestrian and cycle links between the Langley Park and Land South of Sutton Road sites. The cycle infrastructure should be segregated wherever possible.	TC
1.4	BW confirmed that KCC H&T is content with the revised drawing submitted by DHA in respect to the western site access roundabout, incorporating pedestrian crossing facilities on all arms of the junction.	
1.5	PL confirmed that consideration will be given by DHA and Countryside Properties to the further extension of the 30mph speed limit on Sutton Road to the south of the junction with Horseshoes Lane. Consideration will also be given to the enhancement of Public Footpath KH365 to make it a more attractive pedestrian link between Land South of Sutton Road and Langley village.	PL
1.6	BW confirmed that KCC H&T is content with the application of a 30% affordable housing rate in DHA's trip generation assessment. PL confirmed that this rate will continue to be applied in any revised trip generation assessments.	
1.7	BW confirmed that KCC H&T is content for DHA to undertake a revised trip generation assessment based on the Langley Park trip rates and the actual number of dwellings proposed for Land South of Sutton Road and the surrounding committed developments. A trip generation assessment will also be undertaken in respect to the proposed non-residential land uses, with all assumptions relating to internalisation, pass-by / diverted trips etc. clearly referenced.	PL
1.8	BW and DJ confirmed that DHA has now provided sufficient information to satisfy KCC H&T regarding the extent to which existing highway safety conflicts will be addressed as part of the proposed off-site highway mitigation measures. *Note: It is recognised that this issue may need to be revisited in light of any subsequent alterations to the site masterplan and access arrangements.*	
1.9	BW reiterated KCC H&T's concerns regarding the ability of junction capacity modelling software to accurately model over-capacity situations. BW and DJ confirmed that they will liaise with KCC H&T's Traffic Systems Team to provide technical guidance on the principles underpinning the accuracy and interpretation of the modelling analysis, with a view to addressing the these concerns.	BW/DJ

ITEM		ACTION
	Note: It is recognised that the model outputs may in any event be subject to change in light of any subsequent alterations to the site masterplan and access arrangements.	
1.10	PL confirmed that following receipt of KCC H&T's technical guidance, DHA will undertake further junction capacity modelling, based on the revised trip generation assessment detailed above, and confirm whether additional and/or amended off-site highway mitigation is required. BW advised that any such work would need to be undertaken in the context of KCC H&T's 'in principle' concerns regarding the impact of additional development traffic on this part of the highway network.	PL
2	**Masterplan amendments**	
2.1	BW and JH confirmed that KCC H&T is content with the principle of a single site access roundabout to serve the development, together with a separate emergency access, subject to receipt of a revised access design drawing and accompanying junction capacity modelling.	PL
3	**Timescales for provision of further information**	
3.1	BW and DJ confirmed that they would seek to provide DHA with the necessary technical guidance in relation to the off-site highway capacity modelling as soon as possible.	BW/DJ
4	**Date of next meeting (if required)**	
4.1	The requirement for a further meeting will be determined following receipt of KCC H&T's technical guidance.	
5	**Any Other Business**	
5.1	None to report.	

Technical Note – Land South of Sutton Road, Langley

Site: Land South of Sutton Road, Langley, Kent

Prepared by: DHA Transport
Eclipse House
Eclipse Park
Sittingbourne Road
Maidstone ME14 3EN

Date: 27th January 2016

1.1 Introduction

1.1.1 This Technical Note has been produced to address Kent County Council Highways and Transportation (KCC H&T)'s consultation response in respect to Planning Application Reference: MBC/15/509015/OUT – Land South of Sutton Road, Langley, Kent. It provides a technical response to the principal issues raised by the Local Highway Authority with a view to resolving its reasons for objection. KCC H&T's consultation response is included in full at **Appendix A**.

1.2 Issues Raised

<u>*Scoping*</u>

1.2.1 Page 1 of KCC H&T's consultation response notes that:-

"*The application includes a Transport Assessment (TA) that has been informed by scoping dialogue that was undertaken over the period August to October 2014. Although many of the methodological principles agreed at that time remain valid, the KCC Highways review of the TA has had to take account of any changes in evidence available over the intervening period*".

1.2.2 Whilst it is accurate that the initial TA scoping discussions with KCC H&T's Development Planning Team were undertaken during the summer of 2014, DHA Transport (DHAT) engaged with officers from other KCC H&T teams on a regular basis thereafter. This included meetings with KCC's Traffic Manager and Development Agreements Manager to discuss the 'in principle' acceptability of the off-site highway mitigation proposals. The agreed Minutes of these meetings are included at Appendix U of the TA.

1.2.3 It should also be noted that DHAT sought to engage with KCC H&T's current Strategic Transport and Development Planner for Maidstone Borough on several occasions following the retirement of the previous post holder (with whom the initial TA scoping discussions were undertaken). This included email correspondence in May 2015 and October 2015 requesting comments on the TA methodology and emerging conclusions. Unfortunately, neither of these requests were answered.

Site Access

1.2.4 Page 2 of KCC H&T's consultation response comments on the proposed site access roundabouts. It is noted that:-

"*Swept path analysis has not been included and should be submitted to demonstrate the tracking of large pantechnicon vehicles at both junctions*".

1.2.5 DHAT's swept path analysis drawings, which demonstrate that large vehicle types can satisfactorily negotiate the proposed site access roundabouts, are included at **Appendix B**.

1.2.6 KCC H&T's response goes on to note that:-

"*Forward visibility of up to 90m has been proposed on the A274 approaches to the roundabouts on the basis that they will be supported by an eastwards extension of the 30mph speed restriction. This is acceptable, subject to the applicant funding and securing the necessary Traffic Regulation Order*".

1.2.7 It is confirmed that Countryside Properties (UK) Ltd would be content to prepare and fund an application for the necessary Traffic Regulation Order (TRO).

Walking and Cycling

1.2.8 Page 2 of KCC H&T's consultation response considers walking and cycling infrastructure. It is stated that:-

"*The TA does not confirm whether a route of access for pedestrians/cyclists to Sutton Road will be made available at the north western corner of the site, although the 'Illustrative Masterplan' appears to indicate that this is included. This connection is vitally important in how it serves the most direct desire line to/from the Maidstone built-up area.*

The TA and masterplan also indicate that a direct linkage to the adjacent Langley Park development could be provided. This would usefully enable Langley Park residents to access the proposed village centre and primary school, although clarification is required on whether the boundary treatment of Langley Park will afford scope for such connectivity to be created".

1.2.9 It is stated within the TA that the western site access roundabout will incorporate pedestrian crossing facilities within the splitter island on the A274 (west) arm. This will enable pedestrians and cyclists travelling to/from the Maidstone urban area to link in to the shared use route that is proposed to run along the frontage of Site H1(9) – Bicknor Farm – which will in itself connect to the pedestrian and cycle infrastructure being provided in relation to the consented development of Sites H1(6) – North of Sutton Road – and H1(7) – North of Bicknor Wood – and onwards towards Maidstone Town Centre.

1.2.10 It is confirmed that provision will be made within the application site for walking and cycling routes to connect to the adjacent Langley Park residential development, as indicated within the site masterplan. It should further be noted that Item 6 of Policy H1(5) of the Regulation 19 (Publication) Draft Maidstone Local Plan (February 2016), which concerns the Langley Park site, requires that:-

"A separate cycle and pedestrian access will be provided to site H1(10) South of Sutton Road subject to agreement with the highways authority and the Borough Council".

1.2.11 These considerations should provide KCC H&T with comfort that such linkages can be secured.

1.2.12 KCC H&T's consultation response goes on to note that:-

"*In the case of the western roundabout, only the western Sutton Road arm will incorporate a pedestrian crossing facility and no compensatory provision for the other arms is proposed. This could inhibit the movement of those pedestrians using the internal east/west pedestrian route that runs parallel to Sutton Road, who will need to cross the site access*".

1.2.13 It is confirmed that the southern and eastern roundabout splitter islands are of a sufficient standard to accommodate pedestrian crossing facilities, as depicted in the revised junction design drawing which is included at **Appendix C**.

1.2.14 With respect to the eastern site access roundabout, KCC H&T's consultation response states that:-

"*Although uncontrolled refuge crossings will be available on all arms of the eastern roundabout, these do not facilitate direct connectivity to Langley village or the bus stops in the vicinity of the Horseshoes Lane junction. Additional provision to service this desire line is therefore also likely to be appropriate*".

1.2.15 It is contended that the pedestrian crossing facilities on the splitter islands of the eastern site access roundabout will facilitate pedestrian connectivity between Langley village centre and the eastern part of the proposal site (including the primary school), via Horseshoes Lane and the footway on the eastern side of the A274. Nevertheless, it is also confirmed in Paragraph 7.2.4 of the TA that the crossing of Public Footpath KH365 from east to west across the A274 to the south of the Horseshoes Lane junction will be enhanced with the installation of dropped kerbs and tactile paving. This will further facilitate pedestrian trips between Langley village and the on-site services and facilities.

1.2.16 With respect to pedestrian access to the bus stops in the vicinity of the Horseshoes Lane junction, it is confirmed that it is Arriva's intention to divert its Route 12 service via the proposed development spine road; therefore providing future residents with direct access to the service and negating the requirement for them to utilise the existing bus stops on Sutton Road.

<u>*Trip Generation*</u>

1.2.17 Page 3 of KCC H&T's consultation response considers the vehicular trip generation assessment presented within the TA. It is acknowledged that the forecasts are based on a residential development of 950 units, rather than the 800 units for which planning permission is sought, which provides for a robust analysis. It is then noted on Page 4 of the response that:-

"*The vehicle trip rates underpinning the forecasts have been derived through reference to comparable sites within the TRICS database. A similar approach to the Langley Park TA has* *been adopted in the use of separate land use categories for private and non-private housing. Although this has helped to ensure a sufficiently large site selection, the TA does not identify how the 950 units are broken down between private and non-private housing. Confirmation on what assumption has been used in the application of the trip rates is therefore required*".

1.2.18 It is confirmed that the trip generation assessment presented within the TA assumed that 30% of the proposed dwelling units would comprise non-private housing, with the remaining 70% comprising private housing. This is in accordance with Policy DM 13 of the Regulation 19 (Publication) Draft Maidstone Local Plan (February 2016), which states that:-

"*1. The target rates for affordable housing provision within the following geographical areas, as defined on the policies map, are:*

i. Maidstone urban area 30%, with the exception of Policy H1(11) Springfield, Royal Engineers Road 20%; and

ii. Countryside, rural service centres and larger villages 40%".

1.2.19 KCC H&T's consultation response further states that:-

"*It is notable that the two-way vehicle trip rates are comparatively lower than those identified in the Langley Park TA. This is unexpected in view of the site location relative to Maidstone and the key transport networks. The lower than anticipated trip generation could be compensated, either wholly or in part, by the potential over-estimate in development scale*".

1.2.20 It is noted in this respect that the trip generation assessment that informed the Langley Park TA was based on an earlier version of the TRICS trip rate database (2013) than that which informed the TA in respect to Land South of Sutton Road (2014). Moreover, the trip generation assessment within the Langley Park TA was undertaken for the education PM peak hour of 1500-1600, rather than the network PM peak hour of 1700-1800 that has been considered in the TA for Land South of Sutton Road. It should further be noted that the provision of significant bus service enhancements do not form part of the consented Langley Park development; thereby reducing the potential for mode shift away from private vehicular travel relative to the Land South of Sutton Road proposals.

1.2.21 The vehicular trip generation potential of the proposed development has nevertheless been reassessed assuming a total yield of 800 residential dwellings (including 30% affordable housing) and the TRICS trip rates identified in the Langley Park TA. The results of this exercise, together with the net impact of this method relative to that presented in the TA, are depicted in Table 0-1 below for the AM and PM network peak hours.

Period	Arrivals	Departures	Total
AM Peak (0800-0900)	99 (+16)	291 (-29)	391 (-12)
PM Peak (1700-1800)	301 (+24)	180 (+17)	481 (+41)
Daily (0700-1900)	1,946 (+63)	2,005 (+29)	3,951 (+91)

Table 0-1: Total Vehicle Trip Generation assuming Langley Park TA Trip Rates

1.2.22 It is noted that the total vehicular trip generation of the proposed development would be marginally smaller in the AM peak and marginally greater in the PM peak based on the trip rates applied in the Langley Park TA. In practice, these differences equate to one fewer vehicular trip every five minutes in the AM peak and one additional vehicular trip every minute-and-a-half in the PM peak. This is considered to represent a negligible impact which does not materially alter the conclusions of the TA submitted in respect to Land South of Sutton Road.

1.2.23 KCC H&T's consultation response further notes that:-

"*Of greater concern is the absence of any additional allowances for trips associated with the range of other land uses that form part of the proposals. These include retail and employment, which would be highly likely to attract trips from areas external to the site. The omission of these trips serves to undermine the robustness of the analysis as the TA provides no explanation as to why they have been excluded*".

1.2.24 It is confirmed that the proposed non-residential land uses are indicative only for the purposes of the outline planning application and would be progressed on an individual basis as reserved matters applications subject to demand and viability. They include the potential for an A1 convenience retail store, an A3 restaurant, an A4 public house, D1 medical and day nursery uses and a C2 residential care facility. Each of these uses would be small-scale, located within the heart of the development and would be principally intended to serve the on-site residents. Any external vehicular trips to these facilities would be predominantly pass-by and diverted in nature and would therefore be on the local highway network in South East Maidstone in any case. They would also largely occur outside of the network peak periods. Moreover, it is reiterated that the TA assumes a highly robust position based around the provision of 950 residential dwellings on the proposal site, rather than the 800 dwellings for which planning consent is sought. On this basis, it is contended that the exclusion of a specific allowance for the non-residential land uses within the trip generation assessment would not undermine the robustness of its methodology and conclusions.

Traffic Impact and Mitigation

1.2.25 The focus of KCC H&T's consultation response is on traffic impact and mitigation. It is initially noted that:-

"*An analysis of road crash incidents on the A274, A229 and Willington Street corridors has also been included. The TA does not comment on whether there are critical locations where existing highway safety conflicts will be addressed as part of the proposed junction improvements*".

1.2.26 It is confirmed that a detailed analysis of the latest three-year Personal Injury Accident (PIA) data for the TA study area has been undertaken, in accordance with the Department for Transport *Guidance on Transport Assessment* (2007). This analysis concludes that there were few serious accidents and a single fatality during this period and that the vast majority of incidents were the result of human error. There are several locations where the proposed highway mitigation measures will help to address existing highway safety issues and these are detailed below.

<u>A229 Loose Road / Park Way / Armstrong Road</u>

1.2.27 The relocation of the controlled pedestrian crossing from the A229 Loose Road (north) to the A229 Loose Road (south) arm of the junction, together with the provision of a new controlled pedestrian crossing to the north of the junction, in the vicinity of the footbridge, will better cater for observed desire lines across Loose Road at these locations. This will reduce the propensity for pedestrians (including pupils of Borough Primary School and Maidstone Grammar School for Boys) to disregard formal crossing facilities, as is regularly the case at present.

1.2.28 The installation of 'Puffin' technology and pedestrian detection on the new crossings will further improve pedestrian safety at these locations by providing for red/green man signals at the pedestrian waiting point and optimising the pedestrian crossing phase to ensure that it is responsive to individual crossing times.

<u>A229 Loose Road / A274 Sutton Road / Cranborne Avenue (Wheatsheaf)</u>

1.2.29 Again, the installation of 'Puffin' technology on all controlled crossings at this intersection will improve pedestrian safety in the manner described above.

<u>A274 Sutton Road / Wallis Avenue</u>

1.2.30 The provision of a controlled crossing on the Sutton Road (north west) arm of the junction will address a longstanding omission in the pedestrian infrastructure at this location, which may have contributed to at least two serious incidents within the three-year PIA study period. The scheme is supported in principle by KCC H&T's Traffic Systems Team on this basis, as confirmed during pre-application discussions with officers in early 2015.

<u>A274 Sutton Road / Eastern and Western Site Access Roundabouts</u>

1.2.31 The provision of these roundabouts will act to calm traffic speeds on Sutton Road in the vicinity of the proposal site, where there are known to have been loss of control accidents involving excessive speed within the three-year PIA study period. As has been noted, the roundabouts will incorporate pedestrian crossing facilities on the splitter islands and further enhancements to pedestrian crossing facilities will be provided where Public Footpaths KH365 and KH369 cross Sutton Road. The combination of these measures will create a safer environment for pedestrians and cyclists in these locations.

1.2.32 KCC H&T's consultation response further states on page 5 that:-

"Mitigation in the form of junction improvements has been proposed in most cases. These would not enable the junctions to operate within capacity and, as the modelling outputs are likely to have been distorted by the extent to which capacity is exceeded, there is no certainty that the improvements can achieve the minimum requirement of mitigating the impact of the additional development traffic. This results in a level of impact that is unacceptably severe and KCC Highways strongly object to the development proposals on this basis".

1.2.33 In view of the generality of the above statement regarding the alleged distortion of modelling outputs in over-capacity situations, DHA Transport sought clarification from KCC H&T on this point. KCC's Strategic Transport and Development Planner for Maidstone subsequently provided the following response by email on 19th January 2016:-

"The point raised regarding the distortion of the modelling outputs was intended to highlight how junction traffic models become unstable once capacity is exceeded. This reduces the level of confidence that can be attached to any comparison of outputs in instances where junctions are shown to be operating above theoretical capacity".

1.2.34 DHA Transport has discussed these statements with colleagues at JCT Consultancy Ltd, who undertook the junction capacity modelling in question and who developed the LinSig software package for traffic signal design. JCT's Director, Paul Moore, has provided the following response:-

"It is over generalised to say that model results will always be unacceptably distorted in cases where the highway network being modelled is over capacity. In some cases, high levels of congestion in traffic models can distort results if not suitably identified and addressed; however, in most cases a well constructed traffic model should be capable of forecasting the relative performance of development and highway mitigation options even where oversaturation occurs. In any event, it would not be correct to dismiss modelling as flawed simply because over capacity exists without identifying specific issues with the model and demonstrating that any issue will actually lead to distortions in the comparison of options. Depending on the circumstances, in many cases a model operating over capacity will be more stable than a model operating at capacity as the random effect of arriving traffic will have less of an effect".

1.2.35 Further clarification is therefore required from KCC H&T as to whether it is considered that there are specific issues with the modelling presented that have led to distortions in the comparison of options. In the absence of this clarification, it is contended that an objection from the Local Highway Authority based on the proposed development's impact on highway capacity cannot be substantiated.

1.2.36 With regard to the modelling of specific junctions within the TA study area, KCC H&T's consultation response makes the following comments in relation to the A229 Loose Road Park Way / Armstrong Road and A229 Loose Road / A274 Sutton Road / Cranborne Avenue (Wheatsheaf) junctions:-

- *"Future conditions have been modelled on the basis of an 'optimised' junction operation. This is predicated on the assumption that there is currently an underutilisation of capacity at the junction due to KCC Highways deployment of a 'gating strategy' to control the volume of traffic using the town centre gyratory.*

- *This assumption is incorrect given that the KCC Highways have already configured the signal operation to optimise traffic flow conditions in order to minimise the effects of road congestion at this busy interchange. The application of this incorrect assumption has meant that the modelling results are not representative of the current regime or the associated operational constraints*".

1.2.37 KCC H&T will be aware that LinSig software has the capability to introduce an optimised junction management strategy for a signalised intersection. In the case of the two junctions in question, the LinSig modelling presented in the TA identifies that this strategy would significantly enhance their performance in the base year, which strongly indicates that KCC H&T is not currently configuring them to their optimum extent. Having established this, the future year 'Do Minimum' and 'Do Something' model scenarios presented in the TA can be seen to provide a robust assessment of the impact of development traffic and proposed mitigation on junction performance, since these scenarios are factored against the optimised junction management strategy identified in LinSig, rather than existing junction performance.

1.2.38 With respect to the modelling of the A274 Sutton Road / St Saviours Road signal junction, KCC H&T's consultation response notes that:-

- "*Further modelling has highlighted how the improvements would not fully offset the impact of the additional development traffic.*
- *On this basis, KCC Highways does not regard the mitigation to be acceptable on account of the worsening conditions that would arise on the A274 corridor. An objection is therefore raised on account of the unacceptably severe impact*".

1.2.39 Whilst it is the case that the proposed junction capacity enhancements would not fully mitigate the impact of committed and proposed development traffic in the 2029 AM peak, it is contended that the forecast level of residual increase in Practical Reserve Capacity (3.3%) would not constitute a severe highway capacity impact. It should be reiterated in this respect that the modelling assumes the pedestrian crossing phases are called during every cycle. Furthermore, the junction is forecast to operate better than all up-stream and down-stream junctions on the A274 Sutton Road; therefore it would not create a bottleneck on the network and would likely operate at a better level of performance than is presented in the TA. It is also noted that the proposed mitigation is shown to fully offset the impact of committed and proposed development traffic in the 2029 PM peak.

1.2.40 With respect to the modelling of the A274 Sutton Road / Horseshoes Lane and A274 Sutton Road / B2163 Leeds Road / B2163 Plough Wents Road junctions, KCC H&T's consultation response states that:-

"*<u>A274 Sutton Road / Horseshoes Lane</u>*

- *The modelling indicates that the junction will operate at a level close to capacity in the AM peak by 2029. The addition of development traffic would result in the junction operating over capacity by 2029. This is due to queueing on Horseshoes Lane by vehicles seeking to exit onto the A274.*

- *The TA argues that this represents a limited impact and no mitigation is proposed.*

- *KCC Highways does not regard this worsening of conditions to be acceptable and mitigation should be provided to prevent worsening delays and congestion to road users. An objection is therefore raised on account of the unacceptably severe impact.*

<u>A274 Sutton Road / B2163 Leeds Road / B2163 Plough Wents Road</u>

- *The modelling indicates that the junction is already operating over capacity in the AM and at a level approaching capacity in the PM peak.*

- *The additional development would result in the junction operating over capacity on all arms during both peak periods, with an associated worsening of queueing and delays.*

- *The TA has not proposed any mitigation of this impact.*

- *In view of the implications on the effective operation of the A274 and B2163 corridors, KCC Highways does not regard this worsening of conditions to be acceptable and mitigation should be provided. An objection is therefore raised on account of the unacceptably severe impact*".

1.2.41 The proposed development is forecast to add less than two additional vehicular movements per minute to the A274 Sutton Road / Horseshoes Lane junction in both the AM and PM peak hours, of which just 8 movements and 21 movements respectively will exit the Horseshoes Lane arm of the junction. The PICADY modelling presented in the TA demonstrates that this junction is forecast to operate slightly over its design capacity in the AM peak in the 2029 Do Nothing scenario and that the addition of the proposed development traffic in the 2029 Do Minimum scenario would have a limited impact on average queue lengths on the Horseshoes Lane arm. It is contended that this does not represent a severe highway capacity impact.

1.2.42 The proposed development is forecast to add just over one additional vehicular movement per minute to the A274 Sutton Road / B2163 Leeds Road / B2163 Plough Wents Road junction in both the AM and PM peak hours. The PICADY modelling presented in the TA demonstrates that this junction is forecast to operate over its design capacity in all future year scenarios but that the proposed development traffic would not further degrade the operation of the junction to the extent that its impact could be deemed severe relative to the Do Nothing case.

1.2.43 It should further be noted that DHA Transport's overarching approach in respect to these junctions, having identified limited demand for travel to the south and east of the proposed development in the AM and PM peak hours, together with strong resistance from the residents of Leeds and Langley to measures that might increase the attractiveness of the B2163 corridor, has been to 'lock in' the established desire lines towards Maidstone Town Centre and M20 Junction 7 by concentrating highway and public transport mitigation measures on these corridors, which are of a more appropriate standard to cater for increased demand.

1.2.44 The final substantive points raised within KCC H&T's consultation response also concern the impact of the proposed development on the rural routes to the east of the site and the potential implications of this with respect to the case for a Leeds-Langley Relief Road. It is noted on page 7 that:-

"*No detailed impact analysis has been presented for the Gore Court Road, Horseshoes Lane and B2163 Leeds Road corridors, despite these being acknowledged within the TA as routes requiring full assessment. This is important in understanding how traffic conditions in the nearby communities of Otham, Langley and Leeds could be affected by the development.*

Any quantification of impact in the villages must account for prevailing conditions on the A274/A229, given that worsening congestion would be likely to result in more road users seeking to use these alternative routes. The TA does not revisit or refine the trip assignment assumptions in light of the modelling findings for the A274/A229 to provide a robust assessment of impact on the minor roads. This represents a significant omission given that the need for extensive network coverage was identified in the original scoping exercise.

With this in mind, the TA is inconclusive as to whether further mitigation may be required to prevent any deterioration in conditions within Otham, Langley and Leeds. KCC Highways does not therefore accept the assertion made in the TA that a Leeds Langley Relief Road is of limited relevance, given that there is insufficient evidence to determine whether this or alternative forms of mitigation may be appropriate".

1.2.45 Whilst these points have been largely addressed in the preceding commentary with respect to the limited demand for vehicular travel to the south and east of the proposal site and the overriding need to focus multi-modal mitigation measures on the A274 and A229 corridors, in accordance with the Draft Maidstone Local Plan, the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG), it is worth reiterating that the highway mitigation measures proposed in the TA would deliver a degree of planning gain in the majority of cases; therefore locking in existing route choices within South East Maidstone and discouraging the use of minor roads.

1.2.46 Indeed, the TA reports that an Automatic Traffic Count (ATC) survey undertaken on Gore Court Road in 2014 identified an average of no more than two vehicles per minute in either direction, which suggests that this route is of limited attractiveness as a 'rat-run'. A further ATC survey undertaken on the B2163 Leeds Road at a location approximately 500 metres to the north east of its junction with Horseshoes Lane in 2015 recorded peak hour vehicular flows well below the maximum carrying capacity of a two lane single carriageway, as identified in the Design Manual for Roads and Bridges Advice Note TA 79/99. It is therefore contended that the provision of highway capacity enhancements to these routes are neither justified on the basis of the evidence presented in the TA, nor desirable in view of the overriding objective of dissuading their increased use by committed and proposed development traffic.

1.3 Summary and Conclusion

1.3.1 This Technical Note has been produced to address KCC H&T's consultation response in respect to Planning Application Reference: MBC/15/509015/OUT – Land South of Sutton

Road, Langley, Kent. It provides a technical response to the principal issues raised by the Local Highway Authority with a view to resolving its reasons for objection.

1.3.2 It has been identified through the provision of additional information and clarification that the objections raised by KCC H&T can be satisfactorily resolved and that DHA Transport's approach to the TA accompanying the planning application is fully in accordance with the transport planning policies contained within the Draft Maidstone Local Plan, the NPPF and the NPPG.

1.3.3 Given the above, it is reiterated that the proposed development should not have a severe impact in terms of transport and that there should be no sound transport based objections to the proposals.

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Date: 22 December 2015

Maidstone Borough Council
Maidstone Planning Department
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ME15 6JQ

Application - **MBC/15/509015/OUT**

Location - **Land South Of Sutton Road Langley Kent**

Proposal - **Outline application for residential development, together with non-residential uses (including potentially A1 (retail), A3 (sale of food and drink on the premises e.g. restaurant), A4 (public house), D1(a) (medical use), D1(b) (creche/day centre/day nursery), or B1 (office), up to 0.4 ha of land reserved for C2 (residential care), the reservation of 2.1 ha of land for primary education (use class D1), public open space in the form of natural green space, allotments, play facilities and informal open space together with landscaping, parking, footpath and cycle links and the necessary servicing, drainage and the provision of necessary utilities infrastructure, with all matters reserved for future consideration with the exception of access**

Thank you for inviting me to comment on this planning application.

It is noted that this application seeks outline planning permission for new residential development, together with a supporting local centre that will include retail, health, community facilities and, potentially, a primary school.

The application includes a Transport Assessment (TA) that has been informed by scoping dialogue that was undertaken over the period August to October 2014. Although many of the methodological principles agreed at that time remain valid, the KCC Highways review of the TA has had to take account of any changes in evidence available over the intervening period.

A 'Cumulative Transport Impact Assessment' and 'Draft Travel Plan' are also included amongst the suite of supporting documents and form part of KCC Highways review of the application.

I have the following comments to make with respect to highway matters:

Proposed Site Access

The applicant has proposed to achieve road access via two new roundabout junctions on the A274 Sutton Road. These are to be positioned a short distance west of the access to Rumwood Court and south of the access to Playdells Farm.

The roundabouts have both been designed with a 45m Inscribed Circle Diameter and two lane approaches on each arm. Formal pedestrian refuges are incorporated on most of the splitter islands. Swept path analysis has not been included and should be submitted to demonstrate the tracking of large pantechnicon vehicles at both junctions.

Forward visibility of up to 90m has been proposed on the A274 approaches to the roundabouts on the basis that they will be supported by an eastwards extension of the 30 m.p.h. speed restriction. This is acceptable, subject to the applicant funding and securing the necessary Traffic Regulation Order.

A Stage 1 Safety Audit has been completed, which has identified no fundamental safety hazards associated with the junction layout designs.

Sustainable Travel

Walking and Cycling

The Transport Assessment has included a review of the walking distances and journey times associated with the existing key facilities within the local area that are external to the site. This confirms that most key destinations will involve walking distances in excess of 1.2km, equivalent to a journey time of 15 to 21 minutes. These are at or above the suggested walking distances quoted in 'Providing for Journeys on Foot'.

The mix of land uses included within the development proposals, coupled with the local facilities that will become available through the nearby Langley Park development, affords scope for some local journeys to be undertaken over shorter distances. These offer greatest potential for walking and cycling.

The proposals seek to facilitate pedestrian/cyclist movement within and through the site by including dedicated routes that provide access to the proposed village centre and primary school, as well as connectivity to/from the external surrounding areas. Two Public Rights of Way that currently bisect the site will be upgraded and afforded dropped kerbs and tactile paving at the points where they meet Sutton Road. Pedestrian access from Sutton Road will also be available via 1.8m wide footways on both sides of the two access roads.

The TA does not confirm whether a route of access for pedestrians/cyclists to Sutton Road will be made available at the north western corner of the site, although the 'Illustrative Masterplan' appears to indicate that this is included. This connection is vitally important in how it serves the most direct desire line to/from the Maidstone built-up area.

The TA and masterplan also indicate that a direct linkage into the adjacent Langley Park development could be provided. This would usefully enable Langley Park residents to access the proposed village centre and primary school, although clarification is required on whether the boundary treatment of Langley Park will afford scope for such connectivity to be created.

The current lack of crossing facilities on Sutton Road is proposed, in part, to be addressed through the provision of uncontrolled refuges within the site access roundabout splitter islands.

In the case of the western roundabout, only the western Sutton Road arm will incorporate a pedestrian crossing facility and no compensatory provision for the other arms is proposed. This could inhibit the movement of those pedestrians using the internal east/west pedestrian route that runs parallel to Sutton Road, who will need to cross the site access. Crossing Sutton Road via the eastern arm will also be more convenient for those residents using the bus stops located to the east of the roundabout. Appropriate provision therefore needs to be made available and should form part of the proposals.

Although uncontrolled refuge crossings will be available on all arms of the eastern roundabout, these do not facilitate direct connectivity to Langley village or the bus stops in the vicinity of the Horseshoes Lane junction. Additional provision to service this desire line is therefore also likely to be appropriate.

The TA highlights how those proceeding to/from Sutton Road to the west of the site will be able to utilise the controlled crossing facility that is to be provided in conjunction with the west of Bicknor Cottages development (currently under construction). It is accepted that this will facilitate crossing movement at this location.

Public Transport

The TA identifies service no.12 as providing an hourly service along the adjacent section of Sutton Road as part of its route between Maidstone and Tenterden. This limited frequency of service means that the site is not currently well served by public transport.

The TA highlights how the applicant has held discussions with Arriva regarding a potential extension to the no.82 service, which currently operates between Parkwood and Maidstone town centre. This would operate every 15-20 minutes directly to the town centre via Sutton Road. The possibility of an upgrade to the 'Sapphire' brand is also stated as having been discussed with Arriva.

These improvements provide a basis for achieving a more convenient public transport service for residents of the proposed development, subject to confirmation on the proposed routing arrangements and final acceptance by Arriva. The costs of achieving a viable service would need to be met in full by the applicant.

The reliability of the service would be central to ensuring that it provides an attractive travel option. This is influenced by the prevailing traffic conditions on the A274/A229 corridor.

Travel Plan

A Travel Plan has also been submitted in order to provide a basis for encouraging sustainable travel patterns and reducing vehicle trips over time. This is understood to be associated with the residential component of the development, as a separate Travel Plan will also be prepared in support of the primary school.

The Travel Plan includes measures, initiatives and targets that are associated with achieving a reduction in single occupancy car journeys over a five year period. Future adherence to the Travel Plan would need to be secured as part of any planning consent in accordance with KCC guidelines.

Traffic Generation

The trip generation forecasts in the Transport Assessment indicate that the residential component will generate 407 vehicle trips in the AM peak hour and 440 vehicle trips in the PM peak hour.

The forecasts are based on a residential component of 950 units rather than the 800 units that are identified for this site in the emerging Local Plan. This may provide a degree of robustness in the analysis, depending on final confirmation on the quantum of residential development proposed.

The vehicle trip rates underpinning the forecasts have been derived through reference to comparable sites within the TRICS database. A similar approach to the Langley Park TA has been adopted in the use of separate land use categories for private and non-private housing. Although this has helped to ensure a sufficiently large site selection, the TA does not identify how the 950 units are broken down between private and non-private housing. Confirmation on what assumption has been used in the application of the trip rates is therefore required.

It is notable that the two-way vehicle trip rates are comparatively lower than those identified in the Langley Park TA. This is unexpected in view of the site location relative to Maidstone and the key transport networks. The lower than anticipated trip generation could be compensated, either wholly or in part, by the potential over-estimate in development scale.

A separate methodology has been applied within the Transport Assessment to derive trip generation forecasts for the proposed two form entry primary school. These are founded on an assumption that only 60% of those trips associated with the second form of entry would involve pupils being driven to school using the external highway network, given that many pupils will either live within the site or involve trips that are already on the network. An additional allowance has also been made for staff travel.

The applied principles regarding school travel have resulted in a total forecast of 189 vehicle trips in the AM peak period. This is substantially lower than the equivalent 294 vehicle trips that were forecast within the Langley Park TA, where a two form entry primary school also formed part of the proposal. The differential may, at least in part, be attributable to the more refined methodology that has been applied and the greater scope for internalised travel that exists within a larger scale development.

Of greater concern is the absence of any additional allowances for trips associated with the range of other land uses that form part of the proposals. These include retail and employment, which would be highly likely to attract trips from areas external to the site. The omission of these trips serves to undermine the robustness of the analysis as the TA provides no explanation as to why they have been excluded.

For the purposes of assigning vehicle trips across the network, the TA includes a range of assumptions relating to the routing patterns that could be expected to arise for various journey purposes. These have resulted in around three quarters of vehicle trips involving use of the A274/Willington Street junction and over a third of vehicle trips involving use of the A229/A274 Wheatsheaf junction across the peak periods. This provides a good degree of robustness basis for the capacity testing of junctions.

<u>Traffic Impact and Mitigation</u>

The assessment of traffic impact has been founded on an extensive set of weekday peak period turning count surveys undertaken at key junctions along the A229/A274 corridor. Additional surveys were also undertaken at the A20/Willington Street junction, at the request of KCC Highways, and on Gore Court Road and B2163 Leeds Road, in response to local concerns that such roads may be used by ‘rat-running’ traffic. This has provided good coverage of the network surrounding the site.

An analysis of road crash incidents on the A274, A229 and Willington Street corridors has also been included. The TA does not comment on whether there are critical locations where existing highway safety conflicts will be addressed as part of the proposed junction improvements.

Background traffic growth over the period to 2029 and the traffic associated with committed developments on Sutton Road and in Otham has been added to the base flows. Importantly, the prospective developments at Bicknor Farm, north of Bicknor Wood and west of Church Road have also been included to provide a robust representation of future conditions.

On this basis, the TA presents the findings of capacity modelling analysis undertaken on key junctions up to full implementation of the proposed development in 2029.

It is evident from the modelling results that many of the A229/A274 junctions currently operate over capacity. The TA acknowledges that the additional development traffic would cause a further deterioration in road conditions, with worsening levels of congestion and delay for road users.

Mitigation in the form of junction improvements has been proposed in most cases. These would not enable the junctions to operate within capacity and, as the modelling outputs are likely to have been distorted by the extent to which capacity is exceeded, there is no certainty that the improvements can achieve the minimum requirement of mitigating the impact of the additional development traffic. This results in a level of impact that is unacceptably severe and KCC Highways strongly object to the development proposals on this basis.

KCC Highways specific observations in relation to the modelling analysis and mitigation proposals are outlined below:

A274/Site Access Junctions

- The capacity modelling satisfactorily demonstrates that both of the site access roundabout junctions would operate with spare capacity.

A229 Loose Road/A274 Sutton Road/Cranborne Avenue (Wheatsheaf) Junction

- The modelling indicates that the junction already operates over capacity in both peak periods.
- Future conditions have been modelled on the basis of an 'optimised' junction operation. This is predicated on the assumption that there is currently an underutilisation of capacity at the junction due to KCC Highways deployment of a 'gating strategy' to control the volume of traffic using the town centre gyratory.
- This assumption is incorrect given that the KCC Highways have already configured the signal operation to optimise traffic flow conditions in order to minimise the effects of road congestion at this busy interchange. The application of this incorrect assumption has meant that the modelling results that are not representative of the current regime or the associated operational constraints.
- The TA also argues that KCC's planned implementation of the Bridges Gyratory scheme will release additional network capacity sufficient to accommodate the impact of the proposed development. No evidence is provided to substantiate this argument. Whilst the KCC bid submission to secure funding for the scheme did highlight benefits that included the unlocking of potential housing growth, this was in the context of prospective Local Plan sites within the Maidstone urban area rather than those on the periphery.
- In recognition of the worsening conditions that would arise through the additional development traffic, the TA has proposed further mitigation in the form of the closure of the Cranborne Avenue egress and the installation of puffin technology on pedestrian crossings.
- Further modelling is included to show the effects of this additional mitigation on the operating conditions. For the reasons outlined above KCC Highways do not regard this to provide a reliable representation of future conditions. Accordingly, the TA has not satisfactorily demonstrated that the worsening congestion and delays caused by development traffic will be fully mitigated. An objection is therefore raised on account of the unacceptably severe impact.

A229 Loose Road/Park Way/Armstrong Road

- The modelling indicates that the junction already operates over capacity in both peak periods.
- The modelling of future conditions has been based on assumptions identical to those applied at the Wheatsheaf junction. The above comments also therefore apply to this junction.
- The TA proposes further mitigation in the form of the reallocation of lanes on the Park Way arm, relocation of the existing pedestrian crossing (including the installation of puffin technology) and provision of a new pedestrian crossing further to the north.
- The findings of the additional modelling undertaken to show the effects of this mitigation are considered by KCC Highways to be unreliable, as per the Wheatsheaf. Accordingly, the TA has not satisfactorily demonstrated that the worsening congestion and delays caused by development traffic will be fully mitigated. An objection is therefore raised on account of the unacceptably severe impact.

A274 Sutton Road/St. Saviours Road

- The modelling indicates that the junction will operate over capacity in both peak periods by 2019. Additional development traffic would further worsen congestion and delays to road users.
- The TA proposes mitigation in the form of changes to lane allocations on the northbound A274 entry, provision of a merge lane on the A274 northbound exit and minor adjustments to the southbound A274 right turn lane.
- Further modelling has highlighted how the improvements would not fully offset the impact of the additional development traffic.
- On this basis, KCC Highways does not regard the mitigation to be acceptable on account of the worsening conditions that would arise on the A274 corridor. An objection is therefore raised on account of the unacceptably severe impact.

A274 Sutton Road/Willington Street and A274 Sutton Road/Wallis Avenue

- The modelling indicates that the Willington Street junction already operates over capacity in both peak periods. The Wallis Avenue is also predicted to reach capacity in both peak periods by 2019. Additional development would further worsen congestion and delays to road users.
- The TA proposes mitigation in the form of junction improvements that modify the arrangement due to be implemented in support of the Langley Park development. This incorporates the provision of two lanes in each direction on the A274 between the junctions with associated merge lanes at either end, extension of the right turn lane on Willington Street and provision of a controlled pedestrian crossing on the A274 north of the Wallis Avenue junction.
- Further modelling demonstrates that the improvements would mitigate the impact of the additional development traffic, although the extent of any operational benefit is likely to have been distorted by the over capacity conditions.

A274 Sutton Road/Horsehoes Lane

- The modelling indicates that the junction will operate at a level close to capacity in AM peak by 2029. The addition of development traffic would result in the junction operating over capacity by 2029. This is due to queuing on Horseshoes Lane by vehicles seeking to exit onto the A274.
- The TA argues that this represents a limited impact and no mitigation is proposed.
- KCC Highways does not regard this worsening of conditions to be acceptable and mitigation should be provided to prevent worsening delays and congestion to road users. An objection is therefore raised on account of the unacceptably severe impact.

A274 Sutton Road/B2163 Leeds Road/B2163 Plough Wents Road

- The modelling indicates that the junction is already operating over capacity in the AM and at a level approaching capacity in the PM peak.
- The additional development would result in the junction operating over capacity on all arms during both peak periods, with an associated worsening of queuing and delays.
- The TA has not proposed any mitigation of this impact.
- In view of the implications on the effective operation of the A274 and B2163 corridors, KCC Highways does not regard this worsening of conditions to be acceptable and mitigation should be provided. An objection is therefore raised on account of the unacceptably severe impact.

A20 Ashford Road/Willington Street

- The modelling indicates that the junction is already operating capacity during both peak periods. Conditions would be worsened by the additional development traffic.
- Mitigation in the form of a left turn flare on the eastern A20 approach is proposed. The TA concludes that this would offset the impact of the additional development traffic.
- The operating conditions in the AM peak with and without development are comparable and the distortion arising from the over capacity operating conditions, means that no firm conclusions can be drawn by KCC Highways on the acceptability of this form of mitigation.

No detailed impact analysis has been presented for the Gore Court Road, Horeshoes Lane and B2163 Leeds Road corridors, despite these being acknowledged within the TA as routes requiring full assessment. This is important in understanding how traffic conditions in the nearby communities of Otham, Langley and Leeds could be affected by the development.

Any quantification of impact in the villages must account for prevailing conditions on the A274/A229, given that worsening congestion would be likely to result in more road users seeking to use these alternative routes. The TA does not revisit or refine the trip assignment assumptions in light of the modelling findings for the A274/A229 to provide a robust assessment of impact on the minor roads. This represents a significant omission given that need for extensive network coverage was identified in the original scoping exercise.

With this in mind, the TA is inconclusive as to whether further mitigation may be required to prevent any deterioration in conditions within Otham, Langley and Leeds. KCC Highways does not therefore accept the assertion made in the TA that a Leeds Langley Relief Road is of limited relevance, given that there is insufficient evidence determine whether this or alternative forms of mitigation may be appropriate.

Summary

This planning application proposes large scale residential-led development in a location on the south eastern periphery of the Maidstone built-up area. The site lies remote from many of the key transport networks and journey destinations, including the town centre, railway stations and M20 motorway, in an area that is already experiencing substantial growth through planned new development.

These characteristics limit the scope for local journeys to be undertaken by means other than the private car. They also influence the increase in traffic movements likely to occur on the congested south eastern A274/A229 corridor into Maidstone, where there is already extensive queuing and delays over prolonged periods.

The Transport Assessment submitted in support of the planning application includes junction capacity modelling analysis, which confirms that most key junctions on the A274/A229 corridor are currently operating at a level above or approaching capacity. It identifies how conditions could further deteriorate over the period to 2029 as a result of the additional development traffic, even when accounting for the improved opportunities for non-car travel that could be created through the proposed pedestrian/cycle access provision and improved bus service frequency to Maidstone town centre (to achieve a 15-20 minute daytime frequency).

Mitigation of the residual traffic impact has been proposed in the form of capacity improvements to the following junctions:

- A229 Loose Road/Armstrong Road/Park Way
- A229 Loose Road/A274 Sutton Road/Cranborne Avenue (‘Wheatsheaf Junction’)
- A274 Sutton Road/St. Saviours Road
- A274 Sutton Road/Wallis Avenue
- A274 Sutton Road/Willington Street
- A20 Ashford Road/Willington Street

The improvements involve modifications to the existing junction layouts and traffic signal operations. In most cases the junctions would continue to operate over capacity with the improvements in place and, as the modelling outputs are likely to have been distorted by the extent to which capacity is exceeded, there is no certainty that such provision can achieve the minimum requirement of mitigating the impact of the additional development traffic. This results in a level of impact that is unacceptably severe and KCC Highways strongly object to the development proposals on this basis.

In the case of the junctions on the A229 Loose Road, the mitigation proposals have been based on an incorrect set of assumptions regarding the County Council’s current approach to managing traffic flow on this part of the network. The findings of the modelling do not therefore provide a robust representation of conditions to support the form of mitigation proposed. An objection is therefore raised on account of the unacceptably severe impact.

On the A274 Sutton Road, it is evident that the proposed alterations to the St. Saviours Road junction would be insufficient to mitigate the impact of the additional development traffic. Furthermore, no proposals have been included to address the worsening levels of congestion at the Horseshoes Lane and Plough Wents Road junctions, despite the capacity modelling results showing conditions to worsen appreciably as a result of the development. An objection is therefore raised on account of the unacceptably severe impact.

There is also no detailed impact analysis in respect of the roads serving the communities of Otham, Langley and Leeds, which will be affected by re-routing traffic seeking to avoid delays on the A229/A274. No proposals to mitigate any associated impact have been included.

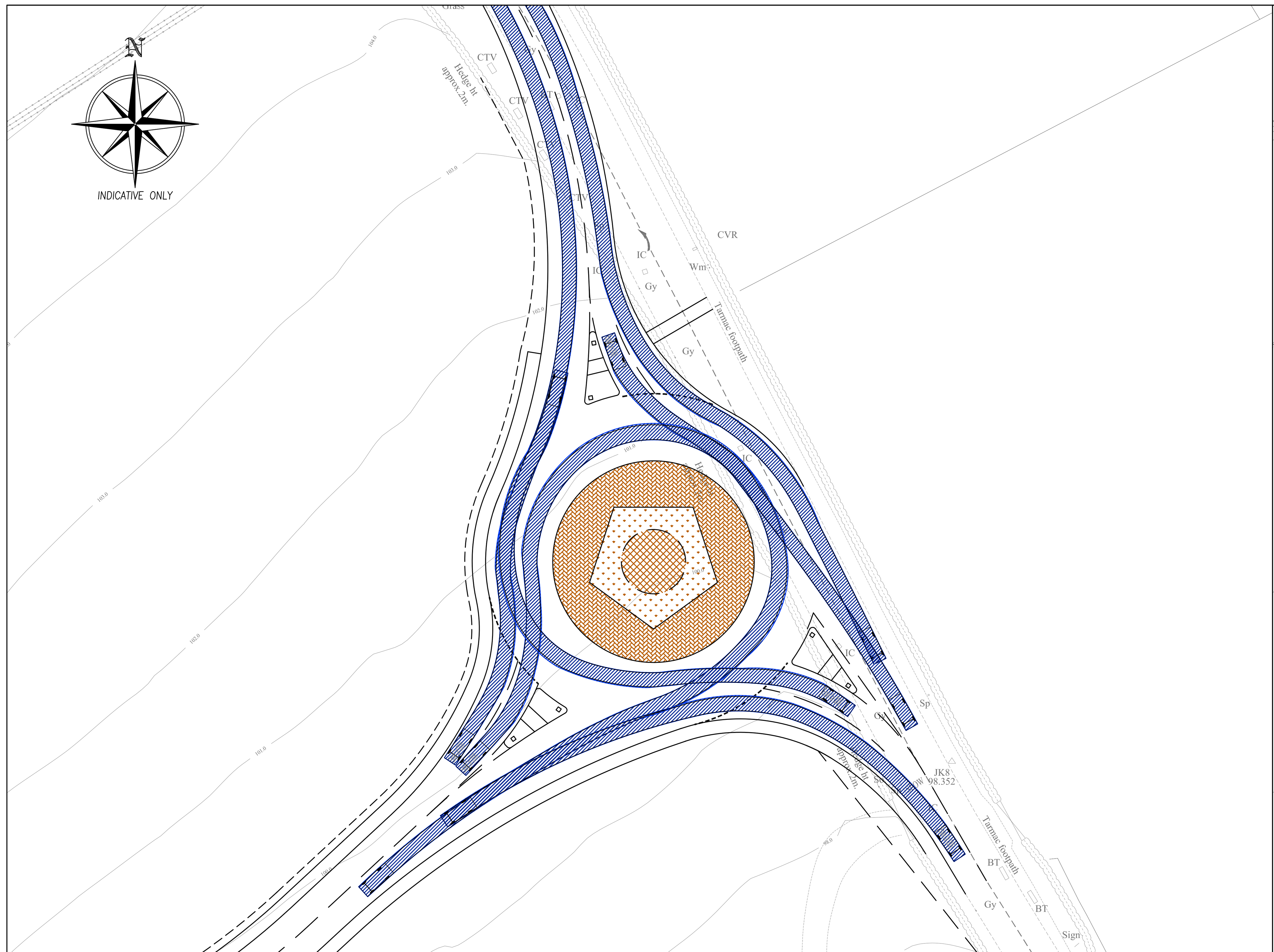
The findings of the Transport Assessment have led the County Council, as Highway Authority, to conclude that the residual traffic impact would have adverse implications on the operation of the A229/A274 corridor. This would result in an unacceptable worsening of the extensive road congestion that is already prevalent on this part of the network. The worsening delays for road users and local residents would also be likely to result in the increased use of minor roads as alternative routes, for which no mitigation is proposed.

A holding objection to the planning application must therefore be raised in the absence of any conclusive evidence to demonstrate that the impact of the development can be fully mitigated and the resulting severe worsening of traffic conditions on the A229/A274.

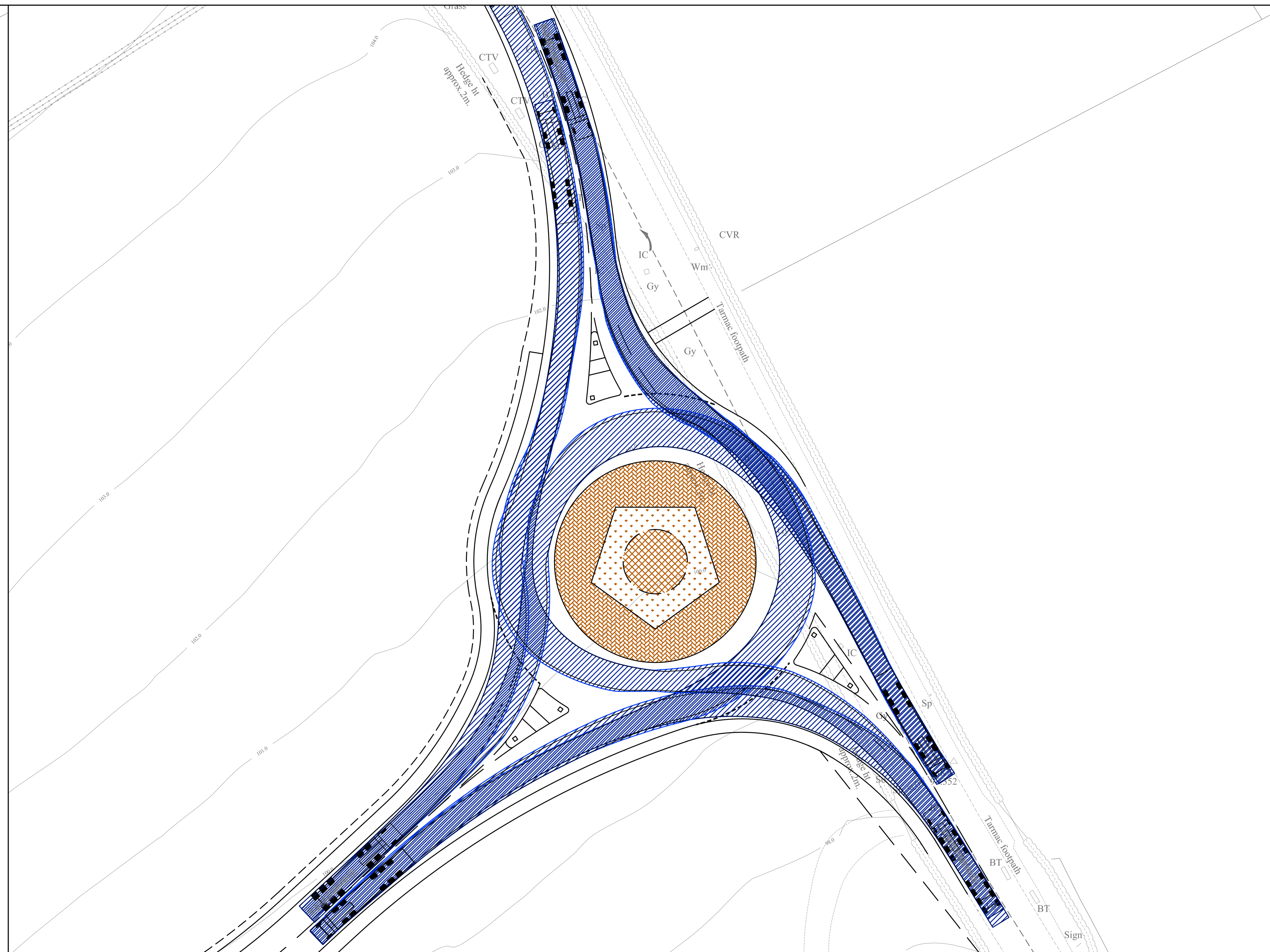
In the event that the Borough Council are minded to grant planning approval, KCC Highways would seek to secure an appropriate financial contribution towards the delivery of a Leeds Langley Relief Road.

Yours faithfully

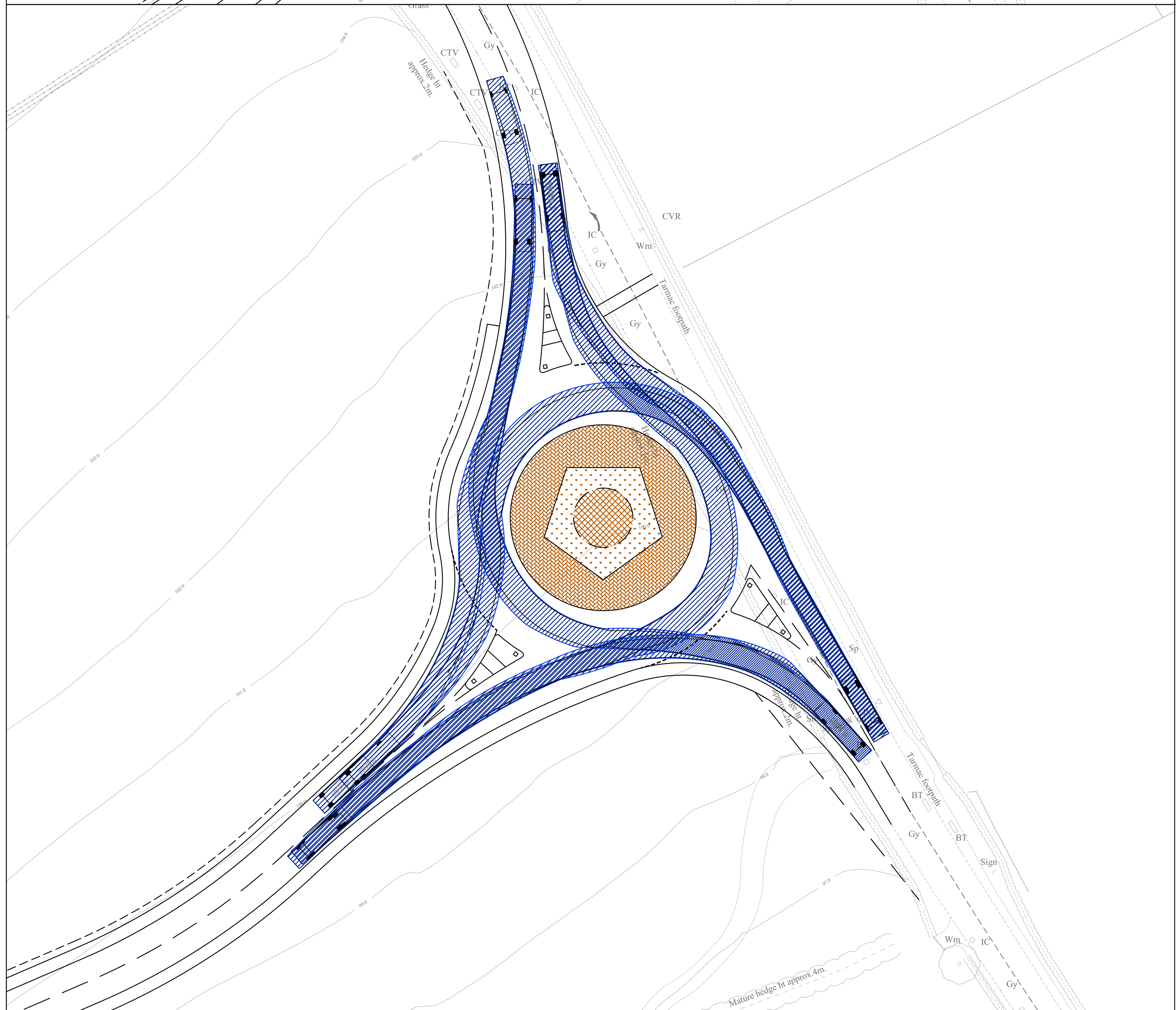
Brendan Wright
Strategic Transport & Development Planner



TRACKING - CAR

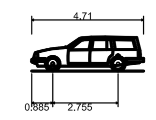


TRACKING - 16.5m HGV

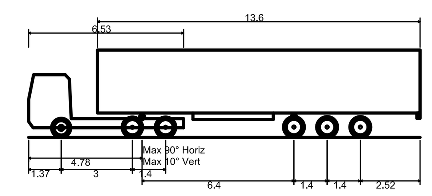


TRACKING - SINGLE DECKER BUS

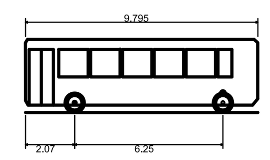
NOTES



Estate Car (2006)	
Overall Length	4.710m
Overall Width	1.804m
Overall Body Height	1.442m
Min Body Ground Clearance	0.207m
Max Track Width	1.756m
Lock to Lock Time	4.00s
Kerb to Kerb Turning Radius	5.950m



Max Legal Length (UK) Articulated Vehicle (16.5m)	
Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	6.530m



Single Deck Bus	
Overall Length	9.795m
Overall Width	2.500m
Overall Body Height	3.070m
Min Body Ground Clearance	0.306m
Track Width	2.322m
Lock to Lock Time	6.00s
Kerb to Kerb Turning Radius	10.111m

REV	AMENDMENTS	DATE	CHK
P1	First issue	26.01.16	JSL

Client

COUNTRYSIDE PROPERITES

Project

LAND AT SUTTON ROAD

Title

PROPOSED EASTERN ACCESS
TRACKING PLAN

Drwg	Rev	Scale	Date
10296/T/01	P1	1:500	26.01.16

dha transport
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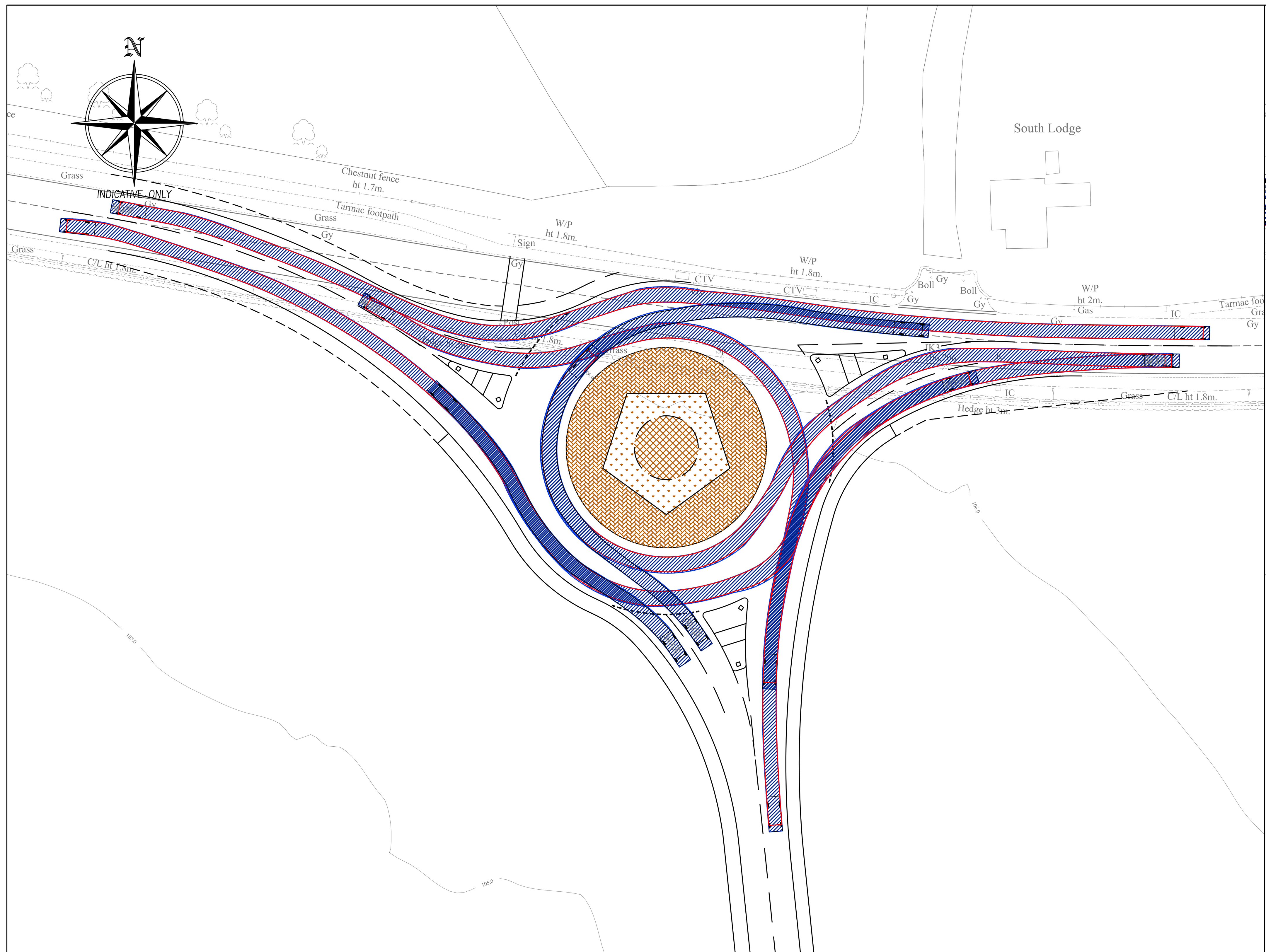
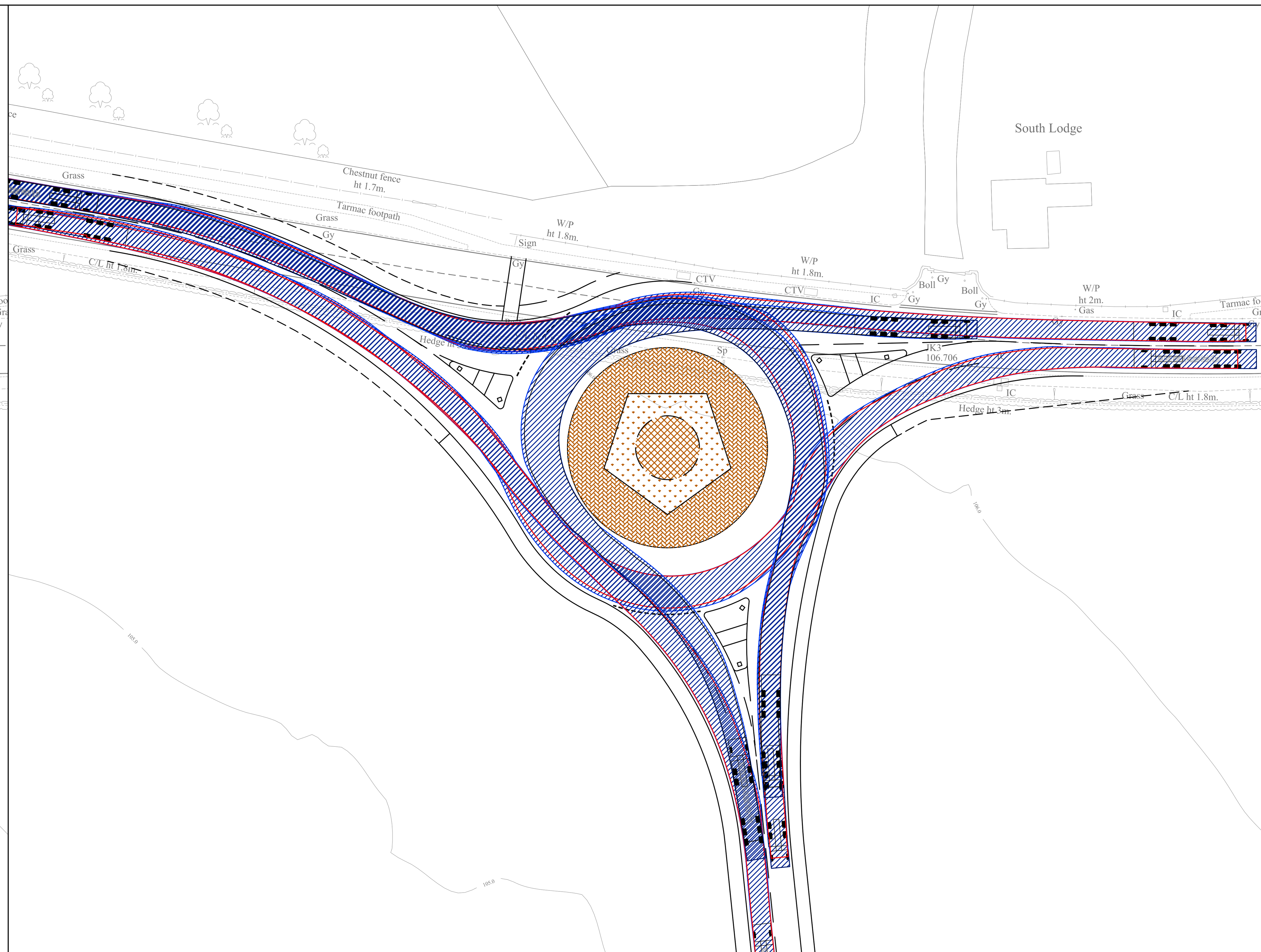
CAD Reference: CAD REF

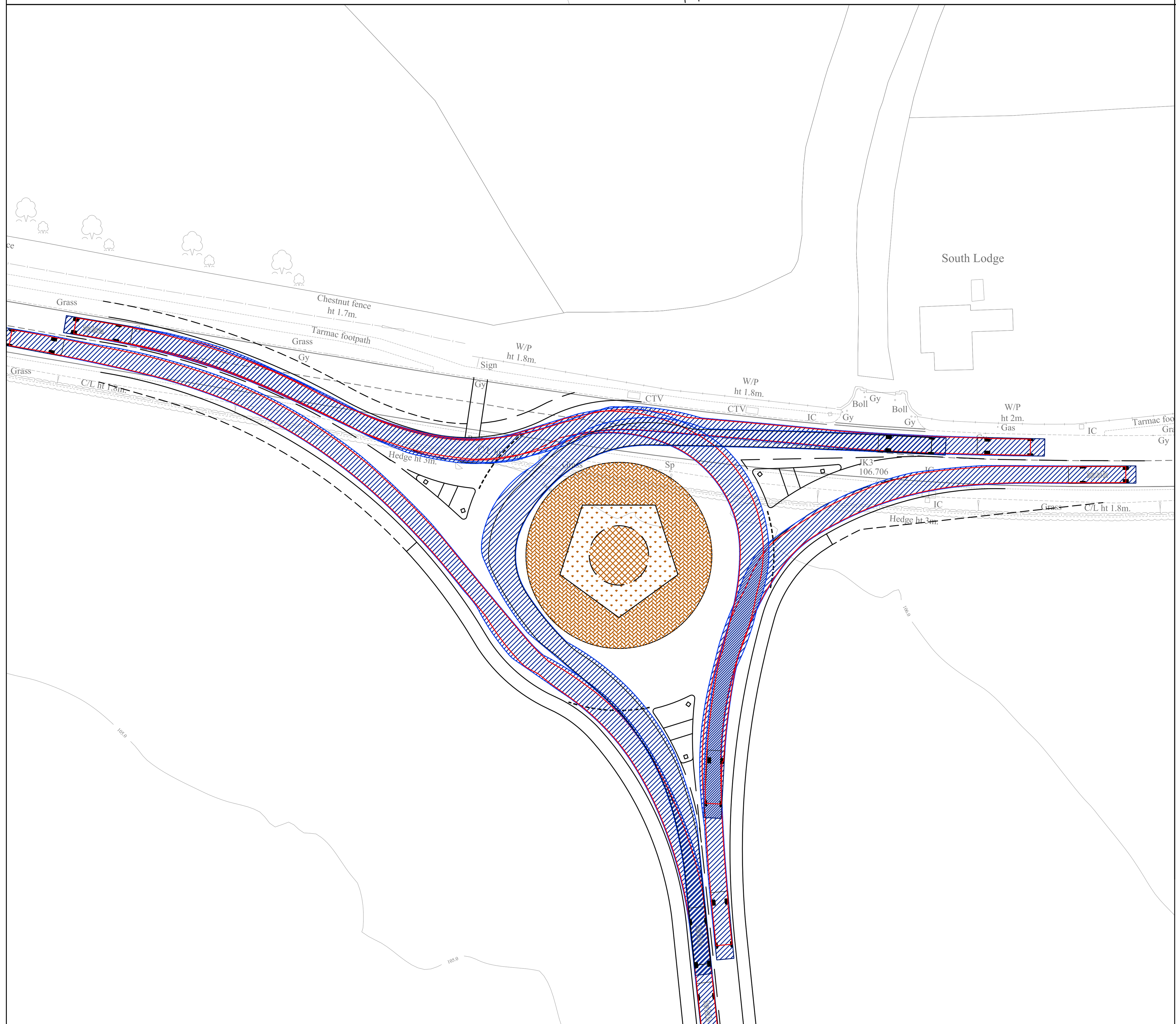
A1



TRACKING - CAR

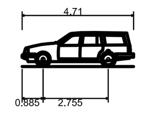


TRACKING - 16.5m HGV

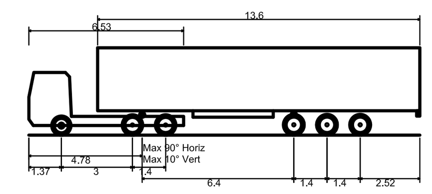


TRACKING - SINGLE DECKER BUS

NOTES



Estate Car (2006)	
Overall Length	4.710m
Overall Width	1.804m
Overall Body Height	1.442m
Min Body Ground Clearance	0.207m
Max Track Width	1.756m
Lock to Lock Time	4.00s
Kerb to Kerb Turning Radius	5.950m



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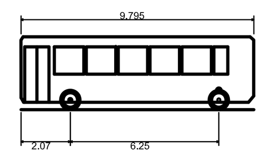

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Min Body Ground Clearance	0.306m
Track Width	2.322m
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Kerb to Kerb Turning Radius	10.111m

REV	AMENDMENTS	DATE	CHK
P1	First issue	26.01.16	JSL

Client

COUNTRYSIDE PROPERITES

Project

LAND AT SUTTON ROAD

Title

PROPOSED WESTERN ACCESS
TRACKING PLAN

Drwg	Rev	Scale	Date
10296/T/01	P1	1:500	26.01.16

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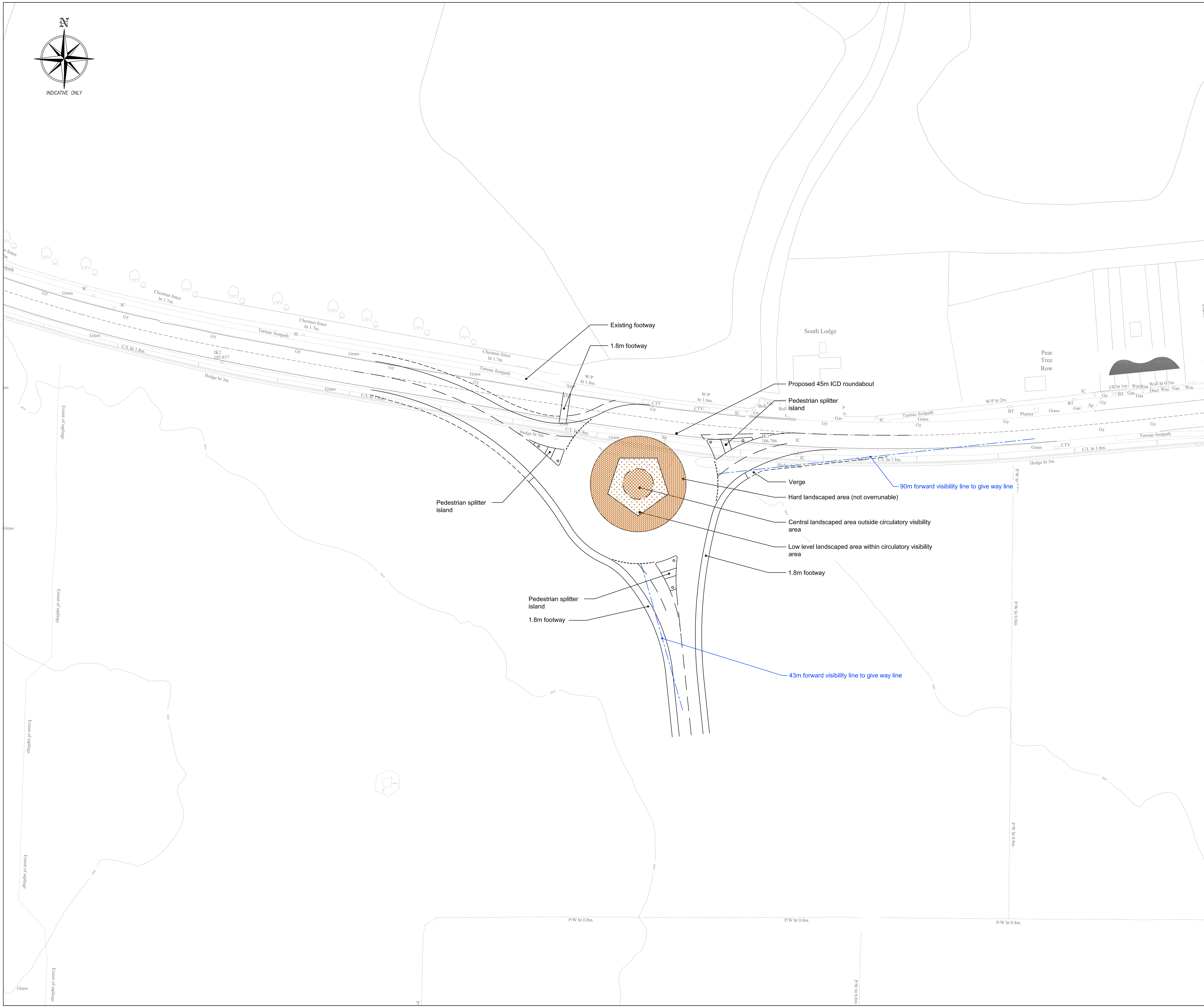
CAD Reference: CAD REF

A1



NOTES

REV	AMENDMENTS	DATE	CHK
P2	Pedestrian crossings provided on splitter islandson the Southern and Eastern Arms	26.01.16	JSL
P1	First issue	13.07.15	JSL

Client
COUNTRYSIDE PROPERITES

Project
LAND AT SUTTON ROAD

Title
PROPOSED WESTERN ACCESS
GENERAL ARRANGEMENT

Drwg	Rev	Scale	Date
10296/H/01	P2	1:500	16.07.15

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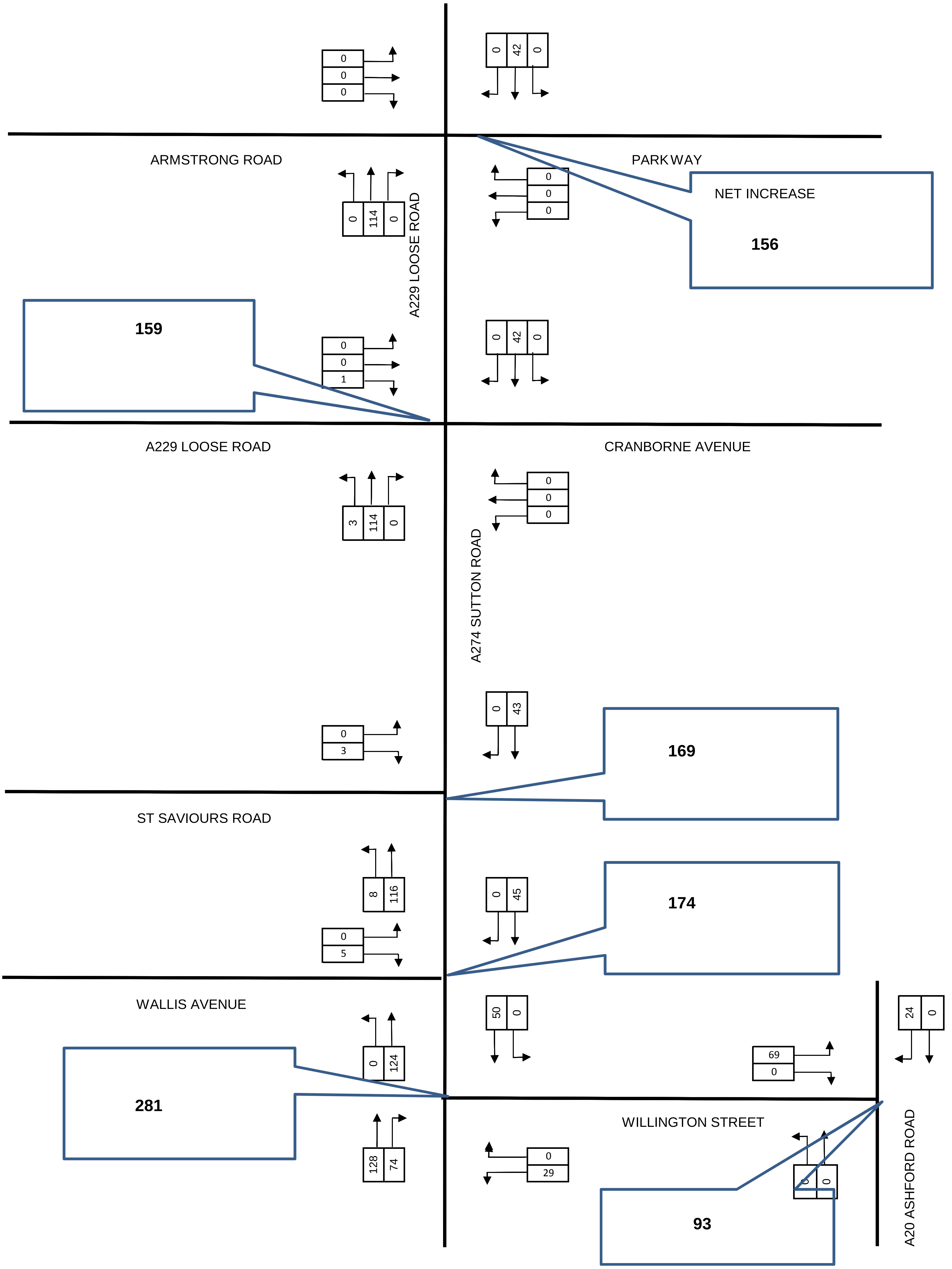
A1

B

APPENDIX



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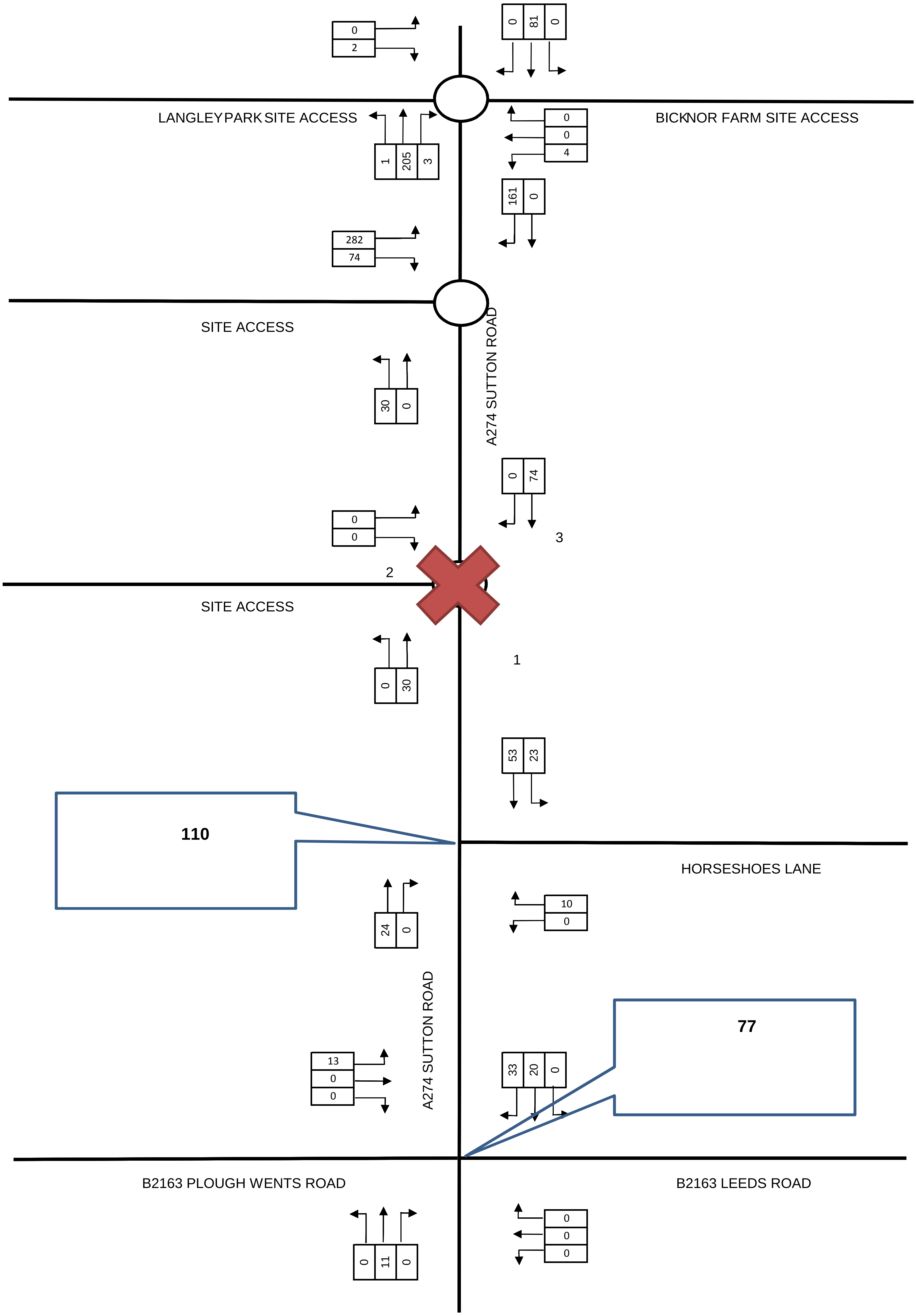
	2029 Development Flows	



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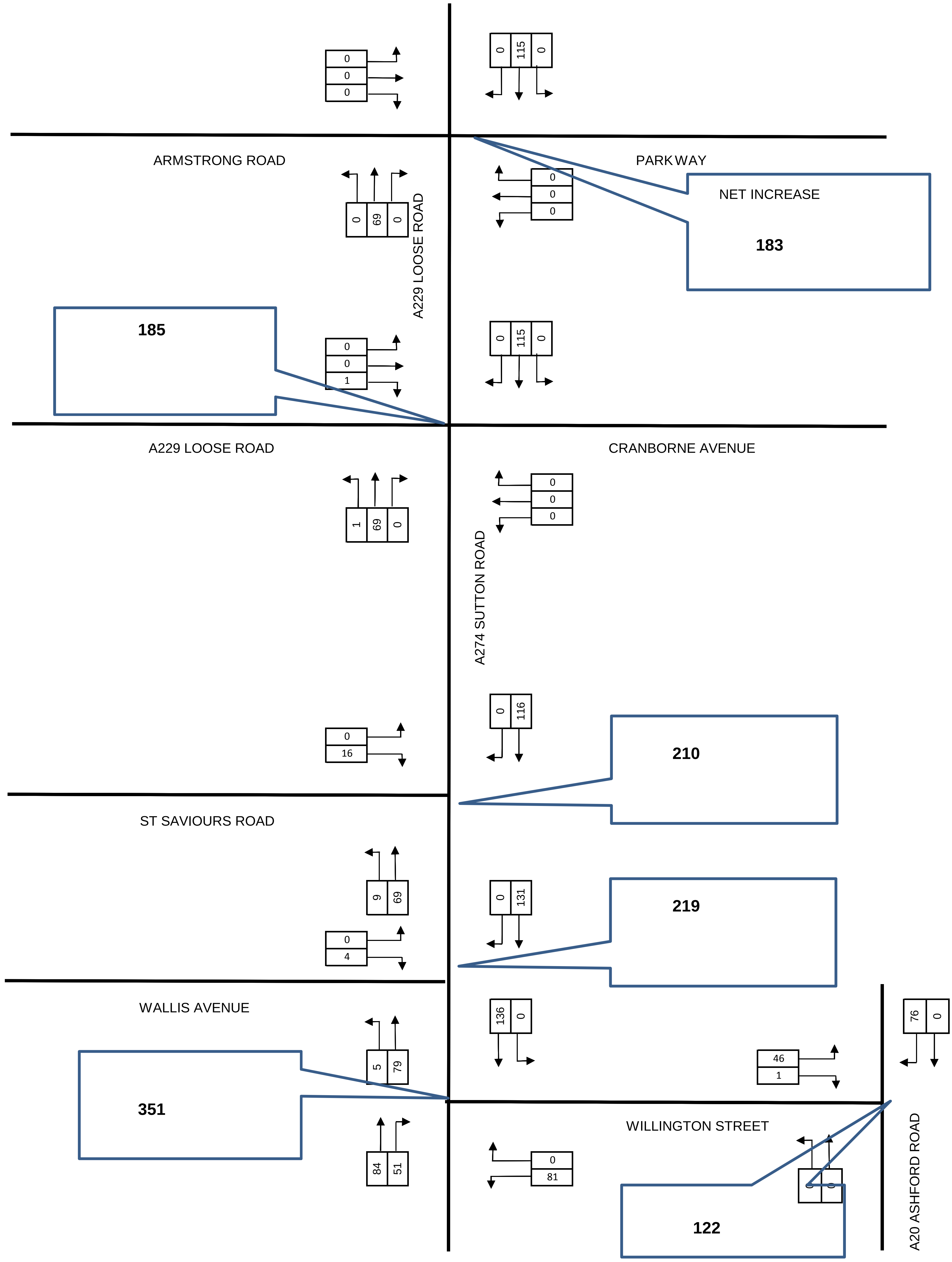
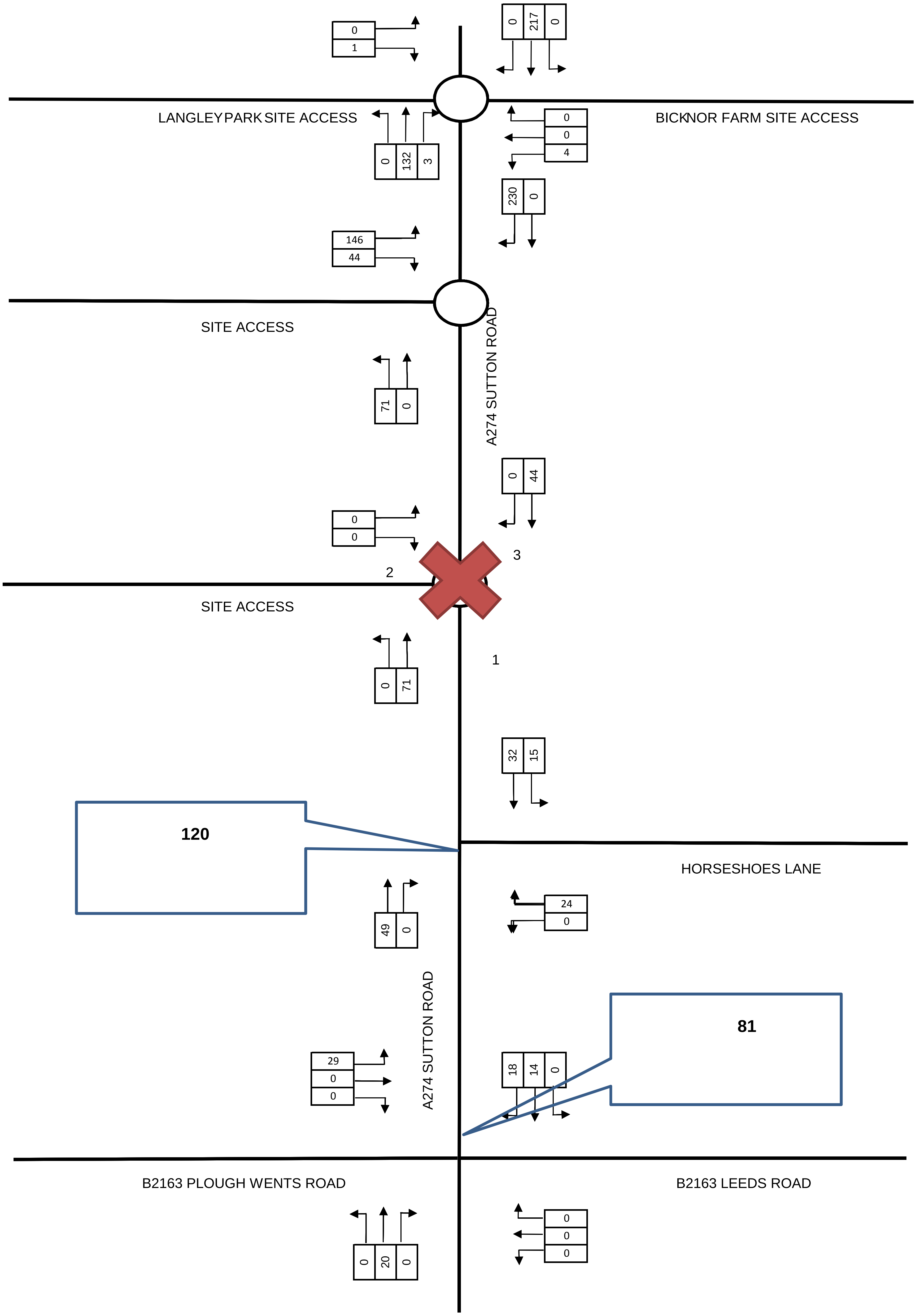
	2029 Development Flows	



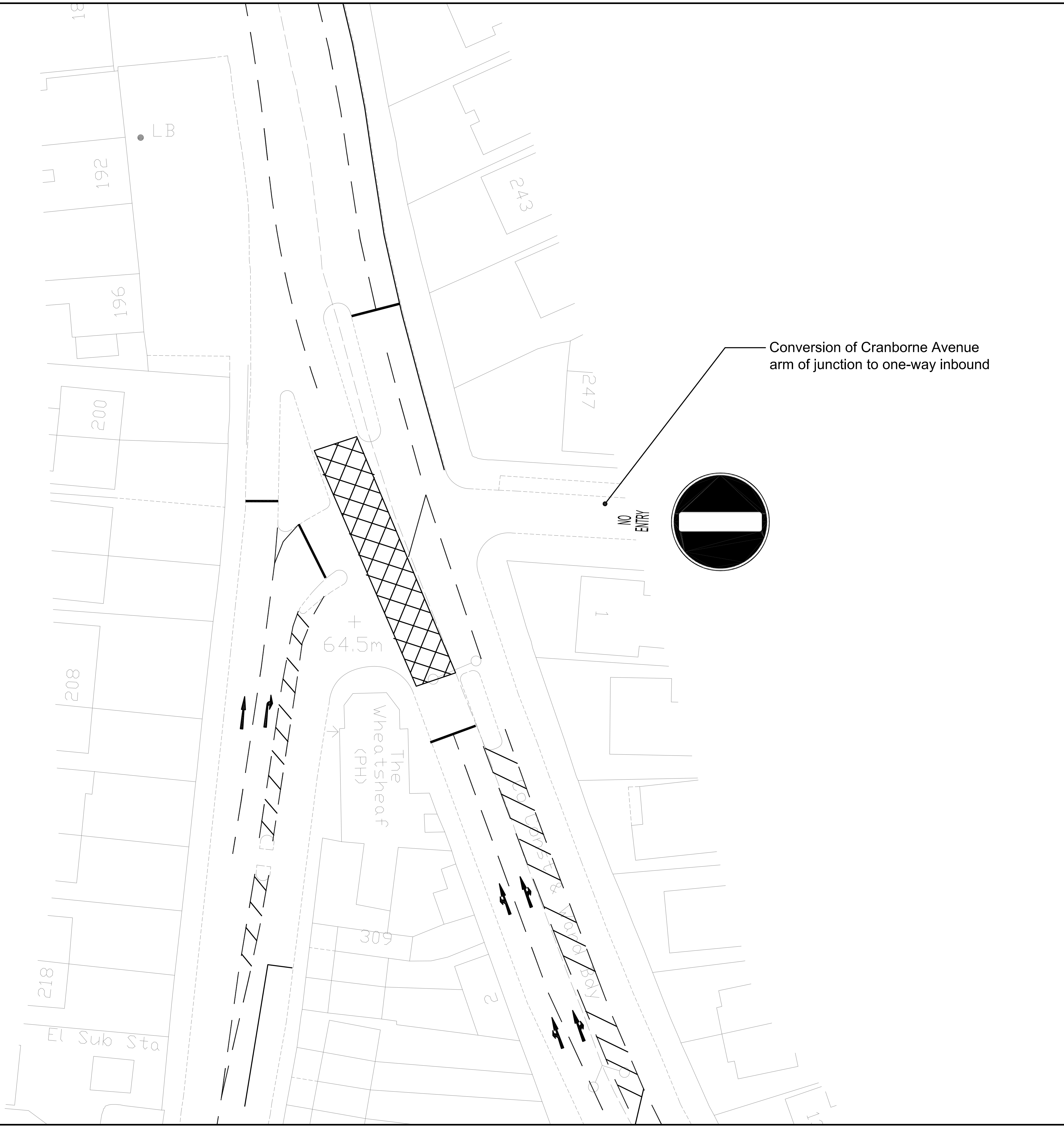
dha transport	PROPOSED RESIDENTIAL DEVELOPMENT AT SUTTON ROAD, MAIDSTONE	FIG
	PM Peak 1700-1800	**TAAD**
	2029 Development Flows	



dha transport	PROPOSED RESIDENTIAL DEVELOPMENT AT SUTTON ROAD, MAIDSTONE	FIG
	PM Peak 1700-1800	**TAAD**
	2029 Development Flows	

C

APPENDIX



DO NOT SCALE

INDICATIVE ONLY

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	07.08.15	SS	First Issue	PL	JL

client

COUNTRYSIDE PROPERTIES

project

LAND SOUTH OF SUTTON ROAD, LANGLEY

title

FEASIBILITY HIGHWAY LAYOUT
A229 /A274/CRANBORNE AVENUE JUNCTION

project	drwg	rev
10296	10296-H-02	P1

Drawn	Checked	Approved	scale @ A3	date
SS	PL	JL	1:500	07.08.15

status

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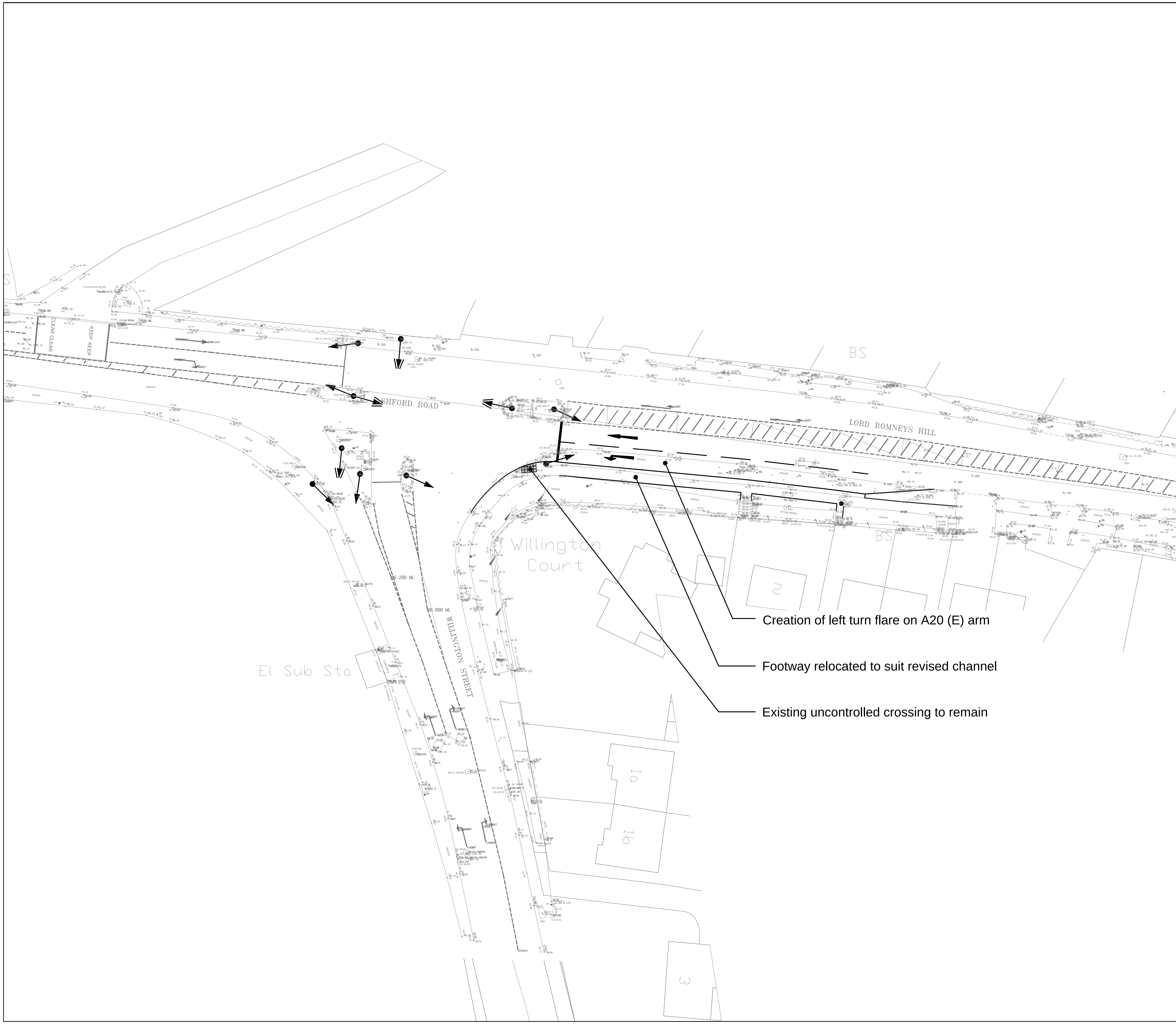
CAD Reference:

A3



DO NOT SCALE

N

INDICATIVE ONLY

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	14.01.16	CS	First Issue	CS	JSL

client

COUNTRYSIDE PROPERTIES

project

LAND SOUTH OF SUTTON ROAD, LANGLEY

title

FEASIBILITY HIGHWAY LAYOUT
A20 ASHFORD RD/WILLINGTON ST

project	drwg	rev
10296	10296-H-23	P1

Drawn	Checked	Approved	scale @ A3	date
CS	CS	JSL	1:500	14.01.16

status

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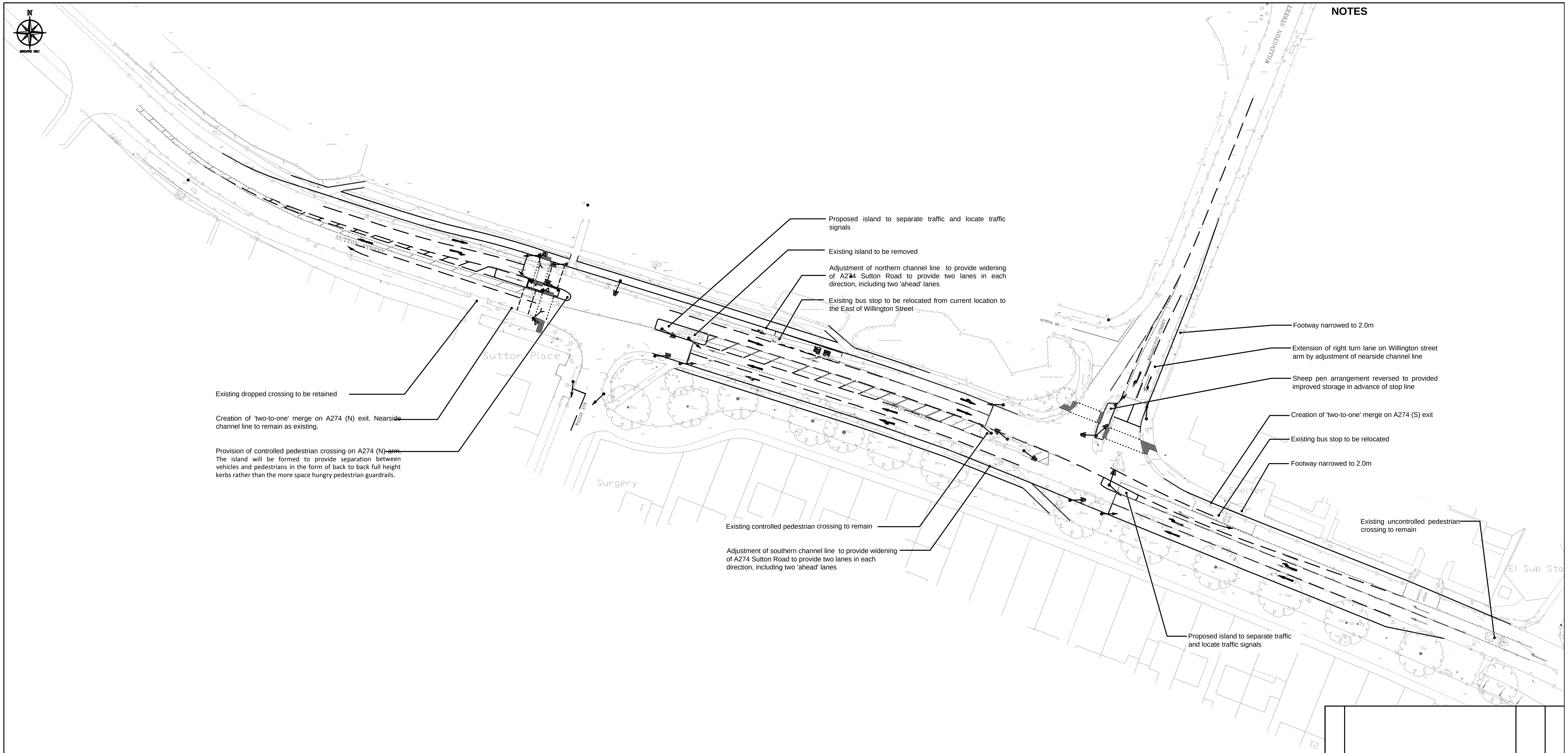

NOTES

REV	AMENDMENTS	DATE	CHK
P1	First Issue	14.01.16	JSL

Client

COUNTRYSIDE PROPERTIES

Project

LAND SOUTH OF SUTTON ROAD, LANGLEY

Title

FEASIBILITY HIGHWAY LAYOUT
A274 / WALLIS AVE / WILLINGTON ST

Drwg	Rev	Scale	Date
10296-H-22	P1	1:500	14.01.16

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CAD Reference:

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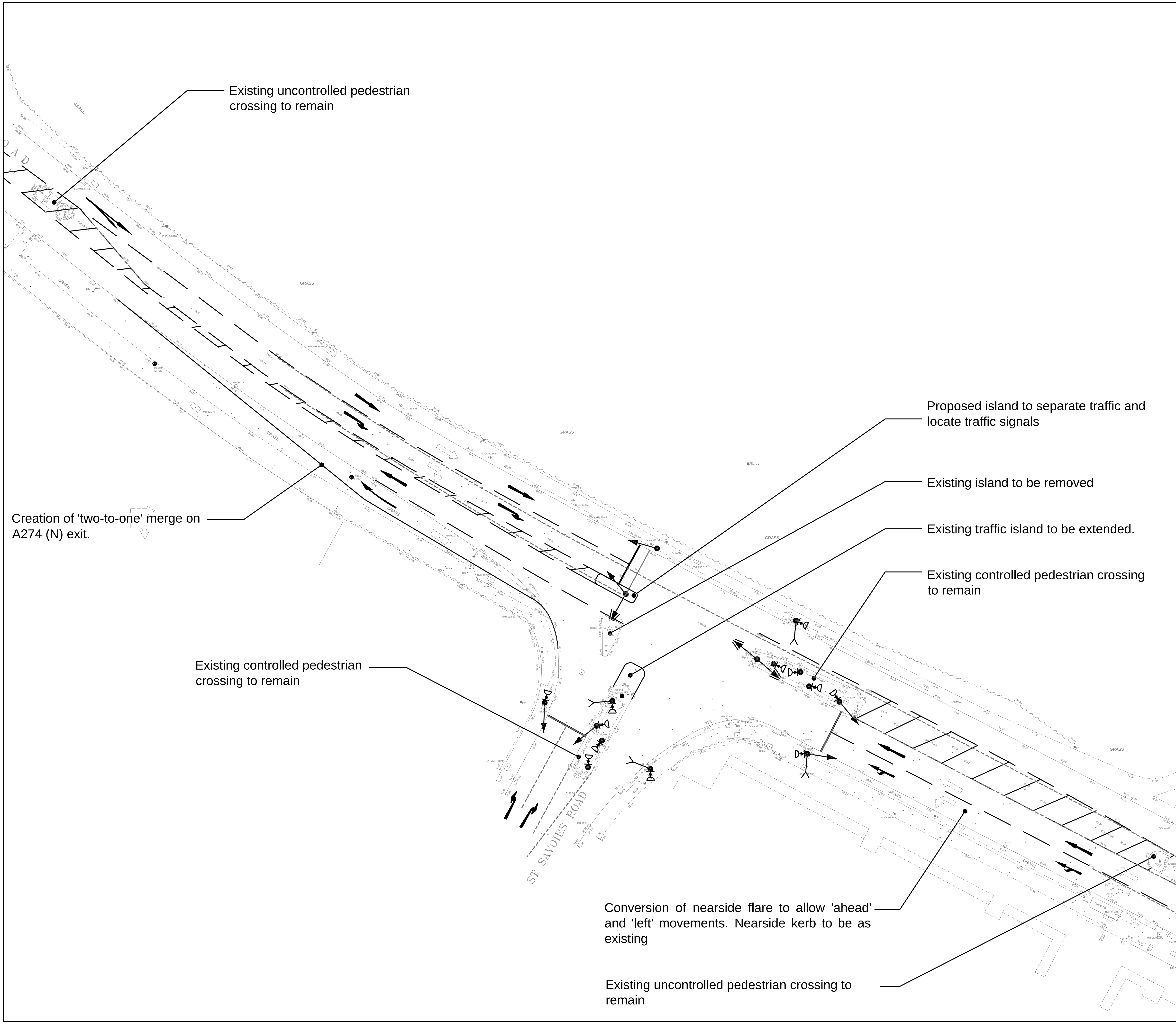

N

DO NOT SCALE

INDICATIVE ONLY

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	14.01.16	CS	First Issue	CS	JSL

client
COUNTRYSIDE PROPERTIES

project
LAND SOUTH OF SUTTON ROAD, LANGLEY

title
FEASIBILITY HIGHWAY LAYOUT
A274 SUTTON ROAD / ST SAVIOURS ROAD

project	drwg	rev
10296	10296-H-21	P1

Drawn	Checked	Approved	scale @ A3	date
CS	CS	JSL	1:500	14.01.16

status
FOR INFORMATION
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t: 01622 776226 f: 01622 776227
e: info@dhaplanning.co.uk w: www.dhatransport.co.uk

CAD Reference:

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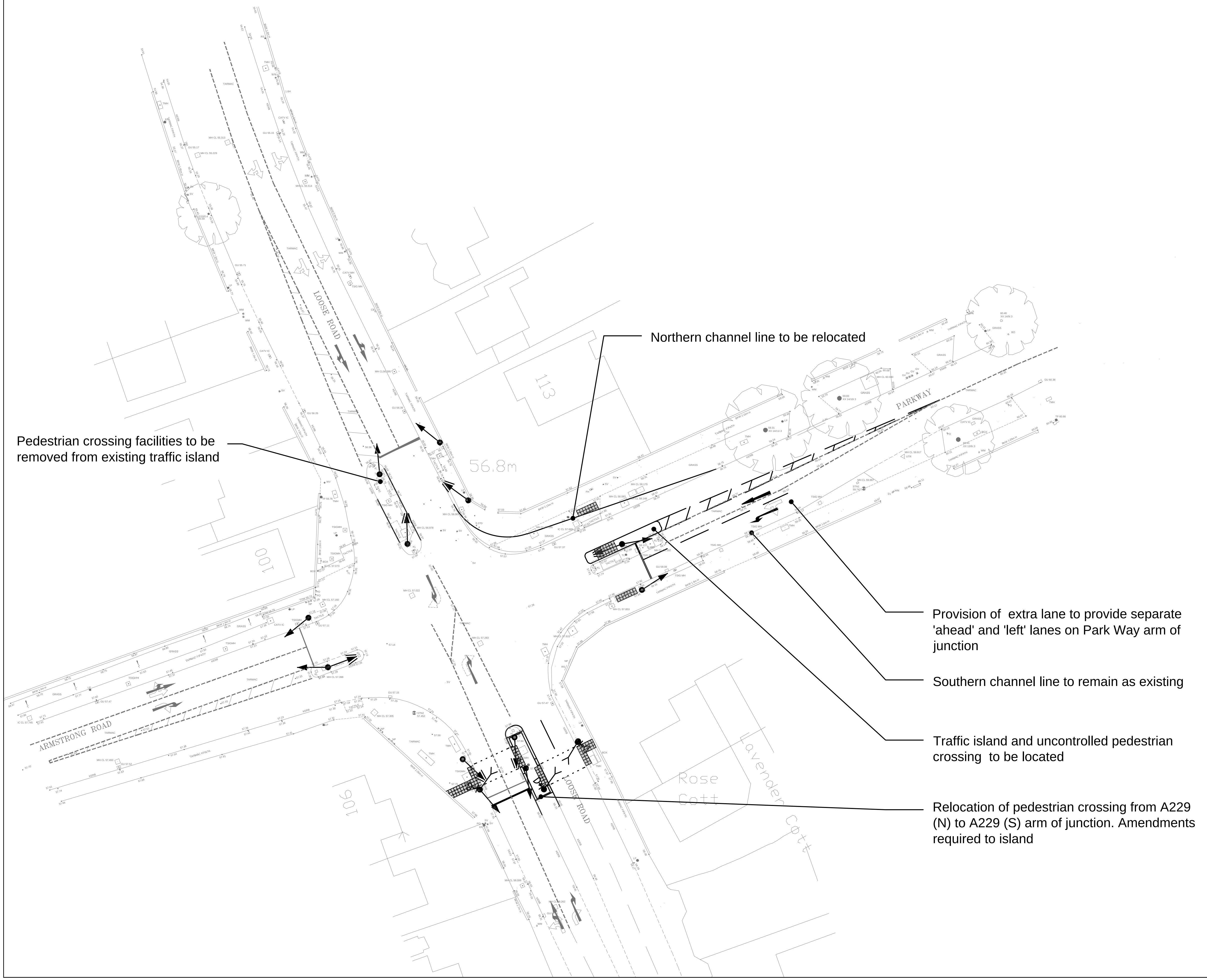

DO NOT SCALE

N
INDICATIVE ONLY

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	14.01.16	CS	First Issue	CS	JSL

client
COUNTRYSIDE PROPERTIES

project
LAND SOUTH OF SUTTON ROAD, LANGLEY

title
FEASIBILITY HIGHWAY LAYOUT
A229 / ARMSTRONG RD / PARK WAY

project	drwg	rev
10296	10296-H-20	P1

Drawn	Checked	Approved	scale @ A3	date
CS	CS	JSL	1:500	14.01.16

status
FOR INFORMATION
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e: info@dhaplanning.co.uk w: www.dhatransport.co.uk

CAD Reference:

A3

D

APPENDIX

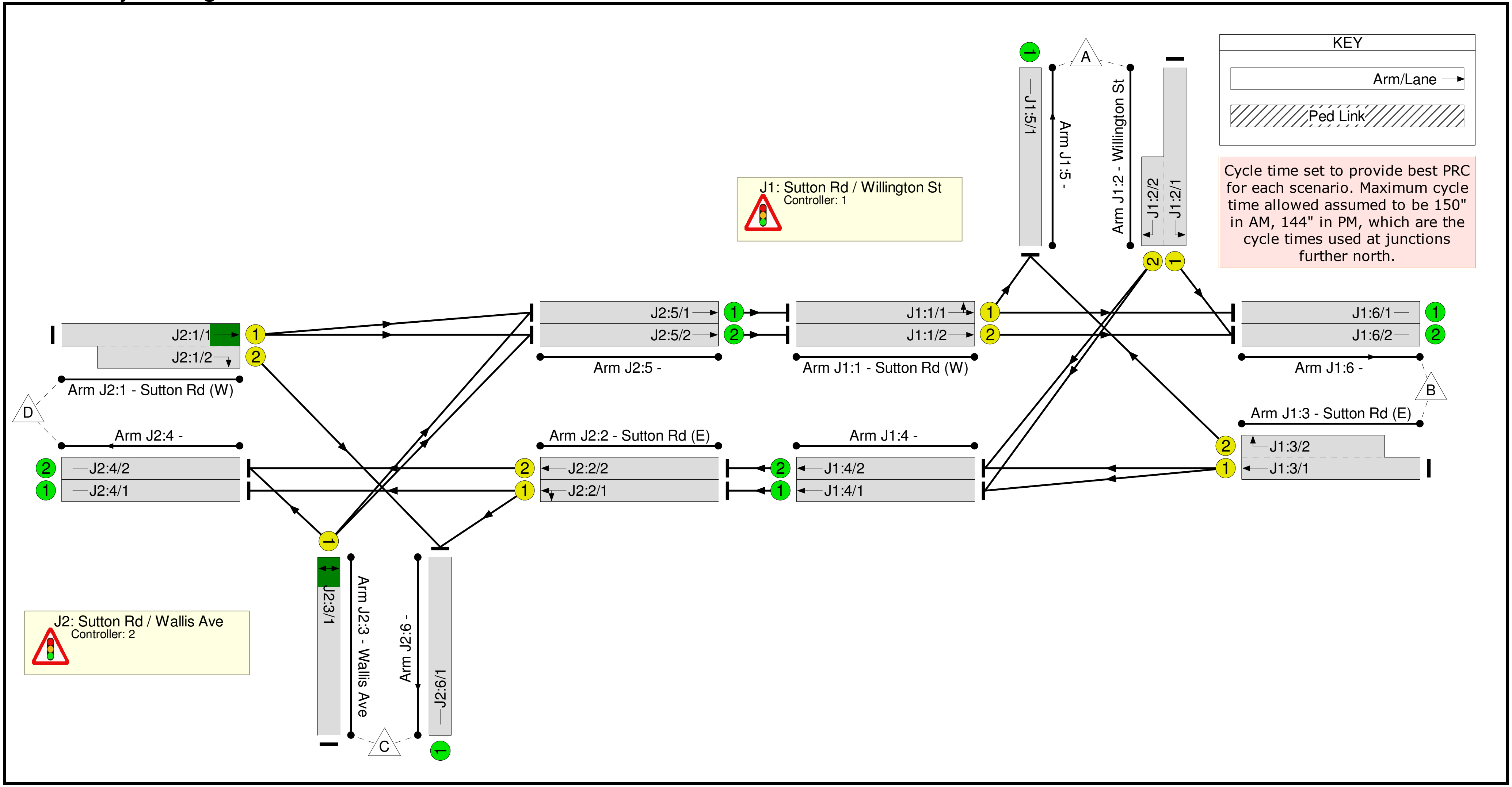
Willington Wallis Proposed LinSig Data

User and Project Details

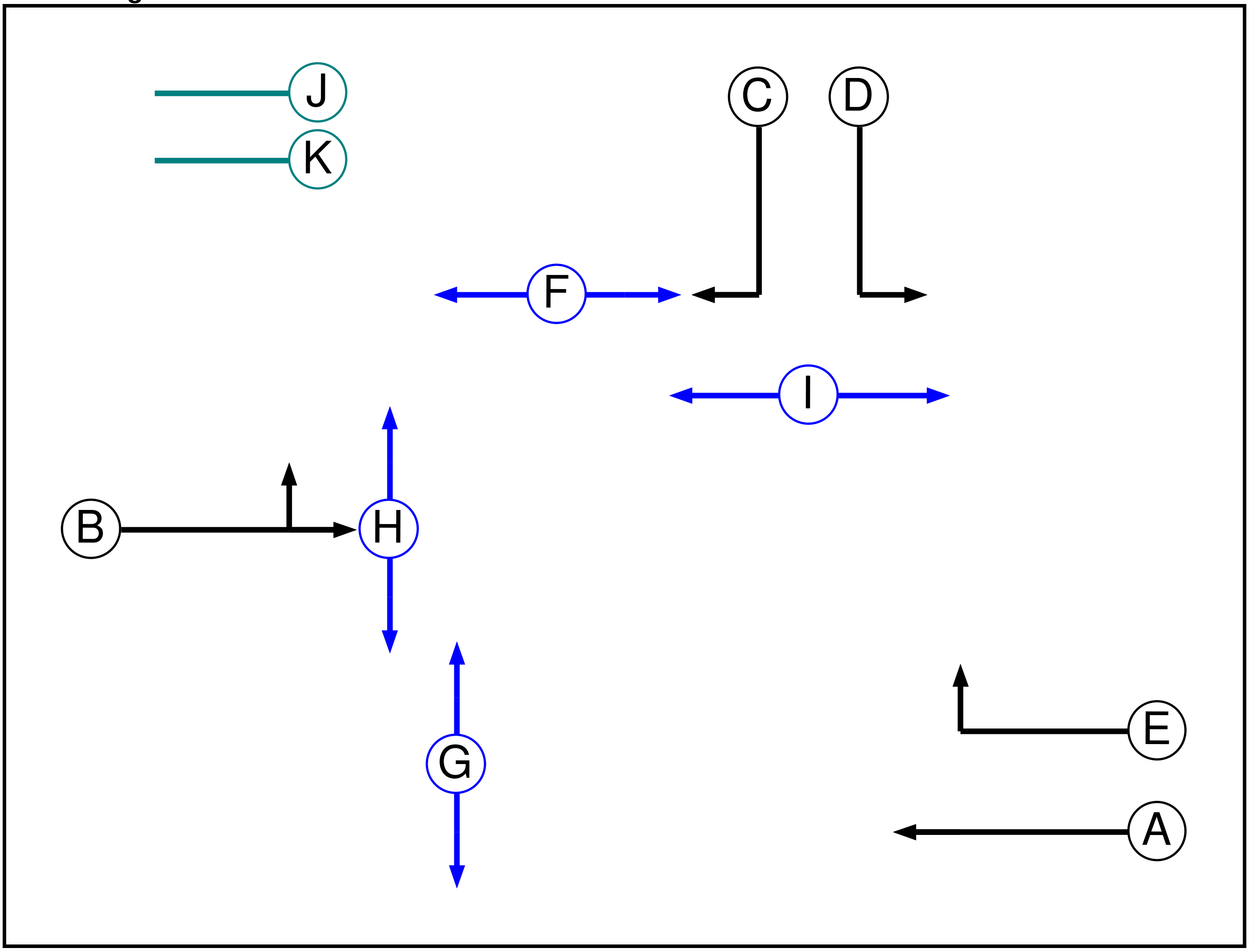
Project:	**16007 Sutton Rd**
Title:	**Willington Wallis Base**
Location:	Langley, Kent
File name:	Willington Wallis Proposed.lsg3x
Author:	Simon Swanston
Company:	JCT Consultancy
Address:	LinSig House, Deepdale Lane, Nettleham, Lincoln, LN2 2LL
Notes:	

Willington Wallis Proposed LinSig Data

Network Layout Diagram



Willington Wallis Proposed LinSig Data
C1
Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		-9999	7
B	Traffic		-9999	7
C	Traffic		-9999	7
D	Traffic		-9999	7
E	Traffic		-9999	7
F	Pedestrian		-9999	6
G	Pedestrian		-9999	6
H	Pedestrian		-9999	6
I	Pedestrian		-9999	6
J	Dummy		-9999	2
K	Dummy		-9999	2

Willington Wallis Proposed LinSig Data

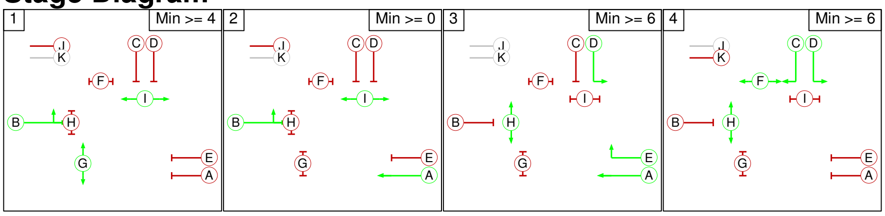
Phase Intergreens Matrix

		Starting Phase										
		A	B	C	D	E	F	G	H	I	J	K
Terminating Phase	A		-	5	-	-	-	5	-	-	-	-
	B	-		6	7	6	5	-	5	-	-	-
	C	6	5		-	6	-	6	-	5	-	-
	D	-	5	-		-	-	-	-	5	-	-
	E	-	5	5	-		7	-	-	-	-	-
	F	-	9	-	-	9		-	-	-	-	0
	G	5	-	5	-	-	-		-	-	-	-
	H	-	7	-	-	-	-	-		-	-	-
	I	-	-	9	9	-	-	-	-		0	-
	J	-	-	-	-	-	-	-	-	0		-
	K	-	-	-	-	-	0	-	-	-	-	

Phases in Stage

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

Stage Diagram



Willington Wallis Proposed LinSig Data

Phase Delays

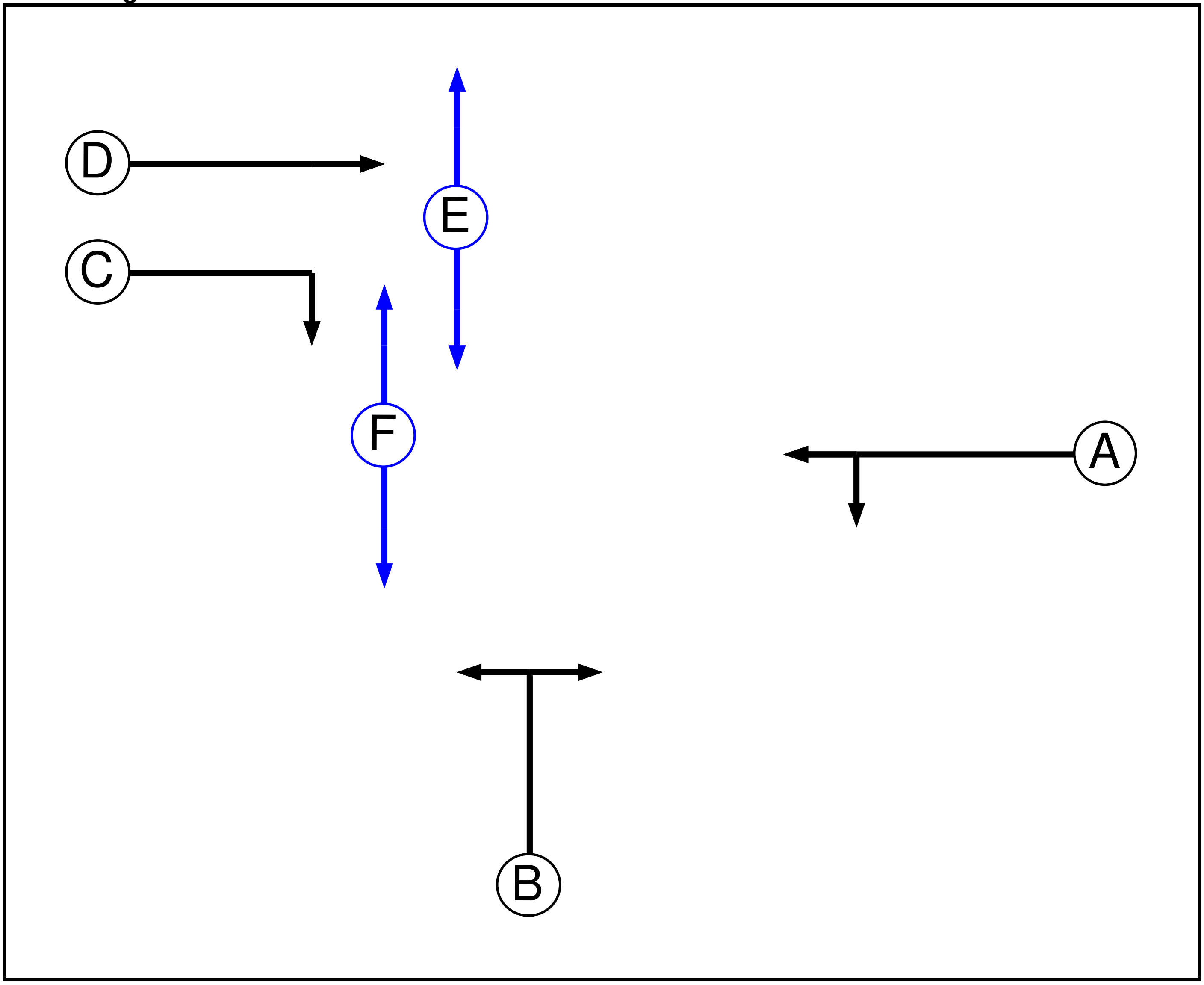
Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	3	B	Losing	2	2
1	4	B	Losing	2	2
2	3	B	Losing	2	2
2	4	A	Losing	4	4
2	4	B	Losing	2	2
3	1	D	Losing	2	2
3	1	E	Losing	2	2
3	2	D	Losing	2	2
3	2	E	Losing	2	2
4	1	C	Losing	4	4
4	1	D	Losing	4	4
4	2	C	Losing	3	3
4	2	D	Losing	4	4
4	3	C	Losing	3	3

Prohibited Stage Change

		To Stage			
From Stage		1	2	3	4
	1		5	9	9
	2	5		9	9
	3	7	7		7
	4	10	9	9	

C2

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		-9999	7
B	Traffic		-9999	7
C	Traffic		-9999	7
D	Traffic		-9999	7
E	Pedestrian		-9999	5
F	Pedestrian		-9999	5

Willington Wallis Proposed LinSig Data

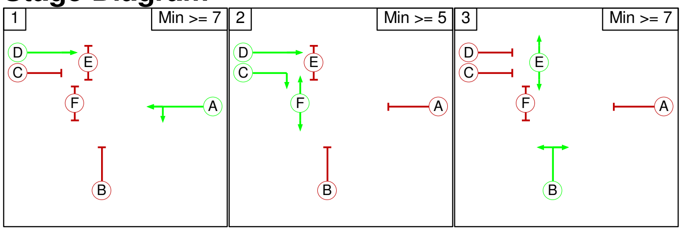
Phase Intergreens Matrix

		Starting Phase					
		A	B	C	D	E	F
Terminating Phase	A		5	5	-	-	8
	B	5		5	5	-	8
	C	6	6		-	5	-
	D	-	5	-		5	-
	E	-	-	5	5		-
	F	5	5	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A D
2	C D F
3	B E

Stage Diagram



Phase Delays

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

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		8	5
	2	6		6
	3	5	8	

Willington Wallis Proposed LinSig Data

Give-Way Lane Input Data

Junction: J1: Sutton Rd / Willington St
There are no Opposed Lanes in this Junction

Junction: J2: Sutton Rd / Wallis Ave
There are no Opposed Lanes in this Junction

Willington Wallis Proposed LinSig Data

Lane Input Data

Junction: J1: Sutton Rd / Willington St												
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)**
J1:1/1 (Sutton Rd (W))	U	B	2	3	60.0	Geom	-	3.10	0.00	Y	Arm J1:5 Left	11.00
											Arm J1:6 Ahead	Inf
J1:1/2 (Sutton Rd (W))	U	B	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J1:6 Ahead	Inf
J1:2/1 (Willington St)	U	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J1:6 Left	12.00
J1:2/2 (Willington St)	U	C	2	3	6.0	Geom	-	3.00	0.00	Y	Arm J1:4 Right	18.00
J1:3/1 (Sutton Rd (E))	U	A	2	3	60.0	Geom	-	3.15	0.00	Y	Arm J1:4 Ahead	Inf
J1:3/2 (Sutton Rd (E))	U	E	2	3	11.0	Geom	-	3.00	0.00	Y	Arm J1:5 Right	9.00
J1:4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:4/2	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:6/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:6/2	U		2	3	60.0	Inf	-	-	-	-	-	-

Junction: J2: Sutton Rd / Wallis Ave												
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)**
J2:1/1 (Sutton Rd (W))	U	D	2	3	60.0	Geom	-	3.15	0.00	Y	Arm J2:5 Ahead	Inf
J2:1/2 (Sutton Rd (W))	U	C	2	3	10.0	Geom	-	3.15	0.00	Y	Arm J2:6 Right	11.00
J2:2/1 (Sutton Rd (E))	U	A	2	3	60.0	Geom	-	3.25	0.00	Y	Arm J2:4 Ahead	Inf
											Arm J2:6 Left	12.00
J2:2/2 (Sutton Rd (E))	U	A	2	3	60.0	Geom	-	3.25	0.00	N	Arm J2:4 Ahead	Inf
J2:3/1 (Wallis Ave)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm J2:4 Left	9.00
											Arm J2:5 Right	19.00
J2:4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:4/2	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:5/2	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:6/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM Survey'	07:30	08:30	01:00	
2: 'AM29+C'	07:30	08:30	01:00	
3: 'AM29+C+D'	07:30	08:30	01:00	F2+F7
4: 'PM Survey'	17:00	18:00	01:00	
5: 'PM29+C'	17:00	18:00	01:00	
6: 'PM29+C+D'	17:00	18:00	01:00	F5+F8

Scenario 1: 'AM29+C+D' (FG3: 'AM29+C+D', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	602	38	317	957
	B	596	0	112	782	1490
	C	31	130	0	251	412
	D	219	646	297	0	1162
	Tot.	846	1378	447	1350	4021

Traffic Lane Flows

Lane	Scenario 1: AM29+C+D
Junction: J1: Sutton Rd / Willington St	
J1:1/1	497
J1:1/2	529
J1:2/1 (with short)	957(In) 602(Out)
J1:2/2 (short)	355
J1:3/1 (with short)	1490(In) 894(Out)
J1:3/2 (short)	596
J1:4/1	585
J1:4/2	664
J1:5/1	846
J1:6/1	247
J1:6/2	1131
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1162(In) 865(Out)
J2:1/2 (short)	297
J2:2/1	585
J2:2/2	664
J2:3/1	412
J2:4/1	435
J2:4/2	915
J2:5/1	497
J2:5/2	529
J2:6/1	447

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	50.3 %	1801	1801
				Arm J1:6 Ahead	Inf	49.7 %		
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:4/2	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf
J1:6/2	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	74.4 %	1880	1880
				Arm J2:6 Left	12.00	25.6 %		
J2:2/2 (Sutton Rd (E))	3.25	0.00	N	Arm J2:4 Ahead	Inf	100.0 %	2080	2080
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	60.9 %	1713	1713
				Arm J2:5 Right	19.00	39.1 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:4/2	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:5/2	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 2: 'PM29+C+D' (FG6: 'PM29+C+D', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

	Destination					
Origin		A	B	C	D	Tot.
	A	0	496	35	278	809
	B	652	0	119	704	1475
	C	32	119	0	280	431
	D	272	802	348	0	1422
	Tot.	956	1417	502	1262	4137

Traffic Lane Flows

Lane	Scenario 2: PM29+C+D
Junction: J1: Sutton Rd / Willington St	
J1:1/1	594
J1:1/2	631
J1:2/1 (with short)	809(In) 496(Out)
J1:2/2 (short)	313
J1:3/1 (with short)	1475(In) 823(Out)
J1:3/2 (short)	652
J1:4/1	523
J1:4/2	613
J1:5/1	956
J1:6/1	290
J1:6/2	1127
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1422(In) 1074(Out)
J2:1/2 (short)	348
J2:2/1	523
J2:2/2	613
J2:3/1	431
J2:4/1	369
J2:4/2	893
J2:5/1	594
J2:5/2	631
J2:6/1	502

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	51.2 %	1799	1799
				Arm J1:6 Ahead	Inf	48.8 %		
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:4/2	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf
J1:6/2	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	70.6 %	1871	1871
				Arm J2:6 Left	12.00	29.4 %		
J2:2/2 (Sutton Rd (E))	3.25	0.00	N	Arm J2:4 Ahead	Inf	100.0 %	2080	2080
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	65.0 %	1708	1708
				Arm J2:5 Right	19.00	35.0 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:4/2	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:5/2	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 3: 'PM29+C+D Block' (FG6: 'PM29+C+D', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	496	35	278	809
	B	652	0	119	704	1475
	C	32	119	0	280	431
	D	272	802	348	0	1422
	Tot.	956	1417	502	1262	4137

Traffic Lane Flows

Lane	Scenario 3: PM29+C+D Block
Junction: J1: Sutton Rd / Willington St	
J1:1/1	594
J1:1/2	631
J1:2/1 (with short)	809(In) 496(Out)
J1:2/2 (short)	313
J1:3/1 (with short)	1475(In) 823(Out)
J1:3/2 (short)	652
J1:4/1	523
J1:4/2	613
J1:5/1	956
J1:6/1	290
J1:6/2	1127
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1422(In) 1074(Out)
J2:1/2 (short)	348
J2:2/1	523
J2:2/2	613
J2:3/1	431
J2:4/1	369
J2:4/2	893
J2:5/1	594
J2:5/2	631
J2:6/1	502

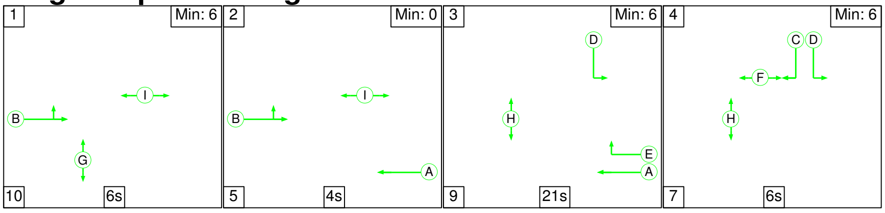
Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	51.2 %	1799	1799
				Arm J1:6 Ahead	Inf	48.8 %		
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:4/2	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf
J1:6/2	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	70.6 %	1871	1871
				Arm J2:6 Left	12.00	29.4 %		
J2:2/2 (Sutton Rd (E))	3.25	0.00	N	Arm J2:4 Ahead	Inf	100.0 %	2080	2080
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	65.0 %	1708	1708
				Arm J2:5 Right	19.00	35.0 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:4/2	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:5/2	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Willington Wallis Proposed LinSig Data

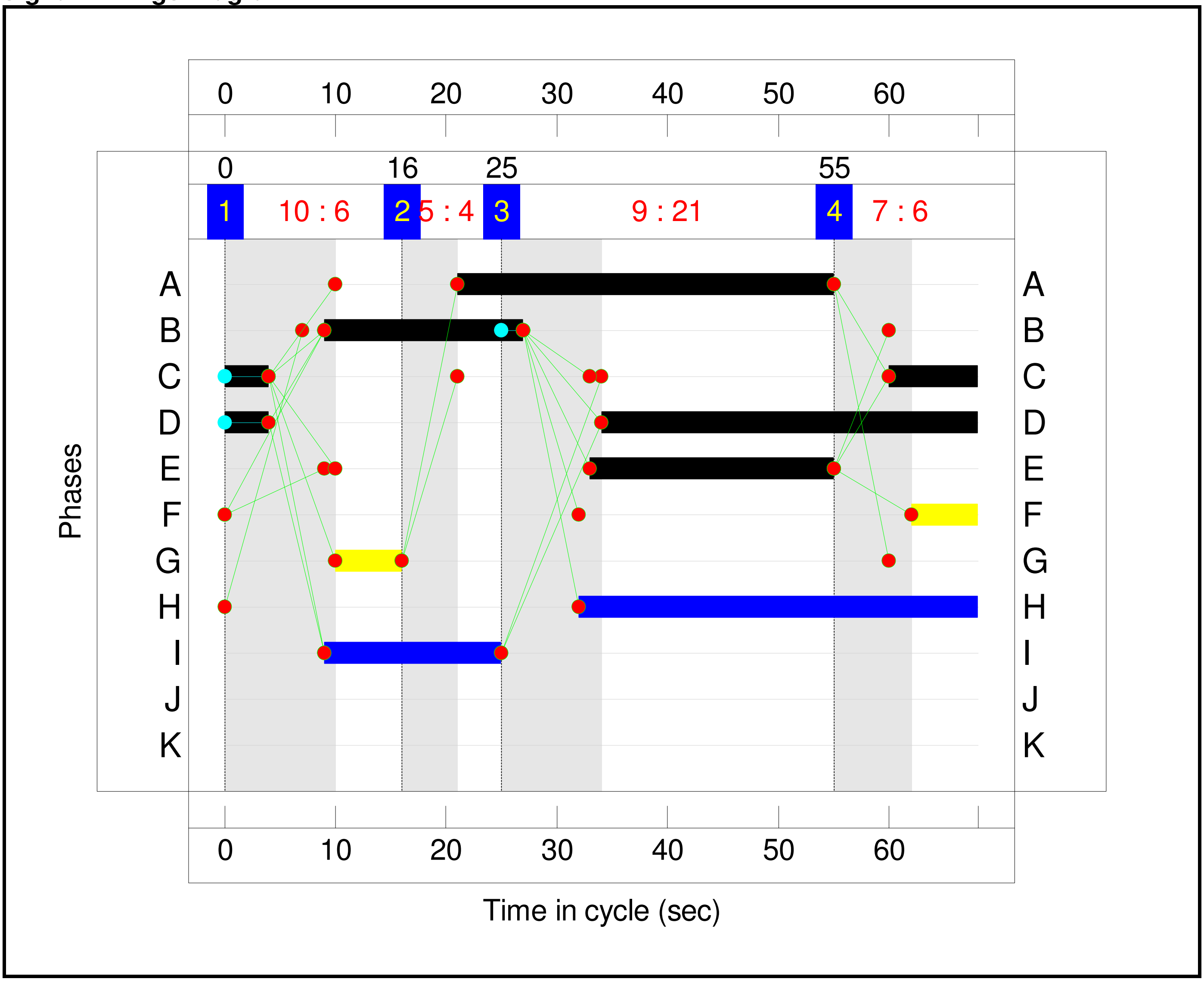
Scenario 1: 'AM29+C+D' (FG3: 'AM29+C+D', Plan 1: 'AM Survey')
C1
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	6	4	21	6
Change Point	0	16	25	55

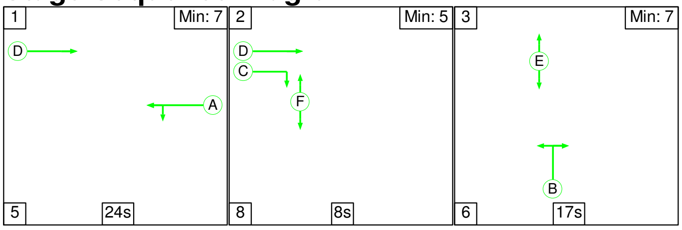
Signal Timings Diagram



Willington Wallis Proposed LinSig Data

C2

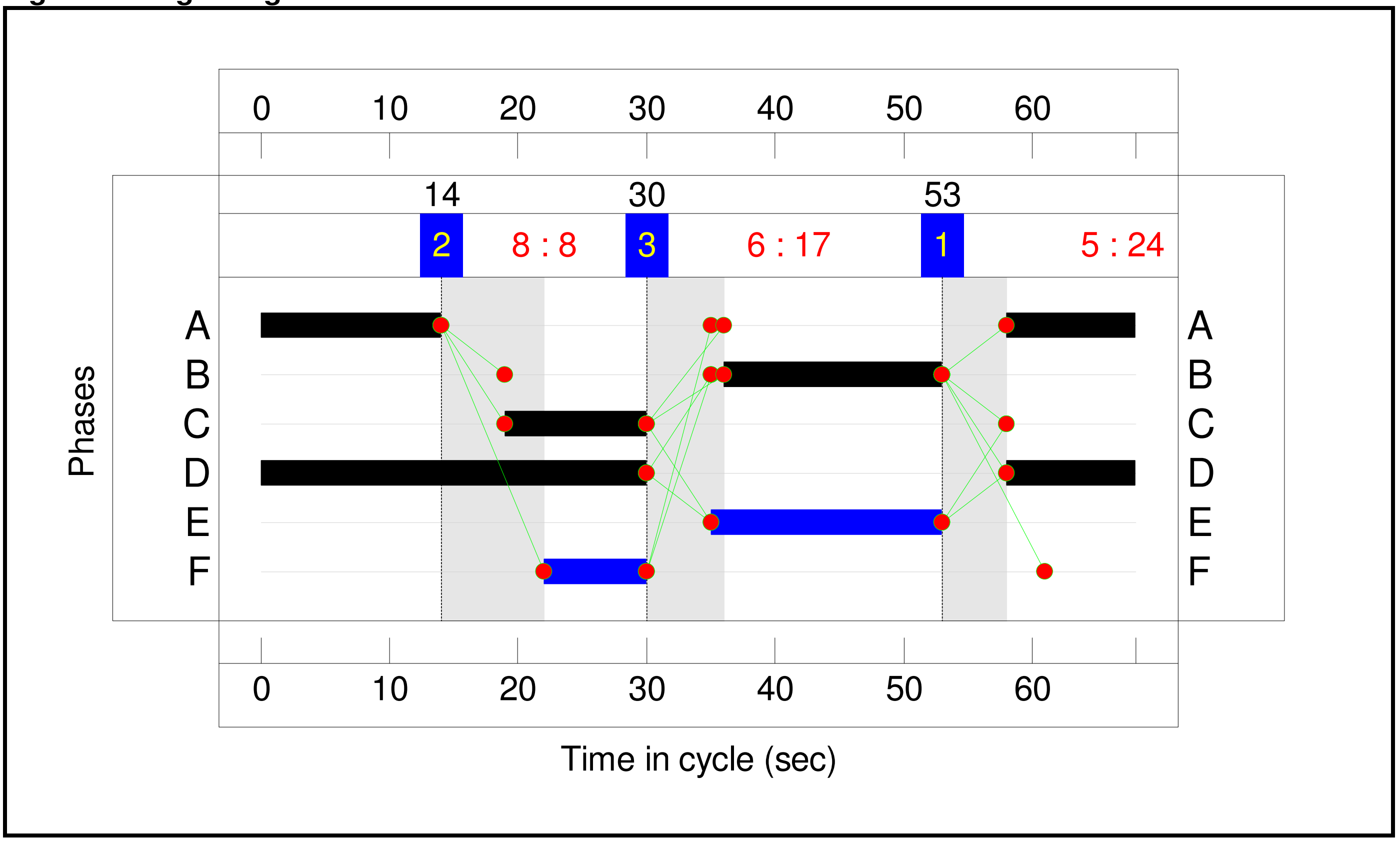
Stage Sequence Diagram



Stage Timings

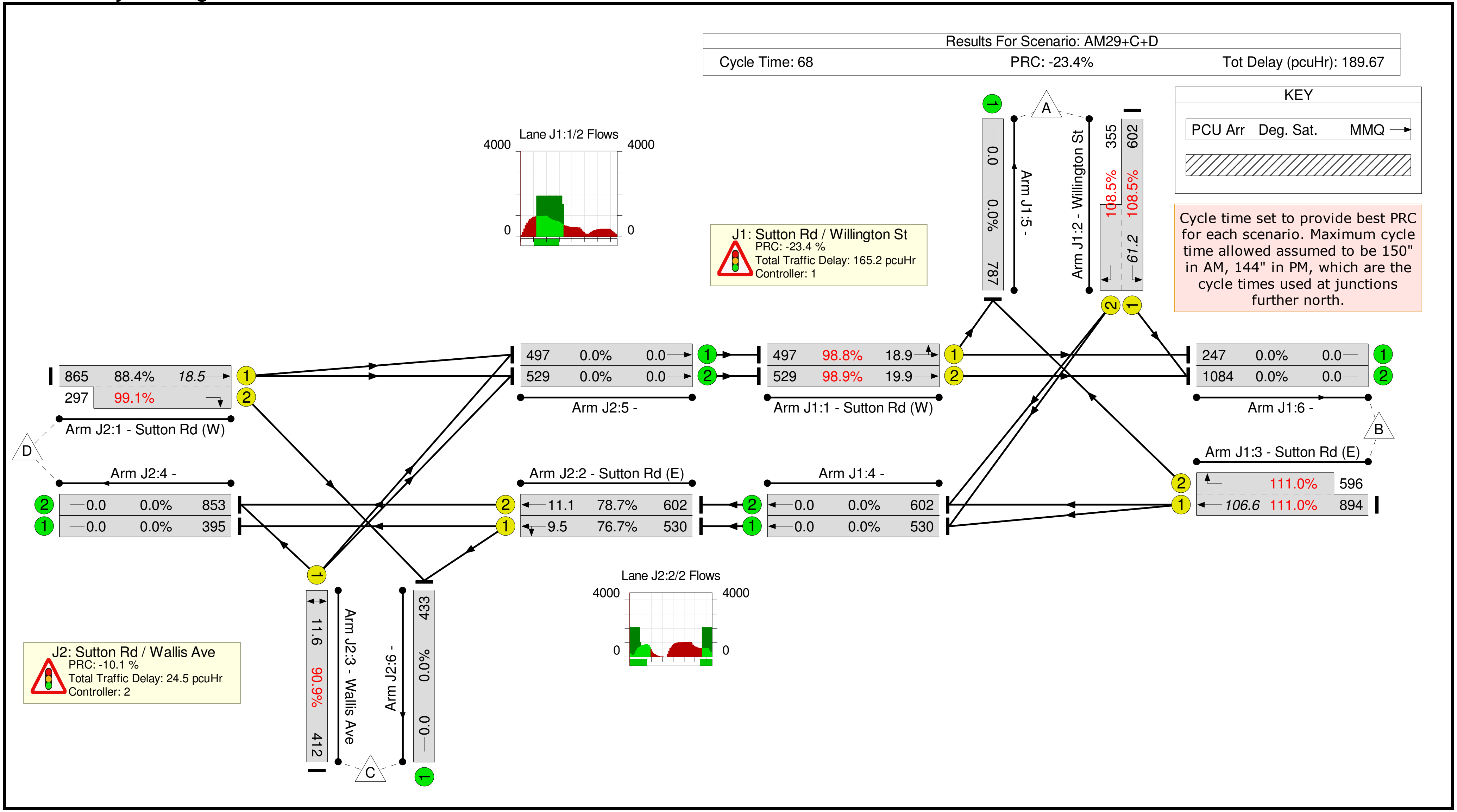
Stage	1	2	3
Duration	24	8	17
Change Point	53	14	30

Signal Timings Diagram



Willington Wallis Proposed LinSig Data

Network Layout Diagram



Willington Wallis Proposed LinSig Data

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: Willington Wallis Base	-	-	**N/A**	-	-		-	-	-	-	-	-	**111.0%**
J1: Sutton Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**111.0%**
1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	18	-	497	1801	503	98.8%
1/2	Sutton Rd (W) Ahead	U	N/A	N/A	C1:B		1	18	-	529	1915	535	98.9%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	38:12	-	957	1702:1768	555+327	108.5 : 108.5%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	34:22	-	1490	1930:1641	805+537	111.0 : 111.0%
4/1	Ahead	U	N/A	N/A	-		-	-	-	585	Inf	Inf	0.0%
4/2	Ahead	U	N/A	N/A	-		-	-	-	664	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	846	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	247	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1131	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	-	-	**N/A**	-	-		-	-	-	-	-	-	**99.1%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	40:11	-	1162	1930:1698	979+300	88.4 : 99.1%
2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	24	-	585	1880	691	76.7%
2/2	Sutton Rd (E) Ahead	U	N/A	N/A	C2:A		1	24	-	664	2080	765	78.7%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	17	-	412	1713	453	90.9%
4/1		U	N/A	N/A	-		-	-	-	435	Inf	Inf	0.0%
4/2		U	N/A	N/A	-		-	-	-	915	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	497	Inf	Inf	0.0%
5/2	Ahead	U	N/A	N/A	-		-	-	-	529	Inf	Inf	0.0%

Willington Wallis Proposed LinSig Data

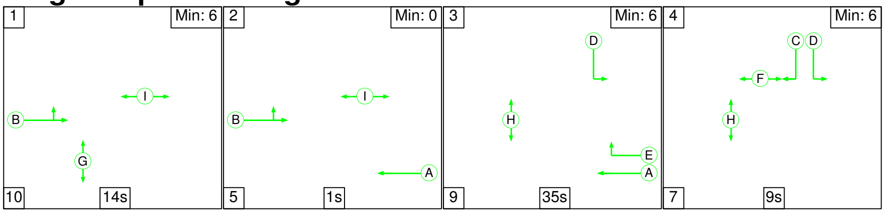
6/1		U	N/A	N/A	-		-	-	-	447	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**35.7**	**154.0**	**0.0**	**189.7**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**23.4**	**141.8**	**0.0**	**165.2**	**-**	**-**	**-**	**-**
1/1	497	497	-	-	-	2.4	9.7	-	12.1	87.7	9.2	9.7	18.9
1/2	529	529	-	-	-	2.6	10.1	-	12.7	86.4	9.8	10.1	19.9
2/1+2/2	957	882	-	-	-	7.2	43.2	-	50.4	189.5	18.0	43.2	61.2
3/1+3/2	1490	1342	-	-	-	11.2	78.8	-	90.0	217.5	27.7	78.8	106.6
4/1	530	530	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	602	602	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	787	787	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	247	247	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	1084	1084	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**12.3**	**12.2**	**0.0**	**24.5**	**-**	**-**	**-**	**-**
1/1+1/2	1162	1162	-	-	-	4.7	4.6	-	9.3	28.8	13.9	4.6	18.5
2/1	530	530	-	-	-	2.2	1.6	-	3.8	26.0	7.9	1.6	9.5
2/2	602	602	-	-	-	2.6	1.8	-	4.4	26.5	9.3	1.8	11.1
3/1	412	412	-	-	-	2.8	4.1	-	6.9	60.4	7.4	4.1	11.6
4/1	395	395	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	853	853	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	497	497	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	529	529	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	433	433	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -23.4 Total Delay for Signalled Lanes (pcuHr): 165.19 Cycle Time (s): 68
C2 PRC for Signalled Lanes (%): -10.1 Total Delay for Signalled Lanes (pcuHr): 24.47 Cycle Time (s): 68
PRC Over All Lanes (%): -23.4 Total Delay Over All Lanes(pcuHr): 189.67

Willington Wallis Proposed LinSig Data
Scenario 2: 'PM29+C+D' (FG6: 'PM29+C+D', Plan 1: 'AM Survey')
C1

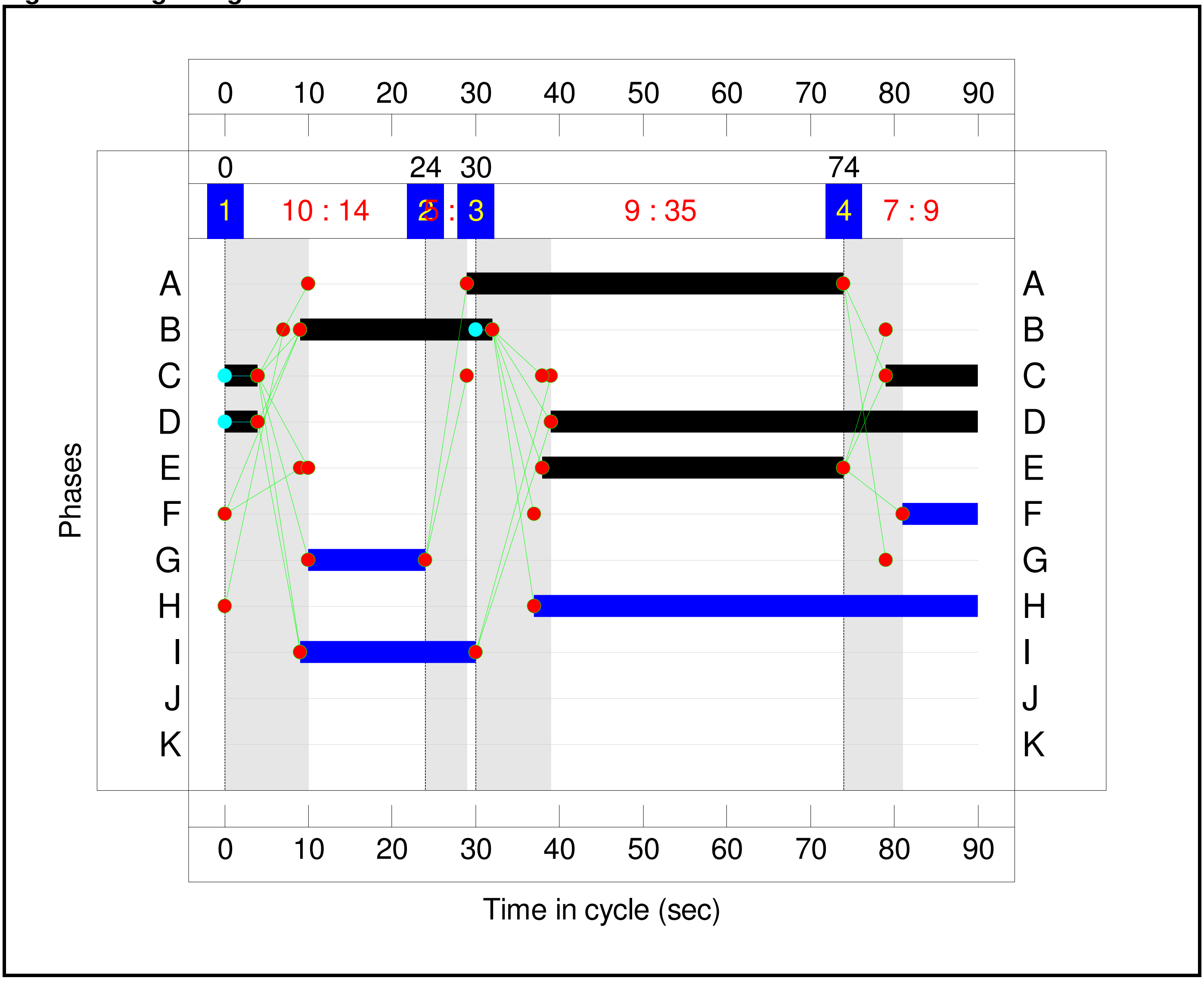
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	14	1	35	9
Change Point	0	24	30	74

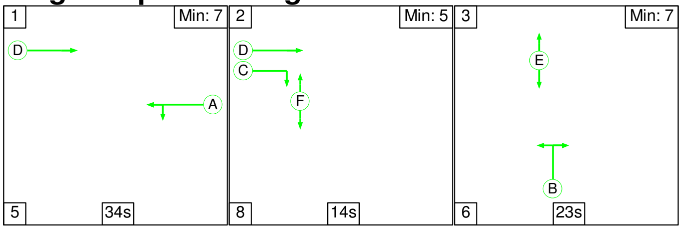
Signal Timings Diagram



Willington Wallis Proposed LinSig Data

C2

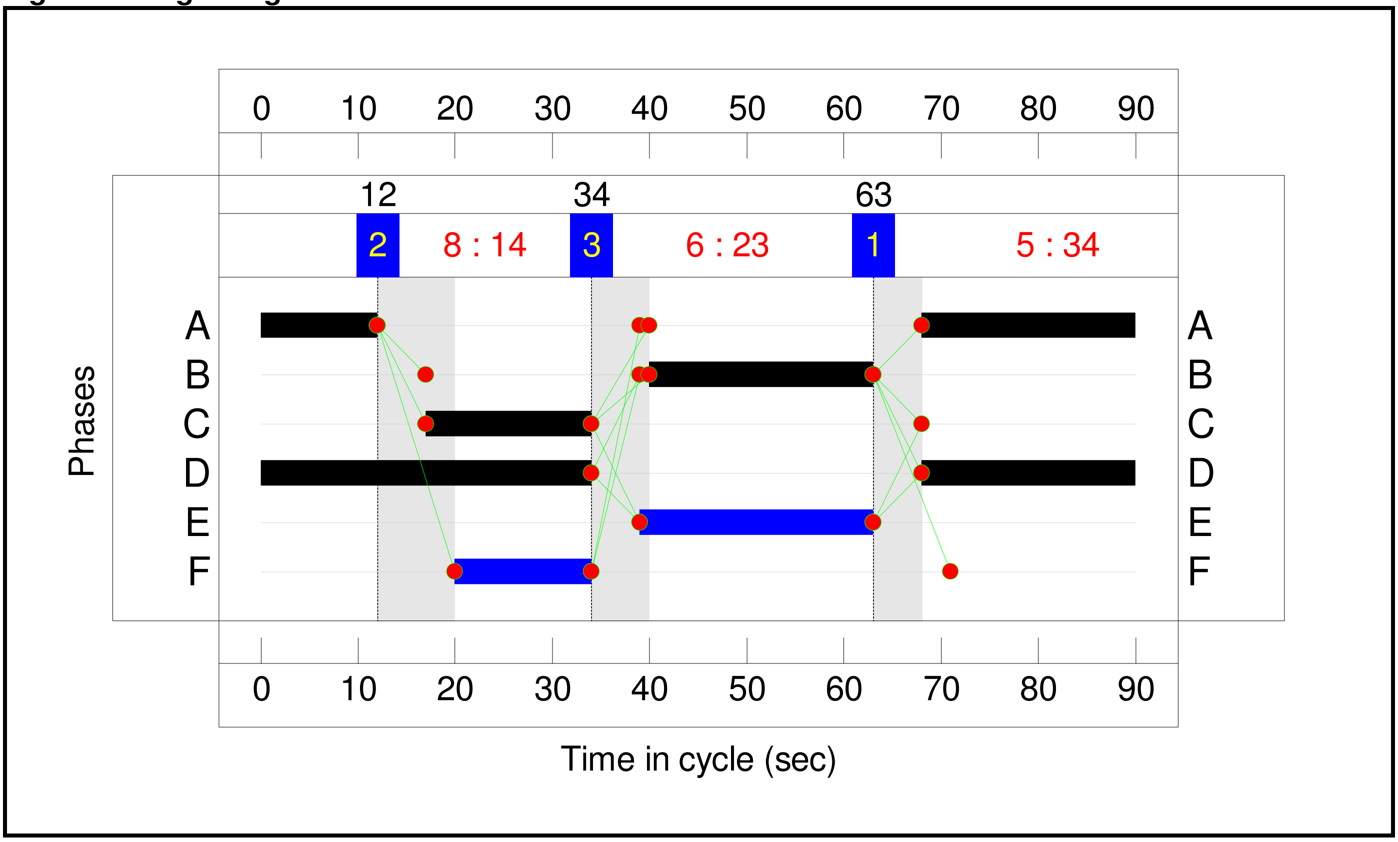
Stage Sequence Diagram



Stage Timings

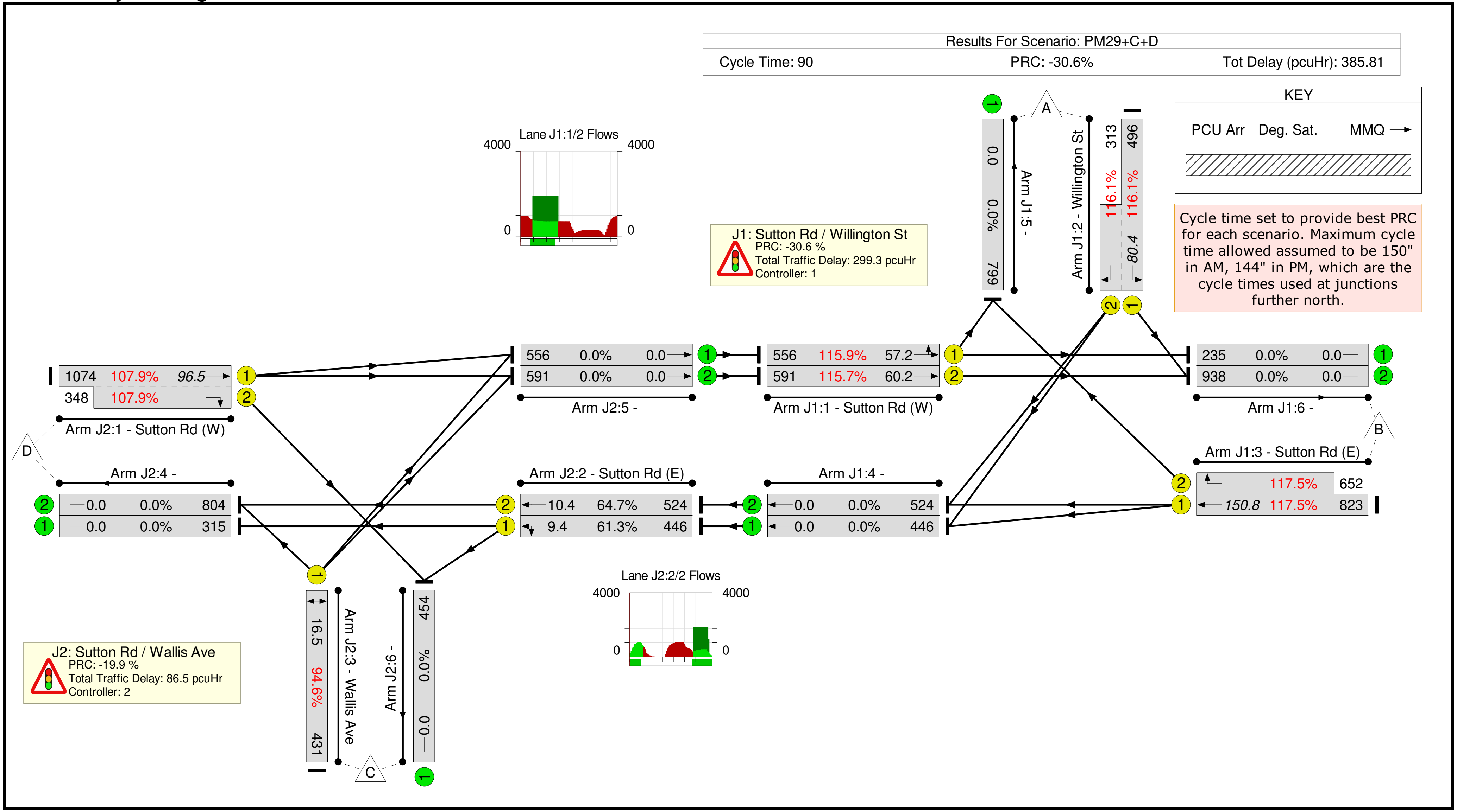
Stage	1	2	3
Duration	34	14	23
Change Point	63	12	34

Signal Timings Diagram



Willington Wallis Proposed LinSig Data

Network Layout Diagram



Willington Wallis Proposed LinSig Data

Network Results

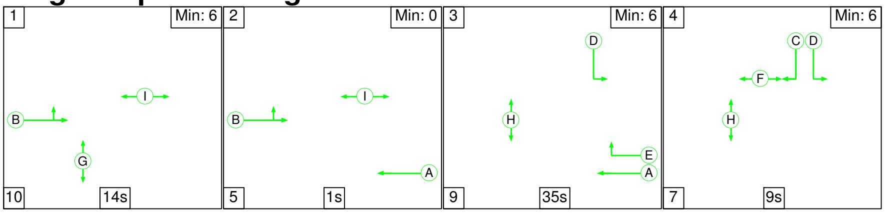
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Willington Wallis Base	-	-	**N/A**	-	-		-	-	-	-	-	-	**117.5%**
J1: Sutton Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**117.5%**
1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	23	-	594	1799	480	115.9%
1/2	Sutton Rd (W) Ahead	U	N/A	N/A	C1:B		1	23	-	631	1915	511	115.7%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	55:15	-	809	1702:1768	427+270	116.1 : 116.1%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	45:36	-	1475	1930:1641	700+555	117.5 : 117.5%
4/1	Ahead	U	N/A	N/A	-		-	-	-	523	Inf	Inf	0.0%
4/2	Ahead	U	N/A	N/A	-		-	-	-	613	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	956	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	290	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1127	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	-	-	**N/A**	-	-		-	-	-	-	-	-	**107.9%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	56:17	-	1422	1930:1698	996+323	107.9 : 107.9%
2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	34	-	523	1871	728	61.3%
2/2	Sutton Rd (E) Ahead	U	N/A	N/A	C2:A		1	34	-	613	2080	809	64.7%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	23	-	431	1708	455	94.6%
4/1		U	N/A	N/A	-		-	-	-	369	Inf	Inf	0.0%
4/2		U	N/A	N/A	-		-	-	-	893	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	594	Inf	Inf	0.0%
5/2	Ahead	U	N/A	N/A	-		-	-	-	631	Inf	Inf	0.0%

Willington Wallis Proposed LinSig Data

6/1		U	N/A	N/A	-		-	-	-	502	Inf	Inf	0.0%
Item	**Arriving (pcu)**	**Leaving (pcu)**	**Turners In Gaps (pcu)**	**Turners When Unopposed (pcu)**	**Turners In Intergreen (pcu)**	**Uniform Delay (pcuHr)**	**Rand + Oversat Delay (pcuHr)**	**Storage Area Uniform Delay (pcuHr)**	**Total Delay (pcuHr)**	**Av. Delay Per PCU (s/pcu)**	**Max. Back of Uniform Queue (pcu)**	**Rand + Oversat Queue (pcu)**	**Mean Max Queue (pcu)**
Network: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**62.6**	**323.2**	**0.0**	**385.8**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**41.8**	**257.5**	**0.0**	**299.3**	**-**	**-**	**-**	**-**
1/1	556	480	-	-	-	7.6	41.4	-	48.9	317.0	15.8	41.4	57.2
1/2	591	511	-	-	-	8.0	43.4	-	51.5	313.6	16.8	43.4	60.2
2/1+2/2	809	697	-	-	-	10.1	59.4	-	69.5	309.2	21.1	59.4	80.4
3/1+3/2	1475	1255	-	-	-	16.1	113.3	-	129.4	315.9	37.5	113.3	150.8
4/1	446	446	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	524	524	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	799	799	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	235	235	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	938	938	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**20.8**	**65.7**	**0.0**	**86.5**	**-**	**-**	**-**	**-**
1/1+1/2	1422	1318	-	-	-	12.7	58.1	-	70.7	179.1	38.5	58.1	96.5
2/1	446	446	-	-	-	2.0	0.8	-	2.8	22.4	8.6	0.8	9.4
2/2	524	524	-	-	-	2.3	0.9	-	3.2	21.8	9.5	0.9	10.4
3/1	431	431	-	-	-	3.9	5.9	-	9.8	81.9	10.5	5.9	16.5
4/1	315	315	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	804	804	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	556	556	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	591	591	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	454	454	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -30.6 Total Delay for Signalled Lanes (pcuHr): 299.31 Cycle Time (s): 90
C2 PRC for Signalled Lanes (%): -19.9 Total Delay for Signalled Lanes (pcuHr): 86.50 Cycle Time (s): 90
PRC Over All Lanes (%): -30.6 Total Delay Over All Lanes(pcuHr): 385.81

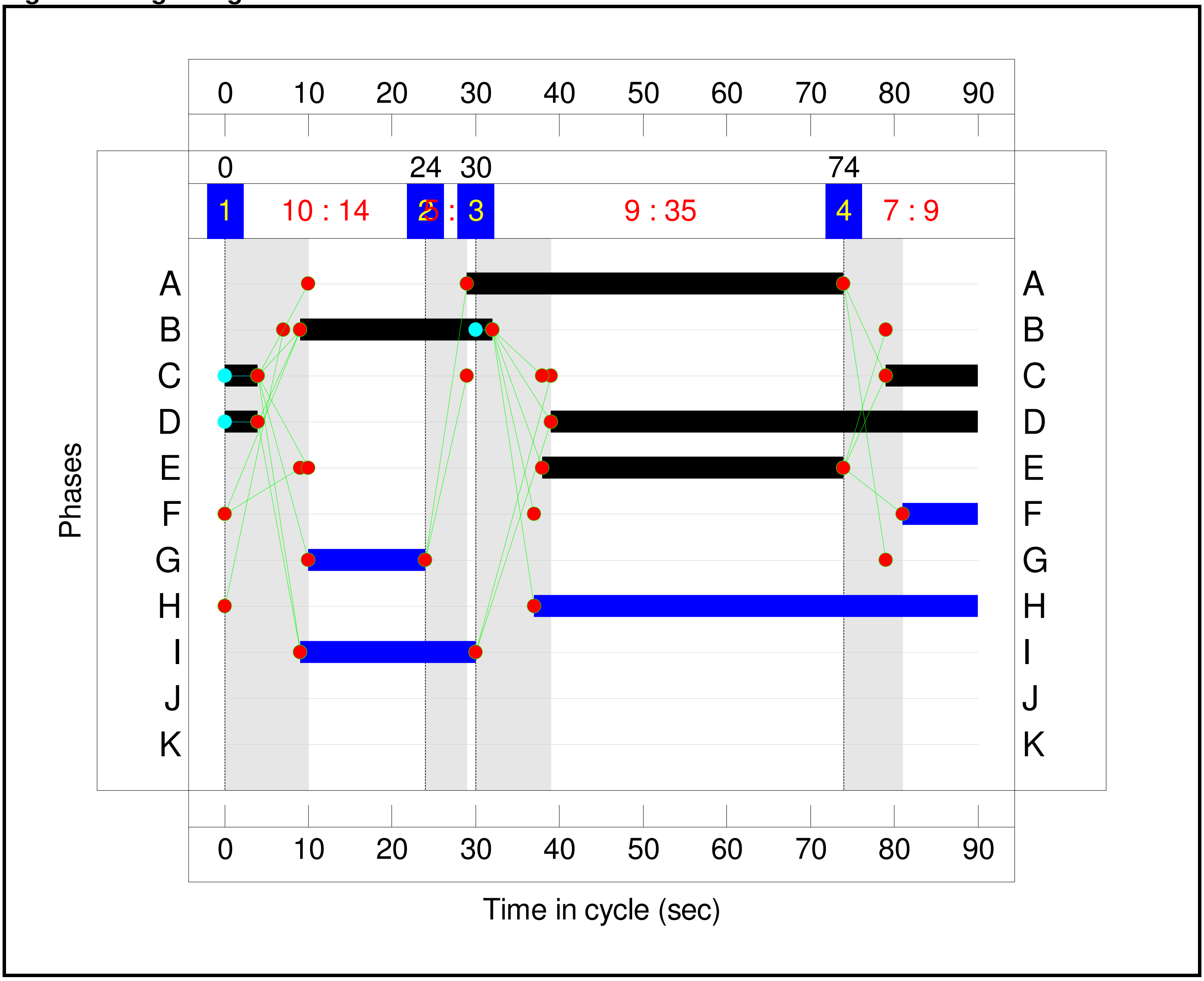
Willington Wallis Proposed LinSig Data
Scenario 3: 'PM29+C+D Block' (FG6: 'PM29+C+D', Plan 1: 'AM Survey')
C1
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	14	1	35	9
Change Point	0	24	30	74

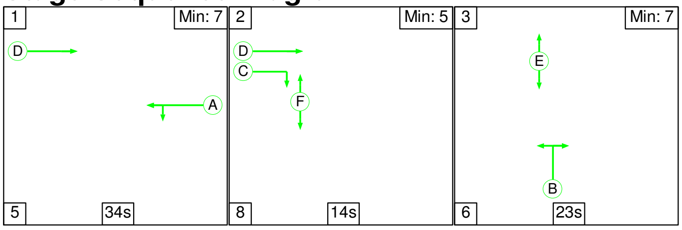
Signal Timings Diagram



Willington Wallis Proposed LinSig Data

C2

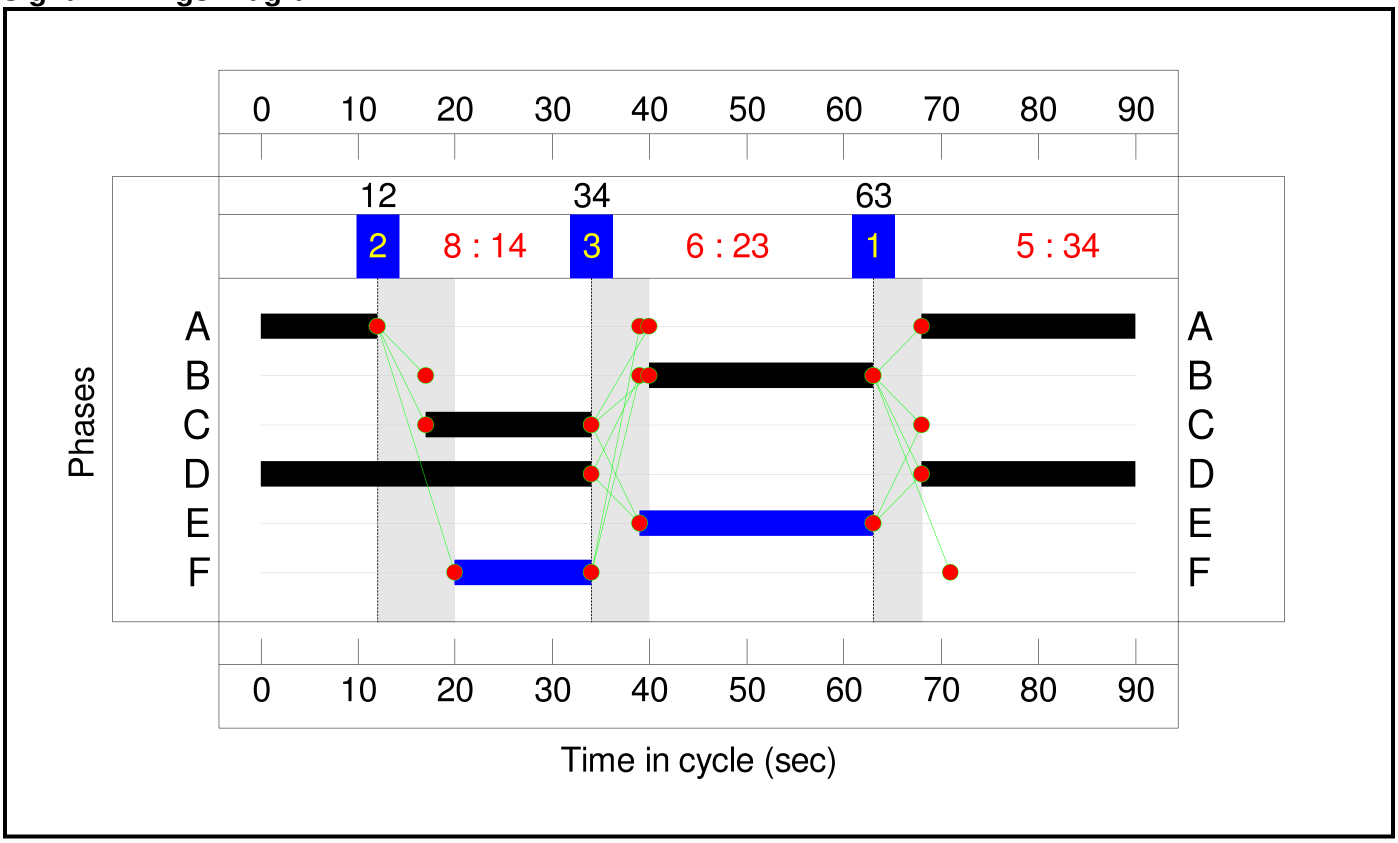
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	34	14	23
Change Point	63	12	34

Signal Timings Diagram



Willington Wallis Proposed LinSig Data

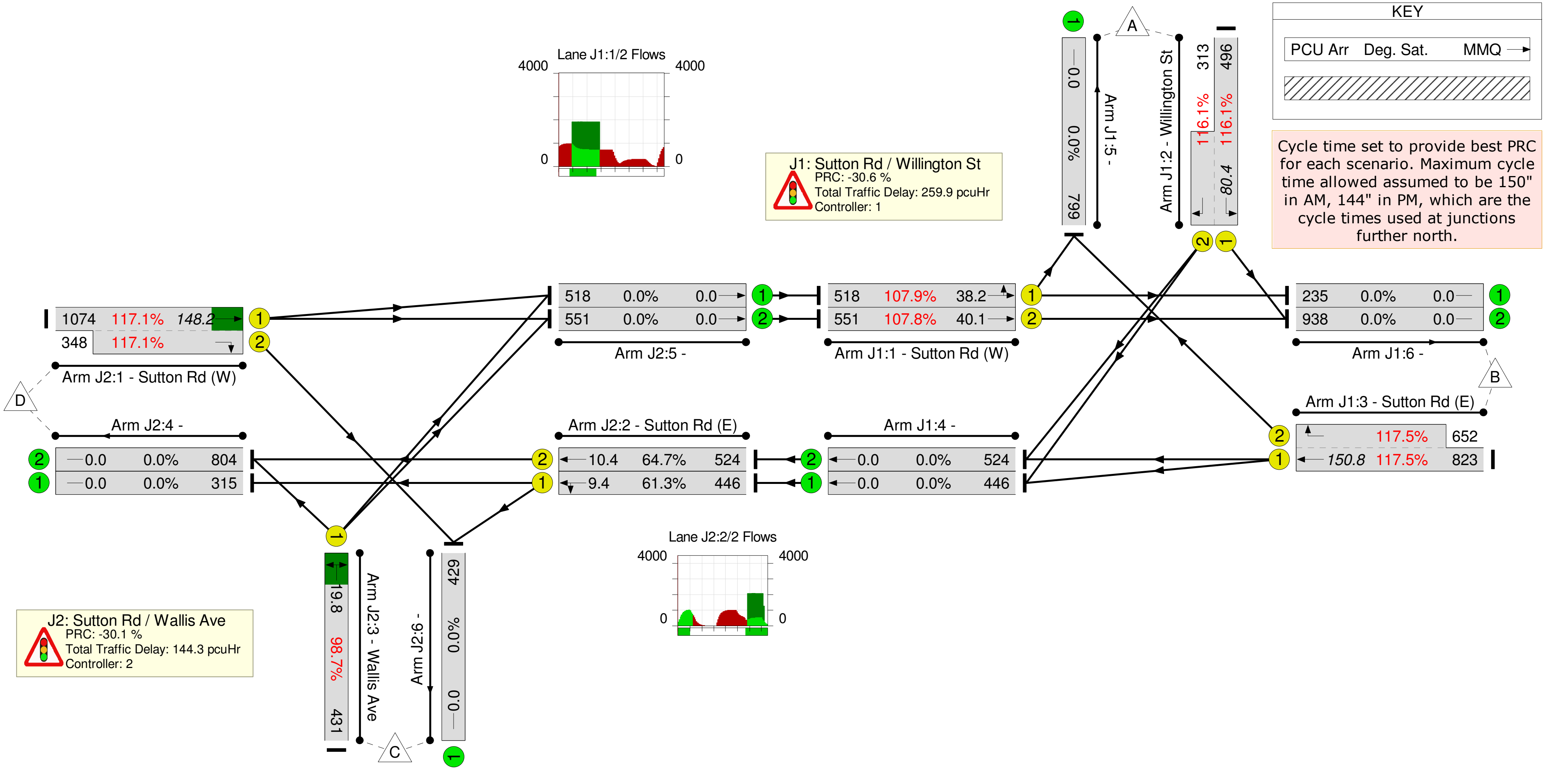
Network Layout Diagram

Results For Scenario: PM29+C+D Block		
Cycle Time: 90	PRC: -30.6%	Tot Delay (pcuHr): 404.24

KEY

PCU Arr Deg. Sat. MMQ

Cycle time set to provide best PRC for each scenario. Maximum cycle time allowed assumed to be 150" in AM, 144" in PM, which are the cycle times used at junctions further north.



Willington Wallis Proposed LinSig Data

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: Willington Wallis Base	-	-	**N/A**	-	-		-	-	-	-	-	-	**117.5%**
J1: Sutton Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**117.5%**
1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	23	-	594	1799	480	107.9%
1/2	Sutton Rd (W) Ahead	U	N/A	N/A	C1:B		1	23	-	631	1915	511	107.8%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	55:15	-	809	1702:1768	427+270	116.1 : 116.1%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	45:36	-	1475	1930:1641	700+555	117.5 : 117.5%
4/1	Ahead	U	N/A	N/A	-		-	-	-	523	Inf	Inf	0.0%
4/2	Ahead	U	N/A	N/A	-		-	-	-	613	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	956	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	290	Inf	Inf	0.0%
6/2		U	N/A	N/A	-		-	-	-	1127	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	-	-	**N/A**	-	-		-	-	-	-	-	-	**117.1%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	56:17	-	1422	1930:1698	917+297	117.1 : 117.1%
2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	34	-	523	1871	728	61.3%
2/2	Sutton Rd (E) Ahead	U	N/A	N/A	C2:A		1	34	-	613	2080	809	64.7%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	23	-	431	1708	436	98.7%
4/1		U	N/A	N/A	-		-	-	-	369	Inf	Inf	0.0%
4/2		U	N/A	N/A	-		-	-	-	893	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	594	Inf	Inf	0.0%
5/2	Ahead	U	N/A	N/A	-		-	-	-	631	Inf	Inf	0.0%

Willington Wallis Proposed LinSig Data

6/1		U	N/A	N/A	-		-	-	-	502	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**64.0**	**340.2**	**0.0**	**404.2**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**37.6**	**222.3**	**0.0**	**259.9**	**-**	**-**	**-**	**-**
1/1	518	480	-	-	-	5.5	24.3	-	29.8	207.1	13.9	24.3	38.2
1/2	551	511	-	-	-	5.9	25.4	-	31.2	204.1	14.8	25.4	40.1
2/1+2/2	809	697	-	-	-	10.1	59.4	-	69.5	309.2	21.1	59.4	80.4
3/1+3/2	1475	1255	-	-	-	16.1	113.3	-	129.4	315.9	37.5	113.3	150.8
4/1	446	446	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	524	524	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	799	799	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	235	235	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	938	938	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**26.4**	**117.9**	**0.0**	**144.3**	**-**	**-**	**-**	**-**
1/1+1/2	1422	1214	-	-	-	18.2	107.1	-	125.3	317.2	41.1	107.1	148.2
2/1	446	446	-	-	-	2.0	0.8	-	2.8	22.4	8.6	0.8	9.4
2/2	524	524	-	-	-	2.3	0.9	-	3.2	21.8	9.5	0.9	10.4
3/1	431	431	-	-	-	4.0	9.1	-	13.1	109.4	10.7	9.1	19.8
4/1	315	315	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	804	804	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	518	518	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	551	551	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	429	429	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -30.6 Total Delay for Signalled Lanes (pcuHr): 259.90 Cycle Time (s): 90
C2 PRC for Signalled Lanes (%): -30.1 Total Delay for Signalled Lanes (pcuHr): 144.34 Cycle Time (s): 90
PRC Over All Lanes (%): -30.6 Total Delay Over All Lanes(pcuHr): 404.24

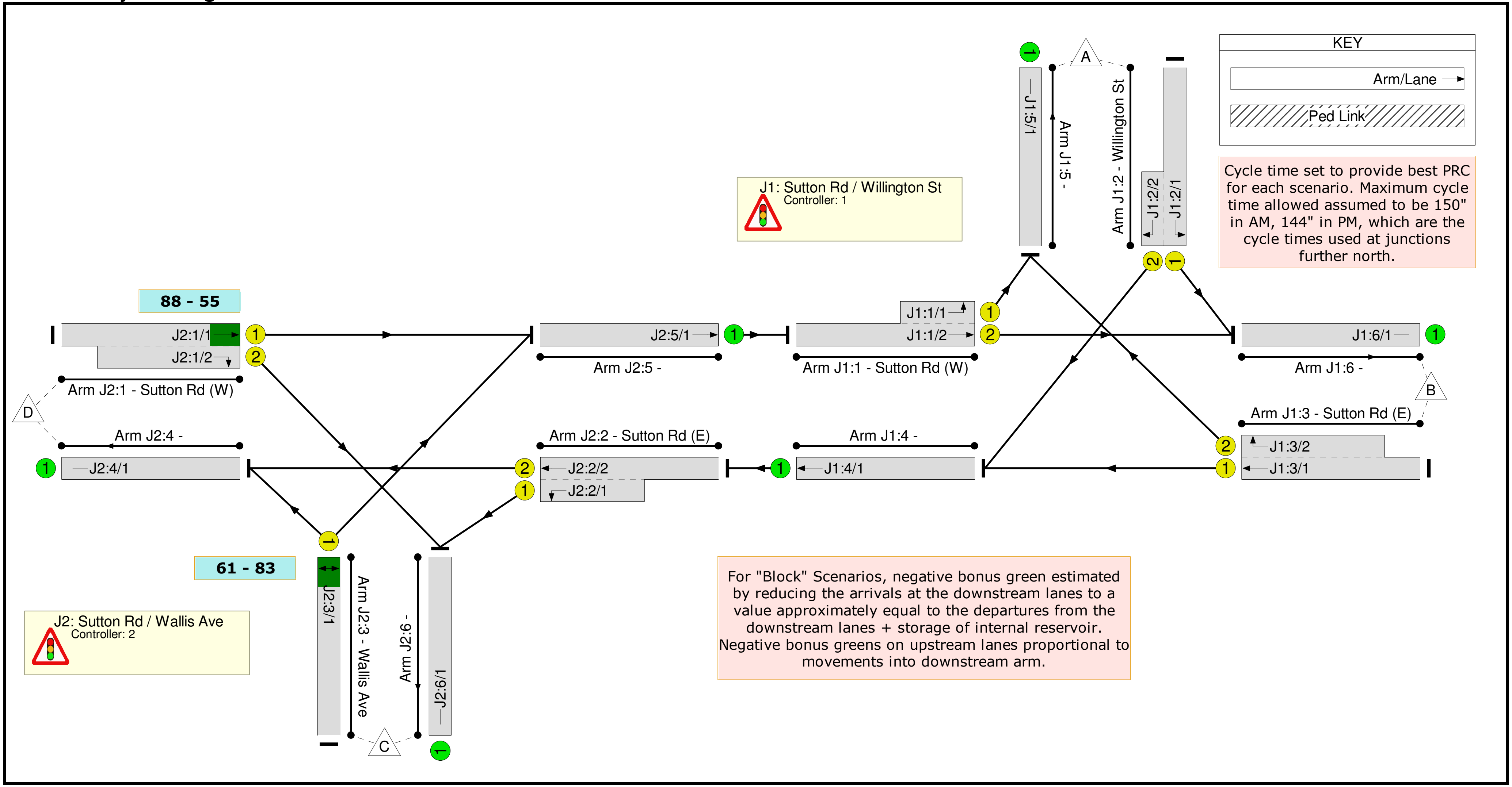
Willinton Wallis Base LinSig Data

User and Project Details

Project:	**16007 Sutton Rd**
Title:	**Willington Wallis Base**
Location:	Langley, Kent
File name:	Willington Wallis Base.lsg3x
Author:	Simon Swanston
Company:	JCT Consultancy
Address:	LinSig House, Deepdale Lane, Nettleham, Lincoln, LN2 2LL
Notes:	

Willinton Wallis Base LinSig Data

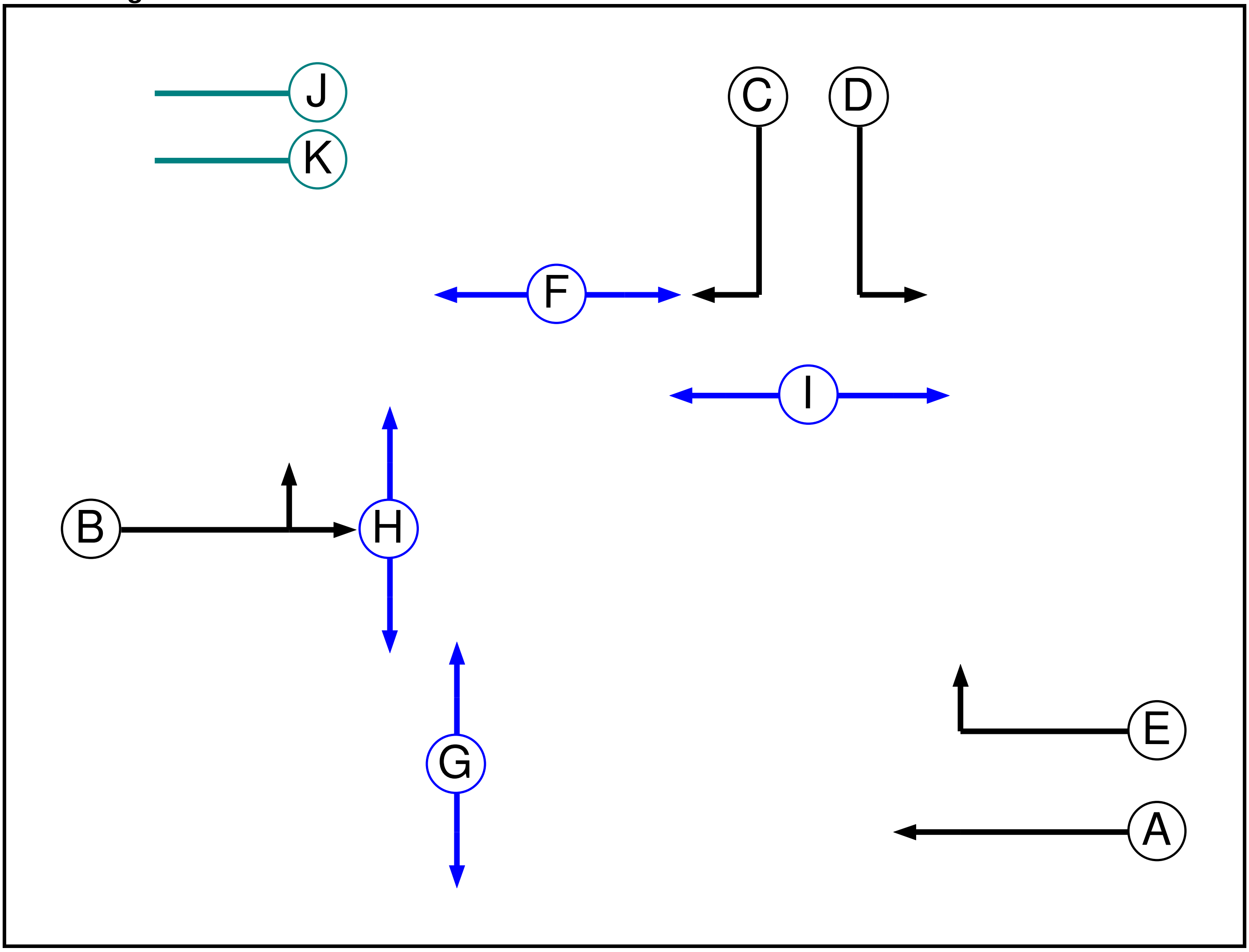
Network Layout Diagram



Willinton Wallis Base LinSig Data

C1

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		-9999	7
B	Traffic		-9999	7
C	Traffic		-9999	7
D	Traffic		-9999	7
E	Traffic		-9999	7
F	Pedestrian		-9999	6
G	Pedestrian		-9999	6
H	Pedestrian		-9999	6
I	Pedestrian		-9999	6
J	Dummy		-9999	2
K	Dummy		-9999	2

Willinton Wallis Base LinSig Data

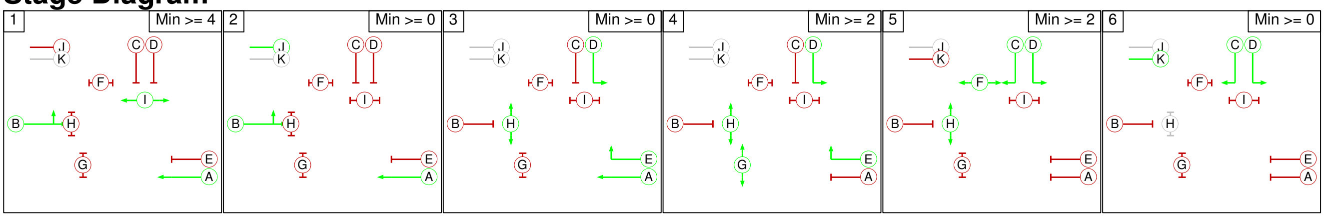
Phase Intergreens Matrix

	Starting Phase											
Terminating Phase		A	B	C	D	E	F	G	H	I	J	K
	A		-	5	-	-	-	5	-	-	-	-
	B	-		6	7	6	5	-	5	-	-	-
	C	6	5		-	6	-	6	-	5	-	-
	D	-	5	-		-	-	-	-	5	-	-
	E	-	5	5	-		7	-	-	-	-	-
	F	-	9	-	-	9		-	-	-	-	0
	G	5	-	5	-	-	-		-	-	-	-
	H	-	7	-	-	-	-	-		-	-	-
	I	-	-	9	9	-	-	-	-		0	-
	J	-	-	-	-	-	-	-	-	0		-
	K	-	-	-	-	-	0	-	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A B I
2	A B J
3	A D E H
4	D E G H
5	C D F H
6	C D K

Stage Diagram



Phase Delays

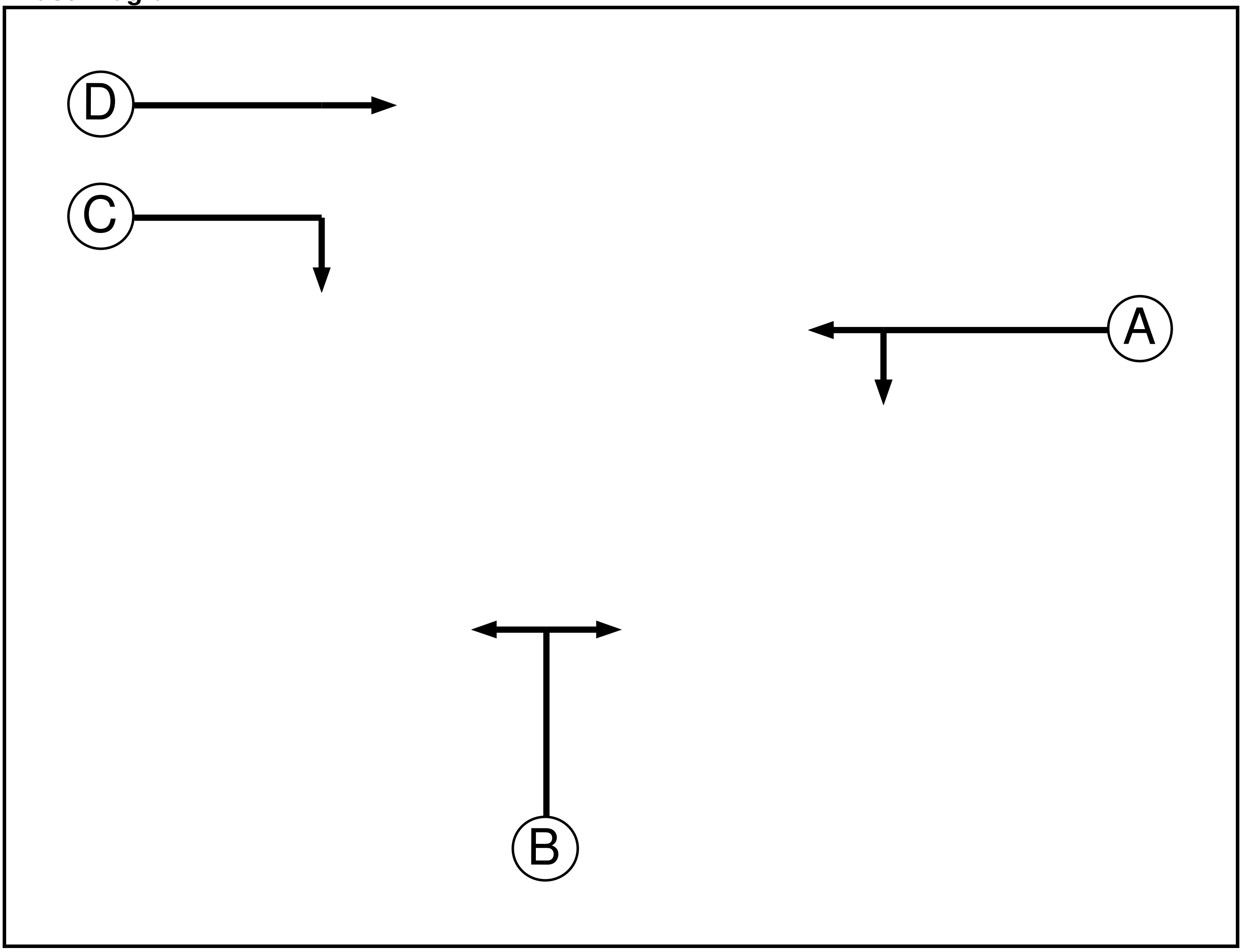
Term. Stage	Start Stage	Phase	Type	Value	Cont value
5	1	D	Losing	4	4
5	2	D	Losing	4	4

Prohibited Stage Change

	To Stage					
From Stage	1	2	3	4	5	6
1		0	9	9	9	9
2	0		7	7	7	7
3	7	7		5	7	5
4	7	7	5		7	5
5	9	9	9	9		0
6	6	6	6	6	0	

C2

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		-9999	7
B	Traffic		-9999	7
C	Traffic		-9999	7
D	Traffic		-9999	7

Willinton Wallis Base LinSig Data

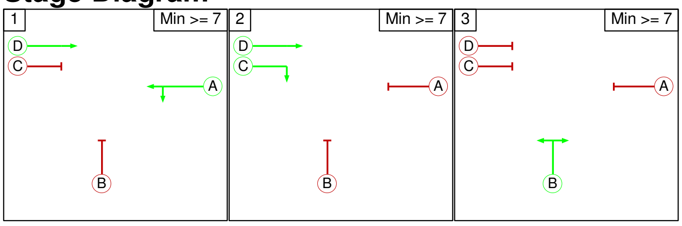
Phase Intergreens Matrix

	Starting Phase				
Terminating Phase		A	B	C	D
	A		6	5	-
	B	5		5	5
	C	5	6		-
	D	-	5	-	

Phases in Stage

Stage No.	Phases in Stage
1	A D
2	C D
3	B

Stage Diagram



Phase Delays

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

Prohibited Stage Change

	To Stage			
From Stage		1	2	3
	1		5	6
	2	5		6
	3	5	5	

Willinton Wallis Base LinSig Data

Give-Way Lane Input Data

Junction: J1: Sutton Rd / Willington St
There are no Opposed Lanes in this Junction

Junction: J2: Sutton Rd / Wallis Ave
There are no Opposed Lanes in this Junction

Willinton Wallis Base LinSig Data

Lane Input Data

Junction: J1: Sutton Rd / Willington St

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)
J1:1/1 (Sutton Rd (W))	U	B	2	3	5.0	Geom	-	3.10	0.00	Y	Arm J1:5 Left	11.00
J1:1/2 (Sutton Rd (W))	U	B	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J1:6 Ahead	Inf
J1:2/1 (Willington St)	U	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J1:6 Left	12.00
J1:2/2 (Willington St)	U	C	2	3	5.0	Geom	-	3.00	0.00	Y	Arm J1:4 Right	18.00
J1:3/1 (Sutton Rd (E))	U	A	2	3	60.0	Geom	-	3.15	0.00	Y	Arm J1:4 Ahead	Inf
J1:3/2 (Sutton Rd (E))	U	E	2	3	11.0	Geom	-	3.00	0.00	Y	Arm J1:5 Right	9.00
J1:4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:6/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Junction: J2: Sutton Rd / Wallis Ave

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)
J2:1/1 (Sutton Rd (W))	U	D	2	3	60.0	Geom	-	3.15	0.00	Y	Arm J2:5 Ahead	Inf
J2:1/2 (Sutton Rd (W))	U	C	2	3	10.0	Geom	-	3.15	0.00	Y	Arm J2:6 Right	11.00
J2:2/1 (Sutton Rd (E))	U	A	2	3	7.0	Geom	-	3.25	0.00	Y	Arm J2:6 Left	12.00
J2:2/2 (Sutton Rd (E))	U	A	2	3	60.0	Geom	-	3.25	0.00	Y	Arm J2:4 Ahead	Inf
J2:3/1 (Wallis Ave)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm J2:4 Left Arm J2:5 Right	9.00 19.00
J2:4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:6/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM Survey'	07:30	08:30	01:00	
2: 'AM29+C'	07:30	08:30	01:00	
3: 'AM29+C+D'	07:30	08:30	01:00	F2+F7
4: 'PM Survey'	17:00	18:00	01:00	
5: 'PM29+C'	17:00	18:00	01:00	
6: 'PM29+C+D'	17:00	18:00	01:00	F5+F8

Scenario 1: 'AM Survey' (FG1: 'AM Survey', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	450	47	246	743
	B	340	0	76	350	766
	C	27	105	0	213	345
	D	163	445	251	0	859
	Tot.	530	1000	374	809	2713

Willinton Wallis Base LinSig Data

Traffic Lane Flows

Lane	Scenario 1: AM Survey
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	190
J1:1/2 (with short)	740(In) 550(Out)
J1:2/1 (with short)	743(In) 450(Out)
J1:2/2 (short)	293
J1:3/1 (with short)	766(In) 426(Out)
J1:3/2 (short)	340
J1:4/1	719
J1:5/1	530
J1:6/1	1000
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	859(In) 608(Out)
J2:1/2 (short)	251
J2:2/1 (short)	123
J2:2/2 (with short)	719(In) 596(Out)
J2:3/1	345
J2:4/1	809
J2:5/1	740
J2:6/1	374

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	61.7 %	1712	1712
				Arm J2:5 Right	19.00	38.3 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 2: 'AM29+C' (FG2: 'AM29+C', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	573	38	317	928
	B	522	0	108	654	1284
	C	31	125	0	251	407
	D	219	601	297	0	1117
	Tot.	772	1299	443	1222	3736

Traffic Lane Flows

Lane	Scenario 2: AM29+C
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	250
J1:1/2 (with short)	976(In) 726(Out)
J1:2/1 (with short)	928(In) 573(Out)
J1:2/2 (short)	355
J1:3/1 (with short)	1284(In) 762(Out)
J1:3/2 (short)	522
J1:4/1	1117
J1:5/1	772
J1:6/1	1299
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1117(In) 820(Out)
J2:1/2 (short)	297
J2:2/1 (short)	146
J2:2/2 (with short)	1117(In) 971(Out)
J2:3/1	407
J2:4/1	1222
J2:5/1	976
J2:6/1	443

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	61.7 %	1712	1712
				Arm J2:5 Right	19.00	38.3 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 3: 'AM29+C+D' (FG3: 'AM29+C+D', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

	Destination					
Origin		A	B	C	D	Tot.
	A	0	602	38	317	957
	B	596	0	112	782	1490
	C	31	130	0	251	412
	D	219	646	297	0	1162
	Tot.	846	1378	447	1350	4021

Traffic Lane Flows

Lane	Scenario 3: AM29+C+D
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	250
J1:1/2 (with short)	1026(In) 776(Out)
J1:2/1 (with short)	957(In) 602(Out)
J1:2/2 (short)	355
J1:3/1 (with short)	1490(In) 894(Out)
J1:3/2 (short)	596
J1:4/1	1249
J1:5/1	846
J1:6/1	1378
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1162(In) 865(Out)
J2:1/2 (short)	297
J2:2/1 (short)	150
J2:2/2 (with short)	1249(In) 1099(Out)
J2:3/1	412
J2:4/1	1350
J2:5/1	1026
J2:6/1	447

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	60.9 %	1713	1713
				Arm J2:5 Right	19.00	39.1 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 4: 'PM Survey' (FG4: 'PM Survey', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	249	36	208	493
	B	442	0	88	402	932
	C	39	84	0	232	355
	D	205	364	289	0	858
	Tot.	686	697	413	842	2638

Traffic Lane Flows

Lane	Scenario 4: PM Survey
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	244
J1:1/2 (with short)	692(In) 448(Out)
J1:2/1 (with short)	493(In) 249(Out)
J1:2/2 (short)	244
J1:3/1 (with short)	932(In) 490(Out)
J1:3/2 (short)	442
J1:4/1	734
J1:5/1	686
J1:6/1	697
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	858(In) 569(Out)
J2:1/2 (short)	289
J2:2/1 (short)	124
J2:2/2 (with short)	734(In) 610(Out)
J2:3/1	355
J2:4/1	842
J2:5/1	692
J2:6/1	413

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	65.4 %	1707	1707
				Arm J2:5 Right	19.00	34.6 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 5: 'PM29+C' (FG5: 'PM29+C', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	415	35	278	728
	B	601	0	114	625	1340
	C	32	115	0	280	427
	D	272	671	348	0	1291
	Tot.	905	1201	497	1183	3786

Traffic Lane Flows

Lane	Scenario 5: PM29+C
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	304
J1:1/2 (with short)	1090(In) 786(Out)
J1:2/1 (with short)	728(In) 415(Out)
J1:2/2 (short)	313
J1:3/1 (with short)	1340(In) 739(Out)
J1:3/2 (short)	601
J1:4/1	1052
J1:5/1	905
J1:6/1	1201
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1291(In) 943(Out)
J2:1/2 (short)	348
J2:2/1 (short)	149
J2:2/2 (with short)	1052(In) 903(Out)
J2:3/1	427
J2:4/1	1183
J2:5/1	1090
J2:6/1	497

Willinton Wallis Base LinSig Data

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	65.6 %	1707	1707
				Arm J2:5 Right	19.00	34.4 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 6: 'PM29+C+D' (FG6: 'PM29+C+D', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	496	35	278	809
	B	652	0	119	704	1475
	C	32	119	0	280	431
	D	272	802	348	0	1422
	Tot.	956	1417	502	1262	4137

Traffic Lane Flows

Lane	Scenario 6: PM29+C+D
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	304
J1:1/2 (with short)	1225(In) 921(Out)
J1:2/1 (with short)	809(In) 496(Out)
J1:2/2 (short)	313
J1:3/1 (with short)	1475(In) 823(Out)
J1:3/2 (short)	652
J1:4/1	1136
J1:5/1	956
J1:6/1	1417
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1422(In) 1074(Out)
J2:1/2 (short)	348
J2:2/1 (short)	154
J2:2/2 (with short)	1136(In) 982(Out)
J2:3/1	431
J2:4/1	1262
J2:5/1	1225
J2:6/1	502

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	65.0 %	1708	1708
				Arm J2:5 Right	19.00	35.0 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 7: 'AM29+C Block' (FG2: 'AM29+C', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

	Destination					
Origin		A	B	C	D	Tot.
	A	0	573	38	317	928
	B	522	0	108	654	1284
	C	31	125	0	251	407
	D	219	601	297	0	1117
	Tot.	772	1299	443	1222	3736

Traffic Lane Flows

Lane	Scenario 7: AM29+C Block
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	250
J1:1/2 (with short)	976(In) 726(Out)
J1:2/1 (with short)	928(In) 573(Out)
J1:2/2 (short)	355
J1:3/1 (with short)	1284(In) 762(Out)
J1:3/2 (short)	522
J1:4/1	1117
J1:5/1	772
J1:6/1	1299
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1117(In) 820(Out)
J2:1/2 (short)	297
J2:2/1 (short)	146
J2:2/2 (with short)	1117(In) 971(Out)
J2:3/1	407
J2:4/1	1222
J2:5/1	976
J2:6/1	443

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	61.7 %	1712	1712
				Arm J2:5 Right	19.00	38.3 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 8: 'AM29+C+D Block' (FG3: 'AM29+C+D', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	602	38	317	957
	B	596	0	112	782	1490
	C	31	130	0	251	412
	D	219	646	297	0	1162
	Tot.	846	1378	447	1350	4021

Traffic Lane Flows

Lane	Scenario 8: AM29+C+D Block
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	250
J1:1/2 (with short)	1026(In) 776(Out)
J1:2/1 (with short)	957(In) 602(Out)
J1:2/2 (short)	355
J1:3/1 (with short)	1490(In) 894(Out)
J1:3/2 (short)	596
J1:4/1	1249
J1:5/1	846
J1:6/1	1378
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1162(In) 865(Out)
J2:1/2 (short)	297
J2:2/1 (short)	150
J2:2/2 (with short)	1249(In) 1099(Out)
J2:3/1	412
J2:4/1	1350
J2:5/1	1026
J2:6/1	447

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	60.9 %	1713	1713
				Arm J2:5 Right	19.00	39.1 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 9: 'PM29+C Block' (FG5: 'PM29+C', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

	Destination					
Origin		A	B	C	D	Tot.
	A	0	415	35	278	728
	B	601	0	114	625	1340
	C	32	115	0	280	427
	D	272	671	348	0	1291
	Tot.	905	1201	497	1183	3786

Traffic Lane Flows

Lane	Scenario 9: PM29+C Block
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	304
J1:1/2 (with short)	1090(In) 786(Out)
J1:2/1 (with short)	728(In) 415(Out)
J1:2/2 (short)	313
J1:3/1 (with short)	1340(In) 739(Out)
J1:3/2 (short)	601
J1:4/1	1052
J1:5/1	905
J1:6/1	1201
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1291(In) 943(Out)
J2:1/2 (short)	348
J2:2/1 (short)	149
J2:2/2 (with short)	1052(In) 903(Out)
J2:3/1	427
J2:4/1	1183
J2:5/1	1090
J2:6/1	497

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	65.6 %	1707	1707
				Arm J2:5 Right	19.00	34.4 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 10: 'PM29+C+D Block' (FG6: 'PM29+C+D', Plan 1: 'AM Survey')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	496	35	278	809
	B	652	0	119	704	1475
	C	32	119	0	280	431
	D	272	802	348	0	1422
	Tot.	956	1417	502	1262	4137

Traffic Lane Flows

Lane	Scenario 10: PM29+C+D Block
Junction: J1: Sutton Rd / Willington St	
J1:1/1 (short)	304
J1:1/2 (with short)	1225(In) 921(Out)
J1:2/1 (with short)	809(In) 496(Out)
J1:2/2 (short)	313
J1:3/1 (with short)	1475(In) 823(Out)
J1:3/2 (short)	652
J1:4/1	1136
J1:5/1	956
J1:6/1	1417
Junction: J2: Sutton Rd / Wallis Ave	
J2:1/1 (with short)	1422(In) 1074(Out)
J2:1/2 (short)	348
J2:2/1 (short)	154
J2:2/2 (with short)	1136(In) 982(Out)
J2:3/1	431
J2:4/1	1262
J2:5/1	1225
J2:6/1	502

Lane Saturation Flows

Junction: J1: Sutton Rd / Willington St

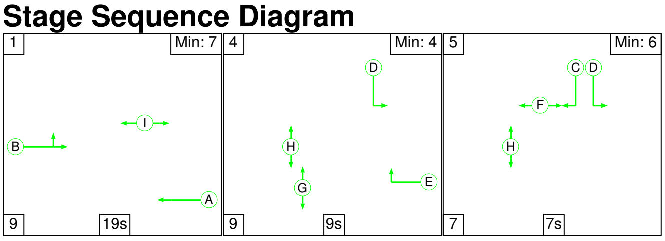
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J1:1/1 (Sutton Rd (W))	3.10	0.00	Y	Arm J1:5 Left	11.00	100.0 %	1694	1694
J1:1/2 (Sutton Rd (W))	3.00	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1915	1915
J1:2/1 (Willington St)	3.00	0.00	Y	Arm J1:6 Left	12.00	100.0 %	1702	1702
J1:2/2 (Willington St)	3.00	0.00	Y	Arm J1:4 Right	18.00	100.0 %	1768	1768
J1:3/1 (Sutton Rd (E))	3.15	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1930	1930
J1:3/2 (Sutton Rd (E))	3.00	0.00	Y	Arm J1:5 Right	9.00	100.0 %	1641	1641
J1:4/1	Infinite Saturation Flow						Inf	Inf
J1:5/1	Infinite Saturation Flow						Inf	Inf
J1:6/1	Infinite Saturation Flow						Inf	Inf

Junction: J2: Sutton Rd / Wallis Ave

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1930	1930
J2:1/2 (Sutton Rd (W))	3.15	0.00	Y	Arm J2:6 Right	11.00	100.0 %	1698	1698
J2:2/1 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:6 Left	12.00	100.0 %	1724	1724
J2:2/2 (Sutton Rd (E))	3.25	0.00	Y	Arm J2:4 Ahead	Inf	100.0 %	1940	1940
J2:3/1 (Wallis Ave)	3.25	0.00	Y	Arm J2:4 Left	9.00	65.0 %	1708	1708
				Arm J2:5 Right	19.00	35.0 %		
J2:4/1	Infinite Saturation Flow						Inf	Inf
J2:5/1	Infinite Saturation Flow						Inf	Inf
J2:6/1	Infinite Saturation Flow						Inf	Inf

Scenario 1: 'AM Survey' (FG1: 'AM Survey', Plan 1: 'AM Survey')
C1

Stage Sequence Diagram

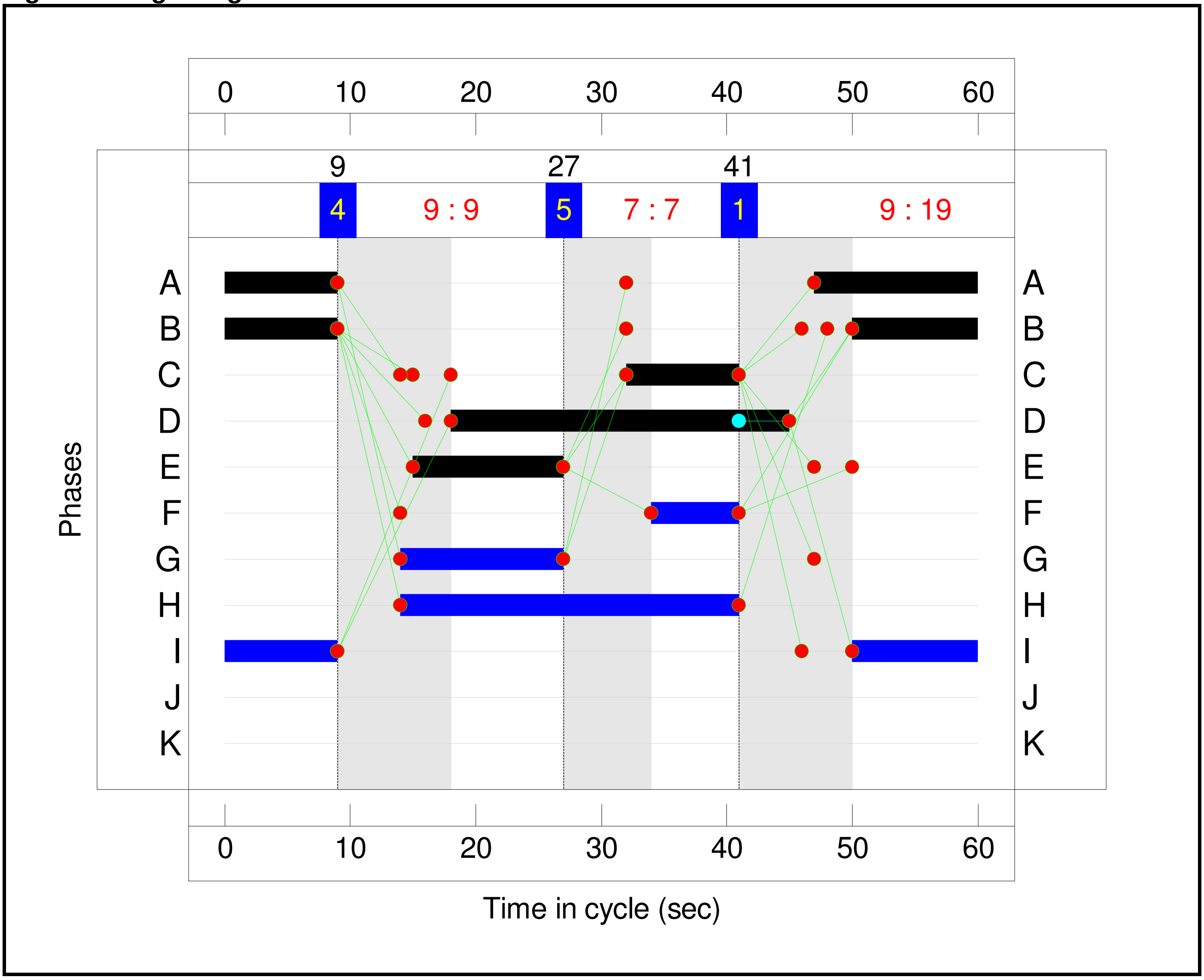


Willinton Wallis Base LinSig Data

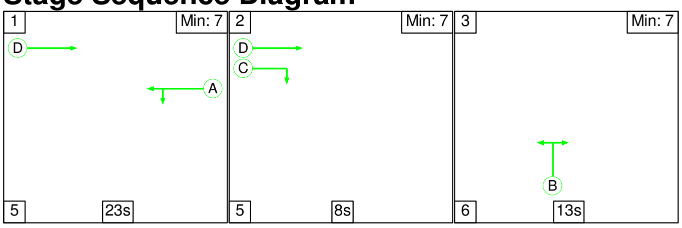
Stage Timings

Stage	1	4	5
Duration	19	9	7
Change Point	41	9	27

Signal Timings Diagram



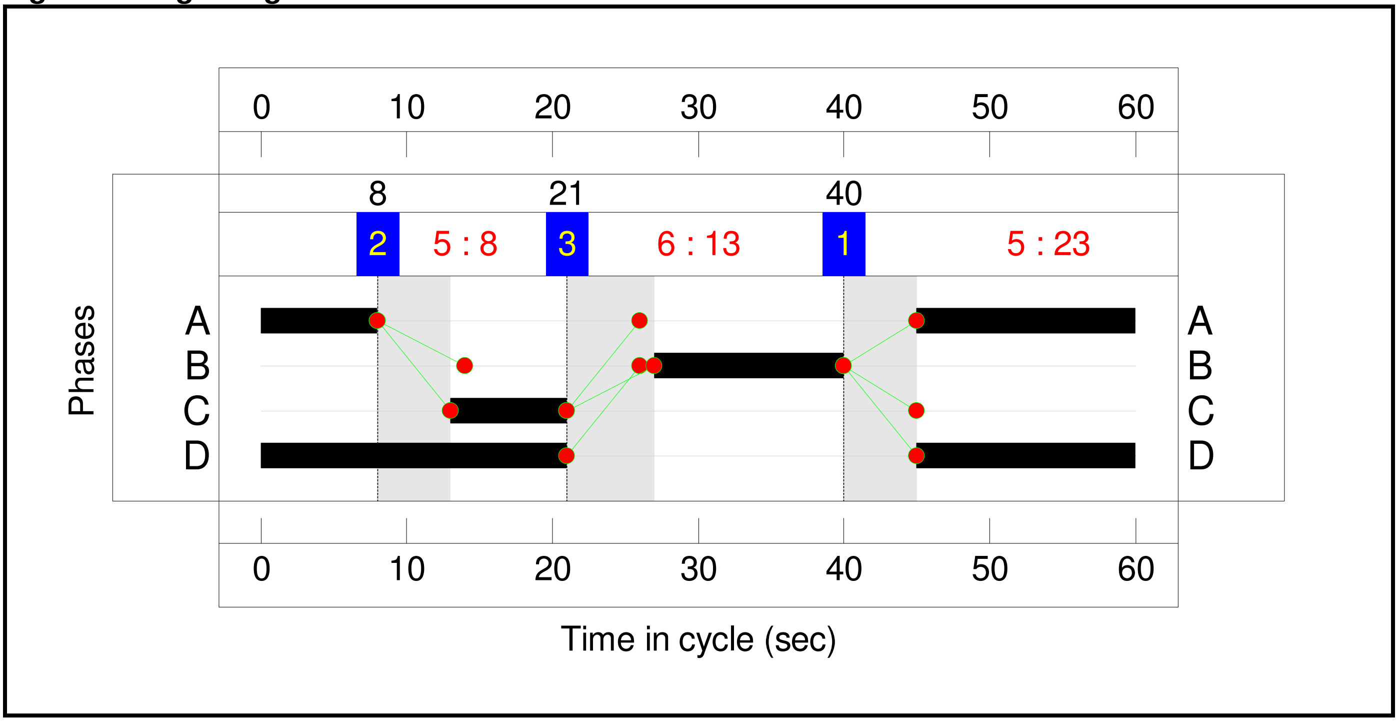
C2
Stage Sequence Diagram



Stage Timings

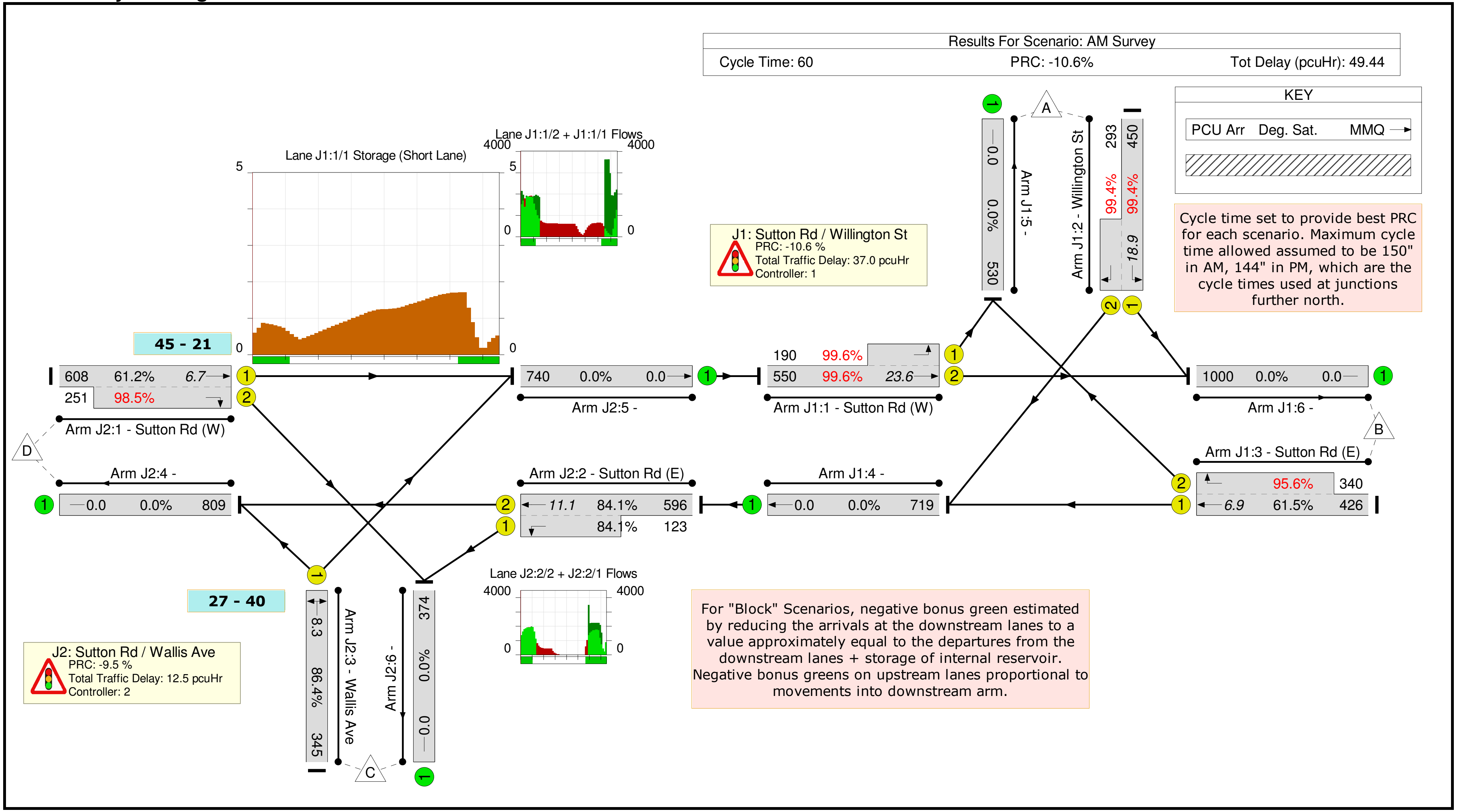
Stage	1	2	3
Duration	23	8	13
Change Point	40	8	21

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**99.6%**
J1: Sutton Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**99.6%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	19	-	740	1915:1694	552+191	99.6 : 99.6%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	27:9	-	743	1702:1768	453+295	99.4 : 99.4%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	22:12	-	766	1930:1641	693+356	61.5 : 95.6%
4/1	Ahead	U	N/A	N/A	-		-	-	-	719	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	530	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1000	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**98.5%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	36:8	-	859	1930:1698	993+255	61.2 : 98.5%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	23	-	719	1940:1724	709+146	84.1 : 84.1%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	13	-	345	1712	399	86.4%
4/1		U	N/A	N/A	-		-	-	-	809	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	740	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	374	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**16.2**	**33.3**	**0.0**	**49.4**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**10.2**	**26.7**	**0.0**	**37.0**	**-**	**-**	**-**	**-**
1/2+1/1	740	740	-	-	-	2.8	12.8	-	15.6	75.8	10.9	12.8	23.6
2/1+2/2	743	743	-	-	-	3.5	12.6	-	16.1	78.0	6.2	12.6	18.9
3/1+3/2	766	766	-	-	-	3.9	1.3	-	5.3	24.8	5.6	1.3	6.9
4/1	719	719	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	530	530	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1000	1000	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**6.0**	**6.5**	**0.0**	**12.5**	**-**	**-**	**-**	**-**
1/1+1/2	859	859	-	-	-	2.9	1.1	-	4.0	16.6	5.6	1.1	6.7
2/2+2/1	719	719	-	-	-	1.0	2.5	-	3.5	17.8	8.6	2.5	11.1
3/1	345	345	-	-	-	2.1	2.9	-	5.0	52.0	5.5	2.9	8.3
4/1	809	809	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	740	740	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	374	374	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

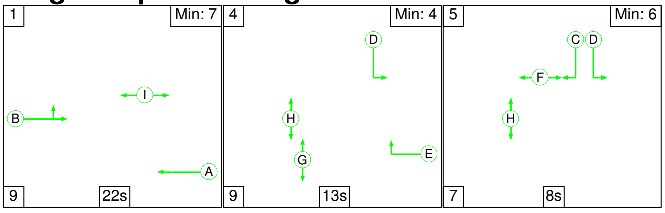
C1	PRC for Signalled Lanes (%):	-10.6	Total Delay for Signalled Lanes (pcuHr):	36.96	Cycle Time (s):	60
C2	PRC for Signalled Lanes (%):	-9.5	Total Delay for Signalled Lanes (pcuHr):	12.49	Cycle Time (s):	60
	PRC Over All Lanes (%):	-10.6	Total Delay Over All Lanes(pcuHr):	49.44		

Willinton Wallis Base LinSig Data

Scenario 2: 'AM29+C' (FG2: 'AM29+C', Plan 1: 'AM Survey')

C1

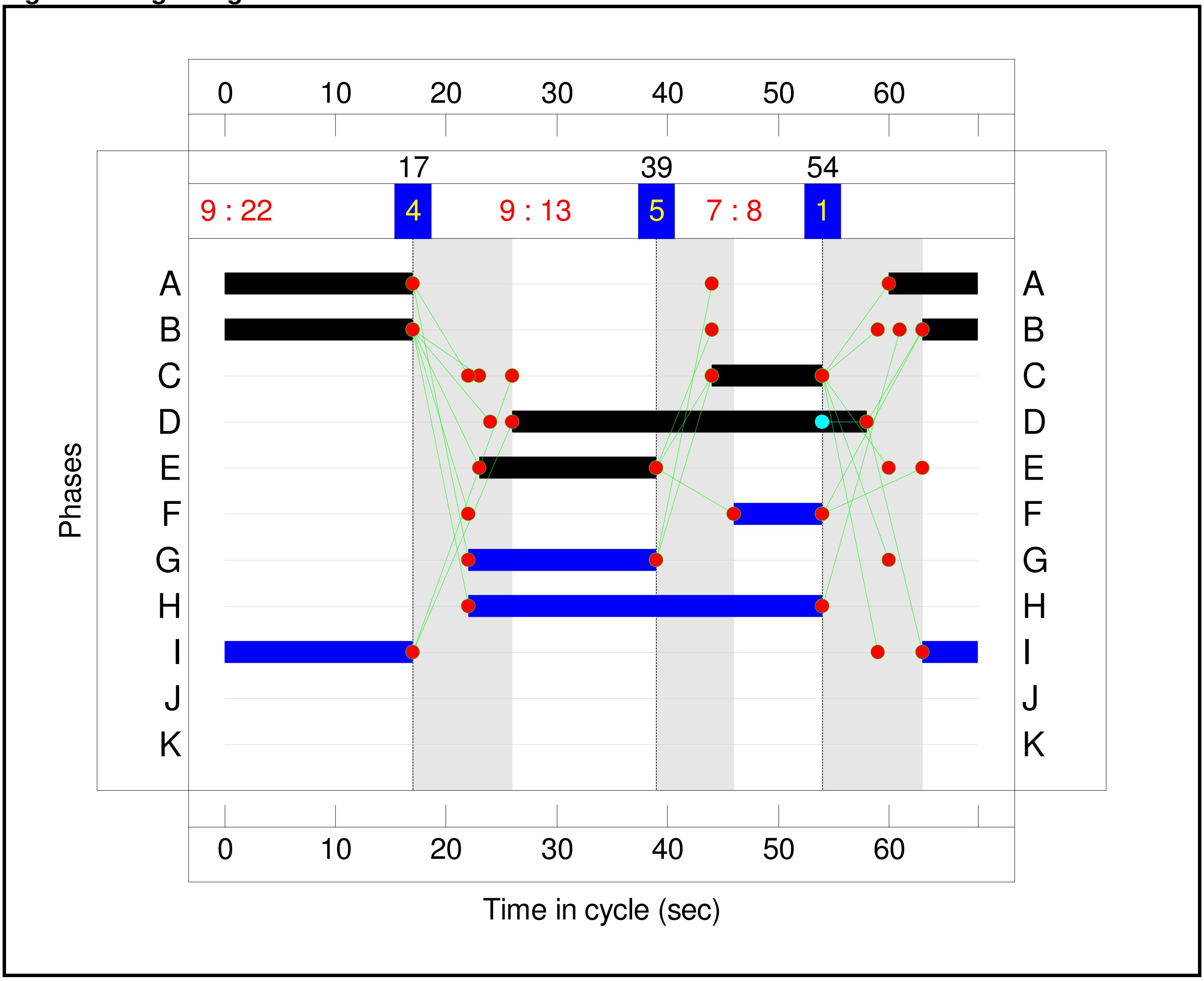
Stage Sequence Diagram



Stage Timings

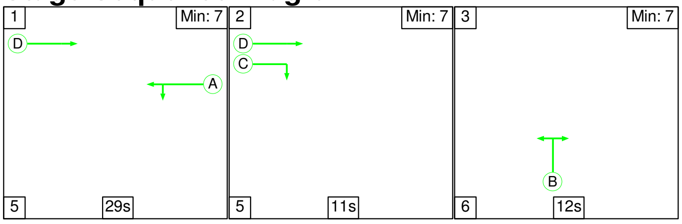
Stage	1	4	5
Duration	22	13	8
Change Point	54	17	39

Signal Timings Diagram



C2

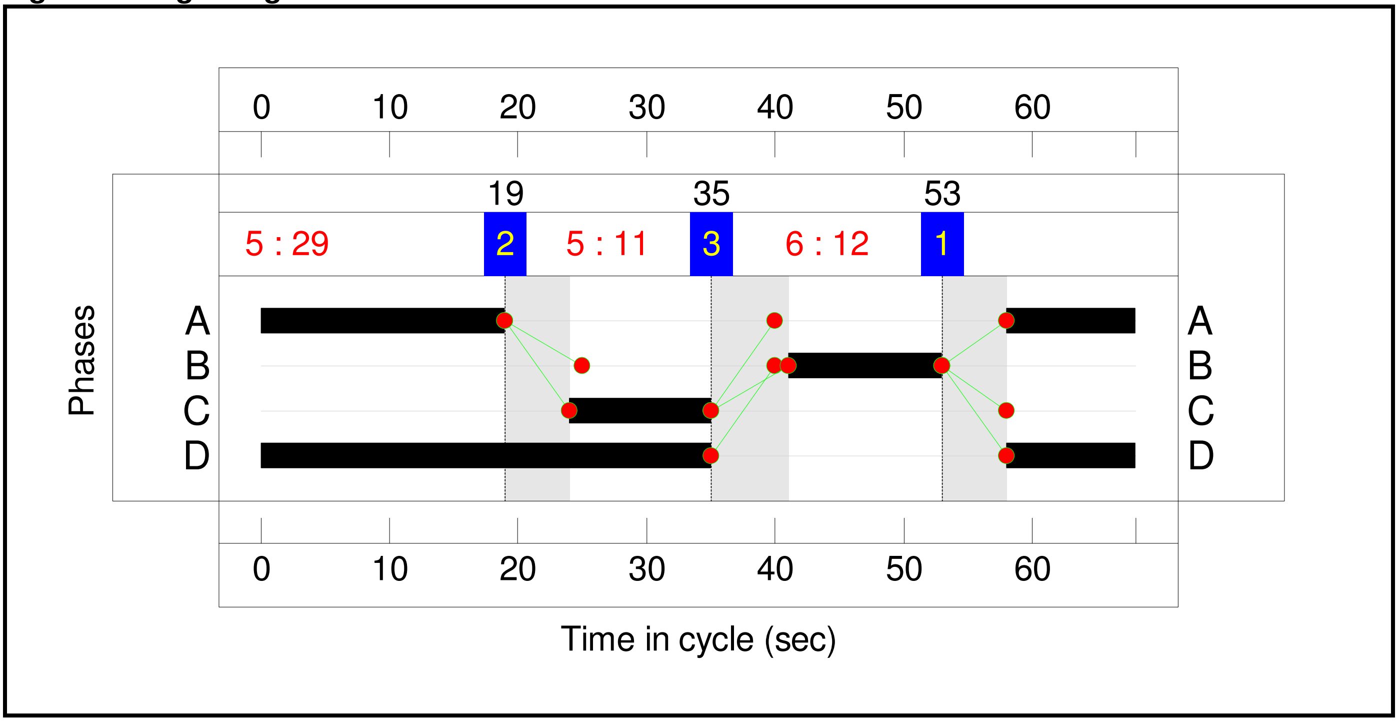
Stage Sequence Diagram



Stage Timings

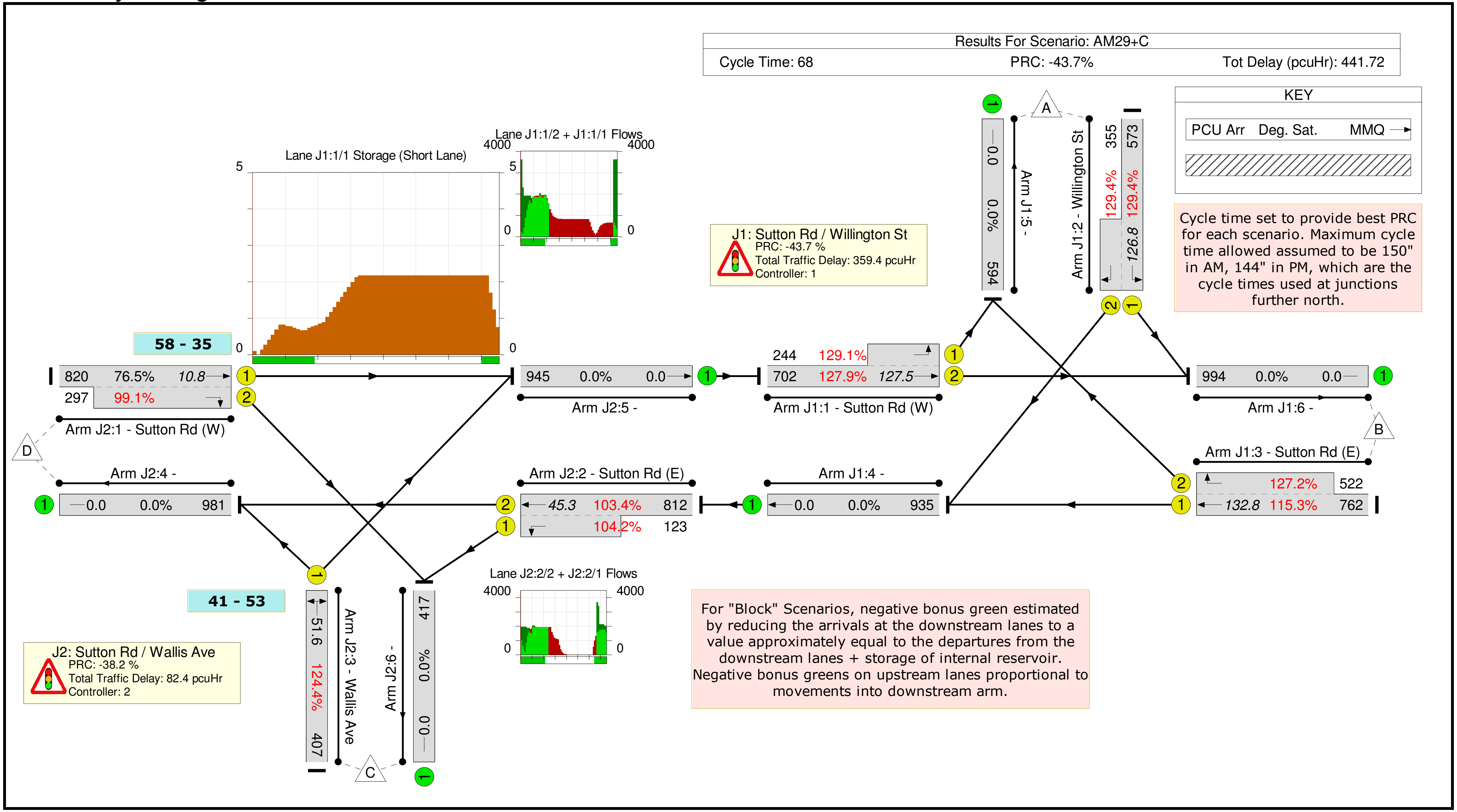
Stage	1	2	3
Duration	29	11	12
Change Point	53	19	35

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

Network Results

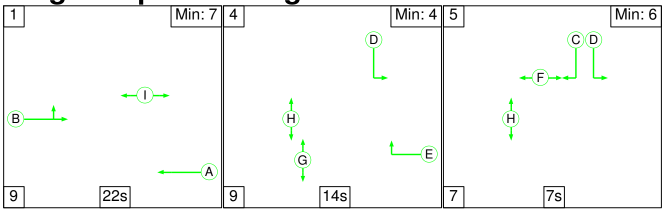
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Willington Wallis Base	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**129.4%**
J1: Sutton Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**129.4%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	22	-	976	1915:1694	548+189	127.9 : 129.1%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	32:10	-	928	1702:1768	443+274	129.4 : 129.4%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	25:16	-	1284	1930:1641	661+410	115.3 : 127.2%
4/1	Ahead	U	N/A	N/A	-		-	-	-	1117	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	772	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1299	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.4%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	45:11	-	1117	1930:1698	1072+300	76.5 : 99.1%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	29	-	1117	1940:1724	785+118	103.4 : 104.2%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	12	-	407	1712	327	124.4%
4/1		U	N/A	N/A	-		-	-	-	1222	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	976	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	443	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**49.0**	**392.7**	**0.0**	**441.7**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**36.3**	**323.1**	**0.0**	**359.4**	**-**	**-**	**-**	**-**
1/2+1/1	945	735	-	-	-	11.7	106.3	-	118.0	449.3	21.2	106.3	127.5
2/1+2/2	928	717	-	-	-	9.8	107.5	-	117.2	454.8	19.3	107.5	126.8
3/1+3/2	1284	1071	-	-	-	14.8	109.3	-	124.1	347.9	23.5	109.3	132.8
4/1	935	935	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	594	594	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	994	994	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**12.7**	**69.6**	**0.0**	**82.4**	**-**	**-**	**-**	**-**
1/1+1/2	1117	1117	-	-	-	3.7	2.2	-	5.9	18.9	8.7	2.2	10.8
2/2+2/1	935	899	-	-	-	3.8	25.2	-	29.0	111.8	20.1	25.2	45.3
3/1	407	327	-	-	-	5.2	42.3	-	47.4	419.7	9.3	42.3	51.6
4/1	981	981	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	945	945	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	417	417	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -43.7 Total Delay for Signalled Lanes (pcuHr): 359.36 Cycle Time (s): 68
C2 PRC for Signalled Lanes (%): -38.2 Total Delay for Signalled Lanes (pcuHr): 82.36 Cycle Time (s): 68
PRC Over All Lanes (%): -43.7 Total Delay Over All Lanes(pcuHr): 441.72

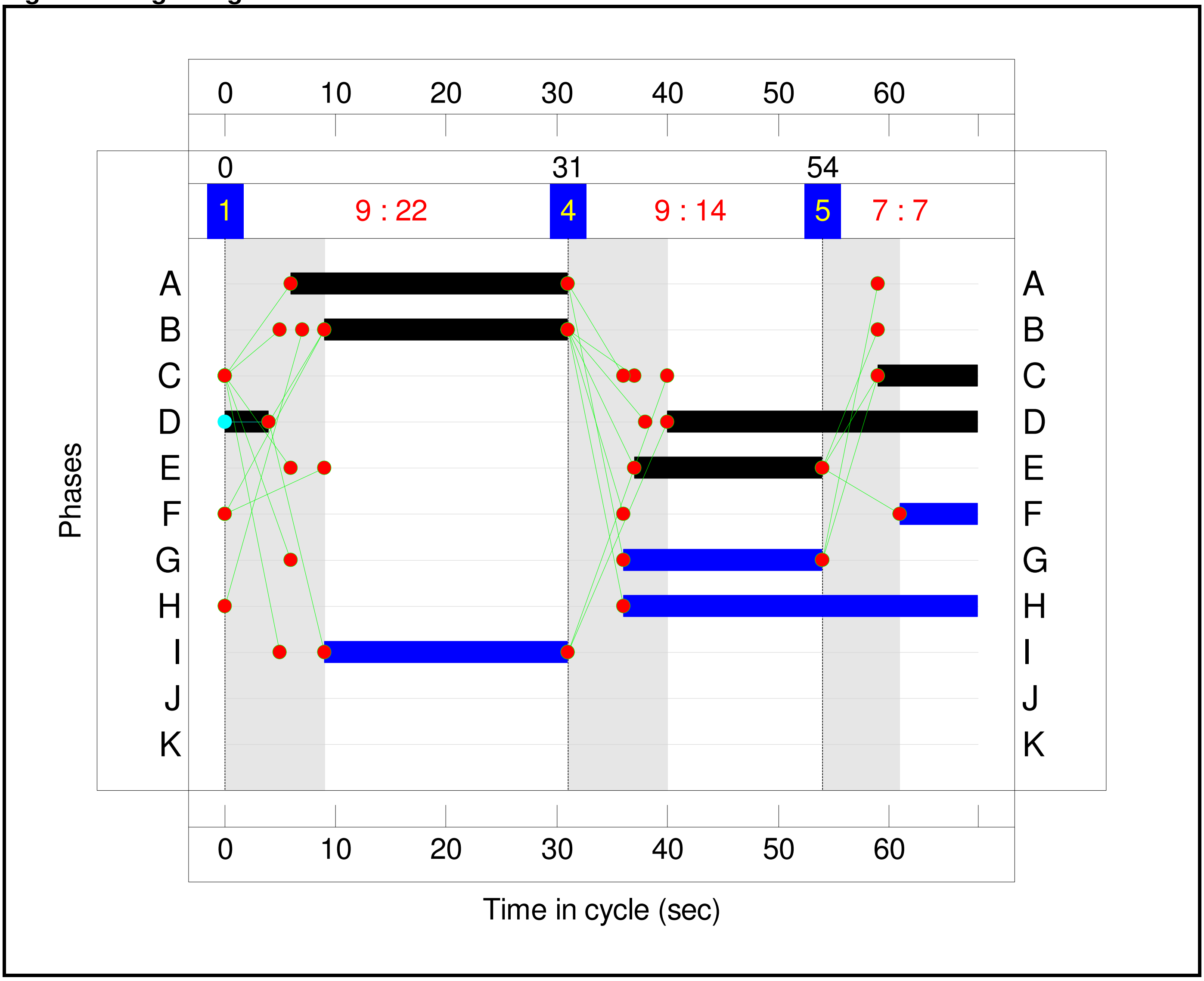
Willinton Wallis Base LinSig Data
Scenario 3: 'AM29+C+D' (FG3: 'AM29+C+D', Plan 1: 'AM Survey')
C1
Stage Sequence Diagram



Stage Timings

Stage	1	4	5
Duration	22	14	7
Change Point	0	31	54

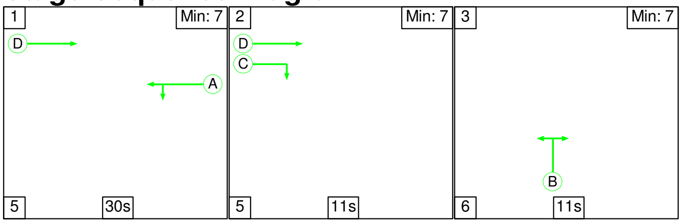
Signal Timings Diagram



Willinton Wallis Base LinSig Data

C2

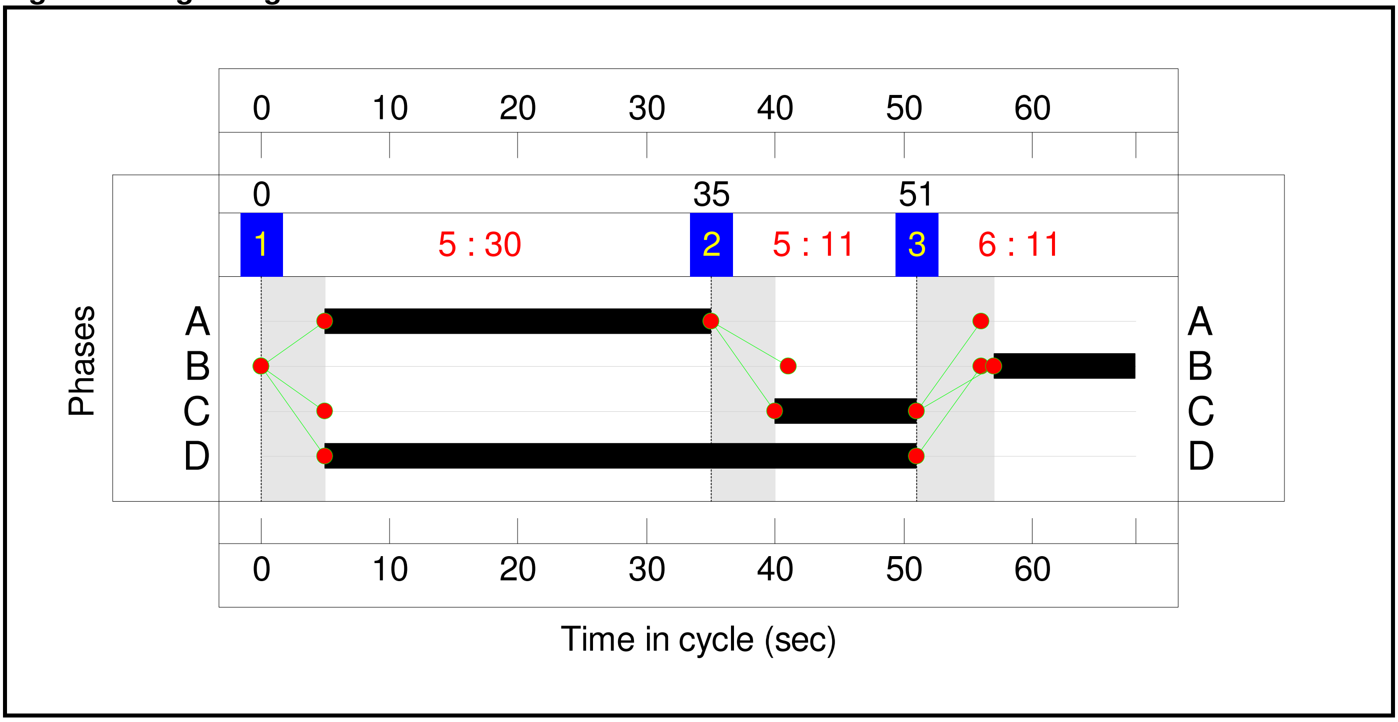
Stage Sequence Diagram



Stage Timings

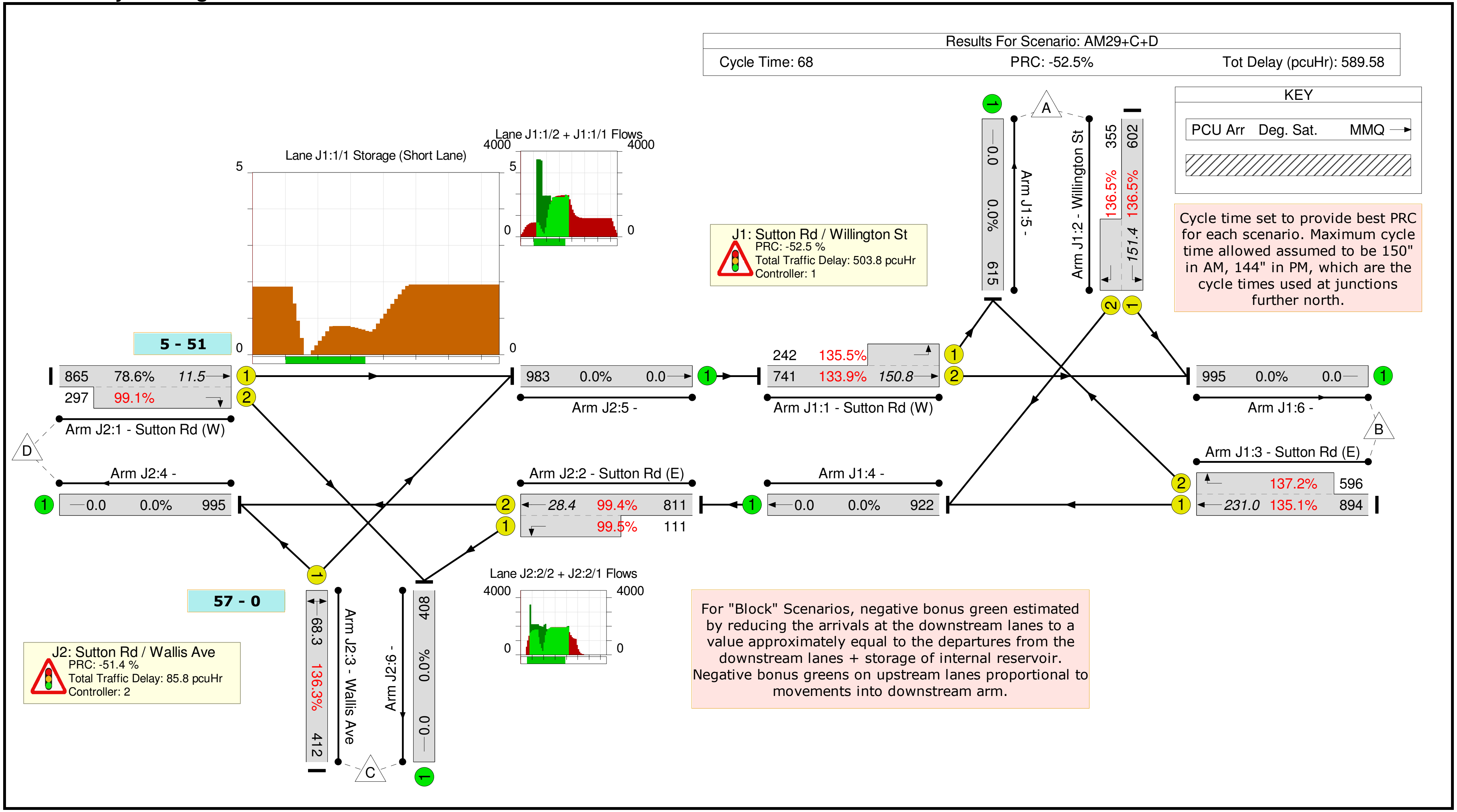
Stage	1	2	3
Duration	30	11	11
Change Point	0	35	51

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

Network Results

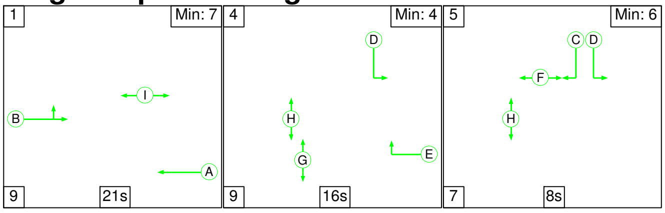
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Willington Wallis Base	-	-	**N/A**	-	-		-	-	-	-	-	-	**137.2%**
J1: Sutton Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**137.2%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	22	-	1026	1915:1694	554+178	133.9 : 135.5%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	32:9	-	957	1702:1768	441+260	136.5 : 136.5%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	25:17	-	1490	1930:1641	662+434	135.1 : 137.2%
4/1	Ahead	U	N/A	N/A	-		-	-	-	1249	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	846	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1378	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	-	-	**N/A**	-	-		-	-	-	-	-	-	**136.3%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	46:11	-	1162	1930:1698	1101+300	78.6 : 99.1%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	30	-	1249	1940:1724	816+111	99.4 : 99.5%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	11	-	412	1713	302	136.3%
4/1		U	N/A	N/A	-		-	-	-	1350	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	1026	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	447	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**60.5**	**529.1**	**0.0**	**589.6**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**47.7**	**456.1**	**0.0**	**503.8**	**-**	**-**	**-**	**-**
1/2+1/1	983	734	-	-	-	13.0	127.4	-	140.4	514.1	23.3	127.4	150.8
2/1+2/2	957	701	-	-	-	14.2	129.9	-	144.1	542.1	21.5	129.9	151.4
3/1+3/2	1490	1096	-	-	-	20.6	198.7	-	219.3	529.8	32.3	198.7	231.0
4/1	922	922	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	615	615	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	995	995	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**12.8**	**73.0**	**0.0**	**85.8**	**-**	**-**	**-**	**-**
1/1+1/2	1162	1162	-	-	-	3.7	2.4	-	6.1	18.9	9.1	2.4	11.5
2/2+2/1	922	922	-	-	-	1.6	13.9	-	15.5	60.7	14.5	13.9	28.4
3/1	412	302	-	-	-	7.5	56.7	-	64.1	560.3	11.6	56.7	68.3
4/1	995	995	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	983	983	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	408	408	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1	PRC for Signalled Lanes (%):	-52.5	Total Delay for Signalled Lanes (pcuHr):	503.80	Cycle Time (s):	68
C2	PRC for Signalled Lanes (%):	-51.4	Total Delay for Signalled Lanes (pcuHr):	85.78	Cycle Time (s):	68
	PRC Over All Lanes (%):	-52.5	Total Delay Over All Lanes(pcuHr):	589.58		

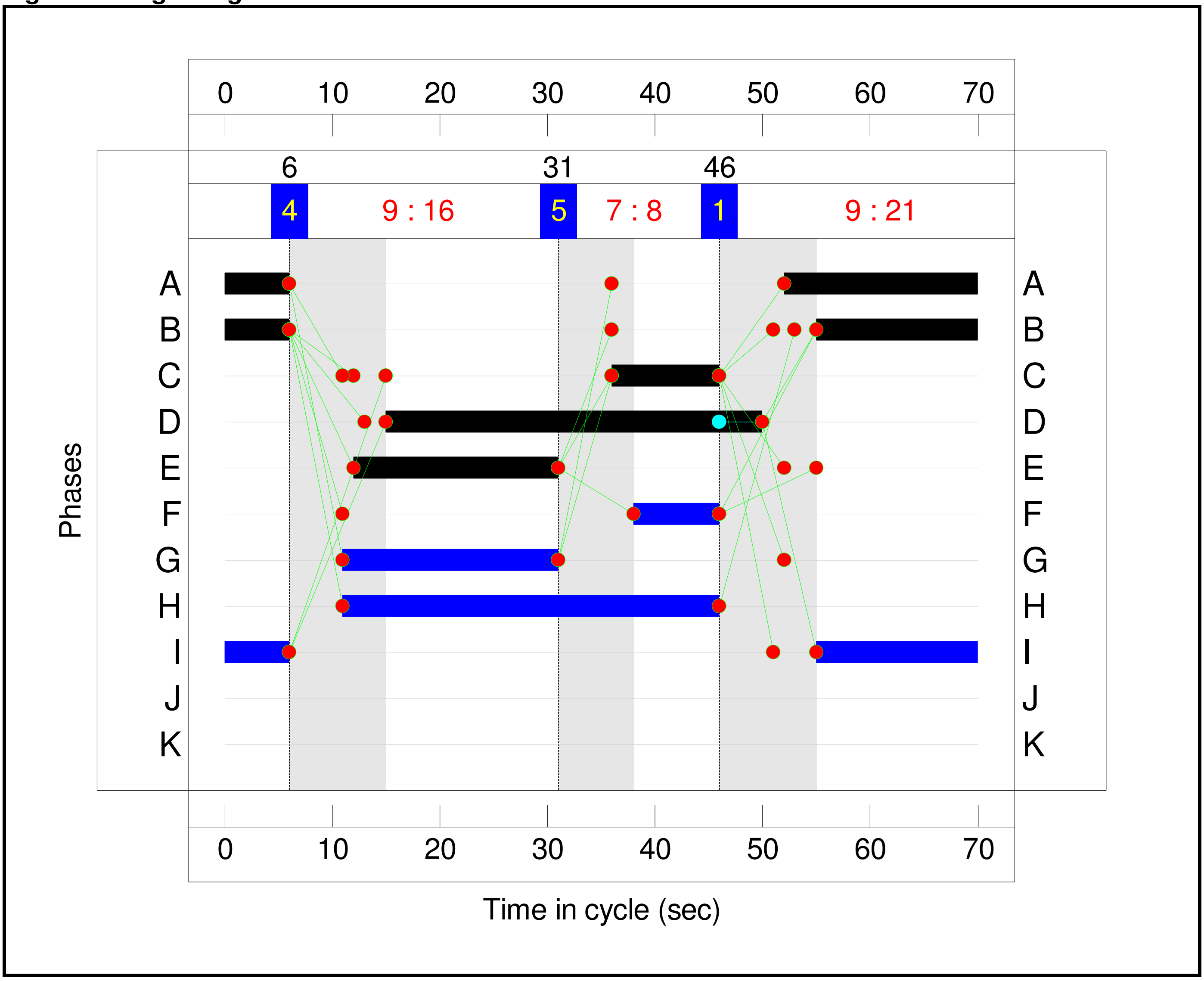
Willinton Wallis Base LinSig Data
Scenario 4: 'PM Survey' (FG4: 'PM Survey', Plan 1: 'AM Survey')
C1
Stage Sequence Diagram



Stage Timings

Stage	1	4	5
Duration	21	16	8
Change Point	46	6	31

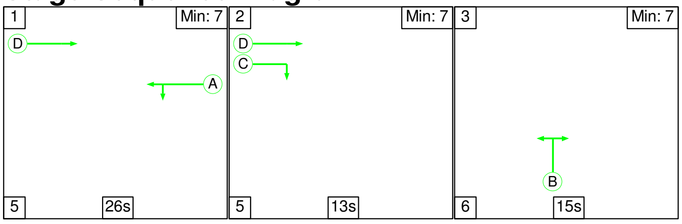
Signal Timings Diagram



Willinton Wallis Base LinSig Data

C2

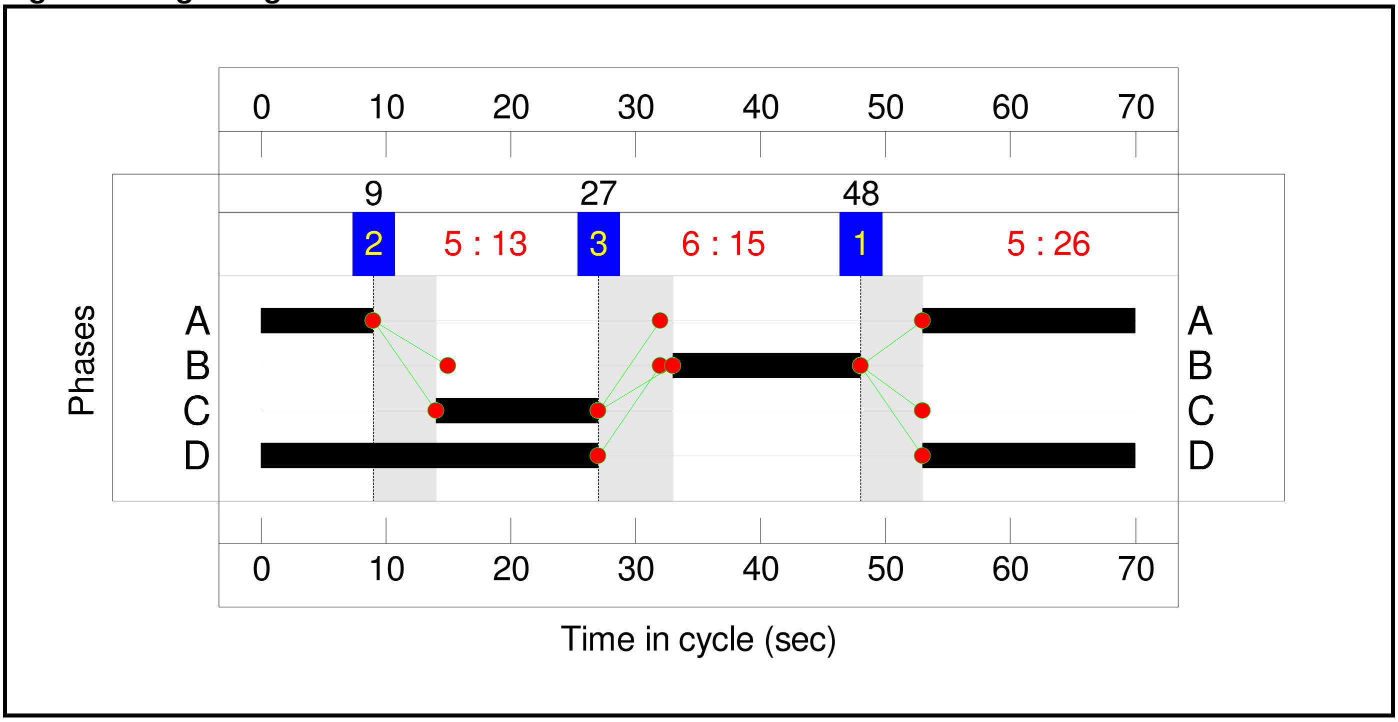
Stage Sequence Diagram



Stage Timings

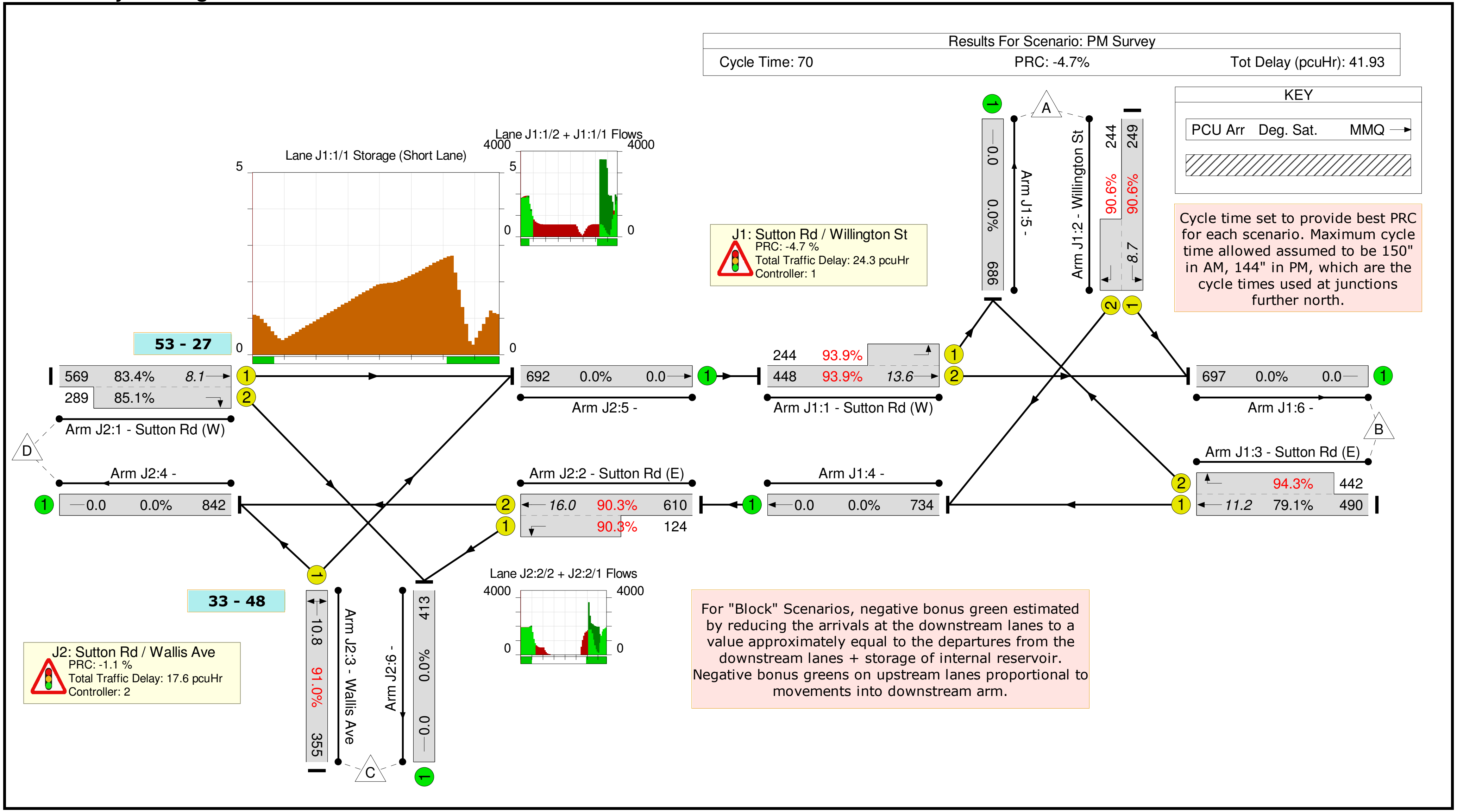
Stage	1	2	3
Duration	26	13	15
Change Point	48	9	27

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

Network Results

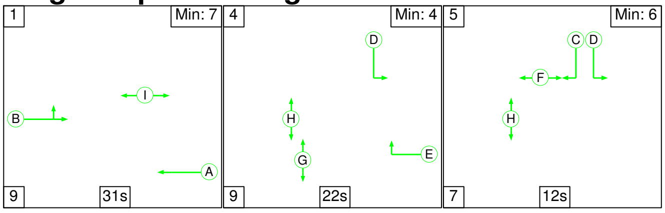
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Willington Wallis Base	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**94.3%**
J1: Sutton Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**94.3%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	21	-	692	1915:1694	477+260	93.9 : 93.9%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	35:10	-	493	1702:1768	275+269	90.6 : 90.6%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	24:19	-	932	1930:1641	619+469	79.1 : 94.3%
4/1	Ahead	U	N/A	N/A	-		-	-	-	734	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	686	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	697	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**91.0%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	44:13	-	858	1930:1698	682+340	83.4 : 85.1%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	26	-	734	1940:1724	676+137	90.3 : 90.3%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	15	-	355	1707	390	91.0%
4/1		U	N/A	N/A	-		-	-	-	842	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	692	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	413	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**18.0**	**23.9**	**0.0**	**41.9**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**11.3**	**13.1**	**0.0**	**24.3**	**-**	**-**	**-**	**-**
1/2+1/1	692	692	-	-	-	3.0	6.0	-	9.0	47.1	7.6	6.0	13.6
2/1+2/2	493	493	-	-	-	2.6	4.1	-	6.8	49.4	4.6	4.1	8.7
3/1+3/2	932	932	-	-	-	5.6	2.9	-	8.5	32.9	8.3	2.9	11.2
4/1	734	734	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	686	686	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	697	697	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**6.8**	**10.8**	**0.0**	**17.6**	**-**	**-**	**-**	**-**
1/1+1/2	858	858	-	-	-	3.2	2.5	-	5.7	24.0	5.5	2.5	8.1
2/2+2/1	734	734	-	-	-	1.0	4.2	-	5.2	25.5	11.8	4.2	16.0
3/1	355	355	-	-	-	2.6	4.1	-	6.7	67.8	6.7	4.1	10.8
4/1	842	842	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	692	692	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	413	413	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -4.7 Total Delay for Signalled Lanes (pcuHr): 24.33 Cycle Time (s): 70
C2 PRC for Signalled Lanes (%): -1.1 Total Delay for Signalled Lanes (pcuHr): 17.60 Cycle Time (s): 70
PRC Over All Lanes (%): -4.7 Total Delay Over All Lanes(pcuHr): 41.93

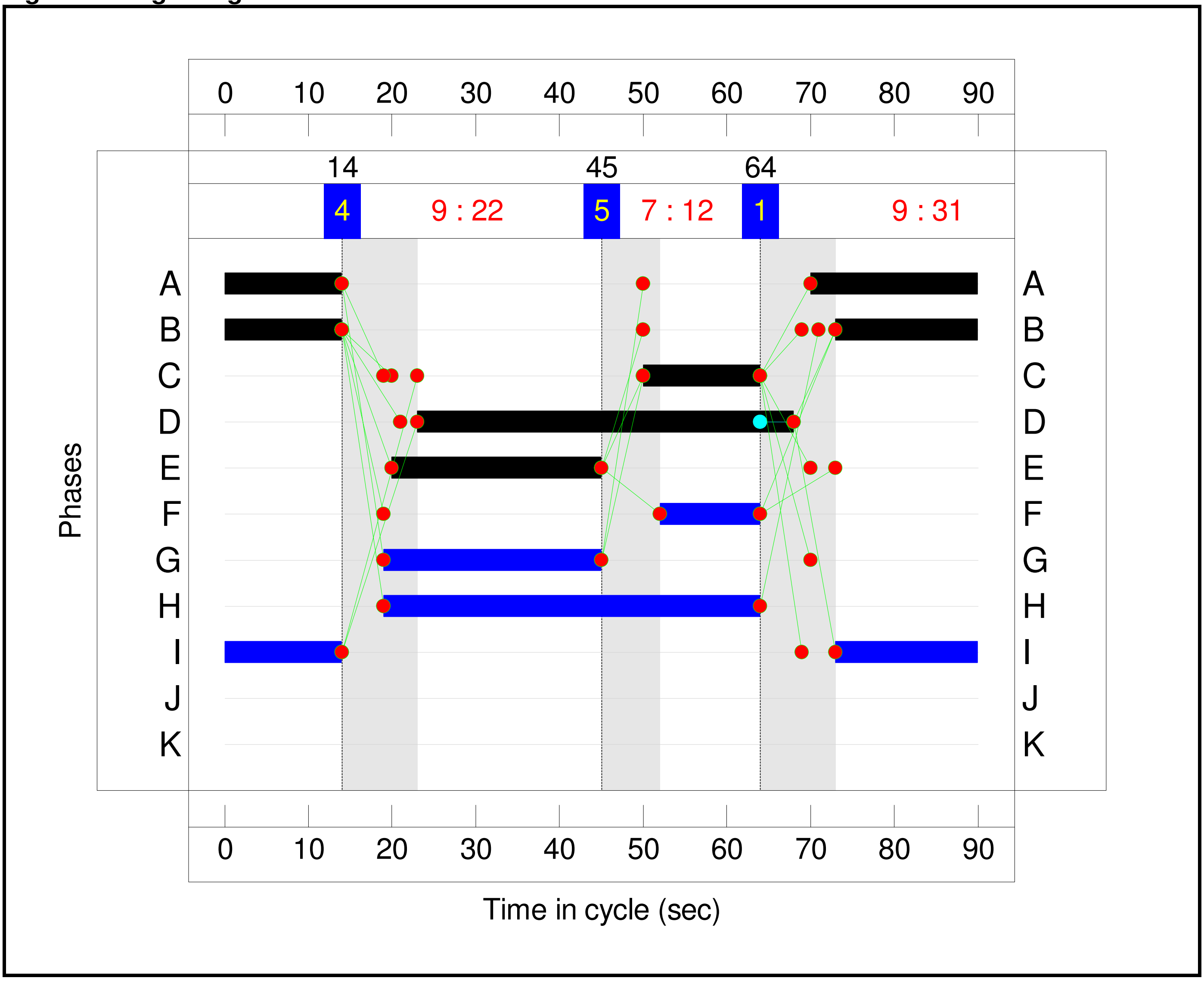
Willinton Wallis Base LinSig Data
Scenario 5: 'PM29+C' (FG5: 'PM29+C', Plan 1: 'AM Survey')
C1
Stage Sequence Diagram



Stage Timings

Stage	1	4	5
Duration	31	22	12
Change Point	64	14	45

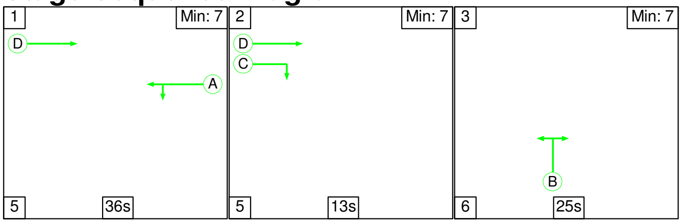
Signal Timings Diagram



Willinton Wallis Base LinSig Data

C2

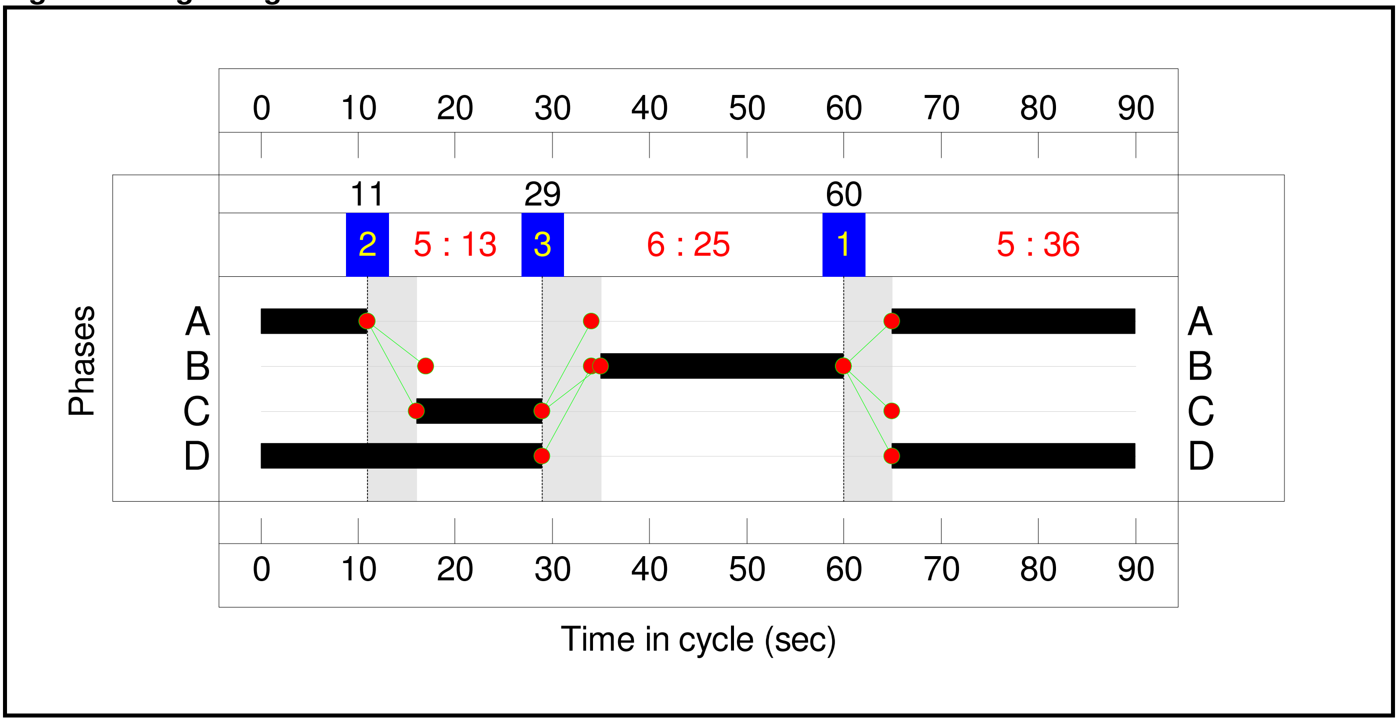
Stage Sequence Diagram



Stage Timings

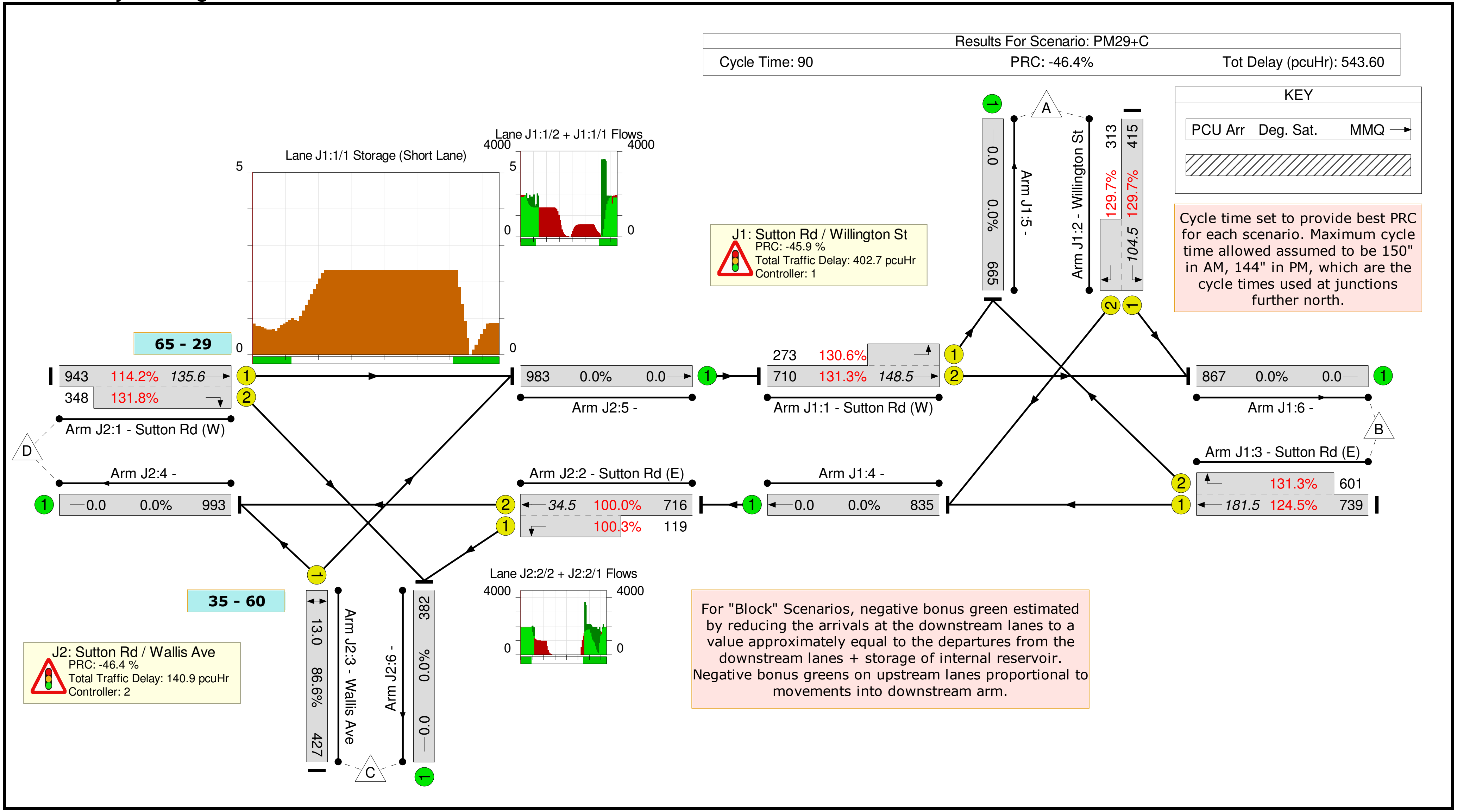
Stage	1	2	3
Duration	36	13	25
Change Point	60	11	29

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

Network Results

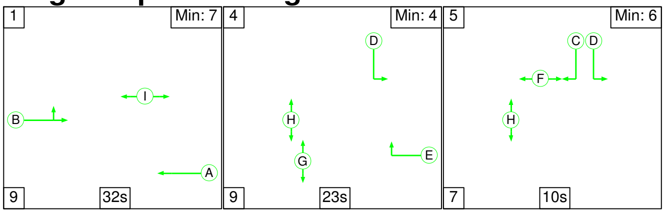
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Willington Wallis Base	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**131.8%**
J1: Sutton Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**131.3%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	31	-	1090	1915:1694	541+209	131.3 : 130.6%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	45:14	-	728	1702:1768	320+241	129.7 : 129.7%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	34:25	-	1340	1930:1641	593+458	124.5 : 131.3%
4/1	Ahead	U	N/A	N/A	-		-	-	-	1052	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	905	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1201	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**131.8%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	54:13	-	1291	1930:1698	826+264	114.2 : 131.8%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	36	-	1052	1940:1724	716+118	100.0 : 100.3%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	25	-	427	1707	493	86.6%
4/1		U	N/A	N/A	-		-	-	-	1183	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	1090	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	497	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**71.5**	**472.1**	**0.0**	**543.6**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**51.9**	**350.8**	**0.0**	**402.7**	**-**	**-**	**-**	**-**
1/2+1/1	983	754	-	-	-	17.8	118.6	-	136.4	499.6	29.9	118.6	148.5
2/1+2/2	728	561	-	-	-	10.5	85.5	-	96.0	474.9	19.0	85.5	104.5
3/1+3/2	1340	1051	-	-	-	23.6	146.6	-	170.2	457.4	34.9	146.6	181.5
4/1	835	835	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	665	665	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	867	867	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**19.7**	**121.3**	**0.0**	**140.9**	**-**	**-**	**-**	**-**
1/1+1/2	1291	1100	-	-	-	13.1	103.8	-	116.9	326.0	31.8	103.8	135.6
2/2+2/1	835	831	-	-	-	2.9	14.6	-	17.5	75.3	19.9	14.6	34.5
3/1	427	427	-	-	-	3.6	3.0	-	6.6	55.3	10.1	3.0	13.0
4/1	993	993	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	983	983	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	382	382	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -45.9 Total Delay for Signalled Lanes (pcuHr): 402.66 Cycle Time (s): 90
C2 PRC for Signalled Lanes (%): -46.4 Total Delay for Signalled Lanes (pcuHr): 140.93 Cycle Time (s): 90
PRC Over All Lanes (%): -46.4 Total Delay Over All Lanes(pcuHr): 543.60

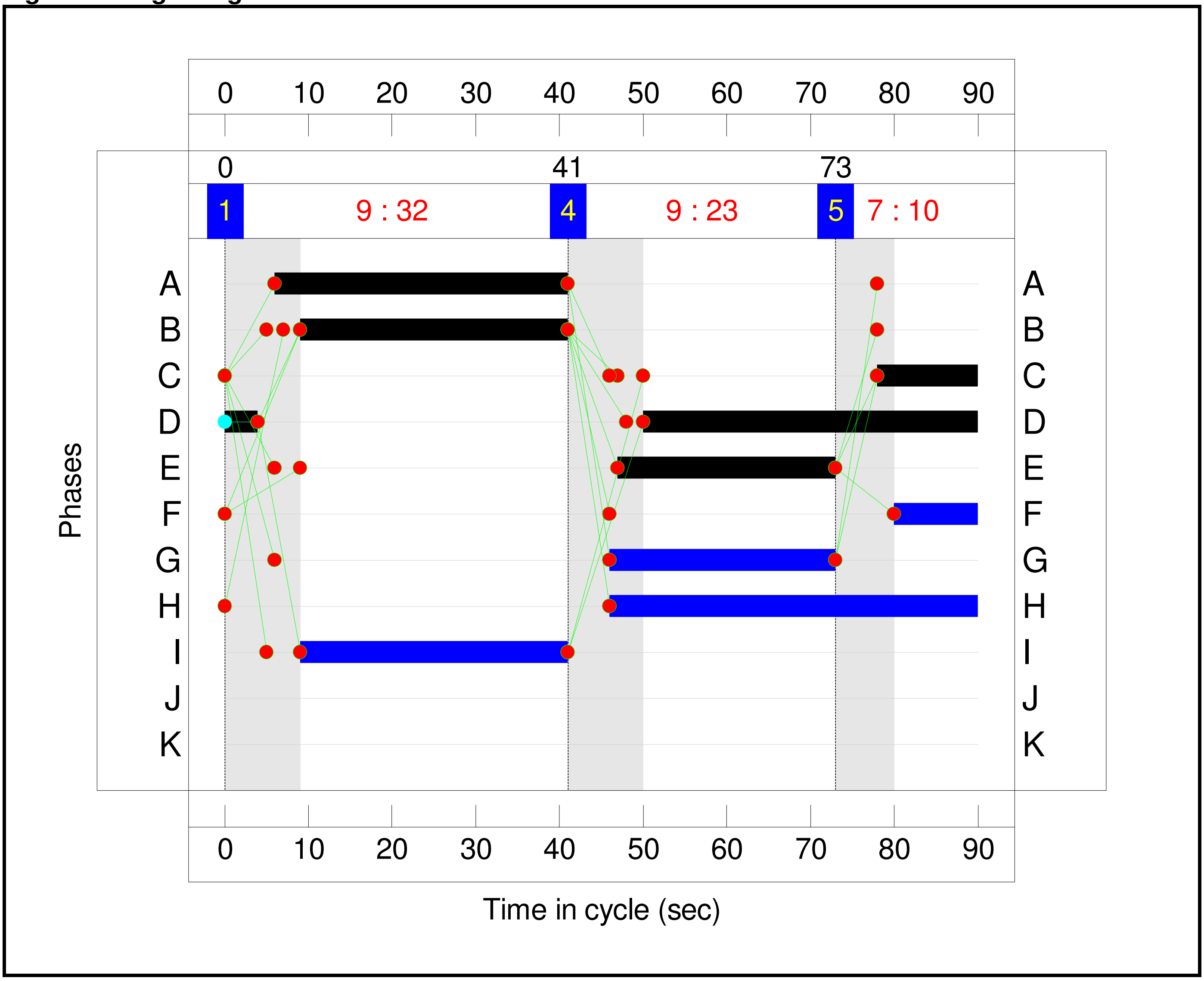
Willinton Wallis Base LinSig Data
Scenario 6: 'PM29+C+D' (FG6: 'PM29+C+D', Plan 1: 'AM Survey')
C1
Stage Sequence Diagram



Stage Timings

Stage	1	4	5
Duration	32	23	10
Change Point	0	41	73

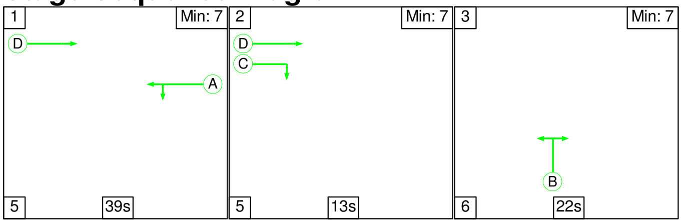
Signal Timings Diagram



Willinton Wallis Base LinSig Data

C2

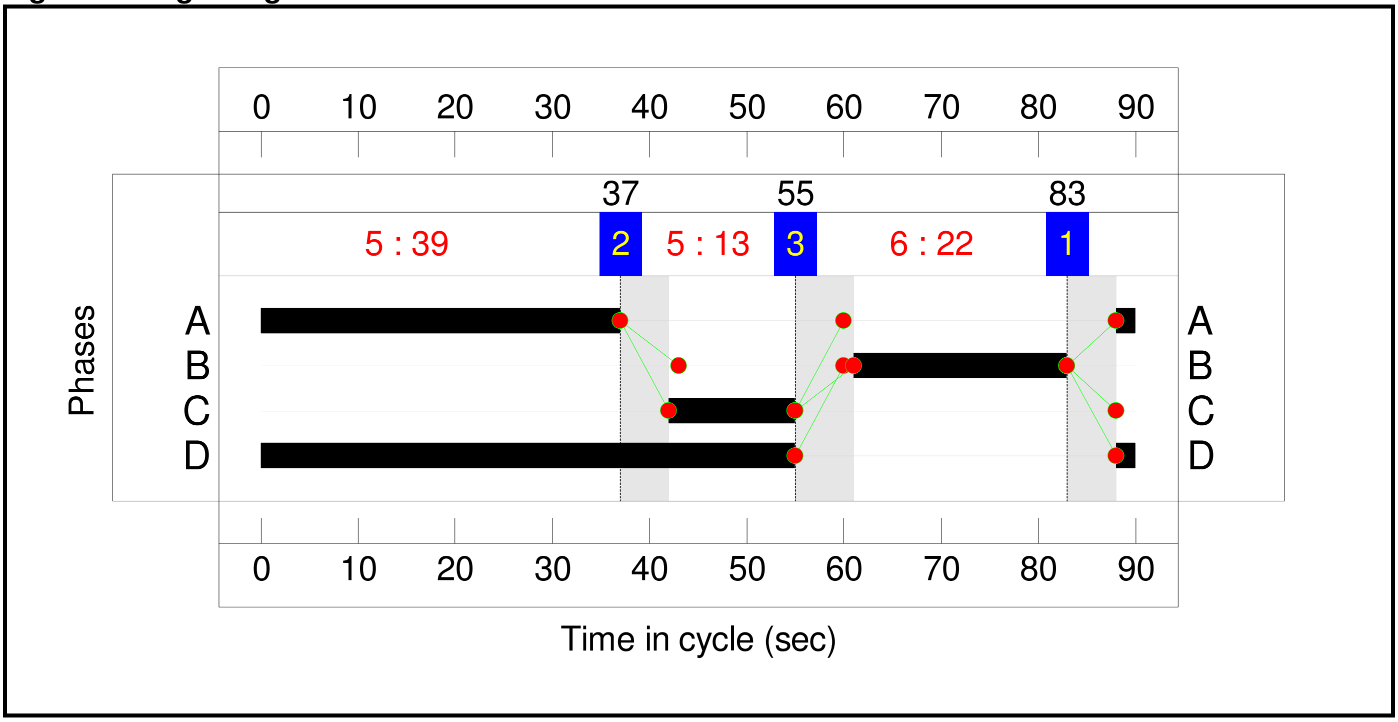
Stage Sequence Diagram



Stage Timings

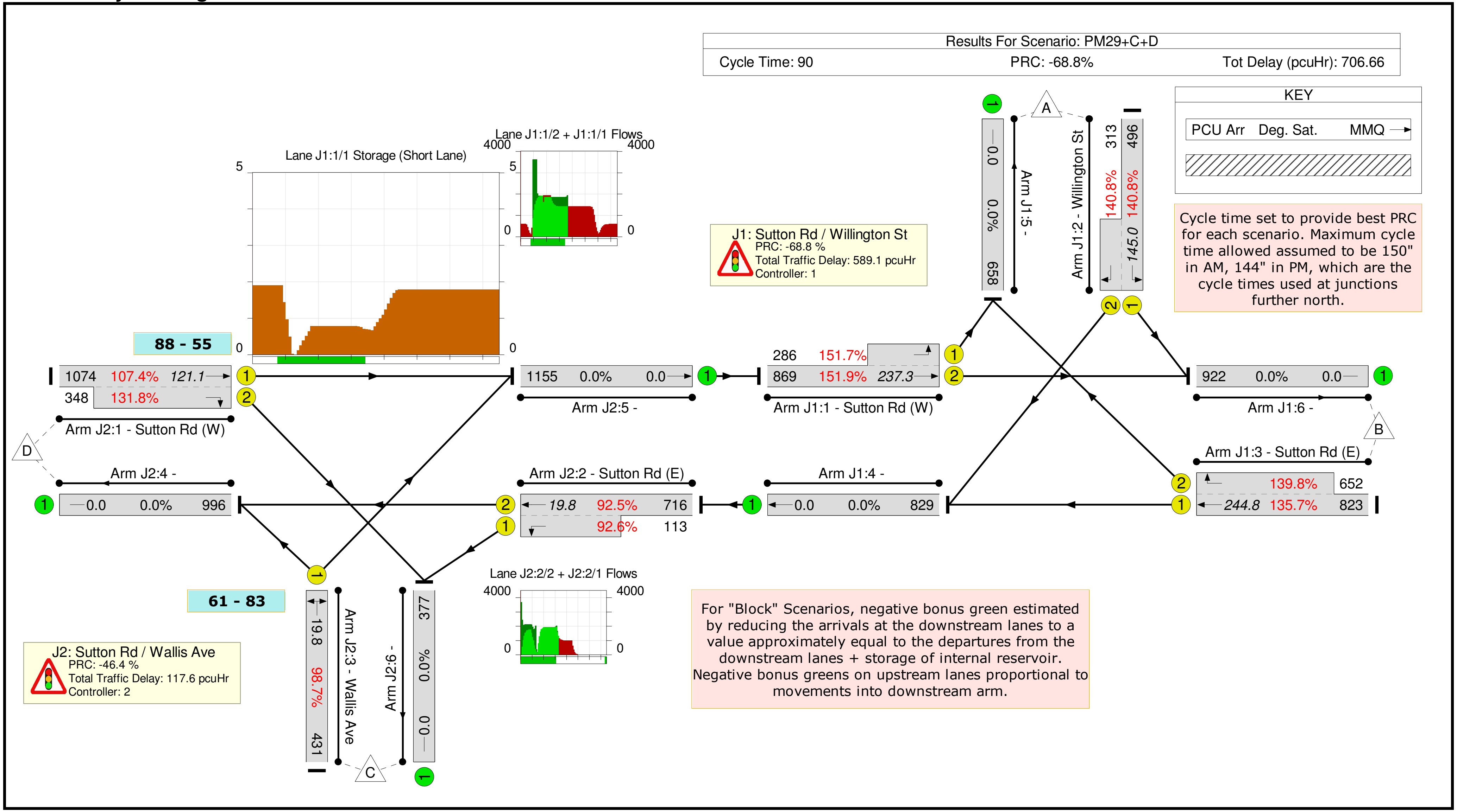
Stage	1	2	3
Duration	39	13	22
Change Point	83	37	55

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

Network Results

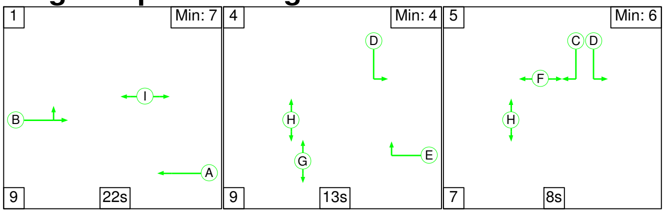
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Willington Wallis Base	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**151.9%**
J1: Sutton Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**151.9%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	32	-	1225	1915:1694	572+189	151.9 : 151.7%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	44:12	-	809	1702:1768	352+222	140.8 : 140.8%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	35:26	-	1475	1930:1641	607+466	135.7 : 139.8%
4/1	Ahead	U	N/A	N/A	-		-	-	-	1136	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	956	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1417	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**131.8%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	57:13	-	1422	1930:1698	1000+264	107.4 : 131.8%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	39	-	1136	1940:1724	775+121	92.5 : 92.6%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	22	-	431	1708	436	98.7%
4/1		U	N/A	N/A	-		-	-	-	1262	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	1225	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	502	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**88.5**	**618.2**	**0.0**	**706.7**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**68.5**	**520.5**	**0.0**	**589.1**	**-**	**-**	**-**	**-**
1/2+1/1	1155	761	-	-	-	24.6	198.7	-	223.4	696.1	38.6	198.7	237.3
2/1+2/2	809	574	-	-	-	17.2	119.0	-	136.1	605.8	26.0	119.0	145.0
3/1+3/2	1475	1073	-	-	-	26.7	202.9	-	229.6	560.3	42.0	202.9	244.8
4/1	829	829	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	658	658	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	922	922	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**20.0**	**97.6**	**0.0**	**117.6**	**-**	**-**	**-**	**-**
1/1+1/2	1422	1268	-	-	-	13.6	83.2	-	96.8	245.0	37.9	83.2	121.1
2/2+2/1	829	829	-	-	-	2.4	5.3	-	7.7	33.4	14.4	5.3	19.8
3/1	431	431	-	-	-	4.0	9.1	-	13.1	109.4	10.7	9.1	19.8
4/1	996	996	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1155	1155	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	377	377	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1	PRC for Signalled Lanes (%):	-68.8	Total Delay for Signalled Lanes (pcuHr):	589.09	Cycle Time (s):	90
C2	PRC for Signalled Lanes (%):	-46.4	Total Delay for Signalled Lanes (pcuHr):	117.57	Cycle Time (s):	90
	PRC Over All Lanes (%):	-68.8	Total Delay Over All Lanes(pcuHr):	706.66		

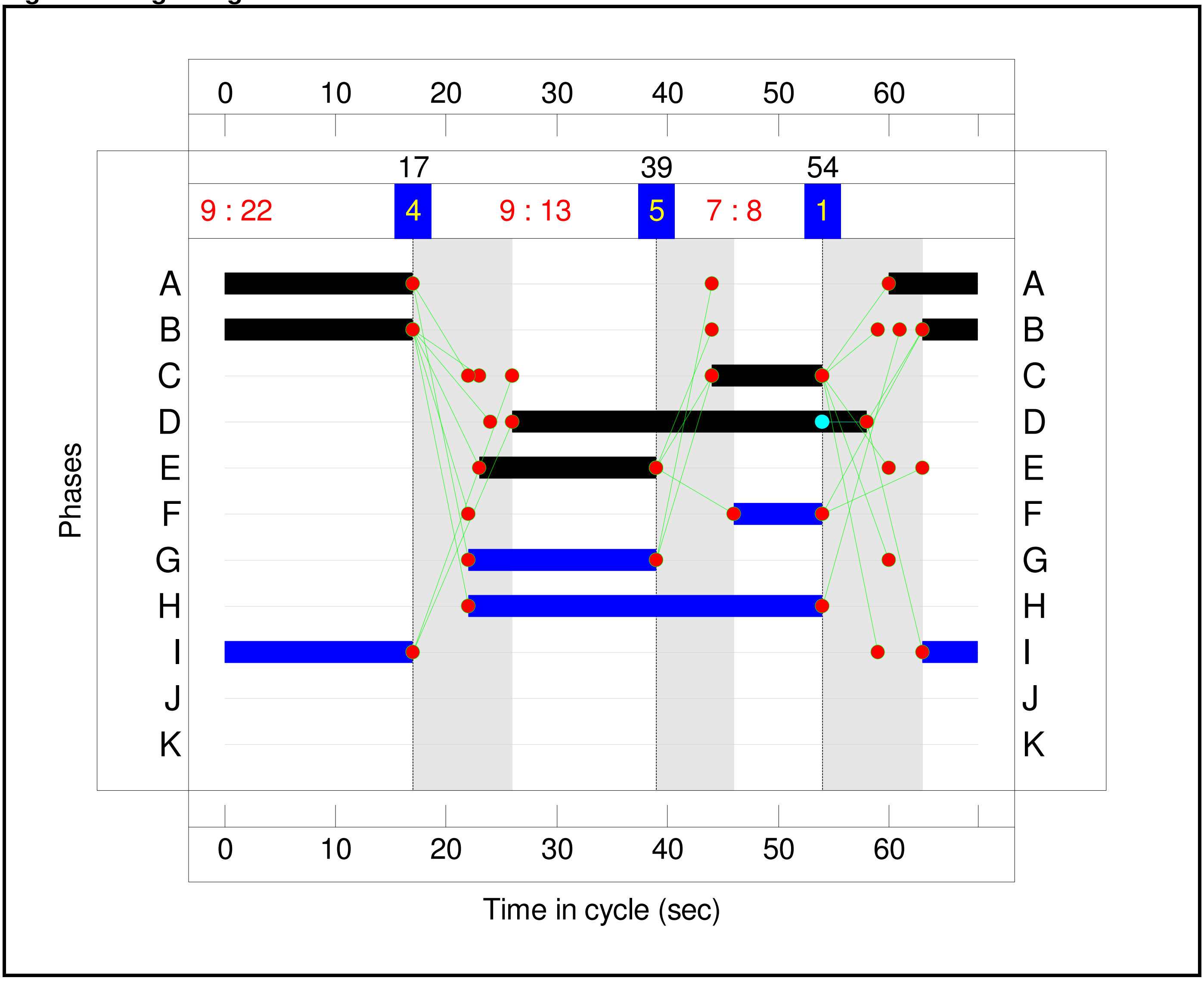
Willinton Wallis Base LinSig Data
Scenario 7: 'AM29+C Block' (FG2: 'AM29+C', Plan 1: 'AM Survey')
C1
Stage Sequence Diagram



Stage Timings

Stage	1	4	5
Duration	22	13	8
Change Point	54	17	39

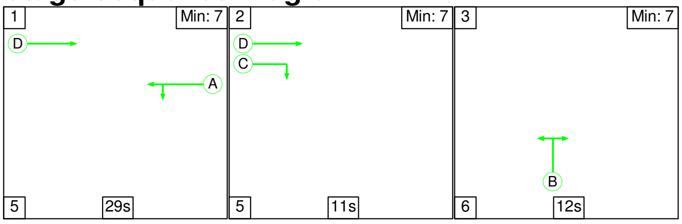
Signal Timings Diagram



Willinton Wallis Base LinSig Data

C2

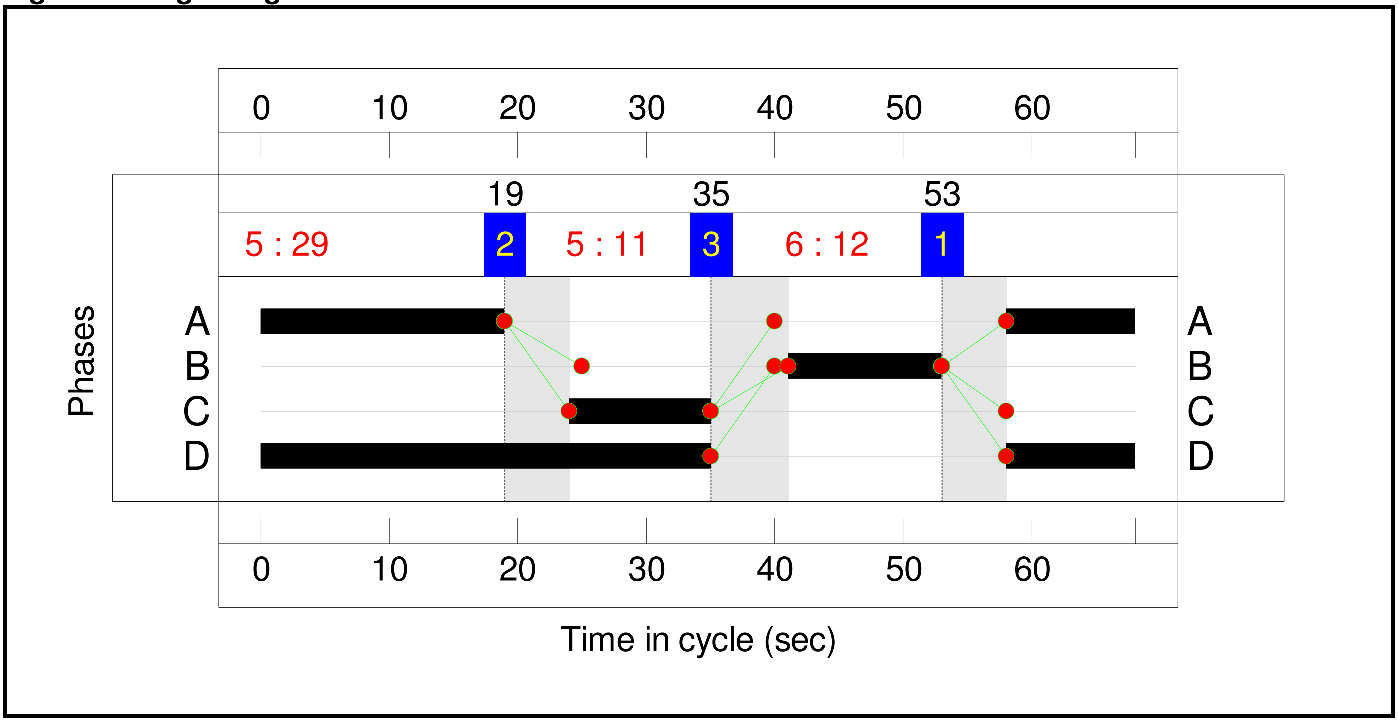
Stage Sequence Diagram



Stage Timings

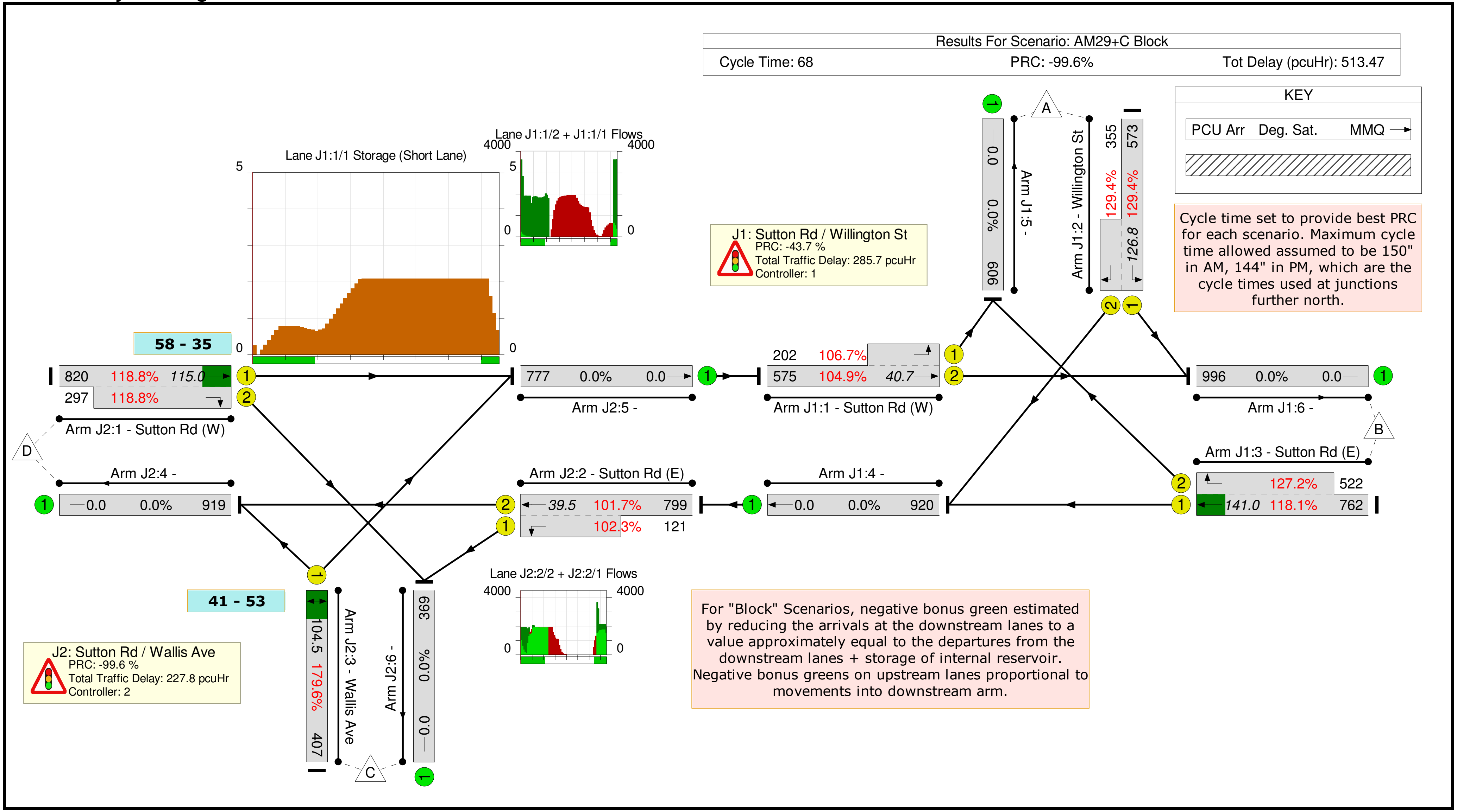
Stage	**1**	**2**	**3**
Duration	29	11	12
Change Point	53	19	35

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

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: Willington Wallis Base	-	-	**N/A**	-	-		-	-	-	-	-	-	**179.6%**
J1: Sutton Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**129.4%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	22	-	976	1915:1694	548+189	104.9 : 106.7%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	32:10	-	928	1702:1768	443+274	129.4 : 129.4%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	25:16	-	1284	1930:1641	645+410	118.1 : 127.2%
4/1	Ahead	U	N/A	N/A	-		-	-	-	1117	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	772	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1299	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	-	-	**N/A**	-	-		-	-	-	-	-	-	**179.6%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	45:11	-	1117	1930:1698	690+250	118.8 : 118.8%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	29	-	1117	1940:1724	785+118	101.7 : 102.3%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	12	-	407	1712	227	179.6%
4/1		U	N/A	N/A	-		-	-	-	1222	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	976	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	443	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**59.5**	**454.0**	**0.0**	**513.5**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**34.2**	**251.5**	**0.0**	**285.7**	**-**	**-**	**-**	**-**
1/2+1/1	777	749	-	-	-	9.0	27.0	-	36.0	166.8	13.7	27.0	40.7
2/1+2/2	928	717	-	-	-	9.8	107.5	-	117.2	454.8	19.3	107.5	126.8
3/1+3/2	1284	1055	-	-	-	15.5	117.0	-	132.5	371.4	24.0	117.0	141.0
4/1	920	920	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	606	606	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	996	996	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**25.3**	**202.5**	**0.0**	**227.8**	**-**	**-**	**-**	**-**
1/1+1/2	1117	940	-	-	-	12.2	91.4	-	103.7	334.1	23.6	91.4	115.0
2/2+2/1	920	898	-	-	-	3.4	19.7	-	23.1	90.6	19.7	19.7	39.5
3/1	407	227	-	-	-	9.6	91.3	-	101.0	893.1	13.1	91.3	104.5
4/1	919	919	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	777	777	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	369	369	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

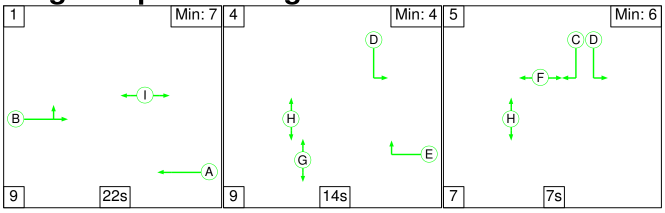
C1 PRC for Signalled Lanes (%): -43.7 Total Delay for Signalled Lanes (pcuHr): 285.71 Cycle Time (s): 68
C2 PRC for Signalled Lanes (%): -99.6 Total Delay for Signalled Lanes (pcuHr): 227.77 Cycle Time (s): 68
PRC Over All Lanes (%): -99.6 Total Delay Over All Lanes(pcuHr): 513.47

Willinton Wallis Base LinSig Data

Scenario 8: 'AM29+C+D Block' (FG3: 'AM29+C+D', Plan 1: 'AM Survey')

C1

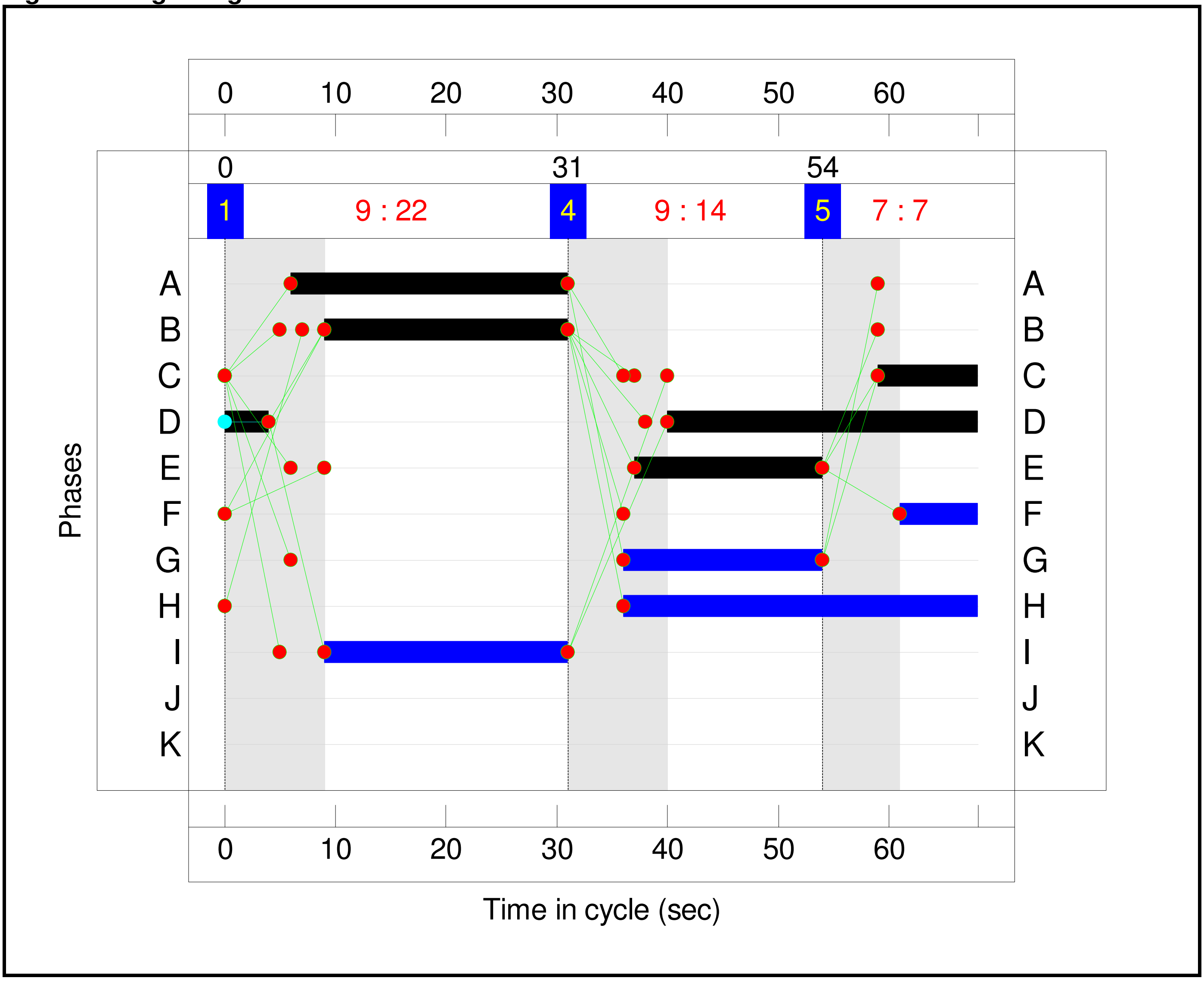
Stage Sequence Diagram



Stage Timings

Stage	1	4	5
Duration	22	14	7
Change Point	0	31	54

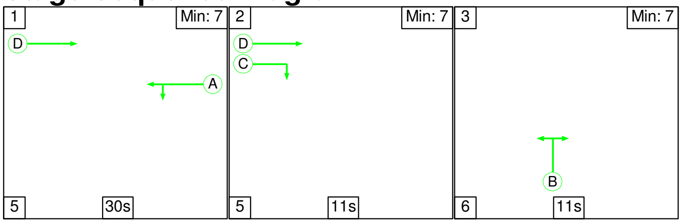
Signal Timings Diagram



Willinton Wallis Base LinSig Data

C2

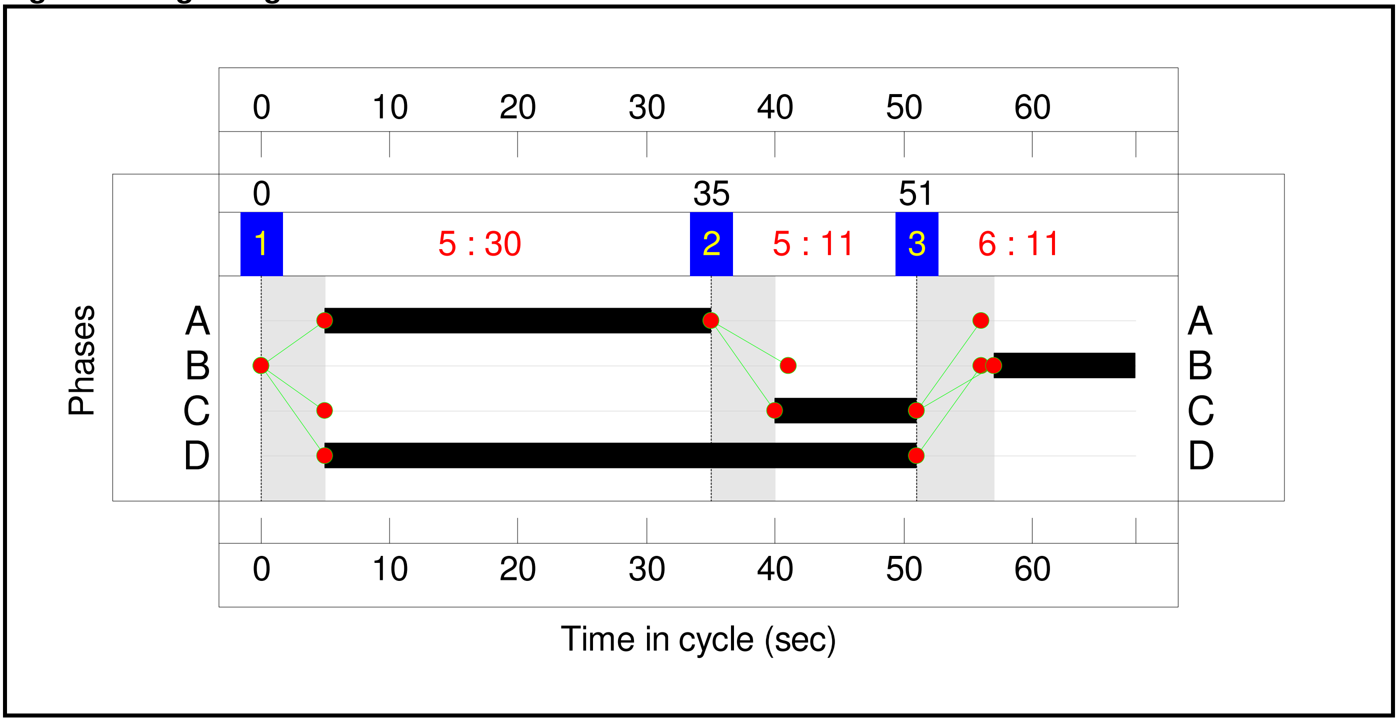
Stage Sequence Diagram



Stage Timings

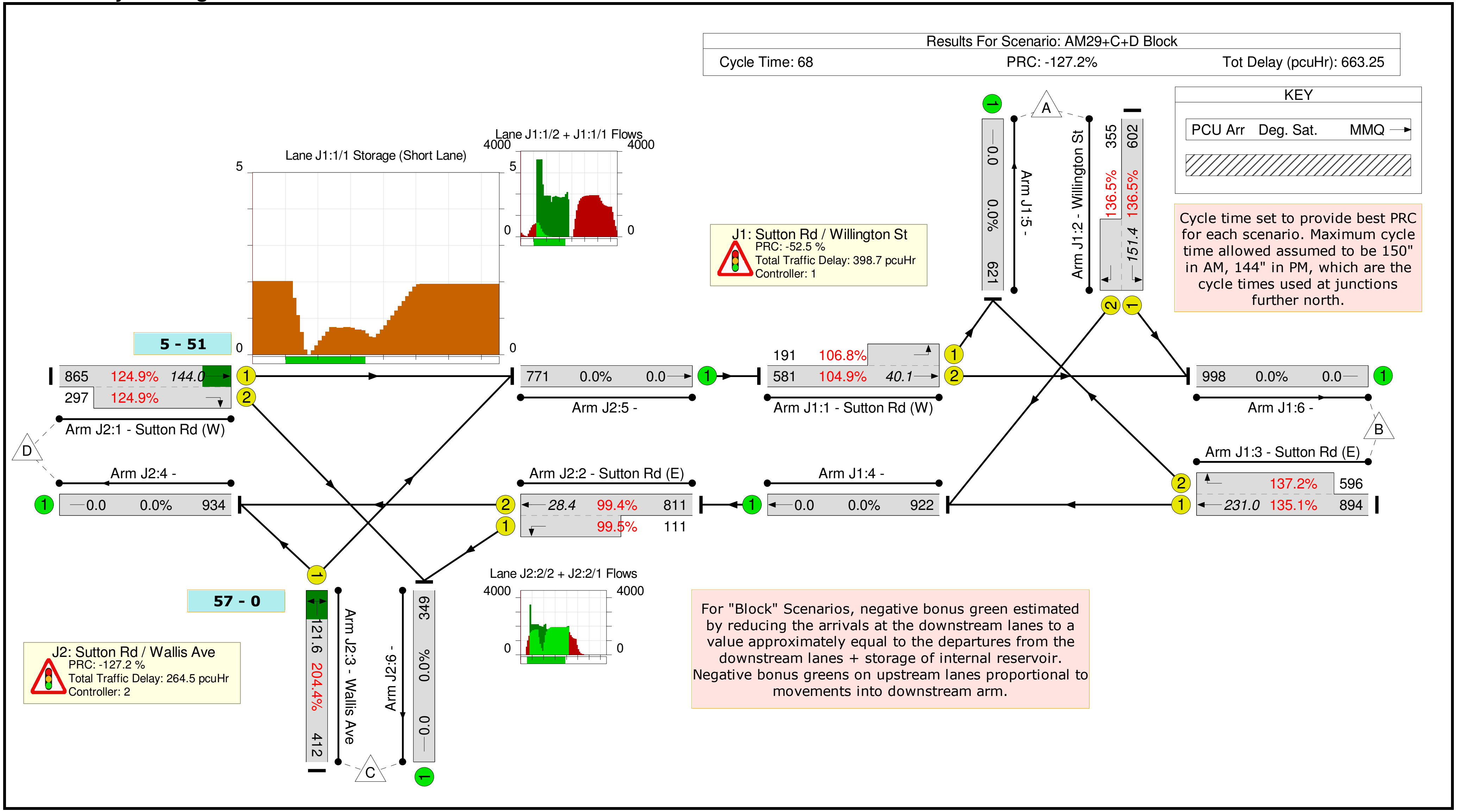
Stage	1	2	3
Duration	30	11	11
Change Point	0	35	51

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**204.4%**
J1: Sutton Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**137.2%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	22	-	1026	1915:1694	554+178	104.9 : 106.8%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	32:9	-	957	1702:1768	441+260	136.5 : 136.5%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	25:17	-	1490	1930:1641	662+434	135.1 : 137.2%
4/1	Ahead	U	N/A	N/A	-		-	-	-	1249	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	846	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1378	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**204.4%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	46:11	-	1162	1930:1698	693+238	124.9 : 124.9%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	30	-	1249	1940:1724	816+111	99.4 : 99.5%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	11	-	412	1713	202	204.4%
4/1		U	N/A	N/A	-		-	-	-	1350	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	1026	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	447	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**69.4**	**593.8**	**0.0**	**663.3**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**43.2**	**355.5**	**0.0**	**398.7**	**-**	**-**	**-**	**-**
1/2+1/1	771	744	-	-	-	8.5	26.9	-	35.3	164.8	13.2	26.9	40.1
2/1+2/2	957	701	-	-	-	14.2	129.9	-	144.1	542.1	21.5	129.9	151.4
3/1+3/2	1490	1096	-	-	-	20.6	198.7	-	219.3	529.8	32.3	198.7	231.0
4/1	922	922	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	621	621	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	998	998	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**26.2**	**238.3**	**0.0**	**264.5**	**-**	**-**	**-**	**-**
1/1+1/2	1162	931	-	-	-	13.1	118.2	-	131.3	406.8	25.8	118.2	144.0
2/2+2/1	922	922	-	-	-	1.6	13.9	-	15.5	60.7	14.5	13.9	28.4
3/1	412	202	-	-	-	11.5	106.2	-	117.7	1028.2	15.4	106.2	121.6
4/1	934	934	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	771	771	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	349	349	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

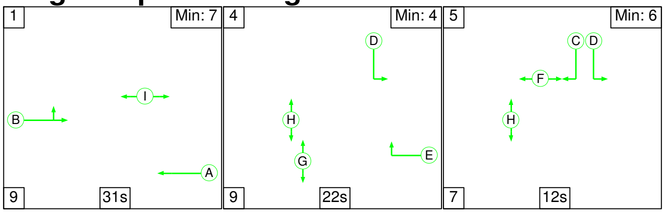
C1 PRC for Signalled Lanes (%): -52.5 Total Delay for Signalled Lanes (pcuHr): 398.73 Cycle Time (s): 68
C2 PRC for Signalled Lanes (%): -127.2 Total Delay for Signalled Lanes (pcuHr): 264.52 Cycle Time (s): 68
PRC Over All Lanes (%): -127.2 Total Delay Over All Lanes(pcuHr): 663.25

Willinton Wallis Base LinSig Data

Scenario 9: 'PM29+C Block' (FG5: 'PM29+C', Plan 1: 'AM Survey')

C1

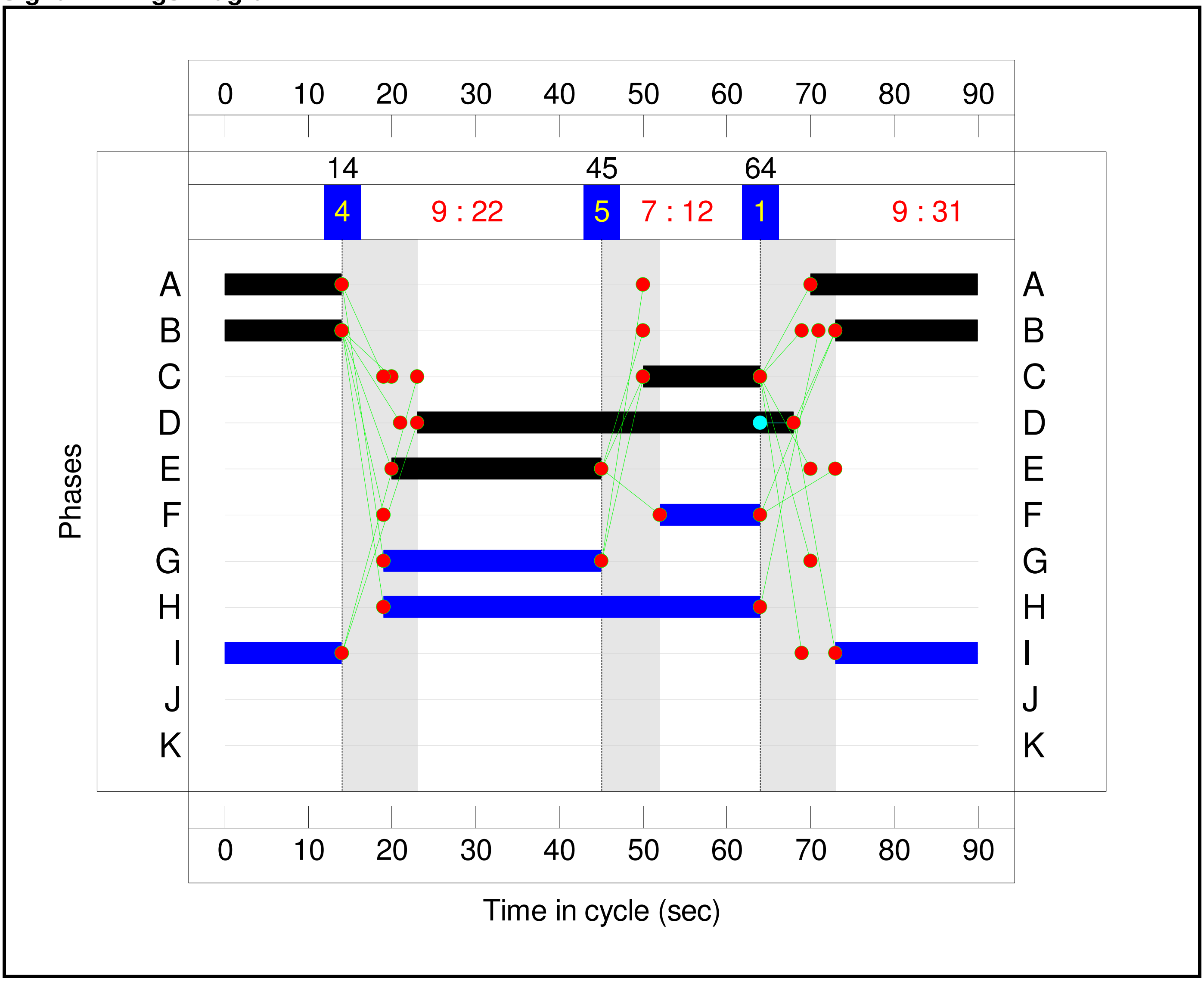
Stage Sequence Diagram



Stage Timings

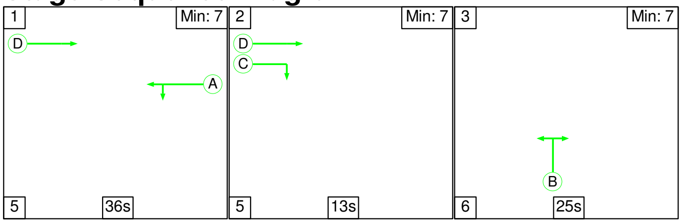
Stage	1	4	5
Duration	31	22	12
Change Point	64	14	45

Signal Timings Diagram



C2

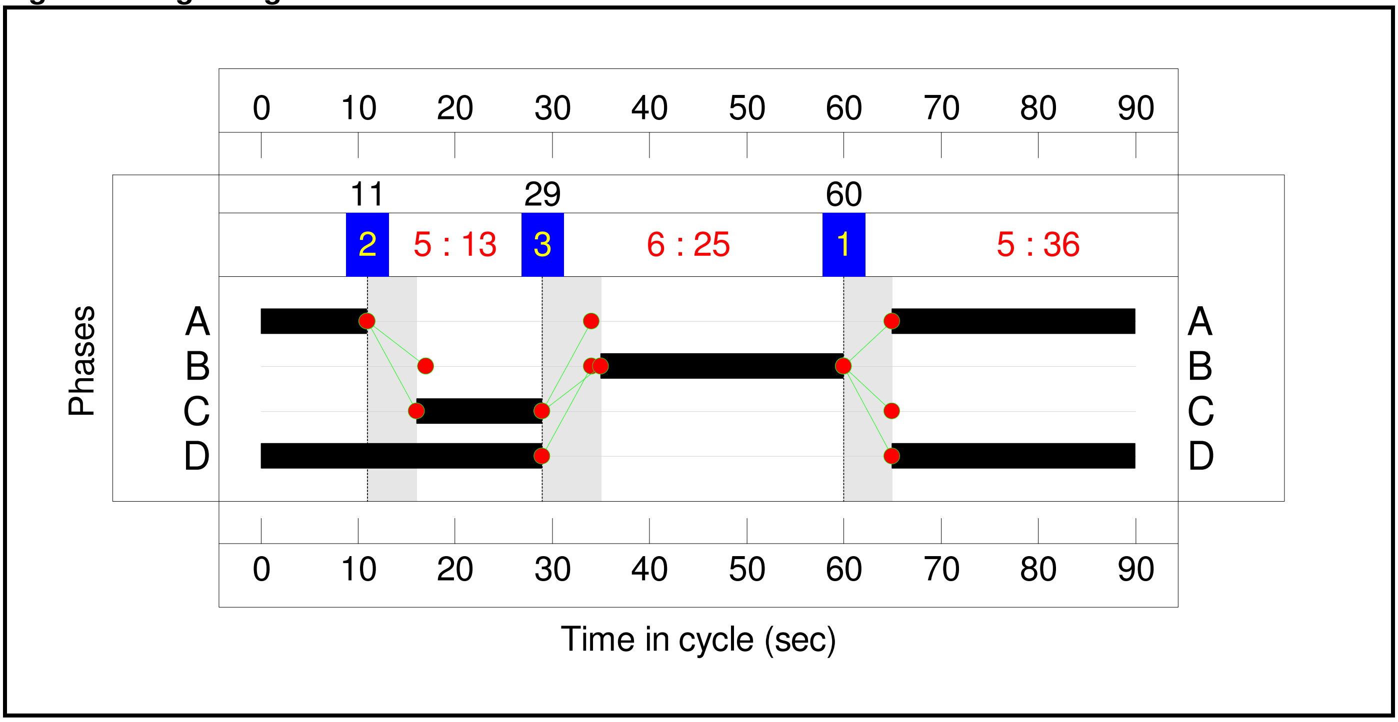
Stage Sequence Diagram



Stage Timings

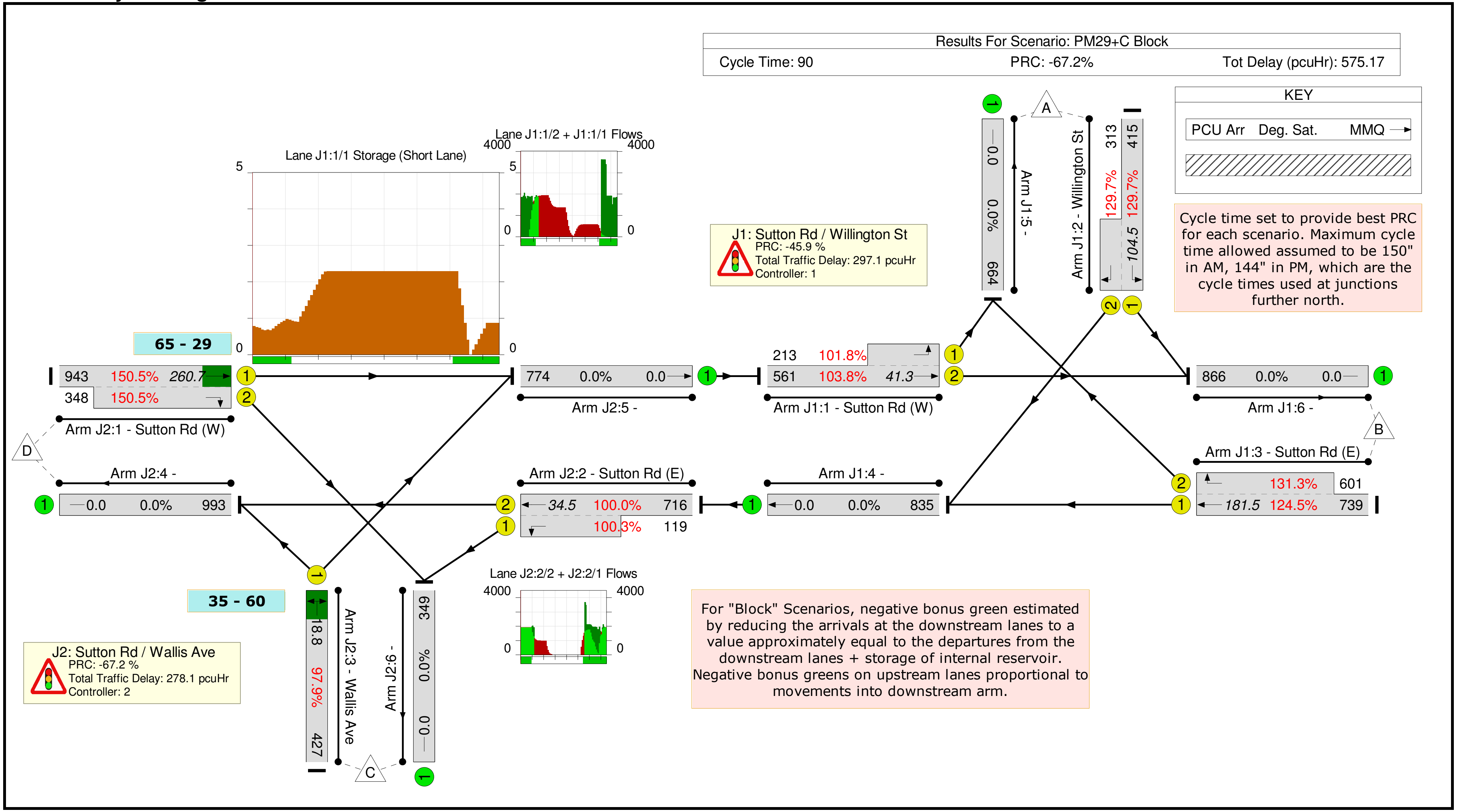
Stage	1	2	3
Duration	36	13	25
Change Point	60	11	29

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

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: Willington Wallis Base	-	-	**N/A**	-	-		-	-	-	-	-	-	**150.5%**
J1: Sutton Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**131.3%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	31	-	1090	1915:1694	541+209	103.8 : 101.8%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	45:14	-	728	1702:1768	320+241	129.7 : 129.7%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	34:25	-	1340	1930:1641	593+458	124.5 : 131.3%
4/1	Ahead	U	N/A	N/A	-		-	-	-	1052	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	905	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1201	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	-	-	**N/A**	-	-		-	-	-	-	-	-	**150.5%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	54:13	-	1291	1930:1698	627+231	150.5 : 150.5%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	36	-	1052	1940:1724	716+118	100.0 : 100.3%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	25	-	427	1707	436	97.9%
4/1		U	N/A	N/A	-		-	-	-	1183	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	1090	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	497	Inf	Inf	0.0%

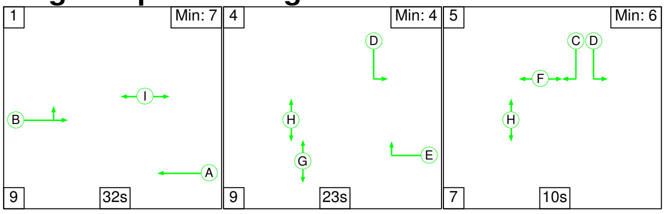
Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**81.0**	**494.2**	**0.0**	**575.2**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**43.8**	**253.3**	**0.0**	**297.1**	**-**	**-**	**-**	**-**
1/2+1/1	774	752	-	-	-	9.6	21.2	-	30.8	143.2	20.1	21.2	41.3
2/1+2/2	728	561	-	-	-	10.5	85.5	-	96.0	474.9	19.0	85.5	104.5
3/1+3/2	1340	1051	-	-	-	23.6	146.6	-	170.2	457.4	34.9	146.6	181.5
4/1	835	835	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	664	664	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	866	866	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**37.2**	**240.9**	**0.0**	**278.1**	**-**	**-**	**-**	**-**
1/1+1/2	1291	858	-	-	-	30.4	218.1	-	248.4	692.8	42.6	218.1	260.7
2/2+2/1	835	831	-	-	-	2.9	14.6	-	17.5	75.3	19.9	14.6	34.5
3/1	427	427	-	-	-	3.9	8.3	-	12.2	103.1	10.6	8.3	18.8
4/1	993	993	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	774	774	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	349	349	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -45.9 Total Delay for Signalled Lanes (pcuHr): 297.06 Cycle Time (s): 90
C2 PRC for Signalled Lanes (%): -67.2 Total Delay for Signalled Lanes (pcuHr): 278.12 Cycle Time (s): 90
PRC Over All Lanes (%): -67.2 Total Delay Over All Lanes(pcuHr): 575.17

Willinton Wallis Base LinSig Data
Scenario 10: 'PM29+C+D Block' (FG6: 'PM29+C+D', Plan 1: 'AM Survey')
C1

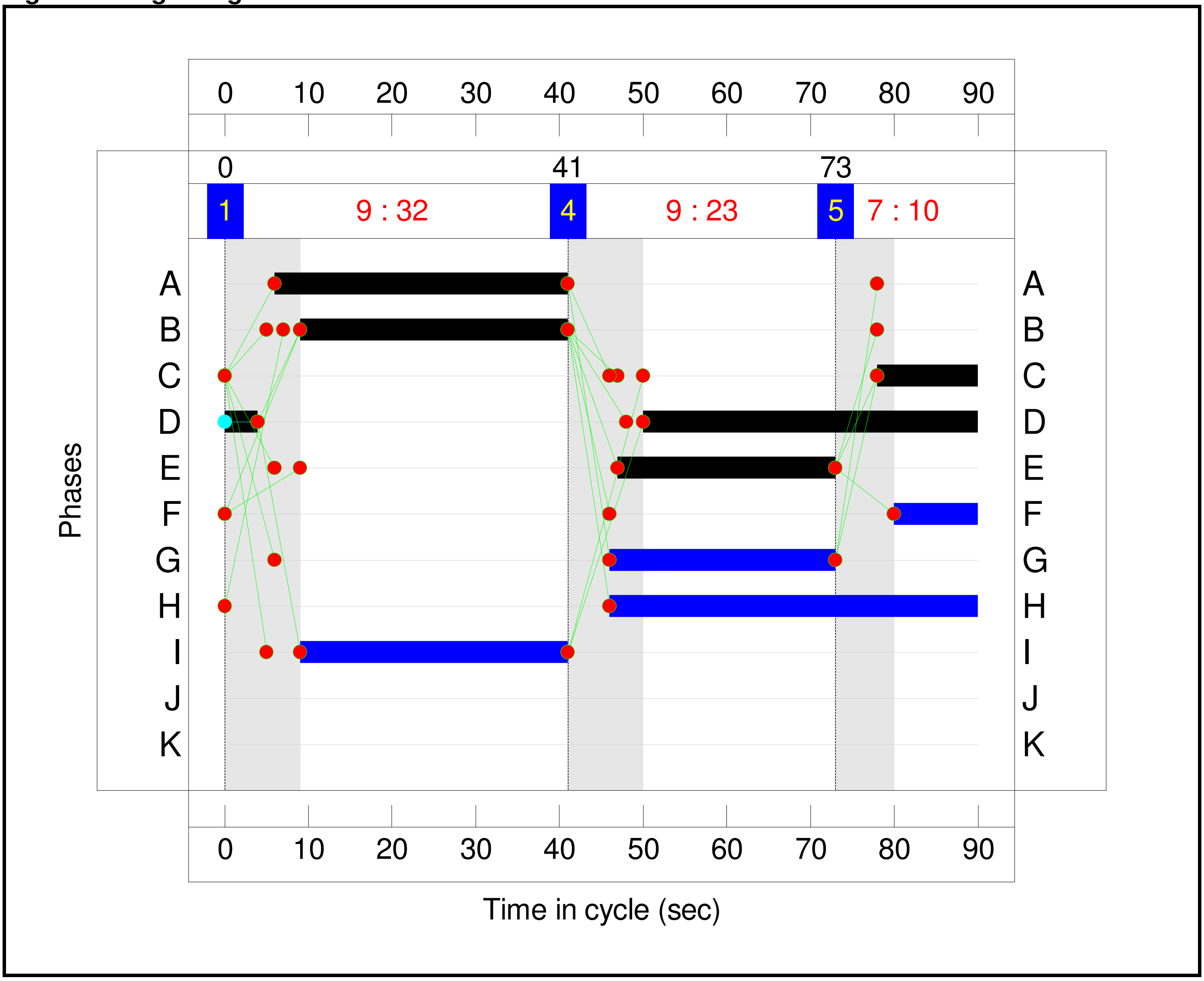
Stage Sequence Diagram



Stage Timings

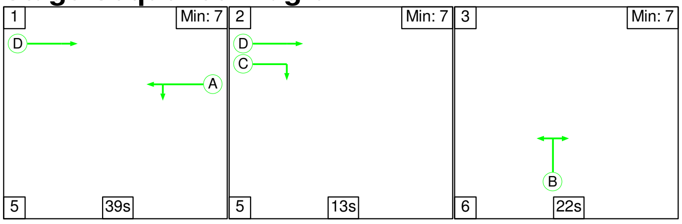
Stage	1	4	5
Duration	32	23	10
Change Point	0	41	73

Signal Timings Diagram



C2

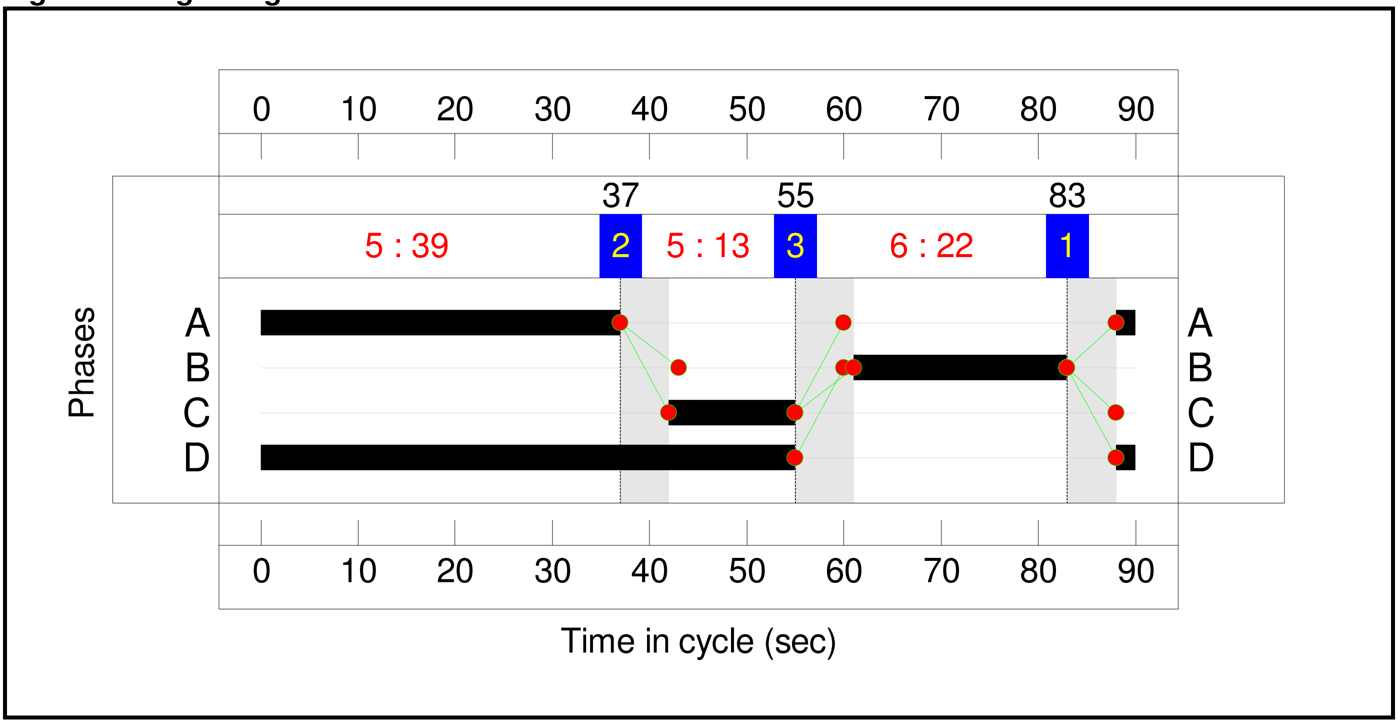
Stage Sequence Diagram



Stage Timings

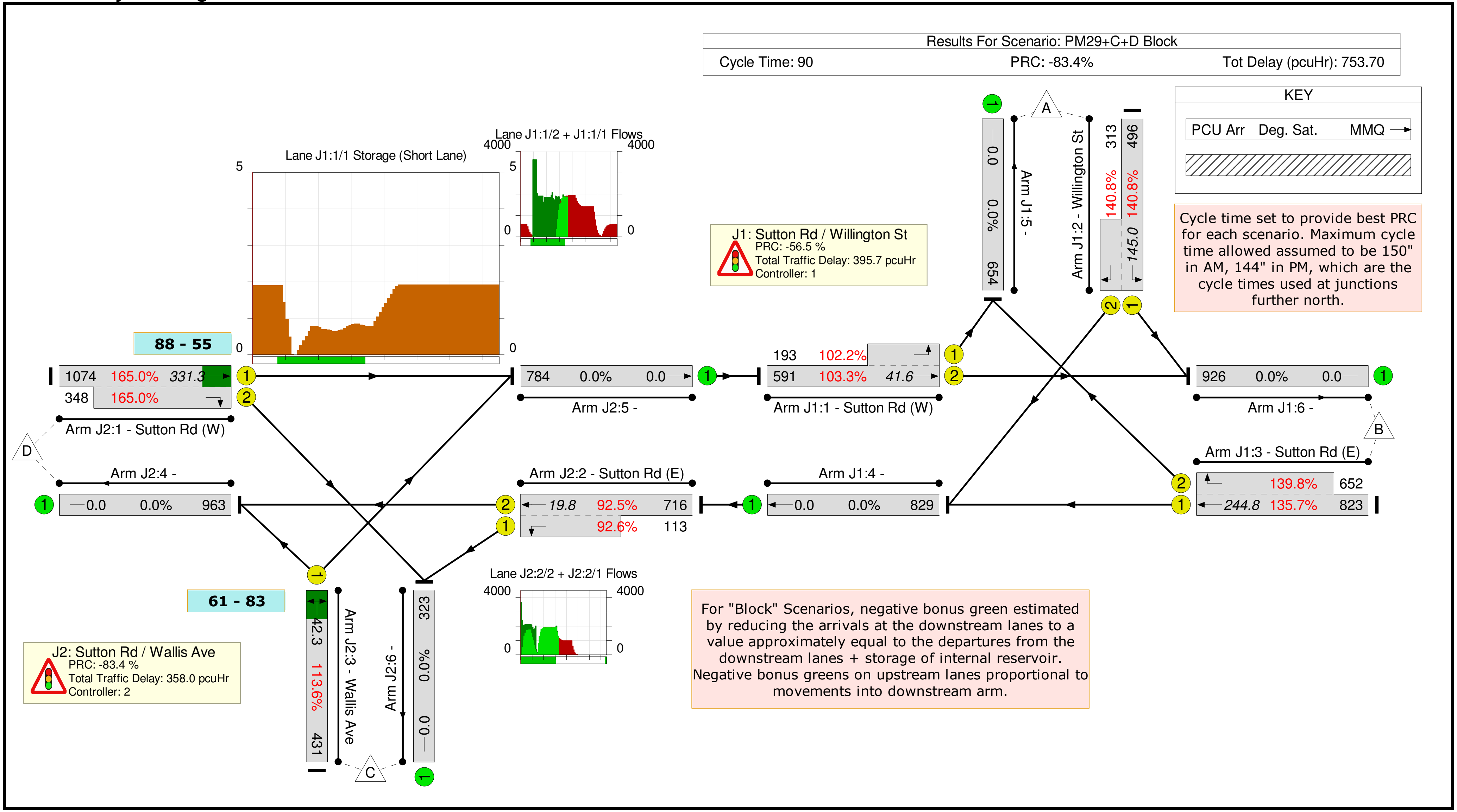
Stage	1	2	3
Duration	39	13	22
Change Point	83	37	55

Signal Timings Diagram



Willinton Wallis Base LinSig Data

Network Layout Diagram



Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**165.0%**
J1: Sutton Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**140.8%**
1/2+1/1	Sutton Rd (W) Left Ahead	U	N/A	N/A	C1:B		1	32	-	1225	1915:1694	572+189	103.3 : 102.2%
2/1+2/2	Willington St Right Left	U	N/A	N/A	C1:D C1:C		1	44:12	-	809	1702:1768	352+222	140.8 : 140.8%
3/1+3/2	Sutton Rd (E) Ahead Right	U	N/A	N/A	C1:A C1:E		1	35:26	-	1475	1930:1641	607+466	135.7 : 139.8%
4/1	Ahead	U	N/A	N/A	-		-	-	-	1136	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	956	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1417	Inf	Inf	0.0%
J2: Sutton Rd / Wallis Ave	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**165.0%**
1/1+1/2	Sutton Rd (W) Ahead Right	U	N/A	N/A	C2:D C2:C		1	57:13	-	1422	1930:1698	651+211	165.0 : 165.0%
2/2+2/1	Sutton Rd (E) Ahead Left	U	N/A	N/A	C2:A		1	39	-	1136	1940:1724	775+121	92.5 : 92.6%
3/1	Wallis Ave Left Right	U	N/A	N/A	C2:B		1	22	-	431	1708	380	113.6%
4/1		U	N/A	N/A	-		-	-	-	1262	Inf	Inf	0.0%
5/1	Ahead	U	N/A	N/A	-		-	-	-	1225	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	502	Inf	Inf	0.0%

Willinton Wallis Base LinSig Data

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: Willington Wallis Base	**-**	**-**	**0**	**0**	**0**	**94.8**	**658.9**	**0.0**	**753.7**	**-**	**-**	**-**	**-**
J1: Sutton Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**52.9**	**342.7**	**0.0**	**395.7**	**-**	**-**	**-**	**-**
1/2+1/1	784	761	-	-	-	9.0	20.9	-	30.0	137.6	20.7	20.9	41.6
2/1+2/2	809	574	-	-	-	17.2	119.0	-	136.1	605.8	26.0	119.0	145.0
3/1+3/2	1475	1073	-	-	-	26.7	202.9	-	229.6	560.3	42.0	202.9	244.8
4/1	829	829	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	654	654	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	926	926	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: Sutton Rd / Wallis Ave	**-**	**-**	**0**	**0**	**0**	**41.9**	**316.2**	**0.0**	**358.0**	**-**	**-**	**-**	**-**
1/1+1/2	1422	862	-	-	-	33.0	281.5	-	314.5	796.1	49.9	281.5	331.3
2/2+2/1	829	829	-	-	-	2.4	5.3	-	7.7	33.4	14.4	5.3	19.8
3/1	431	380	-	-	-	6.5	29.4	-	35.9	299.7	12.9	29.4	42.3
4/1	963	963	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	784	784	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	323	323	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -56.5 Total Delay for Signalled Lanes (pcuHr): 395.67 Cycle Time (s): 90
C2 PRC for Signalled Lanes (%): -83.4 Total Delay for Signalled Lanes (pcuHr): 358.03 Cycle Time (s): 90
PRC Over All Lanes (%): -83.4 Total Delay Over All Lanes(pcuHr): 753.70

E

APPENDIX

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Bicknor Farm.j9
Path: \\FOZZY\Data\Consultancy\Project Files 2016\16007 Sutton Rd 2016\Models
Report generation date: 29/03/2016 11:33:34

»AM29+C+D - 2029+C+D, AM
»PM29+C+D - 2029+C+D, PM

Summary of junction performance

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

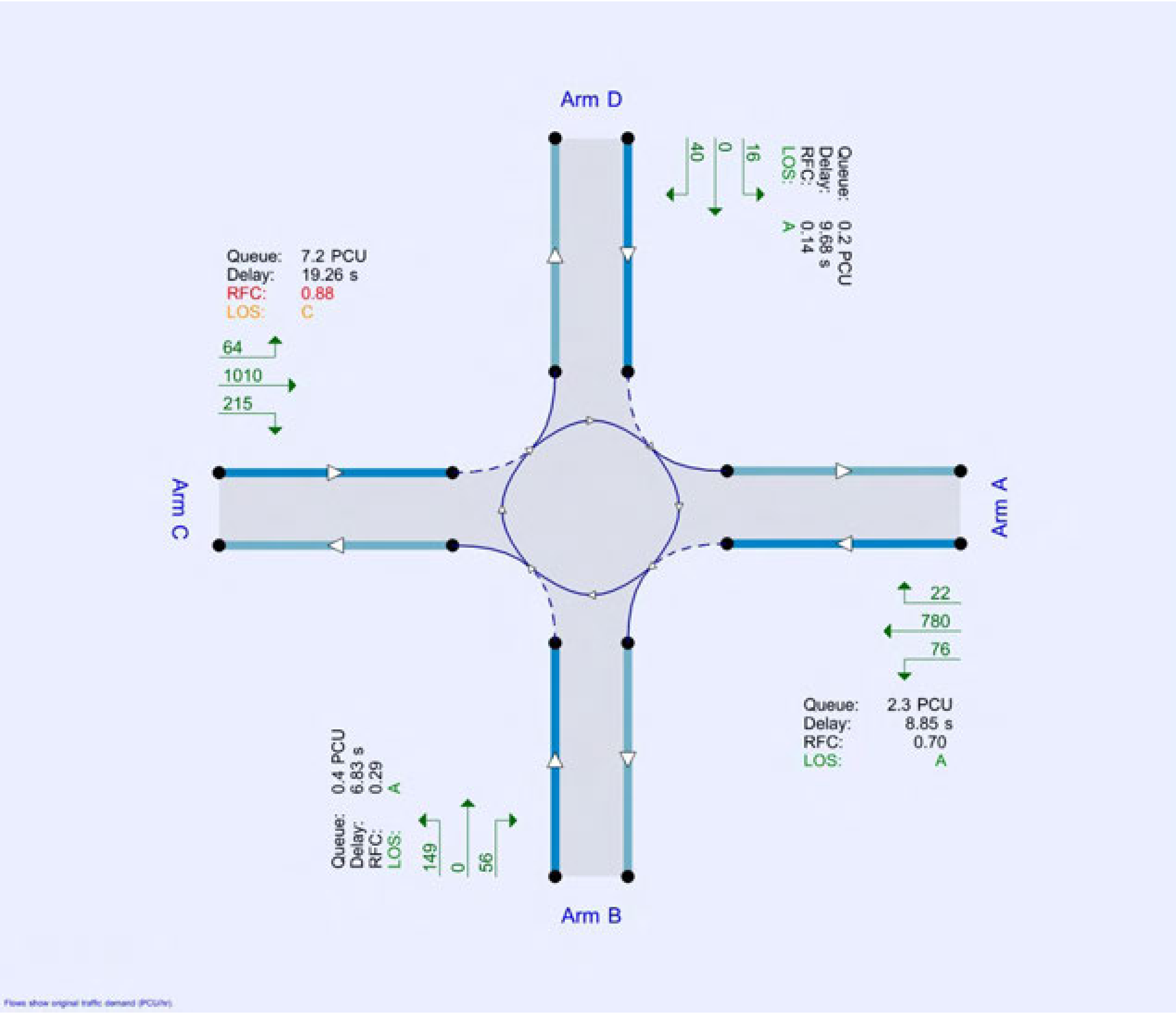
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	25/02/2016
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	jct\simon.swanston
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	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75	✓			0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Locked	Run automatically
D1	2029+C+D	AM	ONE HOUR	07:15	08:45	15	✓	✓
D2	2029+C+D	PM	ONE HOUR	16:45	18:15	15	✓	✓

AM29+C+D - 2029+C+D, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM29+C+D	✓	D1	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	10.11	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	Sutton Rd (E)	
B	Langley Park	
C	Sutton Rd (W)	
D	Bicknor Farm	

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)	Exit only
A	3.90	6.00	5.5	29.0	40.0	15.0	
B	3.75	4.00	19.0	46.0	40.0	10.0	
C	3.85	6.00	12.5	25.0	40.0	19.0	
D	3.00	4.50	13.5	11.0	40.0	31.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.636	1567
B	0.597	1326
C	0.649	1663
D	0.527	1190

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)	Locked	Run automatically
D1	2029+C+D	AM	ONE HOUR	07:15	08:45	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		ONE HOUR	✓	948	100.000
B		ONE HOUR	✓	342	100.000
C		ONE HOUR	✓	1048	100.000
D		ONE HOUR	✓	104	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	43	893	12
	B	77	0	265	0
	C	845	178	0	25
	D	30	0	74	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	7	7	7	7
	B	7	7	7	7
	C	7	7	7	7
	D	7	7	7	7

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.75	11.05	3.1	11.8	B	870	1305
B	0.55	12.51	1.3	4.7	B	314	471
C	0.72	8.61	2.7	6.7	A	962	1442
D	0.21	8.78	0.3	1.2	A	95	143

Main Results for each time segment

07:15 - 07:30

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)	LOS
A	714	178	189	1447	0.493	710	713	0.0	1.0	5.181	A
B	257	64	733	889	0.290	256	166	0.0	0.4	6.050	A
C	789	197	67	1620	0.487	785	922	0.0	1.0	4.580	A
D	78	20	824	756	0.104	78	28	0.0	0.1	5.660	A

07:30 - 07:45

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)	LOS
A	852	213	226	1423	0.599	850	854	1.0	1.6	6.678	A
B	307	77	878	802	0.383	307	198	0.4	0.7	7.732	A
C	942	236	80	1611	0.585	940	1105	1.0	1.5	5.710	A
D	93	23	987	670	0.140	93	33	0.1	0.2	6.657	A

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)	LOS
A	1044	261	276	1391	0.750	1038	1044	1.6	3.1	10.690	B
B	377	94	1072	687	0.548	374	242	0.7	1.3	12.194	B
C	1154	288	97	1600	0.721	1149	1349	1.5	2.7	8.439	A
D	115	29	1206	555	0.206	114	41	0.2	0.3	8.710	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)	LOS
A	1044	261	277	1390	0.751	1043	1048	3.1	3.1	11.047	B
B	377	94	1078	683	0.551	376	243	1.3	1.3	12.506	B
C	1154	288	98	1599	0.722	1154	1356	2.7	2.7	8.612	A
D	115	29	1211	552	0.207	114	41	0.3	0.3	8.778	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)	LOS
A	852	213	228	1422	0.599	858	860	3.1	1.6	6.883	A
B	307	77	886	798	0.386	310	200	1.3	0.7	7.916	A
C	942	236	81	1610	0.585	947	1115	2.7	1.5	5.831	A
D	93	23	994	666	0.140	94	33	0.3	0.2	6.716	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)	LOS
A	714	178	190	1446	0.494	716	719	1.6	1.1	5.280	A
B	257	64	739	885	0.291	258	167	0.7	0.4	6.140	A
C	789	197	67	1619	0.487	791	931	1.5	1.0	4.649	A
D	78	20	830	753	0.104	79	28	0.2	0.1	5.699	A

Queue Variation Results for each time segment

07:15 - 07:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.03	0.59	1.07	1.49	1.55			N/A	N/A
B	0.43	0.00	0.00	0.43	0.43			N/A	N/A
C	1.00	0.59	1.07	1.49	1.55			N/A	N/A
D	0.12	0.00	0.00	0.12	0.12			N/A	N/A

07:30 - 07:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.56	0.06	0.81	3.72	5.40			N/A	N/A
B	0.65	0.09	0.85	1.45	1.53			N/A	N/A
C	1.48	0.06	0.80	3.44	5.03			N/A	N/A
D	0.17	0.00	0.00	0.17	0.17			N/A	N/A

07:45 - 08:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	3.06	0.03	0.31	3.06	11.84			N/A	N/A
B	1.26	0.03	0.29	1.26	1.54			N/A	N/A
C	2.67	0.03	0.30	2.67	6.72			N/A	N/A
D	0.27	0.03	0.27	0.49	0.52			N/A	N/A

08:00 - 08:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	3.14	0.03	0.29	3.14	4.77			N/A	N/A
B	1.29	0.03	0.30	1.29	4.67			N/A	N/A
C	2.72	0.03	0.29	2.72	2.72			N/A	N/A
D	0.28	0.03	0.31	0.83	1.23			N/A	N/A

08:15 - 08:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.62	0.07	0.90	3.81	5.46			N/A	N/A
B	0.68	0.07	0.75	1.45	1.54			N/A	N/A
C	1.53	0.08	1.08	3.15	4.35			N/A	N/A
D	0.18	0.00	0.00	0.18	0.18			N/A	N/A

08:30 - 08:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.05	0.04	0.44	2.57	4.15			N/A	N/A
B	0.44	0.04	0.38	1.26	1.44			N/A	N/A
C	1.02	0.05	0.50	2.27	3.46			N/A	N/A
D	0.12	0.00	0.00	0.12	0.12			N/A	N/A

PM29+C+D - 2029+C+D, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	PM29+C+D	✓	D2	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	14.22	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	Sutton Rd (E)	
B	Langley Park	
C	Sutton Rd (W)	
D	Bicknor Farm	

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)	Exit only
A	3.90	6.00	5.5	29.0	40.0	15.0	
B	3.75	4.00	19.0	46.0	40.0	10.0	
C	3.85	6.00	12.5	25.0	40.0	19.0	
D	3.00	4.50	13.5	11.0	40.0	31.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.636	1567
B	0.597	1326
C	0.649	1663
D	0.527	1190

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)	Locked	Run automatically
D2	2029+C+D	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		ONE HOUR	✓	878	100.000
B		ONE HOUR	✓	205	100.000
C		ONE HOUR	✓	1289	100.000
D		ONE HOUR	✓	56	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	76	780	22
	B	56	0	149	0
	C	1010	215	0	64
	D	16	0	40	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	4	4	4	4
	B	4	4	4	4
	C	4	4	4	4
	D	4	4	4	4

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.70	8.85	2.3	5.1	A	806	1209
B	0.29	6.83	0.4	1.6	A	188	282
C	0.88	19.26	7.2	36.8	C	1183	1774
D	0.14	9.68	0.2	0.5	A	51	77

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)	LOS
A	661	165	191	1446	0.457	658	810	0.0	0.9	4.726	A
B	154	39	631	950	0.162	154	218	0.0	0.2	4.691	A
C	970	243	58	1625	0.597	964	726	0.0	1.5	5.614	A
D	42	11	958	685	0.062	42	64	0.0	0.1	5.812	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)	LOS
A	789	197	228	1422	0.555	788	969	0.9	1.3	5.885	A
B	184	46	755	876	0.210	184	261	0.2	0.3	5.405	A
C	1159	290	70	1617	0.716	1155	869	1.5	2.5	8.010	A
D	50	13	1148	585	0.086	50	77	0.1	0.1	6.986	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)	LOS
A	967	242	278	1390	0.695	963	1178	1.3	2.3	8.663	A
B	226	56	923	775	0.291	225	317	0.3	0.4	6.789	A
C	1419	355	86	1607	0.883	1402	1063	2.5	6.8	16.998	C
D	62	15	1394	455	0.135	61	94	0.1	0.2	9.486	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)	LOS
A	967	242	280	1389	0.696	967	1190	2.3	2.3	8.854	A
B	226	56	927	773	0.292	226	320	0.4	0.4	6.830	A
C	1419	355	86	1607	0.883	1417	1067	6.8	7.2	19.255	C
D	62	15	1409	448	0.138	62	95	0.2	0.2	9.683	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)	LOS
A	789	197	232	1419	0.556	793	987	2.3	1.3	6.016	A
B	184	46	761	872	0.211	185	265	0.4	0.3	5.447	A
C	1159	290	70	1617	0.717	1177	875	7.2	2.7	8.823	A
D	50	13	1169	574	0.088	51	78	0.2	0.1	7.148	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)	LOS
A	661	165	193	1444	0.458	663	818	1.3	0.9	4.798	A
B	154	39	636	947	0.163	155	220	0.3	0.2	4.721	A
C	970	243	59	1625	0.597	975	731	2.7	1.6	5.799	A
D	42	11	969	680	0.062	42	65	0.1	0.1	5.871	A

Queue Variation Results for each time segment

16:45 - 17:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	0.87	0.57	1.04	1.45	1.51			N/A	N/A
B	0.20	0.00	0.00	0.20	0.20			N/A	N/A
C	1.52	0.61	1.42	1.86	1.99			N/A	N/A
D	0.07	0.00	0.00	0.07	0.07			N/A	N/A

17:00 - 17:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.28	0.07	0.86	2.74	3.84			N/A	N/A
B	0.27	0.00	0.00	0.27	0.27			N/A	N/A
C	2.55	0.05	0.54	6.98	11.22			N/A	N/A
D	0.10	0.00	0.00	0.10	0.10			N/A	N/A

17:15 - 17:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	2.30	0.03	0.29	2.30	5.07			N/A	N/A
B	0.42	0.03	0.26	0.48	0.50			N/A	N/A
C	6.76	0.04	0.41	17.25	36.81			N/A	N/A
D	0.16	0.03	0.27	0.49	0.51			N/A	N/A

17:30 - 17:45

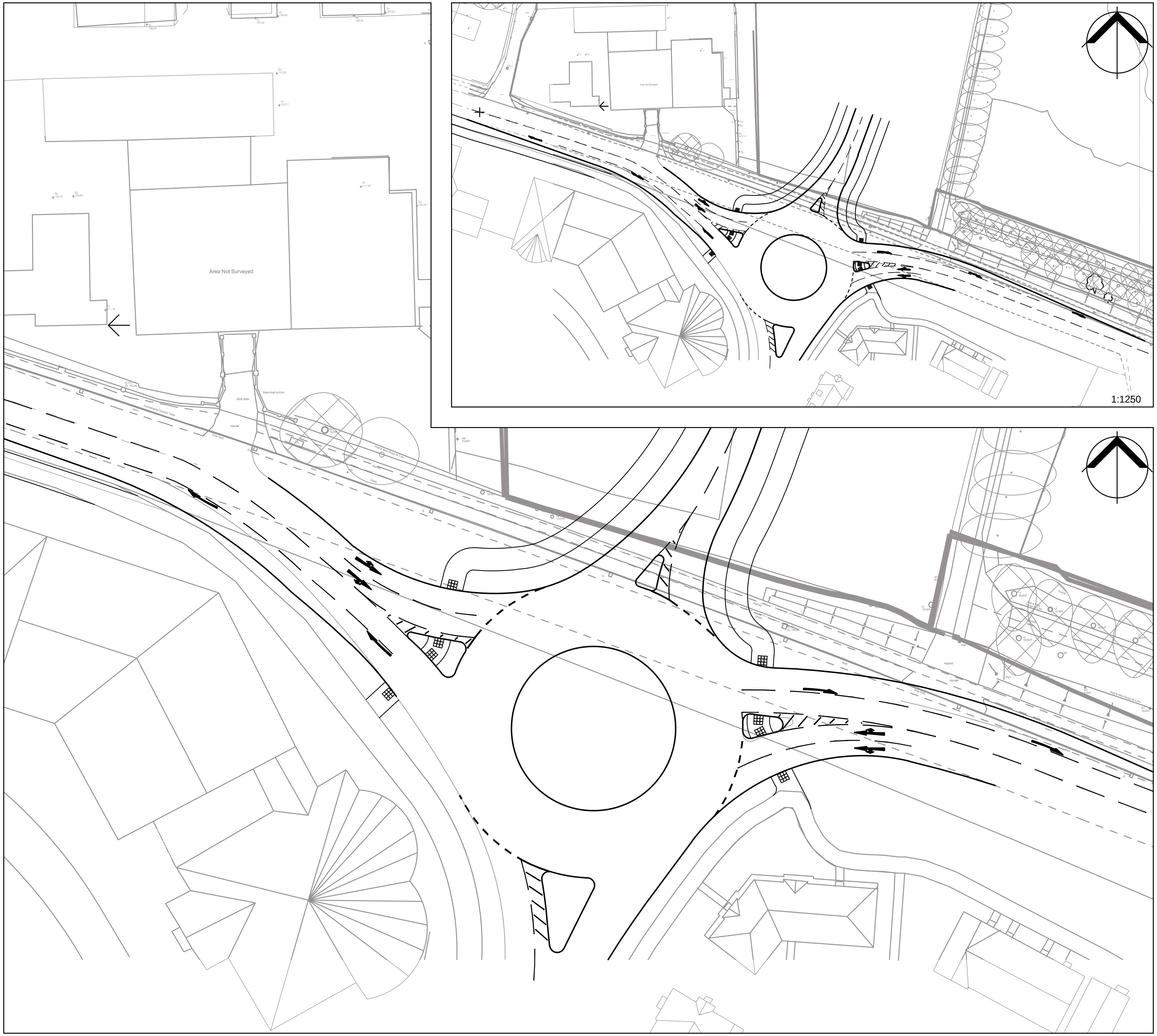
Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	2.34	0.03	0.28	2.34	2.34			N/A	N/A
B	0.43	0.03	0.33	1.37	1.59			N/A	N/A
C	7.22	0.03	0.33	9.27	35.03			N/A	N/A
D	0.16	0.03	0.26	0.47	0.49			N/A	N/A

17:45 - 18:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.32	0.08	1.04	2.58	3.44			N/A	N/A
B	0.28	0.00	0.00	0.28	0.28			N/A	N/A
C	2.71	0.05	0.47	7.50	12.86			N/A	N/A
D	0.10	0.00	0.00	0.10	0.10			N/A	N/A

18:00 - 18:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	0.89	0.05	0.49	1.86	2.74			N/A	N/A
B	0.20	0.00	0.00	0.20	0.20			N/A	N/A
C	1.56	0.03	0.35	3.47	8.08			N/A	N/A
D	0.07	0.00	0.00	0.07	0.07			N/A	N/A



Notes;

1.Based upon the Ordnance Survey's (1:1250) Map with permission of the controller of Her Majesty's Stationery Office, Crown copyright reserved.

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Client

Jones Homes (Southern) Ltd

Project

Bicknor Farm, Maidstone

Title

Propsed Site Access Roundabout

Drawn By	Checked By	Approved By
MG	PC 28/01/2016	PC 28/01/2016

Scale @ A3	Date
1:500	28/01/2016

Project No.	Drawing No.	Rev.
15-T047	06	-

F

APPENDIX

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Western Access.j9
Path: \\FOZZY\Data\Consultancy\Project Files 2016\16007 Sutton Rd 2016\Models
Report generation date: 29/02/2016 12:03:02

»AM29+C+D - 2029+C+D, AM
»PM29+C+D - 2029+C+D, PM

Summary of junction performance

	AM					
	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)
	AM29+C+D - 2029+C+D					
Arm A	5.1	26.5	17.39	0.84	C	13.76
Arm B	2.9	11.2	12.52	0.73	B	
Arm C	0.7	3.1	6.21	0.39	A	

	PM					
	Queue (PCU)	95% Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)
	PM29+C+D [Locked] - 2029+C+D					
Arm A	4.9	24.9	15.39	0.83	C	13.30
Arm B	3.0	12.3	12.59	0.75	B	
Arm C	0.3	1.0	4.47	0.20	A	

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

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

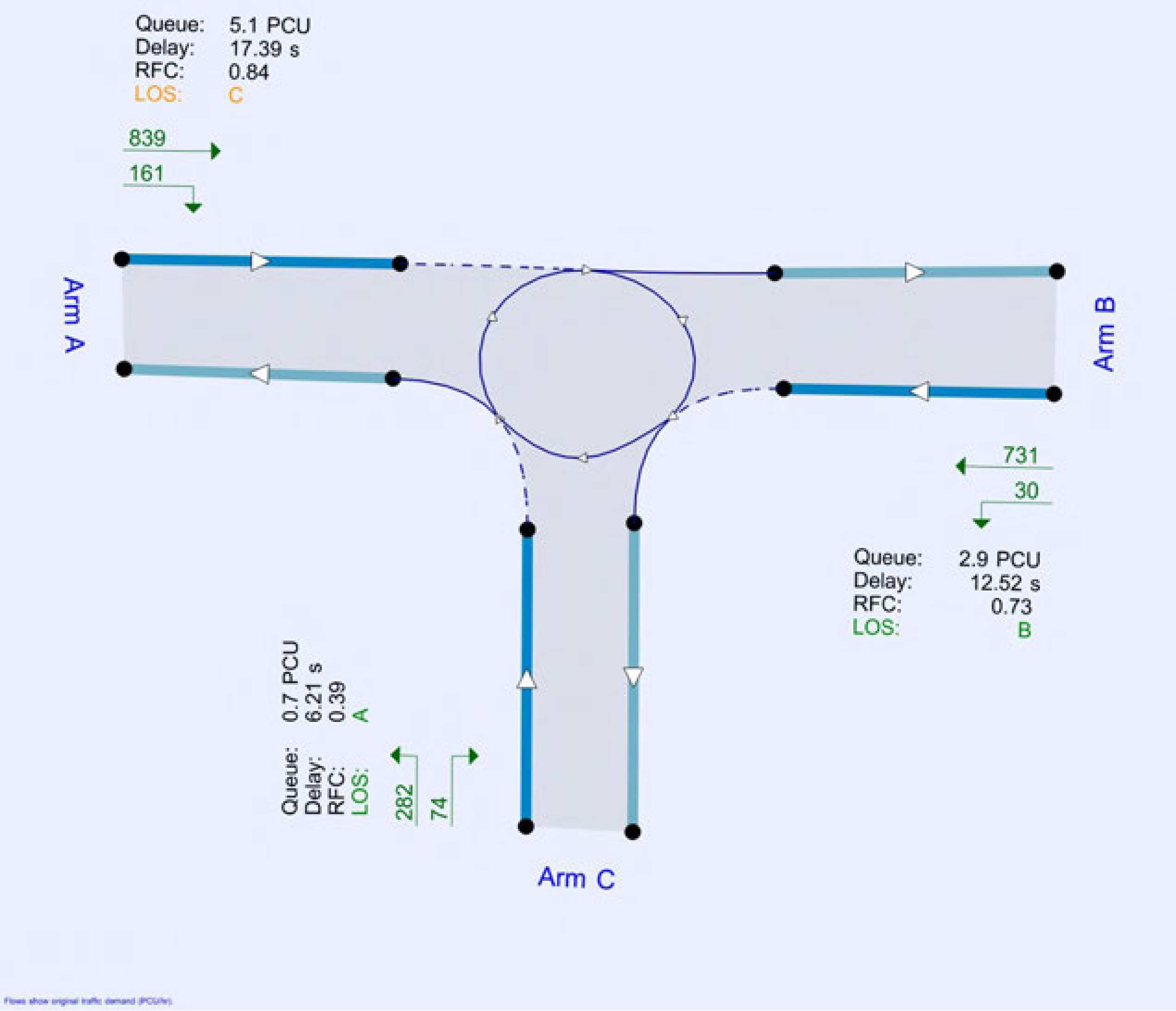
File summary

File Description

Title	(untitled)
Location	Maidstone
Site number	
Date	25/02/2016
Version	
Status	(new file)
Identifier	
Client	DHA Planning
Jobnumber	16007
Enumerator	jct\simon.swanston
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	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75	✓			0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2029+C+D	AM	ONE HOUR	07:15	08:45	15	✓
D2	2029+C+D	PM	ONE HOUR	16:45	18:15	15	✓

AM29+C+D - 2029+C+D, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM29+C+D	✓	✓	D1	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C	13.76	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	Sutton Rd (W)	
B	Sutton Rd (E)	
C	Site Access	

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)	Exit only
A	3.50	7.50	9.0	29.0	45.0	35.0	
B	3.75	7.50	21.0	24.0	45.0	34.0	
C	3.40	7.50	15.5	19.0	45.0	30.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.599	1557
B	0.655	1849
C	0.627	1699

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage	Unequal Lane Usage	87.40
B	Percentage	Unequal Lane Usage	66.00
C	Percentage	Unequal Lane Usage	84.60

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
D1	2029+C+D	AM	ONE HOUR	07:15	08:45	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		ONE HOUR	✓	1000	100.000
B		ONE HOUR	✓	761	100.000
C		ONE HOUR	✓	356	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	839	161
	B	731	0	30
	C	282	74	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	7	7	7
	B	7	7	7
	C	7	7	7

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.84	17.39	5.1	26.5	C	918	1376
B	0.73	12.52	2.9	11.2	B	698	1047
C	0.39	6.21	0.7	3.1	A	327	490

Main Results for each time segment

07:15 - 07:30

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)	LOS
A	753	188	55	1332	0.565	747	758	0.0	1.4	6.510	A
B	573	143	120	1168	0.490	569	683	0.0	1.0	6.370	A
C	268	67	546	1147	0.234	267	143	0.0	0.3	4.356	A

07:30 - 07:45

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)	LOS
A	899	225	66	1326	0.678	896	908	1.4	2.2	8.848	A
B	684	171	144	1158	0.591	682	818	1.0	1.5	8.041	A
C	320	80	655	1090	0.294	320	171	0.3	0.4	4.985	A

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)	LOS
A	1101	275	81	1319	0.835	1090	1110	2.2	4.9	16.086	C
B	838	209	176	1144	0.732	833	996	1.5	2.8	12.133	B
C	392	98	800	1013	0.387	391	208	0.4	0.7	6.169	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)	LOS
A	1101	275	81	1319	0.835	1100	1115	4.9	5.1	17.390	C
B	838	209	177	1144	0.733	838	1004	2.8	2.9	12.524	B
C	392	98	805	1010	0.388	392	210	0.7	0.7	6.210	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)	LOS
A	899	225	67	1326	0.678	910	916	5.1	2.3	9.468	A
B	684	171	147	1157	0.591	689	830	2.9	1.6	8.304	A
C	320	80	662	1086	0.295	321	174	0.7	0.4	5.026	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	753	188	56	1332	0.565	756	765	2.3	1.4	6.717	A
B	573	143	122	1167	0.491	575	690	1.6	1.0	6.509	A
C	268	67	552	1144	0.234	268	144	0.4	0.3	4.388	A

Queue Variation Results for each time segment

07:15 - 07:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.36	0.59	1.07	1.49	1.55			N/A	N/A
B	1.01	0.59	1.07	1.49	1.55			N/A	N/A
C	0.32	0.00	0.00	0.32	0.32			N/A	N/A

07:30 - 07:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	2.18	0.06	0.84	5.64	8.52			N/A	N/A
B	1.51	0.07	0.99	3.24	4.62			N/A	N/A
C	0.44	0.00	0.00	0.44	0.44			N/A	N/A

07:45 - 08:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	4.88	0.04	0.37	10.19	26.47			N/A	N/A
B	2.78	0.03	0.31	2.78	11.24			N/A	N/A
C	0.67	0.03	0.27	0.67	0.67			N/A	N/A

08:00 - 08:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	5.11	0.03	0.32	5.11	20.11			N/A	N/A
B	2.85	0.03	0.29	2.85	5.18			N/A	N/A
C	0.67	0.03	0.31	1.35	3.06			N/A	N/A

08:15 - 08:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	2.31	0.05	0.50	6.28	10.31			N/A	N/A
B	1.58	0.06	0.87	3.69	5.29			N/A	N/A
C	0.45	0.00	0.00	0.45	0.45			N/A	N/A

08:30 - 08:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.41	0.04	0.38	3.47	7.03			N/A	N/A
B	1.04	0.04	0.44	2.53	4.05			N/A	N/A
C	0.33	0.00	0.00	0.33	0.33			N/A	N/A

PM29+C+D - 2029+C+D, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set (s)	Specific Demand Set (s)	Locked	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	PM29+C+D	✓	✓	D2	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C	13.30	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	Sutton Rd (W)	
B	Sutton Rd (E)	
C	Site Access	

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)	Exit only
A	3.50	7.50	9.0	29.0	45.0	35.0	
B	3.75	7.50	21.0	24.0	45.0	34.0	
C	3.40	7.50	15.5	19.0	45.0	30.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.599	1557
B	0.655	1849
C	0.627	1699

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage	Unequal Lane Usage	93.30
B	Percentage	Unequal Lane Usage	69.60
C	Percentage	Unequal Lane Usage	87.20

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
D2	2029+C+D	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		ONE HOUR	✓	1077	100.000
B		ONE HOUR	✓	795	100.000
C		ONE HOUR	✓	190	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	847	230
	B	724	0	71
	C	146	44	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	4	4	4
	B	4	4	4
	C	4	4	4

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max 95th percentile Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.83	15.39	4.9	24.9	C	988	1482
B	0.75	12.59	3.0	12.3	B	730	1094
C	0.20	4.47	0.3	1.0	A	174	262

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)	LOS
A	811	203	33	1435	0.565	806	651	0.0	1.3	5.896	A
B	599	150	172	1208	0.495	594	666	0.0	1.0	6.057	A
C	143	36	541	1185	0.121	142	225	0.0	0.1	3.585	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)	LOS
A	968	242	40	1431	0.677	965	780	1.3	2.1	7.972	A
B	715	179	206	1193	0.599	713	798	1.0	1.5	7.757	A
C	171	43	649	1126	0.152	171	270	0.1	0.2	3.913	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)	LOS
A	1186	296	48	1426	0.832	1175	953	2.1	4.7	14.358	B
B	875	219	251	1172	0.747	870	973	1.5	2.9	12.142	B
C	209	52	792	1048	0.200	209	329	0.2	0.3	4.455	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)	LOS
A	1186	296	48	1426	0.832	1185	958	4.7	4.9	15.385	C
B	875	219	253	1171	0.747	875	980	2.9	3.0	12.590	B
C	209	52	797	1046	0.200	209	331	0.3	0.3	4.471	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)	LOS
A	968	242	40	1431	0.677	979	787	4.9	2.2	8.457	A
B	715	179	209	1191	0.600	720	809	3.0	1.6	8.033	A
C	171	43	656	1123	0.152	171	273	0.3	0.2	3.931	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)	LOS
A	811	203	33	1435	0.565	814	657	2.2	1.4	6.064	A
B	599	150	174	1207	0.496	601	674	1.6	1.0	6.187	A
C	143	36	547	1182	0.121	143	228	0.2	0.1	3.599	A

Queue Variation Results for each time segment

16:45 - 17:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.33	0.57	1.04	1.45	1.51			N/A	N/A
B	1.01	0.57	1.04	1.45	1.51			N/A	N/A
C	0.14	0.00	0.00	0.14	0.14			N/A	N/A

17:00 - 17:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	2.12	0.06	0.71	5.55	8.54			N/A	N/A
B	1.52	0.07	0.91	3.46	4.94			N/A	N/A
C	0.18	0.00	0.00	0.18	0.18			N/A	N/A

17:15 - 17:30

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	4.70	0.03	0.35	8.71	24.95			N/A	N/A
B	2.91	0.03	0.31	2.91	12.28			N/A	N/A
C	0.26	0.03	0.26	0.48	0.50			N/A	N/A

17:30 - 17:45

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	4.89	0.03	0.30	4.89	16.95			N/A	N/A
B	2.99	0.03	0.29	2.99	5.79			N/A	N/A
C	0.26	0.03	0.29	0.52	1.01			N/A	N/A

17:45 - 18:00

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	2.23	0.05	0.50	6.04	9.77			N/A	N/A
B	1.59	0.06	0.82	3.81	5.57			N/A	N/A
C	0.19	0.00	0.00	0.19	0.19			N/A	N/A

18:00 - 18:15

Arm	Mean (PCU)	Q05 (PCU)	Q50 (PCU)	Q90 (PCU)	Q95 (PCU)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
A	1.37	0.04	0.37	3.41	6.74			N/A	N/A
B	1.03	0.04	0.42	2.55	4.14			N/A	N/A
C	0.14	0.00	0.00	0.14	0.14			N/A	N/A

G

APPENDIX

<table>
<tr><th colspan="3">PICADY</th></tr>
<tr><td colspan="3">GUI Version: 5.1 AE
Analysis Program Release: 5.0 (MAY 2010)

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Run Analysis

Parameter	Values
File Run	T:\..\Eastern Bus Access\Eastern Bus Access PICADY.vpi
Date Run	17 March 2016
Time Run	08:37:15
Driving Side	Drive On The Left

Arm Names and Flow Scaling Factors

Arm	Arm Name	Flow Scaling Factor (%)
Arm A	Sutton Rd S	100
Arm B	Site Bus Access	100
Arm C	Sutton Rd N	100

Stream Labelling Convention

Stream A-B contains traffic going from A to B etc.

Run Information

Parameter	Values
Run Title	Sutton Road Eastern Bus Access PICADY
Location	-
Date	17 March 2016
Enumerator	chrisc [DHA-CAD-HP]
Job Number	10296
Status	-
Client	Countryside Properties
Description	-

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

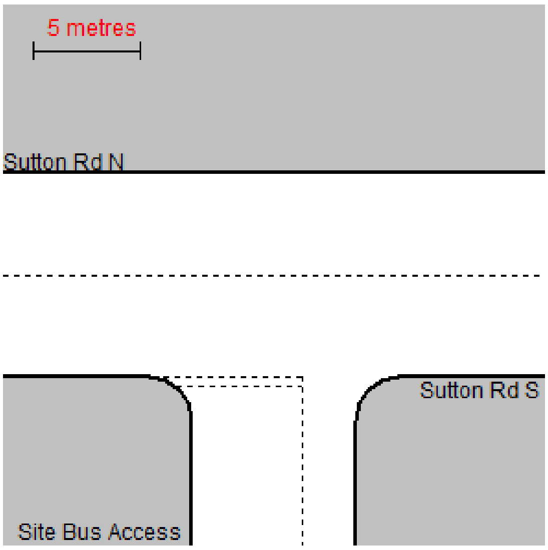
Parameter	Minor Arm B
Major Road Carriageway Width (m)	7.14
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road First Lane Width (m)	5.00
Minor Road Visibility To Right (m)	28
Minor Road Visibility To Left (m)	40
Major Road Right Turn Visibility (m)	182
Major Road Right Turn Blocks Traffic	Yes (if over 0 veh)

Slope and Intercept Values

Stream	Intercept for Stream	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	605.291	0.105	0.265	0.167	0.378
B-C	770.027	0.112	0.284	-	-
C-B	679.361	0.250	0.250	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Junction Diagram



Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	07:15-08:45	90	15
Second Modelling Period	16:45-18:15	90	15

ODTAB Turning Counts

Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45

From/To	Arm A	Arm B	Arm C
Arm A	0.0	1.0	760.0
Arm B	1.0	0.0	0.0
Arm C	913.0	0.0	0.0

Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15

From/To	Arm A	Arm B	Arm C
Arm A	0.0	1.0	796.0
Arm B	1.0	0.0	0.0
Arm C	891.0	0.0	0.0

ODTAB Synthesised Flows

Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45

Arm	Rising Time	Rising Flow (veh/min)	Peak Time	Peak Flow (veh/min)	Falling Time	Falling Flow (veh/min)
Arm A	07:30	9.512	08:00	14.269	08:30	9.512
Arm B	07:30	0.013	08:00	0.019	08:30	0.013
Arm C	07:30	11.413	08:00	17.119	08:30	11.413

Heavy Vehicles Percentages

Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45

From/To	Arm A	Arm B	Arm C
Arm A	-	10.0	10.0
Arm B	10.0	-	10.0
Arm C	10.0	10.0	-

Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15

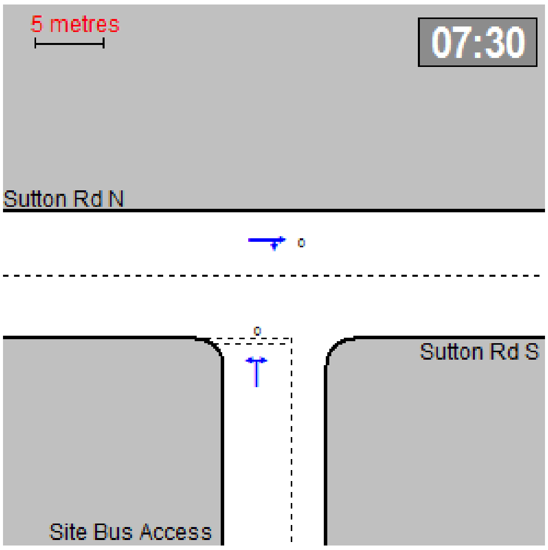
From/To	Arm A	Arm B	Arm C
Arm A	-	10.0	10.0
Arm B	10.0	-	10.0
Arm C	10.0	10.0	-

Default proportions of heavy vehicles are used

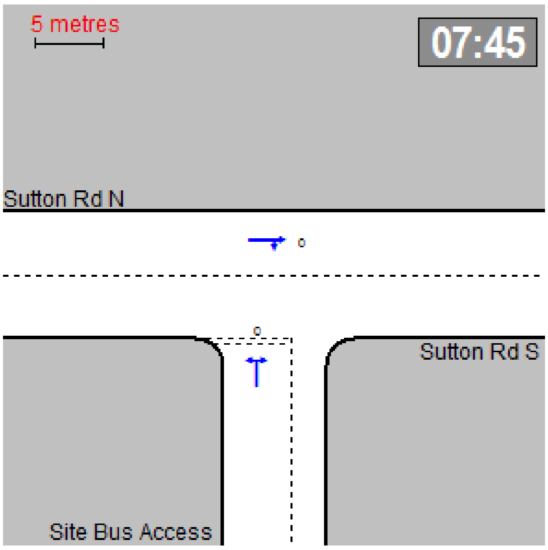
Queue Diagrams

Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45
View Extent: 40m

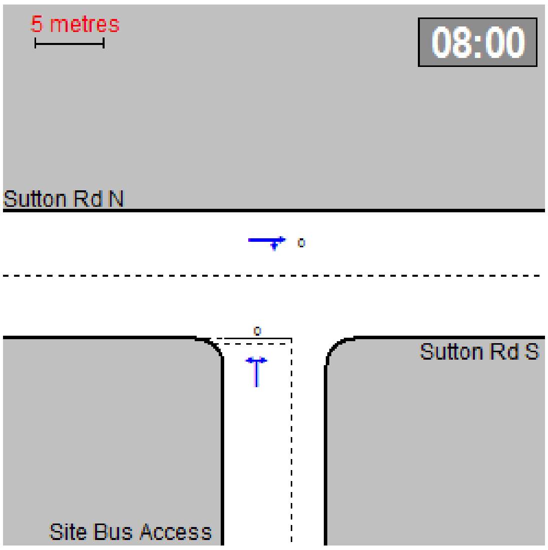
Queue Interval 1: 07:15-07:30



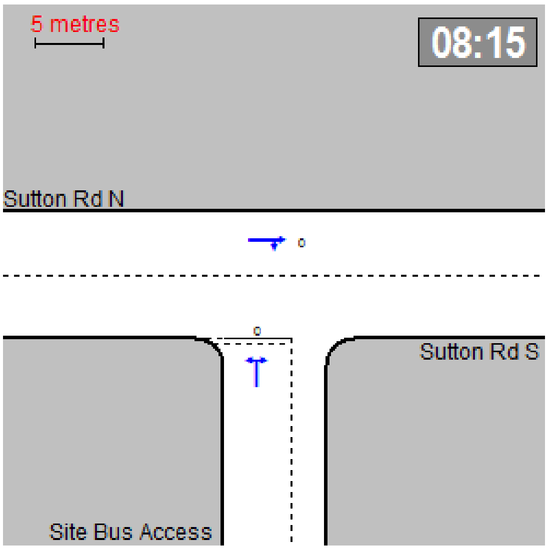
Queue Interval 2: 07:30-07:45



Queue Interval 3: 07:45-08:00

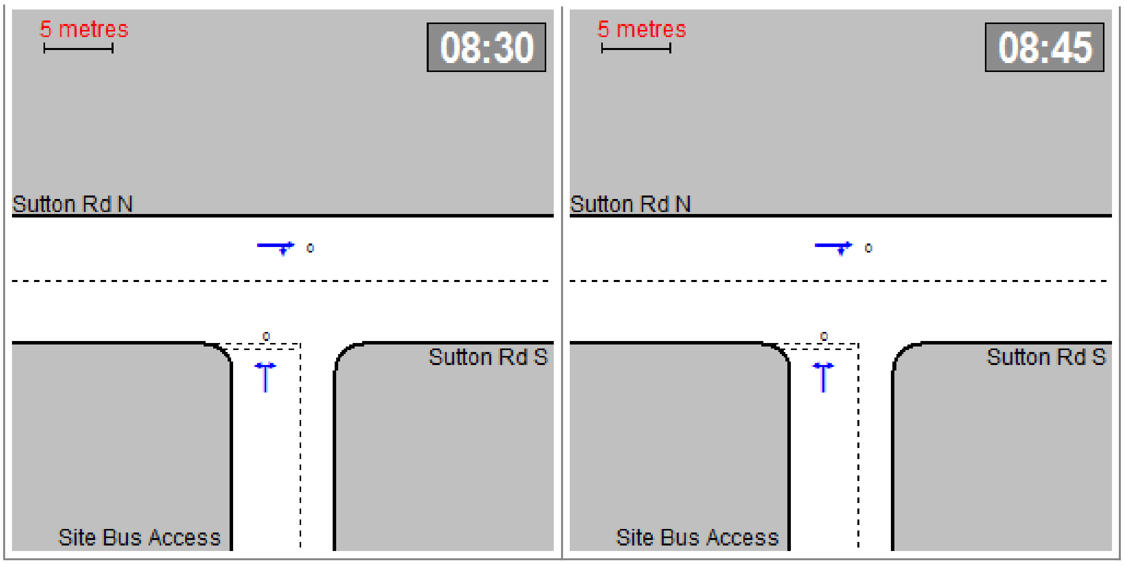


Queue Interval 4: 08:00-08:15



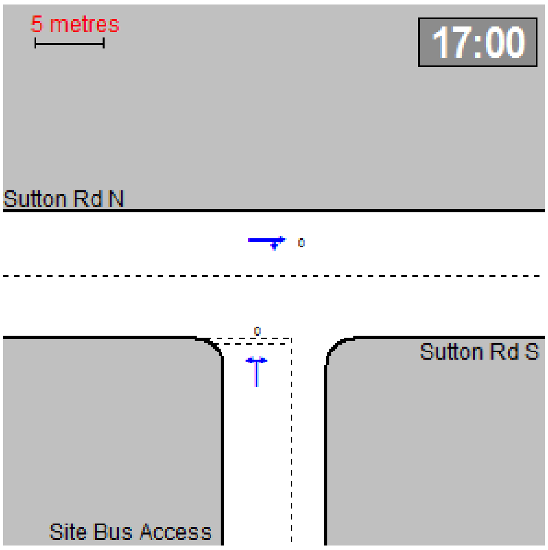
Queue Interval 5: 08:15-08:30

Queue Interval 6: 08:30-08:45

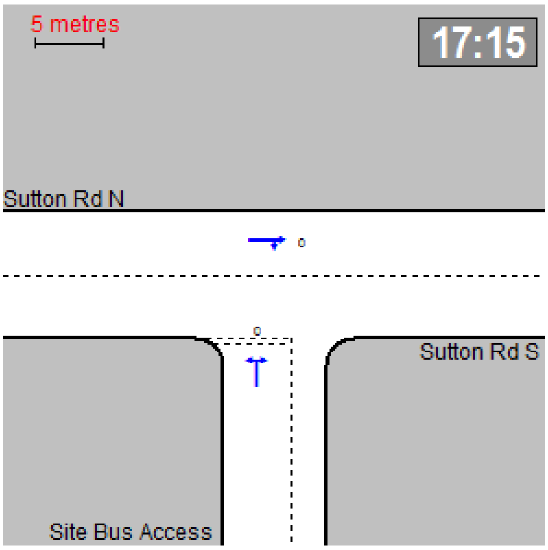

5 metres
08:30
Sutton Rd N
Sutton Rd S
Site Bus Access
5 metres
08:45
Sutton Rd N
Sutton Rd S
Site Bus Access

Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15
View Extent: 40m

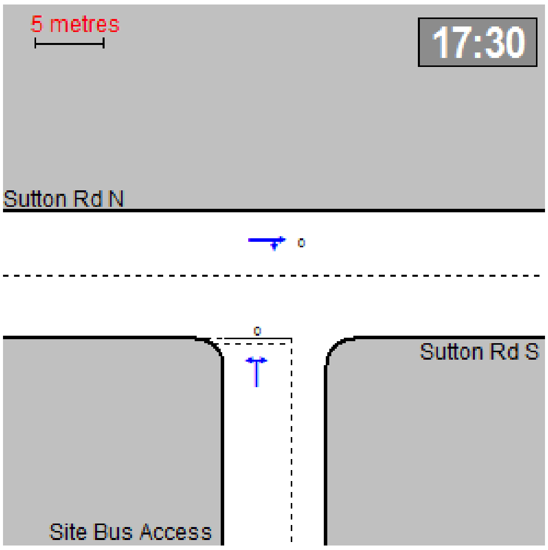
Queue Interval 1: 16:45-17:00



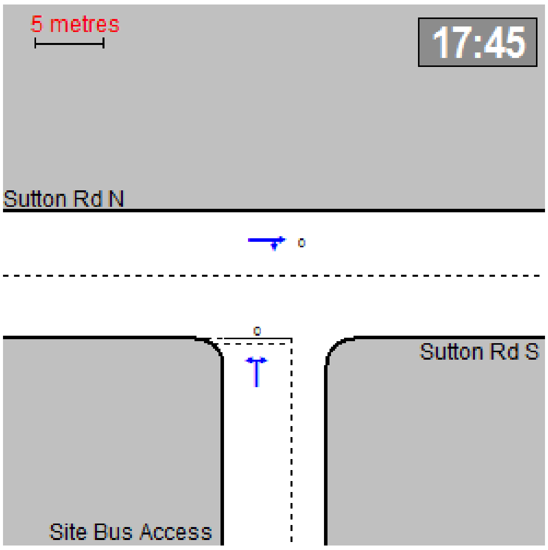
Queue Interval 2: 17:00-17:15



Queue Interval 3: 17:15-17:30

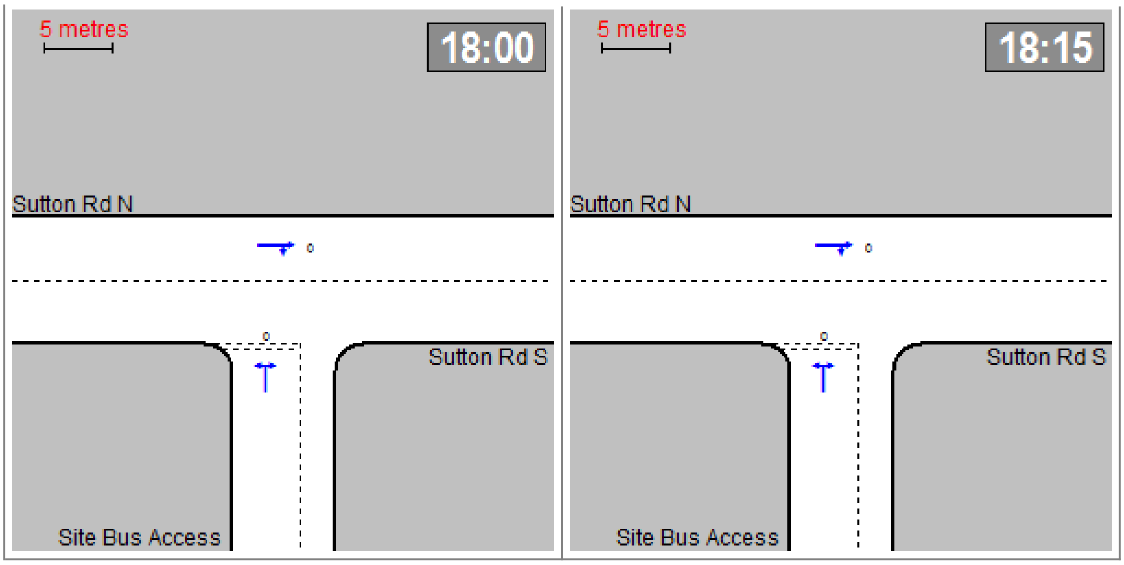


Queue Interval 4: 17:30-17:45



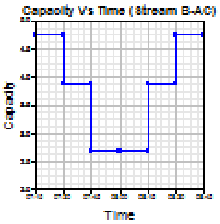
Queue Interval 5: 17:45-18:00

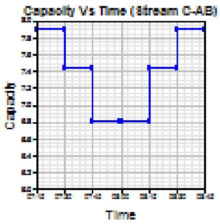
Queue Interval 6: 18:00-18:15


5 metres
18:00
Sutton Rd N
Sutton Rd S
Site Bus Access
5 metres
18:15
Sutton Rd N
Sutton Rd S
Site Bus Access

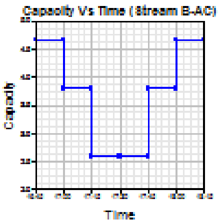
Capacity Graph

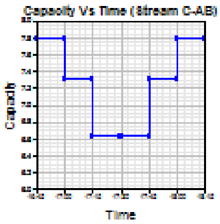
Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45





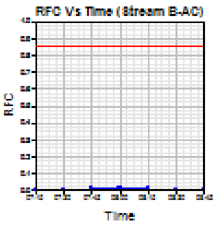
Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15

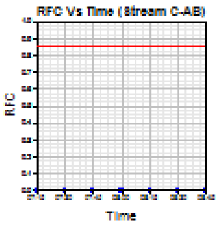




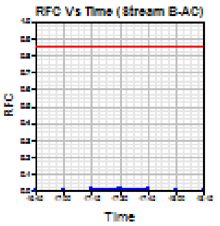
RFC Graph

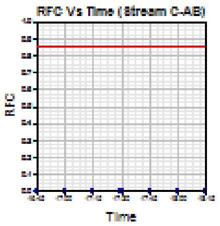
Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45





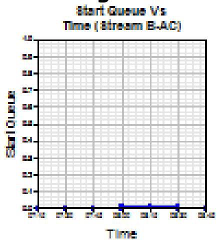
Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15

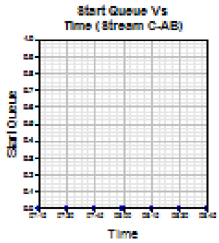




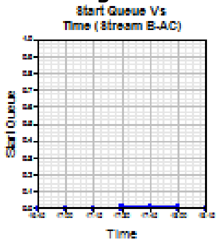
Start Queue Graph

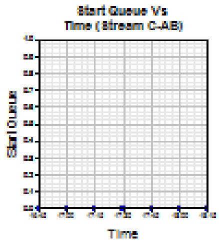
Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45





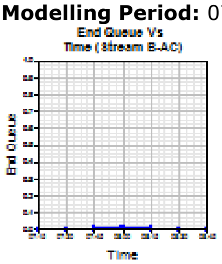
Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15

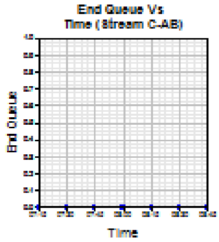




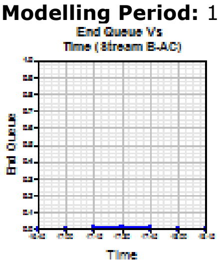
End Queue Graph

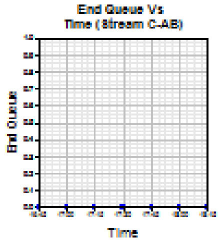
Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45





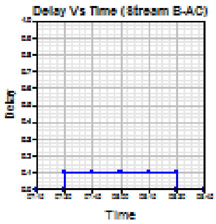
Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15

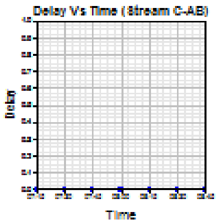




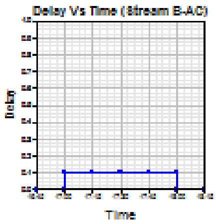
Delay Graph

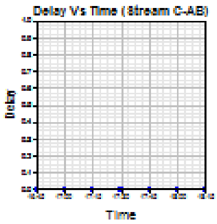
Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45





Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15





Queues & Delays

Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
07:15-07:30	B-AC	0.01	4.74	0.003	-	0.00	0.00	-	0.0	0.21
	C-AB	0.00	7.90	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	11.46	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	9.54	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
07:30-07:45	B-AC	0.01	3.87	0.004	-	0.00	0.00	-	0.1	0.26
	C-AB	0.00	7.44	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	13.68	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	11.39	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
07:45-08:00	B-AC	0.02	2.68	0.007	-	0.00	0.01	-	0.1	0.38
	C-AB	0.00	6.80	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	16.75	-	-	-	-	-	-	-	-
	A-B	0.02	-	-	-	-	-	-	-	-
	A-C	13.95	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-AC	0.02	2.68	0.007	-	0.01	0.01	-	0.1	0.38
	C-AB	0.00	6.80	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	16.75	-	-	-	-	-	-	-	-
	A-B	0.02	-	-	-	-	-	-	-	-
	A-C	13.95	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
08:15-08:30	B-AC	0.01	3.87	0.004	-	0.01	0.00	-	0.1	0.26
	C-AB	0.00	7.44	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	13.68	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	11.39	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
08:30-08:45	B-AC	0.01	4.74	0.003	-	0.00	0.00	-	0.0	0.21
	C-AB	0.00	7.90	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	11.46	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	9.54	-	-	-	-	-	-	-	-

Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
16:45-17:00	B-AC	0.01	4.66	0.003	-	0.00	0.00	-	0.0	0.22
	C-AB	0.00	7.79	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	11.18	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	9.99	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-AC	0.01	3.79	0.004	-	0.00	0.00	-	0.1	0.26
	C-AB	0.00	7.31	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	13.35	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	11.93	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
17:15-17:30	B-AC	0.02	2.58	0.007	-	0.00	0.01	-	0.1	0.39
	C-AB	0.00	6.63	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	16.35	-	-	-	-	-	-	-	-
	A-B	0.02	-	-	-	-	-	-	-	-
	A-C	14.61	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
17:30-17:45	B-AC	0.02	2.58	0.007	-	0.01	0.01	-	0.1	0.39
	C-AB	0.00	6.63	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	16.35	-	-	-	-	-	-	-	-
	A-B	0.02	-	-	-	-	-	-	-	-
	A-C	14.61	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
17:45-18:00	B-AC	0.01	3.79	0.004	-	0.01	0.00	-	0.1	0.26
	C-AB	0.00	7.31	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	13.35	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	11.93	-	-	-	-	-	-	-	-

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/ segment)	Delay (veh.min/ segment)	Mean Arriving Vehicle Delay (min)
18:00-18:15	B-AC	0.01	4.66	0.003	-	0.00	0.00	-	0.0	0.22
	C-AB	0.00	7.79	0.000	-	0.00	0.00	-	0.0	0.00
	C-A	11.18	-	-	-	-	-	-	-	-
	A-B	0.01	-	-	-	-	-	-	-	-
	A-C	9.99	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.
In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.
Delays marked with '##' could not be calculated.

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: AM Peak 2029+Comm+Dev
Modelling Period: 07:15-08:45

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-AC	1.4	0.9	0.4	0.3	0.4	0.3
C-AB	0.0	0.0	0.0	0.0	0.0	0.0
C-A	1256.7	837.8	-	-	-	-
A-B	1.4	0.9	-	-	-	-
A-C	1046.1	697.4	-	-	-	-
All	**2305.5**	**1537.0**	**0.4**	**0.0**	**0.4**	**0.0**

Demand Set: PM Peak 2029+Comm+Dev
Modelling Period: 16:45-18:15

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-AC	1.4	0.9	0.4	0.3	0.4	0.3
C-AB	0.0	0.0	0.0	0.0	0.0	0.0
C-A	1226.4	817.6	-	-	-	-
A-B	1.4	0.9	-	-	-	-
A-C	1095.6	730.4	-	-	-	-
All	**2324.8**	**1549.9**	**0.4**	**0.0**	**0.4**	**0.0**

Delay is that occurring only within the time period.
Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

PICADY 5 Run Successful

H

APPENDIX

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.4.487 [15039,24/03/2014]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758   email: software@trl.co.uk   Web: http://www.trlsoftware.co.uk

Filename: Horseshoes Ln Proposed.arc8
Path: \\FOZZY\Data\Consultancy\Project Files 2016\16007 Sutton Rd 2016\Models
Report generation date: 29/02/2016 15:46:59

File summary

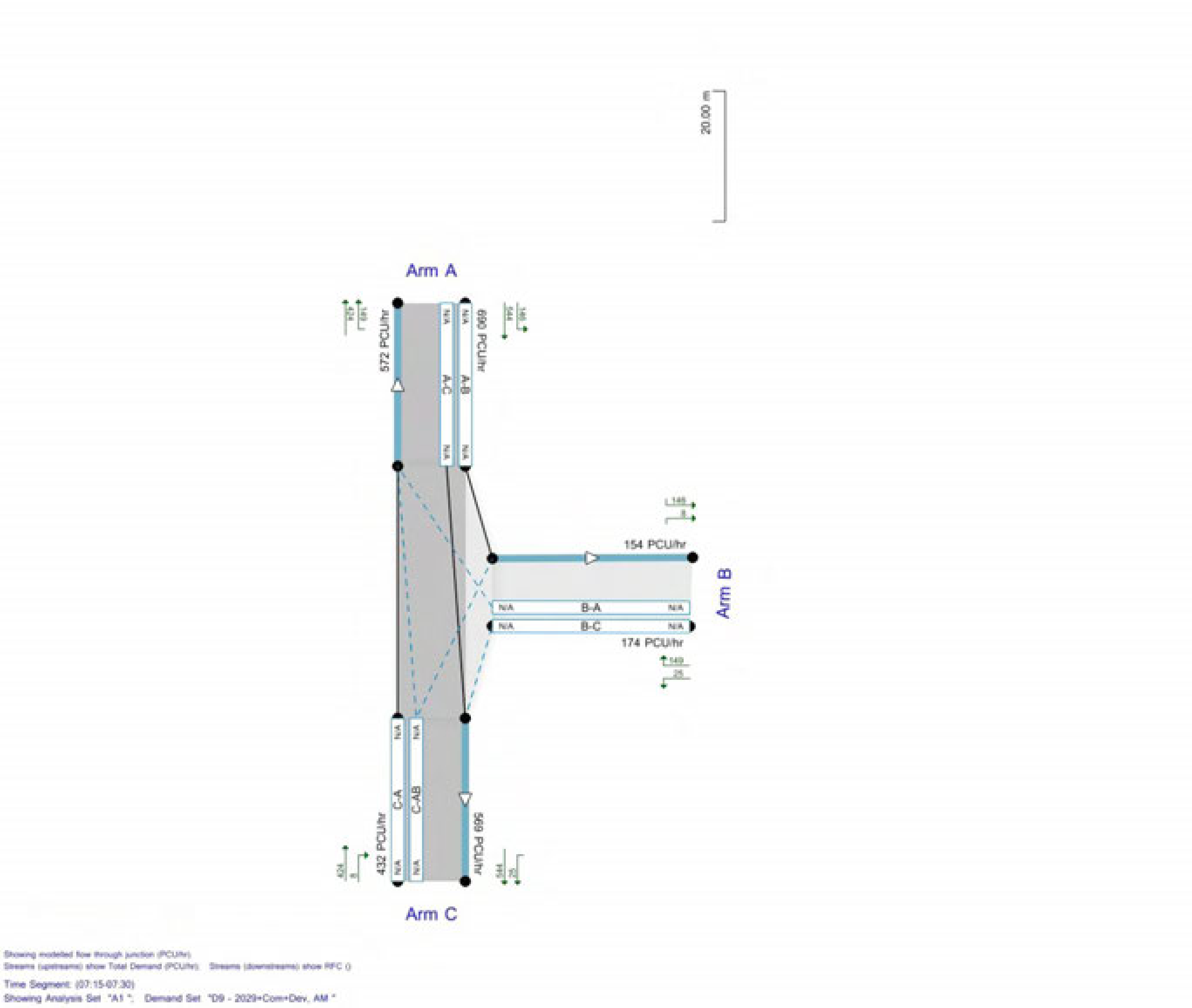
Title	Horseshoes Ln
Location	Langley, Kent
Site Number	
Date	04/08/2014
Version	
Status	(new file)
Identifier	
Client	DHA Planning
Jobnumber	16007
Enumerator	simon.swanston
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

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 ARCADY.

(Default Analysis Set) - 2029+Com+Dev, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship
2029+Com+Dev, AM	2029+Com+Dev	AM		ONE HOUR	07:15	08:45	90	15			✓	✓	

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C		73.90	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Sutton Rd (N)		Major
B	B	Horseshoes Ln		Minor
C	C	Sutton Rd (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.54		0.00		2.20	250.00	✓	0.00

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

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane plus flare				10.00	6.50	6.00	5.80	5.60		5.00	19	40

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	601.643	0.107	0.270	0.170	0.386
1	B-C	573.074	0.086	0.217	-	-
1	C-B	718.741	0.272	0.272	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

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

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	916.00	100.000
B	ONE HOUR	✓	235.00	100.000
C	ONE HOUR	✓	574.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
From		A	B	C
	A	0.000	194.000	722.000
	B	201.000	0.000	34.000
	C	563.000	11.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
From		A	B	C
	A	0.00	0.21	0.79
	B	0.86	0.00	0.14
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
From		A	B	C
	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-C	0.29	38.10	0.38	E	31.20	46.80	13.83	17.73	0.15	13.83	17.73
B-A	0.87	88.67	5.01	F	184.44	276.66	184.77	40.07	2.05	184.81	40.08
C-AB	0.04	4.49	0.05	A	23.16	34.73	3.18	5.50	0.04	3.18	5.50
C-A	-	-	-	-	503.56	755.34	-	-	-	-	-
A-B	-	-	-	-	178.02	267.03	-	-	-	-	-
A-C	-	-	-	-	662.52	993.78	-	-	-	-	-

Main Results for each time segment

Main results: (07:15-07:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	25.60	6.40	25.32	0.00	395.92	0.065	0.00	0.07	9.707	A
B-A	151.32	37.83	148.56	0.00	363.68	0.416	0.00	0.69	16.535	C
C-AB	15.74	3.93	15.65	0.00	817.15	0.019	0.00	0.02	4.491	A
C-A	416.40	104.10	416.40	0.00	-	-	-	-	-	-
A-B	146.05	36.51	146.05	0.00	-	-	-	-	-	-
A-C	543.56	135.89	543.56	0.00	-	-	-	-	-	-

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	30.57	7.64	30.46	0.00	350.49	0.087	0.07	0.09	11.245	B
B-A	180.69	45.17	178.48	0.00	317.51	0.569	0.69	1.24	25.485	D
C-AB	21.58	5.39	21.54	0.00	840.50	0.026	0.02	0.03	4.395	A
C-A	494.44	123.61	494.44	0.00	-	-	-	-	-	-
A-B	174.40	43.60	174.40	0.00	-	-	-	-	-	-
A-C	649.06	162.27	649.06	0.00	-	-	-	-	-	-

Main results: (07:45-08:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	37.43	9.36	36.81	0.00	182.55	0.205	0.09	0.25	24.601	C
B-A	221.31	55.33	209.29	0.00	253.66	0.872	1.24	4.25	68.150	F
C-AB	32.09	8.02	32.02	0.00	873.49	0.037	0.03	0.05	4.278	A
C-A	599.89	149.97	599.89	0.00	-	-	-	-	-	-
A-B	213.60	53.40	213.60	0.00	-	-	-	-	-	-
A-C	794.94	198.73	794.94	0.00	-	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	37.43	9.36	36.91	0.00	130.85	0.286	0.25	0.38	38.096	E
B-A	221.31	55.33	218.24	0.00	253.85	0.872	4.25	5.01	88.670	F
C-AB	32.12	8.03	32.12	0.00	873.52	0.037	0.05	0.05	4.278	A
C-A	599.87	149.97	599.87	0.00	-	-	-	-	-	-
A-B	213.60	53.40	213.60	0.00	-	-	-	-	-	-
A-C	794.94	198.73	794.94	0.00	-	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	30.57	7.64	31.68	0.00	338.83	0.090	0.38	0.10	11.763	B
B-A	180.69	45.17	195.11	0.00	317.85	0.568	5.01	1.41	32.201	D
C-AB	21.61	5.40	21.68	0.00	840.55	0.026	0.05	0.03	4.396	A
C-A	494.40	123.60	494.40	0.00	-	-	-	-	-	-
A-B	174.40	43.60	174.40	0.00	-	-	-	-	-	-
A-C	649.06	162.27	649.06	0.00	-	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	25.60	6.40	25.72	0.00	393.75	0.065	0.10	0.07	9.784	A
B-A	151.32	37.83	154.02	0.00	363.82	0.416	1.41	0.73	17.367	C
C-AB	15.79	3.95	15.83	0.00	817.19	0.019	0.03	0.02	4.494	A
C-A	416.34	104.09	416.34	0.00	-	-	-	-	-	-
A-B	146.05	36.51	146.05	0.00	-	-	-	-	-	-
A-C	543.56	135.89	543.56	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (07:15-07:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	0.98	0.07	9.707	A	A
B-A	9.56	0.64	16.535	C	B
C-AB	0.34	0.02	4.491	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (07:30-07:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	1.37	0.09	11.245	B	B
B-A	17.08	1.14	25.485	D	C
C-AB	0.48	0.03	4.395	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (07:45-08:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	3.48	0.23	24.601	C	C
B-A	48.93	3.26	68.150	F	E
C-AB	0.76	0.05	4.278	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:00-08:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	5.30	0.35	38.096	E	D
B-A	70.18	4.68	88.670	F	F
C-AB	0.76	0.05	4.278	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:15-08:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	1.61	0.11	11.763	B	B
B-A	27.21	1.81	32.201	D	C
C-AB	0.49	0.03	4.396	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:30-08:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	1.09	0.07	9.784	A	A
B-A	11.80	0.79	17.367	C	B
C-AB	0.35	0.02	4.494	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

(Default Analysis Set) - 2029+Com+Dev, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship
2029+Com+Dev, PM	2029+Com+Dev	PM		ONE HOUR	16:45	18:15	90	15			✓	✓	

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C		30.98	D

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Sutton Rd (N)		Major
B	B	Horseshoes Ln		Minor
C	C	Sutton Rd (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.54		0.00		2.20	250.00	✓	0.00

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

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane plus flare				10.00	6.50	6.00	5.80	5.60		5.00	19	40

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	601.852	0.107	0.271	0.170	0.387
1	B-C	572.804	0.086	0.217	-	-
1	C-B	718.741	0.272	0.272	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	895.00	100.000
B	ONE HOUR	✓	182.00	100.000
C	ONE HOUR	✓	664.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	253.000	642.000
	B	156.000	0.000	26.000
	C	641.000	23.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.28	0.72
	B	0.86	0.00	0.14
	C	0.97	0.03	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-C	0.10	13.39	0.11	B	23.86	35.79	6.52	10.93	0.07	6.52	10.93
B-A	0.68	44.59	2.02	E	143.15	214.72	93.32	26.08	1.04	93.34	26.08
C-AB	0.09	4.39	0.17	A	57.52	86.29	9.74	6.78	0.11	9.74	6.78
C-A	-	-	-	-	551.77	827.66	-	-	-	-	-
A-B	-	-	-	-	232.16	348.24	-	-	-	-	-
A-C	-	-	-	-	589.11	883.67	-	-	-	-	-

Main Results for each time segment

Main results: (16:45-17:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	19.57	4.89	19.38	0.00	414.94	0.047	0.00	0.05	9.096	A
B-A	117.44	29.36	115.57	0.00	361.86	0.325	0.00	0.47	14.512	B
C-AB	35.11	8.78	34.88	0.00	856.33	0.041	0.00	0.06	4.381	A
C-A	464.78	116.20	464.78	0.00	-	-	-	-	-	-
A-B	190.47	47.62	190.47	0.00	-	-	-	-	-	-
A-C	483.33	120.83	483.33	0.00	-	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	23.37	5.84	23.31	0.00	378.66	0.062	0.05	0.07	10.130	B
B-A	140.24	35.06	139.03	0.00	315.24	0.445	0.47	0.77	20.287	C
C-AB	53.53	13.38	53.38	0.00	906.84	0.059	0.06	0.10	4.218	A
C-A	543.39	135.85	543.39	0.00	-	-	-	-	-	-
A-B	227.44	56.86	227.44	0.00	-	-	-	-	-	-
A-C	577.14	144.29	577.14	0.00	-	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	28.63	7.16	28.48	0.00	303.86	0.094	0.07	0.10	13.066	B
B-A	171.76	42.94	167.22	0.00	250.82	0.685	0.77	1.91	41.025	E
C-AB	83.70	20.93	83.41	0.00	960.08	0.087	0.10	0.17	4.107	A
C-A	647.37	161.84	647.37	0.00	-	-	-	-	-	-
A-B	278.56	69.64	278.56	0.00	-	-	-	-	-	-
A-C	706.86	176.71	706.86	0.00	-	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	28.63	7.16	28.62	0.00	297.55	0.096	0.10	0.11	13.385	B
B-A	171.76	42.94	171.30	0.00	250.88	0.685	1.91	2.02	44.593	E
C-AB	83.84	20.96	83.84	0.00	960.24	0.087	0.17	0.17	4.111	A
C-A	647.24	161.81	647.24	0.00	-	-	-	-	-	-
A-B	278.56	69.64	278.56	0.00	-	-	-	-	-	-
A-C	706.86	176.71	706.86	0.00	-	-	-	-	-	-

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	23.37	5.84	23.53	0.00	375.76	0.062	0.11	0.07	10.224	B
B-A	140.24	35.06	144.99	0.00	315.39	0.445	2.02	0.83	21.664	C
C-AB	53.68	13.42	53.97	0.00	907.07	0.059	0.17	0.10	4.222	A
C-A	543.24	135.81	543.24	0.00	-	-	-	-	-	-
A-B	227.44	56.86	227.44	0.00	-	-	-	-	-	-
A-C	577.14	144.29	577.14	0.00	-	-	-	-	-	-

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-C	19.57	4.89	19.64	0.00	413.68	0.047	0.07	0.05	9.139	A
B-A	117.44	29.36	118.81	0.00	361.88	0.325	0.83	0.49	14.890	B
C-AB	35.27	8.82	35.42	0.00	856.48	0.041	0.10	0.06	4.387	A
C-A	464.63	116.16	464.63	0.00	-	-	-	-	-	-
A-B	190.47	47.62	190.47	0.00	-	-	-	-	-	-
A-C	483.33	120.83	483.33	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (16:45-17:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	0.71	0.05	9.096	A	A
B-A	6.58	0.44	14.512	B	B
C-AB	0.86	0.06	4.381	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:00-17:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	0.95	0.06	10.130	B	B
B-A	10.85	0.72	20.287	C	C
C-AB	1.43	0.10	4.218	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:15-17:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	1.48	0.10	13.066	B	B
B-A	24.63	1.64	41.025	E	D
C-AB	2.53	0.17	4.107	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:30-17:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	1.57	0.10	13.385	B	B
B-A	29.61	1.97	44.593	E	D
C-AB	2.56	0.17	4.111	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:45-18:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	1.04	0.07	10.224	B	B
B-A	13.85	0.92	21.664	C	C
C-AB	1.47	0.10	4.222	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (18:00-18:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-C	0.77	0.05	9.139	A	A
B-A	7.79	0.52	14.890	B	B
C-AB	0.89	0.06	4.387	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.4.487 [15039,24/03/2014]

For sales and distribution information, program advice and maintenance, contact TRL:
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Filename: Horseshoes Ln Base.arc8
Path: \\FOZZY\Data\Consultancy\Project Files 2016\16007 Sutton Rd 2016\Models
Report generation date: 29/02/2016 15:20:17

File summary

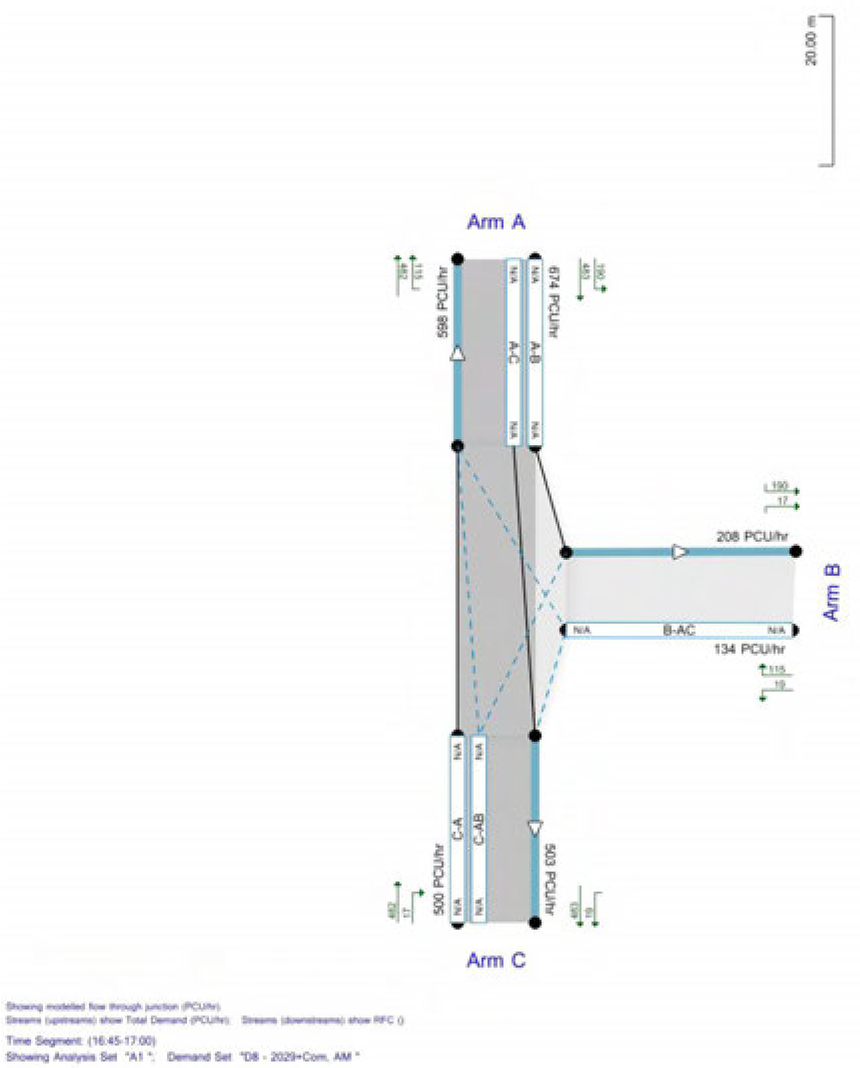
Title	Horseshoes Ln
Location	Langley, Kent
Site Number	
Date	04/08/2014
Version	
Status	(new file)
Identifier	
Client	DHA Planning
Jobnumber	15021
Enumerator	simon.swanston
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

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 ARCADY.

(Default Analysis Set) - 2029+Com, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relations
2029+Com, AM	2029+Com	AM		ONE HOUR	07:15	08:45	90	15				✓	✓		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C		128.33	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Sutton Rd (N)		Major
B	B	Horseshoes Ln		Minor
C	C	Sutton Rd (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.54		0.00		2.20	250.00	✓	0.00

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

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.37										19	26

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	514.924	0.092	0.231	0.146	0.331
1	B-C	664.023	0.099	0.251	-	-
1	C-B	718.741	0.272	0.272	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

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

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	839.00	100.000
B	ONE HOUR	✓	226.00	100.000
C	ONE HOUR	✓	550.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	171.000	668.000
	B	192.000	0.000	34.000
	C	539.000	11.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.20	0.80
	B	0.85	0.00	0.15
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-AC	0.97	141.47	9.34	F	207.38	311.07	305.04	58.84	3.39	305.13	58.85
C-AB	0.03	4.48	0.05	A	22.01	33.01	2.99	5.43	0.03	2.99	5.43
C-A	-	-	-	-	482.68	724.03	-	-	-	-	-
A-B	-	-	-	-	156.91	235.37	-	-	-	-	-
A-C	-	-	-	-	612.97	919.45	-	-	-	-	-

Main Results for each time segment

Main results: (07:15-07:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	170.14	42.54	166.41	0.00	344.64	0.494	0.00	0.93	19.816	C
C-AB	15.18	3.80	15.09	0.00	818.20	0.019	0.00	0.02	4.482	A
C-A	398.89	99.72	398.89	0.00	-	-	-	-	-	-
A-B	128.74	32.18	128.74	0.00	-	-	-	-	-	-
A-C	502.91	125.73	502.91	0.00	-	-	-	-	-	-

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	203.17	50.79	199.82	0.00	307.48	0.661	0.93	1.77	32.433	D
C-AB	20.61	5.15	20.57	0.00	841.24	0.025	0.02	0.03	4.386	A
C-A	473.83	118.46	473.83	0.00	-	-	-	-	-	-
A-B	153.73	38.43	153.73	0.00	-	-	-	-	-	-
A-C	600.52	150.13	600.52	0.00	-	-	-	-	-	-

Main results: (07:45-08:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	248.83	62.21	228.28	0.00	255.64	0.973	1.77	6.91	94.269	F
C-AB	30.18	7.54	30.11	0.00	873.68	0.035	0.03	0.05	4.267	A
C-A	575.38	143.85	575.38	0.00	-	-	-	-	-	-
A-B	188.27	47.07	188.27	0.00	-	-	-	-	-	-
A-C	735.48	183.87	735.48	0.00	-	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	248.83	62.21	239.12	0.00	255.63	0.973	6.91	9.34	141.472	F
C-AB	30.20	7.55	30.20	0.00	873.71	0.035	0.05	0.05	4.267	A
C-A	575.36	143.84	575.36	0.00	-	-	-	-	-	-
A-B	188.27	47.07	188.27	0.00	-	-	-	-	-	-
A-C	735.48	183.87	735.48	0.00	-	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	203.17	50.79	231.73	0.00	307.46	0.661	9.34	2.20	58.486	F
C-AB	20.64	5.16	20.70	0.00	841.28	0.025	0.05	0.03	4.389	A
C-A	473.80	118.45	473.80	0.00	-	-	-	-	-	-
A-B	153.73	38.43	153.73	0.00	-	-	-	-	-	-
A-C	600.52	150.13	600.52	0.00	-	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	170.14	42.54	174.86	0.00	344.61	0.494	2.20	1.02	21.745	C
C-AB	15.23	3.81	15.26	0.00	818.24	0.019	0.03	0.02	4.485	A
C-A	398.84	99.71	398.84	0.00	-	-	-	-	-	-
A-B	128.74	32.18	128.74	0.00	-	-	-	-	-	-
A-C	502.91	125.73	502.91	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (07:15-07:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	12.70	0.85	19.816	C	B
C-AB	0.33	0.02	4.482	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (07:30-07:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	23.72	1.58	32.433	D	C
C-AB	0.46	0.03	4.386	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (07:45-08:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	73.34	4.89	94.269	F	F
C-AB	0.70	0.05	4.267	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:00-08:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	123.10	8.21	141.472	F	F
C-AB	0.70	0.05	4.267	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:15-08:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	55.39	3.69	58.486	F	E
C-AB	0.46	0.03	4.389	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:30-08:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	16.79	1.12	21.745	C	C
C-AB	0.33	0.02	4.485	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

(Default Analysis Set) - 2029+Com+Dev, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship
2029+Com+Dev, AM	2029+Com+Dev	AM		ONE HOUR	07:15	08:45	90	15			✓	✓	

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C		233.96	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Sutton Rd (N)		Major
B	B	Horseshoes Ln		Minor
C	C	Sutton Rd (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.54		0.00		2.20	250.00	✓	0.00

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

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.37										19	26

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	514.924	0.092	0.231	0.146	0.331
1	B-C	664.023	0.099	0.251	-	-
1	C-B	718.741	0.272	0.272	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	916.00	100.000
B	ONE HOUR	✓	235.00	100.000
C	ONE HOUR	✓	574.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	194.000	722.000
	B	201.000	0.000	34.000
	C	563.000	11.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.21	0.79
	B	0.86	0.00	0.14
	C	0.98	0.02	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-AC	1.10	258.60	18.96	F	215.64	323.46	574.71	106.61	6.39	574.85	106.63
C-AB	0.04	4.49	0.05	A	23.16	34.73	3.18	5.50	0.04	3.18	5.50
C-A	-	-	-	-	503.56	755.34	-	-	-	-	-
A-B	-	-	-	-	178.02	267.03	-	-	-	-	-
A-C	-	-	-	-	662.52	993.78	-	-	-	-	-

Main Results for each time segment

Main results: (07:15-07:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	176.92	44.23	172.54	0.00	330.03	0.536	0.00	1.10	22.297	C
C-AB	15.74	3.93	15.65	0.00	817.15	0.019	0.00	0.02	4.491	A
C-A	416.40	104.10	416.40	0.00	-	-	-	-	-	-
A-B	146.05	36.51	146.05	0.00	-	-	-	-	-	-
A-C	543.56	135.89	543.56	0.00	-	-	-	-	-	-

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	211.26	52.82	206.38	0.00	290.09	0.728	1.10	2.32	40.752	E
C-AB	21.58	5.39	21.54	0.00	840.50	0.026	0.02	0.03	4.395	A
C-A	494.44	123.61	494.44	0.00	-	-	-	-	-	-
A-B	174.40	43.60	174.40	0.00	-	-	-	-	-	-
A-C	649.06	162.27	649.06	0.00	-	-	-	-	-	-

Main results: (07:45-08:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	258.74	64.68	221.04	0.00	234.33	1.104	2.32	11.74	145.376	F
C-AB	32.09	8.02	32.02	0.00	873.49	0.037	0.03	0.05	4.278	A
C-A	599.89	149.97	599.89	0.00	-	-	-	-	-	-
A-B	213.60	53.40	213.60	0.00	-	-	-	-	-	-
A-C	794.94	198.73	794.94	0.00	-	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	258.74	64.68	229.87	0.00	234.32	1.104	11.74	18.96	258.601	F
C-AB	32.12	8.03	32.12	0.00	873.52	0.037	0.05	0.05	4.278	A
C-A	599.87	149.97	599.87	0.00	-	-	-	-	-	-
A-B	213.60	53.40	213.60	0.00	-	-	-	-	-	-
A-C	794.94	198.73	794.94	0.00	-	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	211.26	52.82	271.55	0.00	290.07	0.728	18.96	3.89	159.909	F
C-AB	21.61	5.40	21.68	0.00	840.55	0.026	0.05	0.03	4.396	A
C-A	494.40	123.60	494.40	0.00	-	-	-	-	-	-
A-B	174.40	43.60	174.40	0.00	-	-	-	-	-	-
A-C	649.06	162.27	649.06	0.00	-	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	176.92	44.23	187.58	0.00	330.00	0.536	3.89	1.22	26.920	D
C-AB	15.79	3.95	15.83	0.00	817.19	0.019	0.03	0.02	4.494	A
C-A	416.34	104.09	416.34	0.00	-	-	-	-	-	-
A-B	146.05	36.51	146.05	0.00	-	-	-	-	-	-
A-C	543.56	135.89	543.56	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (07:15-07:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	14.71	0.98	22.297	C	C
C-AB	0.34	0.02	4.491	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (07:30-07:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	30.05	2.00	40.752	E	D
C-AB	0.48	0.03	4.395	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (07:45-08:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	112.40	7.49	145.376	F	F
C-AB	0.76	0.05	4.278	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:00-08:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	231.17	15.41	258.601	F	F
C-AB	0.76	0.05	4.278	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:15-08:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	164.34	10.96	159.909	F	F
C-AB	0.49	0.03	4.396	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (08:30-08:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	22.04	1.47	26.920	D	C
C-AB	0.35	0.02	4.494	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

(Default Analysis Set) - 2029+Com, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relations
2029+Com, PM	2029+Com	PM		ONE HOUR	16:45	18:15	90	15			✓	✓		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C		33.81	D

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Sutton Rd (N)		Major
B	B	Horseshoes Ln		Minor
C	C	Sutton Rd (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.54		0.00		2.20	250.00	✓	0.00

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

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.37										19	26

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	514.924	0.092	0.231	0.146	0.331
1	B-C	664.023	0.099	0.251	-	-
1	C-B	718.741	0.272	0.272	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

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

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	848.00	100.000
B	ONE HOUR	✓	158.00	100.000
C	ONE HOUR	✓	615.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	238.000	610.000
	B	132.000	0.000	26.000
	C	592.000	23.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.28	0.72
	B	0.84	0.00	0.16
	C	0.96	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-AC	0.69	44.57	2.05	E	144.98	217.48	97.45	26.89	1.08	97.48	26.89
C-AB	0.08	4.46	0.15	A	53.14	79.72	8.98	6.76	0.10	8.98	6.76
C-A	-	-	-	-	511.19	766.78	-	-	-	-	-
A-B	-	-	-	-	218.39	327.59	-	-	-	-	-
A-C	-	-	-	-	559.75	839.62	-	-	-	-	-

Main Results for each time segment

Main results: (16:45-17:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	118.95	29.74	116.89	0.00	343.88	0.346	0.00	0.51	15.724	C
C-AB	33.34	8.33	33.12	0.00	841.29	0.040	0.00	0.06	4.453	A
C-A	429.66	107.42	429.66	0.00	-	-	-	-	-	-
A-B	179.18	44.79	179.18	0.00	-	-	-	-	-	-
A-C	459.24	114.81	459.24	0.00	-	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	142.04	35.51	140.77	0.00	306.03	0.464	0.51	0.83	21.613	C
C-AB	49.67	12.42	49.54	0.00	885.50	0.056	0.06	0.09	4.306	A
C-A	503.20	125.80	503.20	0.00	-	-	-	-	-	-
A-B	213.96	53.49	213.96	0.00	-	-	-	-	-	-
A-C	548.38	137.09	548.38	0.00	-	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	173.96	43.49	169.58	0.00	253.13	0.687	0.83	1.93	41.081	E
C-AB	76.23	19.06	75.98	0.00	933.56	0.082	0.09	0.15	4.198	A
C-A	600.90	150.22	600.90	0.00	-	-	-	-	-	-
A-B	262.04	65.51	262.04	0.00	-	-	-	-	-	-
A-C	671.62	167.91	671.62	0.00	-	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	173.96	43.49	173.49	0.00	253.08	0.687	1.93	2.05	44.571	E
C-AB	76.35	19.09	76.34	0.00	933.69	0.082	0.15	0.15	4.202	A
C-A	600.78	150.20	600.78	0.00	-	-	-	-	-	-
A-B	262.04	65.51	262.04	0.00	-	-	-	-	-	-
A-C	671.62	167.91	671.62	0.00	-	-	-	-	-	-

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	142.04	35.51	146.60	0.00	305.96	0.464	2.05	0.90	23.177	C
C-AB	49.80	12.45	50.05	0.00	885.70	0.056	0.15	0.09	4.311	A
C-A	503.07	125.77	503.07	0.00	-	-	-	-	-	-
A-B	213.96	53.49	213.96	0.00	-	-	-	-	-	-
A-C	548.38	137.09	548.38	0.00	-	-	-	-	-	-

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	118.95	29.74	120.40	0.00	343.81	0.346	0.90	0.54	16.215	C
C-AB	33.48	8.37	33.61	0.00	841.42	0.040	0.09	0.06	4.457	A
C-A	429.52	107.38	429.52	0.00	-	-	-	-	-	-
A-B	179.18	44.79	179.18	0.00	-	-	-	-	-	-
A-C	459.24	114.81	459.24	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (16:45-17:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	7.18	0.48	15.724	C	B
C-AB	0.83	0.06	4.453	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:00-17:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	11.65	0.78	21.613	C	C
C-AB	1.33	0.09	4.306	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:15-17:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	25.00	1.67	41.081	E	D
C-AB	2.29	0.15	4.198	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:30-17:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	29.96	2.00	44.571	E	D
C-AB	2.32	0.15	4.202	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:45-18:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	15.02	1.00	23.177	C	C
C-AB	1.36	0.09	4.311	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (18:00-18:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	8.63	0.58	16.215	C	B
C-AB	0.85	0.06	4.457	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

(Default Analysis Set) - 2029+Com+Dev, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship
2029+Com+Dev, PM	2029+Com+Dev	PM		ONE HOUR	16:45	18:15	90	15			✓	✓	

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Do Geometric Delay	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C		69.30	F

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	Sutton Rd (N)		Major
B	B	Horseshoes Ln		Minor
C	C	Sutton Rd (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.54		0.00		2.20	250.00	✓	0.00

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

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.37										19	26

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	514.924	0.092	0.231	0.146	0.331
1	B-C	664.023	0.099	0.251	-	-
1	C-B	718.741	0.272	0.272	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	895.00	100.000
B	ONE HOUR	✓	182.00	100.000
C	ONE HOUR	✓	664.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	253.000	642.000
	B	156.000	0.000	26.000
	C	641.000	23.000	0.000

Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.28	0.72
	B	0.86	0.00	0.14
	C	0.97	0.03	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
B-AC	0.86	91.66	4.68	F	167.01	250.51	176.88	42.36	1.97	176.93	42.38
C-AB	0.09	4.39	0.17	A	57.52	86.29	9.74	6.78	0.11	9.74	6.78
C-A	-	-	-	-	551.77	827.66	-	-	-	-	-
A-B	-	-	-	-	232.16	348.24	-	-	-	-	-
A-C	-	-	-	-	589.11	883.67	-	-	-	-	-

Main Results for each time segment

Main results: (16:45-17:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	137.02	34.25	134.26	0.00	328.79	0.417	0.00	0.69	18.263	C
C-AB	35.11	8.78	34.88	0.00	856.33	0.041	0.00	0.06	4.381	A
C-A	464.78	116.20	464.78	0.00	-	-	-	-	-	-
A-B	190.47	47.62	190.47	0.00	-	-	-	-	-	-
A-C	483.33	120.83	483.33	0.00	-	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	163.61	40.90	161.47	0.00	288.51	0.567	0.69	1.23	27.858	D
C-AB	53.53	13.38	53.38	0.00	906.84	0.059	0.06	0.10	4.218	A
C-A	543.39	135.85	543.39	0.00	-	-	-	-	-	-
A-B	227.44	56.86	227.44	0.00	-	-	-	-	-	-
A-C	577.14	144.29	577.14	0.00	-	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	200.39	50.10	189.41	0.00	232.21	0.863	1.23	3.97	71.053	F
C-AB	83.70	20.93	83.41	0.00	960.08	0.087	0.10	0.17	4.107	A
C-A	647.37	161.84	647.37	0.00	-	-	-	-	-	-
A-B	278.56	69.64	278.56	0.00	-	-	-	-	-	-
A-C	706.86	176.71	706.86	0.00	-	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	200.39	50.10	197.54	0.00	232.15	0.863	3.97	4.68	91.657	F
C-AB	83.84	20.96	83.84	0.00	960.24	0.087	0.17	0.17	4.111	A
C-A	647.24	161.81	647.24	0.00	-	-	-	-	-	-
A-B	278.56	69.64	278.56	0.00	-	-	-	-	-	-
A-C	706.86	176.71	706.86	0.00	-	-	-	-	-	-

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	163.61	40.90	176.72	0.00	288.43	0.567	4.68	1.41	35.306	E
C-AB	53.68	13.42	53.97	0.00	907.07	0.059	0.17	0.10	4.222	A
C-A	543.24	135.81	543.24	0.00	-	-	-	-	-	-
A-B	227.44	56.86	227.44	0.00	-	-	-	-	-	-
A-C	577.14	144.29	577.14	0.00	-	-	-	-	-	-

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)	Delay (s)	LOS
B-AC	137.02	34.25	139.69	0.00	328.71	0.417	1.41	0.74	19.299	C
C-AB	35.27	8.82	35.42	0.00	856.48	0.041	0.10	0.06	4.387	A
C-A	464.63	116.16	464.63	0.00	-	-	-	-	-	-
A-B	190.47	47.62	190.47	0.00	-	-	-	-	-	-
A-C	483.33	120.83	483.33	0.00	-	-	-	-	-	-

Queueing Delay Results for each time segment

Queueing Delay results: (16:45-17:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	9.50	0.63	18.263	C	B
C-AB	0.86	0.06	4.381	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:00-17:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	16.81	1.12	27.858	D	C
C-AB	1.43	0.10	4.218	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:15-17:30)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	46.05	3.07	71.053	F	E
C-AB	2.53	0.17	4.107	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:30-17:45)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	65.62	4.37	91.657	F	F
C-AB	2.56	0.17	4.111	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (17:45-18:00)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	26.96	1.80	35.306	E	D
C-AB	1.47	0.10	4.222	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

Queueing Delay results: (18:00-18:15)

Stream	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
B-AC	11.93	0.80	19.299	C	B
C-AB	0.89	0.06	4.387	A	A
C-A	-	-	-	-	-
A-B	-	-	-	-	-
A-C	-	-	-	-	-

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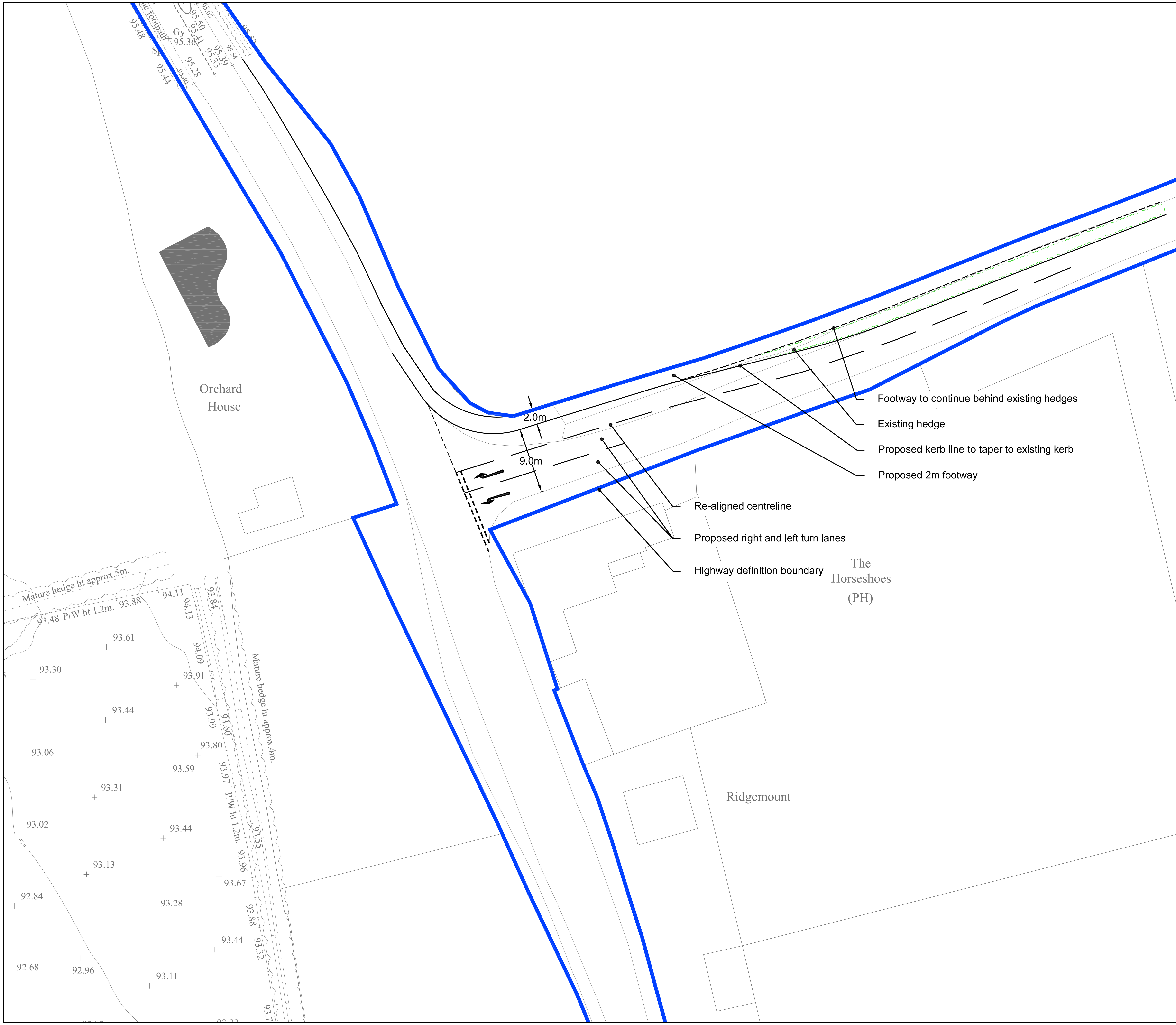
APPENDIX



DO NOT SCALE

INDICATIVE ONLY

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	23/02/15	SS	First Issue	SS	JSL

client

COUNTRYSIDE PROPERTIES

project

LAND AT SUTTON ROAD

title

POTENTIAL IMPROVEMENTS TO HORSEHOES LANE/SUTTON ROAD JUNCTION

project	drwg	rev
10296	H-28	P1

Drawn	Checked	Approved	scale @ A3	date
SS	JSL	JSL	1:500	23/02/2016

status

FOR INFORMATION P

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integrated transport & travel planning

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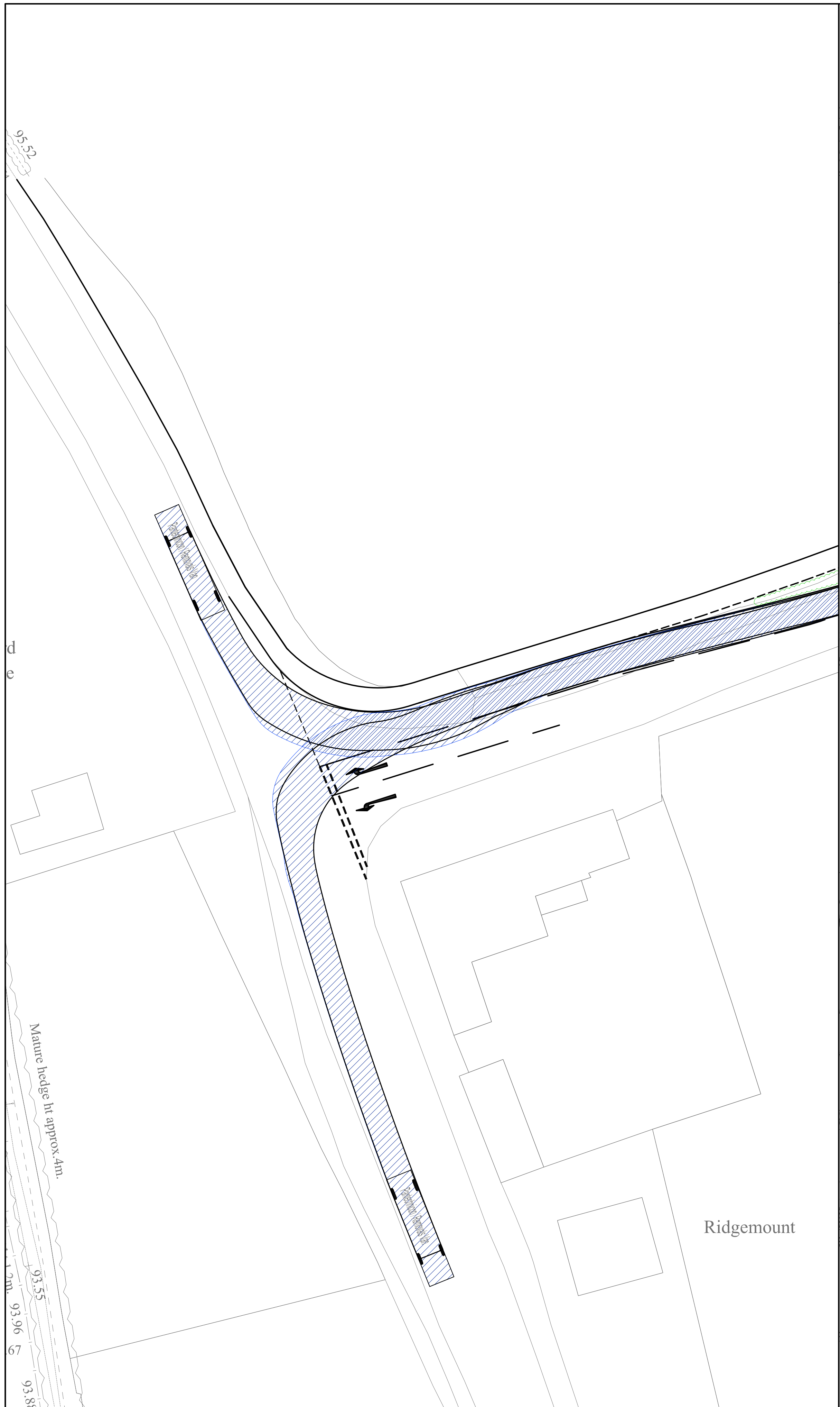
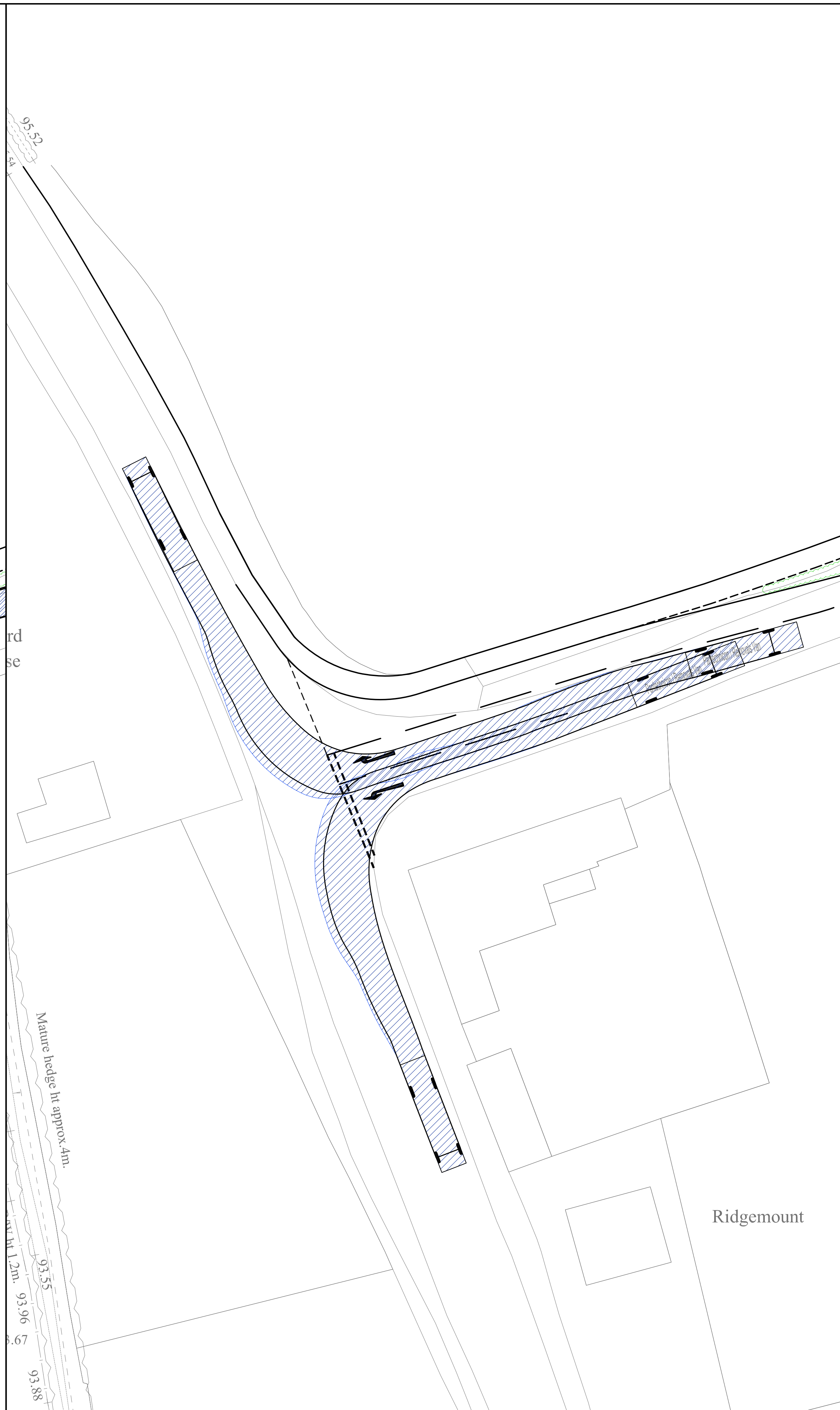
t: 01622 776226 f: 01622 776227
e: info@dhaplanning.co.uk w: www.dhatransport.co.uk

CAD Reference:

A3



PANTECHNICON TURNING INTO HORSESHOES LANE



PANTECHNICON TURNING OUT OF HORSESHOES LANE

N

INDICATIVE ONLY

DO NOT SCALE

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	23/02/15	SS	First Issue	SS	JSL

client
COUNTRYSIDE PROPERTIES

project
LAND AT SUTTON ROAD

title
VEHICLE SWEPT PATH ANALYSIS

project	drwg	rev
10296	H-28	P1

Drawn	Checked	Approved	scale @ A3	date
SS	JSL	JSL	1:500	23/02/2016

status
FOR INFORMATION P

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CAD Reference:

A3

J

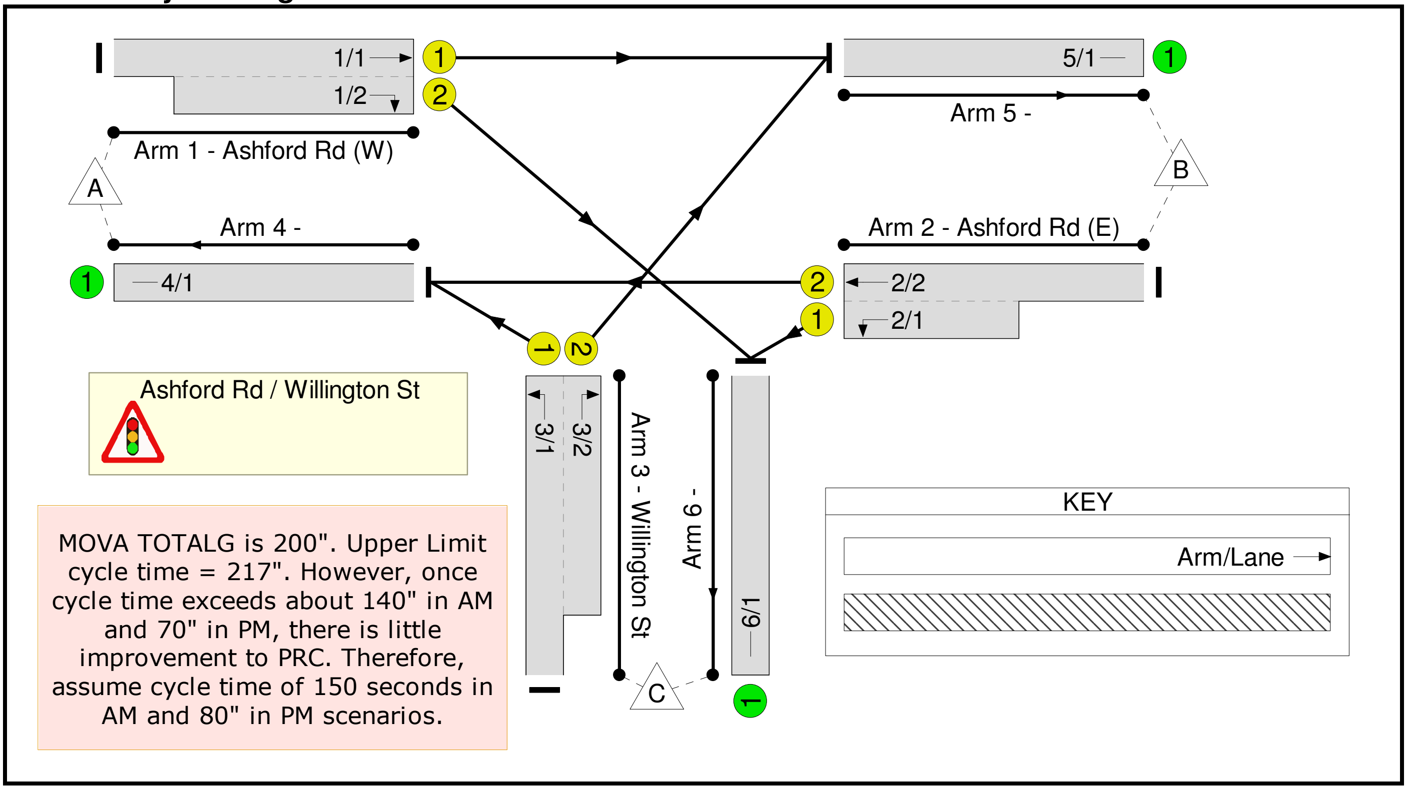
APPENDIX

Ashford Willington Proposed LinSig Data

User and Project Details

Project:	**15021 Sutton Rd June 2015**
Title:	**Ashford Willington Proposed**
Location:	Maidstone
File name:	Ashford Willington Proposed.lsg3x
Author:	Simon Swanston
Company:	JCT Consultancy
Address:	LinSig House, Deepdale Lane, Nettleham, Lincoln, LN2 2LL
Notes:	

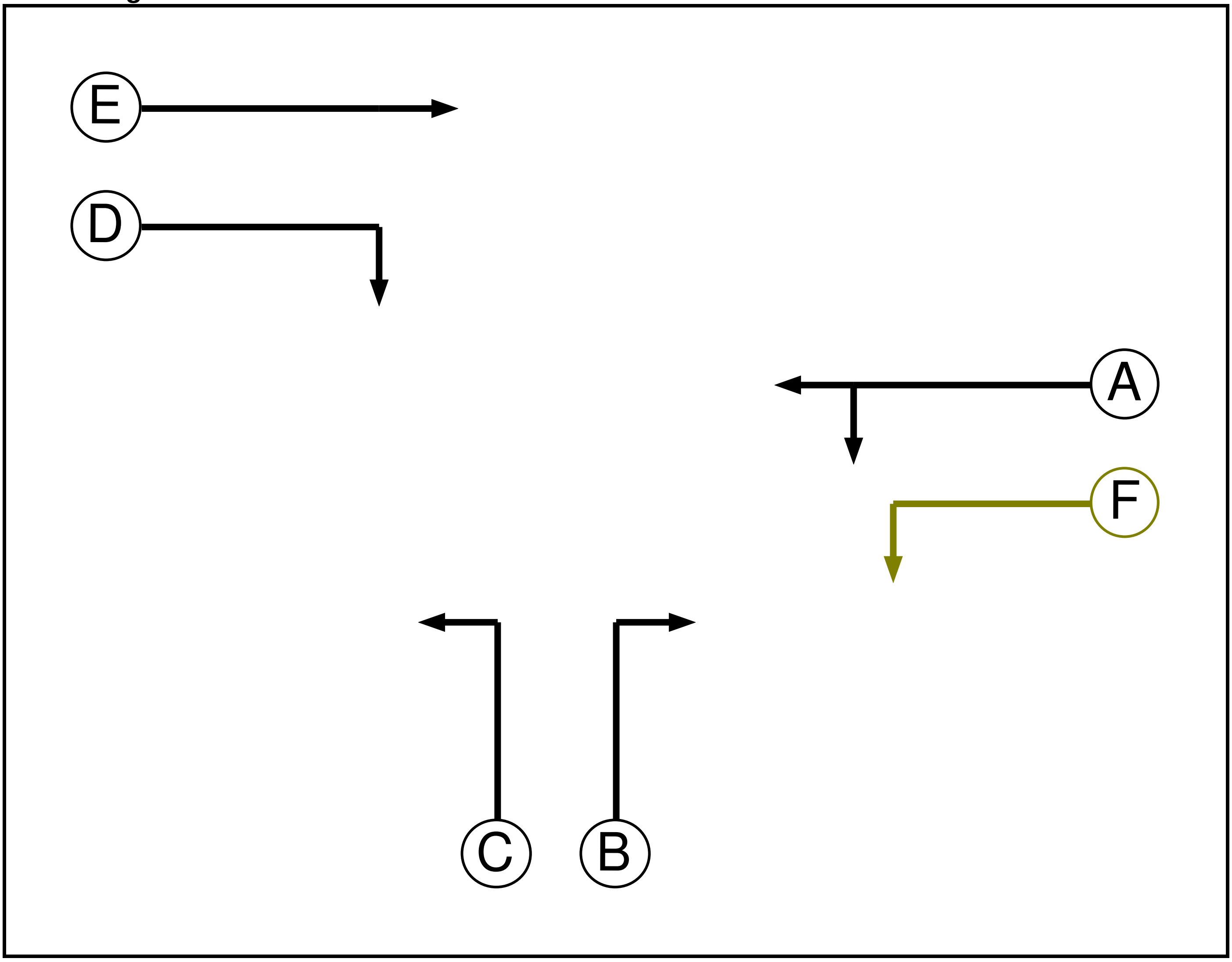
Network Layout Diagram



MOVA TOTALG is 200". Upper Limit cycle time = 217". However, once cycle time exceeds about 140" in AM and 70" in PM, there is little improvement to PRC. Therefore, assume cycle time of 150 seconds in AM and 80" in PM scenarios.

Ashford Willington Proposed LinSig Data

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		-9999	7
B	Traffic		-9999	7
C	Traffic		-9999	7
D	Traffic		-9999	7
E	Traffic		-9999	7
F	Filter	A	-9999	4

Ashford Willington Proposed LinSig Data

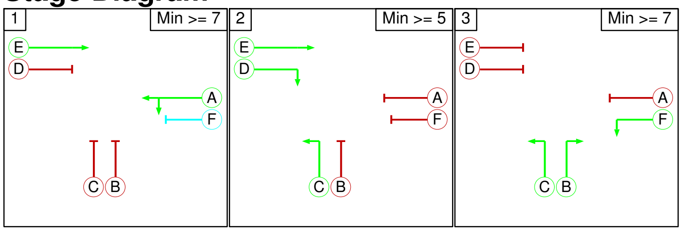
Phase Intergreens Matrix

		Starting Phase					
		A	B	C	D	E	F
Terminating Phase	A		6	7	5	-	-
	B	5		-	5	5	-
	C	5	-		-	-	-
	D	5	5	-		-	5
	E	-	5	-	-		-
	F	-	-	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A E
2	C D E
3	B C F

Stage Diagram



Phase Delays

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

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		7	7
	2	5		5
	3	5	X	

Ashford Willington Proposed LinSig Data

Give-Way Lane Input Data

Junction: Ashford Rd / Willington St
There are no Opposed Lanes in this Junction

Ashford Willington Proposed LinSig Data

Lane Input Data

Junction: Ashford Rd / Willington St												
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 (Ashford Rd (W))	U	E	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 5 Ahead	Inf
1/2 (Ashford Rd (W))	U	D	2	3	10.0	Geom	-	3.00	0.00	Y	Arm 6 Right	14.00
2/1 (Ashford Rd (E))	U	A F	2	3	7.0	Geom	-	2.70	0.00	Y	Arm 6 Left	12.00
2/2 (Ashford Rd (E))	U	A	2	3	60.0	Geom	-	2.70	0.00	Y	Arm 4 Ahead	Inf
3/1 (Willington St)	U	C	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 4 Left	24.00
3/2 (Willington St)	U	B	2	3	15.0	Geom	-	3.00	0.00	Y	Arm 5 Right	16.00
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM Survey'	07:30	08:30	01:00	
2: 'AM 2019 + Committed'	07:30	08:30	01:00	
3: 'AM 2019 + Committed + Development'	07:30	08:30	01:00	
4: 'AM 2024 + Committed'	07:30	08:30	01:00	
5: 'AM 2024 + Committed + Development'	07:30	08:30	01:00	
6: 'AM 2029 + Committed'	07:30	08:30	01:00	
7: 'AM 2029 + Committed + Development'	07:30	08:30	01:00	
8: 'PM Survey'	17:00	18:00	01:00	
9: 'PM 2019 + Committed'	17:00	18:00	01:00	
10: 'PM 2019 + Committed + Development'	17:00	18:00	01:00	
11: 'PM 2024 + Committed'	17:00	18:00	01:00	
12: 'PM 2024 + Committed + Development'	17:00	18:00	01:00	
13: 'PM 2029 + Committed'	17:00	18:00	01:00	
14: 'PM 2029 + Committed + Development'	17:00	18:00	01:00	

Scenario 1: 'AM19+C+D' (FG3: 'AM 2019 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	264	724	988
	B	483	0	202	685
	C	1090	254	0	1344
	Tot.	1573	518	926	3017

Traffic Lane Flows

Lane	Scenario 1: AM19+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	988(In) 264(Out)
1/2 (short)	724
2/1 (short)	202
2/2 (with short)	685(In) 483(Out)
3/1 (with short)	1344(In) 1090(Out)
3/2 (short)	254
4/1	1573
5/1	518
6/1	926

Ashford Willington Proposed LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	2.70	0.00	Y	Arm 6 Left	12.00	100.0 %	1676	1676
2/2 (Ashford Rd (E))	2.70	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1885	1885
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 2: 'AM24+C+D' (FG5: 'AM 2024 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	280	783	1063
	B	513	0	215	728
	C	1136	269	0	1405
	Tot.	1649	549	998	3196

Traffic Lane Flows

Lane	Scenario 2: AM24+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1063(In) 280(Out)
1/2 (short)	783
2/1 (short)	215
2/2 (with short)	728(In) 513(Out)
3/1 (with short)	1405(In) 1136(Out)
3/2 (short)	269
4/1	1649
5/1	549
6/1	998

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	2.70	0.00	Y	Arm 6 Left	12.00	100.0 %	1676	1676
2/2 (Ashford Rd (E))	2.70	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1885	1885
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 3: 'AM29+C+D' (FG7: 'AM 2029 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	295	799	1094
	B	541	0	226	767
	C	1179	284	0	1463
	Tot.	1720	579	1025	3324

Traffic Lane Flows

Lane	Scenario 3: AM29+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1094(In) 295(Out)
1/2 (short)	799
2/1 (short)	226
2/2 (with short)	767(In) 541(Out)
3/1 (with short)	1463(In) 1179(Out)
3/2 (short)	284
4/1	1720
5/1	579
6/1	1025

Ashford Willington Proposed LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	2.70	0.00	Y	Arm 6 Left	12.00	100.0 %	1676	1676
2/2 (Ashford Rd (E))	2.70	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1885	1885
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 4: 'PM19+C+D' (FG10: 'PM 2019 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	395	883	1278
	B	358	0	244	602
	C	824	291	0	1115
	Tot.	1182	686	1127	2995

Traffic Lane Flows

Lane	Scenario 4: PM19+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1278(In) 395(Out)
1/2 (short)	883
2/1 (short)	244
2/2 (with short)	602(In) 358(Out)
3/1 (with short)	1115(In) 824(Out)
3/2 (short)	291
4/1	1182
5/1	686
6/1	1127

Ashford Willington Proposed LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	2.70	0.00	Y	Arm 6 Left	12.00	100.0 %	1676	1676
2/2 (Ashford Rd (E))	2.70	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1885	1885
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 5: 'PM24+C+D' (FG12: 'PM 2024 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	422	923	1345
	B	383	0	260	643
	C	869	311	0	1180
	Tot.	1252	733	1183	3168

Traffic Lane Flows

Lane	**Scenario 5: PM24+C+D**
Junction: Ashford Rd / Willington St	
1/1 (with short)	1345(In) 422(Out)
1/2 (short)	923
2/1 (short)	260
2/2 (with short)	643(In) 383(Out)
3/1 (with short)	1180(In) 869(Out)
3/2 (short)	311
4/1	1252
5/1	733
6/1	1183

Ashford Willington Proposed LinSig Data

Lane Saturation Flows

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
Junction: Ashford Rd / Willington St								
1/1 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	2.70	0.00	Y	Arm 6 Left	12.00	100.0 %	1676	1676
2/2 (Ashford Rd (E))	2.70	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1885	1885
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 6: 'PM29+C+D' (FG14: 'PM 2029 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	447	959	1406
	B	406	0	276	682
	C	910	329	0	1239
	Tot.	1316	776	1235	3327

Traffic Lane Flows

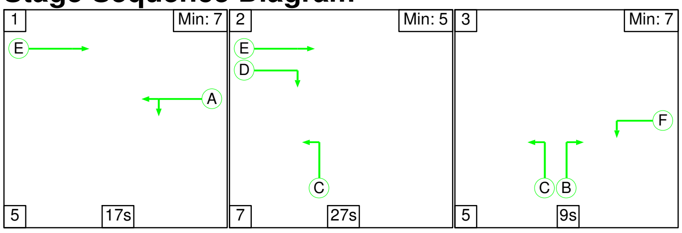
Lane	Scenario 6: PM29+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1406(In) 447(Out)
1/2 (short)	959
2/1 (short)	276
2/2 (with short)	682(In) 406(Out)
3/1 (with short)	1239(In) 910(Out)
3/2 (short)	329
4/1	1316
5/1	776
6/1	1235

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	2.70	0.00	Y	Arm 6 Left	12.00	100.0 %	1676	1676
2/2 (Ashford Rd (E))	2.70	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1885	1885
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 1: 'AM19+C+D' (FG3: 'AM 2019 + Committed + Development', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

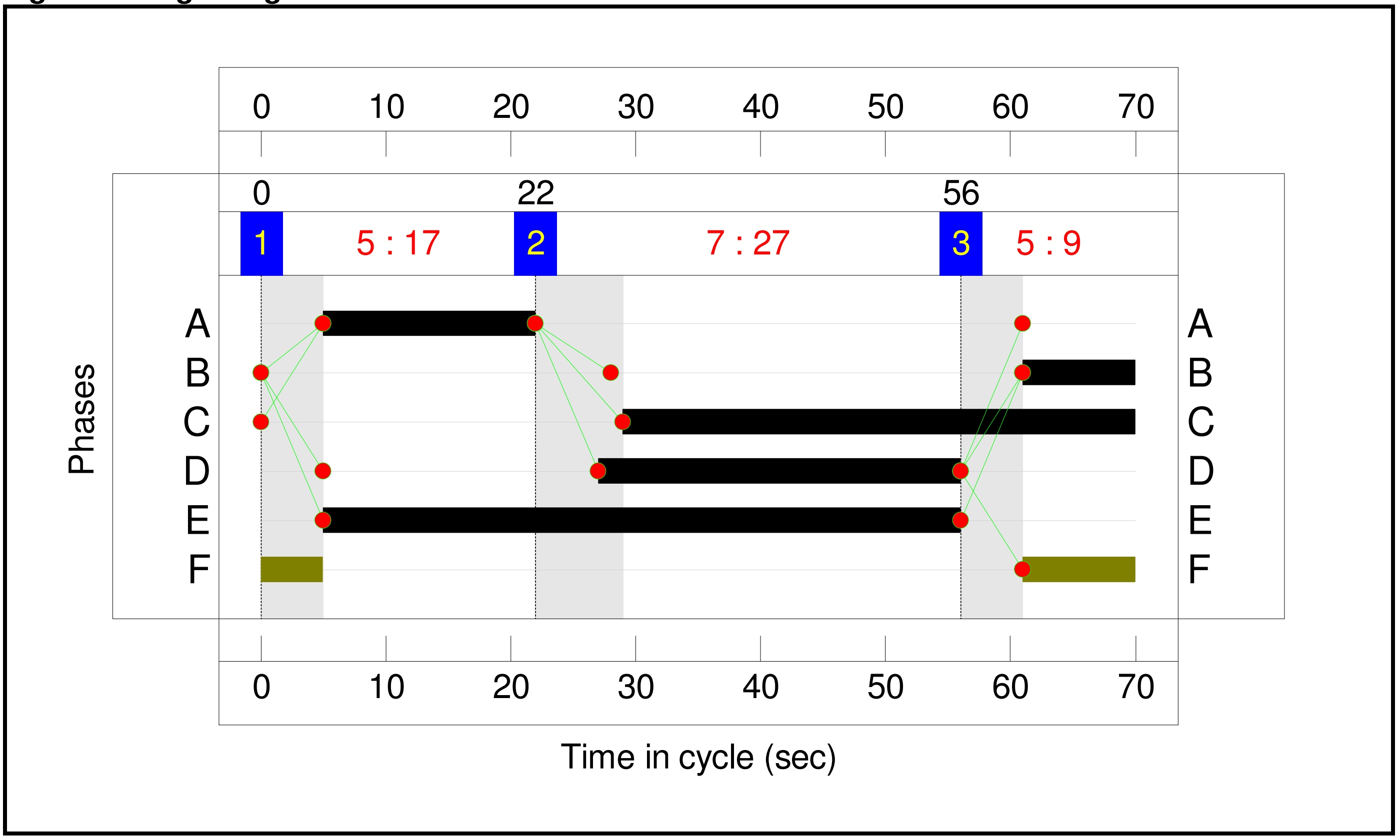


Stage Timings

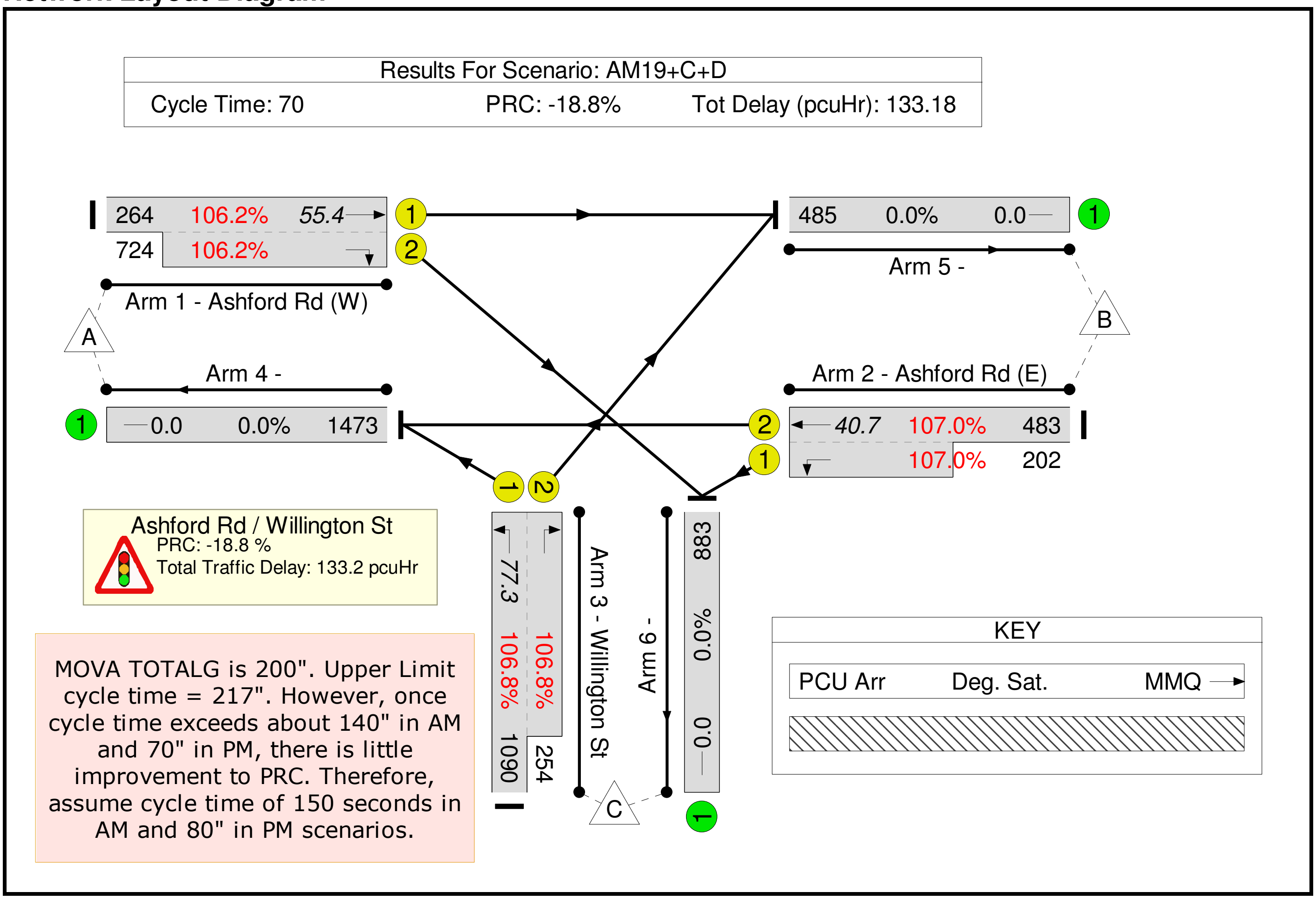
Stage	1	2	3
Duration	17	27	9
Change Point	0	22	56

Ashford Willington Proposed LinSig Data

Signal Timings Diagram



Network Layout Diagram



Ashford Willington Proposed LinSig Data

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: Ashford Willington Proposed	-	-	**N/A**	-	-		-	-	-	-	-	-	**107.0%**
Ashford Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**107.0%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	51:29	-	988	1915:1730	249+682	106.2 : 106.2%
2/2+2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A	F	1	17:31	14	685	1885:1676	452+189	107.0 : 107.0%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	41:9	-	1344	1802:1751	1021+238	106.8 : 106.8%
4/1		U	N/A	N/A	-		-	-	-	1573	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	518	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	926	Inf	Inf	0.0%

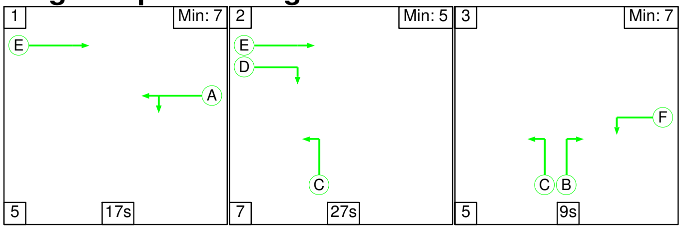
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington Proposed	-	-	**0**	**0**	**0**	**19.5**	**113.7**	**0.0**	**133.2**	-	-	-	-
Ashford Rd / Willington St	-	-	**0**	**0**	**0**	**19.5**	**113.7**	**0.0**	**133.2**	-	-	-	-
1/1+1/2	988	930	-	-	-	5.5	35.8	-	41.4	150.7	19.6	35.8	55.4
2/2+2/1	685	653	-	-	-	5.8	28.3	-	34.1	179.2	12.3	28.3	40.7
3/1+3/2	1344	1258	-	-	-	8.1	49.6	-	57.7	154.6	27.7	49.6	77.3
4/1	1473	1473	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	485	485	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	883	883	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -18.8 Total Delay for Signalled Lanes (pcuHr): 133.18 Cycle Time (s): 70
PRC Over All Lanes (%): -18.8 Total Delay Over All Lanes(pcuHr): 133.18

Ashford Willington Proposed LinSig Data

Scenario 2: 'AM24+C+D' (FG5: 'AM 2024 + Committed + Development', Plan 1: 'Network Control Plan 1')

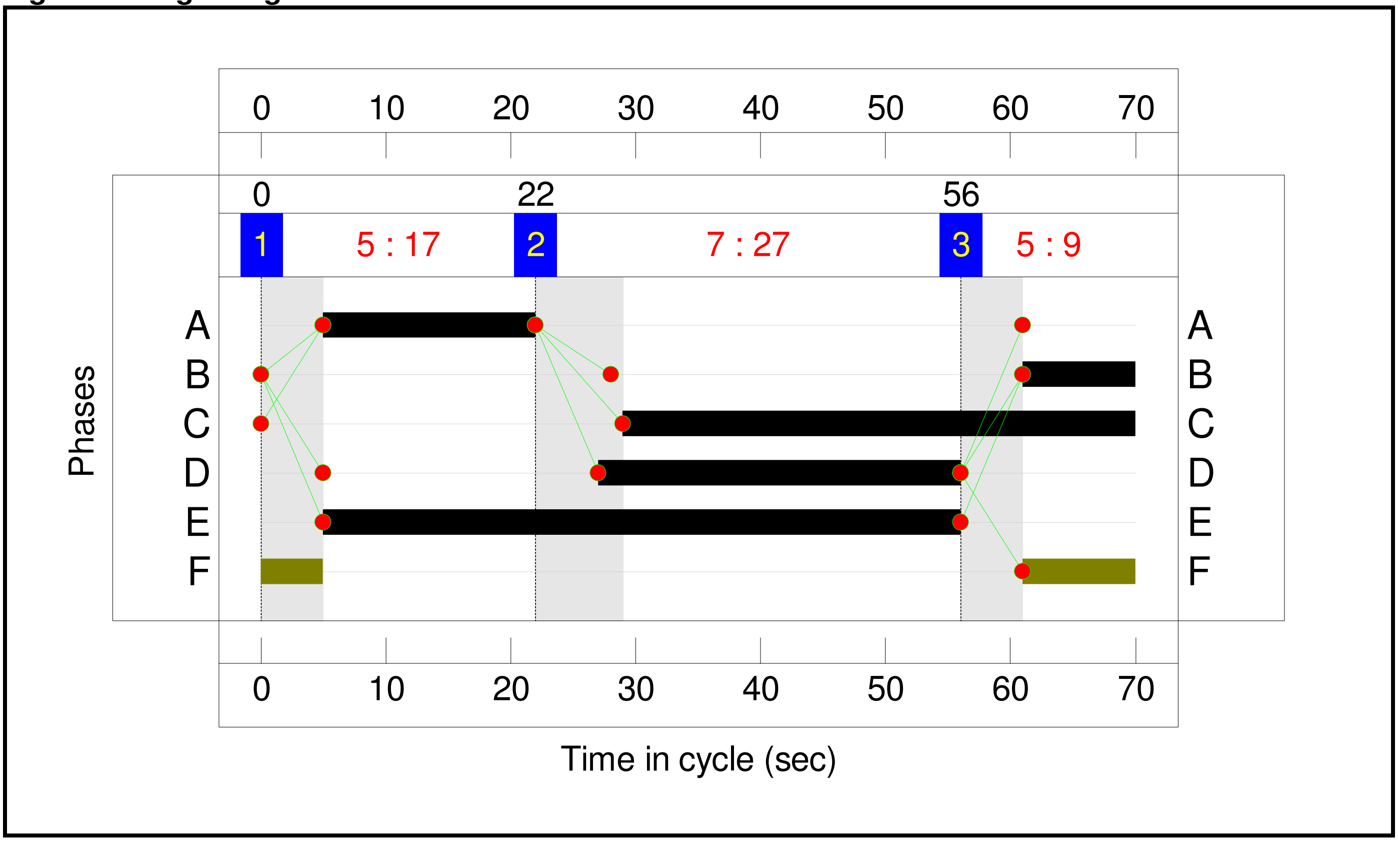
Stage Sequence Diagram



Stage Timings

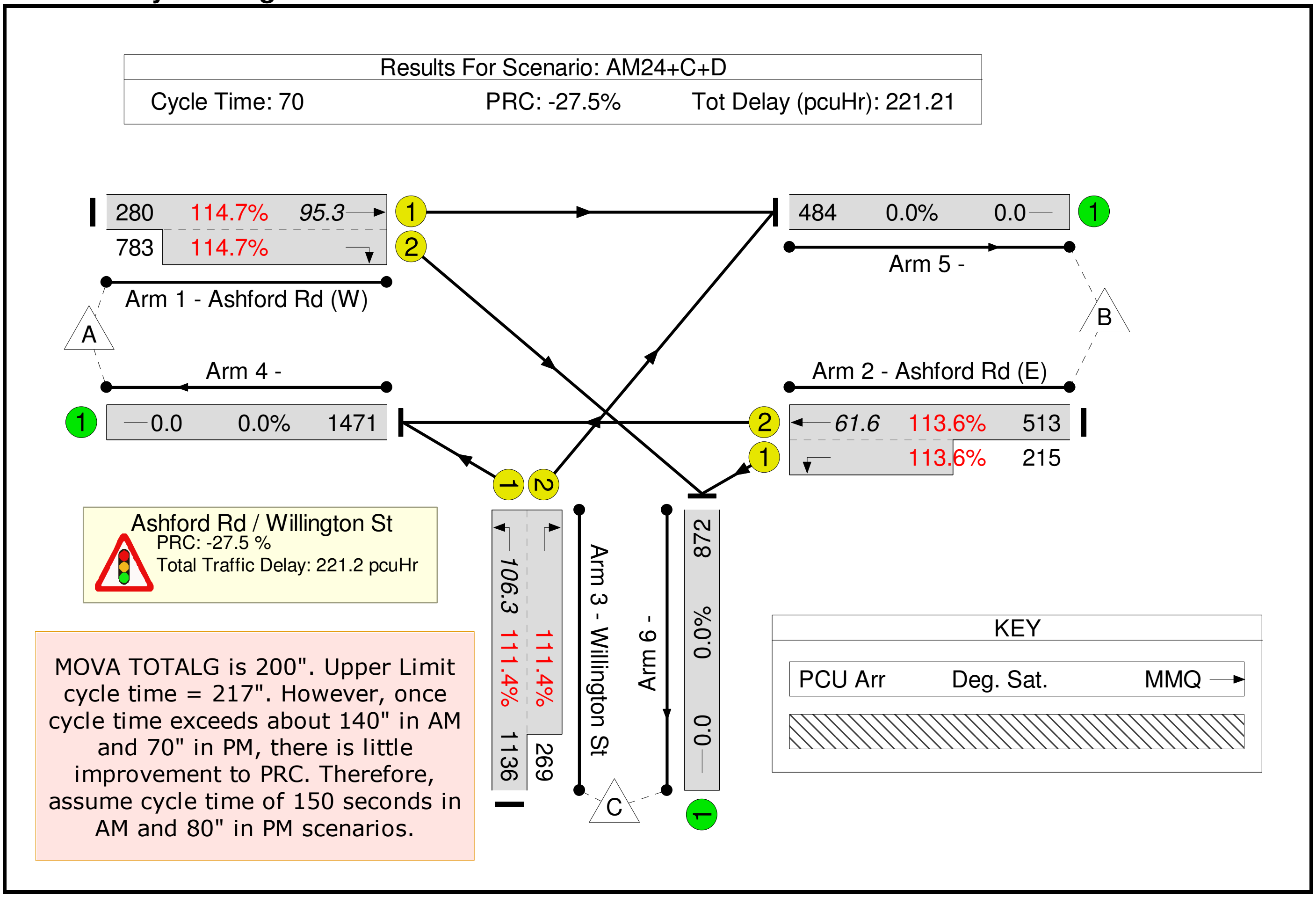
Stage	1	2	3
Duration	17	27	9
Change Point	0	22	56

Signal Timings Diagram



Ashford Willington Proposed LinSig Data

Network Layout Diagram



Ashford Willington Proposed LinSig Data

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: Ashford Willington Proposed	-	-	**N/A**	-	-		-	-	-	-	-	-	**114.7%**
Ashford Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**114.7%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	51:29	-	1063	1915:1730	244+682	114.7 : 114.7%
2/2+2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A	F	1	17:31	14	728	1885:1676	452+189	113.6 : 113.6%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	41:9	-	1405	1802:1751	1020+241	111.4 : 111.4%
4/1		U	N/A	N/A	-		-	-	-	1649	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	549	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	998	Inf	Inf	0.0%

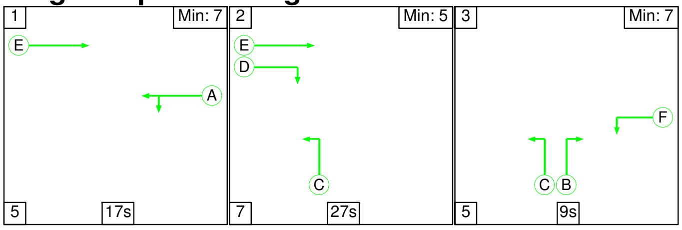
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington Proposed	-	-	**0**	**0**	**0**	**25.3**	**195.9**	**0.0**	**221.2**	-	-	-	-
Ashford Rd / Willington St	-	-	**0**	**0**	**0**	**25.3**	**195.9**	**0.0**	**221.2**	-	-	-	-
1/1+1/2	1063	926	-	-	-	8.0	72.0	-	79.9	270.7	23.3	72.0	95.3
2/2+2/1	728	641	-	-	-	7.5	47.5	-	55.0	272.0	14.1	47.5	61.6
3/1+3/2	1405	1260	-	-	-	9.8	76.4	-	86.3	221.0	29.8	76.4	106.3
4/1	1471	1471	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	484	484	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	872	872	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -27.5 Total Delay for Signalled Lanes (pcuHr): 221.21 Cycle Time (s): 70
PRC Over All Lanes (%): -27.5 Total Delay Over All Lanes(pcuHr): 221.21

Ashford Willington Proposed LinSig Data

Scenario 3: 'AM29+C+D' (FG7: 'AM 2029 + Committed + Development', Plan 1: 'Network Control Plan 1')

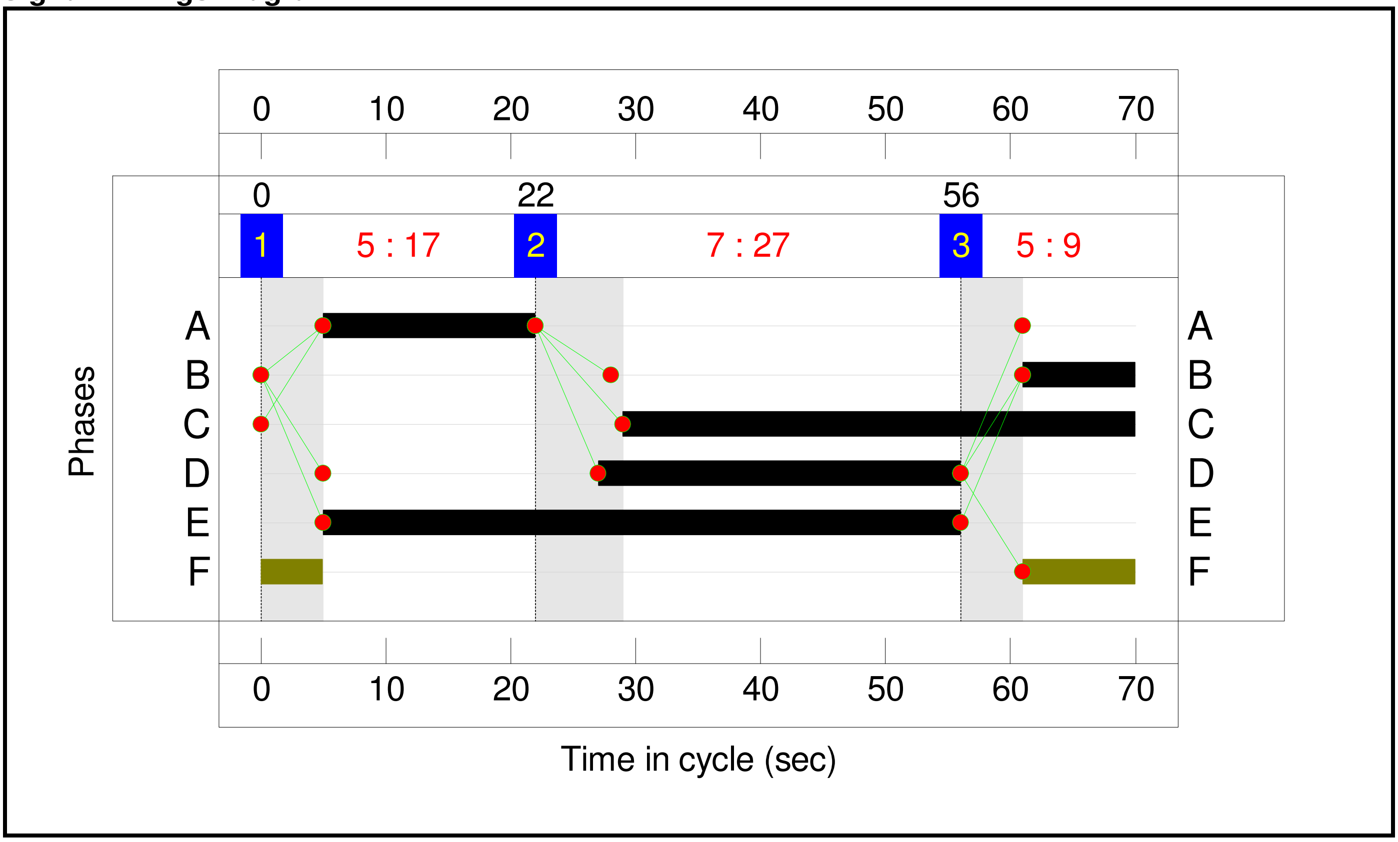
Stage Sequence Diagram



Stage Timings

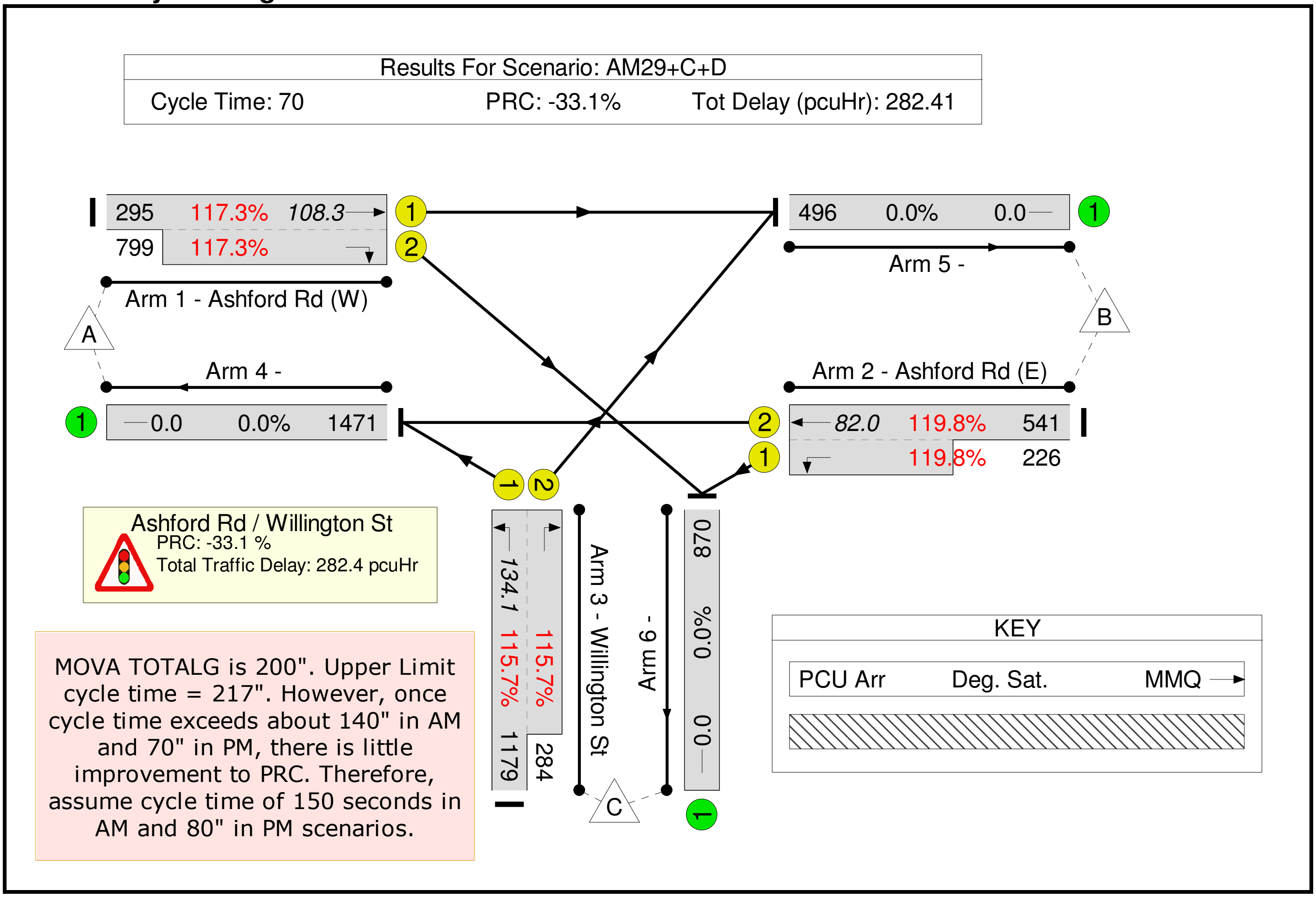
Stage	1	2	3
Duration	17	27	9
Change Point	0	22	56

Signal Timings Diagram



Ashford Willington Proposed LinSig Data

Network Layout Diagram



Ashford Willington Proposed LinSig Data

Network Results

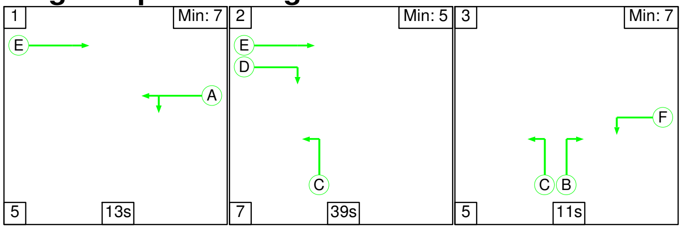
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Ashford Willington Proposed	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**119.8%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**119.8%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	51:29	-	1094	1915:1730	251+681	117.3 : 117.3%
2/2+2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A	F	1	17:31	14	767	1885:1676	452+189	119.8 : 119.8%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	41:9	-	1463	1802:1751	1019+245	115.7 : 115.7%
4/1		U	N/A	N/A	-		-	-	-	1720	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	579	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1025	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington Proposed	**-**	**-**	**0**	**0**	**0**	**29.3**	**253.1**	**0.0**	**282.4**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**29.3**	**253.1**	**0.0**	**282.4**	**-**	**-**	**-**	**-**
1/1+1/2	1094	933	-	-	-	8.7	84.0	-	92.7	305.1	24.3	84.0	108.3
2/2+2/1	767	640	-	-	-	9.2	66.3	-	75.4	354.1	15.7	66.3	82.0
3/1+3/2	1463	1264	-	-	-	11.4	102.8	-	114.3	281.2	31.3	102.8	134.1
4/1	1471	1471	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	496	496	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	870	870	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -33.1 Total Delay for Signalled Lanes (pcuHr): 282.41 Cycle Time (s): 70
PRC Over All Lanes (%): -33.1 Total Delay Over All Lanes(pcuHr): 282.41

Ashford Willington Proposed LinSig Data
Scenario 4: 'PM19+C+D' (FG10: 'PM 2019 + Committed + Development', Plan 1: 'Network Control Plan 1')

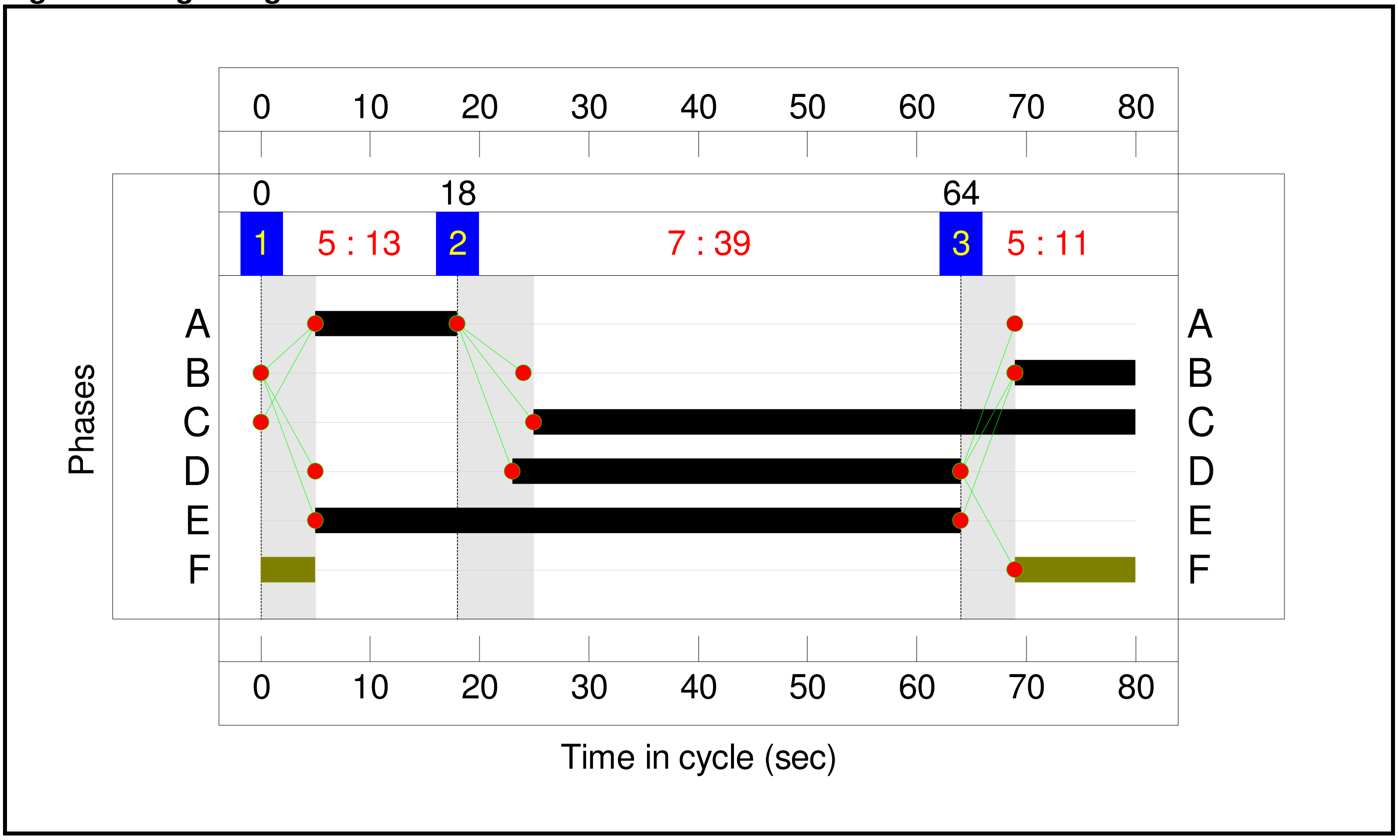
Stage Sequence Diagram



Stage Timings

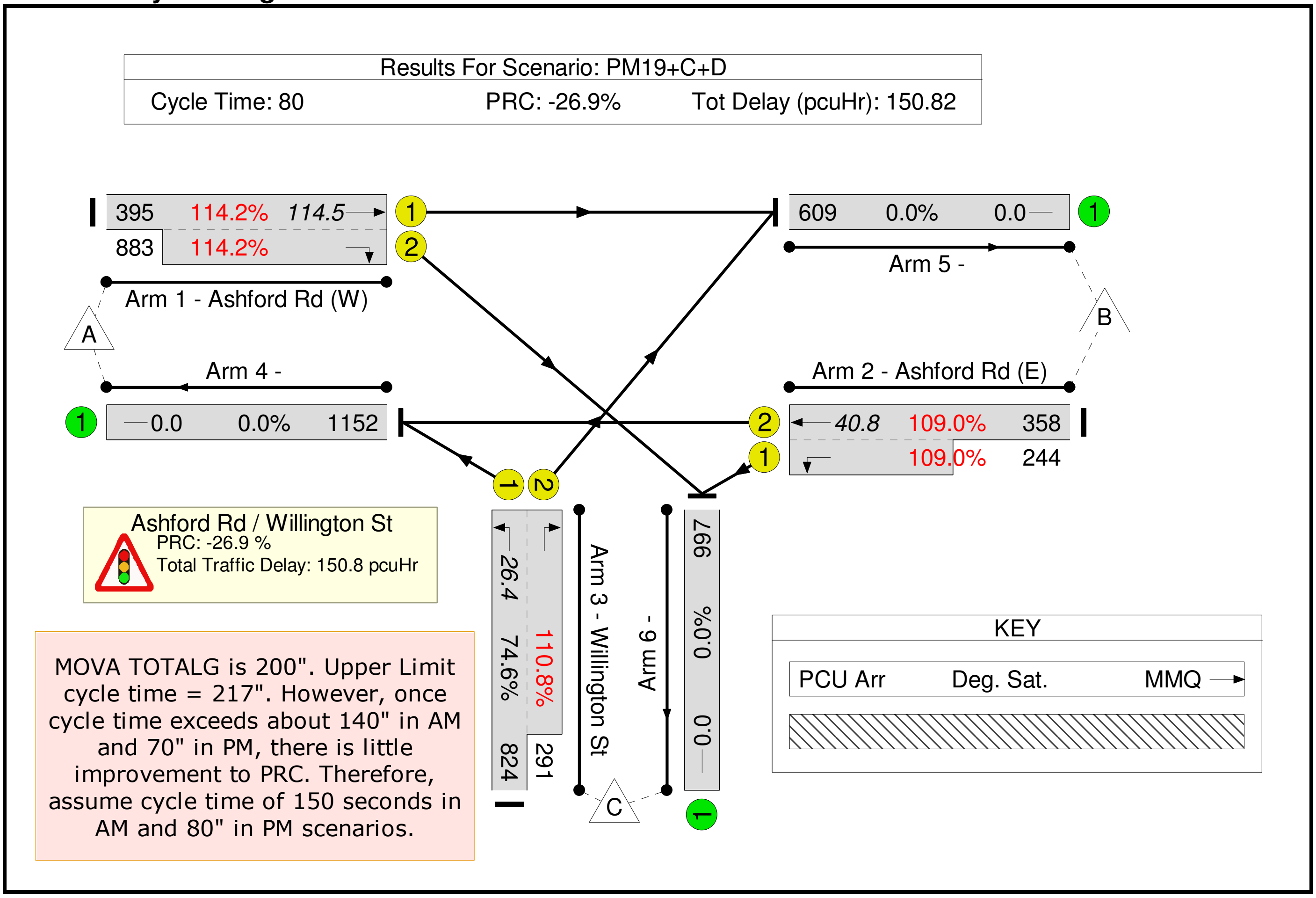
Stage	1	2	3
Duration	13	39	11
Change Point	0	18	64

Signal Timings Diagram



Ashford Willington Proposed LinSig Data

Network Layout Diagram



Ashford Willington Proposed LinSig Data

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: Ashford Willington Proposed	-	-	**N/A**	-	-		-	-	-	-	-	-	**114.2%**
Ashford Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**114.2%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	59:41	-	1278	1915:1730	346+773	114.2 : 114.2%
2/2+2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A	F	1	13:29	16	602	1885:1676	328+224	109.0 : 109.0%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	55:11	-	1115	1802:1751	1105+263	74.6 : 110.8%
4/1		U	N/A	N/A	-		-	-	-	1182	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	686	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1127	Inf	Inf	0.0%

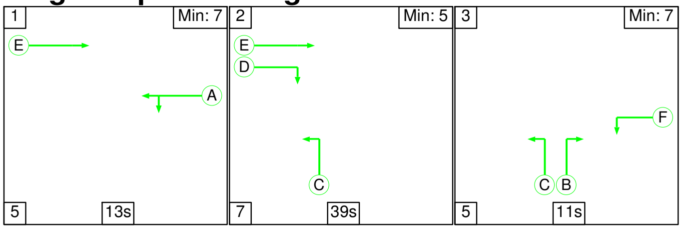
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington Proposed	-	-	**0**	**0**	**0**	**21.4**	**129.5**	**0.0**	**150.8**	-	-	-	-
Ashford Rd / Willington St	-	-	**0**	**0**	**0**	**21.4**	**129.5**	**0.0**	**150.8**	-	-	-	-
1/1+1/2	1278	1119	-	-	-	9.9	83.1	-	93.1	262.1	31.4	83.1	114.5
2/2+2/1	602	552	-	-	-	6.5	30.0	-	36.5	218.2	10.8	30.0	40.8
3/1+3/2	1115	1087	-	-	-	4.9	16.3	-	21.3	68.7	10.1	16.3	26.4
4/1	1152	1152	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	609	609	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	997	997	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -26.9 Total Delay for Signalled Lanes (pcuHr): 150.82 Cycle Time (s): 80
PRC Over All Lanes (%): -26.9 Total Delay Over All Lanes(pcuHr): 150.82

Ashford Willington Proposed LinSig Data

Scenario 5: 'PM24+C+D' (FG12: 'PM 2024 + Committed + Development', Plan 1: 'Network Control Plan 1')

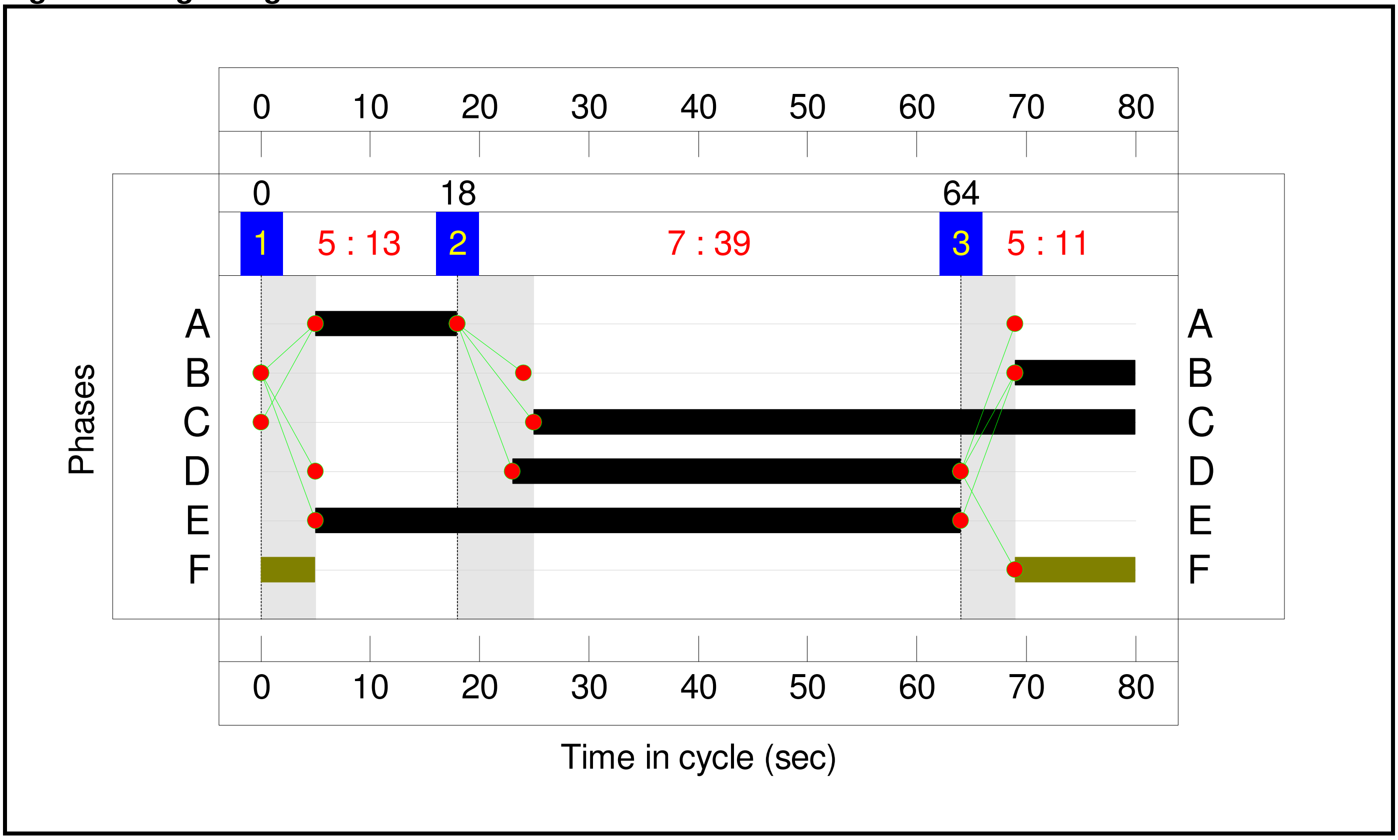
Stage Sequence Diagram



Stage Timings

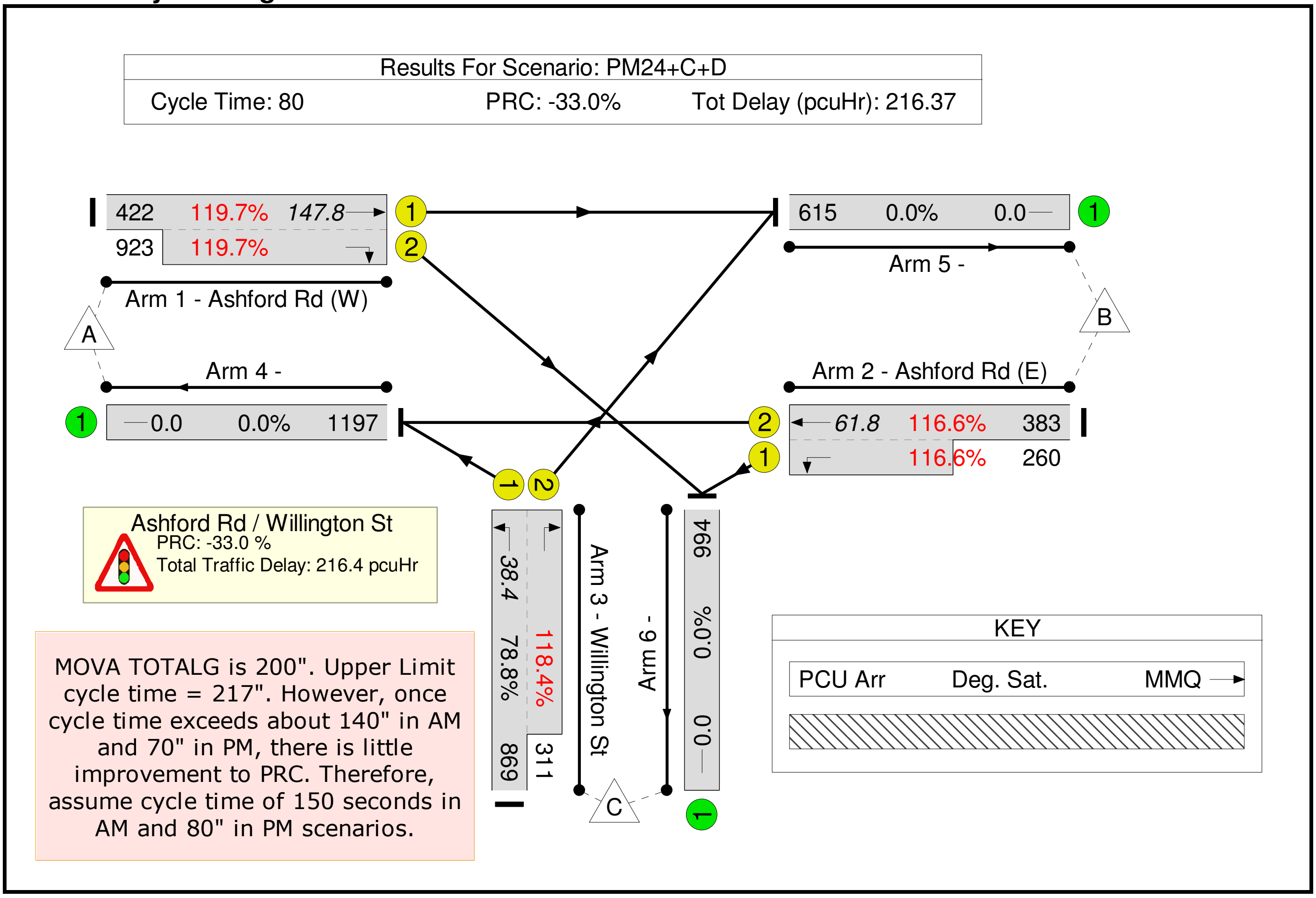
Stage	1	2	3
Duration	13	39	11
Change Point	0	18	64

Signal Timings Diagram



Ashford Willington Proposed LinSig Data

Network Layout Diagram



Ashford Willington Proposed LinSig Data

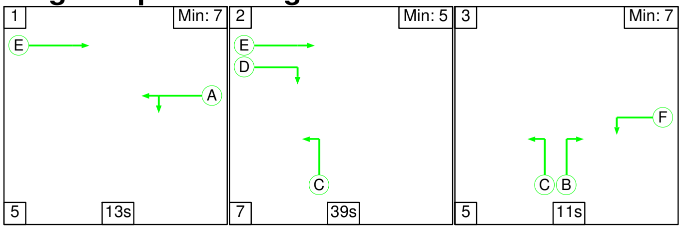
Network Results

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: Ashford Willington Proposed	-	-	**N/A**	-	-		-	-	-	-	-	-	**119.7%**
Ashford Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**119.7%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	59:41	-	1345	1915:1730	353+771	119.7 : 119.7%
2/2+2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A	F	1	13:29	16	643	1885:1676	328+223	116.6 : 116.6%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	55:11	-	1180	1802:1751	1103+263	78.8 : 118.4%
4/1		U	N/A	N/A	-		-	-	-	1252	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	733	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1183	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington Proposed	-	-	**0**	**0**	**0**	**26.5**	**189.8**	**0.0**	**216.4**	-	-	-	-
Ashford Rd / Willington St	-	-	**0**	**0**	**0**	**26.5**	**189.8**	**0.0**	**216.4**	-	-	-	-
1/1+1/2	1345	1124	-	-	-	12.2	113.4	-	125.7	336.3	34.3	113.4	147.8
2/2+2/1	643	551	-	-	-	8.6	49.1	-	57.7	323.2	12.6	49.1	61.8
3/1+3/2	1180	1132	-	-	-	5.7	27.3	-	33.0	100.6	11.1	27.3	38.4
4/1	1197	1197	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	615	615	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	994	994	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -33.0 Total Delay for Signalled Lanes (pcuHr): 216.37 Cycle Time (s): 80
PRC Over All Lanes (%): -33.0 Total Delay Over All Lanes(pcuHr): 216.37

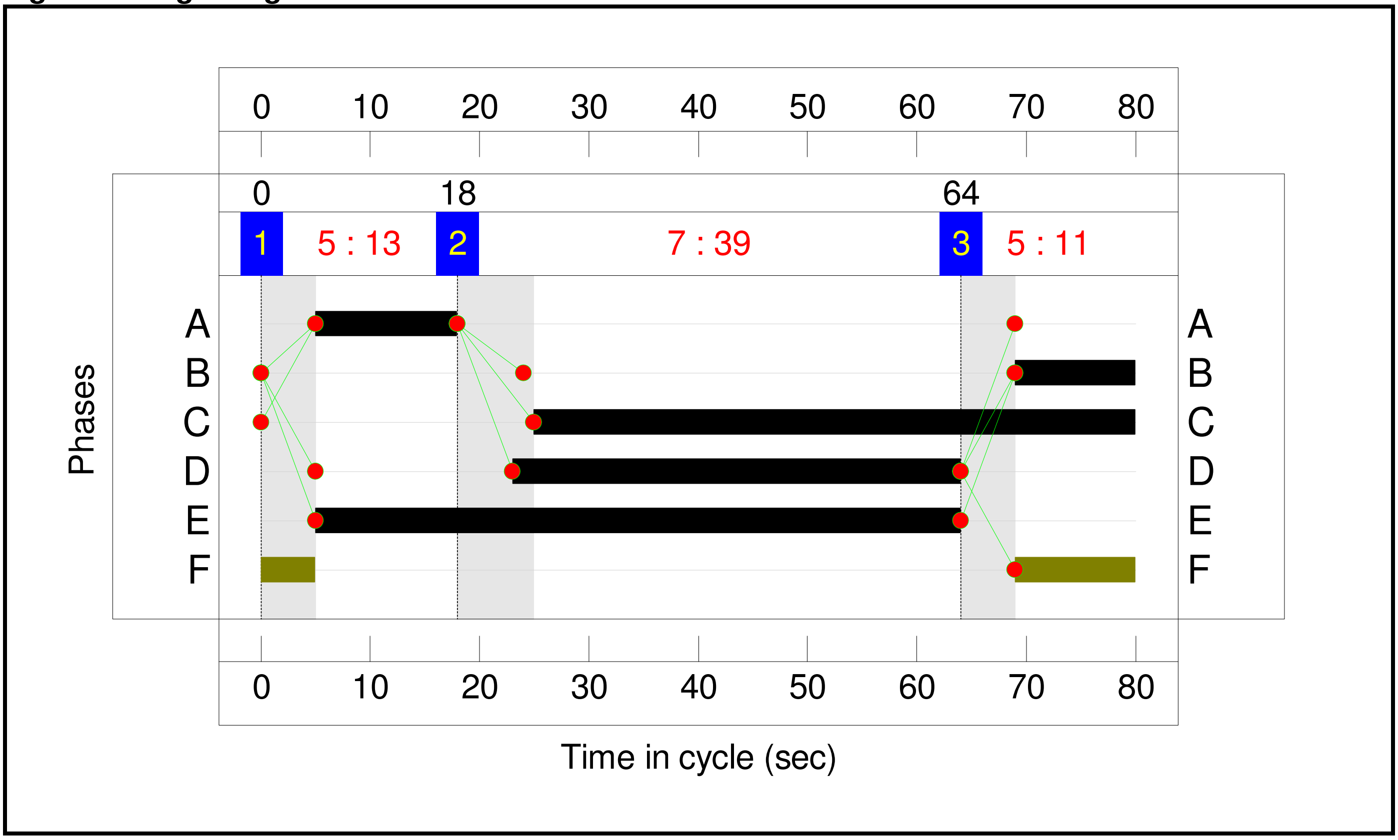
Ashford Willington Proposed LinSig Data
Scenario 6: 'PM29+C+D' (FG14: 'PM 2029 + Committed + Development', Plan 1: 'Network Control Plan 1')
Stage Sequence Diagram



Stage Timings

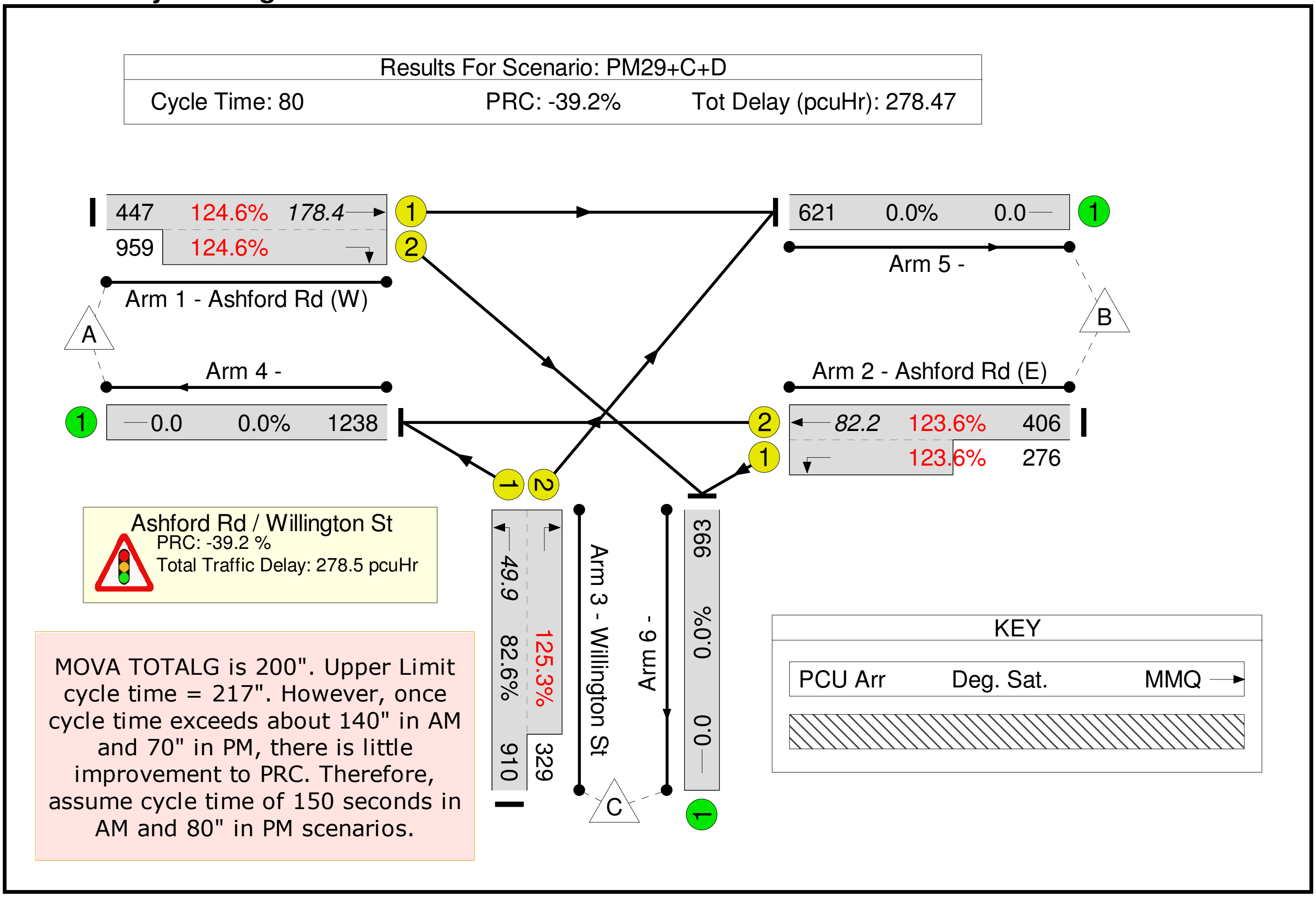
Stage	1	2	3
Duration	13	39	11
Change Point	0	18	64

Signal Timings Diagram



Ashford Willington Proposed LinSig Data

Network Layout Diagram



Ashford Willington Proposed LinSig Data

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: Ashford Willington Proposed	-	-	**N/A**	-	-		-	-	-	-	-	-	**125.3%**
Ashford Rd / Willington St	-	-	**N/A**	-	-		-	-	-	-	-	-	**125.3%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	59:41	-	1406	1915:1730	359+770	124.6 : 124.6%
2/2+2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A	F	1	13:29	16	682	1885:1676	328+223	123.6 : 123.6%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	55:11	-	1239	1802:1751	1102+263	82.6 : 125.3%
4/1		U	N/A	N/A	-		-	-	-	1316	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	776	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1235	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington Proposed	-	-	**0**	**0**	**0**	**31.6**	**246.9**	**0.0**	**278.5**	-	-	-	-
Ashford Rd / Willington St	-	-	**0**	**0**	**0**	**31.6**	**246.9**	**0.0**	**278.5**	-	-	-	-
1/1+1/2	1406	1128	-	-	-	14.3	141.4	-	155.7	398.6	37.1	141.4	178.4
2/2+2/1	682	552	-	-	-	10.5	67.7	-	78.2	413.0	14.4	67.7	82.2
3/1+3/2	1239	1173	-	-	-	6.8	37.8	-	44.5	129.4	12.1	37.8	49.9
4/1	1238	1238	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	621	621	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	993	993	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

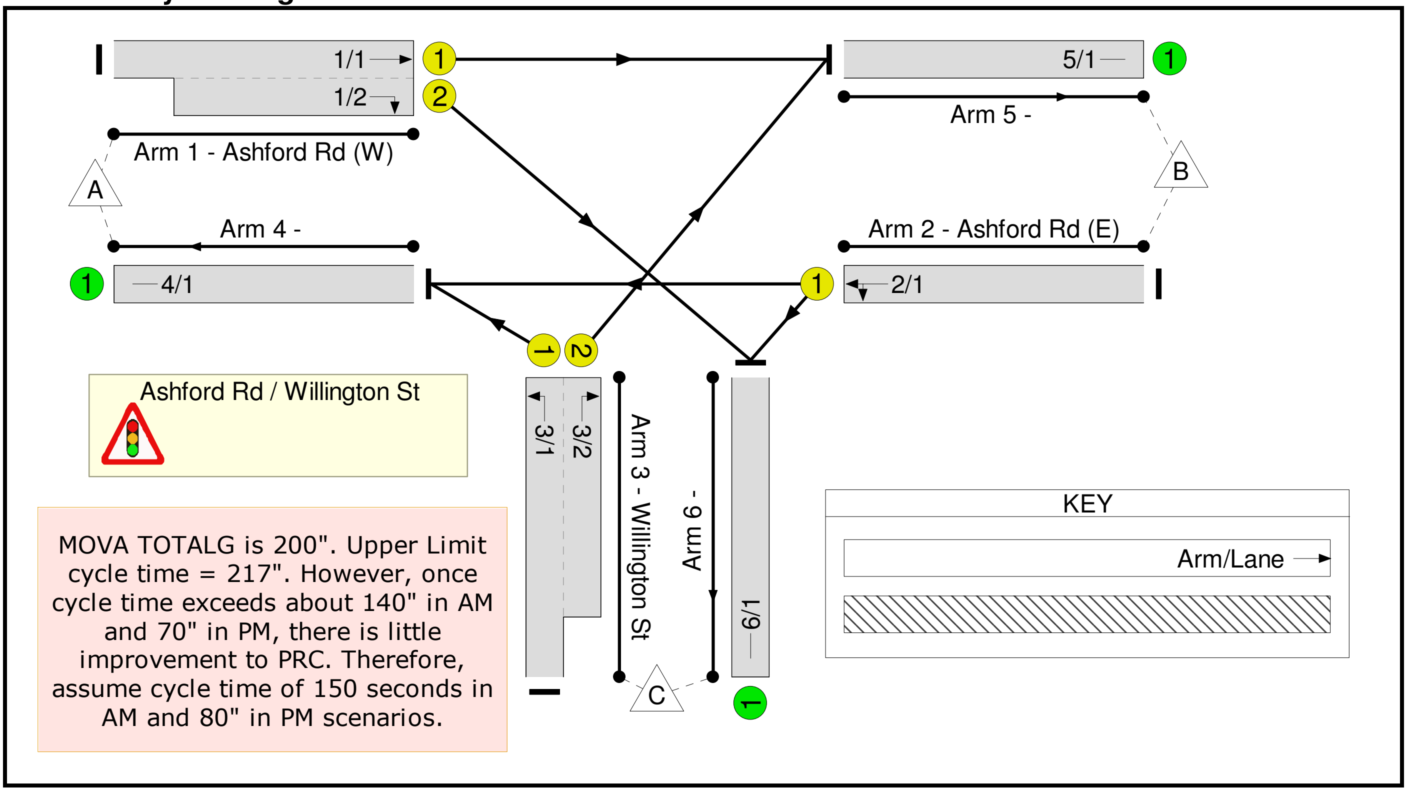
C1 PRC for Signalled Lanes (%): -39.2 Total Delay for Signalled Lanes (pcuHr): 278.47 Cycle Time (s): 80
PRC Over All Lanes (%): -39.2 Total Delay Over All Lanes(pcuHr): 278.47

Ashford Willington LinSig Data

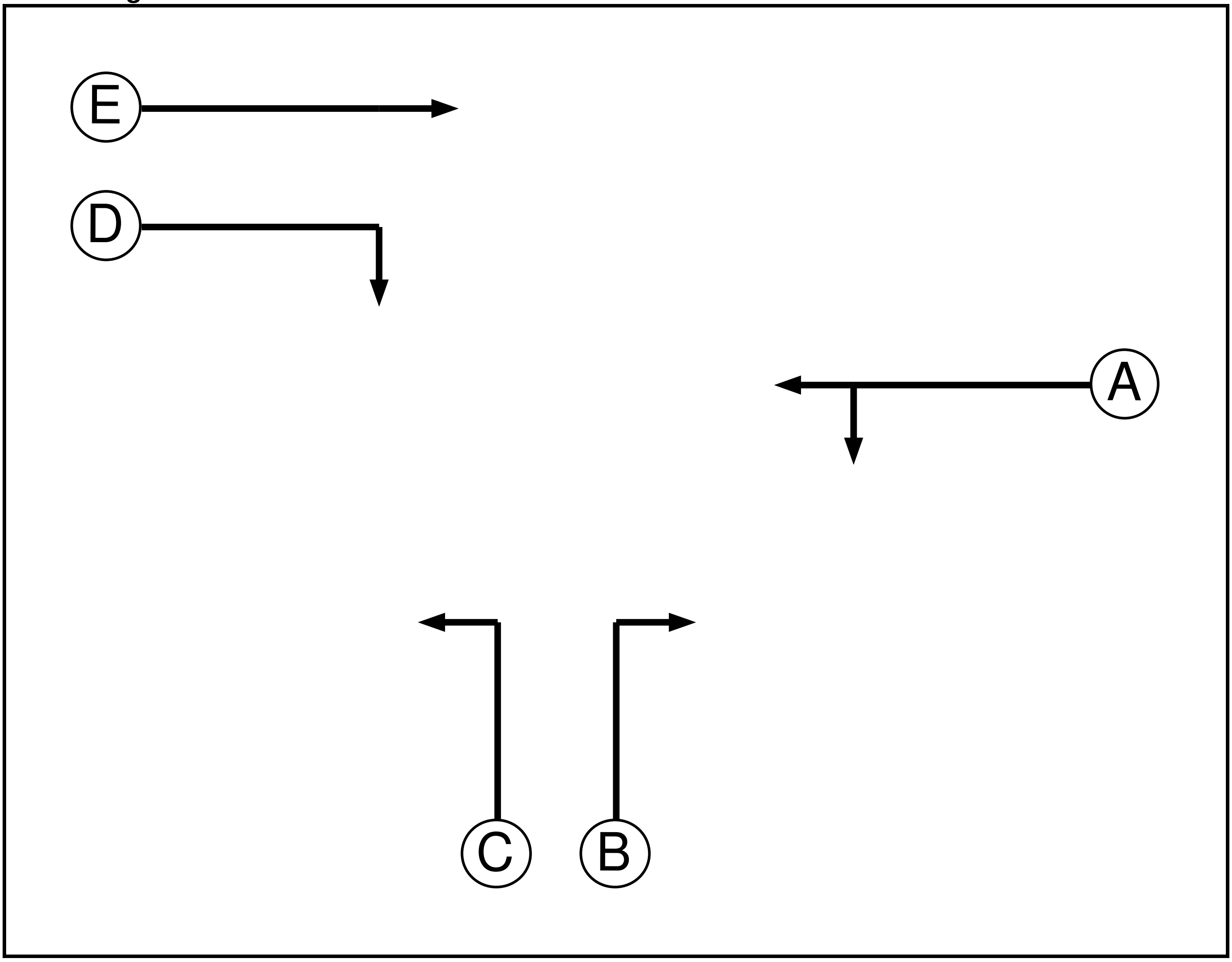
User and Project Details

Project:	**15021 Sutton Rd June 2015**
Title:	**Ashford Willington**
Location:	Maidstone
File name:	Ashford Willington.lsg3x
Author:	Simon Swanston
Company:	JCT Consultancy
Address:	LinSig House, Deepdale Lane, Nettleham, Lincoln, LN2 2LL
Notes:	

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		-9999	7
B	Traffic		-9999	7
C	Traffic		-9999	7
D	Traffic		-9999	7
E	Traffic		-9999	7

Ashford Willington LinSig Data

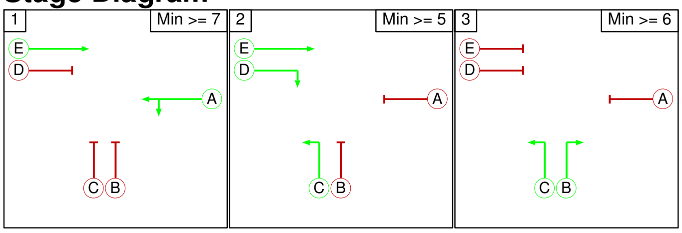
Phase Intergreens Matrix

		Starting Phase				
		A	B	C	D	E
Terminating Phase	A		6	7	5	-
	B	5		-	5	5
	C	5	-		-	-
	D	5	5	-		-
	E	-	5	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A E
2	C D E
3	B C

Stage Diagram



Phase Delays

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

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		7	7
	2	5		5
	3	5	5	

Ashford Willington LinSig Data

Give-Way Lane Input Data

Junction: Ashford Rd / Willington St
There are no Opposed Lanes in this Junction

Ashford Willington LinSig Data

Lane Input Data

Junction: Ashford Rd / Willington St												
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 (Ashford Rd (W))	U	E	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 5 Ahead	Inf
1/2 (Ashford Rd (W))	U	D	2	3	10.0	Geom	-	3.00	0.00	Y	Arm 6 Right	14.00
2/1 (Ashford Rd (E))	U	A	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Ahead	Inf
											Arm 6 Left	20.00
3/1 (Willington St)	U	C	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 4 Left	24.00
3/2 (Willington St)	U	B	2	3	15.0	Geom	-	3.00	0.00	Y	Arm 5 Right	16.00
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM Survey'	07:30	08:30	01:00	
2: 'AM 2019 + Committed'	07:30	08:30	01:00	
3: 'AM 2019 + Committed + Development'	07:30	08:30	01:00	
4: 'AM 2024 + Committed'	07:30	08:30	01:00	
5: 'AM 2024 + Committed + Development'	07:30	08:30	01:00	
6: 'AM 2029 + Committed'	07:30	08:30	01:00	
7: 'AM 2029 + Committed + Development'	07:30	08:30	01:00	
8: 'PM Survey'	17:00	18:00	01:00	
9: 'PM 2019 + Committed'	17:00	18:00	01:00	
10: 'PM 2019 + Committed + Development'	17:00	18:00	01:00	
11: 'PM 2024 + Committed'	17:00	18:00	01:00	
12: 'PM 2024 + Committed + Development'	17:00	18:00	01:00	
13: 'PM 2029 + Committed'	17:00	18:00	01:00	
14: 'PM 2029 + Committed + Development'	17:00	18:00	01:00	

Scenario 1: 'AM Survey' (FG1: 'AM Survey', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	250	598	848
	B	458	0	192	650
	C	715	240	0	955
	Tot.	1173	490	790	2453

Traffic Lane Flows

Lane	Scenario 1: AM Survey
Junction: Ashford Rd / Willington St	
1/1 (with short)	848(In) 250(Out)
1/2 (short)	598
2/1	650
3/1 (with short)	955(In) 715(Out)
3/2 (short)	240
4/1	1173
5/1	490
6/1	790

Ashford Willington LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	70.5 %	1898	1898
				Arm 6 Left	20.00	29.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 2: 'AM19+C' (FG2: 'AM 2019 + Committed', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	264	703	967
	B	483	0	202	685
	C	1009	254	0	1263
	Tot.	1492	518	905	2915

Traffic Lane Flows

Lane	**Scenario 2: AM19+C**
Junction: Ashford Rd / Willington St	
1/1 (with short)	967(In) 264(Out)
1/2 (short)	703
2/1	685
3/1 (with short)	1263(In) 1009(Out)
3/2 (short)	254
4/1	1492
5/1	518
6/1	905

Ashford Willington LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	70.5 %	1898	1898
				Arm 6 Left	20.00	29.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 3: 'AM19+C+D' (FG3: 'AM 2019 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	264	724	988
	B	483	0	202	685
	C	1090	254	0	1344
	Tot.	1573	518	926	3017

Traffic Lane Flows

Lane	Scenario 3: AM19+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	988(In) 264(Out)
1/2 (short)	724
2/1	685
3/1 (with short)	1344(In) 1090(Out)
3/2 (short)	254
4/1	1573
5/1	518
6/1	926

Ashford Willington LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	70.5 %	1898	1898
				Arm 6 Left	20.00	29.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 4: 'AM24+C' (FG4: 'AM 2024 + Committed', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	280	742	1022
	B	513	0	215	728
	C	1056	269	0	1325
	Tot.	1569	549	957	3075

Traffic Lane Flows

Lane	**Scenario 4: AM24+C**
Junction: Ashford Rd / Willington St	
1/1 (with short)	1022(In) 280(Out)
1/2 (short)	742
2/1	728
3/1 (with short)	1325(In) 1056(Out)
3/2 (short)	269
4/1	1569
5/1	549
6/1	957

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	70.5 %	1898	1898
				Arm 6 Left	20.00	29.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 5: 'AM24+C+D' (FG5: 'AM 2024 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	280	783	1063
	B	513	0	215	728
	C	1136	269	0	1405
	Tot.	1649	549	998	3196

Traffic Lane Flows

Lane	Scenario 5: AM24+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1063(In) 280(Out)
1/2 (short)	783
2/1	728
3/1 (with short)	1405(In) 1136(Out)
3/2 (short)	269
4/1	1649
5/1	549
6/1	998

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	70.5 %	1898	1898
				Arm 6 Left	20.00	29.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 6: 'AM29+C' (FG6: 'AM 2029 + Committed', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	295	778	1073
	B	541	0	226	767
	C	1099	284	0	1383
	Tot.	1640	579	1004	3223

Traffic Lane Flows

Lane	Scenario 6: AM29+C
Junction: Ashford Rd / Willington St	
1/1 (with short)	1073(In) 295(Out)
1/2 (short)	778
2/1	767
3/1 (with short)	1383(In) 1099(Out)
3/2 (short)	284
4/1	1640
5/1	579
6/1	1004

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	70.5 %	1898	1898
				Arm 6 Left	20.00	29.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 7: 'AM29+C+D' (FG7: 'AM 2029 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	295	799	1094
	B	541	0	226	767
	C	1179	284	0	1463
	Tot.	1720	579	1025	3324

Traffic Lane Flows

Lane	Scenario 7: AM29+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1094(In) 295(Out)
1/2 (short)	799
2/1	767
3/1 (with short)	1463(In) 1179(Out)
3/2 (short)	284
4/1	1720
5/1	579
6/1	1025

Ashford Willington LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	70.5 %	1898	1898
				Arm 6 Left	20.00	29.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 8: 'PM Survey' (FG8: 'PM Survey', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	372	539	911
	B	337	0	229	566
	C	605	274	0	879
	Tot.	942	646	768	2356

Traffic Lane Flows

Lane	**Scenario 8: PM Survey**
Junction: Ashford Rd / Willington St	
1/1 (with short)	911(In) 372(Out)
1/2 (short)	539
2/1	566
3/1 (with short)	879(In) 605(Out)
3/2 (short)	274
4/1	942
5/1	646
6/1	768

Ashford Willington LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	59.5 %	1883	1883
				Arm 6 Left	20.00	40.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 9: 'PM19+C' (FG9: 'PM 2019 + Committed', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	395	809	1204
	B	358	0	244	602
	C	781	291	0	1072
	Tot.	1139	686	1053	2878

Traffic Lane Flows

Lane	Scenario 9: PM19+C
Junction: Ashford Rd / Willington St	
1/1 (with short)	1204(In) 395(Out)
1/2 (short)	809
2/1	602
3/1 (with short)	1072(In) 781(Out)
3/2 (short)	291
4/1	1139
5/1	686
6/1	1053

Ashford Willington LinSig Data

Lane Saturation Flows

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
Junction: Ashford Rd / Willington St								
1/1 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	59.5 %	1883	1883
				Arm 6 Left	20.00	40.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 10: 'PM19+C+D' (FG10: 'PM 2019 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	395	883	1278
	B	358	0	244	602
	C	824	291	0	1115
	Tot.	1182	686	1127	2995

Traffic Lane Flows

Lane	Scenario 10: PM19+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1278(In) 395(Out)
1/2 (short)	883
2/1	602
3/1 (with short)	1115(In) 824(Out)
3/2 (short)	291
4/1	1182
5/1	686
6/1	1127

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	59.5 %	1883	1883
				Arm 6 Left	20.00	40.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 11: 'PM24+C' (FG11: 'PM 2024 + Committed', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	422	849	1271
	B	383	0	260	643
	C	825	311	0	1136
	Tot.	1208	733	1109	3050

Traffic Lane Flows

Lane	Scenario 11: PM24+C
Junction: Ashford Rd / Willington St	
1/1 (with short)	1271(In) 422(Out)
1/2 (short)	849
2/1	643
3/1 (with short)	1136(In) 825(Out)
3/2 (short)	311
4/1	1208
5/1	733
6/1	1109

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	59.6 %	1883	1883
				Arm 6 Left	20.00	40.4 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 12: 'PM24+C+D' (FG12: 'PM 2024 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	422	923	1345
	B	383	0	260	643
	C	869	311	0	1180
	Tot.	1252	733	1183	3168

Traffic Lane Flows

Lane	Scenario 12: PM24+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1345(In) 422(Out)
1/2 (short)	923
2/1	643
3/1 (with short)	1180(In) 869(Out)
3/2 (short)	311
4/1	1252
5/1	733
6/1	1183

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	59.6 %	1883	1883
				Arm 6 Left	20.00	40.4 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 13: 'PM29+C' (FG13: 'PM 2029 + Committed', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	447	885	1332
	B	406	0	276	682
	C	866	329	0	1195
	Tot.	1272	776	1161	3209

Traffic Lane Flows

Lane	Scenario 13: PM29+C
Junction: Ashford Rd / Willington St	
1/1 (with short)	1332(In) 447(Out)
1/2 (short)	885
2/1	682
3/1 (with short)	1195(In) 866(Out)
3/2 (short)	329
4/1	1272
5/1	776
6/1	1161

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	59.5 %	1883	1883
				Arm 6 Left	20.00	40.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 14: 'PM29+C+D' (FG14: 'PM 2029 + Committed + Development', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	447	959	1406
	B	406	0	276	682
	C	910	329	0	1239
	Tot.	1316	776	1235	3327

Traffic Lane Flows

Lane	Scenario 14: PM29+C+D
Junction: Ashford Rd / Willington St	
1/1 (with short)	1406(In) 447(Out)
1/2 (short)	959
2/1	682
3/1 (with short)	1239(In) 910(Out)
3/2 (short)	329
4/1	1316
5/1	776
6/1	1235

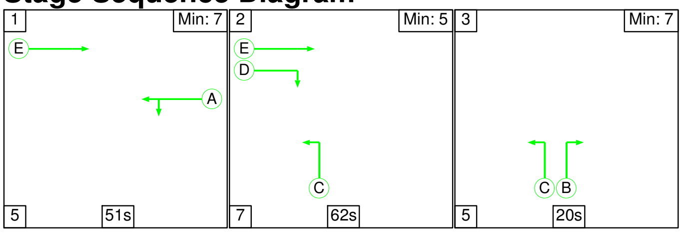
Ashford Willington LinSig Data

Lane Saturation Flows

Junction: Ashford Rd / Willington St								
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 (Ashford Rd (W))	3.00	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1915	1915
1/2 (Ashford Rd (W))	3.00	0.00	Y	Arm 6 Right	14.00	100.0 %	1730	1730
2/1 (Ashford Rd (E))	3.25	0.00	Y	Arm 4 Ahead	Inf	59.5 %	1883	1883
				Arm 6 Left	20.00	40.5 %		
3/1 (Willington St)	3.00	0.00	Y	Arm 4 Left	24.00	100.0 %	1802	1802
3/2 (Willington St)	3.00	0.00	Y	Arm 5 Right	16.00	100.0 %	1751	1751
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 1: 'AM Survey' (FG1: 'AM Survey', Plan 1: 'Network Control Plan 1')

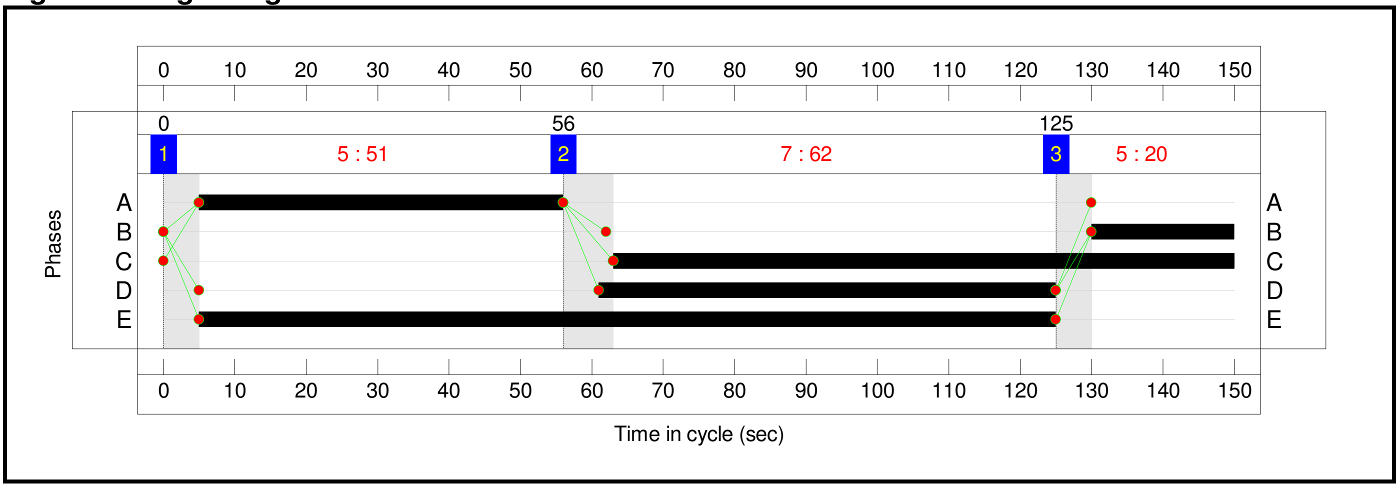
Stage Sequence Diagram



Stage Timings

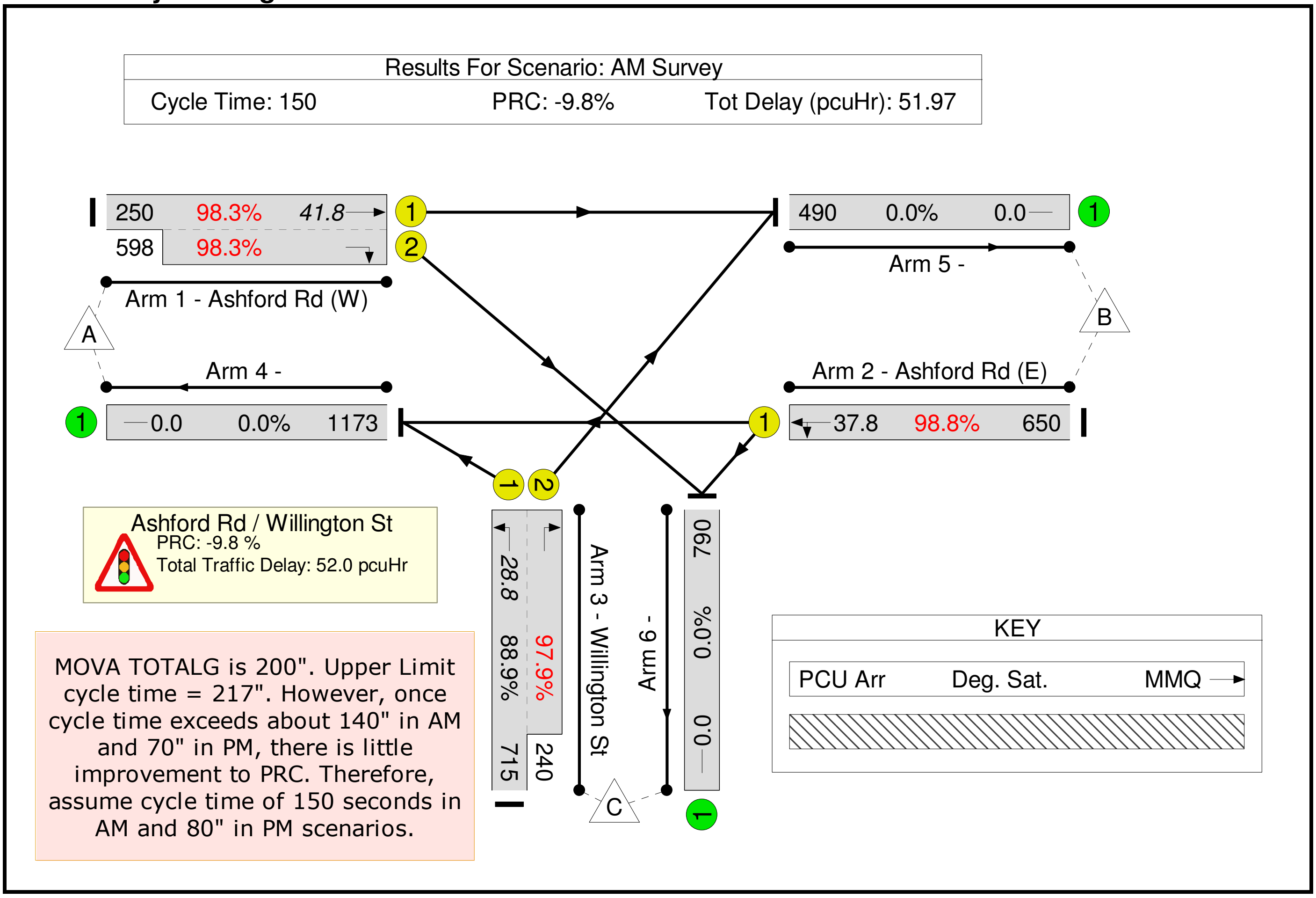
Stage	1	2	3
Duration	51	62	20
Change Point	0	56	125

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**98.8%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**98.8%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	120:64	-	848	1915:1730	254+608	98.3 : 98.3%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	51	-	650	1898	658	98.8%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	87:20	-	955	1802:1751	804+245	88.9 : 97.9%
4/1		U	N/A	N/A	-		-	-	-	1173	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	490	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	790	Inf	Inf	0.0%

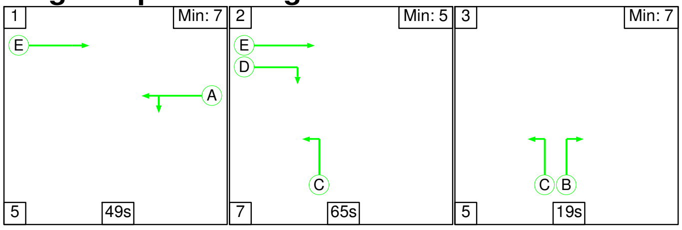
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**25.1**	**26.9**	**0.0**	**52.0**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**25.1**	**26.9**	**0.0**	**52.0**	**-**	**-**	**-**	**-**
1/1+1/2	848	848	-	-	-	7.7	11.3	-	19.1	81.0	30.5	11.3	41.8
2/1	650	650	-	-	-	8.8	10.9	-	19.7	109.1	26.9	10.9	37.8
3/1+3/2	955	955	-	-	-	8.6	4.6	-	13.2	49.8	24.1	4.6	28.8
4/1	1173	1173	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	490	490	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	790	790	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -9.8 Total Delay for Signalled Lanes (pcuHr): 51.97 Cycle Time (s): 150
PRC Over All Lanes (%): -9.8 Total Delay Over All Lanes(pcuHr): 51.97

Ashford Willington LinSig Data

Scenario 2: 'AM19+C' (FG2: 'AM 2019 + Committed', Plan 1: 'Network Control Plan 1')

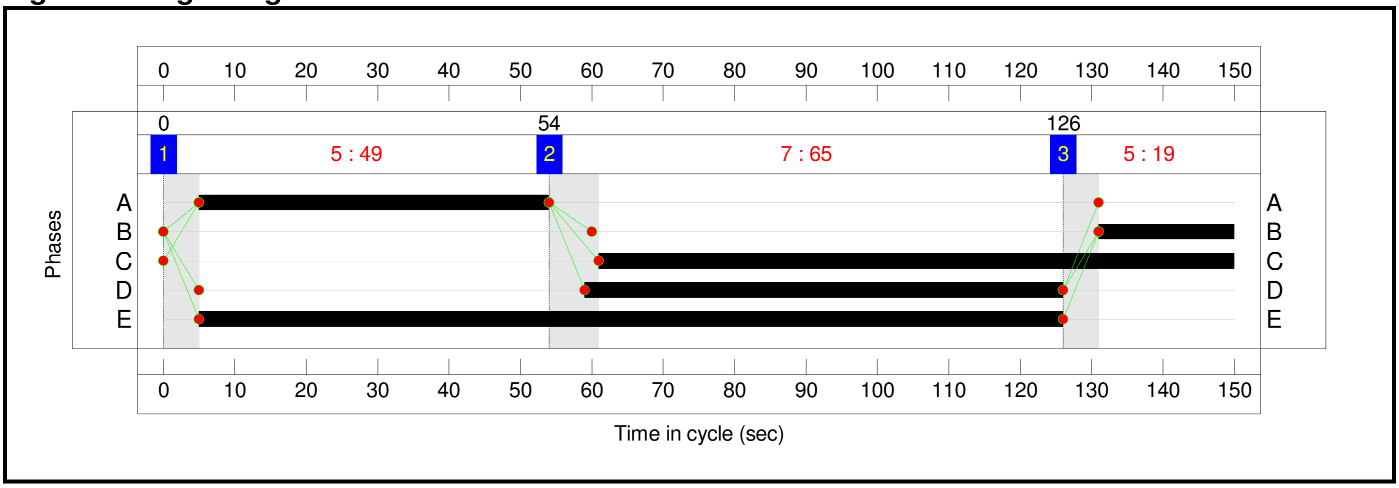
Stage Sequence Diagram



Stage Timings

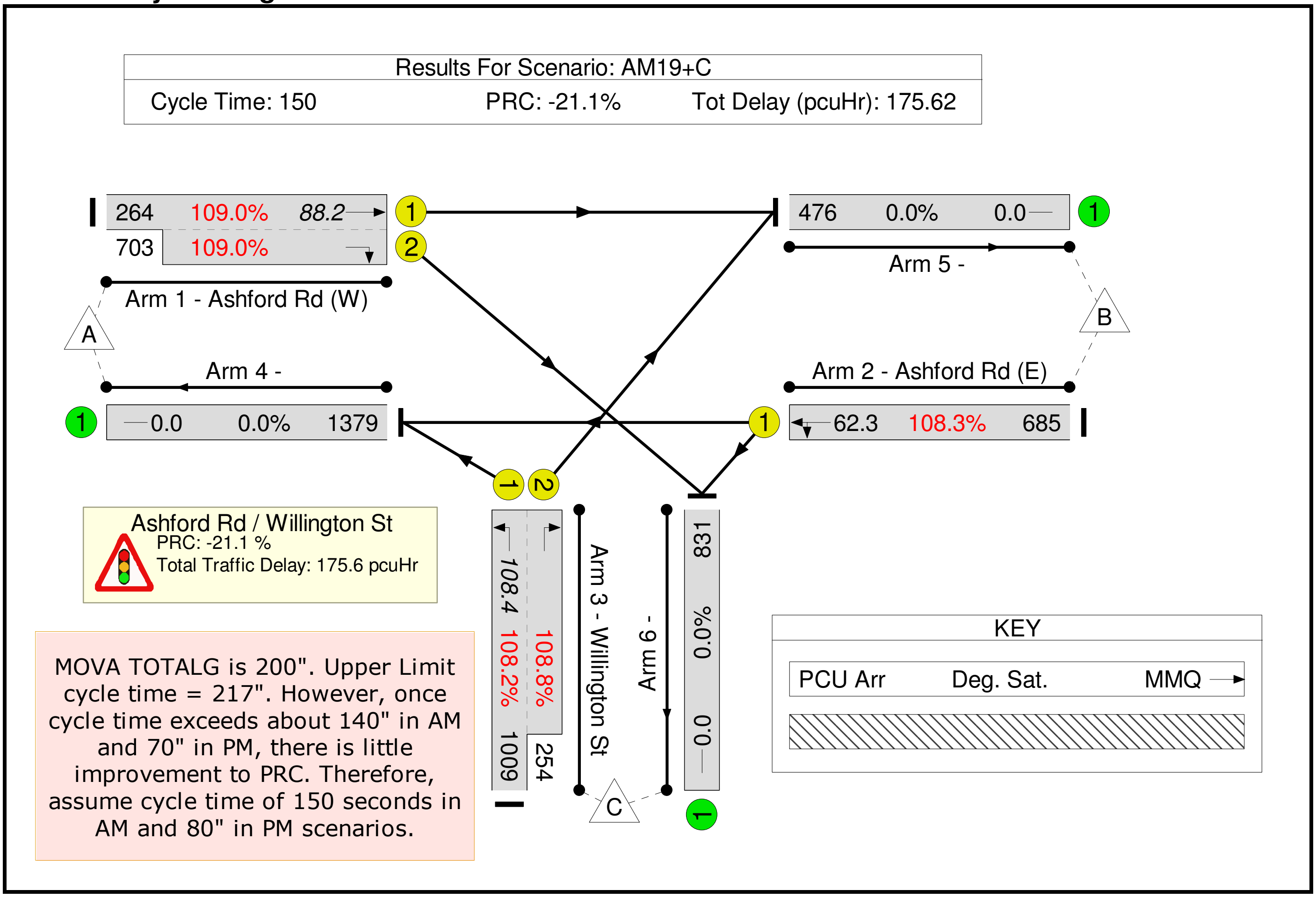
Stage	1	2	3
Duration	49	65	19
Change Point	0	54	126

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



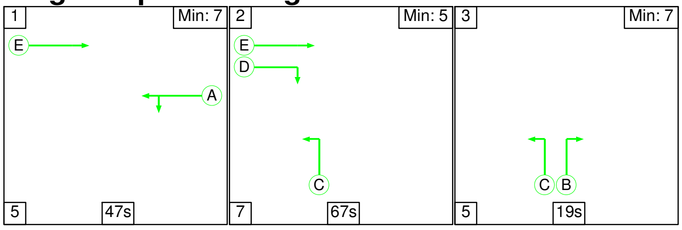
Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**109.0%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**109.0%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	121:67	-	967	1915:1730	242+645	109.0 : 109.0%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	49	-	685	1898	633	108.3%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	89:19	-	1263	1802:1751	932+233	108.2 : 108.8%
4/1		U	N/A	N/A	-		-	-	-	1492	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	518	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	905	Inf	Inf	0.0%

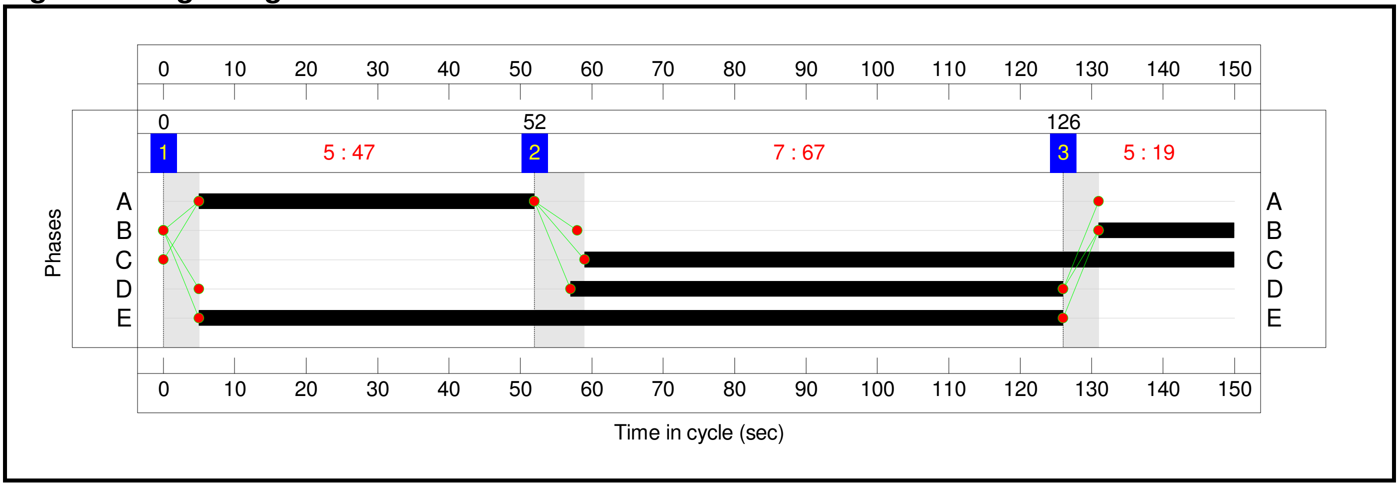
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**44.3**	**131.3**	**0.0**	**175.6**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**44.3**	**131.3**	**0.0**	**175.6**	**-**	**-**	**-**	**-**
1/1+1/2	967	887	-	-	-	13.5	45.4	-	58.9	219.3	42.8	45.4	88.2
2/1	685	633	-	-	-	13.4	31.6	-	45.0	236.5	30.7	31.6	62.3
3/1+3/2	1263	1166	-	-	-	17.4	54.3	-	71.7	204.4	54.1	54.3	108.4
4/1	1379	1379	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	476	476	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	831	831	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -21.1 Total Delay for Signalled Lanes (pcuHr): 175.62 Cycle Time (s): 150
PRC Over All Lanes (%): -21.1 Total Delay Over All Lanes(pcuHr): 175.62

Ashford Willington LinSig Data
Scenario 3: 'AM19+C+D' (FG3: 'AM 2019 + Committed + Development', Plan 1: 'Network Control Plan 1')
Stage Sequence Diagram


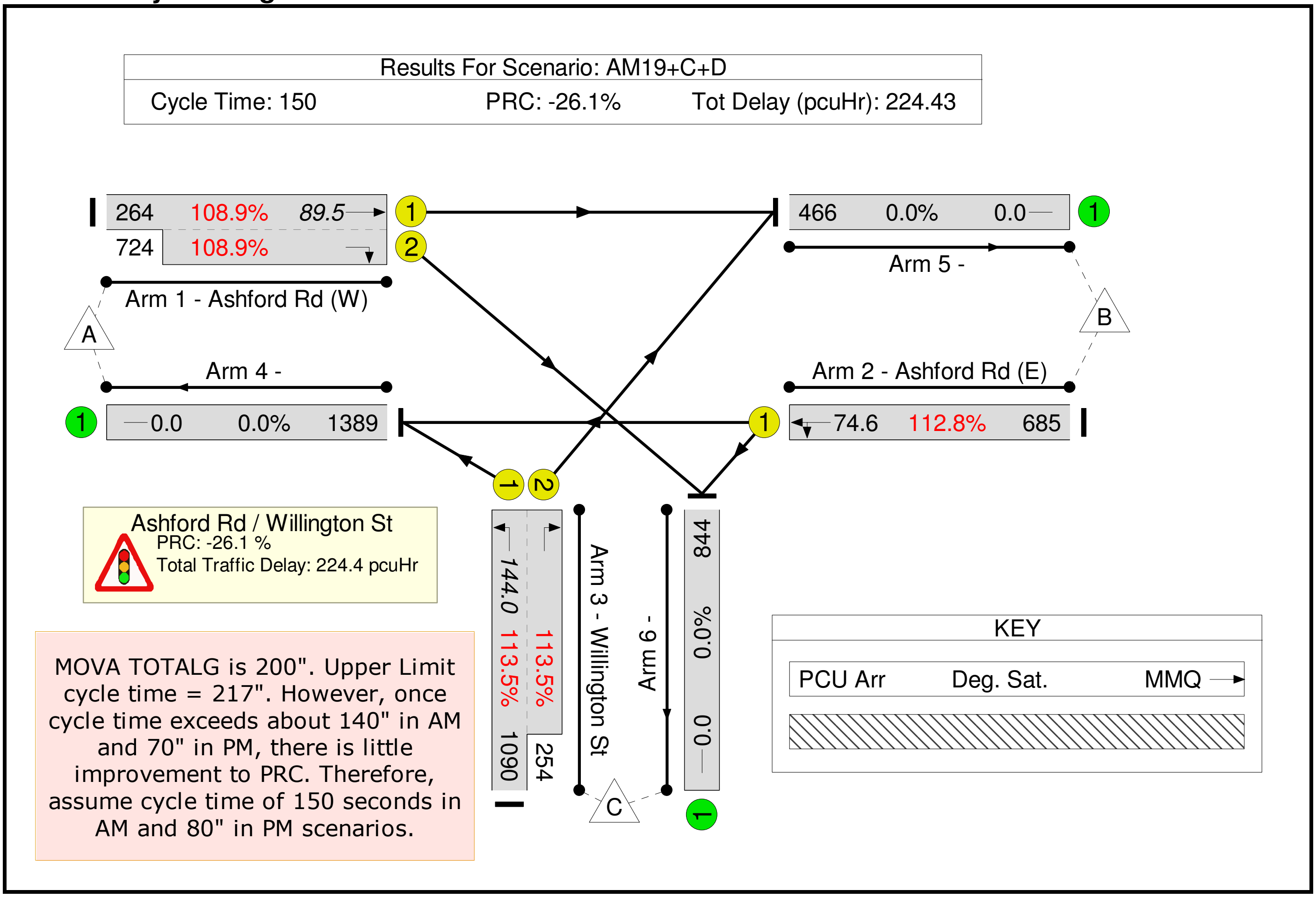
Stage Timings

Stage	1	2	3
Duration	47	67	19
Change Point	0	52	126

Signal Timings Diagram


Ashford Willington LinSig Data

Network Layout Diagram



MOVA TOTALG is 200". Upper Limit cycle time = 217". However, once cycle time exceeds about 140" in AM and 70" in PM, there is little improvement to PRC. Therefore, assume cycle time of 150 seconds in AM and 80" in PM scenarios.

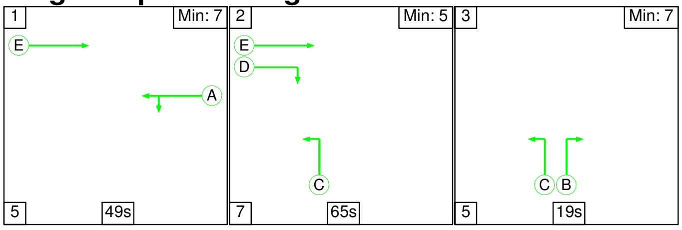
Ashford Willington LinSig Data
Network Results

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**113.5%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**113.5%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	121:69	-	988	1915:1730	243+665	108.9 : 108.9%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	47	-	685	1898	607	112.8%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	91:19	-	1344	1802:1751	961+224	113.5 : 113.5%
4/1		U	N/A	N/A	-		-	-	-	1573	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	518	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	926	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**52.3**	**172.1**	**0.0**	**224.4**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**52.3**	**172.1**	**0.0**	**224.4**	**-**	**-**	**-**	**-**
1/1+1/2	988	908	-	-	-	13.6	45.6	-	59.2	215.8	43.9	45.6	89.5
2/1	685	607	-	-	-	15.5	42.8	-	58.3	306.6	31.8	42.8	74.6
3/1+3/2	1344	1185	-	-	-	23.2	83.7	-	106.9	286.3	60.3	83.7	144.0
4/1	1389	1389	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	466	466	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	844	844	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -26.1 Total Delay for Signalled Lanes (pcuHr): 224.43 Cycle Time (s): 150
PRC Over All Lanes (%): -26.1 Total Delay Over All Lanes(pcuHr): 224.43

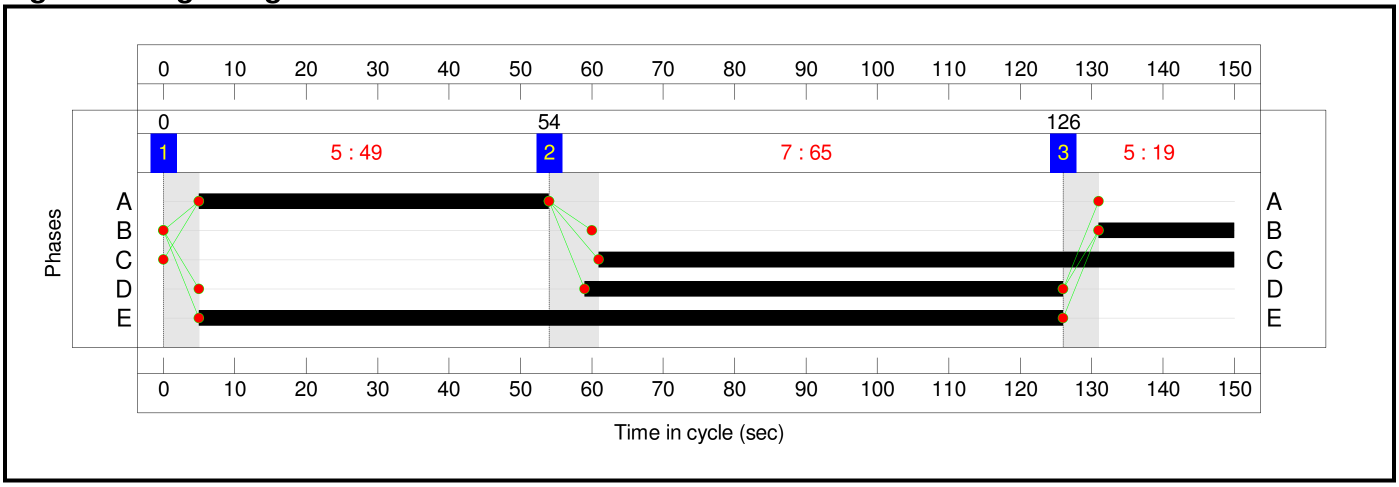
Ashford Willington LinSig Data
Scenario 4: 'AM24+C' (FG4: 'AM 2024 + Committed', Plan 1: 'Network Control Plan 1')
Stage Sequence Diagram



Stage Timings

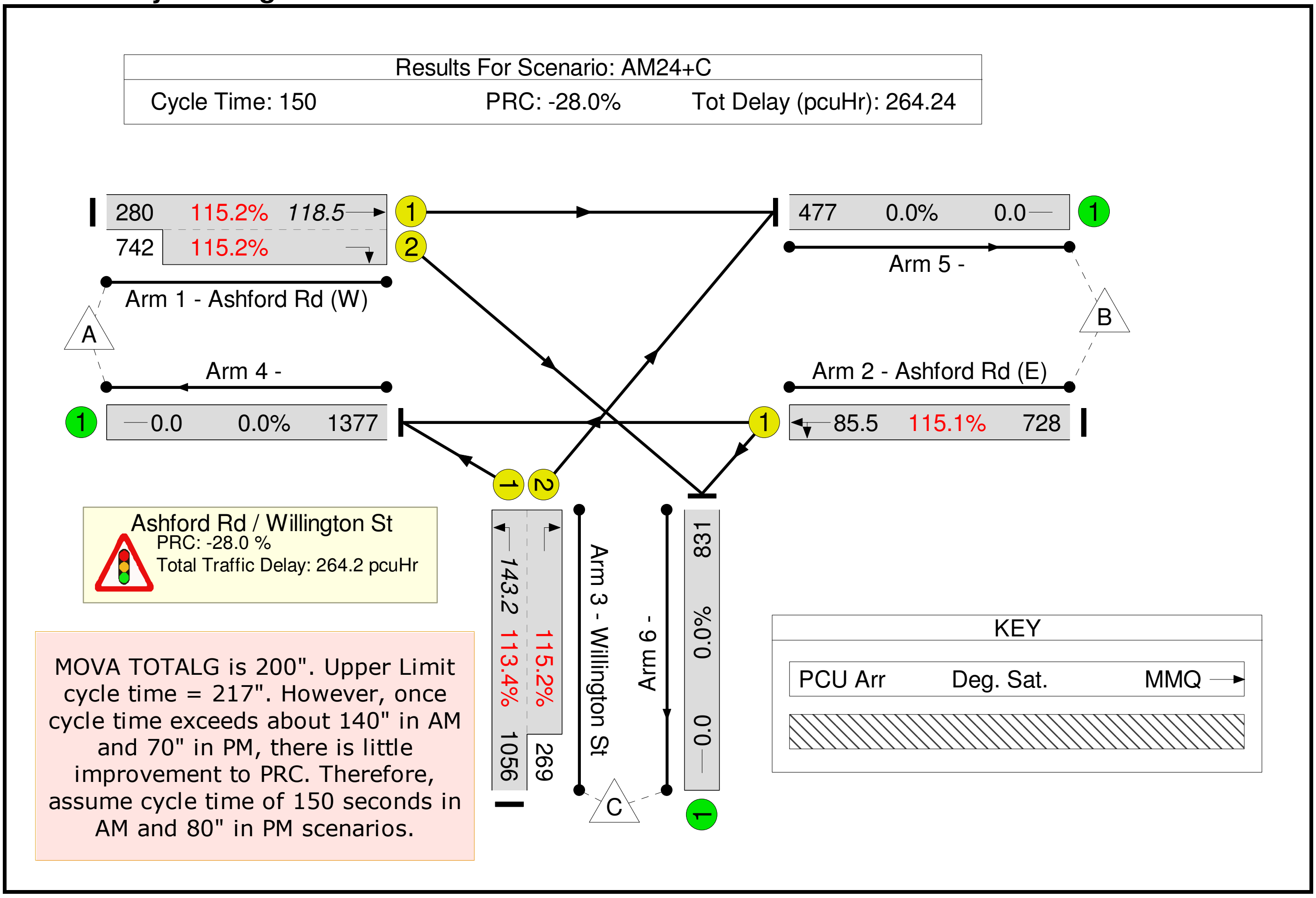
Stage	1	2	3
Duration	49	65	19
Change Point	0	54	126

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**115.2%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**115.2%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	121:67	-	1022	1915:1730	243+644	115.2 : 115.2%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	49	-	728	1898	633	115.1%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	89:19	-	1325	1802:1751	931+233	113.4 : 115.2%
4/1		U	N/A	N/A	-		-	-	-	1569	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	549	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	957	Inf	Inf	0.0%

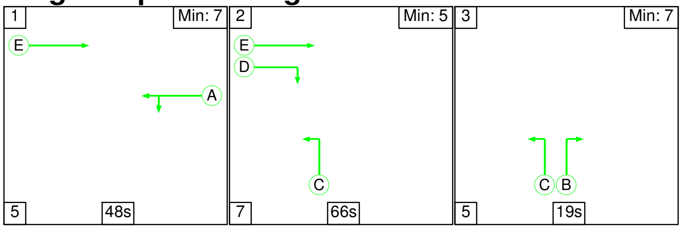
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**57.9**	**206.3**	**0.0**	**264.2**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**57.9**	**206.3**	**0.0**	**264.2**	**-**	**-**	**-**	**-**
1/1+1/2	1022	887	-	-	-	17.3	70.9	-	88.2	310.6	47.5	70.9	118.5
2/1	728	633	-	-	-	17.2	51.2	-	68.4	338.4	34.3	51.2	85.5
3/1+3/2	1325	1165	-	-	-	23.5	84.2	-	107.6	292.4	59.0	84.2	143.2
4/1	1377	1377	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	477	477	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	831	831	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -28.0 Total Delay for Signalled Lanes (pcuHr): 264.24 Cycle Time (s): 150
PRC Over All Lanes (%): -28.0 Total Delay Over All Lanes(pcuHr): 264.24

Ashford Willington LinSig Data

Scenario 5: 'AM24+C+D' (FG5: 'AM 2024 + Committed + Development', Plan 1: 'Network Control Plan 1')

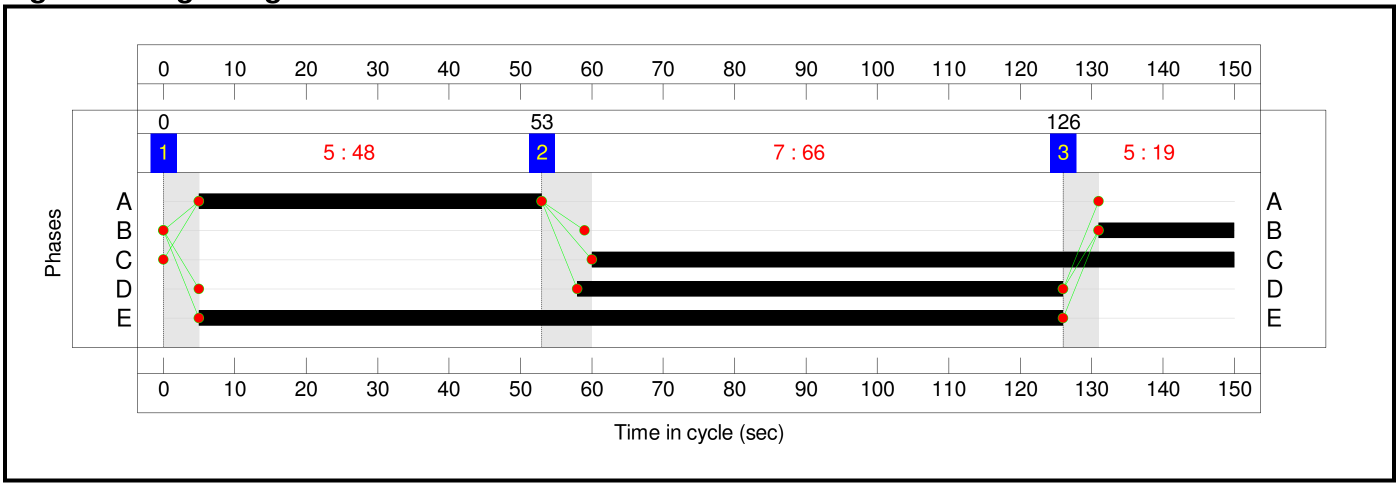
Stage Sequence Diagram



Stage Timings

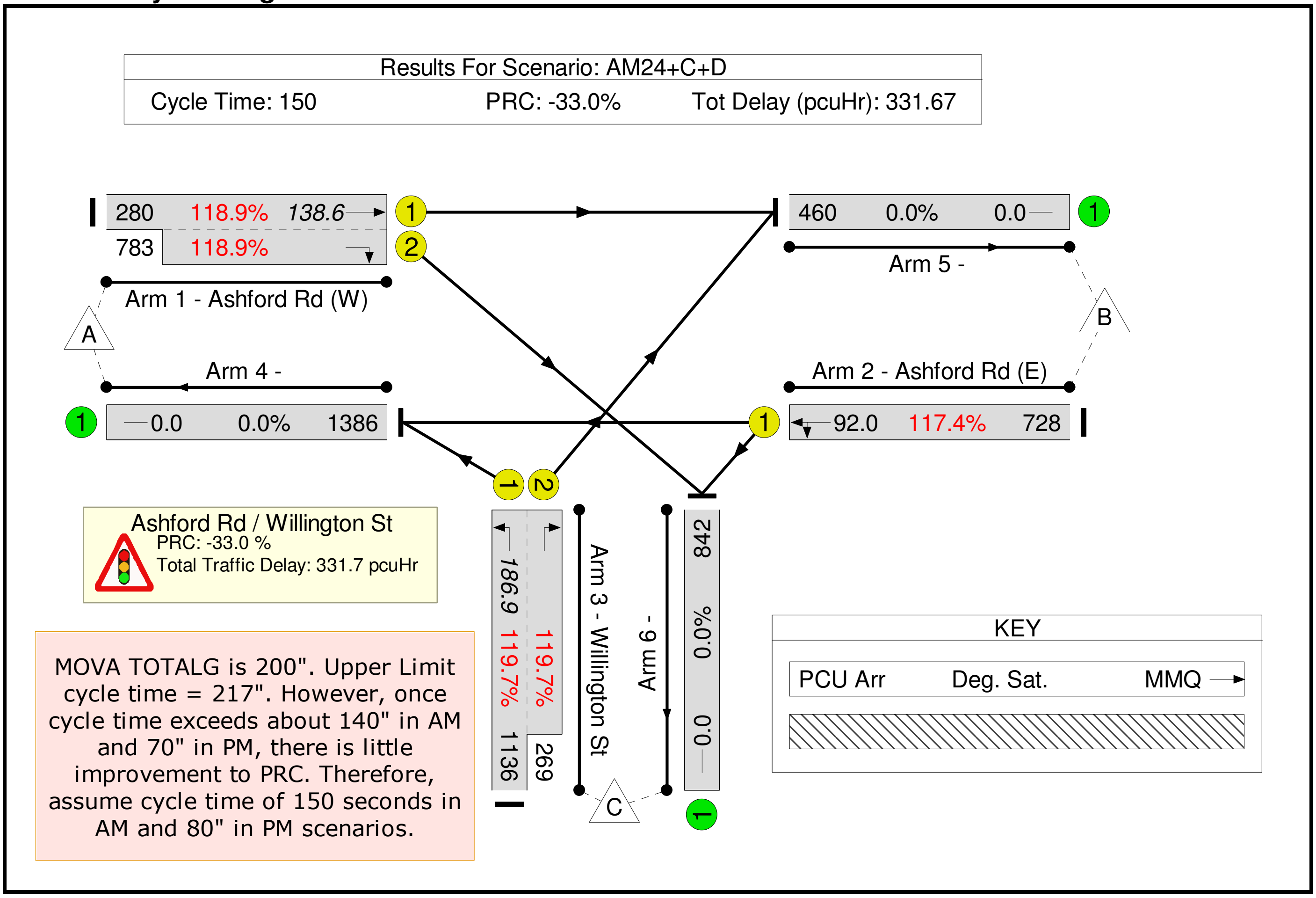
Stage	1	2	3
Duration	48	66	19
Change Point	0	53	126

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**119.7%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**119.7%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	121:68	-	1063	1915:1730	235+658	118.9 : 118.9%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	48	-	728	1898	620	117.4%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	90:19	-	1405	1802:1751	949+225	119.7 : 119.7%
4/1		U	N/A	N/A	-		-	-	-	1649	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	549	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	998	Inf	Inf	0.0%

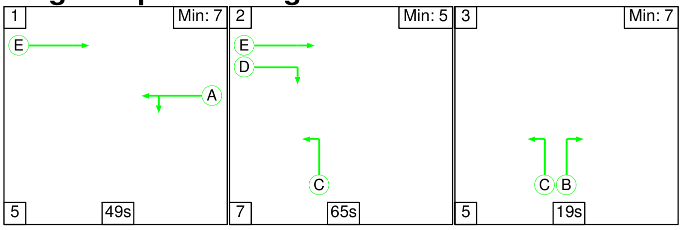
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**68.4**	**263.2**	**0.0**	**331.7**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**68.4**	**263.2**	**0.0**	**331.7**	**-**	**-**	**-**	**-**
1/1+1/2	1063	894	-	-	-	19.7	87.6	-	107.3	363.3	51.0	87.6	138.6
2/1	728	620	-	-	-	18.3	57.2	-	75.5	373.1	34.8	57.2	92.0
3/1+3/2	1405	1174	-	-	-	30.5	118.5	-	148.9	381.6	68.4	118.5	186.9
4/1	1386	1386	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	460	460	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	842	842	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -33.0 Total Delay for Signalled Lanes (pcuHr): 331.67 Cycle Time (s): 150
PRC Over All Lanes (%): -33.0 Total Delay Over All Lanes(pcuHr): 331.67

Ashford Willington LinSig Data

Scenario 6: 'AM29+C' (FG6: 'AM 2029 + Committed', Plan 1: 'Network Control Plan 1')

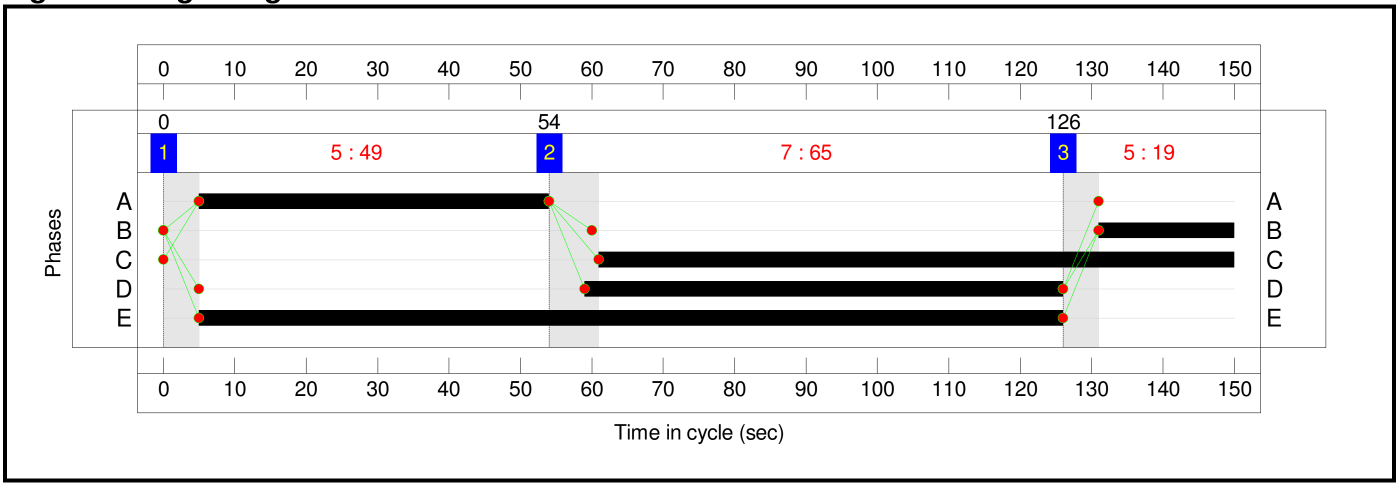
Stage Sequence Diagram



Stage Timings

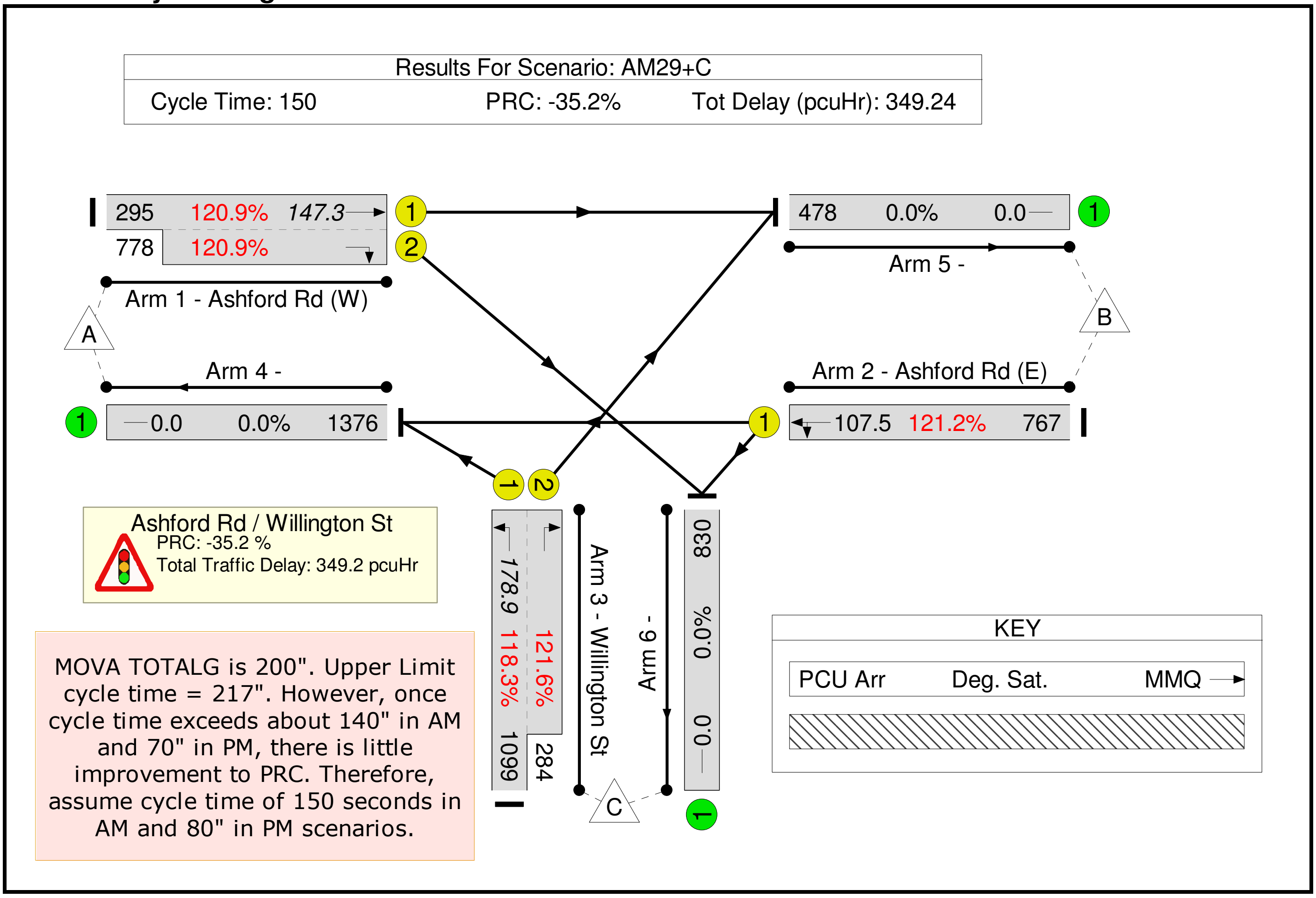
Stage	1	2	3
Duration	49	65	19
Change Point	0	54	126

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**121.6%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**121.6%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	121:67	-	1073	1915:1730	244+644	120.9 : 120.9%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	49	-	767	1898	633	121.2%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	89:19	-	1383	1802:1751	929+233	118.3 : 121.6%
4/1		U	N/A	N/A	-		-	-	-	1640	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	579	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1004	Inf	Inf	0.0%

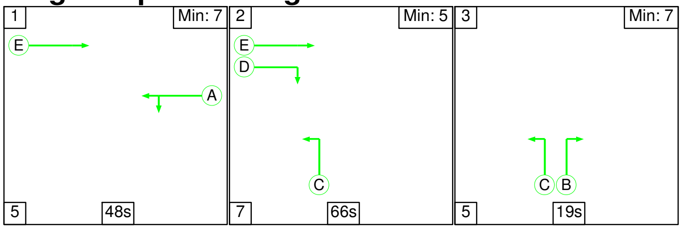
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**70.8**	**278.4**	**0.0**	**349.2**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**70.8**	**278.4**	**0.0**	**349.2**	**-**	**-**	**-**	**-**
1/1+1/2	1073	888	-	-	-	20.7	95.4	-	116.1	389.5	51.9	95.4	147.3
2/1	767	633	-	-	-	20.7	69.9	-	90.6	425.2	37.6	69.9	107.5
3/1+3/2	1383	1163	-	-	-	29.4	113.1	-	142.6	371.1	65.8	113.1	178.9
4/1	1376	1376	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	478	478	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	830	830	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -35.2 Total Delay for Signalled Lanes (pcuHr): 349.24 Cycle Time (s): 150
PRC Over All Lanes (%): -35.2 Total Delay Over All Lanes(pcuHr): 349.24

Ashford Willington LinSig Data

Scenario 7: 'AM29+C+D' (FG7: 'AM 2029 + Committed + Development', Plan 1: 'Network Control Plan 1')

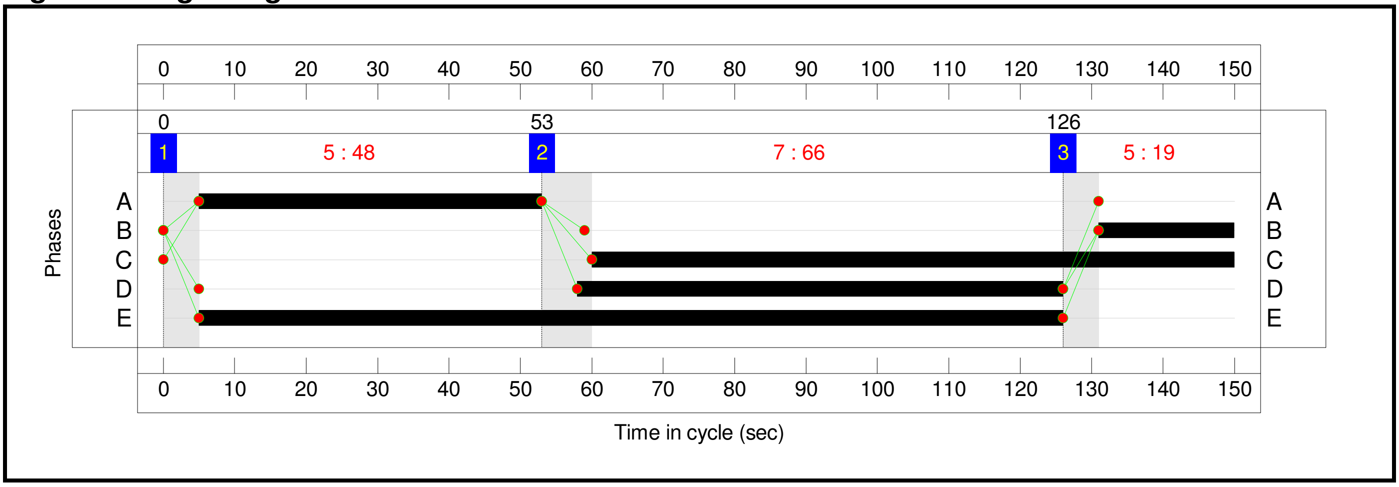
Stage Sequence Diagram



Stage Timings

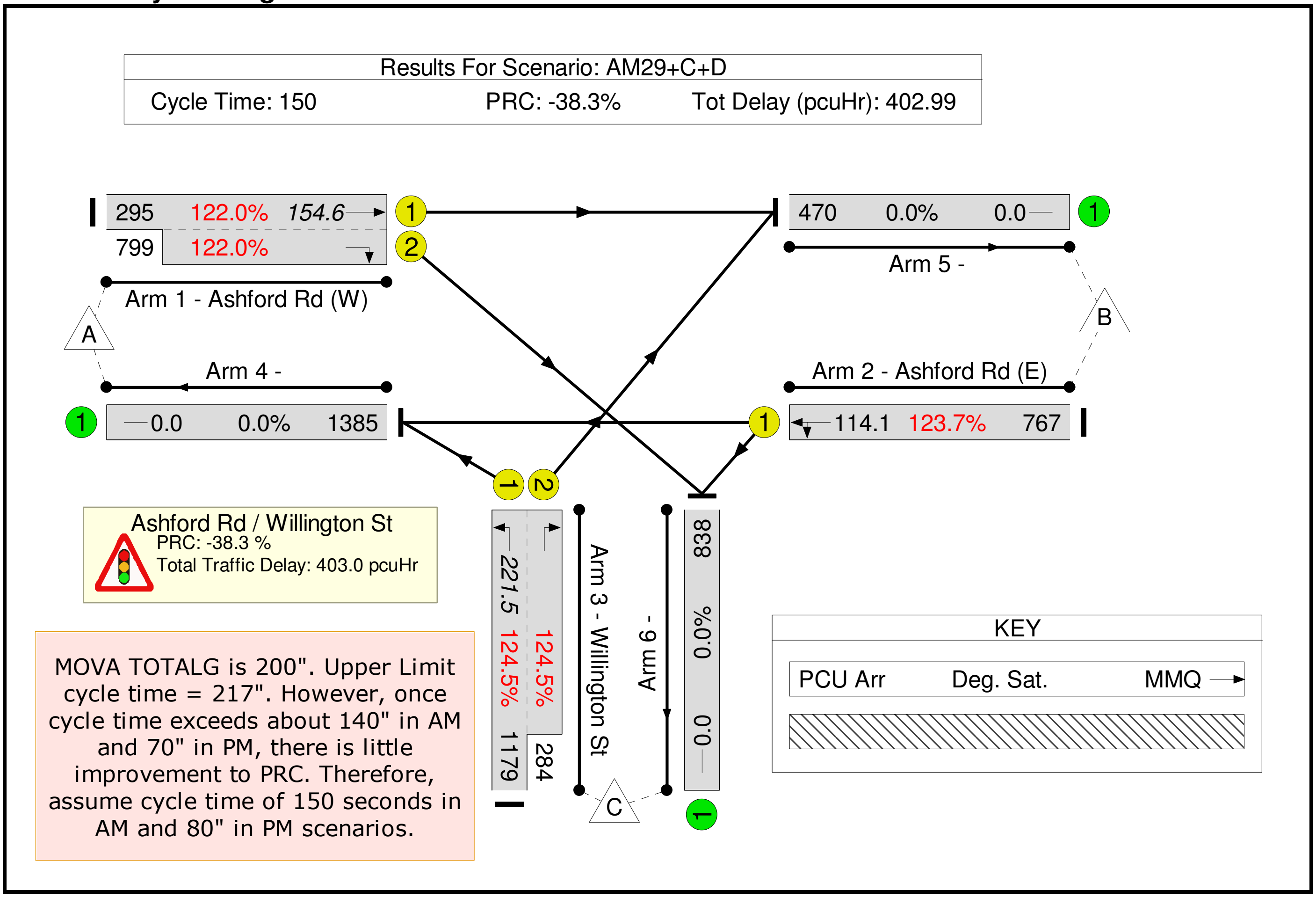
Stage	1	2	3
Duration	48	66	19
Change Point	0	53	126

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.5%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**124.5%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	121:68	-	1094	1915:1730	242+655	122.0 : 122.0%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	48	-	767	1898	620	123.7%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	90:19	-	1463	1802:1751	947+228	124.5 : 124.5%
4/1		U	N/A	N/A	-		-	-	-	1720	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	579	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1025	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**79.5**	**323.5**	**0.0**	**403.0**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**79.5**	**323.5**	**0.0**	**403.0**	**-**	**-**	**-**	**-**
1/1+1/2	1094	897	-	-	-	21.6	101.2	-	122.8	404.0	53.4	101.2	154.6
2/1	767	620	-	-	-	21.7	76.0	-	97.8	458.8	38.1	76.0	114.1
3/1+3/2	1463	1175	-	-	-	36.2	146.3	-	182.5	449.0	75.2	146.3	221.5
4/1	1385	1385	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	470	470	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	838	838	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

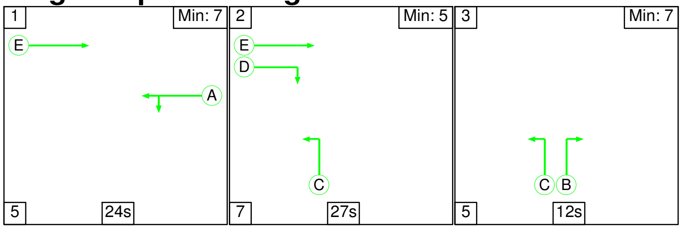
C1 PRC for Signalled Lanes (%): -38.3 Total Delay for Signalled Lanes (pcuHr): 402.99 Cycle Time (s): 150

PRC Over All Lanes (%): -38.3 Total Delay Over All Lanes(pcuHr): 402.99

Ashford Willington LinSig Data

Scenario 8: 'PM Survey' (FG8: 'PM Survey', Plan 1: 'Network Control Plan 1')

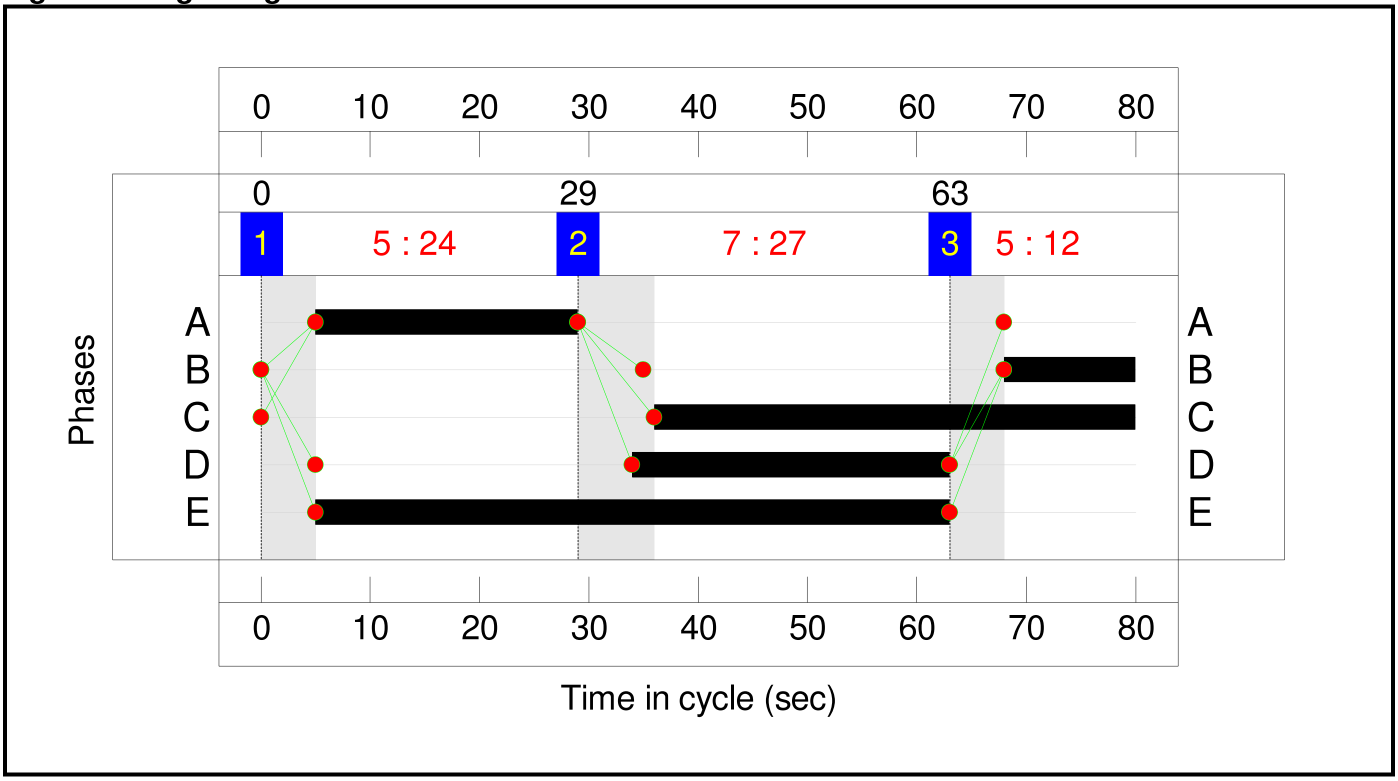
Stage Sequence Diagram



Stage Timings

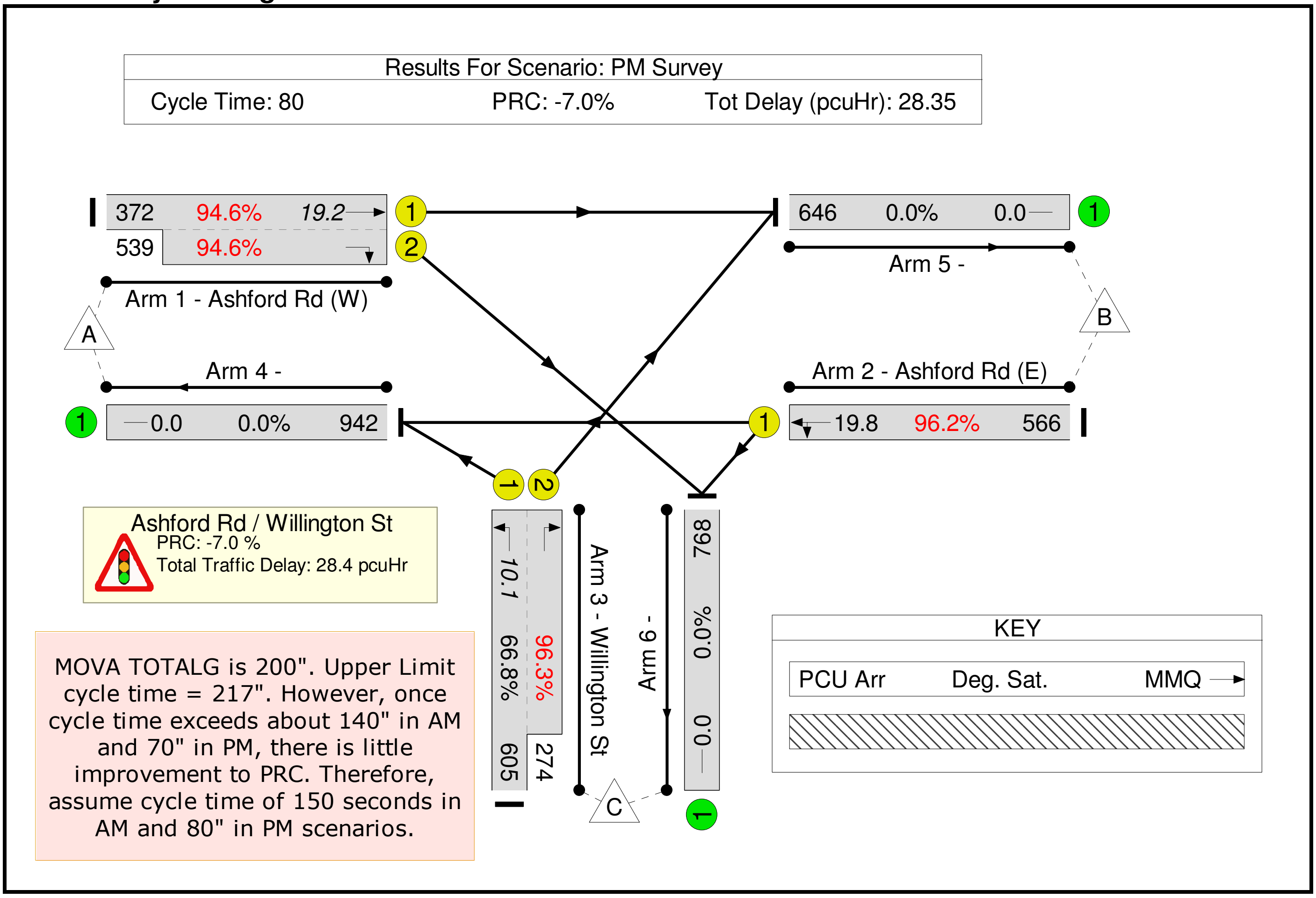
Stage	1	2	3
Duration	24	27	12
Change Point	0	29	63

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**96.3%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**96.3%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	58:29	-	911	1915:1730	393+570	94.6 : 94.6%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	24	-	566	1883	588	96.2%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	44:12	-	879	1802:1751	905+285	66.8 : 96.3%
4/1		U	N/A	N/A	-		-	-	-	942	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	646	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	768	Inf	Inf	0.0%

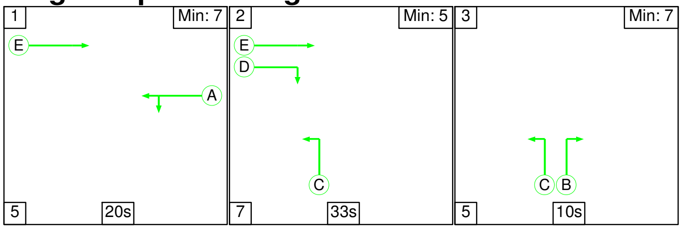
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**12.5**	**15.8**	**0.0**	**28.4**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**12.5**	**15.8**	**0.0**	**28.4**	**-**	**-**	**-**	**-**
1/1+1/2	911	911	-	-	-	3.8	6.9	-	10.7	42.2	12.3	6.9	19.2
2/1	566	566	-	-	-	4.3	7.5	-	11.8	75.0	12.3	7.5	19.8
3/1+3/2	879	879	-	-	-	4.5	1.4	-	5.9	24.0	8.7	1.4	10.1
4/1	942	942	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	646	646	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	768	768	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -7.0 Total Delay for Signalled Lanes (pcuHr): 28.35 Cycle Time (s): 80

PRC Over All Lanes (%): -7.0 Total Delay Over All Lanes(pcuHr): 28.35

Ashford Willington LinSig Data
Scenario 9: 'PM19+C' (FG9: 'PM 2019 + Committed', Plan 1: 'Network Control Plan 1')

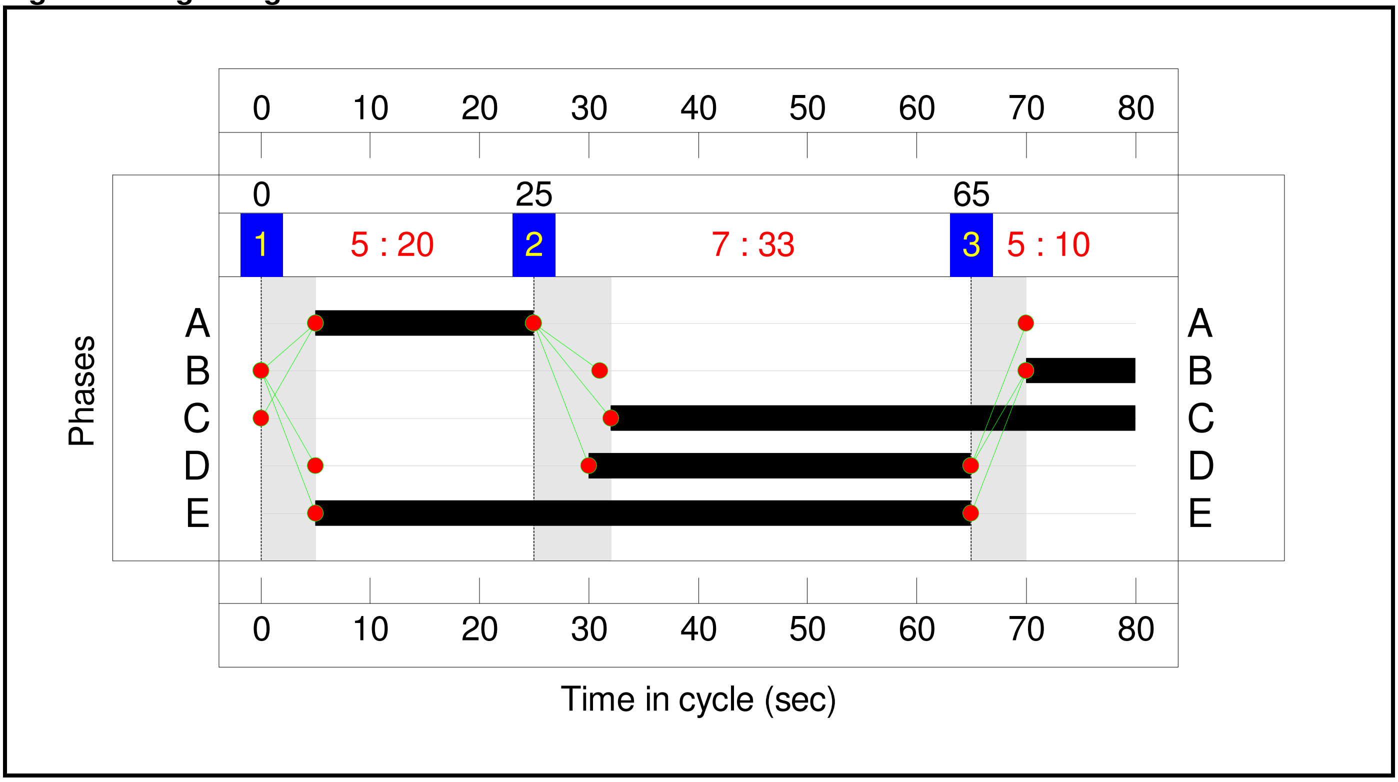
Stage Sequence Diagram



Stage Timings

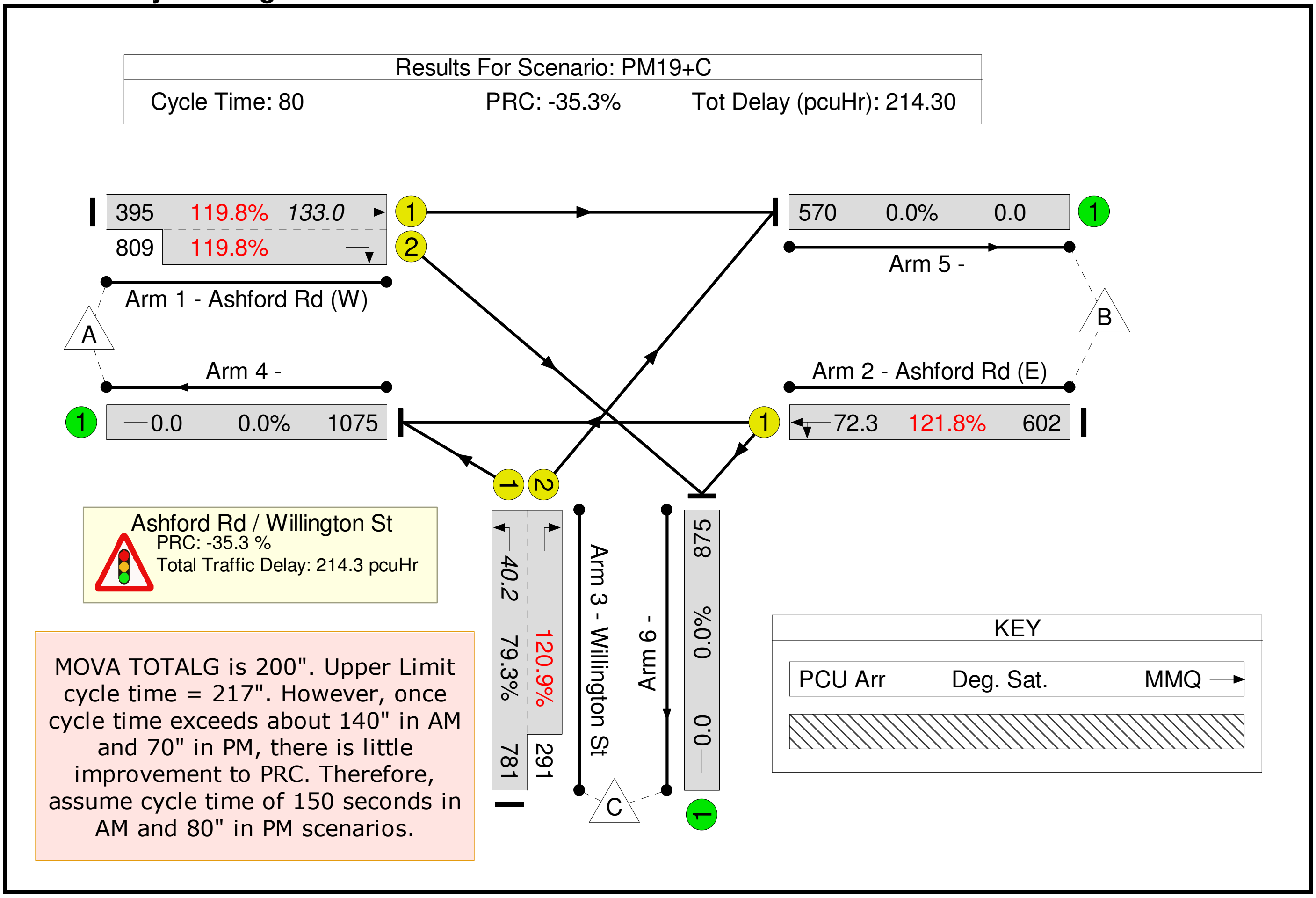
Stage	1	2	3
Duration	20	33	10
Change Point	0	25	65

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

Network Results

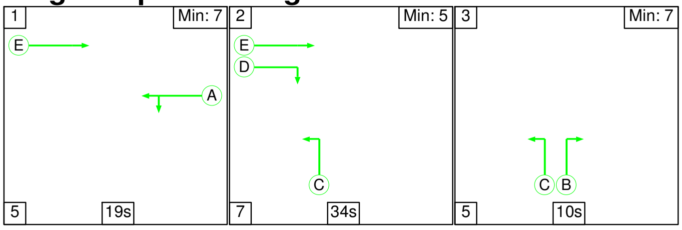
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**121.8%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**121.8%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	60:35	-	1204	1915:1730	330+675	119.8 : 119.8%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	20	-	602	1883	494	121.8%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	48:10	-	1072	1802:1751	984+241	79.3 : 120.9%
4/1		U	N/A	N/A	-		-	-	-	1139	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	686	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1053	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**26.7**	**187.6**	**0.0**	**214.3**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**26.7**	**187.6**	**0.0**	**214.3**	**-**	**-**	**-**	**-**
1/1+1/2	1204	1005	-	-	-	11.2	102.6	-	113.8	340.2	30.4	102.6	133.0
2/1	602	494	-	-	-	9.2	56.5	-	65.7	393.1	15.8	56.5	72.3
3/1+3/2	1072	1022	-	-	-	6.3	28.5	-	34.8	116.8	11.7	28.5	40.2
4/1	1075	1075	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	570	570	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	875	875	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -35.3 Total Delay for Signalled Lanes (pcuHr): 214.30 Cycle Time (s): 80
PRC Over All Lanes (%): -35.3 Total Delay Over All Lanes(pcuHr): 214.30

Ashford Willington LinSig Data
Scenario 10: 'PM19+C+D' (FG10: 'PM 2019 + Committed + Development', Plan 1: 'Network Control Plan 1')

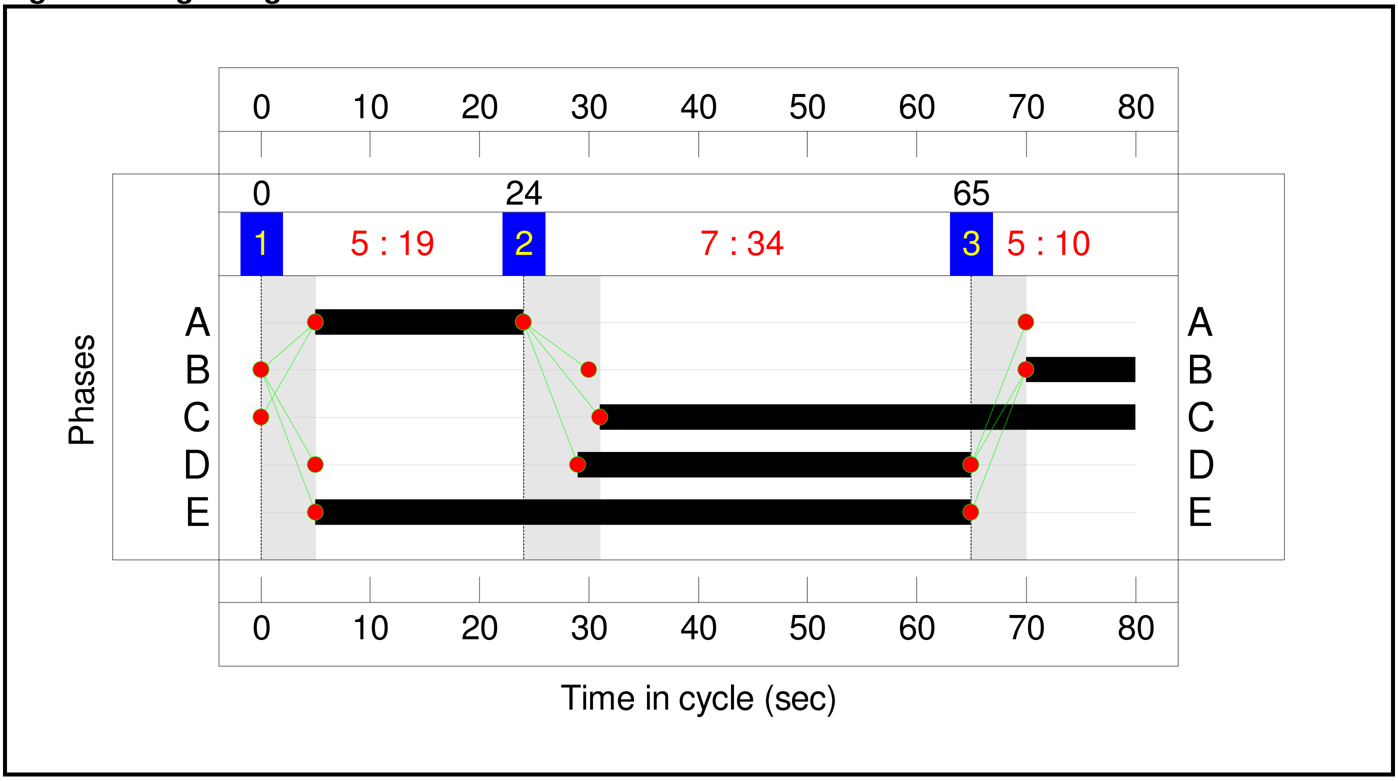
Stage Sequence Diagram



Stage Timings

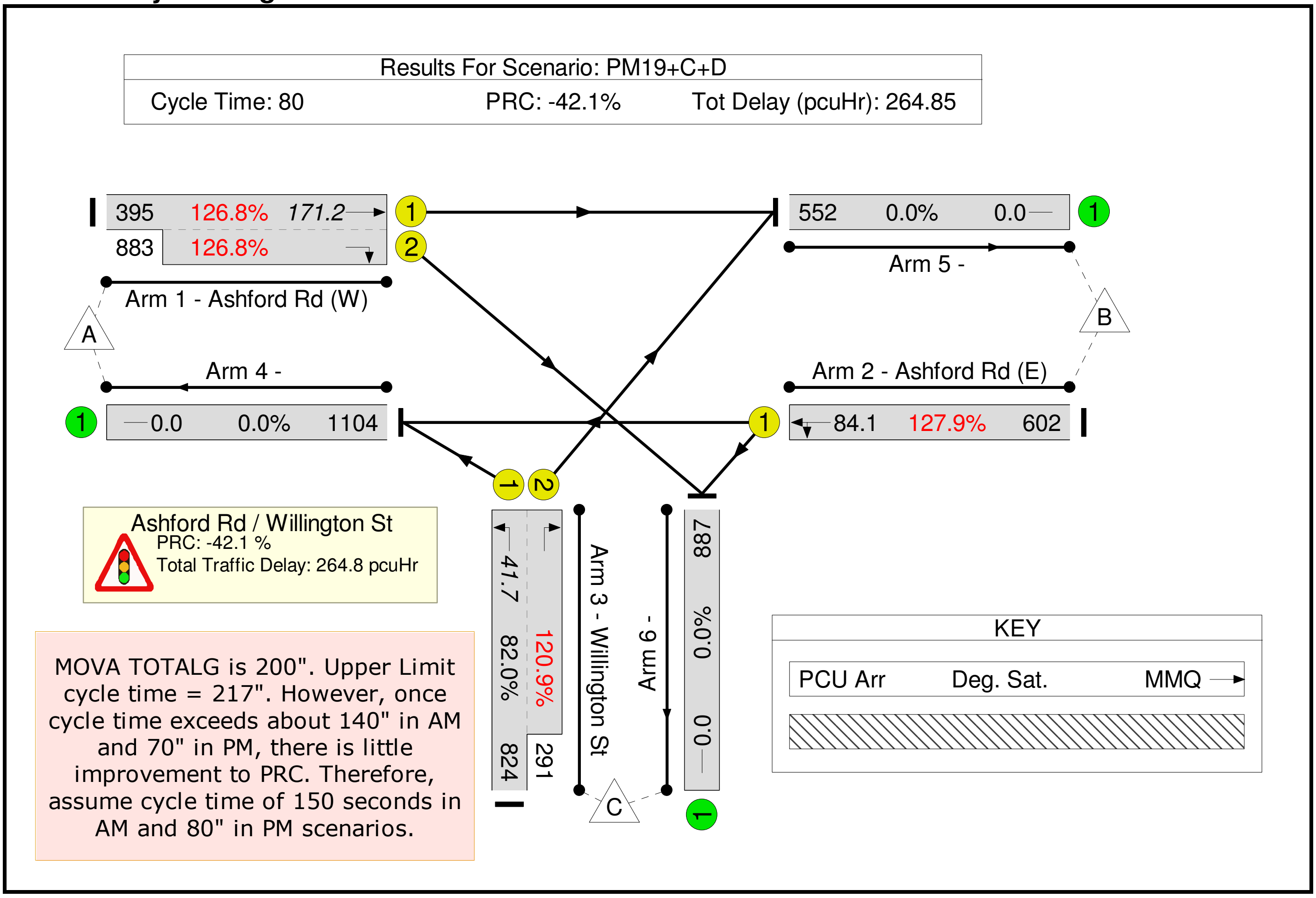
Stage	1	2	3
Duration	19	34	10
Change Point	0	24	65

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**127.9%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**127.9%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	60:36	-	1278	1915:1730	312+696	126.8 : 126.8%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	19	-	602	1883	471	127.9%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	49:10	-	1115	1802:1751	1005+241	82.0 : 120.9%
4/1		U	N/A	N/A	-		-	-	-	1182	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	686	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1127	Inf	Inf	0.0%

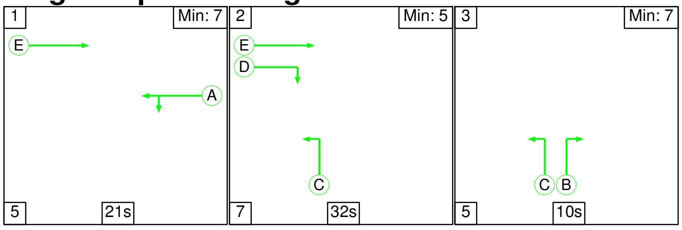
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**30.5**	**234.3**	**0.0**	**264.8**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**30.5**	**234.3**	**0.0**	**264.8**	**-**	**-**	**-**	**-**
1/1+1/2	1278	1008	-	-	-	13.9	137.4	-	151.2	426.1	33.8	137.4	171.2
2/1	602	471	-	-	-	10.2	67.8	-	78.1	467.0	16.3	67.8	84.1
3/1+3/2	1115	1065	-	-	-	6.4	29.1	-	35.5	114.6	12.6	29.1	41.7
4/1	1104	1104	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	552	552	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	887	887	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -42.1 Total Delay for Signalled Lanes (pcuHr): 264.85 Cycle Time (s): 80
PRC Over All Lanes (%): -42.1 Total Delay Over All Lanes(pcuHr): 264.85

Ashford Willington LinSig Data

Scenario 11: 'PM24+C' (FG11: 'PM 2024 + Committed', Plan 1: 'Network Control Plan 1')

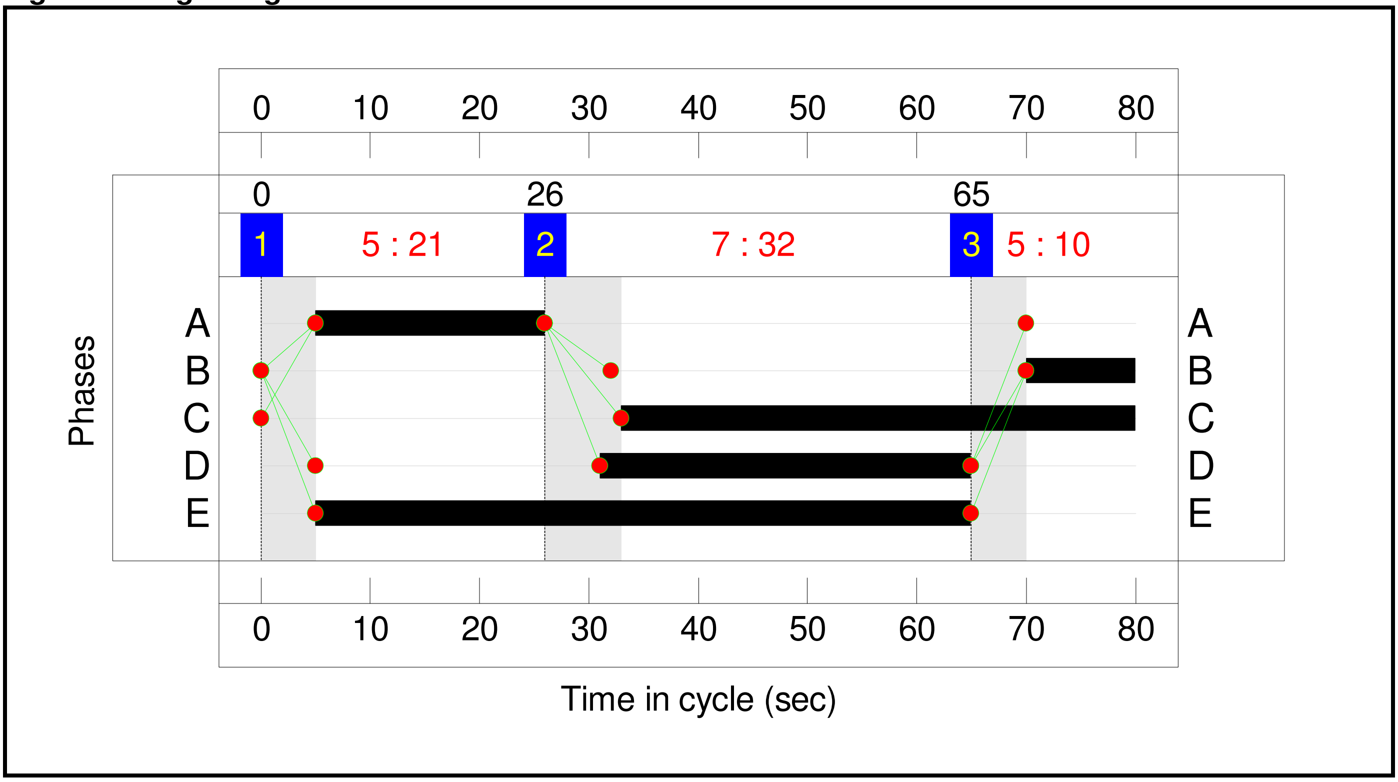
Stage Sequence Diagram



Stage Timings

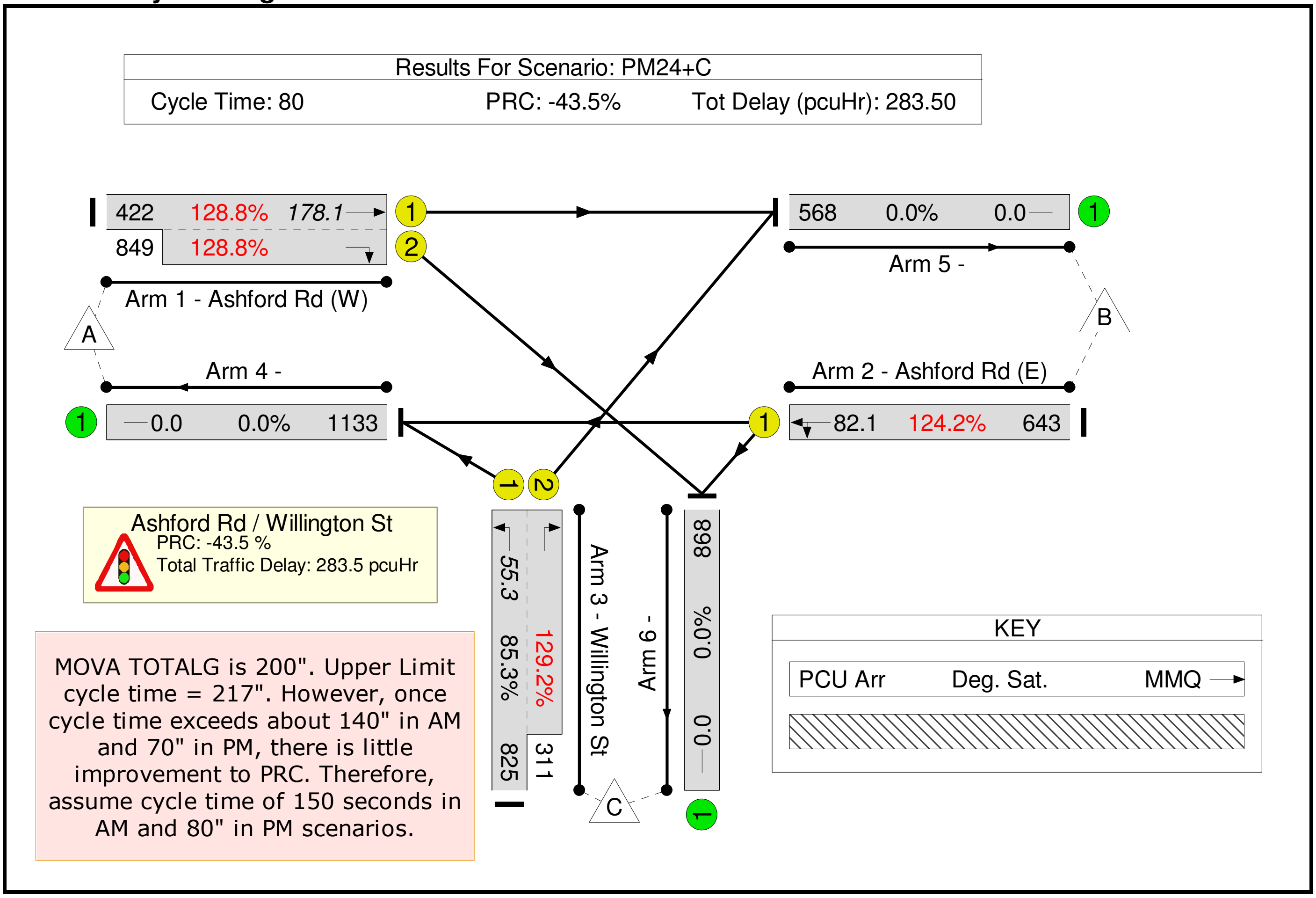
Stage	1	2	3
Duration	21	32	10
Change Point	0	26	65

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



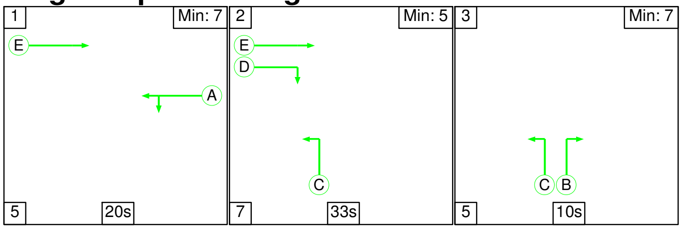
Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**129.2%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**129.2%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	60:34	-	1271	1915:1730	328+659	128.8 : 128.8%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	21	-	643	1883	518	124.2%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	47:10	-	1136	1802:1751	967+241	85.3 : 129.2%
4/1		U	N/A	N/A	-		-	-	-	1208	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	733	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1109	Inf	Inf	0.0%

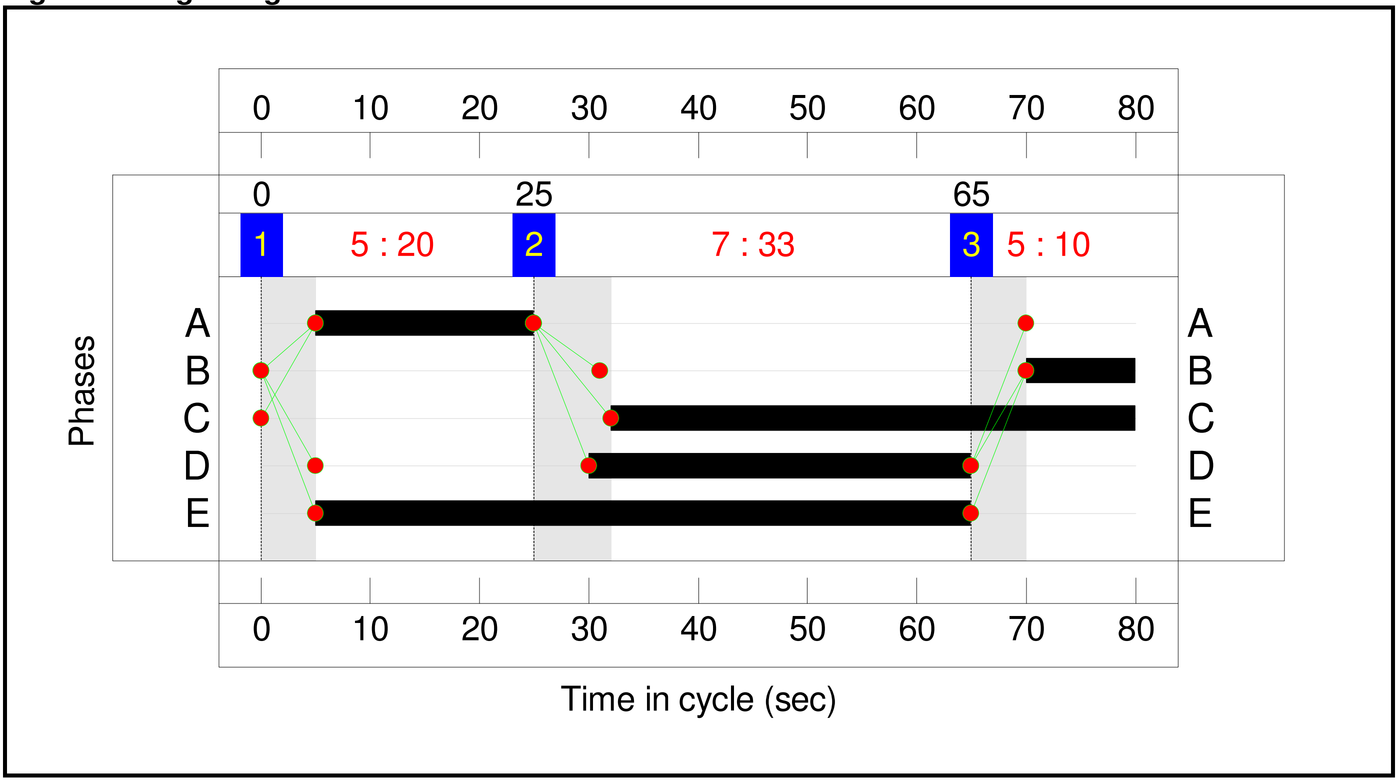
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**32.2**	**251.3**	**0.0**	**283.5**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**32.2**	**251.3**	**0.0**	**283.5**	**-**	**-**	**-**	**-**
1/1+1/2	1271	986	-	-	-	14.3	144.5	-	158.8	449.7	33.6	144.5	178.1
2/1	643	518	-	-	-	10.1	65.1	-	75.2	421.0	17.1	65.1	82.1
3/1+3/2	1136	1066	-	-	-	7.7	41.8	-	49.5	157.0	13.5	41.8	55.3
4/1	1133	1133	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	568	568	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	868	868	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -43.5 Total Delay for Signalled Lanes (pcuHr): 283.50 Cycle Time (s): 80
PRC Over All Lanes (%): -43.5 Total Delay Over All Lanes(pcuHr): 283.50

Ashford Willington LinSig Data
Scenario 12: 'PM24+C+D' (FG12: 'PM 2024 + Committed + Development', Plan 1: 'Network Control Plan 1')
Stage Sequence Diagram


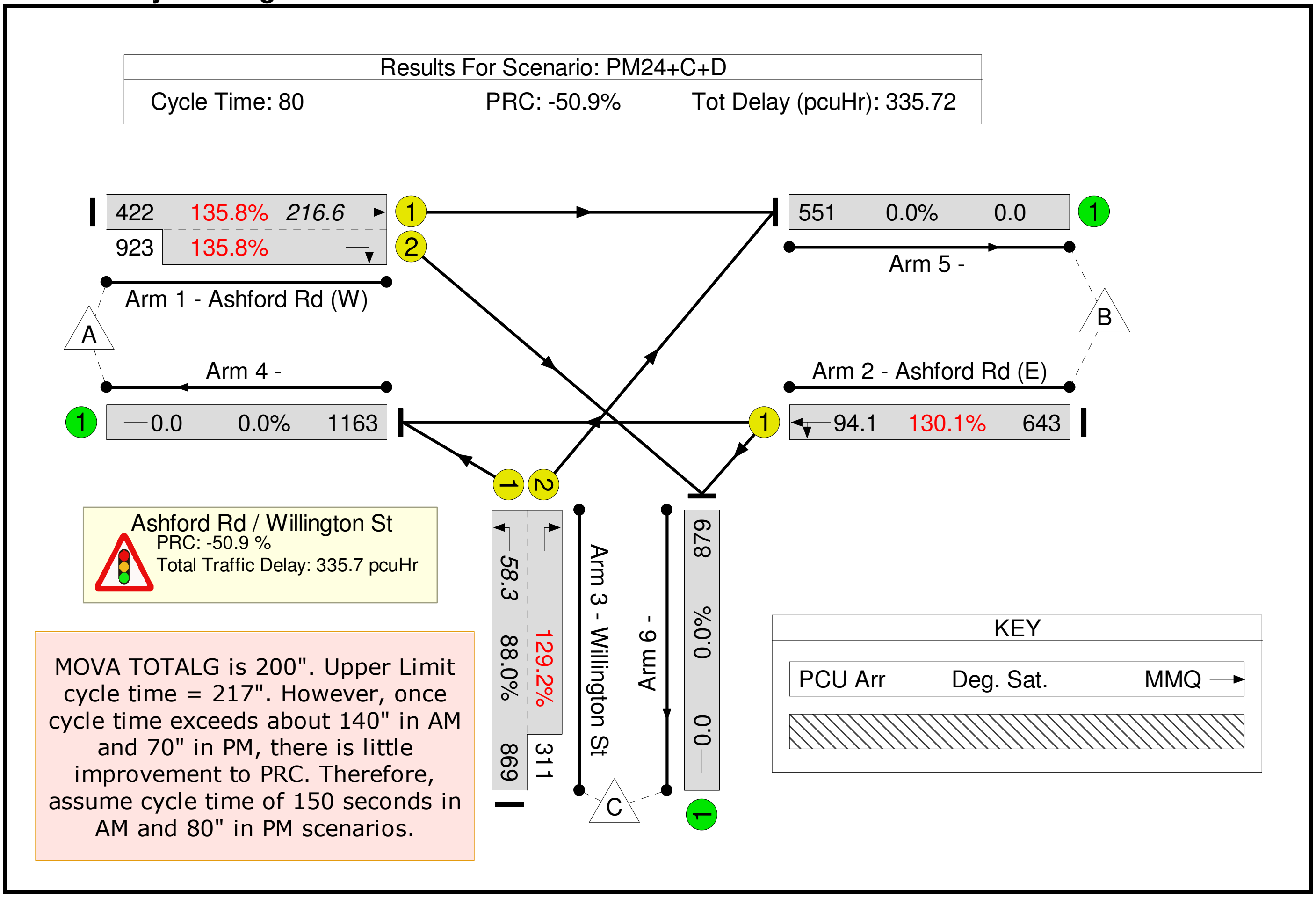
Stage Timings

Stage	1	2	3
Duration	20	33	10
Change Point	0	25	65

Signal Timings Diagram


Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**135.8%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**135.8%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	60:35	-	1345	1915:1730	311+680	135.8 : 135.8%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	20	-	643	1883	494	130.1%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	48:10	-	1180	1802:1751	988+241	88.0 : 129.2%
4/1		U	N/A	N/A	-		-	-	-	1252	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	733	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1183	Inf	Inf	0.0%

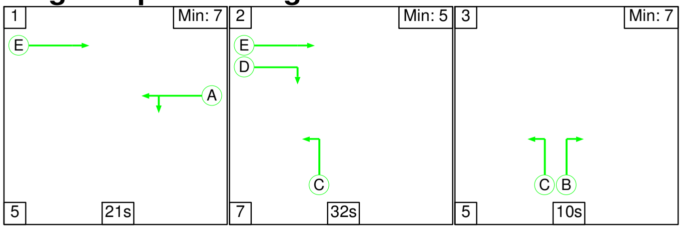
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**36.0**	**299.7**	**0.0**	**335.7**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**36.0**	**299.7**	**0.0**	**335.7**	**-**	**-**	**-**	**-**
1/1+1/2	1345	990	-	-	-	17.0	179.2	-	196.2	525.2	37.3	179.2	216.6
2/1	643	494	-	-	-	11.2	76.5	-	87.6	490.6	17.6	76.5	94.1
3/1+3/2	1180	1110	-	-	-	7.8	44.0	-	51.9	158.2	14.2	44.0	58.3
4/1	1163	1163	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	551	551	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	879	879	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -50.9 Total Delay for Signalled Lanes (pcuHr): 335.72 Cycle Time (s): 80
PRC Over All Lanes (%): -50.9 Total Delay Over All Lanes(pcuHr): 335.72

Ashford Willington LinSig Data

Scenario 13: 'PM29+C' (FG13: 'PM 2029 + Committed', Plan 1: 'Network Control Plan 1')

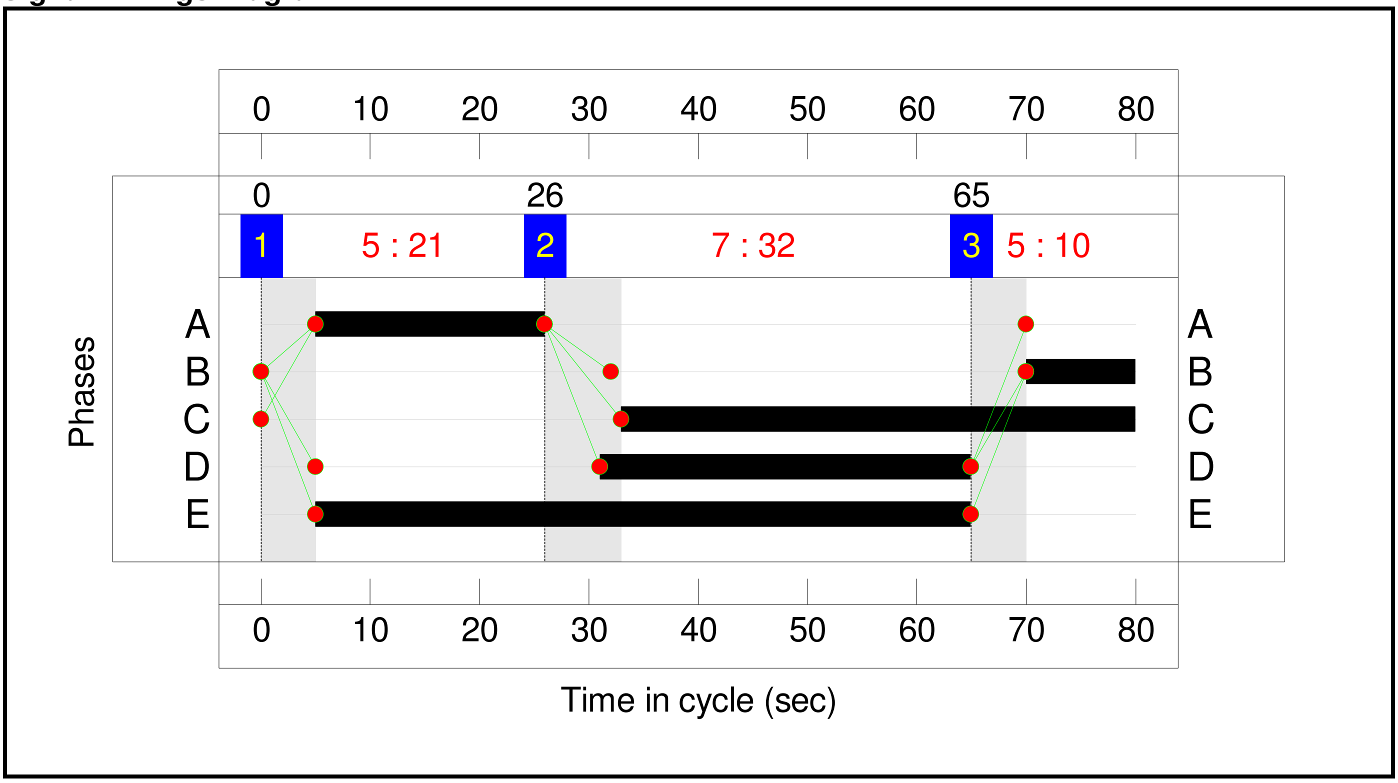
Stage Sequence Diagram



Stage Timings

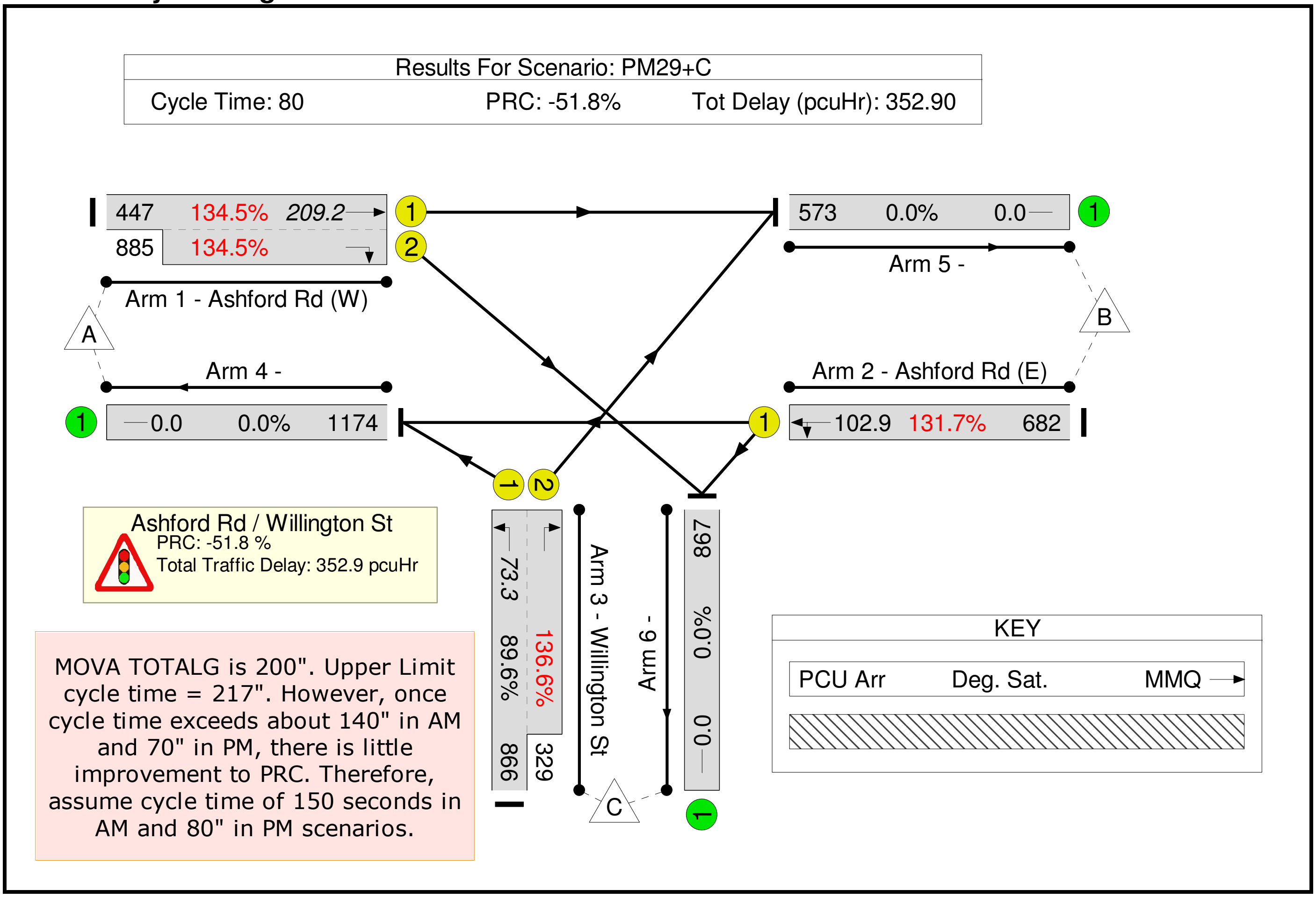
Stage	1	2	3
Duration	21	32	10
Change Point	0	26	65

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



MOVA TOTALG is 200". Upper Limit cycle time = 217". However, once cycle time exceeds about 140" in AM and 70" in PM, there is little improvement to PRC. Therefore, assume cycle time of 150 seconds in AM and 80" in PM scenarios.

Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**136.6%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**136.6%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	60:34	-	1332	1915:1730	332+658	134.5 : 134.5%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	21	-	682	1883	518	131.7%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	47:10	-	1195	1802:1751	966+241	89.6 : 136.6%
4/1		U	N/A	N/A	-		-	-	-	1272	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	776	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1161	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**37.3**	**315.6**	**0.0**	**352.9**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**37.3**	**315.6**	**0.0**	**352.9**	**-**	**-**	**-**	**-**
1/1+1/2	1332	990	-	-	-	16.4	172.8	-	189.3	511.5	36.4	172.8	209.2
2/1	682	518	-	-	-	12.0	84.1	-	96.1	507.3	18.8	84.1	102.9
3/1+3/2	1195	1107	-	-	-	8.9	58.6	-	67.5	203.5	14.7	58.6	73.3
4/1	1174	1174	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	573	573	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	867	867	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

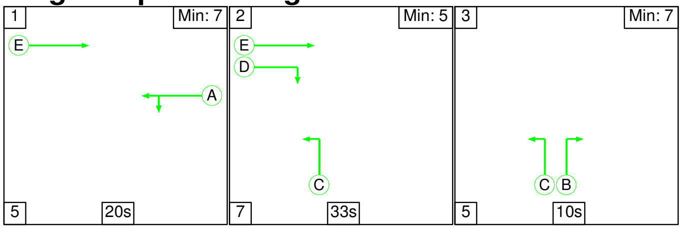
C1 PRC for Signalled Lanes (%): -51.8 Total Delay for Signalled Lanes (pcuHr): 352.90 Cycle Time (s): 80

PRC Over All Lanes (%): -51.8 Total Delay Over All Lanes(pcuHr): 352.90

Ashford Willington LinSig Data

Scenario 14: 'PM29+C+D' (FG14: 'PM 2029 + Committed + Development', Plan 1: 'Network Control Plan 1')

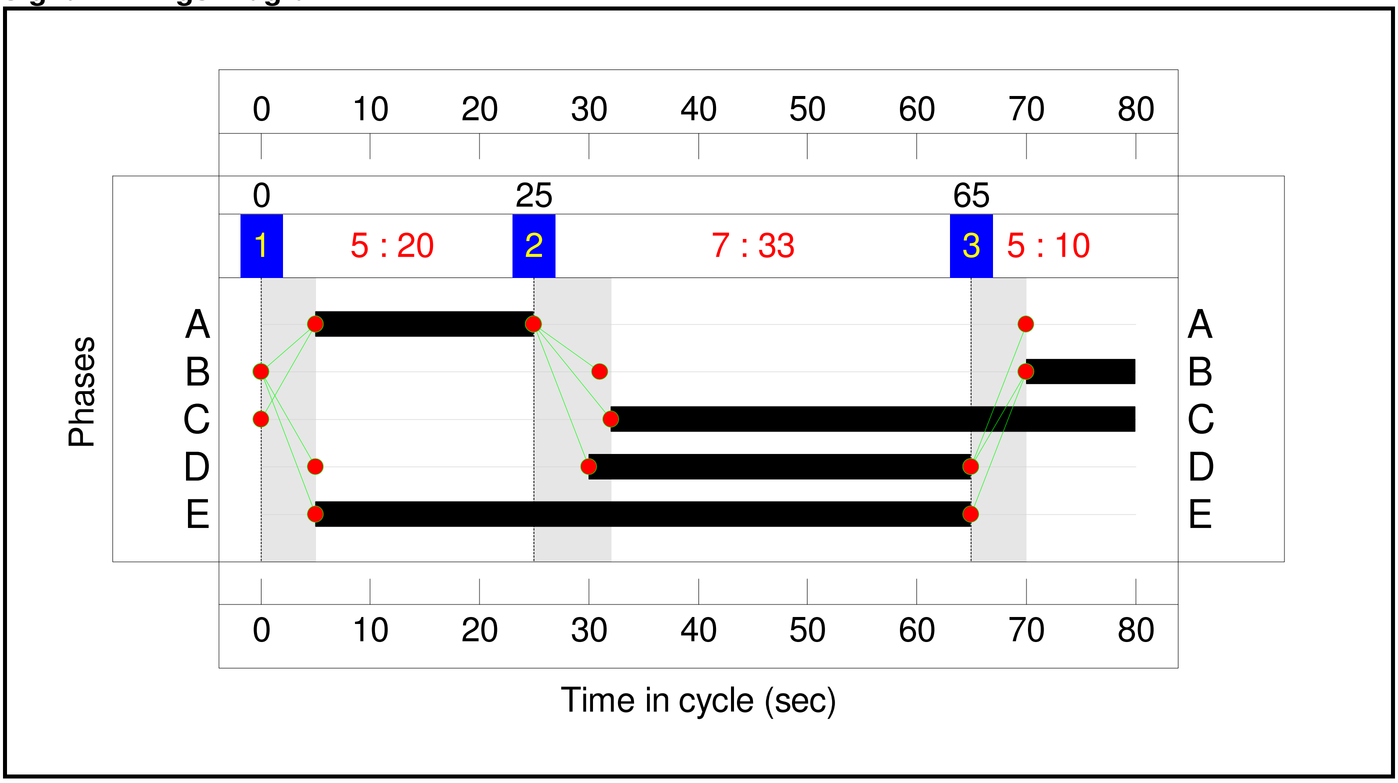
Stage Sequence Diagram



Stage Timings

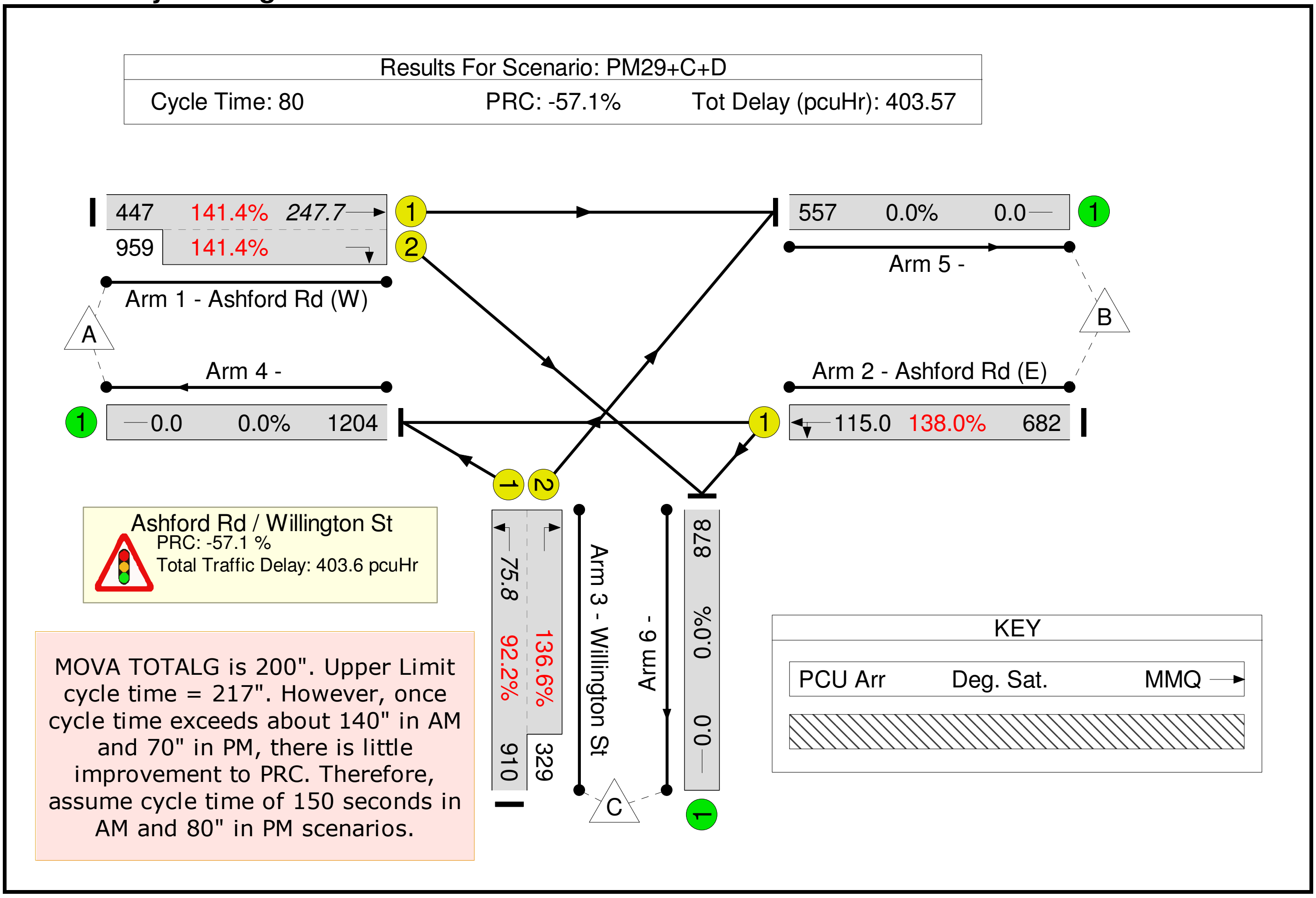
Stage	1	2	3
Duration	20	33	10
Change Point	0	25	65

Signal Timings Diagram



Ashford Willington LinSig Data

Network Layout Diagram



Ashford Willington LinSig Data

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: Ashford Willington	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**141.4%**
Ashford Rd / Willington St	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**141.4%**
1/1+1/2	Ashford Rd (W) Ahead Right	U	N/A	N/A	E D		1	60:35	-	1406	1915:1730	316+678	141.4 : 141.4%
2/1	Ashford Rd (E) Ahead Left	U	N/A	N/A	A		1	20	-	682	1883	494	138.0%
3/1+3/2	Willington St Left Right	U	N/A	N/A	C B		1	48:10	-	1239	1802:1751	987+241	92.2 : 136.6%
4/1		U	N/A	N/A	-		-	-	-	1316	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	776	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	1235	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Ashford Willington	**-**	**-**	**0**	**0**	**0**	**41.3**	**362.2**	**0.0**	**403.6**	**-**	**-**	**-**	**-**
Ashford Rd / Willington St	**-**	**-**	**0**	**0**	**0**	**41.3**	**362.2**	**0.0**	**403.6**	**-**	**-**	**-**	**-**
1/1+1/2	1406	994	-	-	-	19.2	207.5	-	226.7	580.6	40.2	207.5	247.7
2/1	682	494	-	-	-	13.0	95.6	-	108.7	573.7	19.3	95.6	115.0
3/1+3/2	1239	1151	-	-	-	9.0	59.1	-	68.1	198.0	16.7	59.1	75.8
4/1	1204	1204	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	557	557	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	878	878	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1 PRC for Signalled Lanes (%): -57.1 Total Delay for Signalled Lanes (pcuHr): 403.57 Cycle Time (s): 80
PRC Over All Lanes (%): -57.1 Total Delay Over All Lanes(pcuHr): 403.57

K

APPENDIX

Kent County Council
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Transport Business Case Report

Maidstone Integrated Transport Package

CO04300369/013 Revision 01

January 2016

INVESTORS IN PEOPLE | Gold

INVESTORS IN PEOPLE | Champion

Document Control Sheet

Project Name:	Maidstone Integrated Transport Package
Project Number:	CO04300369
Report Title:	Transport Business Case Report
Report Number:	013

Issue Status/Amendment	Prepared	Reviewed	Approved
00 (for SELEP ITE Gate 1 review)	Name: Margaret Nicholls Signature: Date: 06/01/16	Name: Gareth Elphick Signature: Date: 08/01/16	Name: Steve Whittaker Signature: Date: 08/01/16
01 (General updates following SELEP ITE Gate 1 review)	Name: Margaret Nicholls Signature: Date: 27/01/16	Name: Steve Whittaker Signature: Date: 28/01/16	Name: Steve Whittaker Signature: Date: 28/01/16
	Name: Signature: Date:	Name: Signature: Date:	Name: Signature: Date:
	Name: Signature: Date:	Name: Signature: Date:	Name: Signature: Date:

Contents

1 Introduction

1.1 Overview

1.1.1 Amey have been commissioned by KCC (Kent County Council) to develop proportionate business cases for various South East Local Enterprise Partnership (SELEP) schemes being promoted by Kent to be funded by the South East Growth deal as part of the Government's Local Growth Fund.

1.2 Maidstone Integrated Transport Package

1.2.1 The Maidstone Integrated Transport Package (ITP) aims to reduce congestion and ease traffic movements through the town. The scheme's purpose is to help to fulfil the strategic aims of delivering the SELEP housing and employment growth targets, delivering the Maidstone Borough Council Transport Strategy and Local Plan, whilst complying with DfT transport scheme performance and approval criteria to justify investment of capital funds. The scheme is programmed for delivery before the end of 2017.

1.2.2 The scheme (alongside a number of others across Kent) will contribute to the planned introduction of 165,000 new jobs and construction of 128,000 new homes across the 6 year period 2015 to 2021.

1.2.3 The overall Maidstone ITP has an estimated value of £13.9 million. This total is broadly split across funding years from 2016 to 2020 and comprises of £8.9 million LGF contribution and £5.0 million private sector contribution. Additional potential for funding from the Local Authority is under review.

1.2.4 The Maidstone ITP is intended to be delivered in a phased approach as the exact scheme proposals for some elements of the package are developed in greater detail. The first phase of the Maidstone ITP, and the focus of this business case, is the proposed improvements to the junctions at either end of Willington Street, located to the east of Maidstone town centre.

1.2.5 Willington Street connects the A20 and A274 routes which are the two key corridors into Maidstone from the east and south east. The scope of this first phase if the strategy is to improve the operation of the junction at the northern end of Willington Street with the A20 Ashford Road and the junction at the southern end of Willington Street with the A274 Sutton Road. At present these signalised junctions at each end of Willington Street are heavily congested under peak traffic conditions.

1.2.6 The Willington Street Junction Improvements scheme is intended to be delivered in the financial year 2016/17 with an estimated cost of £1.74 million, incorporating the £1.3m LGF allocation for 2016/17.

1.2.7 The remaining phases of the Maidstone ITP will be detailed in a subsequent updated business case to secure the LGF funding allocated funding for the Maidstone ITP scheme for 2017/18 onwards.

1.3 Area Description

1.3.1 Maidstone Borough is a Non-Metropolitan District bounded by Medway and the district authorities of Tonbridge & Malling, Tunbridge Wells, Swale and Ashford. The main urban settlement within the borough is the county town of Maidstone, with rural villages and parishes making up the remainder (Figure 1-1).

Figure 1-1: Kent and Maidstone Borough Council Boundaries

1.3.2 In 2011, the borough had a population of 155,143 with 80% of these people living in urban areas. Census figures indicate that the population of the town of Maidstone rose by 11% between 2001 and 2011. In 2011, the population of Maidstone town was estimated to be 137,137.

1.3.3 Maidstone is located in the heart of Kent and is the county town, providing an administrative, commercial, education and employment hub.

1.3.4 The M20 passes to the north of the town and can be accessed from Maidstone from Junctions 5 to 8. Maidstone is served by radial routes which converge at the river crossing in the heart of the town. The highway network is such that there are limited opportunities for traffic to move between the radial routes without passing through the river crossing. Willington Street provides one of the few links between the two key radial routes to the east of the town, connecting with the A20 and A274.

1.4 Background to the Business Case

1.4.1 In July 2014, the government negotiated a Growth Deal with 39 Local Enterprise Partnerships (LEPs), which awarded a significant proportion of a £12 billion Local Growth Fund to LEPs.

1.4.2 The South East Local Enterprise Partnership (SELEP) brings together key leaders from business, local government, further and higher education in order to create the most enterprising economy in England through exploring opportunities for enterprise while addressing barriers to growth Covering Essex, Southend, Thurrock, Kent, Medway and East Sussex and are the largest strategic enterprise partnership outside of London.

1.4.3 SELEP has secured £442.2 million (as at July 2014) in funding from HM Government to boost economic growth - with a particular focus on transport schemes that will bring new jobs and homes until 2021. This includes £358.2 million for new growth schemes on top of £74 million already committed for large transport projects. The Deal will see at least £84.1 million invested in the SELEP area next year, supporting the delivery of up to 35,000 jobs and 18,000 new homes and over £100 million in private investment over the 6 year period. For Kent the funding allocation is £104 million which was won by the Kent & Medway Economic Partnership – the local arm of the SELEP.

1.4.4 The government asked all LEPs as part of their Growth Deal to sign up to working with them to develop a single assurance framework covering all Government funding flowing through LEPs, to ensure all LEPs have robust value for money processes in place. The purpose of this LEP assurance framework is to support the developing confidence in delegating funding from central budgets and programmes via a single pot mechanism. As part of their Growth Deal, LEPs will be expected to use this national framework to inform how they work locally, which must be set out in their own local assurance framework.

1.4.5 It is important that all LEPs have robust arrangements in place to ensure value for money and effective delivery, through strong project development, project and options appraisal, prioritisation, and business case development.

1.4.6 The methodology used to assess value for money and the degree of detail to which business cases are developed in support of particular projects or programmes should be proportionate to the funding allocated and in line with established Government guidance including the HM Treasury Green Book. Typically the Government expect business cases to address, in a proportionate manner, the 5 cases set out in supplementary guidance to the Green Book.

1.5 Purpose of this Document

1.5.1 This report follows the 5 case model guidance issued by DfT for Business Case preparation. The intention of the report is to provide robust evidence to the SELEP of the merits of the Willington Street junction improvements as the first phase and key part of a wider integrated transport strategy for Maidstone; and justifying the application for the earmarked 2016/17 LGF funding allocation.

1.6 Structure of the Document

1.6.1 This report is structured in accordance with the Department for Transport's guidance on Transport Business Case, which was updated in January 2013. Following this Introduction, the remainder of the document is structured as follows:

- Chapter 2 provides a description of the scheme;
- Chapter 3 states the Strategic Case;
- Chapter 4 presents the Economic Case including the Value for Money Statement
- Chapter 5 outlines the Financial Case;
- Chapter 6 details the Commercial Case; and
- Chapter 7 provides the Management Case.
- Chapter 8 offers conclusions and recommendations.

2 Willington Street Junction Improvements

2.1 Introduction

2.1.1 The junctions at each end of Willington Street are considered to represent significant 'pinch points' along the A20 and A274 corridors, inhibiting traffic movement to the east and south of the town. Both junctions currently operate as signalised T junctions, which cater for heavy turning movements to and from Willington Street.

2.1.2 The scope of the scheme is to improve the existing signalised junctions of Willington Street with the A20 and with the A274 in order to maximise efficiency of the network and reduce queueing and delays. The A274 / Willington Street junction also encompasses the adjacent signalised junction of Wallis Avenue with the A274.

2.1.3 The Willington Street Junction Improvements Scheme will include:

- Widening of carriageway to allow for an additional lane westbound on the A274 on the approach to the Willington Street junction;
- Widening of the westbound carriageway between the Willington Street and Wallis Avenue junctions to allow for 2 lanes of traffic;
- Signal optimisation of the Willington Street and Wallis Avenue junctions to take account of the new arrangement;
- Widening of carriageway to allow for a left turn lane on the westbound approach of the A20 to Willington Street;
- Signal optimisation to take account of the revised junction arrangement; and
- Existing pedestrian and cycle facilities to be retained and enhanced where possible.

2.1.4 Plans showing the specific improvements proposed at each location are contained within **Appendix A** of this report.

2.2 Background

2.2.1 The A20 Ashford Road is the main route to Maidstone town centre from the east and from the M20 junction 8. This single carriageway, 30mph road has an average annual 2 way daily flow of between 13,800 and 21,800 vehicles per hour, to the east and west of the Willington Street junction respectively. The route carries two way peak flows of up to 1,850 vehicles per hour.

2.2.2 The A274 Sutton Road corridor is the main route to Maidstone for the communities to the south east of the town. This route also serves the main commercial and industrial area of Maidstone at Parkwood. The A274 is a single carriageway 30mph road which has a two way average daily flow of 19,000 and peak flows of 1,680 vehicles per hour.

2.2.3 Willington Street provides an important link between the A20 and A274 route corridors to the east of the town centre. A significant number of vehicles travel via Willington Street, the A20 and New Cut to access the M20 at junction 7 and routes to north Kent. The road is heavily used by traffic travelling between the route corridors, attempting to avoid congestion in the town centre. Consequently there is a significant level of turning traffic at each end of Willington Street to and from the A20 and A274.

2.2.4 Figure 2-1 below indicates the location of the junctions to be improved.

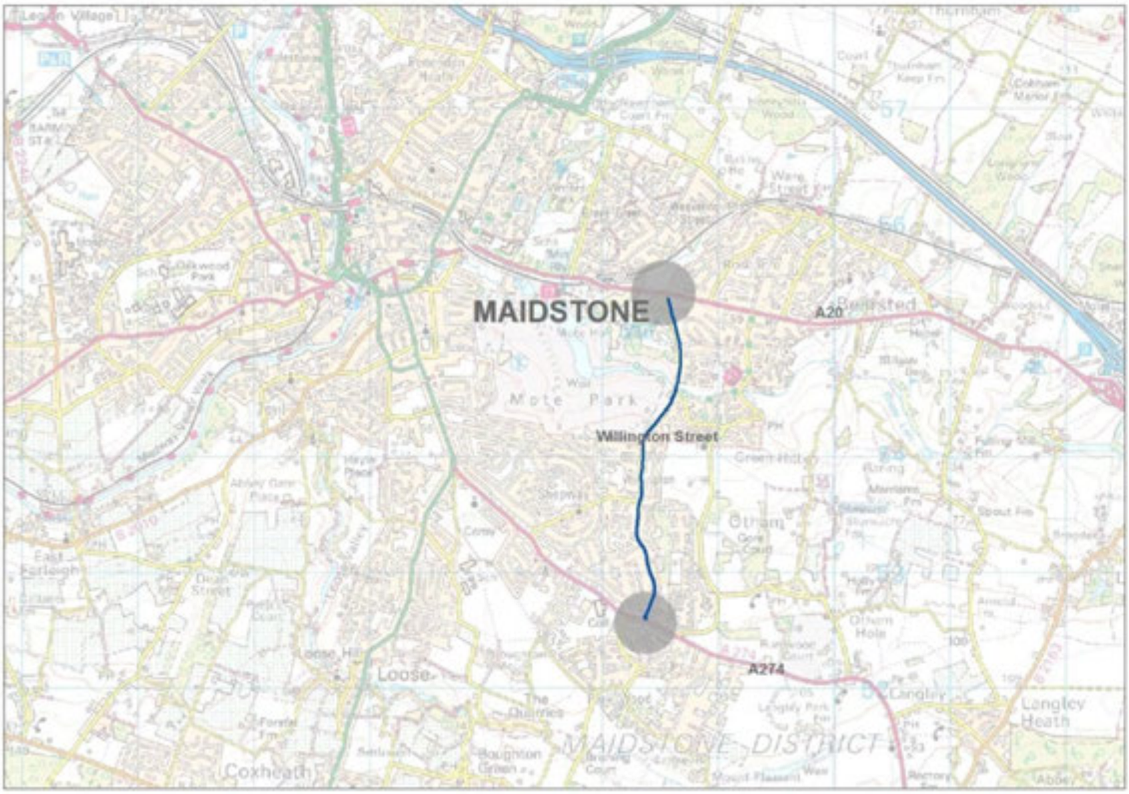


Figure 2-1: Location of Proposed Willington Street Junction Improvements

2.2.5 Willington Street is an unclassified 30mph road serving the residential area with residential frontage. Two way peak hour flows range from 1,200 to 1,800 vehicles per hour at the southern end and northern end of Willington Street, respectively. The Willington Street Park and Ride site is located to the west of Willington Street near to the A20 junction and the Park and Ride bus accesses the site via the A20 / Willington Street junction.

2.3 Purpose of the Scheme

2.3.1 The Willington Street junction improvements are the first phase of the Maidstone ITP, which comprises of a package of measures across the town aimed at reducing the level of congestion within urban area.

2.3.2 The junctions at each end of Willington Street are currently operating with significant delay for traffic on the A20, A274 and on Willington Street, with queues on all arms. The purpose of the scheme is to ease congestion at these junctions, reducing delay and improving journey time reliability and the overall efficiency of the network.

2.3.3 Maidstone Borough Council is committed to the provision of 18,560 additional homes by 2031 as part of the Local Plan housing target. More than 2,000 of these homes are currently planned to the east of the town centre and in particular along the A274 corridor. Improvements to the junctions of Willington Street with the A20 and A274 will be crucial to accommodate additional demand arising from the new homes.

2.4 Complementary Measures

2.4.1 The Willington Street junction improvements are an example of a range of schemes being undertaken by KCC to achieve its strategic aims of being a better, more accessible and more sustainable county. In particular the Willington Street junction improvements will complement the subsequent elements of the wider integrated transport strategy for the Maidstone, which aims to relieve congestion and ease traffic movements through the town.

3 Strategic Case

3.1 Introduction

This section sets out the 'case for change', by explaining the rationale for making investment and presenting evidence on the strategic policy fit of the proposed scheme. This section also sets out the scheme options under consideration.

The Strategic Case establishes the:

- Context for the business case, outlining the strategic aims and responsibilities of Kent County Council (KCC);
- Transport-related problems that have been identified, using evidence to justify intervention and examining the impact of not making the investment;
- Specific, Measurable, Achievable, Realistic and Time-bound (SMART) objectives that solve the problem, identified through alignment with KCC's strategic aims and responsibilities;
- Measures for determining successful delivery of the objectives;
- Scheme scope, determining what the project will and will not deliver;
- Analysis of constraints and opportunities for investment;
- Breakdown of interdependencies on which the successful delivery of the scheme depends;
- Details of main stakeholder(s); and
- Evaluation of the options considered.

3.2 Strategic Context

National Transport Priorities

3.2.1 The Government has long-term objectives aimed at improving the economy, environment and society. These are the three tenets against which major transport infrastructure projects are assessed, and will continue to be assessed in future.

3.2.2 In its National Infrastructure Plan (NIP) 2014, the Government presented its vision for growth and how infrastructure; "Has a significant positive effect on output, productivity and growth rates and is a key driver of jobs throughout the economy";

3.2.3 Transport infrastructure can play a vital role in driving economic growth by improving the links that help to move goods and people around. With regards to the highway network, the strategy aims to;

- increase capacity;
- tackle congestion;
- support development;
- strengthen connectivity; and
- improve reliability and resilience.

3.2.4 The Department for Transport (DfT) is responsible for planning and investing in transport infrastructure to keep people and business in the UK moving. The key priorities for the DfT are aimed at ensuring that these responsibilities are met both now and in future years. Key priorities for the DfT are;

- Continuing to develop and lead preparations for a high speed rail network;
- Improving existing rail and creating new capacity to improve services;
- Tackling congestion on roads;
- Improving road safety;
- Encouraging sustainable travel;
- Promoting lower carbon transport;
- Supporting market for ultra-low emission and electric vehicles;
- Supporting development of aviation; and
- Maintaining high standards of safety and security.

3.2.5 It is clear that whilst not all of the visions are directly associated with the proposed scheme such as rail and aviation, there is considerable overlap between the scheme and measures to tackle congestion and encourage more sustainable forms of travel.

Regional Transport Priorities

3.2.6 In March 2014, the SELEP submitted their Strategic Economic Plan (SEP). Within the six year period covered by the SEP (2015/16 to 2020/21) several considerable developments are planned within Kent. Kent is South East England's fastest recovering region and has potential for successful economic growth. Over the last 20 years Kent has seen 100,000 more people living in the county, housing stock increase by over 60,000 homes and 130,000 more cars on the road. The pace of change is set to accelerate further over the next 20 years with a projected 8% population increase.

3.2.7 Through the Kent and Medway Growth Deal (as part of the Strategic Economic Plan), the public and private sectors intend to invest over £80 million each year for the next six years to unlock potential through:

- Substantially increasing the delivery of housing and commercial developments;
- Delivering transport and broadband infrastructure to unlock growth;
- Backing business expansion through better access to finance and support; and
- Delivering the skills that the local economy needs.

3.2.8 The integrated transport package for Maidstone has been included in the South East Local Enterprise Partnership provisional allocation for transport schemes starting in 2016-17 and beyond. The proposed Willington Street Junction Improvements is a key feature of the integrated transport package.

3.2.9 Growth without Gridlock is the delivery plan for transport investment in Kent, published in 2010. It sets out the priorities for transport investment and how these will be delivered in order to meet the current and future demands of the County in the context of its crucial role in the UK and European economy.

3.2.10 The overarching goal of Growth without Gridlock is to enable growth and prosperity for Kent and the UK as a whole. Although predating the South-East LEP Strategic Economic Plan, the key elements of both are entirely in accord. This has enabled the development of an effective package of transport schemes to be brought forward as part of the Local Growth Fund investment.

3.2.11 In Growth without Gridlock, Maidstone is identified as an area experiencing severe congestion. The key transport challenges facing the town are;

- Tackling congestion hotspots and areas of poor air quality, particularly in the town centre and on the A roads into Maidstone;
- Providing multi-modal access to the town for development proposed to meet the Borough's challenging housing target;
- Maintaining accessibility to the town centre by public transport;
- Maintaining and enhancing rail services, particularly to the City of London.

Local Transport Priorities

3.2.12 The Borough has a target of providing 18,560 new homes by 2031. The location of the new housing is to be distributed across the borough and will be controlled by the policies set out in the Maidstone Borough Local Plan, which is currently being finalised. As part of this plan a number of larger housing developments are planned along the A274 corridor to the south west of the town centre.

3.2.13 The Maidstone Borough Local Plan is supported by a transport strategy which has been developed to manage the additional travel demand that will be generated by proposed new housing

3.2.14 One of the key priorities is the relief of congestion hot spots on the major routes into the town. The objective is to maximise the functionality of the existing network to free up movements around the town where possible. The junctions at each end of Willington Street are both regarded as significant points of congestion for the A20 and A274 which are the main corridors into Maidstone from the south and east.

3.2.15 Air Quality Management is an important element of the transport strategy and air quality is monitored at a number of locations around the town, including Willington Street, the A20 and A274 in the vicinity of the proposed improvements.

3.3 Problem Identified

3.3.1 Kent's LTP3 identifies the following key transport related issues affecting the county;

- Transport congestion;
- Supporting economic growth;
- The need to improve access to jobs and services;

- The need for a resilient network;
- Importance as a UK gateway; and
- A safer and healthier county.

3.3.2 The urban area of Maidstone currently suffers from severe traffic congestion with excessive delay on many of the major radial routes into the town during peak periods. The highway network of Maidstone is dominated by the radial routes and the potential to move between these main corridors is limited. Consequently there are a number of key locations where traffic converges which have been identified as congestion 'hotspots'.

3.3.3 Throughout the urban area of Maidstone the highway network is operating close to capacity during the peak periods. The existing heavy delays are prone to rapid escalation in response to problems that arise at recognised congestion hotspots and from any interruption to traffic flow, however small. This situation is exacerbated by any incidents on the M20 locally and on the M20 corridor generally, the impact of which rapidly spills over into and across the whole town. Delays and congestion through the town result in traffic searching out alternative routes, often on inappropriate roads.

3.3.4 The junctions at each end of Willington Street with the A20 and A274 routes have been identified as congestion 'hotspots'. The A20 and A274 are key routes serving the east and south east of Maidstone. The A20 provides an important link to the M20 at junction 8 and the A274 serves the commercial and industrial area around Parkwood. Willington Street is the only reasonable route for traffic movements between the A20 and A274 corridors which can serve all traffic and offers an alternative to crossing the congested town centre. Consequently the junctions at each end of Willington Street handle a significant volume of turning traffic as well as through movements.

3.3.5 The delay and congestion experienced at each junction inevitably has an impact on the bus services operating along the A20, A274 and Willington Street. This has an impact on the bus journey times and reliability of the services which in turn affects the attractiveness of the bus as an alternative mode of transport.

3.3.6 The Willington Street Park and Ride site is located to the west of Willington Street, near to the junction with the A20. Park and Ride buses and potential users of the services experience delay at the A20 junction when they arrive and leave the site via the A20 junction.

3.3.7 As a stand-alone scheme, the junction improvements are intended to tackle current local issues by:

- Improving the operation of the junctions in order to reduce congestion and delay,
- Improving journey time reliability for all vehicles including public transport.

3.3.8 As the first phase of the Maidstone ITP, the Willington Street Junction Improvements will relieve congestion on two major routes into the town.

3.4 Current Conditions

3.4.1 Congestion at the junctions of Willington Street with the A20 and A274 has been assessed based on manual classified turning counts, queue length surveys and travel times through the junctions.

Queue Length Surveys

3.4.2 Queue length surveys carried out in 2013 at the junction of A274/Willington St indicate significant queues on all arms throughout the peak hour. Figure 3-1 and Figure 3-2 show that queues approach 50 metres in length on Willington Street and 40 metres on the A274 during the peak periods. Throughout the AM peak period there are reasonably consistent queues on the A274 W and on Willington Street.

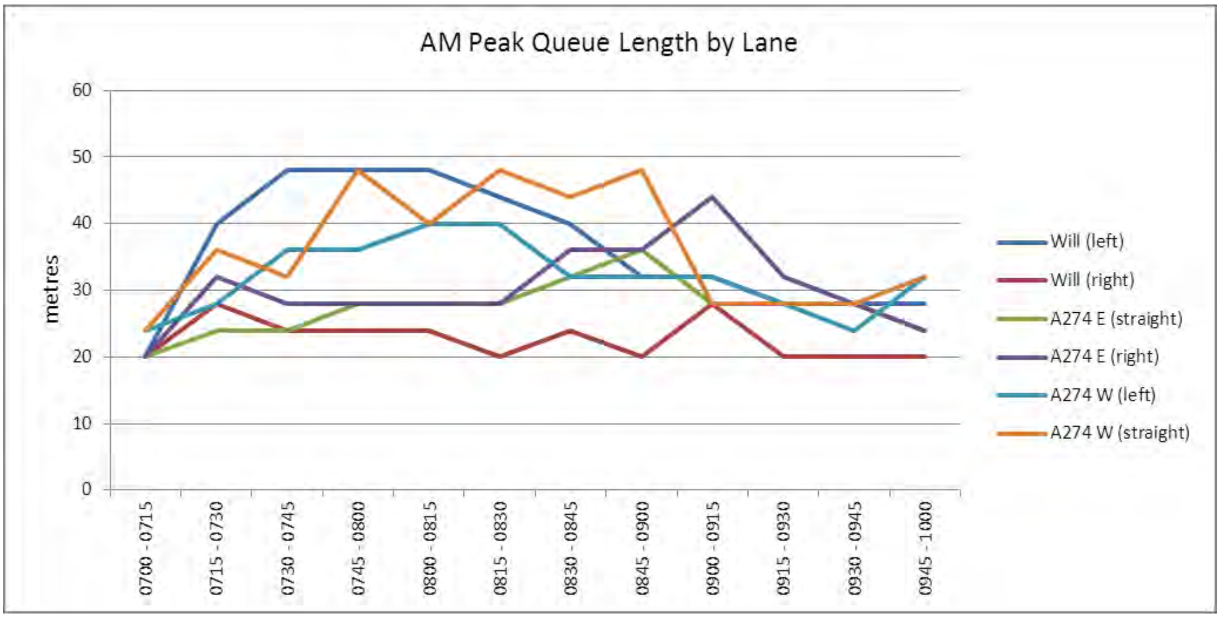


Figure 3-1: A274/Willington Street AM Peak Queues

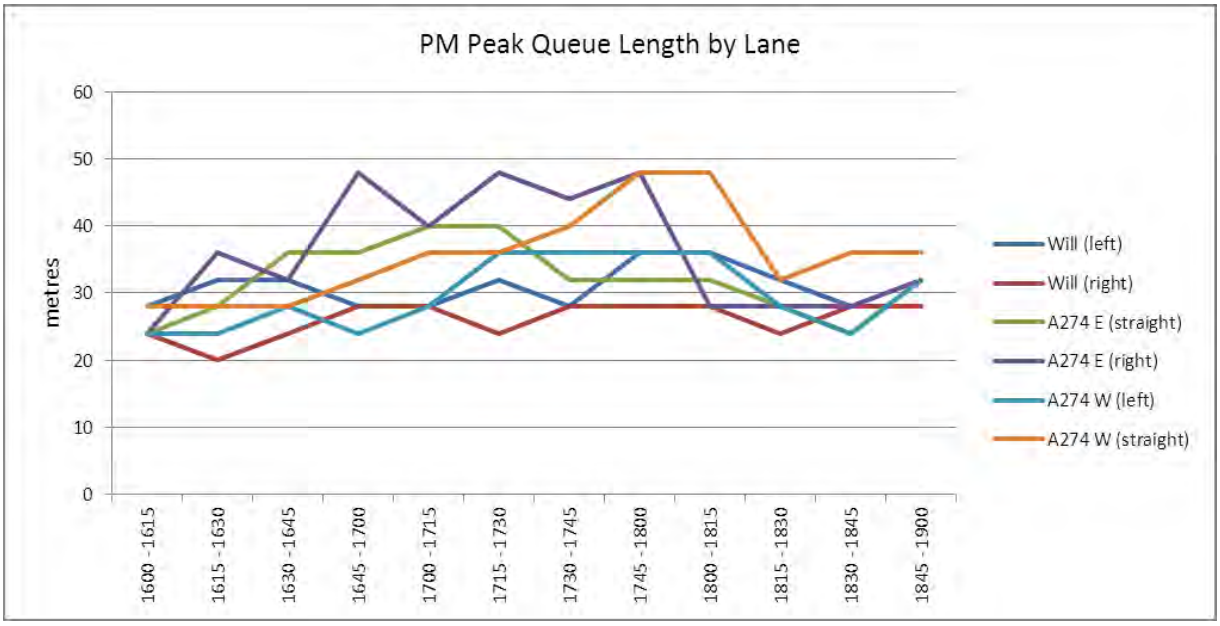


Figure 3-2: A274 / Willington Street PM Queues

Manual Classified Junction Turning Counts

3.4.3 Manual classified junction counts were recorded on 16th July 2014 at each end of Willington Street and are summarised in Figure 3-3 below. The average two way 12 hour traffic flow is over 19,800 on the A20 and over 17,900 on the A274. Willington Street has an average two way 12 hour flow of between 17,400 and 11,800 on the northern and southern sections, respectively.

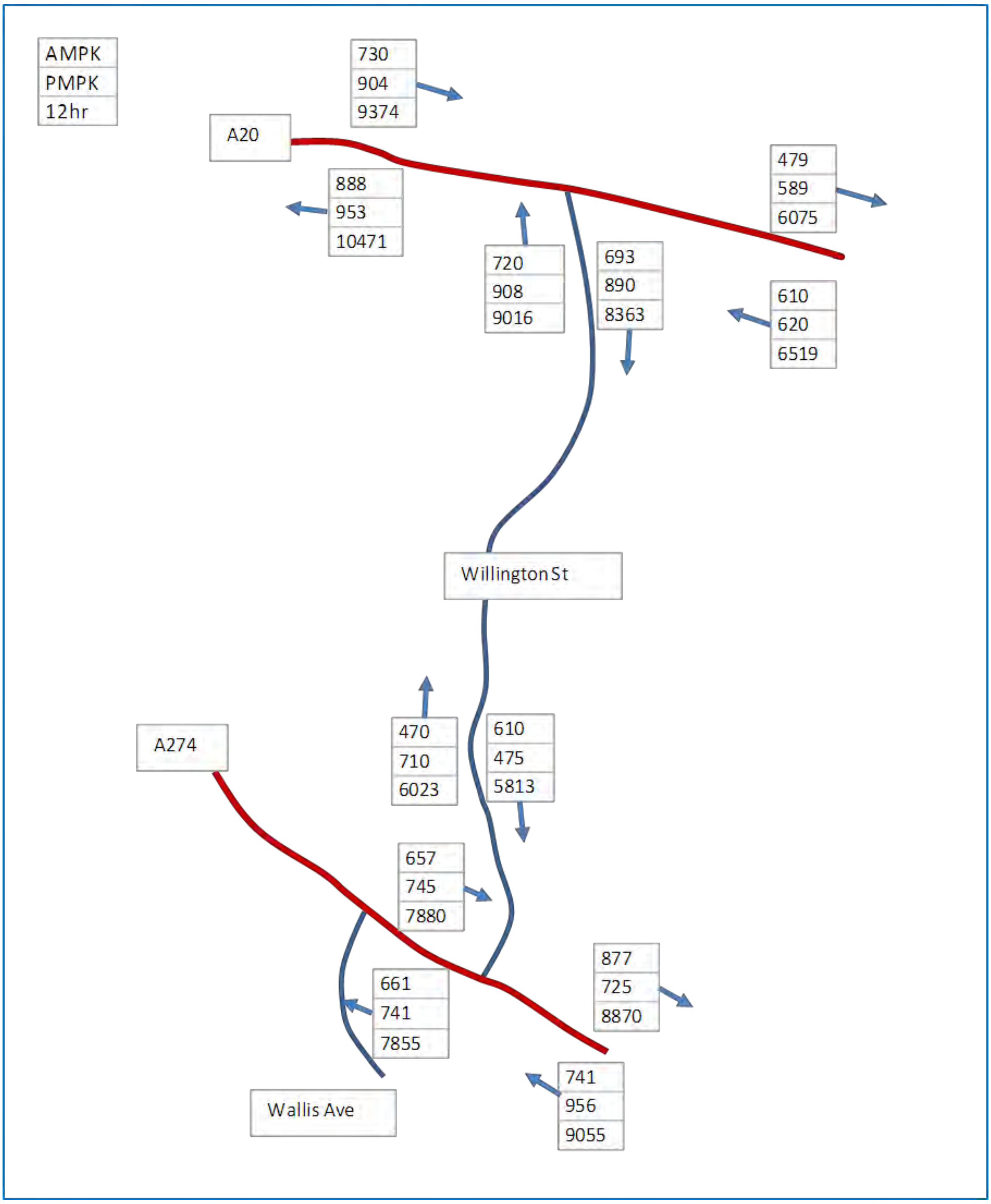


Figure 3-3: Willington Street Traffic (2014)

3.4.4 The junctions at each end of Willington Street both carry a significant volume of traffic throughout the day. During the peak periods the A20 junction caters for 2100 to 2400 vehicle movements, the PM peak having the heavier flows. The A274 junction has a total peak inflow of 2000 to 2180 vehicle movements (Figure 3-4).

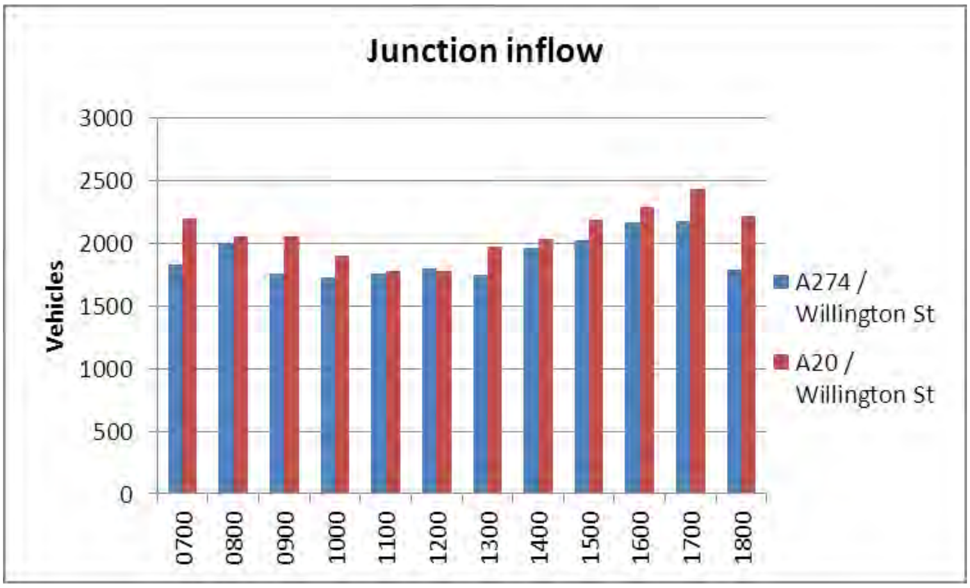


Figure 3-4: Willington Street Junctions - Inflow

3.4.5 The operation of each of the junctions is affected by the pattern of turning movements and the limitations of the current junction layouts. The 2 way link flows on the approach to the A20 junction shown in Figure 3-5 indicate that the A20 (west) and Willington Street are the most heavily used arms.

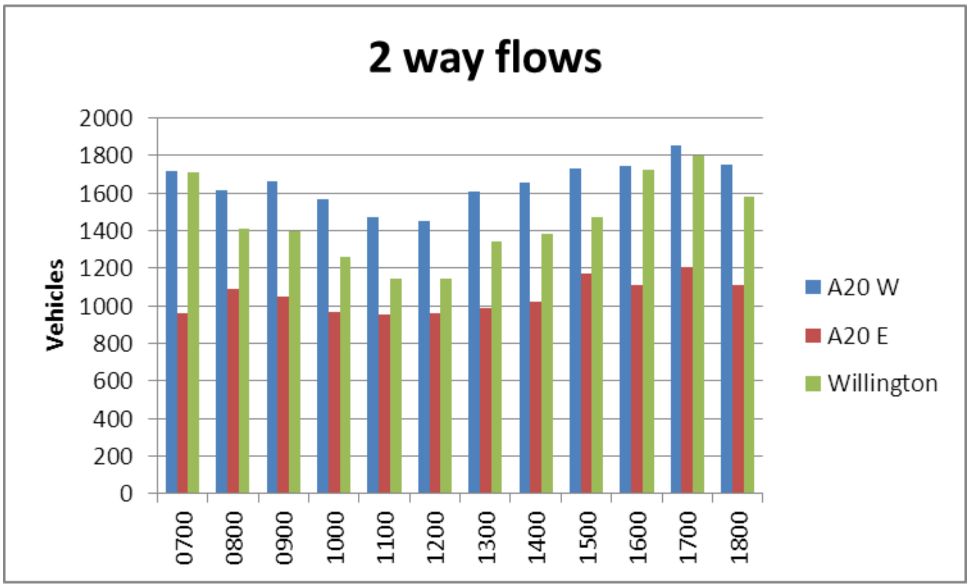


Figure 3-5: A20 / Willington Street Link Flows

3.4.6 At the southern end of Willington Street the flows on A274 (east and west) approaches are dominant at the junction (Figure 3-6). However there is also a significant volume of traffic on the Willington Street approach where HGVs account for 9% of the AM peak traffic moving from the A274 (east) to Willington Street.

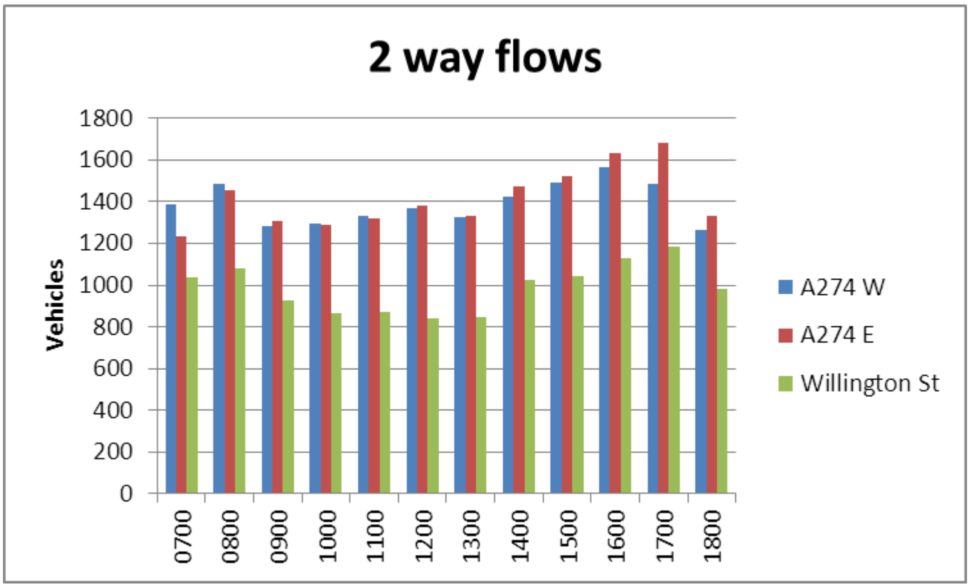


Figure 3-6: A274 / Willington Street Link Flows

Travel Time Data

3.4.7 The impact of congestion and delay on travel time along the A274, A20 and Willington Street has been assessed using Traffic Master GPS data. Weekday travel times have been extracted from 2014 Traffic Master data for three routes over a four week period to capture the impact of typical pattern of delays at the key junctions during the AM and PM peak periods. The routes analysed are;

- A20 between New Cut Road and The Landway to capture the impact of delay to the through movement on the A20;
- A274 between Bircholt Road and Nottingham Avenue to capture the impact of delay to through movements on the A274;
- Willington Street between the A20 and A274 junctions. This will capture the impact of delay to traffic using Willington Street, including the approaches to the junctions at each end.

3.4.8 The minimum, maximum and average travel times for each route are summarised in Figure 3-7. The minimum travel time effectively reflects the free and unimpeded movement of traffic. The difference between the minimum and average travel time indicates the typical level of delay experienced on each of the routes in the peak periods. The maximum travel times recorded were up to 5 minutes longer than the estimated average time.

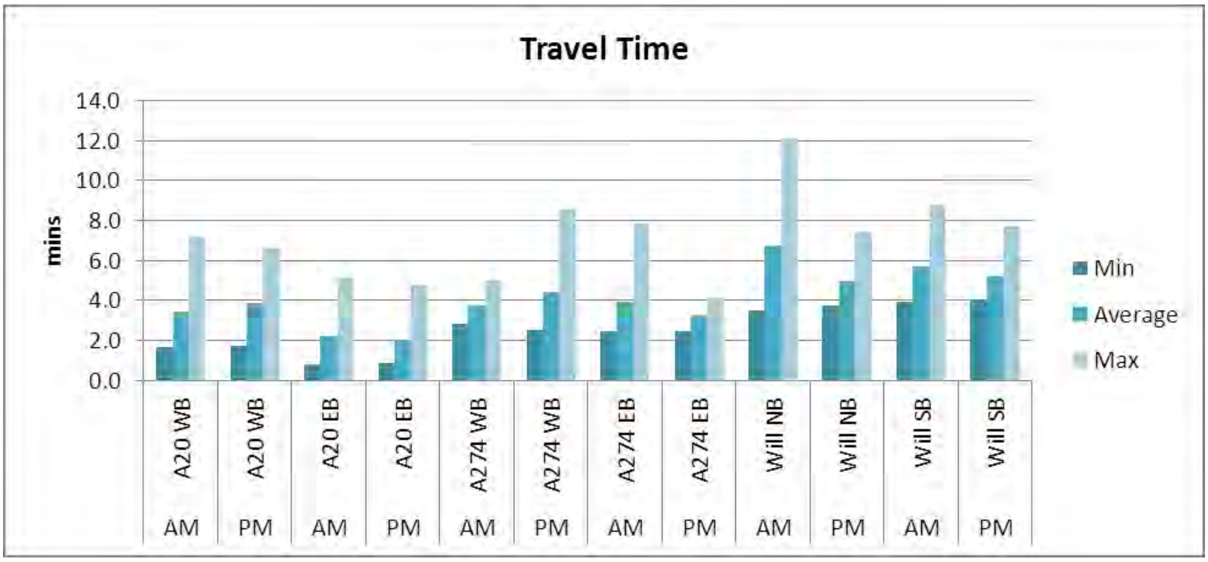


Figure 3-7: AM and PM Peak Travel Time

3.4.9 The frequency of the occurrence of delay above the average provides an indication of journey time reliability. Figure 3-8 indicates the frequency with which the average journey time is exceeded and the percentage of journeys which exceeded the average time by more than 1 minute.

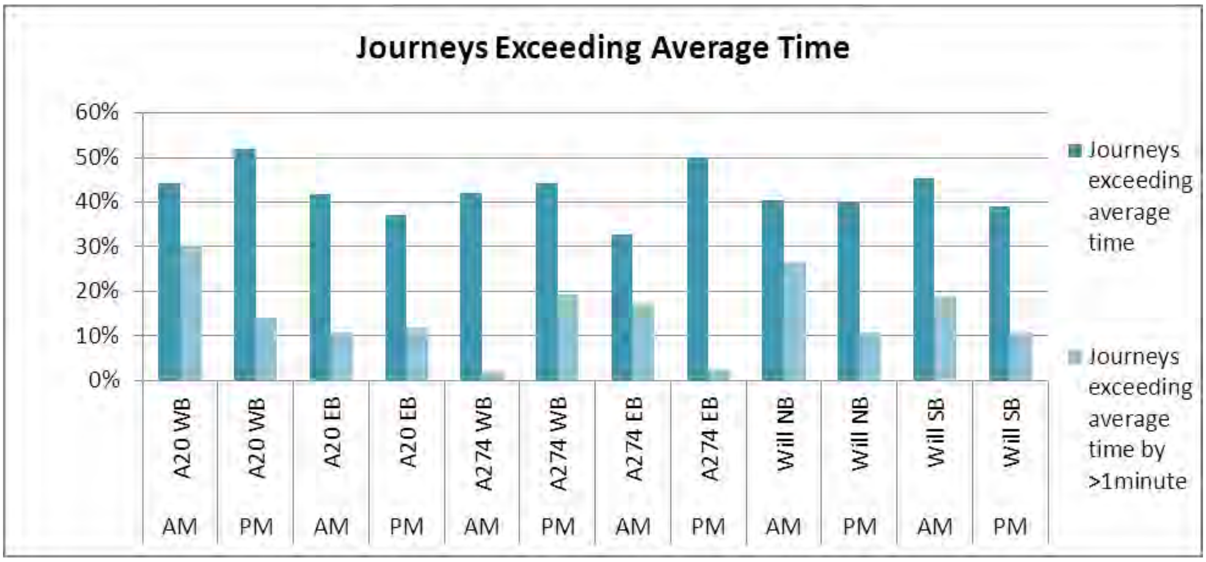


Figure 3-8: Proportion of Journeys Exceeding Average Travel Time

3.4.10 The movements suffering from higher total delay, most frequent delay and most frequent longer delay are:

- A274 eastbound in the AM peak;
- A274 westbound in the PM peak;
- Willington Street northbound in the AM peak;
- Willington Street southbound in the AM and PM peak
- A20 westbound in the AM and PM peak.

Accident Data

3.4.11 The main objective of the Willington Street Junction Improvements is the reduction of delay and congestion. Although the improvements are not designed to deal with issues around crashes specifically, a brief review of available data is included. The data indicates that there were a total of 27 accidents were recorded on Willington Street over a 5 year period between May 2010 and April 2015. In addition there were 4 accidents at or on the approach to the junction of Willington Street with the A20, 4 associated with the junction with the A274 and 5 associated with the junction of Wallis Avenue with the A274.

3.4.12 The observed accident rate for Willington Street and for the junctions is less than the average accident rates used for COBALT, as set out in the WebTAG DataBook (Autumn 2015 v1.4) (Table 3-1). These are determined by the number of personal injury accidents (PIA) every million vehicle kilometres (mvk) for links and PIA per annum for junctions.

Table 3-1: Crash Data

Location	Cobalt Accident rate	Accident rate recorded
Willington Street between A20 and A274	0.41 (PIA/mvk)	0.13 (PIA/mvk)
Junction of Willington St with A20	2.85 (PIA/annum)	0.80 (PIA/annum)
Junction of Willington St with A274	3.02 (PIA/annum)	0.80 (PIA/annum)
Junction of Wallis Avenue with A274	2.70 (PIA/annum)	1.20 (PIA/annum)

Air Quality

3.4.13 The A20, A274 and Willington Street routes all lie within the Maidstone town Air Quality Management Area (AQMA) which incorporates the entire urban conurbation. There are 4 nitrogen dioxide monitoring sites in the vicinity of Willington Street and the junctions with the A20 and A274. The Air quality report for Maidstone[1] for 2014 indicates that annual mean concentration of nitrogen dioxide at each of these sites is currently within the air quality objectives defined for Local Air Quality Management.

3.4.14 Although the existing air quality is at acceptable levels, the main source of air pollution in the borough is traffic emissions, a major factor being the impact of standing and slow moving traffic in queues at congestion 'hot spots'.

3.5 Impact of No Change

3.5.1 Allowing the existing situation to continue is likely to lead to the levels of congestion and delay described above to worsen. This will present a constraint to the planned development aspired to for the A274 and A20 corridors.

3.5.2 The introduction of further homes and employment opportunities to the local area will inevitably increase the number of people using the already saturated highway network. Increasing delay and congestion will encourage drivers to use inappropriate minor roads and to take longer circuitous routes to their destinations.

3.5.3 Bus services will be exposed to the same delay and congestion which will worsen journey times and the reliability of services.

3.5.4 Although the air quality recorded at the monitoring stations is above the recommended threshold it will deteriorate as a consequence of additional traffic travelling through congestion 'hot spots'.

3.5.5 Excessive congestion at key points on the network will further inhibit movement around the town. This in turn will make the town less accessible and consequently less attractive as a retail and business centre.

3.6 Internal Drivers for Change

[1] Maidstone Borough Council LAQM Progress Report 2014 (Bureau Veritas January 2015)

3.6.1 A key delivery strand of 21st Century Kent—Unlocking Kent's Potential, "Growth Without Gridlock" outlines how economic growth and regeneration can be delivered in a sustainable manner and also details the infrastructure required to deliver an integrated transport network which is fit for purpose in the 21st Century. If Kent is to accommodate this growth, its transport network must have sufficient capacity and resilience to provide for efficient and reliable journeys.

3.6.2 A main objective of the Willington Street junction improvements is to reduce delay and congestion on the A274 and A20 corridors and on Willington Street. This will allow the existing network to operate more efficiently and also present some potential capacity to accommodate the future trip growth arising from new development in and around Maidstone.

3.7 External Drivers for Change

3.7.1 Journey time reliability and congestion are the primary drivers and the planned growth of housing and jobs across the South East will contribute the existing problems. Whilst KCC has the power and ability to control what happens within its boundaries, it cannot be accountable for development elsewhere in the South East and beyond which may have repercussions within its boundaries.

3.8 Objectives

3.8.1 The objectives of the scheme align with both local and national strategic aims. The main purpose of the scheme is to reduce delay and ease congestion along the A274 and A20 routes into Maidstone. The introduction of the scheme is expected to reduce delay and improve journey times along these routes, which in turn could help reduce the impact of pollution from vehicles.

3.8.2 The following are the primary objectives associated with the scheme;

- Objective 1: Relieve congestion on the A20 and A274 corridors and on Willington Street, reducing disruption to traffic movements;
- Objective 2: Improve journey times and journey time reliability for all travellers.

3.8.3 Achieving the primary objectives will inevitably lead to a number of secondary objectives being realised although these may not be directly linked. These are likely to be;

- Improvement in bus travel time and reliability attracting travellers to more sustainable modes;
- Improved access to Maidstone town centre to benefit the economic heart of the town; and
- Increase capacity on the network to accommodate further development.

3.8.4 It can be seen that both primary and secondary objectives accord well with the strategic aims of both the local authority and national policy.

3.9 Measures for Success

3.9.1 It is envisaged that successful outcomes from the scheme will be gauged in terms of its easing of travel delays for traffic on Willington Street, the A20 and A274 corridors, delivery of planned homes and jobs growth across the District and improved performance against various measures of transport and travel activity on key routes, specifically:

- Travel time and distance by bus and car;
- Journey time variability by bus and car.

3.10 Constraints

3.10.1 The key constraints likely to affect delivery of the scheme are summarised below:

- KCC committee approval;
- The preferred option may require land take;
- Statutory procedures must be completed in time for works procurement, construction preparation, and the main works;
- LGF funding allocation granted by SELEP.

3.11 Interdependencies

3.11.1 The Willington Street Junction Improvements are the first key phase of the wider ITP for Maidstone.

3.11.2 As a scheme developed in isolation, the Willington Street Junction Improvements are expected to demonstrate benefits locally to Willington Street, the A20 and the A274 corridors.

3.11.3 As the first phase of the Maidstone ITP the scheme will make a major contribution to the overall effectiveness and impact of the wider strategy.

3.12 Stakeholders

3.12.1 Key stakeholders have been identified by KCC who will play a key role in ensuring that the scheme can not only be delivered successfully, but also operated and maintained in future. The list of Stakeholders identified by KCC is neither definitive nor exhaustive and will be added to during the transport business case process. The following have been identified at this stage:

- Maidstone Borough Council;
- Arriva Buses and other smaller operators;
- Land-use developers;
- South East Local Enterprise Partnership;
- Local residents and businesses; and
- Regular users of affected transport facilities (road, rail, bus, walk and cycle).

3.12.2 In addition to these stakeholders, it is anticipated that KCC staff will be consulted across a range of departments.

3.13 Options

3.13.1 KCC have considered alternative solutions to improve the operation of the junctions of Willington Street with the A20 and A274. The first option investigated was the optimisation of the existing signal arrangement at the junction the A20 with the north end of Willington Street and the junction of the A274 with the southern end of Willington Street, in conjunction with the Wallis Avenue signals.

3.13.2 The junctions at each end of Willington Street were reviewed and a preliminary assessment of the potential to optimise the current signal arrangements carried out. The optimisation of the existing signal arrangements resulted in minimal changes in traffic delays. It was concluded that there is limited potential to achieve any significant improvements without some physical reconfiguration of the junctions.

3.13.3 The second option, which has been selected as the preferred route forward, was to develop alternative layouts for the junctions with additional lane provision and revised signal arrangements. Indicative layouts for the revised junction layouts are attached in Appendix A.

3.13.4 At the northern end of Willington Street the preferred option proposes an additional lane on the A20 approach to Willington Street from the east, for left turning traffic. This will allow increased capacity for the straight ahead movement westbound at this junction.

3.13.5 At the junction of Willington Street with the A274 an additional lane westbound on the A274 is provided, from east of the junction with Willington Street to west of the junction with Wallis Avenue. This will allow two lanes for straight ahead movements westbound and a right turn lane at the Willington Street signals. The two lanes westbound merge to one lane after the Wallis Avenue junction.

4 Economic Case

4.1 Overview

4.1.1 The Economic Case provides evidence of how the scheme is predicted to perform, in relation to its stated objectives, identified problems and targeted outcomes. The Economic Case determines if the proposed scheme is a viable investment, whose strengths outweigh its weaknesses and which provides good value for money.

4.1.2 The predicted scheme appraisal focuses on those aspects of scheme performance that are relevant to the nature of the intervention. However, we do acknowledge the strands of assessment that are required under various pieces of statutory guidance (e.g. DfT WebTAG, VfM Assessment, LSTF; HM Treasury 'Green Book').

4.1.3 The junction improvement scheme is being assessed based on LINSIG results of the junction delays comparing the 'with' and 'without' scheme scenarios. These results are available for the AM and PM peaks. The method used was spreadsheet-based, undertaking a TUBA-like calculation for travel time savings for vehicle users and for public transport passengers.

4.1.4 The LINSIG reports are provided as **Appendix B**.

4.2 Economic Case Criteria and Method

4.2.1 The economic case for this scheme is focussed on

- Assessing the direct, localised, economic efficiency benefit of the scheme.
- Qualitative appraisal of wider scheme benefits, relating to other complementary elements of the wider Maidstone ITP.
- Assessing the scheme benefits against the direct scheme costs as an individual package.

4.2.2 The appraisal criteria and overall approach for their assessment are as shown in Table 4-1.

Table 4-1: Appraisal Criteria for Assessing Scheme Performance

Appraisal Criteria	Direct / Indirect Impact Appraisal	Approach Adopted
Journey time savings	Direct	Linsig modelling with TUBA style calculation of benefits
Improved junction layout and journey perception	Indirect	Qualitative
Wider economic impacts (*key part of the transport strategy supporting emerging local plan*)	Indirect	Qualitative

4.3 Assumptions

4.3.1 The economic case has been developed based on the comparison of a 'without scheme (optimisation of existing signals) and the 'with scheme' (proposed improvements to junctions).

4.3.2 The following assumptions have been made in the development of the economic case;

- The signal arrangements modelled for the 'without scheme' scenario are assumed to be optimised, on the grounds that this would be necessary natural step in the future, in the absence of any other junction improvements.
- Optimisation of 'with' scheme signal timings (as shown in LINSIG report).
- Signal delay savings extracted from LINSIG, for weekday AM and PM peak hours, have been annualised over 253 days. There is potential for benefits beyond the peak hours but these have not been accounted for.
- Value of time per vehicle and journey purpose proportions are taken from the WebTAG DataBook (Autumn 2015 v1.4). To be conservative these values are not growthed over time.
- Downstream capacity initially assumed not to be a limiting factor. However, this will be taken into further consideration with regards to the wider transport strategy.
- LINSIG is assumed to be a robust tool for this assessment.

- All efforts will be made to minimise the effect of roadworks and these are not included in the assessment. KCC are aware of importance of minimising the impact of roadworks and successfully operate a lane rental scheme to this end.
- Maintenance costs are not included as the broad network stays unchanged.
- No variable demand responses, particularly trip distribution, have been included.
- Opening year (2017) flows have also been used for forecast years. This will present a conservative estimate of the BCR, and to be realistic with the wider ITP which is likely to include demand management features.
- Optimism bias of 3% - ('final stages of approval') in line with WebTag Unit A1.2 (November 2014). This allows for some safeguards against cost escalation.
- Scheme opening year 2017
- Appraisal period of 10 years – As the wider strategy develops the benefits of this scheme will become entrenched in the wider benefit stream in the longer term.

4.4 Scheme Performance – Willington Street Junction Improvements

4.4.1 The scheme performance locally is assessed based on predicted travel time savings during the peak periods. No account is made for any travel time savings outside the peak hours. The total vehicle travel time is based on the average delay time per vehicle, provided from Linsig output, and the vehicle turning movements (Table 4-2).

Table 4-2: Total Vehicle Movements (2017)

	Total Vehicle Movements (2017)	
Junction	**AM**	**PM**
A20 / Willington St	2085	2456
A274 / Willington St	2043	2193
A274 / Wallis Avenue	1888	2149
Total	6016	6789

4.4.2 Buses are assumed to experience the same average delay per vehicle. The total passenger hours are based on the same average delay per vehicle, the number of buses and the average number of bus passengers per bus. Up to 14 buses per hour pass through each of the junctions in the peak periods. The estimated average number of passengers is based on 50% occupancy of seats. The number of seats per bus is weighted to allow for single and double deck vehicles.

4.4.3 Table 4-3 summarises the opening year delay (total vehicle and passenger hours) with and without the scheme and the travel time saving.

Table 4-3: Localised Scheme Performance – Vehicle and Passenger Delay per day

Scenario	Units	AM	PM	AM + PM
Without scheme	Vehicle hrs	132	245	377
With scheme	Vehicle hrs	62	117	179
Travel time saving	Vehicle hrs	70	128	198
Scenario	**Units**	**AM**	**PM**	**AM + PM**
Without scheme	Passenger hrs	10	25	35
With scheme	Passenger hrs	8	14	22
Travel time saving	Passenger hrs	2	11	13

4.5 Appraisal Summary Table

4.5.1 A qualitative/quantitative assessment of predicted scheme performance against WebTAG appraisal criteria has been completed using an Appraisal Summary Table (AST) – this is attached as **Appendix C**.

4.5.2 The Willington Street Junction Improvements is essentially a highway scheme and the key quantitative outcome has been calculated for travel time savings. These are recorded as travel costs for commuters and other users. Qualitative statements are included for other key items.

4.5.3 It is noted that highway schemes are often assessed with both travel time savings and accident benefits. Accident benefits normally come from a change of junction or link types or of flow volume. Scheme accident benefits have not been directly assessed in this case because the proposed scheme does not involve any change to junction types or to traffic flows. In addition the accident rate in the area is not above what might be expected and the scheme is not being promoted as an accident reduction measure.

However analysis of this data will become part of the design process; and accident monitoring will be part of the post-opening evaluation.

4.6 Present Value Outcomes from Economic Appraisal

4.6.1 The present value outcomes of the Willington Street Junction Improvements are set out in Table 4-4, which summarises the Analysis of Monetised Costs and Benefits (AMCB). The costs and benefits are calculated based on the following:

- Scheme cost (2015 prices) - KCC supplied (**Appendix D**);
- Risk and optimism bias adjusted cost (2015 prices excl. VAT);
- Risk and optimism bias adjusted cost in 2010 prices;
- Discounted Risk and optimism bias adjusted cost in 2010 prices;
- Discounted Risk and optimism bias adjusted cost in 2010 market prices;
- User Benefits (PVB) for the initial BCR are based on vehicle and bus user time savings.

Table 4-4: Summary of Analysis of Monetised Costs and Benefits (2010 present values and prices)

Item	Present Value (£000s)
User Present Value Benefit (PVB)	£5,734
Capital Present Value Cost (PVC)	£1,443
Scheme Net Present Value (NPV) = PVB - PVC	£4,290
Scheme Initial Benefit to Cost Ratio (BCR) = PVB / PVC	3.97

4.7 Sensitivity Tests

4.7.1 Sensitivity tests have been carried out to provide a broader understanding of the value for money presented by the Willington Street Junction Improvements. The initial BCR of 3.97 is based on travel time benefits for vehicle users and for bus passengers. The sensitivity tests, which address the assumptions made in the calculation of traveller benefits and the estimation of costs, are summarised in Table 4-5.

Table 4-5: Sensitivity Test Summary (2010 present values and prices)

Item	Present Values (£000s)		
	Initial BCR	Test 1	Test 2
	Vehicle user & bus user benefits	Vehicle user benefits only	Vehicle user benefits only & cost increase by 50%
Present Value Benefit (PVB)	£5,734	£5,479	£5,479
Present Value Cost (PVC)	£1,443	£1,443	£2,165
Net Present Value (NPV) = PVB - PVC	£4,290	£4,036	£3,315
Benefit to Cost Ratio (BCR) = PVB / PVC	3.97	3.80	2.53

4.7.2 Based on travel time benefits for vehicle users only, the BCR is 3.80. An increase of 50% in scheme costs would reduce the BCR to 2.53.

4.8 Value for Money Assessment

4.8.1 The initial BCR of 3.97 for the Willington Street Junction Improvements is based on travel time savings alone and is reported in the Analysis of Monetised Costs and Benefits (AMCB) Table 4-4.

4.8.2 The Value for Money (VfM) Assessment of the initial BCR of 3.97 would be 'high' based on the DfT 'Value for Money Assessment: Advice Note for Local Transport Decision Makers'. Sensitivity tests around the estimated benefits and scheme costs reduce the initial BCR to 2.53, which would also return a VfM assessment of 'high'.

4.8.3 The Value for Money Assessment builds on the initial BCR with the objective of capturing qualitative and quantitative impacts in an adjusted BCR.

4.8.4 The Willington Street Junction Improvements, as part of the wider ITP, are expected to contribute to improvements in journey time reliability on the major route corridors. Journey time reliability benefits for the Willington Street Junction Improvements, as the first phase of the strategy, have not been directly quantified and the adjusted BCR for the Willington Street Junction Improvement is based on a qualitative assessment.

4.8.5 The impact of the Willington Street Junction Improvements on journey time reliability is assumed to be slight, which the DfT 'Value for Money Assessment: Advice Note for Local Transport Decision Makers' suggests may be reflected by a 5% uplift in time savings. A 5% uplift in the benefits from time savings would result in a BCR of 3.99.

4.8.6 The Value for Money Assessment has been summarised in Table 4-6 below.

Table 4-6: Summary of Scheme Value for Money Assessment

Scheme Value for Money (VfM) Summary				
VfM Component	**VfM Assessment Mechanism & Outcome Measurement Method**	**Scope of VfM Component**	**VfM Component Strands**	**VfM Outcome** **Qualitative (See 2nd Column)**
Initial BCR	Quantified BCR, or 5pt Qualitative BCR: Poor (<1.0) Low (1.0-1.5) Medium (1.5-2.0) High (2.0-4.0) Very High (>4.0)	Derived from usually-monetised scheme user economic appraisal and cost/benefit analysis	Economic Efficiency (Consumer Users) – Economic Efficiency (Business Users & Providers) – Noise – Local Air Quality – Greenhouse Gases – Journey Quality – Physical Activity – Accidents – Wider Public Finances (Indirect Tax revenues) – Broad Transport Budget –	
			Overall	High (3.97)
Adjusted BCR	Quantified adjustment to BCR, or 5pt Qualitative adjustment to BCR: Poor Low Medium High Very High	Initial BCR adjusted to allow for sometimes-monetised scheme impacts	Journey Reliability – slight (5% uplift of time benefits) Area Regeneration – Wider economy – Landscape – Non-user option / non-use values –	
			<u>Overall Adjusted</u>	High
Qualitative Assessment	7pt Qualitative outcome: Large Beneficial Moderate Slight Neutral Slight Moderate Large Adverse	Covers rarely-monetised scheme impacts	Townscape – Heritage / Historic Environment – Biodiversity – Water Environment – Security – Access to Services – Affordability – Severance –	
			<u>Overall</u>	Neutral
Initial VfM Category	4pt Qualitative outcome: Low Medium High Very High	Aggregate of above VfM components, excluding risk component	Initial BCR – High Adjusted BCR – High Qualitative Assessment - Neutral	
			<u>Overall Initial VfM Category</u> (excluding risk adjustment)	High
Key Risks, Uncertainties & Sensitivities	7pt Qualitative negative or positive adjustment to initial VfM: Large Beneficial Moderate Slight Neutral Slight Moderate Large Adverse	*Risk around scheme performance, outcome sensitivity, outline capital costs over or under estimated etc.*	Scheme performance may be impinged on by other works – slight adverse Conservative estimate of scheme performance – slight beneficial	
			<u>Overall risk/uncertainty/sensitivity adjustment</u>	Neutral
Final VfM Category	**4pt Qualitative outcome:** **Low** **Medium** **High** **Very High**	**Aggregate of above VfM components, including risk component**	**Overall Final VfM Category (including risk adjustment)**	**High**

4.9 Overall Value for Money Statement

4.9.1 The initial BCR calculated for the scheme is 3.97. This is based on conservative estimates of travel time benefits in the peak hours only. The improved junctions also offer the potential for improved journey time reliability for consumer users, business users and providers.

4.9.2 The overall Value for Money category for the Willington Street Junction Improvements, as a stand-alone element of the Maidstone ITP, is considered to be High.

4.10 Wider Integrated Transport Strategy

4.10.1 The wider ITP for Maidstone is currently being finalised in association with the local plan process, which will build on and lock in the benefits gained from the Phase 1 schemes. The strategy, which takes into account the location and quantum of development included in the local plan, will include a package of measures aimed at demand management and further improvement of network efficiency.

5 Financial Case

5.1 Overview

5.1.1 The Financial Case for Phase 1 of the Maidstone ITP gives an breakdown of the expected project cost components and the time profile for the transport investment. It considers if these capital costs are affordable from public accounts at the times when the costs will arise. It also identifies where contributions of anticipated funding will be obtained, to meet the scheme costs and it assesses the breakdown of funds between available sources and by year and considers how secure these funds are likely to be. Finally, it reviews the risks associated with the scheme investment and examines possible mitigation.

5.2 Phased Approach

5.2.1 The Maidstone ITP has been developed in conjunction with the Maidstone local plan which is currently being finalised. The objective of the strategy is to accommodate and manage the current heavy travel demand as effectively as possible, in the expectation of the forecast development in the Local Plan.

5.2.2 The strategy will incorporate a wide package of highway and demand management measures. The highway measures proposed are aimed at maximising the efficiency of the network within the limitations of what is feasibly achievable. The Willington Street Junction Improvements are to be completed as the first phase in this process.

5.2.3 This funding bid, for the Maidstone ITP, has been phased, to cover the initial 2016/17 costs of Phase 1, Willington Street Junction Improvements, and also the subsequent costs of complementary transport improvements which form part of the complete strategy.

5.2.4 Phase two will include schemes across the network which will build on the benefits achieved by the Willington Street Junction Improvements. It is proposed that a separate transport business case will be prepared for the second strand of funding for 2017/18 to 2020/21, when the details of complementary schemes have been fully established.

5.3 Project Funding

5.3.1 Funding for the wider Maidstone ITP is sought from SELEP (LGF) with supporting funds from developer funding and from local sources, primarily Kent County Council. The total SELEP contribution sought for the wider strategy is £8.9 million. A breakdown of funding sources for the strategy is summarised in Table 5-1.

Table 5-1: Maidstone ITP - Funding Sources

Funding Sources	Maidstone ITP £(m)	Phase 1 of ITP £(m)
LGF Funding	£8.9	£1.3
Developer Funding / Contribution	£5.0	£0.44
Other Local Funding / Contribution	To be confirmed	
Total	£13.9*	£1.74

**The current total project funding reported here excludes 'other local funding' which is under review/awaiting confirmation.*

Table 5-2 summarises the breakdown of the funding stream for the wider Maidstone ITP from 2016 to 2021. Funding for the Willington Street Junction Improvements is sought from SELEP as the first phase of the wider Maidstone ITP, programmed for the funding period 2016/17. The SELEP contribution being sought for this phase is £1.3 million.

Table 5-2: Funding Stream Breakdown

Funding Period	£(m)
2016/17	£1.3
2017/18	£2.0
2018/19	£2.0
2019/20	£3.6
2020/2021	£0.0
Total	£8.9

5.3.2 Phase 1, Willington Street Junction Improvements, is dependent on £1.3m SELEP funding and £0.44m developer contribution to meet the project cost of £1.74 million.

5.4 Project Costs

5.4.1 The breakdown of the wider project costs for the two phases of the Maidstone ITP is summarised in Table 5-3.

Table 5-3: Maidstone ITP Project Costs

Phase	Item	Cost (£m)
Phase 1 (2016/17)	Willington St Junction Improvements	£1.74
Phase 2 (post 2017)	Study and outline design of complementary schemes for remainder of the Integrated Transport Package	£12.2*
Total		£13.9*

**The current total project funding reported here excludes 'other local funding' which is under review/awaiting confirmation.*

5.4.2 The scheme costs for Phase 1 (Willington Street Junction Improvements) are summarised in Table 5-4 and the full breakdown of costs is included in **Appendix D**. The breakdown of costs makes allowance for inflation and excludes 'sunk costs' incurred prior to the scheme appraisal.

Table 5-4: Phase 1 Breakdown of Costs (2015 prices)

Item	Cost (£m)
Main works	£1.09
Fees etc.	£0.32
Contingency	£0.21
Inflation	£0.12
Total	£1.74

5.5 Risks / Leverage

5.5.1 The Willington Street Junction Improvements Scheme is dependent on SELEP funding of £1.3 million and funding from local sources.

5.5.2 Should scheme costs escalate, delivery will be hindered, most likely with a delivery including a reduced level of service which doesn't lock-in the benefits of the junction improvements. The scheme cost estimate for the Willington Street Junction Improvements include a 15% allowance for risk.

6 Commercial Case

6.1 Overview

6.1.1 The Commercial Case for the Willington Street Junction improvements provides evidence that the proposed investment can be procured, implemented and operated in a viable and sustainable way. The aim is to achieve best value during the process, by engaging with the commercial market.

6.2 Expected Outcomes from the Commercial Strategy

6.2.1 The outcomes which the commercial strategy must deliver are to:

- Confirm that procedures are available to procure the scheme successfully;
- Check that available / allocated capital funds will cover contractor and construction costs;
- Verify that risk allowance is sufficient;
- Ensure that arrangements have been made to handle cost overruns.

6.3 Scheme Procurement Strategy

Procurement Options

6.3.2 KCC have identified two procurement options for the delivery of their LEP funded schemes. The alternative options are:

Full OJEU Tender

This option is required for schemes with an estimated value of over £4,322,012.

KCC will then need to opt for an 'open' tender, where anyone may submit a tender, or a 'restricted' tender, where a Pre-Qualification is used to whittle down the open market to a pre-determined number of tenderers. This process takes approximately one month and the first part is a 47 day minimum period for KCC to publish a contract notice on the OJEU website.

The minimum tender period is 6 weeks but could be longer for larger schemes. Once the tenders are received they must be assessed and a preferred supplier identified. There is a mandatory 10 day 'standstill' period, during which unsuccessful tenderers may challenge the intention to award to the preferred contractor.

Delivery through existing Amey Highways Term Maintenance Contract (HTMC)

This option is strictly not procurement as the HTMC is an existing contract. The HTMC is based on a Schedule of Rates agreed at the inception of the contract. The price for each individual scheme is determined by identifying the quantities of each required item into a Bill of Quantities. Amey may price 'star' items if no rate already exists for the required item. If the scope of a specific scheme is different from the item coverage within the HTMC contract a new rate can be negotiated.

Preferred Procurement Option

The preferred procurement route for the Willington Street Junction improvements is the existing HTMC contract. This option has been selected as the value of the scheme, £1.74m, is less than the OJEU scheme value threshold.

6.4 Commercial Risk Assessment

The commercial risk assessment is shown in Table 6-1 below.

Table 6-1: Commercial Risk Assessment

Qualitative Commercial Risk Assessment										
Scheme Commercial Risk Item	**Likelihood of Risk Arising (✓)**			**Impact Severity (✓)**			**Predicted Effect on Scheme Procurement, Delivery & Operation (✓)**			**Immediate Bearer of Risk and Suggested Mitigation**
	Low	**Medium**	**High**	**Slight**	**Moderate**	**Severe**	**Slight**	**Moderate**	**Severe**	
Scheme construction is delayed and costs increase, owing to unexpected engineering difficulties.		✓				✓		✓		Kent CC, as scheme promoter, bears the risk. Ensure that scheme development, design, procurement and construction procedures are sufficiently robust to minimise likelihood of construction difficulties.

7 Management Case

7.1 Overview

The Management Case outlines how the proposed scheme and its intended outcomes will be delivered successfully. It gives assurances that the scheme content, programme, resources, impacts, problems, affected groups and decision makers, will all be handled appropriately, to ensure that the scheme is ultimately successful. It also covers monitoring of the scheme.

7.2 Approach to Scheme Development and Delivery

7.2.1 Although not fully defined at this stage, the project is likely to be managed in house by PRINCE2 trained and experienced Kent County Council staff, using a well-established governance structure, which has been successfully applied to deliver other transport improvement schemes.

7.3 Evidence of Previously Successful Scheme Management Strategy

7.3.1 KCC have a successful track record of delivering major transport schemes within the county. The most recent of which were the East Kent Access Phase 2 (EKA2) and Sittingbourne Northern Relief Road schemes (SNRR).

7.3.2 The EKA2 scheme, completed in May 2012, was designed to support economic development, job creation and social regeneration, improving access with high quality connections between the urban centres, transport hubs and development sites in East Kent. The overall objectives of the scheme were to unlock the development potential of the area, attract inward investment and maximise job opportunities for local people. The extent of the scheme is shown in Figure 7-1.

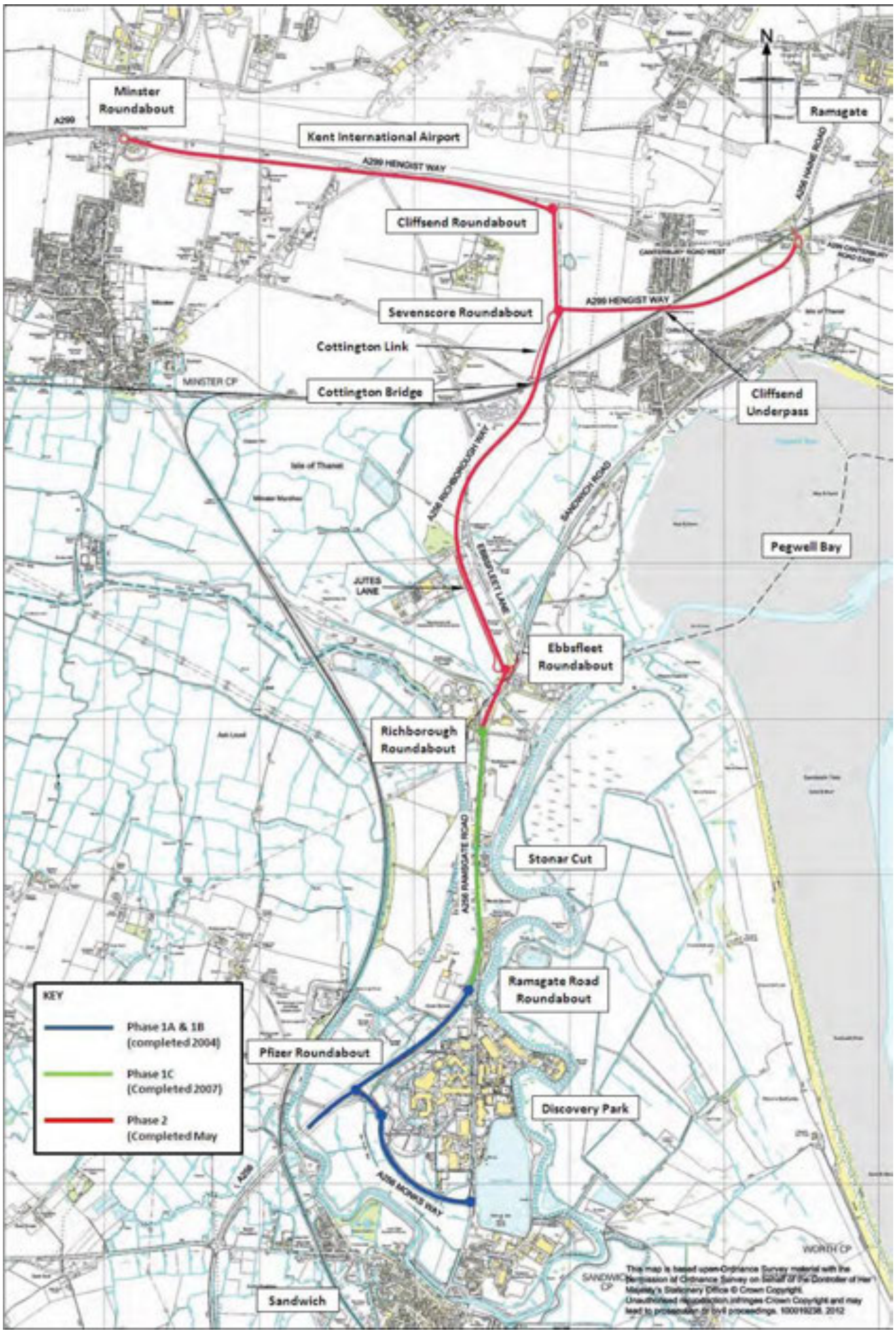


Figure 7-1: EKA2 Scheme Layout

7.3.3 The scheme was successfully delivered within budget and ahead of programme through the adoption of a robust management approach similar to that set out above to deliver the Willington Street Junction Improvements. The total value of the scheme was £87.0m of which £81.25m was funded by Central Government.

7.3.4 The intended scheme outcomes are currently being monitored but the intended benefits of the scheme are anticipated to be realised.

7.3.5 The SNRR scheme, completed in December 2011, was designed to remove the severance caused by Milton Creek and give direct access to the A249 trunk road for existing and new development areas, thereby relieving Sittingbourne town centre.

7.3.6 The delivered scheme is shown in Figure 7-2 below:

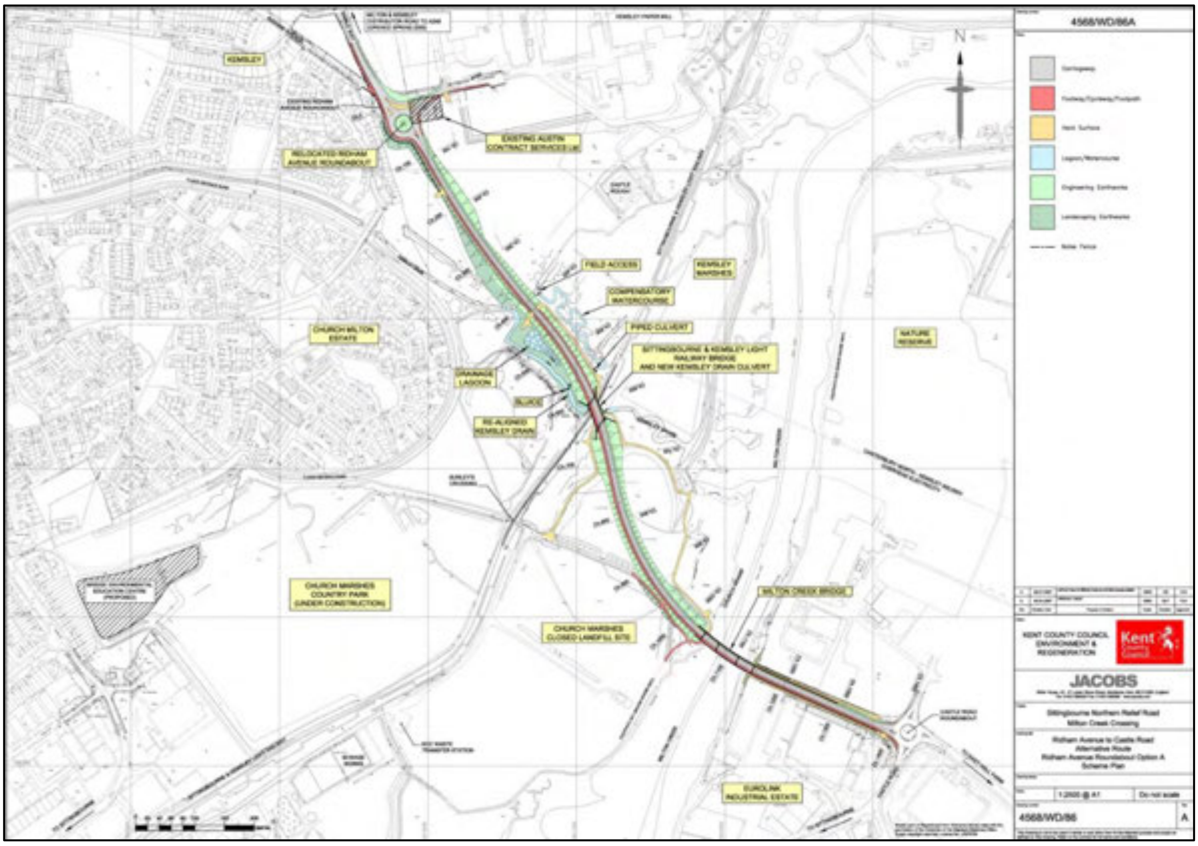


Figure 7-2: SNRR Scheme Layout

7.3.7 The project is an excellent example of multi agencies working towards a common aim. The scheme was funded by the Homes & Communities Agency in its Thames Gateway (Kent) regeneration role, by the Department of Transport in its support of local major schemes and by private sector S106 contributions. The scheme was delivered under budget and to programme.

7.3.8 Both the EKA2 and SNRR schemes have since been awarded regional Institute of Civil Engineers (ICE) Excellence Awards.

7.4 Key Project Work Stages and Tasks

7.4.1 The key stages identified are:

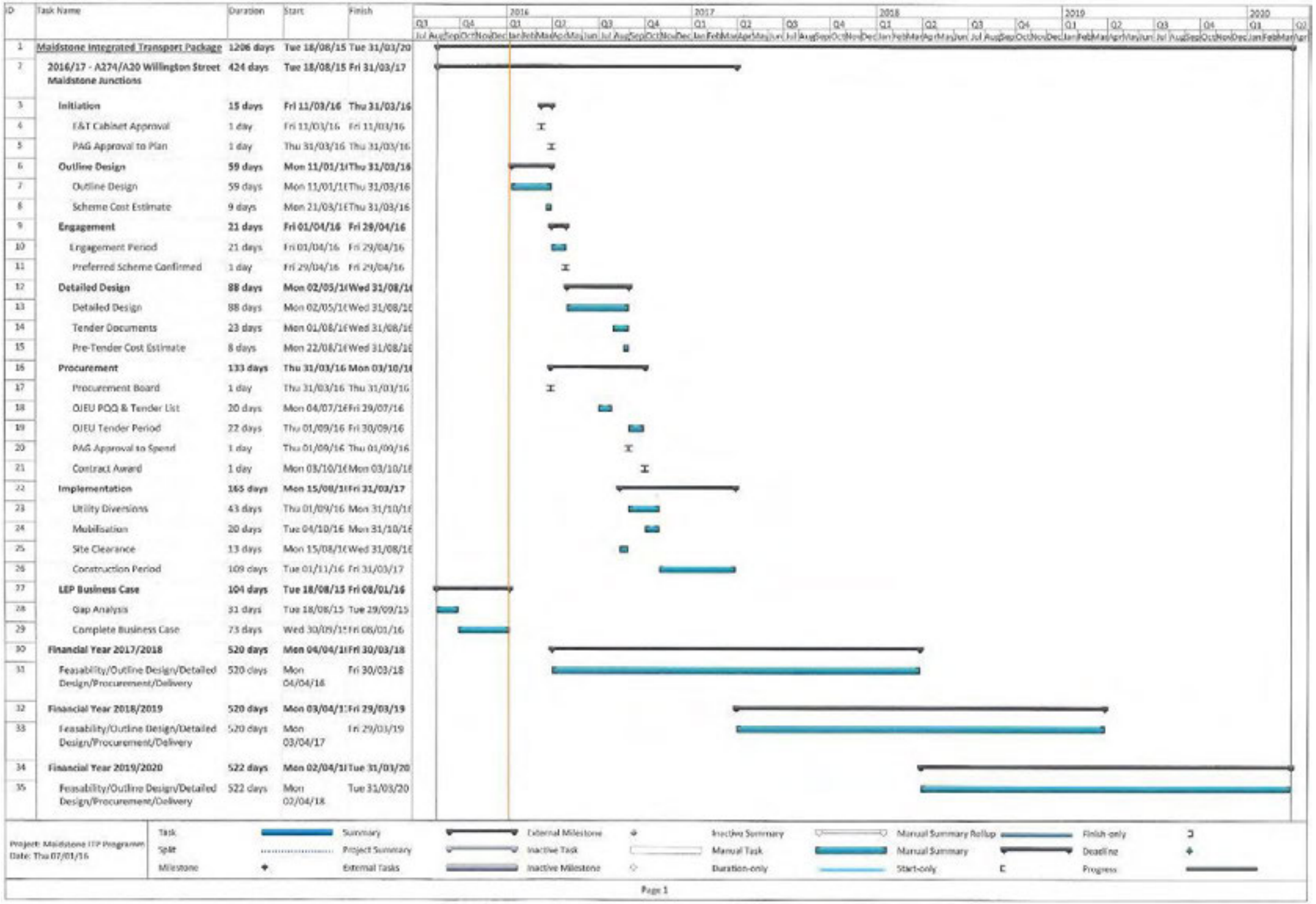
- Initial scheme design / Outline Business Case
- Feasibility work
- Land Acquisition
- Consultation
- Committee Approval
- Detailed design / Full Business Case
- Acquisition of statutory powers
- Procurement
- Environmental surveys
- Start/end of construction
- Monitoring

7.5 Project Delivery Programme

7.5.1 An overall Project Delivery Programme has been developed for the Maidstone ITP, which also sets out the key stages of the Willington Street Junction Improvements as the first phase of the project (Figure 7-3).

7.5.2 The key project milestones for the Willington Street Junction Improvements are:

- Complete outline design March 2016
- Complete detailed design August 2016
- Complete procurement October 2016
- Complete construction March 2017



ID	Task Name	Duration	Start	Finish
1	Maidstone Integrated Transport Package	1206 days	Tue 18/08/15	Tue 31/03/20
2	2016/17 - A274/A20 Willington Street Maidstone Junctions	424 days	Tue 18/08/15	Fri 31/03/17
3	Initiation	15 days	Fri 11/03/16	Thu 31/03/16
4	E&T Cabinet Approval	1 day	Fri 11/03/16	Fri 11/03/16
5	PAG Approval to Plan	1 day	Thu 31/03/16	Thu 31/03/16
6	Outline Design	59 days	Mon 11/01/1	Thu 31/03/16
7	Outline Design	59 days	Mon 11/01/1	Thu 31/03/16
8	Scheme Cost Estimate	9 days	Mon 21/03/1	Thu 31/03/16
9	Engagement	21 days	Fri 01/04/16	Fri 29/04/16
10	Engagement Period	21 days	Fri 01/04/16	Fri 29/04/16
11	Preferred Scheme Confirmed	1 day	Fri 29/04/16	Fri 29/04/16
12	Detailed Design	88 days	Mon 02/05/1	Wed 31/08/1
13	Detailed Design	88 days	Mon 02/05/1	Wed 31/08/1
14	Tender Documents	23 days	Mon 01/08/1	Wed 31/08/1
15	Pre-Tender Cost Estimate	8 days	Mon 22/08/1	Wed 31/08/1
16	Procurement	133 days	Thu 31/03/16	Mon 03/10/1
17	Procurement Board	1 day	Thu 31/03/16	Thu 31/03/16
18	OJEU PQQ & Tender List	20 days	Mon 04/07/1	Fri 29/07/16
19	OJEU Tender Period	22 days	Thu 01/09/16	Fri 30/09/16
20	PAG Approval to Spend	1 day	Thu 01/09/16	Thu 01/09/16
21	Contract Award	1 day	Mon 03/10/1	Mon 03/10/1
22	Implementation	165 days	Mon 15/08/1	Fri 31/03/17
23	Utility Diversions	43 days	Thu 01/09/16	Mon 31/10/1
24	Mobilisation	20 days	Tue 04/10/16	Mon 31/10/1
25	Site Clearance	13 days	Mon 15/08/1	Wed 31/08/1
26	Construction Period	109 days	Tue 01/11/16	Fri 31/03/17
27	LEP Business Case	104 days	Tue 18/08/15	Fri 08/01/16
28	Gap Analysis	31 days	Tue 18/08/15	Tue 29/09/15
29	Complete Business Case	73 days	Wed 30/09/1	Fri 08/01/16
30	Financial Year 2017/2018	520 days	Mon 04/04/1	Fri 30/03/18
31	Feasability/Outline Design/Detailed Design/Procurement/Delivery	520 days	Mon 04/04/16	Fri 30/03/18
32	Financial Year 2018/2019	520 days	Mon 03/04/1	Fri 29/03/19
33	Feasability/Outline Design/Detailed Design/Procurement/Delivery	520 days	Mon 03/04/17	Fri 29/03/19
34	Financial Year 2019/2020	522 days	Mon 02/04/1	Tue 31/03/20
35	Feasability/Outline Design/Detailed Design/Procurement/Delivery	522 days	Mon 02/04/18	Tue 31/03/20

Figure 7-3: Maidstone ITP Delivery Programme

7.6 Project Governance, Roles and Responsibilities

7.6.1 KCC have set up a clear and robust structure to provide accountability and an effectual decision making process for the management of the LEP funded schemes. Each scheme will have a designated project manager (Russell Boorman for the Maidstone ITP) who is an appropriately trained and experienced member of KCC staff.

7.6.2 Figure 7-4 provides an outline of the overall governance structure implemented to manage the delivery of each scheme.

Bid / Design / Construction	High level Agenda	Frequency	Attendees	Format	Scope	Agenda Items	Key Deliverables/Feedback	Templates
Sponsoring Group	Bid Design Construction	Monthly - Can be called in emergency if required	**Chair: TR** BC/RW/MG Supported by IPM attendees as required	Face to face meeting, rotating venue	To discuss programme (i.e. high level progress/preview next steps and discuss and resolve issues.	LEP programme (high level) progress to date Programme Financial reporting Next steps Issues/Risk/Change Actions	Minutes of Meeting Action/Decision Log Output distributed to MG	**Agenda** **Minutes** **Decision list**
Sponsoring Group Progress Report	Decisions Needed	Monthly	MG/JW	Report	To record outstanding actions/issues that require a decision made by the board		Action list ready for the Steering Group	**Action List**
Programme Board Meeting	Bid Design Construction	Monthly	**Chair: MG** MG/KCC Promoters/KCC PMs/ AQ or RC/SW/PC/JW	Face to face meeting, rotating venue	To discuss progress/preview next steps and discuss and resolve issues	LEP programme progress to date Project financial reporting Next steps Issues/Risk/Change Actions	Minutes of Meeting Action List Output distributed to all attendees	**Agenda** **Minutes**
Highlight Report	Identify key points for Programme Meeting	Monthly	JW/MG	Face to face meeting/report	JW to collate and streamline all reports highlighting areas of interest for the programme meeting. To be fed back to MG by report/meeting		Highlight report for MG to use for Programme Meeting. Highlight report shared with PR attendees.	**Highlight Report**
Steering Group Meeting	Progress Update	Monthly/Fortnightly as required	**Chair: KCC PMs** All input staff - KCC Bidding/KCC Promoters/KCC PMs/Amey Design/TMC/JW	Face to face meeting	Individual meetings per project (including each stage of the LEP process to discuss progress in detail).	LEP project progress to date/MS Programme Project financial reporting Issues/Risk/Change Actions	MS Programme Update Progress update in template for each project	**Progress Report**

List of Initials:

BC	Barbara Cooper
RW	Roger Wilkin
TR	Tim Read
MG	Mary Gillett
AQ	Andrew Quilter
RC	Richard Cowling
SW	Steve Whittaker
PC	Paul Couchman
JW	Joanne Whittaker

Figure 7-4: Governance Diagram

7.6.3 A detailed breakdown of the meetings (along with the attendees, scope and output of each) which make up the established governance process is set out below.

Project Steering Group (PSG) Meetings

PSG meetings are held fortnightly to discuss individual progress on each scheme and are chaired by KCC Project Managers (PMs). Attendees include representatives from each stage of the LEP scheme (i.e. KCC Bid Team, KCC sponsor, KCC PMs, Amey design team and construction manager). Progress is discussed in technical detail raising any issues or concerns for all to action. A progress report, minutes of meeting and an update on programme dates are provided ahead of the Programme Board (PB) meeting for collation and production of the Highlight Report.

Highlight Report

The Progress Reports sent by the KCC PMs comprise of the following updates; general progress, project finances, issues, risks and governance meeting dates. The Highlight Report identifies any areas of concern or where decisions are required by the PB meeting or higher to the KCC LEP Programme Manager. An agreed version of the Highlight Report is issued to the PB meeting attendees during the meeting.

Programme Board (PB) Meeting

The PB meeting is held monthly and is chaired by the KCC LEP Programme Manager. Attendees include representatives from all three stages of the schemes (i.e. KCC LEP Management, KCC LEP Bidding, KCC Sponsors, KCC PMs, Amey Account Manager, Amey Technical Advisors, Amey Construction representatives). This meeting discusses project progress to date, drilling into detail if there is an issue or action (as identified in the PSG meeting), financial progress, next steps and actions. Outputs of this meeting are the Highlight Report and the minutes of meeting.

Escalation Report

A list of actions and decisions that the PB meeting was unable to resolve is prepared ready for the Sponsoring Group (SG) meeting to discuss and ultimately resolve.

Sponsoring Group (SG) Meeting

The SG is held monthly and will be chaired by Tim Read (KCC Head of Transportation). Attendees are Barbara Cooper (Corporate Director), Roger Wilkin (Director of Highways, Transportation and Waste), Tim Read and Mary Gillett (KCC Major Projects Planning Manager). This meeting discusses high-level programme progress to date, financial progress, next steps and closes out any actions from the escalation report. Output is sent to Mary Gillett for distribution. Technical advisors are invited if necessary to expand upon an issue. All actions from the start of this meeting cycle are to be closed out by the SG when they meet (i.e. no actions roll over to subsequent meetings).

7.7 Communication and Stakeholder Management Strategy

7.7.1 Consultation is a key stage in the project programme. The approach to the management of different stakeholders and other interested parties is illustrated in Figure 7-5.

Itemise Stakeholders to be Handled in Accordance with Interest / Influence Matrix		
High	**To be Passively Monitored:**	**To be Actively Engaged and Managed:** ***SELEP / DfT*** ***MBC***
Stakeholder Influence **Low**	**To be Passively Conciliated:** ***Local population***	**To be Actively Informed:** ***Local businesses*** ***Bus Operators (Arriva)***
	Low **Stakeholder Interest**	**High**

Figure 7-5: Stakeholder Management Plan

7.8 Project Risk Management and Contingency Plan

7.8.1 Project risk is managed as an on-going process as part of the scheme governance structure, as set out in section 7.2 of this report. A scheme risk register is maintained and updated at each of the two-weekly Project Steering Group meetings. Responsibility for the risk register being maintained is held by the KCC PM and is reported as part of the monthly Progress Reports.

7.8.2 Any high residual impact risks are then identified on the highlight report for discussion at the Programme Board (PB) meeting. Required mitigation measures are discussed and agreed at the PB meeting and actioned by the KCC PM as appropriate.

7.8.3 An example scheme risk register is shown in Figure 7-6 below:

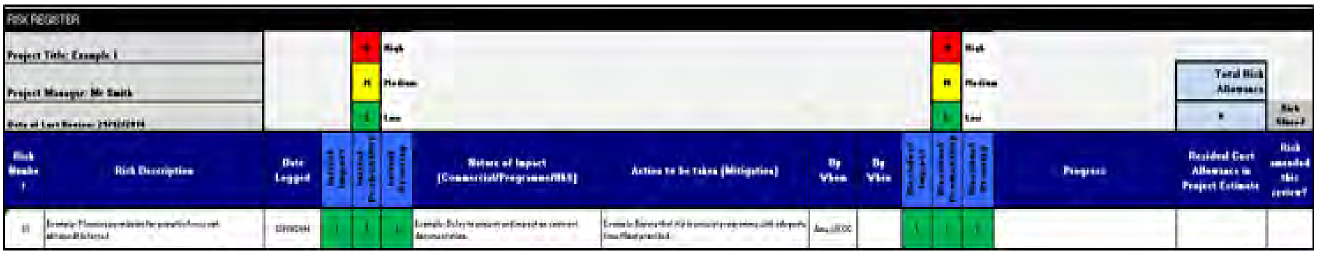


Figure 7-6: Example Risk Register

7.8.4 Table 7-1 shows a summary of the project risk assessment. This includes higher level risks associated with Willington Street Junction Improvements, their potential, effects, likelihood of occurring and mitigation. The scoring is based on a 5 point scale where 1 = unlikely and 5 = extremely likely.

Table 7-1: Project Risk Assessment

Project Risk Management Strategy				
Risk description	**Likelihood**	**Impact**	**Likelihood x Impact**	**Mitigation**
Increase in Scheme Costs	2	3	6	Investigate scheme design and amend to achieve greater BCR & VFM
Funds do not cover costs	2	3	6	Lobby alternative sources for shortfall in funding
Changes in direction (from government, LEP, Local Authority)	2	3	6	Ensure co-operation and communication between all concerned parties
Scheme Performance e.g. downstream capacity erodes	2	3	6	Phase 2 improvements will mitigate

benefits				
Statutory Undertakers	1	4	4	KCC to ensure that relevant searches along scheme corridor are conducted as early as is practicable to flag up any issues at the earliest possible juncture
Issues uncovered during construction (environmental, archaeology etc.)	1	4	4	Early liaison with geotechnical, environmental and archaeology specialists to minimise impact
Opposition to scheme (Residents/ Cyclists/ Road Users)	3	2	6	Ensure clear and effective consultation is undertaken with all relevant consultees providing fullest possible information

7.9 Project Assurance

A signed Section 151 officer letter is provided in **Appendix E**. The resources required to complete the project will be made available by Amey via the preferred procurement option of the HTMC contract.

7.10 Scheme Monitoring

7.10.1 KCC are committed to monitoring, evaluating and reporting the scheme post-opening. Data surveys undertaken before the scheme will be repeated. In addition, pre-opening data for Accidents and Air Quality is available and can also be repeated post-opening.

7.10.2 It is important for a congestion relief scheme to compare traffic flows so that the changes in delay are put into context. Table 7-2 shows the scheme monitoring plan. The acceptability will be judged on delivering the scheme objectives.

Table 7-2: Scheme Monitoring, Evaluation and Benefits Realisation Plan

Potential Benefit / Impact	Measure	Owner	Review timescale	Review Method
Travel-time improvement	Journey times Queues	KCC	One and five year post-opening	Traffic master data Queue surveys
Air Quality improvement	Nitrogen Dioxide	MBC		On-going measurements
Impact on accidents and safety	Number and type of accidents	KCC	Five year post-opening	KCC data base

Impact of potential change in traffic routing	Traffic Flows on A20, A274 and Willington St	KCC	One and five year post-opening	ATC data

8 Conclusion

8.1 Summary

8.1.1 The scheme provides an affordable and deliverable scheme that can improve the existing problem of congestion and delay at the junctions of Willington Street with the A20 and A274. This scheme is association with the subsequent elements of the Maidstone ITP will assist in the provision of infrastructure to support the Local Plan.

8.1.2 The scheme is worthwhile from a 'value for money' standpoint.

8.2 Recommended Next Steps

8.2.1 The development and delivery of the scheme, as the first phase of Maidstone ITP, should be approved and should proceed.

8.3 Value for Money Statement

8.3.1 The 'value for money' statement in this report suggests a 'high' value for money. This should be revisited if scheme costs escalate.

8.4 Funding Recommendation

8.4.1 The £1.3 million for the first phase of the Maidstone ITP, which comprises of the Willington Street Junction Improvements, should be released from SELEP to KCC.

Appendix A Scheme Layout

Appendix B Linsig Report

Appendix C AST

Appendix D Cost Breakdown

Appendix E Section 151 Officer Letter

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APPENDIX

To : Maidstone Joint Transportation Board

By : Tim Read – KCC Head of Transportation

Date : 22nd February 2016

Subject : Results of the VISUM Transport Modelling

Classification: For Information and Discussion

Summary : This report summarises the results of the interim 2022 modelling scenario that has been undertaken to inform the Maidstone Local Plan.

---

1. Introduction

1.1 The VISUM modelling work undertaken by Amey in support of the emerging Local Plan has tested a series of scenarios relating to the transport interventions that could be implemented alongside future housing and employment development. Each of the scenarios has been predicated on an individual set of assumptions regarding the package of transport interventions.

1.2 The modelling enables the relative effectiveness of each scenario to be compared and contrasted by providing a measure of their influence on future travel demand and highway network performance.

1.3 The purpose of this report is to ensure that Members are informed of the model results for the 2022 scenario and how these compare against those previously derived for 2031.

2. Background

2.1 At the previous meeting of this board on 7th December 2015, Members resolved:

> *"We agree in the absence of an agreed transport strategy and in light of the evidence presented to this Board demonstrating Maidstone's significant highway capacity constraints, this Board recommends that a transport strategy be taken forward urgently by the Borough and County Councils covering the period of the Local Plan, with a further review completed in 2022.*
>
> *The aim of this strategy will be to mitigate the transport impact of future growth, in the first instance up to 2022. The strategy should comprise of the key highway schemes and public transport improvements agreed by the Board, and further traffic modelling will be required to identify its impact. It is proposed that the £8.9 million growth fund monies identified for transport be used to accelerate the delivery of these improvements. Existing developer contributions may then be used to support further measures.*
> *The agreed transport strategy should also develop the justification for a relief road between the A20 to the A274 (the Leeds and Langley Relief Road), along with a preferred route, in order to allow testing with other strategic transport options and*

identify all source of potential funding to enable the schemes to be implemented at the earliest opportunity."

2.2 The traffic modelling referred to within the resolution has now been undertaken by consultants Amey in order to identify how implementation of the strategy over this interim period to 2022 could impact upon network performance.

2.3 Assumptions on the quantum of development that is expected to come forward over the period to 2022 have been made on the basis of advice from MBC. This has resulted in an adjustment being made to the Local Plan housing target of 18,560 to deduct the strategic sites, namely those at Lenham, Invicta Barracks and the town centre, and windfall sites that are expected to come forward over the period 2022 – 2031. A revised housing target of 14,034 has therefore been taken forward for 2022 modelling purposes, alongside all employment and retail sites.

2.4 Two model runs have been undertaken for the 2022 scenario. The '2022 Base' model run assumes that no transport interventions are implemented, aside from the Bridges Gyratory scheme. The '2022 Do Something' model run assumes that the transport strategy components previously agreed by this Board are implemented, with the exception of the Leeds Langley Relief Road. These components are comprised of:

- the package of highway improvement schemes
    - Bridges Gyratory
    - A20/M20 Junction 5
    - A229/A274 Wheatsheaf
    - A20/Willington Street
    - A274/Willington Street and A274/Wallis Avenue
    - A20/Hermitage Lane
    - A20/Coldharbour Lane
    - A249 Bearsted Road and Bearsted Road/New Cut
    - A26/Fountain Lane
- a typical 10 minute bus frequency
- the discounting of walk/cycle trips to be based on a distance threshold of 5km within the town centre
- a 50% increase in long-stay parking charges
- the removal of park and ride sites at Linton and M20 J7

2.5 The above components are entirely consistent with the '2031 Do Something 4b' model run previously reported to Members on 4th November 2015 and provide a basis for comparing and contrasting results.

2.6 It should be noted that the exclusion of the Leeds Langley Relief Road from the 2022 tests is purely intended to reflect how the timescales associated with the delivery of this scheme are expected to extend beyond 2022.

3. Modelling Results

3.1 In view of the limited timeframe within which to undertake the modelling work, Amey were instructed to focus on the AM peak period. This has ensured that the busiest period has been tested.

3.2 A summary of the 2022 results, set against the results of the previously modelled '2014 base' and '2031 Do Something 4b' scenarios, is presented in Appendix A.

3.3 The results of the '2022 Do Minimum' scenario serve to emphasise how substantive increases of 16% in travel distance and 29% in travel time will occur on the highway network in the absence of mitigation.

3.4 Implementation of the transport strategy components in the '2022 Do Something' scenario results in increases of 8% in travel distance and 10% in travel time across the highway network. These increases compare favourably against those identified for the '2022 Do Minimum' scenario and support the transport strategy as a form of mitigation.

3.5 A comparison of the '2022 Do Something' results against those previously reported for the '2031 Do Something 4b' modelling results highlights how the '2022 Do Something' approach would result in a near halving of the associated impact on travel distance and time.

4. Summary

4.1 The modelling work has been completed to test the effects of the 2022 scenario on travel demand and highway network performance.

4.2 On the basis of a revised housing target of 14,034, this has identified a level of impact that is close to half of that previously reported for the 2031 scenario in terms of travel time.

4.3 The findings support the implementation of the transport strategy over the period to 2022 in how they demonstrate a substantially lower impact on the highway network.

4.4 It can also be concluded that the added inclusion of the Leeds Langley Relief Road within the transport strategy will provide further benefits to network performance, as previous model runs have identified how, by 2031, this scheme could achieve a 25% saving in travel time across the network and could reduce traffic flows on individual routes by up to 16%. It is therefore imperative that the work necessary to support delivery of the Leeds Langley Relief Road is progressed immediately.

5. Recommendation

5.1 The findings of the 2022 modelling are commended to Members on the basis that they demonstrate a level of impact on the highway network that is not regarded as severe in the context of the National Planning Policy Framework.

5.2 In light of these findings it is recommended that the identified transport interventions, together with the requirement for further work to be undertaken in support of the Leeds

Langley Relief Road, are approved by Members as forming the transport strategy that will cover the period to 2022.

Contact Officers:

KCC : Tim Read , Brendan Wright – 03000 418181

Appendix A: Maidstone Transport Model - Option Testing Summary

Model Scenario	Transport Intervention Assumptions	Model Results: Network Performance	
		Travel Distance (Veh km)	Travel Time (Veh hours)
		AM	AM
2014 Base	None	122,000	8,300
2022 Do Minimum	Adjusted housing allocation (14,034 homes) and unchanged employment allocation (200,100m^2) Maidstone Gyratory scheme only	141,400 (+16%)	10,700 (+29%)
2022 Do Something	Adjusted housing allocations (14,034 homes) and unchanged employment allocation (200,100m^2) Package of transport improvements: • Highway capacity improvements • Public transport improvements (10 min bus frequency) • Discounting of walk/cycle trips up to 5km • Increase in long-stay parking charges (by 50%) • Removal of P&R at Linton and M20 J7	132,000 (+8%)	9,100 (+10%)
2031 Do Something 4b	Revised housing and employment allocations (18,560 homes) Package of transport improvements: • Highway capacity improvements • Public transport improvements (10 min bus frequency) • Discounting of walk/cycle trips up to 5km • Increase in long-stay parking charges (by 50%) • Removal of P&R at Linton and M20 J7	135,600 (+11%)	9,700 (+17%)

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APPENDIX


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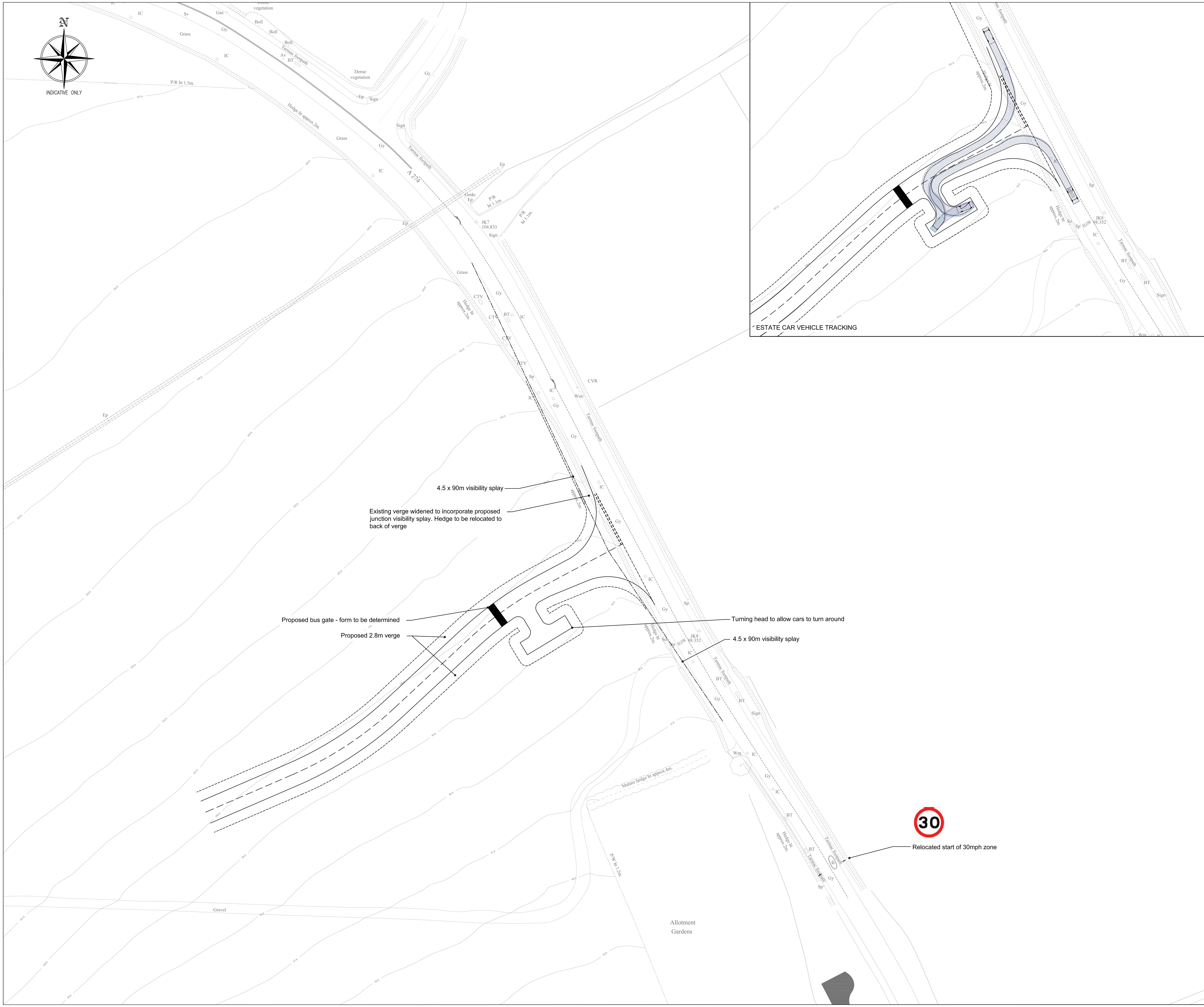
APPENDIX



NOTES

4.71
0.885 2.755

Estate Car (2006)	
Overall Length	4.710m
Overall Width	1.804m
Overall Body Height	1.442m
Min Body Ground Clearance	0.207m
Max Track Width	1.756m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.950m

REV	AMENDMENTS	DATE	CHK
P1	First issue	15.03.16	PL

Client
COUNTRYSIDE PROPERITES

Project
LAND AT SUTTON ROAD

Title
PROPOSED EASTERN ACCESS
GENERAL ARRANGEMENT
SIMPLE T JUNCTION

Drwg	Rev	Scale	Date
10296/H/12	P1	1:500	15.03.16

dha transport
integrated transport & travel planning

Eclipse House, Eclipse Park, Sittingbourne Road
Maidstone, Kent. ME14 3EN
t: 01622 776226 f: 01622 776227
e: info@dhaplanning.co.uk w: www.dhatransport.co.uk

CAD Reference: CAD REF

A1