

TECHNICAL NOTE – SIGNAL MODELLING

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This document has been prepared to supplement the Transport Assessment and is submitted to PCC for their approval.

PURPOSE

The purpose of this Technical Note is to respond to comments that have been provided by Plymouth City Council (PCC) and their consultant (Lillington Consultancy Ltd) concerning the signalised junction modelling that has been undertaken in relation to the planning application which has been submitted in support of the proposed Energy from Waste Combined Heat and Power (EfW CHP) facility at North Yard, Devonport.

A number of documents are referred to within this Technical Note. Most notably, these include:

Transport Assessment, May 2011, URS Scott Wilson

Transport Assessment Appendix (Annex G), May 2011, URS Scott Wilson

Modelling Note, June 2011, URS Scott Wilson

Model Audit, June 2011, Lillington Consultancy (on behalf of Plymouth City Council)



1. INTRODUCTION AND BACKGROUND

URS Scott Wilson prepared a Transport Assessment (TA) on behalf of MVV Umwelt GmbH in support of a planning application for an Energy from Waste Combined Heat and Power (EfW CHP) facility at North Yard, Devonport in May 2011.

The assessment was prepared on the basis of an agreed TA Scope in addition to a number of consultations and meetings which were held with officers of Plymouth City Council (PCC), throughout the preparation of the TA. As such, the TA included junction modelling assessments of three existing junctions which were located within the agreed TA study area.

Since the submission of the TA which accompanied the planning application, comments on the signalised junction modelling have been received from PCC and their consultant Andrew Lillington (Lillington Consultancy Ltd). A summary of the relevant correspondence which has taken place since the submission of the TA is provided below:

1st June 2011 – email from Scott Smy (PCC)
 Further information requested regarding the modelled cycletimes at the Wolseley Road / Weston Mill Drive junction.

 7^{th} June 2011 – email response from Kirsty Lees (URS SW) which included a short modelling note and output files (included at **APPENDIX A**). The modelling confirmed that revising the junction cycletimes at this location did not adversely affect the overall operation of the junction and the outputs were therefore consistent with those presented within the TA.

 16th June 2011 – email from Scott Smy (PCC) PCC confirmed receipt of the modelling note (referred to above, issued on 7th June) and asked for models to be forwarded for the future year scenarios, as well as the baseline information which had been provided.

16th June 2011 – email from Colin Romain (URS SW) which confirmed that URS SW had liaised with Andrew Lillington and had agreed that the future year models did not need to be revised on the basis of the existing cycletimes, as in the future, different cycletimes may be employed. It was agreed however, that the models for the Wolseley Road / Weston Mill Drive and Weston Mill Drive / Carlton Terrace junctions should run the same cycletimes as each other in each scenario.

16th June 2011 – email from Scott Smy (PCC)
 Confirmation requested that HGVs modelled within LINSIG had been converted into PCUs.

16th June 2011 – email response from Colin Romain (URS SW) which confirmed that all signal modelling had been undertaken utilising flows converted into PCUs.

 17th June 2011 – email from Scott Smy (PCC) Technical Note prepared by Andrew Lillington issued by PCC, summarising the audit of the signal modelling which had been undertaken.

URS SW have prepared this Technical Note in response to the model audit which has been undertaken. In doing so, the Technical Note follows the same order as that presented within the audit document and therefore aims to respond to each comment, as appropriate.



2. FLOW INPUT TO LINSIG MODELS

It is noted that the independent model audit that has been undertaken has cross-checked the flow diagrams presented within the TA against the LINSIG models, and taking into account the conversion of vehicles to PCUs, has confirmed that the model flows are consistent with the flow diagrams.

3. CALIBRATION / VALIDATION OF MODELS

The Modelling Note referred to above, which was issued to PCC on 7th June, presented additional modelling results for the Weston Mill Drive / Wolseley Road junction taking into account the existing cycletime at the junction, of 100 and 96 seconds in the AM and PM peak hours respectively. These cycletimes also apply at the nearby Weston Mill Drive / Carlton Terrace junction.

A detailed explanation is therefore provided in the aforementioned Modelling Note but notwithstanding this, URS Scott Wilson can confirm that the models were re-visited following the submission of the TA which accompanies the EfW CHP planning application. As such, the models were re-run using the 100 and 96 second cycletimes and the results of the analysis are presented below at **TABLES 3.1** and **3.2** for the 2010 Observed and 2011 Baseline scenarios respectively. It should be noted that further information is provided on this matter specifically within the Modelling Note (see **APPENDIX A**).

Approach	AN 100 Se	/I (0800-09) econd Cyc	00) letime	PM (1600-1700) 96 Second Cycletime			
	DoS	MMQ	Obs Q	DoS	MMQ	Obs Q	
Wolseley Rd N Ahead + Left	65.9	8.7	7.7	81.3	7.6	6.1	
Wolseley Rd N Ahead + Right	60.4	8.8	7.7	76.9	7.7	6.1	
Weston Mill Dr Left	65.5	8.2	6.8	48.9	8.5	2.4	
Weston Mill Dr Ahead + Left	64.6	8.7	6.8	51.6	2.1	1.3	
Weston Mill Dr Ahead + Right	63.8	6.4	2.5	48.4	2.5	3.7	
Wolseley Rd S Ahead + Left	52.1	6.9	8.9	80.9	15.3	13.0	
Wolseley Rd S Right	46.0	6.5	7.1	80.8	15.5	12.9	
Dockyard Ahead + Left	33.3	1.9	1.9	80.8	9.7	10.0	
Dockyard Right	33.8	1.7	1.4	22.6	2.2	3.3	
Cycletime (secs)	100			96			
Practical Reserve Capacity (PRC)		53.4%		79.3%			

TABLE 3.1 Wolseley Road / Weston Mill Drive – 2010 Observed: Revised Cycletime
Refer to Modelling Note at Appendix A for further information



Approach	AM (08 100 Secon	00-0900) d Cycletime	PM (1600-1700) 96 Second Cycletime		
	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	66.4	8.9	82.2	7.9	
Wolseley Rd N Ahead + Right	60.7	8.9	77.2	7.8	
Weston Mill Dr Left	64.7	8.1	29.3	4.5	
Weston Mill Dr Ahead + Left	66.2	9.1	30.8	5.0	
Weston Mill Dr Ahead + Right	62.4	6.2	72.3	4.4	
Wolseley Rd S Ahead + Left	52.5	7.0	83.9	16.2	
Wolseley Rd S Right	46.2	6.2	83.8	16.2	
Dockyard Ahead + Left	34.1	1.5	81.5	10.3	
Dockyard Right	33.8	1.7	21.7	2.2	
Cycletime (secs)	100		96		
Practical Reserve Capacity (PRC)	54	.5%	82.8%		

TABLE 3.2 Wolseley Road / Weston Mill Drive – 2011 Baseline: Revised Cycletime *Refer to Modelling Note at Appendix A for further information*

It is noted that the model audit that has been undertaken has confirmed that the modelled queues are generally of the same order as the observed queues, which it is considered therefore represents a good level of model validation. It should be noted that the queue surveys on site were undertaken concurrently with the traffic flow surveys, which therefore assisted in the calibration and validation process. URS Scott Wilson therefore considered that the junction models provided a robust basis for the future year modelling to be undertaken and therefore, for the various scenario results to be compared given that the observed models reasonably reflect the observed conditions.

As part of the auditors comments however, it has been identified that there are a few minor queue anomalies. In order to provide further information on this point, the auditor has commented that it is typical for queue surveys to record 'end of red' queues which are not the same as the 'mean maximum queues' which are reported within LINSIG. LINSIG models queue lengths according to three components:

- Uniform Queue LINSIG calculates the maximum queue for each cycle in the modelled period. The maximum uniform queue is therefore the maximum length of the back of the queue, which allows for vehicles to still be joining the back of the queue even once vehicles have started to move off from the front of the queue.
- Oversaturated Queue LINSIG calculates the additional amount of queuing when a lane becomes over-saturated, thereby meaning that not all of the initial queue will clear across the stopline at the first attempt. As such, the residual queue will form part of the queue which occurs in the subsequent period, thereby leading to the queue increasing by cycle until either demand reduces or additional greentime is available.
- Random Queue LINSIG calculates an element of random queuing to reflect reality. In doing so, it
 is recognised that during some cycles even during saturated conditions, queues can completely
 clear at the first attempt whereas during other cycles, residual queuing may occur. This is likely to



reflect changes in driver behaviour as the Saturation Flow may temporarily alter as drivers attempt to proceed through the junction more quickly than they might at quieter times. The random queue element within the LINSIG calculation therefore seeks to take account of any such conditions.

The Mean Maximum Queue (MMQ) which is reported by LINSIG is therefore the sum of the modelled maximum back of queue (the uniform queue) and the calculated oversaturated and random queue. The 'mean' in this case refers to the average length of these queues being taken, over the course of the modelled period.

For the purposes of the modelling analysis presented within the TA, the modelled MMQ was therefore compared against the observed queues recorded on site. For clarity however, each queue component has been derived and disaggregated from LINISG for the 2010 Observed situation, and compared against the observed queues. This analysis is presented below at **TABLES 3.3**, **3.4** and **3.5** for each of the three study junctions.

Annroach	AM (0800-0900)				PM (1600-1700)			
Αμρισασίι	Uf	OS+Rm	MMQ	Obs Q	Uf	OS+Rm	MMQ	Obs Q
Wolseley Rd N Ahead	10.2	0.8	11.0	7.1	5.2	0.5	5.7	5.3
Wolseley Rd N Right	16.9	3.8	20.7	12.5	8.0	2.9	10.9	11.2
Wolseley Rd S Ahead + Left	4.3	2.3	6.7	4.6	6.0	3.3	9.3	6.8
Wolseley Rd S Ahead	4.3	2.1	6.4	3.4	6.1	3.2	9.2	8.7
Saltash Rd Left	1.7	0.2	1.9	4.8	8.2	1.9	10.0	14.0
Saltash Rd Right	0.4	0.0	0.4	0.2	0.5	0.1	0.5	0.0
Cycletime (secs)	76				59			
Practical Reserve Capacity (PRC)		89.	1%		87.7%			

TABLE 3.3 Wolseley Road / Saltash Road – 2010 Observed: Queue Comparison

Uf – Uniform Queue

Os+Rm – Oversaturated Queue plus Random Queue MMQ – Mean Maximum Queue

Obs Q – Observed Queue



Annroach	AM (0800-0900)				PM (1600-1700)			
Αρρισασίι	Uf	OS+Rm	MMQ	Obs Q	Uf	OS+Rm	MMQ	Obs Q
Wolseley Rd N Ahead + Left	7.8	1.0	8.7	7.7	5.6	2.0	7.6	6.1
Wolseley Rd N Ahead + Right	8.0	0.8	8.8	7.7	6.1	1.6	7.7	6.1
Weston Mill Dr Left	7.3	0.9	8.2	6.8	8.1	0.5	8.5	2.4
Weston Mill Dr Ahead + Left	7.8	0.9	8.7	6.8	1.5	0.5	2.1	1.3
Weston Mill Dr Ahead + Right	5.5	0.9	6.4	2.5	2.0	0.5	2.5	3.7
Wolseley Rd S Ahead + Left	6.4	0.5	6.9	8.9	13.2	2.1	15.3	13.0
Wolseley Rd S Right	5.7	0.4	6.5	7.1	13.5	2.0	15.5	12.9
Dockyard Ahead + Left	1.6	0.2	1.9	1.9	7.7	2.0	9.7	10.0
Dockyard Right	1.4	0.3	1.7	1.4	2.0	0.1	2.2	3.3
Cycletime (secs)	100			96				
Practical Reserve Capacity (PRC)	53.4%				79.3%			

TABLE 3.4 Wolseley Road / Weston Mill Drive – 2010 Observed: Queue Comparison

Uf – Uniform Queue

Os+Rm – Oversaturated Queue plus Random Queue MMQ – Mean Maximum Queue

Obs Q – Observed Queue

TABLE 3.5 Weston Mill Drive / Carlton Terrace – 2010 Observed: Queue Comparison

Annroach	AM (0800-0900)				PM (1600-1700)			
Αμρισασίι	Uf	OS+Rm	MMQ	Obs Q	Uf	OS+Rm	MMQ	Obs Q
Carlton Terrace	4.6	0.9	5.5	6.4	2.5	0.5	3.0	3.1
Weston Mill Dr E Ahead + Left	12.1	0.9	13.0	13.6	8.4	2.6	11.0	9.7
Weston Mill Dr E Ahead + Right	13.5	1.0	14.4	12.6	9.7	3.4	13.1	9.6
Ferndale Rd	5.2	3.0	8.2	7.0	4.9	3.2	8.0	6.4
Weston Mill Dr W Ahead + Left	9.3	2.1	11.4	11.6	12.7	6.0	18.7	18.0
Weston Mill Dr W Ahead + Right	10.1	2.3	12.4	7.5	13.3	5.4	18.7	16.4
Cycletime (secs)	100				96			
Practical Reserve Capacity (PRC)		87.	8%		93.9%			

Uf – Uniform Queue

Os+Rm – Oversaturated Queue plus Random Queue

MMQ – Mean Maximum Queue

Obs Q – Observed Queue

In most cases, the MMQ modelled within LINSIG has been shown to be closely comparable to the observed queue levels and it is recognised that this has been acknowledged as part of the model audit which has been undertaken.



Notwithstanding this, it is noted from the additional queue information that has been presented above at **TABLES 3.3**, **3.4** and **3.5**, that where the MMQ has been shown to be overestimated within the model compared to the observed queue, that the corresponding uniform queue does accord more closely with the observed queue. In these cases, it therefore appears that the oversaturated and random queue components may be being slightly overestimated.

Hence, in a number of cases the uniform queue can be used to demonstrate that the models validate well against the observed queue levels. Thus, the observed queues on site appear to reflect the 'end of red' queues in these cases.

Finally, please note that all table references have been updated within this Technical Note for clarity. The Degree of Saturation (DoS) as a percentage is presented for each approach to each junction, whilst the overall Practical Reserve Capacity (PRC) is also presented for each junction as a whole.

4. LINSIG MODEL FOR WOLSELEY ROAD / SALTASH ROAD

It is noted that the model audit has confirmed that the model detail that has been reviewed seems 'broadly reasonable' and that the model has been cross-checked against the PCC controller specification which has confirmed that the model is correct. Some minor comments have been made however, and these are responded to in turn, below:

A. Saturation Flows

For the purposes of the development of the various junction models, all saturation flows utilised within the LINSIG programme have been calculated therein, based on the geometric parameters which have been input into the models. This is a standard technique which allows the functionality of the software to obtain appropriate saturation values, based on the input parameters which include lane width, turning radii, permissible movements and location (ie. nearside or offside).

Notwithstanding this, the audit of the junction models has identified that where possible, the calculated saturation flow levels should be compared against observed values. In light of this request, a supplementary site visit was undertaken on Tuesday 28th June 2011 such that saturation flows could be measured at the key locations, at each of the three study junctions during the AM and PM peak hours. Where possible, a series of measurements were taken and the average saturation flow has then been calculated. The average value in all cases excludes both low and high 'outlier' saturation flow levels which were generally considered to be below 1400 and above 2400 respectively.

In order to make a comparison between the modelled and observed saturation flows, the GEH statistic has been employed. This follows the 'Validation Acceptability Guidelines' as set out within DMRB guidance (Vol 12-2-1). It is thus stated in DMRB that 'the standard method of comparison is to compare modelled values against observations' in this case according to the following formula:

 $GEH = \sqrt{((M-C)^2 / ((M+C) / 2))}$

where: GEH is the goodness of fit M is the Modelled Saturation Flow C is the Observed Saturation Flow

Where the GEH is below or equal to a value of 5, then according to the guidelines this is considered to comprise a 'good fit'.



For the Wolseley Road / Saltash Road junction in this case, a comparison has therefore been made between the observed and modelled saturation flows. This analysis is presented below at **TABLE 4.1** which includes the calculated GEH value. It should be noted that the GEH has only be calculated where the modelled saturation flow is greater than the observed saturation flow.

Where two saturation flow values are presented (eg. 1800 / 1950) this indicates that there are two approaches, whereby the first value represents the nearside lane and the second value represents the offside lane.

		AM (0800-0900))	PM (1600-1700)			
Approach	Observed Sat Flow	Modelled Sat Flow	GEH	Observed Sat Flow	Modelled Sat Flow	GEH	
Wolseley Rd N Ahead	-	2015	-	1800	2015	4.92	
Wolseley Rd N Right	1969	2005	0.81	1895	2005	2.49	
Wolseley Rd S Ahead + Left	2061	2065	0.09	1850	2065	4.86	
Wolseley Rd S Ahead	2125	2155	0.66	1886	2155	5.99	
Saltash Rd Left	1920	1901 / 2052	N/A / 2.96	2016 / 1885	1901 / 2052	N/A / 3.76	
Saltash Rd Right	2160	2051	N/A	-	2051	-	

TABLE 4.1 Wolseley Road / Saltash Road: Saturation Flow Comparison

Comparing the observed saturation flow values with those that have been calculated within LINSIG for the AM peak in the first instance confirms that the two sets of values are very similar. The highest GEH value is 2.96 and all modelled saturation flows are therefore considered to be a 'good fit' compared to the observed values (ie. none of the GEH values exceed 5.00).

In the PM peak, the modelled saturation flows are again observed to be similar to those observed although the modelled values do tend to be slightly higher, overall. In particular, the modelled saturation flow of 2155 at the Wolseley Road South Ahead approach is shown to not be a 'good fit' with the observed value (the GEH is 5.99 in this case), although the same saturation flow has been modelled in the AM peak when the observed saturation is higher (the GEH value in that case is 0.66).

Assuming that a GEH value of up to 5.00 would represent a 'good fit' between the observed and modelled saturation flow, it has been calculated that the maximum saturation flow that might be appropriate to be modelled for this approach during the PM peak would therefore be 2109.

The corresponding saturation flow for this approach has therefore been manually adjusted within LINSIG and the results of this adjustment are presented at the end of this section of the Technical Note.

B. Lane Markings

The model audit refers to the lane markings on Saltash Road, given that the offside left turn lane is fed from the right turning lane, rather than the nearside left turn lane.

This was recognised as part of the development of the junction model, although on site observations indicated that drivers approaching the junction to turn left would often arrive in the left turn lane but then filter into the right turn lane at the stopline, as opposed to approaching in the right turn lane and then entering the offside left turn lane.



It was nonetheless noted that the right turn lane may inhibit the capacity of the offside left turn lane and to take account of this, a limited lane length of 3 pcu was input to the model, where as it is considered that the actual lane length is more likely to be 4-5 pcu.

C. Left Turn Give-Way

The model audit has identified that the left turn give-way on Wolseley Road South is set at 1400 within the LINSIG modelling and it has been suggested that this value should be reduced to 1000, coupled with a lower co-efficient of 0.5.

It was noted by the auditor that this lane is not critical in terms of capacity but the suggested changes have nonetheless been incorporated. The results of the combined adjustments are presented at the end of this section of the Technical Note.

D. Results

The model audit states that the capacity results presented within the TA indicate that an overall improvement in junction performance (PRC in this case) has occurred between the 2011 Baseline and the 2014 Do Minimum scenarios, even allowing for the inclusion of background traffic growth. For clarity, the following **TABLES** should be referred to within the TA:

- TABLE 5.5 2011 Baseline
- TABLE 7.2 2014 Do Minimum
- TABLE 7.3 2014 Do Something

Similar comments to that mentioned above have also been received from PCC more generally, in relation to the junction modelling analysis which is presented within the TA. In general terms therefore, the reason why an 'improvement' has been reported between the two scenarios is due to the increase in cycletime that has been modelled.

In specific relation to the comment which has been made in this case, at the Saltash Road junction, it is noted that in the 2011 Baseline scenario the existing cycletimes have been employed within the junction model (76 and 59 seconds in the AM and PM peak hours respectively). For the 2014 Do Minimum future year scenario however, the optimiser function has been run within LINSIG and proposed cycletimes have therefore been utilised (81 and 62 seconds in the AM and PM peak hours respectively). According to the relevant traffic conditions therefore, the optimised signal timings in some cases, have indicated slight performance improvements compared with the existing situation.

Supplementary Comment(s)

In reviewing the model audit which has been undertaken on behalf of PCC, the auditor has requested that further information be provided relating to the modelling of phase delays specifically in relation to the Wolseley Road / Weston Mill Drive junction. As such, further information is provided in response to Item G in Section 5, presented below.

As part of the consideration of that item however, a review of supplementary controller information for the Wolseley Road / Saltash Road junction has also identified that two phase delays apply within the controller. As such, these have also been incorporated into the model in addition to the comments discussed above. In summary however, the associated phase delays are summarised below at **TABLE 4.2**.



TABLE 4.2 Wolseley Road / Saltash Road: Phase Delays

Phase Delayed	From Stage	To Stage	By n Seconds
E	2	1	3
E	3	1	2

Summary

In light of the above comments and review work, each of the minor adjustments that have been identified (including the additional phase delay information) have been employed within the LINSIG modelling, such that revised junction model outputs have been obtained. **TABLES 4.3** – **4.6** below present the revised LINSIG results and should be compared against **TABLES 5.1**, **5.5**, **7.2** and **7.3** of the TA respectively.

TABLE 4.3 Wolseley Road / Saltash Road – 2010 Observed

Annroach	AM (080	0-0900)	PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead	62.6	11.0	47.8	5.7	
Wolseley Rd N Right	89.2	20.7	86.0	10.9	
Wolseley Rd S Ahead + Left	83.8	6.7	87.9	9.3	
Wolseley Rd S Ahead	82.3	6.4	89.5	9.8	
Saltash Rd Left	26.6	1.7	74.7	8.9	
Saltash Rd Right	7.8	0.4	10.4	0.5	
Cycletime (secs)	7	6	59		
Practical Reserve Capacity (PRC)	89.	1%	89.5%		

TABLE 4.4 Wolseley Road / Saltash Road – 2011 Baseline

Annroach	AM (080	0-0900)	PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead	63.1	11.1	48.1	5.7	
Wolseley Rd N Right	89.9	21.4	86.6	11.1	
Wolseley Rd S Ahead + Left	84.2	6.8	88.9	9.6	
Wolseley Rd S Ahead	83.1	6.6	90.0	9.9	
Saltash Rd Left	26.8	1.7	74.9	9.1	
Saltash Rd Right	7.8	0.4	10.4	0.5	
Cycletime (secs)	7	6	59		
Practical Reserve Capacity (PRC)	89.	9%	90.0%		



Annroach	AM (080	00-0900)	PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead	62.7	11.6	48.2	5.9	
Wolseley Rd N Right	89.1	22.3	87.3	11.8	
Wolseley Rd S Ahead + Left	83.2	7.0	87.6	9.6	
Wolseley Rd S Ahead	81.9	6.8	87.9	9.7	
Saltash Rd Left	27.4	1.8	79.2	11.6	
Saltash Rd Right	8.7	0.5	11.0	0.6	
Cycletime (secs)	8	1	61		
Practical Reserve Capacity (PRC)	89.	0%	87.6%		

TABLE 4.5 Wolseley Road / Saltash Road – 2014 Do Minimum

TABLE 4.6 Wolseley Road / Saltash Road – 2014 Do Something

Approach	AM (080	0-0900)	PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead	63.0	11.7	48.7	6.1	
Wolseley Rd N Right	89.2	22.4	87.4	11.9	
Wolseley Rd S Ahead + Left	84.3	7.3	87.1	9.4	
Wolseley Rd S Ahead	83.4	7.2	89.2	10.2	
Saltash Rd Left	27.4	1.9	77.4	10.4	
Saltash Rd Right	8.7	0.5	11.0	0.6	
Cycletime (secs)	81		61		
Practical Reserve Capacity (PRC)	89.	1%	89	.1%	

The analysis presented above has confirmed that the adjustments that have been made to the junction models do not fundamentally affect the predicted operation of the junction and furthermore, indicates that the modelled results are consistent with the findings presented within the TA.

5. LINSIG MODEL WOLSELEY ROAD / WESTON MILL DRIVE

It is noted that the model audit has confirmed that the model detail that has been reviewed seems 'broadly reasonable' and that the model has been cross-checked against the PCC controller specification which has confirmed that the model is correct. Some minor comments have been made however, and these are responded to in turn, below:



A. Saturation Flows

For the purposes of the development of the various junction models, all saturation flows utilised within the LINSIG programme have been calculated therein, based on the geometric parameters which have been input into the models, as discussed previously.

In order to consider the application of the resultant saturation flows in more detail, the calculated saturation flow levels have been compared against observed values recorded on site on Tuesday 28th June 2011 during the AM and PM peak hours. Where possible, a series of measurements were taken and the average saturation flow has then been calculated. The average value in all cases excludes both low and high 'outlier' saturation flow levels which were generally considered to be below 1400 and above 2400 respectively.

In order to make a comparison between the modelled and observed saturation flows, the GEH statistic has been employed, as explained previously.

For the Wolseley Road / Weston Mill Drive junction in this case, a comparison has therefore been made between the observed and modelled saturation flows. This analysis is presented below at **TABLE 5.1** which includes the calculated GEH value. It should be noted that this has only be calculated where the modelled saturation flow is greater than the observed saturation flow.

	AM (0800-0900)		PM (1600-1700)			
Approach	Observed Sat Flow	Modelled Sat Flow	GEH	Observed Sat Flow	Modelled Sat Flow	GEH
Wolseley Rd N Ahead + Left	1951	1923	N/A	1920	1923	0.07
Wolseley Rd N Ahead + Right	1800	2155	7.98	1800	2155	7.98
Weston Mill Dr Left	1920	1919	N/A	-	1919	-
Weston Mill Dr Ahead + Left	1980	2066	1.91	1886	2066	4.06
Weston Mill Dr Ahead + Right	2109	2096	N/A	1969	2096	2.82
Wolseley Rd S Ahead + Left	1740	2015	6.35	1962	2015	1.18
Wolseley Rd S Right	2085	2005	N/A	1936	2005	1.56
Dockyard Ahead + Left	2340	2105	N/A	2117	2105	-
Dockyard Right	-	2033	-	2130	2033	-

TABLE 5.1 Wolseley Road / Weston Mill Drive: Saturation Flow Comparison

Comparing the observed saturation flow values with those that have been calculated within LINSIG for both peak hours confirms that the two sets of values are very similar.

The highest GEH value is 7.98 and occurs in both peak hours, for the ahead and right lane on Wolseley Road North. There is one further instance where the GEH value exceeds 5.00 and this occurs during the AM peak for the Ahead and Left movement on Wolseley Road South. The GEH in this case is 6.35. It is noted that the same modelled saturation was identified as being appropriate by on site observations at that location, during the PM peak hour. All other GEH values are below 5.00 and therefore deemed to be a 'good fit'.



On the basis that the relevant guidance indicates that a GEH value of up to 5.00 would represent a 'good fit' between the observed and modelled saturation flow, it has been calculated that the maximum saturation flow that might be appropriate to be modelled would be 2018 and 1954 (rather than 2155 and 2015), for the Wolseley Road North and Wolseley Road South approaches referred to above, respectively.

The corresponding saturation flows for these approaches have therefore been manually adjusted within LINSIG, for the relevant peak hours, and the combined results of this adjustment are presented at the end of this section of the Technical Note.

B. Left Turn Give-Way

The model audit has identified that the left turn give-way on Wolseley Road South, Wolseley Road North and the Dockyard approach is set at 1400 within the LINSIG modelling and it has been suggested that this value should be reduced to 1000, coupled with a lower co-efficient of 0.5.

The suggested changes have been incorporated and the combined results of the adjustments are presented at the end of this section of the Technical Note.

C. Left Turn Give-Way – Lane Length

The model audit has indicated that traffic queuing on Wolseley Road North may 'cut off' access to the giveway left turn prior to the lane length which was set at 2 pcu being reached. It has therefore been suggested that the lane length be reduced to 1.5 pcu.

The suggested changes have been incorporated and the combined results of the adjustments are presented at the end of this section of the Technical Note.

D. Lane Length

The model audit has identified that on the Dockyard approach to the junction, the offside lane used by right turning vehicles has been modelled as a 'long lane' (infinitely long). Although it is noted that there is a short green given to this approach, it has been recommended that the approach is converted to a short lane (16 pcu).

The model does already include a manual inputted lane length of 16 pcu but nonetheless has been converted to a short lane, as per the recommendation. The combined results of the adjustments are presented at the end of this section of the Technical Note.

E. Right Turn Lane Usage

The model audit has identified that equal lane usage has been modelled for the two right turn lanes from Wolseley Road South into Weston Mill Drive and requested whether or not further information is available to justify this lane usage.

The Manual Classified Count data obtained on site does not disaggregate these particular turning movements by lane and so it not possible to calculate the actual proportion of traffic which used each lane at the time when the survey data was collected. On site observations have indicated however, that traffic turning right at this location does tend to use both lanes reasonably evenly and furthermore, this is corroborated by the queue survey data.

In the AM peak for example, the queue survey indicated that on average that the queue was 7.2 vehicles in the nearside and 6.9 vehicles in the offside right turn lanes.



F. Long and Short Lane Allocation

The model audit has recommended that for completeness Wolseley Road North Lane 3 (ahead) should be converted to a long lane and Wolseley Road North Lane 4 (right turn) should be converted to a short lane.

This comment is acknowledged and based on the site plan for the junction, this configuration seems to be most appropriate. Indeed, as part of the initial building of the model, the recommended configuration was employed.

As part of the calibration of the junction model and based on on-site observations however, it has been observed that the right turn lane in affect, operates as a long lane as vehicles arrive at the stopline and wait for the green signal. This in turn can cut off the access to the offside ahead lane (Lane 3) affectively converting it into a short lane, which can be fed by the adjacent ahead lane (Lane 2), which is a long lane.

G. Phase Delays

The model audit has questioned whether or not there are any phase delays in operation at this junction and if so, whether or not these have been included within the LINSIG Modelling. Supplementary controller information for the junction has therefore been reviewed and it can be confirmed that phase delays are employed at the junction (as summarised below at **TABLE 5.2**). These have therefore been included within the LINSIG Modelling presented herein.



Phase Delayed	From Stage	To Stage	By n Seconds
I	1	3	4
J	1	3	6
В	1	4	5
F	1	4	2
E	1	5	1
Н	2	1	1
А	2	4	4
В	2	4	4
G	2	4	1
Н	2	4	2
н	3	1	1
А	3	4	4
В	3	4	4
G	3	4	1
Н	3	4	2
В	4	2	1
В	4	3	1
I	4	3	3
J	4	3	5
Н	5	1	1
С	5	2	1
С	5	3	1
I	5	3	4
J	5	3	6
Н	5	4	4

TABLE 5.2 Wolseley Road / Weston Mill Drive: Phase Delays

H. Pedestrian Phase J

The model audit has identified that the LINSIG modelling does not include Pedestrian Phase J being called on the Weston Mill Drive exit from the junction.



In preparing the LINSIG junction model, it was considered that the pedestrian phase did not run regularly enough (ie. every cycle or every other cycle) to warrant its inclusion with the modelling. On site survey data has been collected however, to further support this approach, as summarised below at **TABLE 5.3**.

Time	Total Peds Observed To Cross Road	Peds who Cross Using Green Man	Calculated 'Green Man' Demand
AM (0800-0900)	41	9	1 every 7 minutes (60 mins / 9 peds)
PM (1600-1700)	28	5	1 every 12 minutes (60 mins / 5 peds)

TABLE 5.3 Pedestrian Demand (at Phase J), Weston Mill Drive Junction Exit

The analysis therefore identifies that the demand to use the pedestrian crossing is relatively low and at a maximum was observed to be called nine times during the AM peak. This is equivalent to one pedestrian using the crossing every seven minutes and hence it was considered that the 'normal' situation which the LINSIG modelling should seek to reflect would not include the pedestrian phase being called.

I. Stage Sequence

The model audit has identified that the stage sequence in the AM and PM peaks is different, whereby Stage 4 and 5 run in order in the AM peak but are reversed in the PM peak.

This staging arrangement was observed on site and was subsequently confirmed by Amey, on behalf of PCC.

Summary

In light of the above comments and review work, each of the minor adjustments that have been identified (including the additional phase delay information) have been employed within the LINSIG modelling, such that revised junction model outputs have been obtained. **TABLES 5.4** – **5.7** below present the revised LINSIG results and should be compared against **TABLES 5.2**, **5.6**, **7.4** and **7.5** of the TA respectively.



Annroach	AM (08	00-0900)	PM (1600-1700)		
Арргоцон	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	63.1	8.8	75.6	7.3	
Wolseley Rd N Ahead + Right	62.7	8.9	78.2	7.8	
Weston Mill Dr Left	62.4	8.0	45.9	8.0	
Weston Mill Dr Ahead + Left	61.6	8.4	51.6	2.1	
Weston Mill Dr Ahead + Right	60.1	6.2	48.4	2.5	
Wolseley Rd S Ahead + Left	54.4	7.1	83.3	15.9	
Wolseley Rd S Right	47.8	6.3	83.3	16.0	
Dockyard Ahead + Left	30.5	1.3	80.8	9.7	
Dockyard Right	33.5	1.9	75.1	9.3	
Cycletime (secs)	100		96		
Practical Reserve Capacity (PRC)	47	.3%	82.0%		

TABLE 5.4 Wolseley Road / Weston Mill Drive – 2010 Observed

TABLE 5.5 Wolseley Road / Weston Mill Drive - 2011 Baseline

Annroach	AM (08	00-0900)	PM (1600-1700)		
Αμρισασίι	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	63.6	8.9	81.3	8.1	
Wolseley Rd N Ahead + Right	63.0	8.9	84.0	8.6	
Weston Mill Dr Left	61.7	7.9	26.9	4.1	
Weston Mill Dr Ahead + Left	63.1	8.7	28.3	4.6	
Weston Mill Dr Ahead + Right	62.4	6.2	72.3	4.4	
Wolseley Rd S Ahead + Left	52.9	7.0	83.9	16.2	
Wolseley Rd S Right	46.2	6.2	83.8	16.2	
Dockyard Ahead + Left	34.1	1.5	81.5	10.3	
Dockyard Right	31.8	1.7	68.2	8.4	
Cycletime (secs)	100		96		
Practical Reserve Capacity (PRC)	48	.4%	82	8%	



Annroach	AM (08	800-0900) PM (1600-170		
Арргоцон	DoS	MMQ	DoS	MMQ
Wolseley Rd N Ahead + Left	80.1	7.3	78.3	8.2
Wolseley Rd N Ahead + Right	87.0	8.9	82.4	9.1
Weston Mill Dr Left	843	7.1	49.2	9.4
Weston Mill Dr Ahead + Left	83.9	7.4	53.4	2.2
Weston Mill Dr Ahead + Right	66.6	4.6	54.4	2.9
Wolseley Rd S Ahead + Left	84.3	7.3	82.5	17.1
Wolseley Rd S Right	74.3	5.7	82.6	17.4
Dockyard Ahead + Left	23.2	0.9	79.1	10.1
Dockyard Right	20.7	1.0	77.8	10.7
Cycletime (secs)	64		103	
Practical Reserve Capacity (PRC)	86	.5%	81	.1%

TABLE 5.6 Wolseley Road / Weston Mill Drive – 2014 Do Minimum

TABLE 5.7 Wolseley Road / Weston Mill Drive - 2014 Do Something

Annroach	AM (08	00-0900)	PM (16	PM (1600-1700)	
Αμρισασίι	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	79.4	7.2	79.0	8.4	
Wolseley Rd N Ahead + Right	87.8	9.1	83.2	9.2	
Weston Mill Dr Left	84.0	7.1	52.8	10.4	
Weston Mill Dr Ahead + Left	84.2	7.6	53.6	2.6	
Weston Mill Dr Ahead + Right	67.5	4.7	56.2	3.0	
Wolseley Rd S Ahead + Left	84.3	7.3	81.4	17.0	
Wolseley Rd S Right	74.6	5.7	80.7	17.1	
Dockyard Ahead + Left	25.6	1.1	82.6	11.0	
Dockyard Right	23.4	1.2	80.7	11.4	
Cycletime (secs)	64		104		
Practical Reserve Capacity (PRC)	87	.5%	81	.8%	

The analysis presented above has confirmed that the adjustments that have been made to the junction models do not fundamentally affect the predicted operation of the junction and furthermore, indicates that the modelled results are consistent with the findings presented within the TA.



6. LINSIG MODEL WESTON MILL DRIVE / CARLTON TERRACE

It is noted that the model audit has confirmed that the model detail that has been reviewed seems 'broadly reasonable' and that the model has been cross-checked against the PCC controller specification which has confirmed that the model is correct. Some minor comments have been made however, and these are responded to in turn, below:

A. Weston Mill Drive South-West Approach

The model audit has identified that the south-western approach to the junction from Weston Mill Drive (West) has been modelled as two-full lanes. For ahead traffic using this approach however, the audit has noted that there is a two-to-one merge to the north-east of the junction which may in affect, constrain the overall saturation flow of traffic passing over the stopline.

It has therefore been suggested that the offside approach lane to the junction be modelled as a flare to the nearside lane, thereby giving consideration to the upstream funnelling affect. This amendment has therefore been included, based on a lane length 16 pcu, taking into account the pedestrian crossing and associated utilisation survey, as reported previously.

B. Weston Mill Drive North-East Approach

The model audit has identified that the north-eastern approach to the junction from Weston Mill Drive (East) has been modelled as two full lanes. The audit has suggested however, that the offside lane is modelled as a flare (15 pcu) to the nearside lane. This amendment has therefore been included.

C. Junction Model

As part of the development of the initial LINSIG junction model(s), it was noted that the Wolseley Road / Weston Mill Drive and Weston Mill Drive / Carlton Terrace junctions are located in proximity of each other (approximately 120m). Notwithstanding this, it was identified that the junctions are not linked on street.

As part of the preliminary LINSIG calibration and validation work, an initial model was built within LINSIG which included both of the aforementioned junctions. This model did not calibrate well however and it was found that the two models of each of the respective junctions returned much more comparable results to the observed situation as has been identified within the TA and confirmed as part of the model audit.

Indeed, the minor adjustments that have been made to the models as part of the auditing process has demonstrated a good level of calibration and validation in the observed scenarios thereby confirming that the models provide a robust platform on which to undertake the relative comparison of the potential future year scenarios.

D. Stage Sequence

The model audit has identified that stage one is called twice in the PM peak, whereby the stage sequence is 1-2-1-3.

This staging arrangement was observed on site and was subsequently confirmed by Amey, on behalf of PCC.



E. Results

The model audit states that the capacity results presented within the TA indicate that an overall improvement in junction performance (PRC in this case) has occurred between the 2014 Do Minimum and the 2014 Do Something scenarios in the PM Peak, allowing for the inclusion of development related traffic. It is anticipated that the auditor is referring to the AM Peak in this case however, not the PM peak.

For clarity, the following TABLES should be referred to within the TA:

- TABLE 7.6 2014 Do Minimum
- TABLE 7.7 2014 Do Something

Similar comments to that mentioned above have also been received from PCC more generally, in relation to the junction modelling analysis which is presented within the TA. In general terms therefore, the reason why an 'improvement' has been reported between the two scenarios is due to the increase in cycletime that has been modelled.

In specific relation to the comment which has been made in this case, at the Weston Mill Drive / Carlton Terrace junction, it is noted that in the AM Peak in the 2014 Do Something scenario the cycletime has been increased by one second, compared with the 2014 Do Minimum scenario (from 55 to 56 seconds), based on the optimiser function within LINSIG. Hence in this case, the results on some approaches to the junction are reported as being 'better' in the Do Something case, than in the Do Minimum.

F. Cycletime

The model audit has identified that in the future year Do Minimum and Do Something scenarios (2014) the optimiser function has been employed within the LINSIG to determine the most appropriate cycletime at the respective junction. Whilst this is an acceptable approach and conforms with standard practice the auditor has stated that the Wolseley Road / Weston Mill Drive and Weston Mill Drive / Carlton Terrace junctions should utilise the same 'optimum' cycletime, as appropriate, in the respective peak hours.

In reviewing the junction modelling presented herein, the two aforementioned junctions have been run on common AM and PM peak cycletimes to each other, according to each of the model scenarios.

G. Reserve Capacity

The auditor has indicated that in the 2014 PM peak scenarios, for both the Do Minimum (without development) and Do Something (with development) cases, the reserve capacity at the junction is less than zero. This is to say that the junction is operating in excess of its ideal level (ie. above 90%) although within its theoretical capacity (ie. at or below 100%).

The modelling therefore indicates that in 2014, even without the proposed development coming on line, that queuing at the Weston Mill Drive / Carlton Terrace junction is expected to increase and that this may interact with the nearby Wolseley Road / Weston Mill Drive junction. It is noted however, that this situation currently arises and is expected to continue to do so, for a very short period during the afternoon peak between approximately 1600 and 1615, when the Dockyard shift ends and employees leave the site.

As this is an existing issue which is expected to slightly worsen in the future, irrespective of whether or not the proposed EfW CHP facility is delivered, MVV Umwelt GmbH and the MoD have commenced discussions with PCC as the local highway authority, in order to consider the most appropriate measures which can be taken at this location. Further consideration will also need to be given by PCC, should



additional 'potential' developments come forward in the area, most notably including proposals for a supermarket which would be accessed off Carlton Terrace.

Summary

In light of the above comments and review work, each of the minor adjustments that have been identified have been employed within the LINSIG modelling, such that revised junction model outputs have been obtained. For clarity, it should be noted that there are no phase delays at this junction. **TABLES 6.1** – **6.4** below present the revised LINSIG results and should be compared against **TABLES 5.3**, **5.7**, **7.6** and **7.7** of the TA respectively.

It should be noted that as the 'long' offside lanes on both Weston Mill Drive West and East approaches have been converted to 'short' lanes, acting as flares to the nearside lanes (see Comments A and B above), that the results presented are now combined for the respective long and short lanes for each of the Weston Mill Drive West and East approaches.

Approach	AM (080	0-0900)	PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Carlton Terrace	60.1	5.2	48.8	3.0	
Weston Mill Dr E	85.3	16.6	91.4	14.5	
Ferndale Rd	80.7	7.1	89.1	8.0	
Weston Mill Dr W	82.5	12.4	91.0	17.8	
Cycletime (secs)	100		96		
Practical Reserve Capacity (PRC)	84.	5%	91	.6%	

TABLE 6.1 Weston Mill Drive / Carlton Terrace – 2010 Observed

TABLE 6.2 Weston Mill Drive / Carlton Terrace – 2011 Baseline

Approach	AM (080	(0800-0900) PM (1600-		
Арргоцон	DoS	MMQ	DoS	MMQ
Carlton Terrace	60.8	5.4	49.3	3.1
Weston Mill Dr E	85.7	16.8	92.2	14.8
Ferndale Rd	81.9	7.2	90.1	8.3
Weston Mill Dr W	83.1	12.5	91.8	18.4
Cycletime (secs)	100		96	
Practical Reserve Capacity (PRC)	85.	0%	92	.4%



Approach	AM (080	(0800-0900) PM (1600-17		
	DoS	MMQ	DoS	MMQ
Carlton Terrace	71.1	4.3	49.8	3.3
Weston Mill Dr E	82.9	13.0	91.9	15.5
Ferndale Rd	81.9	5.4	90.9	9.1
Weston Mill Dr W	78.6	8.3	94.1	21.8
Cycletime (secs)	64		103	
Practical Reserve Capacity (PRC)	81.	4%	94	.5%

TABLE 6.3 Weston Mill Drive / Carlton Terrace – 2014 Do Minimum

TABLE 6.4 Weston Mill Drive / Carlton Terrace - 2014 Do Something

Approach	AM (080	0-0900)	PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Carlton Terrace	71.1	4.3	50.3	3.4	
Weston Mill Dr E	84.4	13.5	94.5	17.6	
Ferndale Rd	81.9	5.4	91.8	9.3	
Weston Mill Dr W	80.2	8.7	95.3	23.4	
Cycletime (secs)	64		104		
Practical Reserve Capacity (PRC)	83.	3%	95	.8%	

The analysis presented above has confirmed that the adjustments that have been made to the junction models do not fundamentally affect the predicted operation of the junction and furthermore, indicates that the modelled results are consistent with the findings presented within the TA.

7. LINSIG MODEL WOLSELEY ROAD / WESTON MILL DRIVE / SITE ACCESS

It is noted that the model audit has confirmed that the model detail that has been reviewed seems 'broadly reasonable'. Some minor comments have been made however, and these are responded to in turn, below:

A. Dockyard Western Approach

The model audit has identified that the western approach from the Dockyard will be subject to a set back to the MoD roundabout of approximately 7 pcu. To reflect this, the offside (long) lane has been converted to a short lane, with a flared length of 7 pcu.

B. Dockyard Western Approach – Third Flare Lane

The model has identified that a third offside flared lane has been included within the model on the western approach from the Dockyard, which differs from the junction layout plan included with the TA. This third 'flared lane' has therefore been removed from the model.



C. Intergreen Phase Q - R

The model audit has identified that the intergreen which has been modelled between phases Q and R is 6 seconds and this may be lower than the appropriate standard. This has therefore been reviewed and it is confirmed that a higher intergreen of 8 seconds is appropriate.

D. Queue Back Capacity

The model audit has identified that the queue during the PM peak of 2014 Do Something scenario (when the site access would be delivered to serve the proposed EfW CHP facility) would be likely to exceed the storage capacity between the respective stopline and the site access, thereby implying that the queue would be displaced to the west off the site access.

The comment above is therefore noted and as it has been proposed that a yellow-box marking will be provided at the site access, it is agreed that once the queuing space is taken up to the east of the site access, that the residual queue is likely to be displaced to the west of the site access junction. This is not considered to be a significant issue however, as the queuing will occur off of PCC's highway network, as it does in the existing situation. Furthermore, it is noted that queuing only usually occurs at this location between approximately 1600 and 1615, when the Dockyard shift ends and employees leave the site.

Summary

In light of the above comments and review work, each of the minor adjustments that have been identified have been employed within the LINSIG modelling, such that revised junction model outputs have been obtained.

For clarity, it should be noted that the amendments that have applied to the Wolseley Road / Weston Mill Drive junction have also been applied to this model as well. **TABLE 7.1** below presents the revised LINSIG results and should be compared against **TABLE 7.9** of the TA.



Approach	AM (080	00-0900)	PM (1600-1700)		
Αρρισασίι	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	79.4	7.2	78.7	8.3	
Wolseley Rd N Ahead + Right	87.8	9.1	83.5	9.3	
Weston Mill Dr Left	84.2	7.1	51.2	10.1	
Weston Mill Dr Ahead + Left	84.1	7.5	50.2	2.2	
Weston Mill Dr Ahead + Right	70.8	5.0	62.8	3.5	
Wolseley Rd S Ahead + Left	84.3	7.3	81.4	17.0	
Wolseley Rd S Right	74.3	5.7	81.0	17.2	
Dockyard Ahead + Left	25.6	1.1	81.6	10.7	
Dockyard Right	24.0	1.1	24.6	2.2	
Site Access Left	3.2	0.3	10.2	0.7	
Dockyard Ahead (Exit)	16.3	1.3	45.4	4.5	
Cycletime (secs)	64		104		
Practical Reserve Capacity (PRC)	87.5%		82.3%		

TABLE 7.1 Wolseley Road / Weston Mill Drive / Site Access – 2014 Do Something

The analysis presented above has confirmed that the adjustments that have been made to the junction models do not fundamentally affect the predicted operation of the junction and furthermore, indicates that the modelled results are consistent with the findings presented within the TA.

8. CONCLUSION

The model audit identified that "in general, the submitted LINSIG traffic models provide a broadly reasonable interpretation of the current operation and performance of the junctions on the local highway network".

A number of minor amendments have been recommended however, and these have been taken into account, as presented herein. As such, a revised set of junction capacity results have been derived from LINSIG and again, these have been summarised within this Technical Note. Full model outputs are also available (see **APPENDIX B**).

In conclusion, the amendments which have been made to the junction models have not fundamentally altered the findings of the analysis and the results of the junction modelling are therefore consistent with those presented within the TA.

9. SENSITIVITY ASSESSMENT

For completeness, the TA was accompanied by a number of sensitivity assessments which were provided to provide PCC with supplementary information for the purposes of their review of materials submitted as part of the planning application. Three scenarios were considered in this respect:



- 2014 Do Something Maximum
- 2014 Do Something plus Potential
- 2014 Do Something Maximum plus Potential

Further information is provided at Annex G of the TA, but taking each junction in turn, the scenarios referred to above have been re-run and reported below, utilising the amended junction models.

Wolseley Road / Saltash Road

TABLES 9.1 – 9.3 below should be compared against TABLES G.4, G.23 and G.27 of Annex G which accompanies the TA, respectively.

Approach	AM (0800-0900)		PM (1600-1700)	
	DoS	MMQ	DoS	MMQ
Wolseley Rd N Ahead	63.8	11.8	49.7	6.2
Wolseley Rd N Right	89.4	22.5	87.7	12.0
Wolseley Rd S Ahead + Left	86.7	7.8	89.1	10.2
Wolseley Rd S Ahead	85.3	7.6	89.7	10.3
Saltash Rd Left	27.5	1.9	79.5	11.7
Saltash Rd Right	8.7	0.5	11.0	0.6
Cycletime (secs)	81		6	61
Practical Reserve Capacity (PRC)	89.3%		89	.6%

TABLE 9.1 Wolseley Road / Saltash Road - 2014 Do Something 'Maximum Scenario'

TABLE 9.2 Wolseley Road / Saltash Road – 2014 Do Something plus Potential Development

Approach	AM (0800-0900)		PM (1600-1700)	
	DoS	MMQ	DoS	MMQ
Wolseley Rd N Ahead	63.6	12.1	52.3	6.9
Wolseley Rd N Right	89.2	22.9	87.0	12.2
Wolseley Rd S Ahead + Left	84.4	7.7	89.4	10.8
Wolseley Rd S Ahead	83.0	7.5	89.6	10.9
Saltash Rd Left	27.9	2.0	79.7	12.2
Saltash Rd Right	8.9	0.5	11.4	0.6
Cycletime (secs)	83		e	63
Practical Reserve Capacity (PRC)	89.	2%	89	.6%



TABLE 9.3 Wolseley Road / Saltash Road – 2014 Do Something 'Maximum Scenario' plus Potential Development

Approach	AM (0800-0900)		PM (1600-1700)	
	DoS	MMQ	DoS	MMQ
Wolseley Rd N Ahead	64.4	12.3	52.6	7.0
Wolseley Rd N Right	89.4	23.0	88.7	12.8
Wolseley Rd S Ahead + Left	86.2	8.2	85.8	10.0
Wolseley Rd S Ahead	85.1	8.0	86.4	10.2
Saltash Rd Left	28.0	2.0	81.2	13.0
Saltash Rd Right	8.9	0.5	11.5	0.6
Cycletime (secs)	83		e	64
Practical Reserve Capacity (PRC)	89.	89.4%		.6%

The analysis presented above has confirmed that the adjustments that have been made to the junction models do not fundamentally affect the predicted operation of the junction and furthermore, indicates that the modelled results are consistent with the findings presented within the TA, at Annex G.

Wolseley Road / Weston Mill Drive

TABLES 9.4 – 9.6 below should be compared against **TABLES G.5**, **G.24** and **G.28** of Annex G which accompanies the TA, respectively.

Annroach	AM (0800-0900)		PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	79.9	7.3	81.3	8.5	
Wolseley Rd N Ahead + Right	87.3	9.0	86.2	9.6	
Weston Mill Dr Left	84.3	7.1	55.1	10.8	
Weston Mill Dr Ahead + Left	84.6	7.8	68.3	4.2	
Weston Mill Dr Ahead + Right	75.2	5.7	62.1	3.5	
Wolseley Rd S Ahead + Left	84.3	7.3	84.3	17.4	
Wolseley Rd S Right	74.6	5.7	83.2	17.1	
Dockyard Ahead + Left	33.5	1.5	86.5	12.2	
Dockyard Right	30.7	1.7	84.3	12.5	
Cycletime (secs)	64		101		
Practical Reserve Capacity (PRC)	86	86.9%		85.9%	



Annroach	AM (08	AM (0800-0900)		00-1700)
Αρρισσοί	DoS	MMQ	DoS	MMQ
Wolseley Rd N Ahead + Left	80.3	7.7	84.4	10.8
Wolseley Rd N Ahead + Right	85.9	9.1	82.8	10.5
Weston Mill Dr Left	84.3	7.5	57.0	13.1
Weston Mill Dr Ahead + Left	84.4	8.1	54.9	3.2
Weston Mill Dr Ahead + Right	79.7	6.3	81.0	6.3
Wolseley Rd S Ahead + Left	79.7	6.8	82.9	19.4
Wolseley Rd S Right	74.6	6.1	85.4	20.8
Dockyard Ahead + Left	26.4	1.1	85.1	13.5
Dockyard Right	24.2	1.3	82.3	13.6
Cycletime (secs)	66		117	
Practical Reserve Capacity (PRC)	85.3%		84.6%	

TABLE 9.5 Wolseley Road / Weston Mill Drive - 2014 Do Something plus Potential Development

TABLE 9.6 Wolseley Road / Weston Mill Drive – 2014 Do Something 'Maximum Scenario' plus Potential Development

Approach	AM (08	AM (0800-0900)		PM (1600-1700)	
Арргоион	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	77.4	7.5	84.8	11.0	
Wolseley Rd N Ahead + Right	83.4	8.8	86.8	11.7	
Weston Mill Dr Left	83.8	7.6	61.2	14.8	
Weston Mill Dr Ahead + Left	84.9	8.5	72.1	5.5	
Weston Mill Dr Ahead + Right	79.7	6.7	83.7	6.8	
Wolseley Rd S Ahead + Left	82.1	7.3	84.1	20.2	
Wolseley Rd S Right	76.0	6.3	85.5	21.3	
Dockyard Ahead + Left	35.6	1.6	86.1	14.8	
Dockyard Right	32.6	1.9	84.2	15.2	
Cycletime (secs)	68		3 120		
Practical Reserve Capacity (PRC)	84.0%		86.3%		

The analysis presented above has confirmed that the adjustments that have been made to the junction models do not fundamentally affect the predicted operation of the junction and furthermore, indicates that the modelled results are consistent with the findings presented within the TA, at Annex G.



Weston Mill Drive / Carlton Terrace

TABLES 9.7 – 9.9 below should be compared against TABLES G.6, G.25 and G.29 of Annex G which accompanies the TA, respectively.

Approach	AM (0800-0900)		PM (1600-1700)	
Αμρισασίι	DoS	MMQ	DoS	MMQ
Carlton Terrace	71.1	4.3	53.3	3.4
Weston Mill Dr E	87.5	14.9	97.8	21.8
Ferndale Rd	81.9	5.4	97.3	11.1
Weston Mill Dr W	85.0	10.0	97.8	29.4
Cycletime (secs)	64		1	01
Practical Reserve Capacity (PRC)	87.1%		98	.7%

TABLE 9.7 Weston Mill Drive / Carlton Terrace – 2014 Do Something 'Maximu	n Scenario'
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TABLE 9.8 Weston Mill Drive / Carlton Terrace – 2014 Do Something plus Potential Development

Approach	AM (0800-0900)		PM (1600-1700)	
	DoS	MMQ	DoS	MMQ
Carlton Terrace	64.0	4.2	55.7	4.3
Weston Mill Dr E	89.9	16.3	106.7	45.0
Ferndale Rd	88.0	7.7	107.7	30.3
Weston Mill Dr W	89.9	11.6	108.2	121.9
Cycletime (secs)	66		1	17
Practical Reserve Capacity (PRC)	89.9%		110	0.2%

TABLE 9.9 Weston Mill Drive / Carlton Terrace – 2014 Do Something 'Maximum Scenario' plus Potential Development

Approach	AM (080	0-0900)	PM (1600-1700)	
	DoS	MMQ	DoS	MMQ
Carlton Terrace	66.0	4.4	57.2	4.4
Weston Mill Dr E	92.2	18.5	111.3	65.9
Ferndale Rd	91.8	8.9	110.4	34.4
Weston Mill Dr W	91.9	13.3	110.5	147.0
Cycletime (secs)	68		1	20
Practical Reserve Capacity (PRC)	92.	5%	113	8.6%



The analysis presented above has confirmed that the adjustments that have been made to the junction models do not fundamentally affect the predicted operation of the junction and furthermore, indicates that the modelled results are consistent with the findings presented within the TA, at Annex G.

Wolseley Road / Weston Mill Drive / Site Access

TABLES 9.10 – 9.12 below should be compared against **TABLES G.9**, **G.26** and **G.32** of Annex G which accompanies the TA, respectively.

TABLE 9.10 Wolseley Road / Weston Mill Drive / Site Access – 2014 Do Something 'Maximum Scenario'

Approach	AM (080	00-0900)	PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	79.9	7.3	80.9	8.4	
Wolseley Rd N Ahead + Right	87.3	9.0	86.6	9.7	
Weston Mill Dr Left	84.3	7.1	51.5	9.8	
Weston Mill Dr Ahead + Left	84.8	7.8	46.3	2.1	
Weston Mill Dr Ahead + Right	74.0	5.5	79.2	5.7	
Wolseley Rd S Ahead + Left	84.3	7.3	86.7	18.2	
Wolseley Rd S Right	74.6	5.7	85.6	17.9	
Dockyard Ahead + Left	32.4	1.6	85.5	11.8	
Dockyard Right	29.1	1.2	27.0	1.9	
Site Access Left	10.0	0.9	15.7	1.9	
Dockyard Ahead (Exit)	18.7	1.5	57.0	7.2	
Cycletime (secs)	64		101		
Practical Reserve Capacity (PRC)	86.9%		86.9%		



Approach	AM (080	00-0900)	PM (1600-1700)		
	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	80.3	7.7	84.4	10.8	
Wolseley Rd N Ahead + Right	85.9	9.1	82.8	10.5	
Weston Mill Dr Left	84.4	7.5	54.1	12.1	
Weston Mill Dr Ahead + Left	84.4	8.1	50.2	2.5	
Weston Mill Dr Ahead + Right	79.0	6.2	80.1	6.6	
Wolseley Rd S Ahead + Left	79.7	6.8	84.9	20.0	
Wolseley Rd S Right	74.1	6.0	87.5	21.4	
Dockyard Ahead + Left	23.7	1.2	84.6	13.4	
Dockyard Right	24.8	1.1	27.2	2.8	
Site Access Left	3.0	0.3	11.5	0.8	
Dockyard Ahead (Exit)	16.8	1.4	48.8	5.1	
Cycletime (secs)	66		117		
Practical Reserve Capacity (PRC)	85.3%		87.2%		

TABLE 9.11 Wolseley Road / Weston Mill Drive / Site Access – 2014 Do Something plus Potential Development



Approach	AM (080	00-0900)	PM (1600-1700)		
Αμρισασίι	DoS	MMQ	DoS	MMQ	
Wolseley Rd N Ahead + Left	77.9	7.5	90.3	12.5	
Wolseley Rd N Ahead + Right	82.9	8.7	90.2	12.4	
Weston Mill Dr Left	84.9	8.0	54.3	12.5	
Weston Mill Dr Ahead + Left	86.2	9.1	40.3	2.3	
Weston Mill Dr Ahead + Right	79.2	6.2	84.4	9.0	
Wolseley Rd S Ahead + Left	75.8	6.6	88.1	21.6	
Wolseley Rd S Right	70.7	5.9	89.8	22.9	
Dockyard Ahead + Left	36.0	1.5	89.1	15.5	
Dockyard Right	30.9	1.4	29.7	2.7	
Site Access Left	9.6	0.9	17.5	2.4	
Dockyard Ahead (Exit)	18.7	1.5	59.5	9.6	
Cycletime (secs)	68		120		
Practical Reserve Capacity (PRC)	85.6%		90.3%		

TABLE 9.12 Wolseley Road / Weston Mill Drive / Site Access – 2014 Do Something plus Potential Development

The analysis presented above has confirmed that the adjustments that have been made to the junction models do not fundamentally affect the predicted operation of the junction and furthermore, indicates that the modelled results are consistent with the findings presented within the TA, at Annex G.

SUMMARY

The overall contention of this Technical Note is that the comments which have been made as part of the audit of the junction models presented as part of the Transport Assessment and accompanying Annex G have been considered and taken into account.

As such, the model results presented herein are based on agreed junction models which therefore supersede the results presented in the TA and accompanying Annex G. Fundamentally, the results are consistent in all cases, with the findings of both the TA and Annex G.

Appendix A



ENERGY FROM WASTE COMBINED HEAT AND POWER FACILITY, NORTH YARD, DEVONPORT – TRANSPORT ASSESSMENT: PCC COMMENTS 001 (JUNE 2011)

Wolseley Road / Weston Mill Drive Junction

Background

This note has been prepared in response to comments received from PCC relating to the Transport Assessment (TA) submitted in support of the proposed Energy from Waste Combined Heat and Power (EfW CHP) Facility at North Yard, Devonport.

The comments were received by email dated 1st June 2011 and relate to the modelled cycletimes which have been employed within LINSIG for the Wolseley Road / Weston Mill Drive Junction. As such, PCC have requested confirmation of the cycletimes for the model results presented at **TABLE 5.2** of the TA, which presents the case for the 2010 Observed Scenario.

It is understood that PCCs comments are based on information provided by Amey, who have confirmed that this junction currently operates 100 and 96 second cycletimes during the modelled AM and PM peak hours. This is also the case for the nearby Weston Mill Drive / Carlton Terrace junction. However, these cycletimes were employed within the LINSIG for the modelling of this junction (as presented at **TABLE 5.3** of the TA).

Review – 2010 Observed Scenario

Following receipt of PCCs comments, URS Scott Wilson can confirm that the optimiser has been run within the LINSIG programme for the 2010 Observed scenarios (AM and PM), as presented within **TABLE 5.2** of the TA as it was considered that this modelled situation provided a more accurate reflection of the operation of the junction on the ground. As such, the results of the LINSIG analysis were based on cycletimes of 64 and 79 seconds for the AM and PM peak hours, respectively.

In order to provide a full response to PCC however, the models have been re-run, using the 100 and 96 second cycletimes and the results of this scenario have been compared to that previously presented within **TABLE 5.2** of the TA, at **TABLES 1.1** and **1.2** below.



TABLE 1.1 Wolseley Road / Weston Mill Drive – 2010 Observed AMbased on TABLE 5.2 of the TA

Approach	AM (0800-0900) 64 Second Cycletime (TA)			AM (0800-0900) 100 Second Cycletime (Response)		
	Sat (%)	MMQ	Obs Q	Sat (%)	MMQ	Obs Q
Wolseley Rd N Ahead + Left	86.0	7.9	7.7	65.9	8.7	7.7
Wolseley Rd N Ahead + Right	81.9	7.7	7.7	60.4	8.8	7.7
Weston Mill Dr Left	90.4	8.7	6.8	65.5	8.2	6.8
Weston Mill Dr Ahead + Left	89.2	8.6	6.8	64.6	8.7	6.8
Weston Mill Dr Ahead + Right	65.3	4.5	2.5	63.8	6.4	2.5
Wolseley Rd S Ahead + Left	78.8	6.4	8.9	52.1	6.9	8.9
Wolseley Rd S Right	72.3	5.4	7.1	46.0	6.5	7.1
Dockyard Ahead + Left	21.3	1.1	1.9	33.3	1.9	1.9
Dockyard Right	21.6	1.0	1.4	33.8	1.7	1.4
Cycletime (secs)	64			100		
Practical Reserve Capacity (PRC)	90.6%			53.4%		

TABLE 1.2 Wolseley Road / Weston Mill Drive – 2010 Observed PMbased on TABLE 5.2 of the TA

Approach	PM (1600-1700) 79 Second Cycletime (TA)			PM (1600-1700) 96 Second Cycletime (Response)			
	Sat (%)	MMQ	Obs Q	Sat (%)	MMQ	Obs Q	
Wolseley Rd N Ahead + Left	89.7	8.0	6.1	81.3	7.6	6.1	
Wolseley Rd N Ahead + Right	87.2	8.0	6.1	76.9	7.7	6.1	
Weston Mill Dr Left	49.0	7.1	2.4	48.9	8.5	2.4	
Weston Mill Dr Ahead + Left	42.4	1.6	1.3	51.6	2.1	1.3	
Weston Mill Dr Ahead + Right	39.8	2.0	3.7	48.4	2.5	3.7	
Wolseley Rd S Ahead + Left	87.0	14.4	13.0	80.9	15.3	13.0	
Wolseley Rd S Right	87.8	14.8	12.9	80.8	15.5	12.9	
Dockyard Ahead + Left	88.8	9.8	10.0	80.8	9.7	10.0	
Dockyard Right	25.3	1.9	3.3	22.6	2.2	3.3	
Cycletime (secs)	79			96			
Practical Reserve Capacity (PRC)	89.6%			79.3%			



Re-running the LINSIG models using the increased signal times has confirmed that the junctions continue to operate within their capacity thresholds, although not necessarily at their 'optimum levels'. Comparison of the modelled situation against the observed queue data still provides a good level of calibration however.

Review – 2011 Baseline Scenario

Although it was not identified by PCC, it is also noted that the existing cycletimes of 100 and 96 seconds for the AM and PM peak hours will apply to the 2011 Baseline models which are also presented within **CHAPTER 5** of the TA.

As previously, the Weston Mill Drive / Carlton Terrace junction has been modelled in LINSIG using the existing cycletimes of 100 and 96 seconds. The junction at Wolseley Road / Weston Mill Drive had again been modelled using the optimiser function within LINSIG however, as it was again considered that this provided a more accurate reflection of the operation of the junction on the ground. The results of that analysis are presented at **TABLE 5.6** of the TA.

In order to provide a comprehensive response to PCC therefore, the 2011 Baseline models have been re-run using the 100 and 96 second cycletimes and the results of this scenario have been compared to that previously presented within **TABLE 5.6** of the TA, at **TABLES 1.3** and **1.4** below.

Approach	AM (08 65 Second (⁻	00-0900) d Cycletime ΓΑ)	AM (0800-0900) 100 Second Cycletime (Response)		
	Sat (%)	MMQ	Sat (%)	MMQ	
Wolseley Rd N Ahead + Left	88.0	8.7	66.4	8.9	
Wolseley Rd N Ahead + Right	83.7	8.1	60.7	8.9	
Weston Mill Dr Left	86.2	7.4	64.7	8.1	
Weston Mill Dr Ahead + Left	88.3	8.5	66.2	9.1	
Weston Mill Dr Ahead + Right	64.9	4.5	62.4	6.2	
Wolseley Rd S Ahead + Left	73.9	6.0	52.5	7.0	
Wolseley Rd S Right	67.5	5.2	46.2	6.2	
Dockyard Ahead + Left	22.2	1.0	34.1	1.5	
Dockyard Right	22.0	1.0	33.8	1.7	
Cycletime (secs)	65		100		
Practical Reserve Capacity (PRC)	88.0%		54.5%		

TABLE 1.3 Wolseley Road / Weston Mill Drive – 2011 Baseline AM based on TABLE 5.6 of the TA



TABLE 1.4 Wolseley Road / Weston Mill Drive – 2011 Baseline PM based on TABLE 5.6 of the TA

Approach	PM (16 83 Secon (00-1700) d Cycletime ГА)	PM (1600-1700) 96 Second Cycletime (Response)		
	Sat (%)	MMQ	Sat (%)	MMQ	
Wolseley Rd N Ahead + Left	87.8	8.0	82.2	7.9	
Wolseley Rd N Ahead + Right	83.9	7.7	77.2	7.8	
Weston Mill Dr Left	29.4	3.9	29.3	4.5	
Weston Mill Dr Ahead + Left	30.8	4.3	30.8	5.0	
Weston Mill Dr Ahead + Right	62.5	3.5	72.3	4.4	
Wolseley Rd S Ahead + Left	88.7	15.7	83.9	16.2	
Wolseley Rd S Right	89.2	16.0	83.8	16.2	
Dockyard Ahead + Left	87.2	10.2	81.5	10.3	
Dockyard Right	23.5	1.9	21.7	2.2	
Cycletime (secs)	83		96		
Practical Reserve Capacity (PRC)	89.1%		82.8%		

Re-running the LINSIG models using the increased signal times has again confirmed that the junctions continue to operate within their capacity thresholds.
LINSIG Model Output

Network Layout Diagram

Scenario 1: '2010 AM Observed' (FG1: '2010 AM Observed', Plan 1: 'AM')





Stage Diagram Stage Stream: 1







Network Results Scenario 1: '2010 AM Observed' (FG1: '2010 AM Observed', Plan 1: 'AM')

Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)		
Network	-	-	-	-	-	65.9%	-		
Dockyard	-	-	-	-	-	65.9%	-		
1/2+1/1	Wolseley Rd N Left Ahead	A -	25	42	67	65.9%	8.7		
1/4+1/3	Wolseley Rd N Ahead Right	ВA	27:25	40:42	67	60.4%	8.8		
2/1	Weston Mill Dr (int) Left	Н	39	22	35	65.5%	8.2		
2/3+2/2	Weston Mill Dr (int) Left Ahead	GН	15:39	20:22	35	64.6%	8.7		
2/4	Weston Mill Dr (int) Right Ahead	G	15	20	35	63.8%	6.4		
3/2+3/1	Wolseley Rd S Ahead Left	C -	26	74	0	52.1%	6.9		
3/3	Wolseley Rd S Right	D	26	74	0	46.0%	6.2		
3/4	Wolseley Rd S Right	D	26	74	0	45.3%	6.1		
4/2+4/1	Dockyard Ahead Ahead2	E	8	6	14	30.5%	1.3		
4/3	Dockyard Ahead	E	8	6	14	33.3%	1.9		
4/4	Dockyard Right	F	7	7	14	33.8%	1.7		
6/1	Weston Mill Dr E Ped Ahead	I	100	0	100	20.4%	0.1		
6/2	Weston Mill Dr E Ped Ahead	I	100	0	100	14.3%	0.1		
9/1	Left Turn Left	-	-	-	-	1.9%	0.0		
	C1 Stream: 1 PRC for Signalled Lanes (%): 36.6 Total Delay for Signalled Lanes (pcuHr): 27.23 PRC Over All Lanes (%): 36.6 Total Delay Over All Lanes (pcuHr): 27.24								

Scenario 2: '2010 PM Observed' (FG2: '2010 PM Observed', Plan 2: 'PM')





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Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	81.3%	-	
Dockyard	-	-	-	-	-	81.3%	-	
1/2+1/1	Wolseley Rd N Left Ahead	A -	13	47	60	81.3%	7.6	
1/4+1/3	Wolseley Rd N Ahead Right	BA	17:13	43:47	60	76.9%	7.7	
2/1	Weston Mill Dr (int) Left	Н	44	91	39	48.9%	8.5	
2/3+2/2	Weston Mill Dr (int) Left Ahead	GН	7:44	89:91	0:39	51.6%	2.1	
2/4	Weston Mill Dr (int) Right Ahead	G	7	89	0	48.4%	2.5	
3/2+3/1	Wolseley Rd S Ahead Left	C -	32	7	39	80.9%	15.3	
3/3	Wolseley Rd S Right	D	32	7	39	80.8%	15.5	
3/4	Wolseley Rd S Right	D	32	7	39	80.4%	15.4	
4/2+4/1	Dockyard Ahead Ahead2	E	18	65	83	80.8%	9.7	
4/3	Dockyard Ahead	E	18	65	83	75.1%	9.3	
4/4	Dockyard Right	F	18	65	83	22.6%	2.2	
6/1	Weston Mill Dr E Ped Ahead	I	96	0	96	44.7%	0.4	
6/2	Weston Mill Dr E Ped Ahead	I	96	0	96	40.2%	0.3	
9/1	Left Turn Left	-	-	-	-	8.9%	0.0	
C1 Stream: 1 PRC for Signalled Lanes (%): 10.7 Total Delay for Signalled Lanes (pcuHr): 44.98 PRC Over All Lanes (%): 10.7 Total Delay Over All Lanes (pcuHr): 45.03								

Scenario 2: '2010 PM Observed' (FG2: '2010 PM Observed', Plan 2: 'PM')

Scenario 3: '2011 AM Base' (FG3: '2011 AM Base', Plan 1: 'AM')





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Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)		
Network	-	-	-	-	-	66.4%	-		
Dockyard	-	-	-	-	-	66.4%	-		
1/2+1/1	Wolseley Rd N Left Ahead	A -	25	93	18	66.4%	8.9		
1/4+1/3	Wolseley Rd N Ahead Right	ВA	27:25	91:93	18	60.7%	8.9		
2/1	Weston Mill Dr (int) Left	Н	39	73	86	64.7%	8.1		
2/3+2/2	Weston Mill Dr (int) Left Ahead	GН	15:39	71:73	86	66.2%	9.1		
2/4	Weston Mill Dr (int) Right Ahead	G	15	71	86	62.4%	6.2		
3/2+3/1	Wolseley Rd S Ahead Left	C -	26	25	51	52.5%	7.0		
3/3	Wolseley Rd S Right	D	26	25	51	46.2%	6.2		
3/4	Wolseley Rd S Right	D	26	25	51	45.8%	6.1		
4/2+4/1	Dockyard Ahead Ahead2	E	8	57	65	34.1%	1.5		
4/3	Dockyard Ahead	E	8	57	65	30.1%	1.7		
4/4	Dockyard Right	F	7	58	65	33.8%	1.7		
6/1	Weston Mill Dr E Ped Ahead	I	100	0	100	20.8%	0.1		
6/2	Weston Mill Dr E Ped Ahead	I	100	0	100	14.2%	0.1		
9/1	Left Turn Left	-	-	-	-	1.9%	0.0		
C1 Stream: 1 PRC for Signalled Lanes (%): 35.5 Total Delay for Signalled Lanes (pcuHr): 27.44 PRC Over All Lanes (%): 35.5 Total Delay Over All Lanes (pcuHr): 27.45									

Scenario 3: '2011 AM Base' (FG3: '2011 AM Base', Plan 1: 'AM')

Scenario 4: '2011 PM Base' (FG4: '2011 PM Base ', Plan 2: 'PM')





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Scenario 4: '2011 PM Base' (FG4: '2011 PM Base ', Plan 2: 'PM')



Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)		
Network	-	-	-	-	-	83.9%	-		
Dockyard	-	-	-	-	-	83.9%	-		
1/2+1/1	Wolseley Rd N Left Ahead	A -	13	83	0	82.2%	7.9		
1/4+1/3	Wolseley Rd N Ahead Right	ВA	17:13	79:83	0	77.2%	7.8		
2/1	Weston Mill Dr (int) Left	н	43	32	75	29.3%	4.5		
2/3+2/2	Weston Mill Dr (int) Left Ahead	GН	7:43	30:32	37:75	30.8%	5.0		
2/4	Weston Mill Dr (int) Right Ahead	G	7	30	37	72.3%	4.4		
3/2+3/1	Wolseley Rd S Ahead Left	C -	31	44	75	83.9%	16.2		
3/3	Wolseley Rd S Right	D	31	44	75	83.8%	16.2		
3/4	Wolseley Rd S Right	D	31	44	75	83.8%	16.2		
4/2+4/1	Dockyard Ahead Ahead2	E	19	5	24	81.5%	10.3		
4/3	Dockyard Ahead	E	19	5	24	68.2%	8.4		
4/4	Dockyard Right	F	19	5	24	21.7%	2.2		
6/1	Weston Mill Dr E Ped Ahead	I	96	0	96	45.8%	0.4		
6/2	Weston Mill Dr E Ped Ahead	I	96	0	96	39.9%	0.3		
9/1	Left Turn Left	-	-	-	-	9.1%	0.1		
C1 Stream: 1 PRC for Signalled Lanes (%): 7.2 Total Delay for Signalled Lanes (pcuHr): 46.86 PRC Over All Lanes (%): 7.2 Total Delay Over All Lanes (pcuHr): 46.92									

Scenario 4: '2011 PM Base' (FG4: '2011 PM Base ', Plan 2: 'PM')

Appendix B

Wolseley Road / Saltash Road

LINSIG Model Output

Scenario 1: '2010 AM Observed' (FG1: '2010 AM Observed', Plan 1: 'Network Control Plan 1') Network Layout Diagram







Signal Timings Diagram



Network Results

Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.2%	-
Saltash	-	-	-	-	-	89.2%	-
1/1	Wolseley Rd N Ahead	А	48	14	62	62.6%	11.0
1/2	Wolseley Rd N Right	D	37	25	62	89.2%	20.7
2/2+2/1	Wolseley Rd S Ahead Left	В	8:28	14:70	22	83.8%	6.7
2/3	Wolseley Rd S Ahead	В	8	14	22	82.3%	6.4
3/1+3/2	Saltash Left	E	49	29	2	26.6%	1.7
3/3	Saltash Right	F	9	67	0	7.8%	0.4
7/1	Left Turn Ahead	-	-	-	-	2.2%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.9 Tot 0.9	al Delay for Signalled L Total Delay Over All	anes (pcuHr): Lanes(pcuHr):	19.98 19.99 Cycle Time (s): 76

Scenario 2: '2010 PM Observed' (FG2: '2010 PM Observed', Plan 1: 'Network Control Plan 1') Network Layout Diagram







Signal Timings Diagram



Network Results

Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.5%	-
Saltash	-	-	-	-	-	89.5%	-
1/1	Wolseley Rd N Ahead	А	31	14	45	47.8%	5.7
1/2	Wolseley Rd N Right	D	17	28	45	86.0%	10.9
2/2+2/1	Wolseley Rd S Ahead Left	В	11:31	14:53	25	87.9%	9.3
2/3	Wolseley Rd S Ahead	В	11	14	25	89.5%	9.8
3/1+3/2	Saltash Left	E	29	32	2	74.7%	8.9
3/3	Saltash Right	F	9	50	0	10.4%	0.5
7/1	Left Turn Ahead	-	-	-	-	2.8%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.5 Tota 0.5	al Delay for Signalled L Total Delay Over All	.anes (pcuHr): Lanes(pcuHr):	23.24 23.25 Cycle Time (s): 59







Signal Timings Diagram



Network Results

Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.9%	-
Saltash	-	-	-	-	-	89.9%	-
1/1	Wolseley Rd N Ahead	А	48	14	62	63.1%	11.1
1/2	Wolseley Rd N Right	D	37	25	62	89.9%	21.4
2/2+2/1	Wolseley Rd S Ahead Left	В	8:28	14:70	22	84.2%	6.8
2/3	Wolseley Rd S Ahead	В	8	14	22	83.1%	6.6
3/1+3/2	Saltash Left	E	49	29	2	26.8%	1.7
3/3	Saltash Right	F	9	67	0	7.8%	0.4
7/1	Left Turn Ahead	-	-	-	-	2.2%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.1 Tota 0.1	al Delay for Signalled L Total Delay Over All	anes (pcuHr): Lanes(pcuHr):	20.55 20.56 Cycle Time (s): 76







Signal Timings Diagram



Network Results

Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	90.0%	-
Saltash	-	-	-	-	-	90.0%	-
1/1	Wolseley Rd N Ahead	А	31	14	45	48.1%	5.7
1/2	Wolseley Rd N Right	D	17	28	45	86.6%	11.1
2/2+2/1	Wolseley Rd S Ahead Left	В	11:31	14:53	25	88.9%	9.6
2/3	Wolseley Rd S Ahead	В	11	14	25	90.0%	9.9
3/1+3/2	Saltash Left	E	29	32	2	74.9%	9.1
3/3	Saltash Right	F	9	50	0	10.4%	0.5
7/1	Left Turn Ahead	-	-	-	-	2.9%	0.0
C1		PRC for PRC	: Signalled Lanes (%): C Over All Lanes (%):	0.0 Tota 0.0	al Delay for Signalled L Total Delay Over All	_anes (pcuHr): Lanes(pcuHr):	23.92 23.93 Cycle Time (s): 59

LINSIG Model Output

Scenario 1: '2014 AM Do Min' (FG1: '2014 AM Do Min', Plan 1: 'Network Control Plan 1') Network Layout Diagram








Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.1%	-
Saltash	-	-	-	-	-	89.1%	-
1/1	Wolseley Rd N Ahead	А	53	14	67	62.7%	11.6
1/2	Wolseley Rd N Right	D	41	26	67	89.1%	22.3
2/2+2/1	Wolseley Rd S Ahead Left	В	9:29	14:75	23	83.2%	7.0
2/3	Wolseley Rd S Ahead	В	9	14	23	81.9%	6.8
3/1+3/2	Saltash Left	E	53	30	2	27.4%	1.8
3/3	Saltash Right	F	9	72	0	8.7%	0.5
7/1	Left Turn Ahead	-	-	-	-	2.2%	0.0
	C1	PRC fo PRC	r Signalled Lanes (%): C Over All Lanes (%):	1.0 Tot 1.0	al Delay for Signalled Total Delay Over All	Lanes (pcuHr): Lanes(pcuHr):	20.49 20.50 Cycle Time (s): 8

Scenario 2: '2014 PM Do Min' (FG2: '2014 PM Do Min', Plan 1: 'Network Control Plan 1') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	87.9%	-
Saltash	-	-	-	-	-	87.9%	-
1/1	Wolseley Rd N Ahead	А	33	14	47	48.2%	5.9
1/2	Wolseley Rd N Right	D	18	29	47	87.3%	11.8
2/2+2/1	Wolseley Rd S Ahead Left	В	12:32	14:55	26	87.6%	9.6
2/3	Wolseley Rd S Ahead	В	12	14	26	87.9%	9.7
3/1+3/2	Saltash Left	E	30	33	2	79.2%	11.6
3/3	Saltash Right	F	9	52	0	11.0%	0.6
7/1	Left Turn Ahead	-	-	-	-	2.9%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	2.4 Tot 2.4	al Delay for Signalled L Total Delay Over All	anes (pcuHr): Lanes(pcuHr):	24.28 24.29 Cycle Time (s): 61

LINSIG Model Output

Scenario 1: '2014 AM Do Something' (FG1: '2014 AM Do Something', Plan 1: 'Network Control Plan 1') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.2%	-
Saltash	-	-	-	-	-	89.2%	-
1/1	Wolseley Rd N Ahead	А	53	14	67	63.0%	11.7
1/2	Wolseley Rd N Right	D	41	26	67	89.2%	22.4
2/2+2/1	Wolseley Rd S Ahead Left	В	9:29	14:75	23	84.3%	7.3
2/3	Wolseley Rd S Ahead	В	9	14	23	83.4%	7.2
3/1+3/2	Saltash Left	E	53	30	2	27.4%	1.9
3/3	Saltash Right	F	9	72	0	8.7%	0.5
7/1	Left Turn Ahead	-	-	-	-	2.2%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.9 Tot 0.9	al Delay for Signalled L Total Delay Over All	anes (pcuHr): Lanes(pcuHr):	21.00 21.01 Cycle Time (s): 81

Scenario 2: '2014 PM Do Something' (FG2: '2014 PM Do Something', Plan 1: 'Network Control Plan 1') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.2%	-
Saltash	-	-	-	-	-	89.2%	-
1/1	Wolseley Rd N Ahead	А	33	14	47	48.7%	6.1
1/2	Wolseley Rd N Right	D	18	29	47	87.4%	11.9
2/2+2/1	Wolseley Rd S Ahead Left	В	12:32	14:55	26	87.1%	9.4
2/3	Wolseley Rd S Ahead	В	12	14	26	89.2%	10.2
3/1+3/2	Saltash Left	E	30	33	2	77.4%	10.4
3/3	Saltash Right	F	9	52	0	11.0%	0.6
7/1	Left Turn Ahead	-	-	-	-	2.9%	0.0
	C1	PRC fo PRC	r Signalled Lanes (%): C Over All Lanes (%):	0.9 Tot 0.9	al Delay for Signalled Total Delay Over All	Lanes (pcuHr): Lanes(pcuHr):	24.37 24.39 Cycle Time (s): 6

LINSIG Model Output

Scenario 1: '2014 AM Do Something MAX' (FG1: '2014 AM Do Something MAX', Plan 1: 'Network Control Plan 1') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.4%	-
Saltash	-	-	-	-	-	89.4%	-
1/1	Wolseley Rd N Ahead	А	53	14	67	63.8%	11.8
1/2	Wolseley Rd N Right	D	41	26	67	89.4%	22.5
2/2+2/1	Wolseley Rd S Ahead Left	В	9:29	14:75	23	86.7%	7.8
2/3	Wolseley Rd S Ahead	В	9	14	23	85.3%	7.6
3/1+3/2	Saltash Left	E	53	30	2	27.5%	1.9
3/3	Saltash Right	F	9	72	0	8.7%	0.5
7/1	Left Turn Ahead	-	-	-	-	2.2%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.7 Tota 0.7	al Delay for Signalled L Total Delay Over All	anes (pcuHr): Lanes(pcuHr):	21.97 21.98 Cycle Time (s): 81

Scenario 2: '2014 PM Do Something MAX' (FG2: '2014 PM Do Something MAX', Plan 1: 'Network Control Plan 1') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.7%	-
Saltash	-	-	-	-	-	89.7%	-
1/1	Wolseley Rd N Ahead	А	33	14	47	49.7%	6.2
1/2	Wolseley Rd N Right	D	18	29	47	87.7%	12.0
2/2+2/1	Wolseley Rd S Ahead Left	В	12:32	14:55	26	89.1%	10.2
2/3	Wolseley Rd S Ahead	В	12	14	26	89.7%	10.3
3/1+3/2	Saltash Left	E	30	33	2	79.5%	11.7
3/3	Saltash Right	F	9	52	0	11.0%	0.6
7/1	Left Turn Ahead	-	-	-	-	2.9%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.4 Tota 0.4	al Delay for Signalled L Total Delay Over All	anes (pcuHr): Lanes(pcuHr):	25.59 25.61 Cycle Time (s): 61

LINSIG Model Output

Scenario 1: '2014 AM Do Something plus potential' (FG1: '2014 AM Do Something plus potential', Plan 1: 'Network Control Plan 1')









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.2%	-
Saltash	-	-	-	-	-	89.2%	-
1/1	Wolseley Rd N Ahead	А	55	14	69	63.6%	12.1
1/2	Wolseley Rd N Right	D	42	27	69	89.2%	22.9
2/2+2/1	Wolseley Rd S Ahead Left	В	10:30	14:77	24	84.4%	7.7
2/3	Wolseley Rd S Ahead	В	10	14	24	83.0%	7.5
3/1+3/2	Saltash Left	E	54	31	2	27.9%	2.0
3/3	Saltash Right	F	9	74	0	8.9%	0.5
7/1	Left Turn Ahead	-	-	-	-	2.2%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.8 Tota 0.8	al Delay for Signalled L Total Delay Over All	₋anes (pcuHr): Lanes(pcuHr):	21.57 21.58 Cycle Time (s): 83

Scenario 2: '2014 PM Do Something plus potential' (FG2: '2014 PM Do Something plus potential', Plan 1: 'Network Control Plan 1') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.6%	-
Saltash	-	-	-	-	-	89.6%	-
1/1	Wolseley Rd N Ahead	А	35	14	49	52.3%	6.9
1/2	Wolseley Rd N Right	D	19	30	49	87.0%	12.2
2/2+2/1	Wolseley Rd S Ahead Left	В	13:33	14:57	27	89.4%	10.8
2/3	Wolseley Rd S Ahead	В	13	14	27	89.6%	10.9
3/1+3/2	Saltash Left	E	31	34	2	79.7%	12.2
3/3	Saltash Right	F	9	54	0	11.4%	0.6
7/1	Left Turn Ahead	-	-	-	-	2.9%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.4 Tot 0.4	al Delay for Signalled L Total Delay Over All	anes (pcuHr): Lanes(pcuHr):	26.21 26.23 Cycle Time (s): 63

LINSIG Model Output

Scenario 1: '2014 AM Do Something MAX plus potential' (FG1: '2014 AM Do Something MAX plus potential', Plan 1: 'Network Control Plan 1') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.4%	-
Saltash	-	-	-	-	-	89.4%	-
1/1	Wolseley Rd N Ahead	А	55	14	69	64.4%	12.3
1/2	Wolseley Rd N Right	D	42	27	69	89.4%	23.0
2/2+2/1	Wolseley Rd S Ahead Left	В	10:30	14:77	24	86.2%	8.2
2/3	Wolseley Rd S Ahead	В	10	14	24	85.1%	8.0
3/1+3/2	Saltash Left	E	54	31	2	28.0%	2.0
3/3	Saltash Right	F	9	74	0	8.9%	0.5
7/1	Left Turn Ahead	-	-	-	-	2.2%	0.0
C1		PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	0.6 Tot 0.6	al Delay for Signalled L Total Delay Over All	anes (pcuHr): Lanes(pcuHr):	22.48 22.49 Cycle Time (s): 83

Scenario 2: '2014 PM Do Something MAX plus potential' (FG2: '2014 PM Do Something MAX plus potential', Plan 1: 'Network Control Plan 1')








Network Results

Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	88.7%	-
Saltash	-	-	-	-	-	88.7%	-
1/1	Wolseley Rd N Ahead	А	36	14	50	52.6%	7.0
1/2	Wolseley Rd N Right	D	19	31	50	88.7%	12.8
2/2+2/1	Wolseley Rd S Ahead Left	В	14:34	14:58	28	85.8%	10.0
2/3	Wolseley Rd S Ahead	В	14	14	28	86.4%	10.2
3/1+3/2	Saltash Left	E	31	35	2	81.2%	13.0
3/3	Saltash Right	F	9	55	0	11.5%	0.6
7/1	Left Turn Ahead	-	-	-	-	2.9%	0.0
	C1	PRC for PRC	Signalled Lanes (%): Over All Lanes (%):	1.4 Tota 1.4	al Delay for Signalled L Total Delay Over All	∟anes (pcuHr): Lanes(pcuHr):	25.49 25.50 Cycle Time (s): 64

Wolseley Road / Weston Mill Drive

Scenario 1: '2010 AM Observed' (FG1: '2010 AM Observed', Plan 1: 'AM') Network Layout Diagram





Stage Diagram





Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	63.1%	-			
Dockyard	-	-	-	-	-	63.1%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	26	42	68	63.1%	8.8			
1/4+1/3	Wolseley Rd N Ahead Right	ВA	27:26	41:42	68	62.7%	8.9			
2/1	Weston Mill Dr (int) Left	Н	41	22	37	62.4%	8.0			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	16:41	20:22	36:37	61.6%	8.4			
2/4	Weston Mill Dr (int) Right Ahead	G	16	20	36	60.1%	6.2			
3/2+3/1	Wolseley Rd S Ahead Left	C -	25	75	0	54.4%	7.1			
3/3	Wolseley Rd S Right	D	25	75	0	47.8%	6.3			
3/4	Wolseley Rd S Right	D	25	75	0	47.0%	6.2			
4/2+4/1	Dockyard Ahead Ahead2	E	8	6	14	30.5%	1.3			
4/3+4/4	Dockyard Ahead Right	EF	8:7	6:7	14	33.5%	1.9			
6/1	Weston Mill Dr E Ped Ahead	I	100	0	100	20.4%	0.1			
6/2	Weston Mill Dr E Ped Ahead	I	100	0	100	14.3%	0.1			
9/1	Left Turn Left	-	-	-	-	2.6%	0.3			
	C1 Stream: 1 PRC for Signalled Lanes (%): 42.7 Total Delay for Signalled Lanes (pcuHr): 26.61 PRC Over All Lanes (%): 42.7 Total Delay Over All Lanes(pcuHr): 26.62 Cycle Time (s): 100									

Scenario 2: '2010 PM Observed' (FG2: '2010 PM Observed', Plan 2: 'PM') Network Layout Diagram









Network	letwork Results										
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)				
Network	-	-	-	-	-	83.3%	-				
Dockyard	-	-	-	-	-	83.3%	-				
1/2+1/1	Wolseley Rd N Left Ahead	A -	14	46	60	75.6%	7.3				
1/4+1/3	Wolseley Rd N Ahead Right	BA	18:14	42:46	60	78.2%	7.8				
2/1	Weston Mill Dr (int) Left	Н	47	91	42	45.9%	8.0				
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	7:47	89:91	0:42	51.6%	2.1				
2/4	Weston Mill Dr (int) Right Ahead	G	7	89	0	48.4%	2.5				
3/2+3/1	Wolseley Rd S Ahead Left	C -	31	7	38	83.3%	15.9				
3/3	Wolseley Rd S Right	D	31	7	38	83.3%	16.0				
3/4	Wolseley Rd S Right	D	31	7	38	82.9%	15.9				
4/2+4/1	Dockyard Ahead Ahead2	E	18	65	83	80.8%	9.7				
4/3+4/4	Dockyard Ahead Right	EF	18	65	83	75.1%	9.3				
6/1	Weston Mill Dr E Ped Ahead	I	96	0	96	44.7%	0.4				
6/2	Weston Mill Dr E Ped Ahead	I	96	0	96	40.2%	0.3				
9/1	Left Turn Left	-	-	-	-	12.0%	0.4				
	C1 Stream: 1 PRC for Signalled Lanes (%): 8.0 Total Delay for Signalled Lanes (pcuHr): 45.56 PRC Over All Lanes (%): 8.0 Total Delay Over All Lanes(pcuHr): 45.63 Cycle Time (s): 96										

Scenario 3: '2011 AM Base' (FG3: '2011 AM Base', Plan 1: 'AM') Network Layout Diagram





Stage Diagram





Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	63.6%	-			
Dockyard	-	-	-	-	-	63.6%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	26	92	18	63.6%	8.9			
1/4+1/3	Wolseley Rd N Ahead Right	ВA	27:26	91:92	18	63.0%	8.9			
2/1	Weston Mill Dr (int) Left	Н	41	73	87	61.7%	7.9			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	15:41	71:73	86:87	63.1%	8.7			
2/4	Weston Mill Dr (int) Right Ahead	G	15	71	86	62.4%	6.2			
3/2+3/1	Wolseley Rd S Ahead Left	C -	26	25	51	52.9%	7.0			
3/3	Wolseley Rd S Right	D	26	25	51	46.2%	6.2			
3/4	Wolseley Rd S Right	D	26	25	51	45.8%	6.1			
4/2+4/1	Dockyard Ahead Ahead2	E	8	57	65	34.1%	1.5			
4/3+4/4	Dockyard Ahead Right	EF	8:7	57:58	65	31.8%	1.7			
6/1	Weston Mill Dr E Ped Ahead	I	100	0	100	20.8%	0.1			
6/2	Weston Mill Dr E Ped Ahead	I	100	0	100	14.2%	0.1			
9/1	Left Turn Left	-	-	-	-	2.6%	0.3			
	C1 Stream: 1 PRC for Signalled Lanes (%): 41.6 Total Delay for Signalled Lanes (pcuHr): 26.72 PRC Over All Lanes (%): 41.6 Total Delay Over All Lanes(pcuHr): 26.73 Cycle Time (s): 100									

Scenario 4: '2011 PM Base' (FG4: '2011 PM Base ', Plan 2: 'PM') Network Layout Diagram









Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	84.0%	-			
Dockyard	-	-	-	-	-	84.0%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	13	83	0	81.3%	8.1			
1/4+1/3	Wolseley Rd N Ahead Right	ВA	17:13	79:83	0	84.0%	8.6			
2/1	Weston Mill Dr (int) Left	Н	47	32	79	26.9%	4.1			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	7:47	30:32	37:79	28.3%	4.6			
2/4	Weston Mill Dr (int) Right Ahead	G	7	30	37	72.3%	4.4			
3/2+3/1	Wolseley Rd S Ahead Left	C -	31	44	75	83.9%	16.2			
3/3	Wolseley Rd S Right	D	31	44	75	83.8%	16.2			
3/4	Wolseley Rd S Right	D	31	44	75	83.8%	16.2			
4/2+4/1	Dockyard Ahead Ahead2	E	19	5	24	81.5%	10.3			
4/3+4/4	Dockyard Ahead Right	EF	19	5	24	68.2%	8.4			
6/1	Weston Mill Dr E Ped Ahead	I	96	0	96	45.8%	0.4			
6/2	Weston Mill Dr E Ped Ahead	I	96	0	96	39.9%	0.3			
9/1	Left Turn Left	-	-	-	-	12.0%	0.4			
	C1 Stream: 1 PRC for Signalled Lanes (%): 7.2 Total Delay for Signalled Lanes (pcuHr): 47.11 PRC Over All Lanes (%): 7.2 Total Delay Over All Lanes(pcuHr): 47.18 Cycle Time (s): 96									

Scenario 1: '2014 AM Do Min' (FG1: '2014 AM Do Min', Plan 1: 'AM') Network Layout Diagram









Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	87.0%	-			
Dockyard	-	-	-	-	-	87.0%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	12	35	47	80.1%	7.3			
1/4+1/3	Wolseley Rd N Ahead Right	BA	13:12	34:35	47	87.0%	8.9			
2/1	Weston Mill Dr (int) Left	Н	19	22	30	84.3%	7.1			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	9:19	20:22	29:30	83.9%	7.4			
2/4	Weston Mill Dr (int) Right Ahead	G	9	20	29	66.6%	4.6			
3/2+3/1	Wolseley Rd S Ahead Left	C -	10	54	0	84.3%	7.3			
3/3	Wolseley Rd S Right	D	10	54	0	74.3%	5.7			
3/4	Wolseley Rd S Right	D	10	54	0	74.3%	5.7			
4/2+4/1	Dockyard Ahead Ahead2	E	8	6	14	23.2%	0.9			
4/3+4/4	Dockyard Ahead Right	EF	8:7	6:7	14	20.7%	1.0			
6/1	Weston Mill Dr E Ped Ahead	I	64	0	64	21.4%	0.1			
6/2	Weston Mill Dr E Ped Ahead	I	64	0	64	14.5%	0.1			
9/1	Left Turn Left	-	-	-	-	2.7%	0.0			
	C1 Stream: 1 PRC for Signalled Lanes (%): 3.5 Total Delay for Signalled Lanes (pcuHr): 32.62 PRC Over All Lanes (%): 3.5 Total Delay Over All Lanes(pcuHr): 32.63 Cycle Time (s): 64									

Scenario 2: '2014 PM Do Min' (FG2: '2014 PM Do Min', Plan 2: 'PM') Network Layout Diagram





Stage Diagram





Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	82.6%	-			
Dockyard	-	-	-	-	-	82.6%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	15	45	60	78.3%	8.2			
1/4+1/3	Wolseley Rd N Ahead Right	ВA	19:15	41:45	60	82.4%	9.1			
2/1	Weston Mill Dr (int) Left	Н	51	93	41	49.2%	9.4			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	7:51	91:93	98:41	53.4%	2.2			
2/4	Weston Mill Dr (int) Right Ahead	G	7	91	98	54.4%	2.9			
3/2+3/1	Wolseley Rd S Ahead Left	C -	35	2	37	82.5%	17.1			
3/3	Wolseley Rd S Right	D	35	2	37	82.6%	17.4			
3/4	Wolseley Rd S Right	D	35	2	37	81.6%	16.9			
4/2+4/1	Dockyard Ahead Ahead2	E	20	65	85	79.1%	10.1			
4/3+4/4	Dockyard Ahead Right	EF	20	65	85	77.8%	10.7			
6/1	Weston Mill Dr E Ped Ahead	I	103	0	103	45.9%	0.4			
6/2	Weston Mill Dr E Ped Ahead	I	103	0	103	42.0%	0.4			
9/1	Left Turn Left	-	-	-	-	12.6%	0.4			
	C1 Stream: 1 PRC for Signalled Lanes (%): 8.9 Total Delay for Signalled Lanes (pcuHr): 49.01 PRC Over All Lanes (%): 8.9 Total Delay Over All Lanes(pcuHr): 49.09 Cycle Time (s): 103									

Scenario 1: '2014 AM Do Something' (FG1: '2014 AM Do Something', Plan 1: 'AM') Network Layout Diagram









Network	letwork Results										
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)				
Network	-	-	-	-	-	87.8%	-				
Dockyard	-	-	-	-	-	87.8%	-				
1/2+1/1	Wolseley Rd N Left Ahead	A -	12	35	47	79.4%	7.2				
1/4+1/3	Wolseley Rd N Ahead Right	BA	13:12	34:35	47	87.8%	9.1				
2/1	Weston Mill Dr (int) Left	Н	19	22	30	84.0%	7.1				
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	9:19	20:22	29:30	84.2%	7.6				
2/4	Weston Mill Dr (int) Right Ahead	G	9	20	29	67.5%	4.7				
3/2+3/1	Wolseley Rd S Ahead Left	C -	10	54	0	84.3%	7.3				
3/3	Wolseley Rd S Right	D	10	54	0	74.0%	5.6				
3/4	Wolseley Rd S Right	D	10	54	0	74.6%	5.7				
4/2+4/1	Dockyard Ahead Ahead2	E	8	6	14	25.6%	1.1				
4/3+4/4	Dockyard Ahead Right	EF	8:7	6:7	14	23.4%	1.2				
6/1	Weston Mill Dr E Ped Ahead	I	64	0	64	21.7%	0.1				
6/2	Weston Mill Dr E Ped Ahead	I	64	0	64	15.1%	0.1				
9/1	Left Turn Left	-	-	-	-	2.8%	0.0				
	C1 Stream: 1 PRC for Signalled Lanes (%): 2.5 Total Delay for Signalled Lanes (pcuHr): 33.13 PRC Over All Lanes (%): 2.5 Total Delay Over All Lanes(pcuHr): 33.15 Cycle Time (s): 64										

Scenario 2: '2014 PM Do Something' (FG2: '2014 PM Do Something', Plan 2: 'PM') Network Layout Diagram









Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	83.2%	-			
Dockyard	-	-	-	-	-	83.2%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	15	45	60	79.0%	8.4			
1/4+1/3	Wolseley Rd N Ahead Right	ВA	19:15	41:45	60	83.2%	9.2			
2/1	Weston Mill Dr (int) Left	Н	52	93	41	52.8%	10.4			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	7:52	91:93	98:41	53.6%	2.6			
2/4	Weston Mill Dr (int) Right Ahead	G	7	91	98	56.2%	3.0			
3/2+3/1	Wolseley Rd S Ahead Left	C -	36	1	37	81.4%	17.0			
3/3	Wolseley Rd S Right	D	36	1	37	80.6%	16.9			
3/4	Wolseley Rd S Right	D	36	1	37	80.7%	17.1			
4/2+4/1	Dockyard Ahead Ahead2	E	20	65	85	82.6%	11.0			
4/3+4/4	Dockyard Ahead Right	EF	20	65	85	80.7%	11.4			
6/1	Weston Mill Dr E Ped Ahead	I	104	0	104	46.2%	0.4			
6/2	Weston Mill Dr E Ped Ahead	I	104	0	104	42.6%	0.4			
9/1	Left Turn Left	-	-	-	-	12.8%	0.4			
	C1 Stream: 1 PRC for Signalled Lanes (%): 8.2 Total Delay for Signalled Lanes (pcuHr): 50.20 PRC Over All Lanes (%): 8.2 Total Delay Over All Lanes(pcuHr): 50.28 Cycle Time (s): 104									

Scenario 1: '2014 AM Do Something MAX' (FG1: '2014 AM Do Something MAX', Plan 1: 'AM') Network Layout Diagram









Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	87.3%	-			
Dockyard	-	-	-	-	-	87.3%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	12	35	47	79.9%	7.3			
1/4+1/3	Wolseley Rd N Ahead Right	ВA	13:12	34:35	47	87.3%	9.0			
2/1	Weston Mill Dr (int) Left	Н	19	22	30	84.3%	7.1			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	9:19	20:22	29:30	84.6%	7.8			
2/4	Weston Mill Dr (int) Right Ahead	G	9	20	29	75.2%	5.7			
3/2+3/1	Wolseley Rd S Ahead Left	C -	10	54	0	84.3%	7.3			
3/3	Wolseley Rd S Right	D	10	54	0	74.0%	5.6			
3/4	Wolseley Rd S Right	D	10	54	0	74.6%	5.7			
4/2+4/1	Dockyard Ahead Ahead2	E	8	6	14	33.5%	1.5			
4/3+4/4	Dockyard Ahead Right	EF	8:7	6:7	14	30.7%	1.7			
6/1	Weston Mill Dr E Ped Ahead	I	64	0	64	22.7%	0.1			
6/2	Weston Mill Dr E Ped Ahead	I	64	0	64	16.3%	0.1			
9/1	Left Turn Left	-	-	-	-	2.9%	0.0			
	C1 Stream: 1 PRC for Signalled Lanes (%): 3.1 Total Delay for Signalled Lanes (pcuHr): 34.61 PRC Over All Lanes (%): 3.1 Total Delay Over All Lanes(pcuHr): 34.63 Cycle Time (s): 64									

Scenario 2: '2014 PM Do Something MAX' (FG2: '2014 PM Do Something MAX', Plan 2: 'PM') Network Layout Diagram





Stage Diagram





Network	letwork Results												
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)						
Network	-	-	-	-	-	86.5%	-						
Dockyard	-	-	-	-	-	86.5%	-						
1/2+1/1	Wolseley Rd N Left Ahead	A -	14	46	60	81.3%	8.5						
1/4+1/3	Wolseley Rd N Ahead Right	BA	18:14	42:46	60	86.2%	9.6						
2/1	Weston Mill Dr (int) Left	Н	50	93	42	55.1%	10.8						
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	7:50	91:93	98:42	68.3%	4.2						
2/4	Weston Mill Dr (int) Right Ahead	G	7	91	98	62.1%	3.5						
3/2+3/1	Wolseley Rd S Ahead Left	C -	34	4	38	84.3%	17.4						
3/3	Wolseley Rd S Right	D	34	4	38	83.2%	17.1						
3/4	Wolseley Rd S Right	D	34	4	38	82.5%	16.9						
4/2+4/1	Dockyard Ahead Ahead2	E	20	65	85	86.5%	12.2						
4/3+4/4	Dockyard Ahead Right	EF	20	65	85	84.3%	12.5						
6/1	Weston Mill Dr E Ped Ahead	I	101	0	101	47.5%	0.5						
6/2	Weston Mill Dr E Ped Ahead	I	101	0	101	43.7%	0.4						
9/1	Left Turn Left	-	-	-	-	12.9%	0.4						
	C1 Stream	: 1 PRC for Signa PRC Over	alled Lanes (%): All Lanes (%):	C1 Stream: 1 PRC for Signalled Lanes (%): 4.1 Total Delay for Signalled Lanes (pcuHr): 54.84 PRC Over All Lanes (%): 4.1 Total Delay Over All Lanes(pcuHr): 54.92 Cycle Time (s): 101									

Scenario 1: '2014 AM Do Something plus potential' (FG1: '2014 AM Do Something plus potential', Plan 1: 'AM') Network Layout Diagram









Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	85.9%	-			
Dockyard	-	-	-	-	-	85.9%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	13	35	48	80.3%	7.7			
1/4+1/3	Wolseley Rd N Ahead Right	BA	14:13	34:35	48	85.9%	9.1			
2/1	Weston Mill Dr (int) Left	Н	20	22	30	84.3%	7.5			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	9:20	20:22	29:30	84.4%	8.1			
2/4	Weston Mill Dr (int) Right Ahead	G	9	20	29	79.7%	6.3			
3/2+3/1	Wolseley Rd S Ahead Left	C -	11	55	0	79.7%	6.8			
3/3	Wolseley Rd S Right	D	11	55	0	73.0%	5.9			
3/4	Wolseley Rd S Right	D	11	55	0	74.6%	6.1			
4/2+4/1	Dockyard Ahead Ahead2	E	8	6	14	26.4%	1.1			
4/3+4/4	Dockyard Ahead Right	EF	8:7	6:7	14	24.2%	1.3			
6/1	Weston Mill Dr E Ped Ahead	I	66	0	66	23.9%	0.2			
6/2	Weston Mill Dr E Ped Ahead	I	66	0	66	15.8%	0.1			
9/1	Left Turn Left	-	-	-	-	2.9%	0.0			
	C1 Stream: 1 PRC for Signalled Lanes (%): 4.7 Total Delay for Signalled Lanes (pcuHr): 34.18 PRC Over All Lanes (%): 4.7 Total Delay Over All Lanes(pcuHr): 34.20 Cycle Time (s): 66									
Scenario 2: '2014 PM Do Something plus potential' (FG2: '2014 PM Do Something plus potential', Plan 2: 'PM')
Network Layout Diagram



Phase Diagram



Stage Diagram





Network	letwork Results										
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)				
Network	-	-	-	-	-	85.4%	-				
Dockyard	-	-	-	-	-	85.4%	-				
1/2+1/1	Wolseley Rd N Left Ahead	A -	18	42	60	84.4%	10.8				
1/4+1/3	Wolseley Rd N Ahead Right	ВA	22:18	38:42	60	82.8%	10.5				
2/1	Weston Mill Dr (int) Left	Н	58	97	38	57.0%	13.1				
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	9:58	95:97	104:38	54.9%	3.2				
2/4	Weston Mill Dr (int) Right Ahead	G	9	95	104	81.0%	6.3				
3/2+3/1	Wolseley Rd S Ahead Left	C -	40	111	34	82.9%	19.4				
3/3	Wolseley Rd S Right	D	40	111	34	85.4%	20.8				
3/4	Wolseley Rd S Right	D	40	111	34	84.7%	20.5				
4/2+4/1	Dockyard Ahead Ahead2	E	24	65	89	85.1%	13.5				
4/3+4/4	Dockyard Ahead Right	EF	24	65	89	82.3%	13.6				
6/1	Weston Mill Dr E Ped Ahead	I	117	0	117	50.9%	0.5				
6/2	Weston Mill Dr E Ped Ahead	I	117	0	117	44.8%	0.4				
9/1	Left Turn Left	-	-	-	-	16.0%	0.7				
	C1 Stream	: 1 PRC for Signa PRC Over	alled Lanes (%): All Lanes (%):	5.4 Total D 5.4 To	elay for Signalled Lar otal Delay Over All La	nes (pcuHr): 6 nes(pcuHr): 6	1.93 2.02 Cycle Time (s): 117				

LINSIG Model Output

Scenario 1: '2014 AM Do Something MAX plus potential' (FG1: '2014 AM Do Something MAX plus potential', Plan 1: 'AM')



Phase Diagram







Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	84.9%	-			
Dockyard	-	-	-	-	-	84.9%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	14	36	50	77.4%	7.5			
1/4+1/3	Wolseley Rd N Ahead Right	BA	15:14	35:36	50	83.4%	8.8			
2/1	Weston Mill Dr (int) Left	Н	21	22	31	83.8%	7.6			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	10:21	20:22	30:31	84.9%	8.5			
2/4	Weston Mill Dr (int) Right Ahead	G	10	20	30	79.7%	6.7			
3/2+3/1	Wolseley Rd S Ahead Left	C -	11	57	0	82.1%	7.3			
3/3	Wolseley Rd S Right	D	11	57	0	76.0%	6.3			
3/4	Wolseley Rd S Right	D	11	57	0	76.0%	6.3			
4/2+4/1	Dockyard Ahead Ahead2	E	8	6	14	35.6%	1.6			
4/3+4/4	Dockyard Ahead Right	EF	8:7	6:7	14	32.6%	1.9			
6/1	Weston Mill Dr E Ped Ahead	I	68	0	68	25.0%	0.2			
6/2	Weston Mill Dr E Ped Ahead	I	68	0	68	16.9%	0.1			
9/1	Left Turn Left	-	-	-	-	3.0%	0.0			
	C1 Stream	: 1 PRC for Signa PRC Over	alled Lanes (%): All Lanes (%):	6.0 Total D 6.0 To	elay for Signalled Lar otal Delay Over All La	nes (pcuHr): 3 nes(pcuHr): 3	5.58 5.59 Cycle Time (s): 68			

Scenario 2: '2014 PM Do Something MAX plus potential' (FG2: '2014 PM Do Something MAX plus potential', Plan 2: 'PM')



Phase Diagram







Network	letwork Results									
Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	86.8%	-			
Dockyard	-	-	-	-	-	86.8%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	18	42	60	84.8%	11.0			
1/4+1/3	Wolseley Rd N Ahead Right	ВA	22:18	38:42	60	86.8%	11.7			
2/1	Weston Mill Dr (int) Left	Н	59	99	38	61.2%	14.8			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	9:59	97:99	106:38	72.1%	5.5			
2/4	Weston Mill Dr (int) Right Ahead	G	9	97	106	83.7%	6.8			
3/2+3/1	Wolseley Rd S Ahead Left	C -	41	113	34	84.1%	20.2			
3/3	Wolseley Rd S Right	D	41	113	34	85.5%	21.3			
3/4	Wolseley Rd S Right	D	41	113	34	84.8%	20.8			
4/2+4/1	Dockyard Ahead Ahead2	E	26	65	91	86.1%	14.8			
4/3+4/4	Dockyard Ahead Right	EF	26	65	91	84.2%	15.2			
6/1	Weston Mill Dr E Ped Ahead	I	120	0	120	52.0%	0.5			
6/2	Weston Mill Dr E Ped Ahead	I	120	0	120	46.1%	0.4			
9/1	Left Turn Left	-	-	-	-	16.1%	0.7			
	C1 Stream	: 1 PRC for Signa PRC Over	alled Lanes (%): All Lanes (%):	3.7 Total D 3.7 To	elay for Signalled Lar otal Delay Over All La	nes (pcuHr): 6 nes(pcuHr): 6	7.33 7.43 Cycle Time (s): 120			

Weston Mill Drive / Carlton Terrace

LINSIG Model Output

Scenario 1: '2010 AM Observed' (FG1: '2010 AM Observed', Plan 1: 'AM') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	85.3%	-
Carlton	-	-	-	-	-	85.3%	-
1/1	Carlton Terrace Left Ahead Right	С	15	85	0	60.1%	5.2
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	46	34	80	85.3%	16.6
3/1	Ferndale Rd Ahead Right Left	D	15	85	0	80.7%	7.1
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	22	6	28	82.5%	12.4
	C1 Stream:	1 PRC for Signal PRC Over A	led Lanes (%): 5 All Lanes (%): 5	5.5 Total De 5.5 To	elay for Signalled Land tal Delay Over All Lan	es (pcuHr): 2 es(pcuHr): 2	6.48 6.48 Cycle Time (s): 100

Scenario 2: '2010 PM Observed' (FG2: '2010 PM Observed', Plan 2: 'PM') Network Layout Diagram





Stage Diagram Stage Stream: 1





Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	91.4%	-	
Carlton	-	-	-	-	-	91.4%	-	
1/1	Carlton Terrace Left Ahead Right	С	10	86	0	48.8%	3.0	
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	18	30	48	91.4%	14.5	
3/1	Ferndale Rd Ahead Right Left	D	10	86	0	89.1%	8.0	
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	45	6	24	91.0%	17.8	
C1 Stream: 1 PRC for Signalled Lanes (%): -1.6 Total Delay for Signalled Lanes (pcuHr): 29.55 PRC Over All Lanes (%): -1.6 Total Delay Over All Lanes(pcuHr): 29.55 Cycle Time (s								

Scenario 3: '2011 AM Base' (FG3: '2011 AM Base', Plan 1: 'AM') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	85.7%	-
Carlton	-	-	-	-	-	85.7%	-
1/1	Carlton Terrace Left Ahead Right	С	15	85	0	60.8%	5.4
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	46	34	80	85.7%	16.8
3/1	Ferndale Rd Ahead Right Left	D	15	85	0	81.9%	7.2
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	22	6	28	83.1%	12.5
	C1 Stream:	1 PRC for Signal PRC Over A	led Lanes (%): 5 All Lanes (%): 5	5.0 Total De 5.0 Total De	elay for Signalled Land al Delay Over All Lan	es (pcuHr): 27 es(pcuHr): 27	7.00 7.00 Cycle Time (s): 100





Stage Diagram Stage Stream: 1





Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	92.2%	-	
Carlton	-	-	-	-	-	92.2%	-	
1/1	Carlton Terrace Left Ahead Right	С	10	86	0	49.3%	3.1	
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	18	30	48	92.2%	14.8	
3/1	Ferndale Rd Ahead Right Left	D	10	86	0	90.1%	8.3	
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	45	6	24	91.8%	18.4	
C1 Stream: 1 PRC for Signalled Lanes (%): -2.4 Total Delay for Signalled Lanes (pcuHr): 30.78 PRC Over All Lanes (%): -2.4 Total Delay Over All Lanes(pcuHr): 30.78 Cycle Time (s)								

LINSIG Model Output

Scenario 1: '2014 AM Do Min' (FG1: '2014 AM Do Minimum', Plan 1: 'AM') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	82.9%	-
Carlton	-	-	-	-	-	82.9%	-
1/1	Carlton Terrace Left Ahead Right	С	8	56	0	71.1%	4.3
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	24	27	51	82.9%	13.0
3/1	Ferndale Rd Ahead Right Left	D	8	56	0	81.9%	5.4
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	15	6	21	78.6%	8.3
C1 Stream: 1 PRC for Signalled Lanes (%): 8.6 Total Delay for Signalled Lanes (pcuHr): 21.36 PRC Over All Lanes (%): 8.6 Total Delay Over All Lanes(pcuHr): 21.36							

Scenario 2: '2014 PM Do Min' (FG2: '2014 AM Do Minimum', Plan 2: 'PM') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	94.1%	-	
Carlton	-	-	-	-	-	94.1%	-	
1/1	Carlton Terrace Left Ahead Right	С	11	92	0	49.8%	3.3	
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	20	35	55	91.9%	15.5	
3/1	Ferndale Rd Ahead Right Left	D	11	92	0	90.9%	9.1	
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	49	6	29	94.1%	21.8	
C1 Stream: 1 PRC for Signalled Lanes (%): -4.5 Total Delay for Signalled Lanes (pcuHr): 34.34 PRC Over All Lanes (%): -4.5 Total Delay Over All Lanes(pcuHr): 34.34 Cycle Time (s): 1(

LINSIG Model Output

Scenario 1: '2014 AM Do Something' (FG1: '2014 AM Do Something', Plan 1: 'AM') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	84.4%	-	
Carlton	-	-	-	-	-	84.4%	-	
1/1	Carlton Terrace Left Ahead Right	С	8	56	0	71.1%	4.3	
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	24	27	51	84.4%	13.5	
3/1	Ferndale Rd Ahead Right Left	D	8	56	0	81.9%	5.4	
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	15	6	21	80.2%	8.7	
C1 Stream: 1 PRC for Signalled Lanes (%): 6.7 Total Delay for Signalled Lanes (pcuHr): 22.09 PRC Over All Lanes (%): 6.7 Total Delay Over All Lanes(pcuHr): 22.09 Cycle Time (s):								

Scenario 2: '2014 PM Do Something' (FG2: '2014 AM Do Something', Plan 2: 'PM') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	95.3%	-	
Carlton	-	-	-	-	-	95.3%	-	
1/1	Carlton Terrace Left Ahead Right	С	11	93	0	50.3%	3.4	
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	20	35	55	94.5%	17.6	
3/1	Ferndale Rd Ahead Right Left	D	11	93	0	91.8%	9.3	
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	50	6	29	95.3%	23.4	
C1 Stream: 1 PRC for Signalled Lanes (%): -5.8 Total Delay for Signalled Lanes (pcuHr): 38.11 PRC Over All Lanes (%): -5.8 Total Delay Over All Lanes(pcuHr): 38.11 Cycle Time (s): 1								

LINSIG Model Output

Scenario 1: '2014 AM Do Something MAX' (FG1: '2014 AM Do Something MAX', Plan 1: 'AM') Network Layout Diagram








Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	87.5%	-
Carlton	-	-	-	-	-	87.5%	-
1/1	Carlton Terrace Left Ahead Right	С	8	56	0	71.1%	4.3
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	24	27	51	87.5%	14.9
3/1	Ferndale Rd Ahead Right Left	D	8	56	0	81.9%	5.4
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	15	6	21	85.0%	10.0
C1 Stream: 1 PRC for Signalled Lanes (%): 2.9 Total Delay for Signalled Lanes (pcuHr): 24.28 PRC Over All Lanes (%): 2.9 Total Delay Over All Lanes (pcuHr): 24.28 Cy							

Scenario 2: '2014 PM Do Something MAX' (FG2: '2014 AM Do Something MAX', Plan 2: 'PM') Network Layout Diagram





Stage Diagram





Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	97.8%	-
Carlton	-	-	-	-	-	97.8%	-
1/1	Carlton Terrace Left Ahead Right	С	10	91	0	53.3%	3.4
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	20	31	51	97.8%	21.8
3/1	Ferndale Rd Ahead Right Left	D	10	91	0	97.3%	11.1
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	48	6	25	97.8%	29.4
C1 Stream: 1 PRC for Signalled Lanes (%): -8.7 Total Delay for Signalled Lanes (pcuHr): 49.41 PRC Over All Lanes (%): -8.7 Total Delay Over All Lanes(pcuHr): 49.41 Cycle Time (s							

LINSIG Model Output

Scenario 1: '2014 AM Do Something plus potential' (FG1: '2014 AM Do Something plus potential', Plan 1: 'AM') Network Layout Diagram









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	89.9%	-
Carlton	-	-	-	-	-	89.9%	-
1/1	Carlton Terrace Left Ahead Right	С	10	56	0	64.0%	4.2
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	24	27	51	89.9%	16.3
3/1	Ferndale Rd Ahead Right Left	D	10	56	0	88.0%	7.7
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	15	6	21	89.9%	11.6
	C1 Stream:	1 PRC for Signal PRC Over A).1 Total De D.1 Total De	elay for Signalled Land al Delay Over All Lan	es (pcuHr): 28 es(pcuHr): 28	3.63 3.63 Cycle Time (s): 66	

Scenario 2: '2014 PM Do Something plus potential' (FG2: '2014 AM Do Something plus potential', Plan 2: 'PM') Network Layout Diagram



Phase Diagram



Stage Diagram





Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	108.2%	-
Carlton	-	-	-	-	-	108.2%	-
1/1	Carlton Terrace Left Ahead Right	С	20	97	0	55.7%	4.3
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	21	39	60	106.7%	45.0
3/1	Ferndale Rd Ahead Right Left	D	20	97	0	107.7%	30.3
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	53	6	33	108.2%	121.9
	C1 Stream:	1 PRC for Signal PRC Over A	led Lanes (%): -20 All Lanes (%): -20	0.2 Total De D.2 To	elay for Signalled Land tal Delay Over All Lan	es (pcuHr): 169 nes(pcuHr): 169	9.29 9.29 Cycle Time (s): 117

LINSIG Model Output

Scenario 1: '2014 AM Do Something MAX plus potential' (FG1: '2014 AM Do Something MAX plus potential', Plan 1: 'AM')









Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	92.2%	-
Carlton	-	-	-	-	-	92.2%	-
1/1	Carlton Terrace Left Ahead Right	С	10	58	0	66.0%	4.4
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	25	28	53	92.2%	18.5
3/1	Ferndale Rd Ahead Right Left	D	10	58	0	91.8%	8.9
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	16	6	22	91.9%	13.3
	C1 Stream:	1 PRC for Signal PRC Over A	led Lanes (%): -2 All Lanes (%): -2	2.5 Total De 2.5 Total De	elay for Signalled Land tal Delay Over All Lan	es (pcuHr): 3 es(pcuHr): 3	3.02 3.02 Cycle Time (s): 68

Scenario 2: '2014 PM Do Something MAX plus potential' (FG2: '2014 AM Do Something MAX plus potential', Plan 2: 'PM')



Phase Diagram



Stage Diagram Stage Stream: 1





Item	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	111.3%	-
Carlton	-	-	-	-	-	111.3%	-
1/1	Carlton Terrace Left Ahead Right	С	20	100	0	57.2%	4.4
2/1+2/2	Weston Mill Dr E Right Left Ahead	В	22	39	61	111.3%	65.9
3/1	Ferndale Rd Ahead Right Left	D	20	100	0	110.4%	34.4
4/1+4/2	Weston Mill Dr W Left Ahead Right	А	55	6	33	110.5%	147.0
C1 Stream: 1 PRC for Signalled Lanes (%): -23.6 Total Delay for Signalled Lanes (pcuHr): 215.31 PRC Over All Lanes (%): -23.6 Total Delay Over All Lanes(pcuHr): 215.31 Cycle Time (s):							

Wolseley Road / Weston Mill Drive / Site Access

LINSIG Model Output

Scenario 1: '2014 AM Do Something' (FG1: '2014 AM Do Something', Plan 1: 'AM') Network Layout Diagram



Phase Diagram



Stage Diagram





Stage Stream: 2





ltem	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	87.8%	-			
J1: Dockyard	-	-	-	-	-	87.8%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	12	33	45	79.4%	7.2			
1/4+1/3	Wolseley Rd N Ahead Right	ΒA	13:12	32:33	45	87.8%	9.1			
2/1	Weston Mill Dr (int) Left	н	19	20	28	84.2%	7.1			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GΗ	9:19	18:20	27:28	84.1%	7.5			
2/4	Weston Mill Dr (int) Right Ahead	G	9	18	27	70.8%	5.0			
3/2+3/1	Wolseley Rd S Ahead Left	C -	10	52	62	84.3%	7.3			
3/3	Wolseley Rd S Right	D	10	52	62	74.3%	5.7			
3/4	Wolseley Rd S Right	D	10	52	62	74.3%	5.7			
4/2+4/1	Dockyard Ahead Ahead2	E	8	4	12	25.6%	1.0			
4/3	Dockyard Ahead	E	8	4	12	23.0%	1.1			
4/4	Dockyard Right	F	7	5	12	24.0%	1.1			
6/1	Weston Mill Dr E Ped Ahead	I	64	0	64	21.7%	0.1			
6/2	Weston Mill Dr E Ped Ahead	I	64	0	64	15.0%	0.1			
8/1	Left Turn Left	-	-	-	-	2.8%	0.0			
J2: Site Access	-	-	-	-	-	16.3%	-			
2/1+2/2	Dockyard Pre Sig Ahead Left	Q	27	60	23	16.3%	1.3			
3/1	Site Access Left	R	23	31	54	3.2%	0.3			
	C1 Stream: 1 PRC for Signalled Lanes (%): 2.5 Total Delay for Signalled Lanes (pcuHr): 32.93 C1 Stream: 2 PRC for Signalled Lanes (%): 451.3 Total Delay for Signalled Lanes (pcuHr): 0.75 PRC Over All Lanes (%): 2.5 Total Delay Over All Lanes(pcuHr): 33.76 Cycle Time (s): 64									

Scenario 2: '2014 PM Do Something' (FG2: '2014 PM Do Something', Plan 2: 'PM') Network Layout Diagram



Phase Diagram



Stage Diagram





Stage Stream: 2





ltem	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	83.5%	-			
J1: Dockyard	-	-	-	-	-	83.5%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	15	72	87	78.7%	8.3			
1/4+1/3	Wolseley Rd N Ahead Right	ВA	19:15	68:72	87	83.5%	9.3			
2/1	Weston Mill Dr (int) Left	н	52	16	68	51.2%	10.1			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	7:52	14:16	21:68	50.2%	2.2			
2/4	Weston Mill Dr (int) Right Ahead	G	7	14	21	62.8%	3.5			
3/2+3/1	Wolseley Rd S Ahead Left	C -	36	28	64	81.4%	17.0			
3/3	Wolseley Rd S Right	D	36	28	64	81.0%	17.2			
3/4	Wolseley Rd S Right	D	36	28	64	80.3%	16.8			
4/2+4/1	Dockyard Ahead Ahead2	E	20	92	8	81.6%	10.7			
4/3	Dockyard Ahead	E	20	92	8	81.6%	11.7			
4/4	Dockyard Right	F	20	92	8	24.6%	2.2			
6/1	Weston Mill Dr E Ped Ahead	I	104	0	104	46.2%	0.4			
6/2	Weston Mill Dr E Ped Ahead	I	104	0	104	42.7%	0.4			
8/1	Left Turn Left	-	-	-	-	12.8%	0.4			
J2: Site Access	-	-	-	-	-	45.4%	-			
2/1+2/2	Dockyard Pre Sig Ahead Left	Q	76	86	58	45.4%	4.5			
3/1	Site Access Left	R	14	66	80	10.2%	0.7			
	C1 Stream: 1 PRC for Signalled Lanes (%): 7.7 Total Delay for Signalled Lanes (pcuHr): 49.37 C1 Stream: 2 PRC for Signalled Lanes (%): 98.2 Total Delay for Signalled Lanes (pcuHr): 1.68 PRC Over All Lanes (%): 7.7 Total Delay Over All Lanes(pcuHr): 51.35 Cycle Time (s): 104									

LINSIG Model Output

Scenario 1: '2014 AM Do Something MAX' (FG1: '2014 AM Do Something MAX', Plan 1: 'AM') Network Layout Diagram



Phase Diagram



Stage Diagram





Stage Stream: 2





ltem	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	87.3%	-			
J1: Dockyard	-	-	-	-	-	87.3%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	12	40	52	79.9%	7.3			
1/4+1/3	Wolseley Rd N Ahead Right	ΒA	13:12	39:40	52	87.3%	9.0			
2/1	Weston Mill Dr (int) Left	н	19	27	35	84.3%	7.1			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GΗ	9:19	25:27	34:35	84.8%	7.8			
2/4	Weston Mill Dr (int) Right Ahead	G	9	25	34	74.0%	5.5			
3/2+3/1	Wolseley Rd S Ahead Left	C -	10	59	5	84.3%	7.3			
3/3	Wolseley Rd S Right	D	10	59	5	74.0%	5.6			
3/4	Wolseley Rd S Right	D	10	59	5	74.6%	5.7			
4/2+4/1	Dockyard Ahead Ahead2	E	8	11	19	33.1%	1.4			
4/3	Dockyard Ahead	E	8	11	19	32.4%	1.6			
4/4	Dockyard Right	F	7	12	19	29.1%	1.2			
6/1	Weston Mill Dr E Ped Ahead	I	64	0	64	22.6%	0.1			
6/2	Weston Mill Dr E Ped Ahead	I	64	0	64	16.4%	0.1			
8/1	Left Turn Left	-	-	-	-	2.9%	0.0			
J2: Site Access	-	-	-	-	-	18.7%	-			
2/1+2/2	Dockyard Pre Sig Ahead Left	Q	22	5	27	18.7%	1.5			
3/1	Site Access Left	R	28	35	63	10.0%	0.9			
	C1 Stream: 1 PRC for Signalled Lanes (%): 3.1 Total Delay for Signalled Lanes (pcuHr): 34.17 C1 Stream: 2 PRC for Signalled Lanes (%): 381.6 Total Delay for Signalled Lanes (pcuHr): 1.12 PRC Over All Lanes (%): 3.1 Total Delay Over All Lanes(pcuHr): 35.42 Cycle Time (s): 64									





Phase Diagram



Stage Diagram





Stage Stream: 2





ltem	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)			
Network	-	-	-	-	-	86.7%	-			
J1: Dockyard	-	-	-	-	-	86.7%	-			
1/2+1/1	Wolseley Rd N Left Ahead	A -	14	77	91	80.9%	8.4			
1/4+1/3	Wolseley Rd N Ahead Right	ΒA	18:14	73:77	91	86.6%	9.7			
2/1	Weston Mill Dr (int) Left	н	50	23	73	51.5%	9.8			
2/3+2/2	Weston Mill Dr (int) Left Ahead	GΗ	8:50	21:23	29:73	46.3%	2.1			
2/4	Weston Mill Dr (int) Right Ahead	G	8	21	29	79.2%	5.7			
3/2+3/1	Wolseley Rd S Ahead Left	C -	33	36	69	86.7%	18.2			
3/3	Wolseley Rd S Right	D	33	36	69	85.6%	17.9			
3/4	Wolseley Rd S Right	D	33	36	69	84.9%	17.5			
4/2+4/1	Dockyard Ahead Ahead2	E	20	96	15	85.5%	11.8			
4/3	Dockyard Ahead	E	20	96	15	85.2%	12.7			
4/4	Dockyard Right	F	20	96	15	27.0%	1.9			
6/1	Weston Mill Dr E Ped Ahead	I	101	0	101	47.3%	0.4			
6/2	Weston Mill Dr E Ped Ahead	I	101	0	101	43.9%	0.4			
8/1	Left Turn Left	-	-	-	-	12.9%	0.4			
J2: Site Access	-	-	-	-	-	57.0%	-			
2/1+2/2	Dockyard Pre Sig Ahead Left	Q	56	91	46	57.0%	7.2			
3/1	Site Access Left	R	31	54	85	15.7%	1.9			
	C1 Stream: 1 PRC for Signalled Lanes (%): 3.9 Total Delay for Signalled Lanes (pcuHr): 54.37 C1 Stream: 2 PRC for Signalled Lanes (%): 57.9 Total Delay for Signalled Lanes (pcuHr): 3.89 PRC Over All Lanes (%): 3.9 Total Delay Over All Lanes(pcuHr): 58.91 Cycle Time (s): 101									

LINSIG Model Output

Scenario 1: '2014 AM Do Something plus Potential' (FG1: '2014 AM Do Something plus Potential', Plan 1: 'AM') Network Layout Diagram



Phase Diagram



Stage Diagram





Stage Stream: 2




ltem	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)
Network	-	-	-	-	-	85.9%	-
J1: Dockyard	-	-	-	-	-	85.9%	-
1/2+1/1	Wolseley Rd N Left Ahead	A -	13	33	46	80.3%	7.7
1/4+1/3	Wolseley Rd N Ahead Right	ВA	14:13	32:33	46	85.9%	9.1
2/1	Weston Mill Dr (int) Left	н	20	20	28	84.4%	7.5
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	9:20	18:20	27:28	84.4%	8.1
2/4	Weston Mill Dr (int) Right Ahead	G	9	18	27	79.0%	6.2
3/2+3/1	Wolseley Rd S Ahead Left	C -	11	53	64	79.7%	6.8
3/3	Wolseley Rd S Right	D	11	53	64	73.5%	6.0
3/4	Wolseley Rd S Right	D	11	53	64	74.1%	6.0
4/2+4/1	Dockyard Ahead Ahead2	E	8	4	12	26.4%	1.1
4/3	Dockyard Ahead	E	8	4	12	23.7%	1.2
4/4	Dockyard Right	F	7	5	12	24.8%	1.1
6/1	Weston Mill Dr E Ped Ahead	I	66	0	66	24.0%	0.2
6/2	Weston Mill Dr E Ped Ahead	I	66	0	66	15.7%	0.1
8/1	Left Turn Left	-	-	-	-	2.9%	0.0
J2: Site Access	-	-	-	-	-	16.8%	-
2/1+2/2	Dockyard Pre Sig Ahead Left	Q	27	61	22	16.8%	1.4
3/1	Site Access Left	R	25	30	55	3.0%	0.3
C1 Stream: 1 PRC for Signalled Lanes (%): 4.7 Total Delay for Signalled Lanes (pcuHr): 33.73 C1 Stream: 2 PRC for Signalled Lanes (%): 434.5 Total Delay for Signalled Lanes (pcuHr): 0.79 PRC Over All Lanes (%): 4.7 Total Delay Over All Lanes (pcuHr): 34.59 Cycle Time (s): 66							





Phase Diagram



Stage Diagram





Stage Stream: 2



Signal Timings Diagram



ltem	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	87.5%	-	
J1: Dockyard	-	-	-	-	-	87.5%	-	
1/2+1/1	Wolseley Rd N Left Ahead	A -	18	52	70	84.4%	10.8	
1/4+1/3	Wolseley Rd N Ahead Right	ΒA	22:18	48:52	70	82.8%	10.5	
2/1	Weston Mill Dr (int) Left	н	58	107	48	54.1%	12.1	
2/3+2/2	Weston Mill Dr (int) Left Ahead	GΗ	10:58	105:107	115:48	50.2%	2.5	
2/4	Weston Mill Dr (int) Right Ahead	G	10	105	115	80.1%	6.6	
3/2+3/1	Wolseley Rd S Ahead Left	C -	39	5	44	84.9%	20.0	
3/3	Wolseley Rd S Right	D	39	5	44	87.5%	21.4	
3/4	Wolseley Rd S Right	D	39	5	44	86.8%	21.1	
4/2+4/1	Dockyard Ahead Ahead2	E	24	75	99	84.6%	13.4	
4/3	Dockyard Ahead	E	24	75	99	82.7%	13.7	
4/4	Dockyard Right	F	24	75	99	27.2%	2.8	
6/1	Weston Mill Dr E Ped Ahead	I	117	0	117	50.8%	0.5	
6/2	Weston Mill Dr E Ped Ahead	I	117	0	117	44.9%	0.4	
8/1	Left Turn Left	-	-	-	-	16.0%	0.7	
J2: Site Access	-	-	-	-	-	48.8%	-	
2/1+2/2	Dockyard Pre Sig Ahead Left	Q	89	70	42	48.8%	5.1	
3/1	Site Access Left	R	14	50	64	11.5%	0.8	
C1 Stream: 1 PRC for Signalled Lanes (%): 2.8 Total Delay for Signalled Lanes (pcuHr): 62.35 C1 Stream: 2 PRC for Signalled Lanes (%): 84.3 Total Delay for Signalled Lanes (pcuHr): 1.80 PRC Over All Lanes (%): 2.8 Total Delay Over All Lanes (pcuHr): 64.51 Cycle Time (s): 117								

LINSIG Model Output

Scenario 1: '2014 AM Do Something MAX plus Potential' (FG1: '2014 AM Do Something MAX plus Potential', Plan 1: 'AM')



Phase Diagram



Stage Diagram Stage Stream: 1





Stage Stream: 2



Signal Timings Diagram



ltem	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	86.2%	-	
J1: Dockyard	-	-	-	-	-	86.2%	-	
1/2+1/1	Wolseley Rd N Left Ahead	A -	14	42	56	77.9%	7.5	
1/4+1/3	Wolseley Rd N Ahead Right	ΒA	15:14	41:42	56	82.9%	8.7	
2/1	Weston Mill Dr (int) Left	н	21	29	37	84.9%	8.0	
2/3+2/2	Weston Mill Dr (int) Left Ahead	GΗ	9:21	27:29	36:37	86.2%	9.1	
2/4	Weston Mill Dr (int) Right Ahead	G	9	27	36	79.2%	6.2	
3/2+3/1	Wolseley Rd S Ahead Left	C -	12	63	7	75.8%	6.6	
3/3	Wolseley Rd S Right	D	12	63	7	69.7%	5.8	
3/4	Wolseley Rd S Right	D	12	63	7	70.7%	5.9	
4/2+4/1	Dockyard Ahead Ahead2	E	8	13	21	36.0%	1.5	
4/3	Dockyard Ahead	E	8	13	21	33.7%	1.7	
4/4	Dockyard Right	F	7	14	21	30.9%	1.4	
6/1	Weston Mill Dr E Ped Ahead	I	68	0	68	25.0%	0.2	
6/2	Weston Mill Dr E Ped Ahead	I	68	0	68	16.9%	0.1	
8/1	Left Turn Left	-	-	-	-	3.0%	0.0	
J2: Site Access	-	-	-	-	-	18.7%	-	
2/1+2/2	Dockyard Pre Sig Ahead Left	Q	23	7	30	18.7%	1.5	
3/1	Site Access Left	R	31	38	1	9.6%	0.9	
C1Stream: 1 PRC for Signalled Lanes (%):4.4Total Delay for Signalled Lanes (pcuHr):33.99C1Stream: 2 PRC for Signalled Lanes (%):381.0Total Delay for Signalled Lanes (pcuHr):1.18PRC Over All Lanes (%):4.4Total Delay Over All Lanes(pcuHr):35.29Cycle Time (s):68								

Scenario 2: '2014 PM Do Something MAX plus Potential' (FG2: '2014 PM Do Something MAX plus Potential', Plan 2: 'PM')



Phase Diagram



Stage Diagram





Stage Stream: 2



Signal Timings Diagram



ltem	Lane Description	Full Phase	Total Green (s)	Start Green (s)	End Green (s)	Deg Sat (%)	Mean Max Queue (pcu)	
Network	-	-	-	-	-	90.3%	-	
J1: Dockyard	-	-	-	-	-	90.3%	-	
1/2+1/1	Wolseley Rd N Left Ahead	A -	17	70	87	90.3%	12.5	
1/4+1/3	Wolseley Rd N Ahead Right	ΒA	21:17	66:70	87	90.2%	12.4	
2/1	Weston Mill Dr (int) Left	н	61	5	66	54.3%	12.5	
2/3+2/2	Weston Mill Dr (int) Left Ahead	GH	13:61	3:5	16:66	40.3%	2.3	
2/4	Weston Mill Dr (int) Right Ahead	G	13	3	16	84.4%	9.0	
3/2+3/1	Wolseley Rd S Ahead Left	C -	39	23	62	88.1%	21.6	
3/3	Wolseley Rd S Right	D	39	23	62	89.8%	22.9	
3/4	Wolseley Rd S Right	D	39	23	62	89.0%	22.4	
4/2+4/1	Dockyard Ahead Ahead2	E	25	92	117	89.1%	15.5	
4/3	Dockyard Ahead	E	25	92	117	87.7%	16.1	
4/4	Dockyard Right	F	25	92	117	29.7%	2.7	
6/1	Weston Mill Dr E Ped Ahead	I	120	0	120	51.9%	0.5	
6/2	Weston Mill Dr E Ped Ahead	I	120	0	120	46.2%	0.4	
8/1	Left Turn Left	-	-	-	-	16.1%	0.7	
J2: Site Access	-	-	-	-	-	59.5%	-	
2/1+2/2	Dockyard Pre Sig Ahead Left	Q	73	88	41	59.5%	9.6	
3/1	Site Access Left	R	33	49	82	17.5%	2.4	
C1 Stream: 1 PRC for Signalled Lanes (%): -0.3 Total Delay for Signalled Lanes (pcuHr): 71.13 C1 Stream: 2 PRC for Signalled Lanes (%): 51.3 Total Delay for Signalled Lanes (pcuHr): 4.27 PRC Over All Lanes (%): -0.3 Total Delay Over All Lanes (pcuHr): 76.29 Cycle Time (s): 120								