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# **TVBC DEVELOPMENT IMPACT NORTH BADDESLEY CROSSROADS – 2012 UPDATE**

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### Revision History

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# TVBC DEVELOPMENT IMPACT NORTH BADDESLEY CROSSROADS – 2012 UPDATE

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### 1. INTRODUCTION

#### 1.1. Background

- 1.1.1. A technical note (Ref: 14780/TR02A, July 2008), assessing the impacts of development proposals in Southern Test Valley on the Botley Road/Rownhams Road junction in North Baddesley, was prepared by Gifford (now Ramboll) in 2008 as a background document to the Core Strategy, which was submitted by Test Valley Borough Council to the Secretary of State in March 2009. Following the Exploratory Meeting that was held in May 2009, the Council decided to withdraw the Core Strategy. Work has since been undertaken to revise the Core Strategy which has **included a focused 'key issues' consultation, updating the evidence base and also taking account of the various policy changes that came into effect since the first Core Strategy was initially produced.**
- 1.1.2. This technical note has been prepared by Ramboll for Test Valley Borough Council and provides a review of the previous technical note, taking into account the latest Core Strategy proposals and also any changes to standard traffic growth predictions issued by the Department of Transport (DfT) since the original 2008 Gifford Technical Note. The current development proposals are contained within the Core Strategy Preferred Development Options document, January 2012. Details of the development sites have been included in section 3 of this report. The Botley Road/Rownhams Road junction will **be referred to as the 'North Baddesley crossroads' in this report.**
- 1.1.3. Under the previous assessment, a LINSIG junction capacity model was developed to enable assessment of the traffic impact of the development sites on the North Baddesley crossroads. The turning moves at the junction were obtained through a traffic survey. The likely distribution of trips from the proposed developments was derived from Census 2001 journey to work information. The identification of the proportion of those trips likely to pass through the junction was manually estimated on the basis of the probable routing of the trips across the local network, to and from the development sites. The same broad methodology is employed in this report.

#### 1.2. Site Location

The North Baddesley junction is a four arm signalised junction, formed by the A27 Botley Road to the east and west, Nutburn Road to the north and Rownhams Road to the south, as shown in Figure 1.1 overleaf.

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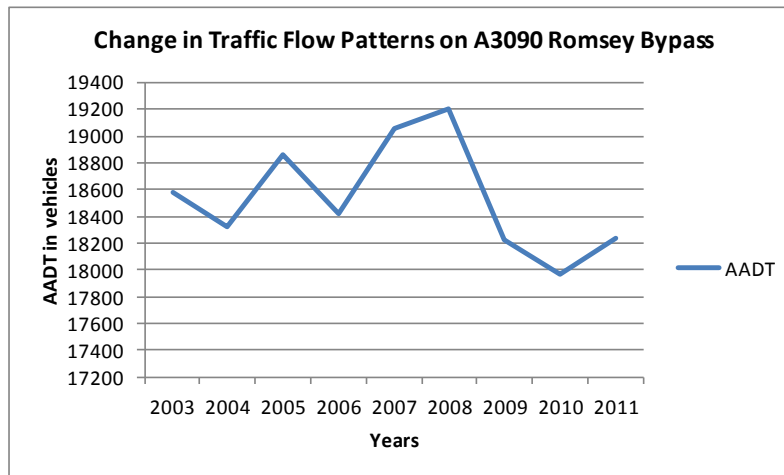
**Figure 1-1 North Baddesley Crossroads Location Plan**

**1.3. Background Traffic Flow Information**

Observed Traffic Growth

- 1.3.1. The previous Technical Note was based on 2008 traffic data. Traditionally, growth in general traffic flows would have been expected since then in North Baddesley, as elsewhere. However over recent years UK economic growth has slowed, petrol prices have risen and new development has been slow coming forward. Hence traffic growth locally, year by year, may not have occurred as might have been anticipated previously.
- 1.3.2. Annual Average Daily Traffic (AADT) information provided by Hampshire Council for a permanent count site on the A3090 Romsey Bypass (Site Ref: 34200002) gives an indication of the changes in local traffic flows in this area, over the period 2003-2011. The AADT flows are shown in Figure 1.2. It can be seen from the analysis of this AADT data that, for this section of road, whilst the general trend was for traffic flows to rise between 2003 and 2008, since that time traffic flows have fallen (by about 5%, 2008-2011). Other permanent count sites on the A27 at Sherfield English and the A3057 at Mottisfont tell the same story.

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**Figure 1-2 Change in Traffic Flow Patterns on the A3090 Romsey Bypass**

- 1.3.3. Also, Test Valley Borough Council has provided recent traffic survey information for the Romsey area. These surveys, summarised in Table 1.1 also suggest no real growth and/or possible reductions in traffic flows.

**Table 1-1 Change in Traffic Flow Patterns on Key Routes in Romsey**

Location	Two Way AM Peak Hour Traffic Flows		Change
	2007	(March) 2012	
A27 Luzborough Lane	1368	1365	0%
A27 Southampton Road	1893	1982	-4%
A27 By Pass Road	1982	2157	-8%
Alma Road	889	957	-7%
A3090 Winchester Road	1618	1718	-6%

- 1.3.4. It is therefore considered reasonable to assume that the traffic flows passing through the North Baddesley crossroads have not materially increased, and in fact possibly reduced, since the previous Technical Note.

### Predicted Traffic Growth

- 1.3.5. The DfT provides standard traffic growth predictions which enables future year traffic flows to be predicted, based on observed traffic flows. The baseline traffic flows for the previous Technical Note assessment were established through a traffic survey in April 2008. The results of this survey are enclosed in Appendix A.
- 1.3.6. In order to predict current traffic flows from past traffic data it would be normal practice to apply the DfT defined growth rates for this area, obtained from the TEMPRO 6.2 and National Traffic Model (NTM) databases. Following this methodology, traffic growth factors can be applied to the 2008 flows in order to **predict the theoretical, 'current' 2012** flows. These 2012 flows can then form the base flows from which to assess the impacts on the North Baddesley crossroads of the development proposals within the latest Core

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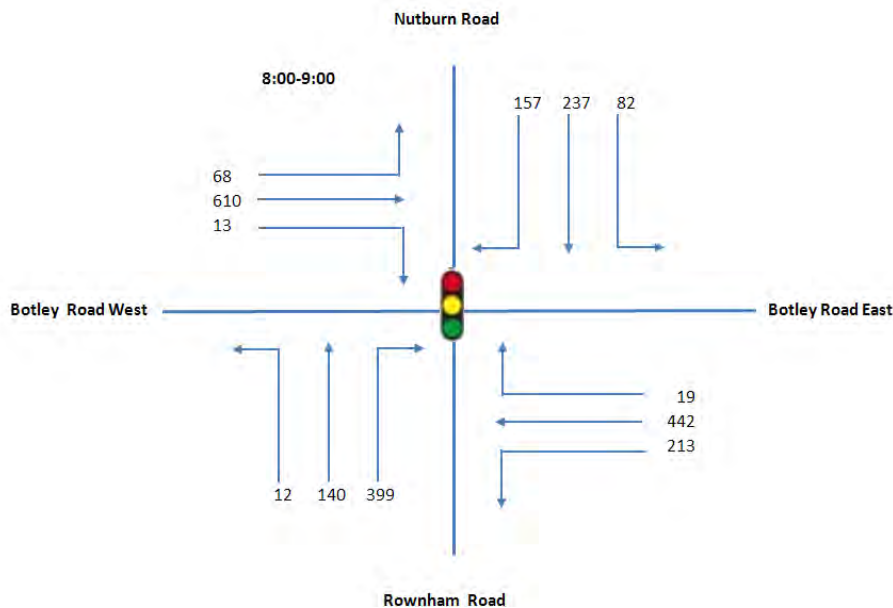
Strategy. As stated in paragraph 1.3.2, traffic flows generally in the area are likely to have remained largely unchanged or reduced since 2008 rather than having increased. It is considered therefore that 2008 traffic flows factored using TEMPRO/NTM factors to 2012 will represent an overestimate of current traffic flows – a ‘worst case’ scenario.

- 1.3.7. The AM peak was taken as the critical period to be assessed for the purposes of the previous Technical Note. It can be seen that the TEMPRO/NTM growth factor shown in Table 1.1 suggests a growth of about 5% over the period 2008-2012. This in contrast to the observed fall in growth of 5% observed on Romsey By Pass, 2008-2011. Table 1.1 also shows the growth factor to the end of the Core Strategy period (2008-2031).

**Table 1-2 Traffic Growth Factor**

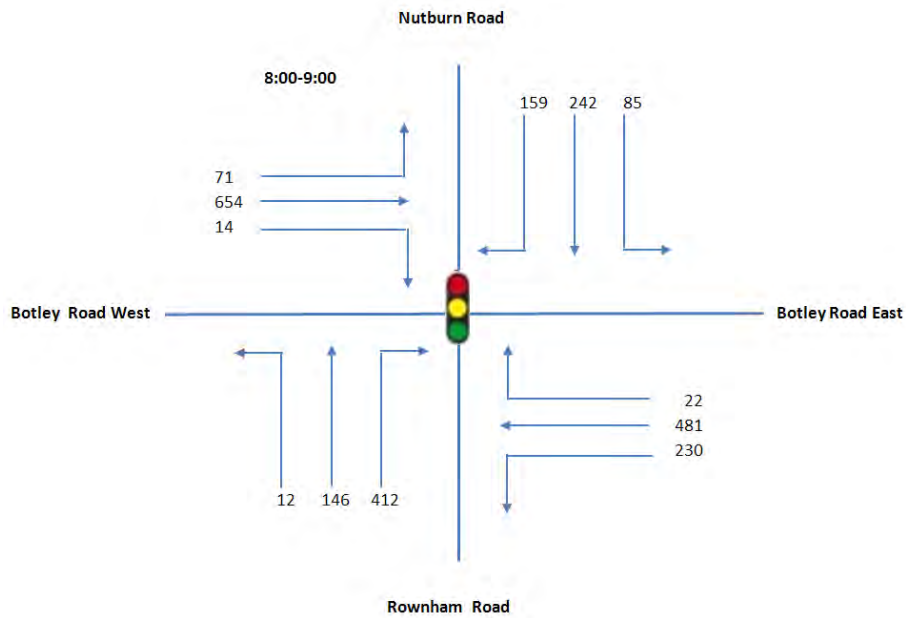
Period	2008-2012	2008-2031
TEMPRO/NTM Growth Factor	1.048	1.232

- 1.3.8. The surveyed 2008 flows and the predicted ‘worst case’ factored 2012 flows, for the AM peak between 8:00 and 9:00, are given in Figure 1.2 and 1.3. The peak hour vehicle flows are converted into PCUs (passenger car units. PCUS represent vehicles in terms of the equivalent number of axle pairs) for the LINSIG calculation.



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**Figure 1-3 2008 Surveyed Base Flows AM Peak Hour**



**Figure 1-4 Factored Base Traffic Flows to Represent 2012 Flows AM Peak Hour**



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### 2. DEVELOPMENT OF JUNCTION MODEL

- 2.1.1. A LINSIG model was developed for the North Baddesley crossroads, to represent 2008 flows, in order to provide a benchmark to assess its performance following the addition of the proposed development traffic. The signal specification obtained from Hampshire County Council was used to determine the average green times and intergreen values for the various phases under the 'SCOOT' signal operating system.
- 2.1.2. In the absence of any information regarding the occurrence of pedestrian demand at the North Baddesley crossroads, it has been assumed that there is a pedestrian stage in every cycle for all the scenarios modelled. **This tends to provide a 'worst case' scenario.**
- 2.1.3. In order to validate the LINSIG model with the observed queue lengths, the saturation flows were adjusted to reflect the surveyed (2008) traffic conditions at the crossroads. As the surveyed queue data is recorded separately for both lanes at the approach on Nutburn Road and Botley Road, queue values are summed over the lanes across the survey period and averaged to get the mean queue for that arm.
- 2.1.4. A comparison of the LINSIG modelled queuing results against the observed queues is given in Table 2.1. It can be seen that the model queues are reasonably consistent with the observed values (An exact match is not possible as adjustment to one arm can then produce a disproportionate change elsewhere. Hence a 'best fit' is made).

Scenario	Approach	Modelled Mean Max Queues	Degree of Saturation (%)	Observed Queues
2008 Base	Nutburn Road	19	88.8	13
	Botley Road West	29	94.3	30
	Rownhams Road	25	96.4	26
	Botley Road West	22	76.8	19

**Table 2-1 Comparison of Modelled Queues and Observed Queues AM Peak Hour**

- 2.1.5. As can be seen from the queue values and the Degree of Saturation (a measure of capacity), the junction was predicted to be operating close to capacity in 2008, with the highest degree of saturation on the A27 Botley Road West and Rownhams Road approaches in the morning peak period. Relatively high queuing on Rownhams Road is a direct consequence of the heavy right turning traffic on that arm and the absence of a dedicated lane for this turning traffic.
- 2.1.6. It should be noted that the crossroads junction has been assessed in isolation. The queuing on Botley Road east will be influenced by the rate of flow of traffic through the Botley Road/Castle Lane junction.

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2.1.7. The validated LINSIG model has been used to predict the 2012 situation, using the DfT growth factors. The resulting mean maximum queues and degrees of saturation are shown in Table 2.2 below. The 2008 base results are included for comparison purposes.

Approach	2008 Base		2012 Current (predicted)	
	Modelled Mean Max Queues	Degree of Saturation (%)	Modelled Mean Max Queues	Degree of Saturation (%)
Nutburn Road	19	88.8	21	93.1
Botley Road West	29	94	32	96.4
Rownhams Road	25	96	24	93.8
Botley Road East	22	76.8	24	78.5

**Table 2-2 North Baddesley Crossroads 2008 and 2012 Base Flows, AM Peak Hour**

2.1.8. Table 2.2 shows that the modelled Mean Maximum Queues and the Degrees of Saturation are slightly higher in 2012 than the 2008 base scenario, with the exception of Rownhams Road. (The model seeks to optimise the performance of the junction by adjusting the green time given to each arm, which may lead to one or more arms 'improving' whilst others experience higher degrees of saturation).

2.1.9. It is worth noting again that this assessment is based on applying a growth factor of about 5% to the 2008 base flows, whereas it is likely that local traffic flows in the area have not grown since 2008. Hence, in practice, it is likely that the junction is currently operating in a similar manner to how it was operating in 2008.

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### 3. TRIP GENERATION

- 3.1.1. The trip generation methodology used in this Technical Note is the same as that adopted for the previous 2008 study. The methodology is reproduced below.
- 3.1.2. Test Valley Borough Council has identified the proposed scale of development in each of the settlements in Romsey, North Baddesley and Nursling. The proposed development for southern Test Valley includes residential allocations for each of these settlements plus an employment allocation at Nursling. The trips between the residential proposals and the employment allocation will be included in the trips generated by the residential element and assigned to the local road network. Hence there is no need for an additional assignment of trips to the employment proposal onto the network from the residential development proposals. The trips coming into and out of the employment site at Nursling from origins further away are highly unlikely to travel through North Baddesley and are therefore assumed to not travel through the crossroads.
- 3.1.3. Trip rates for the proposed development in southern Test Valley are the same as those used in the Romsey Movement and Access Study Review Phase II report (Ref: 14780/TR02A). The scale of development, the associated trip rates and the resulting number of trips generated in the AM peak hour are shown in Table 3.1. The development within North Baddesley is on the west side of the settlement as proposed in the Core Strategy.
- 3.1.4. Following the latest revision of the Core Strategy, the number of dwellings in North Baddesley has been reduced from 500 to 300 and the number of dwellings in Nursling has been increased from 300 to 350, as reflected in Table 3.1. The assessment in this Technical Report takes account of these changes.

**Table 3-1 Development Proposals and Trip Generation, AM Peak Hour**

Development Location	No of Dwellings	Trip Rates		Total Trips	
		In	Out	In	Out
Romsey	2300	0.15	0.465	345	1070
North Baddesley	300	0.15	0.456	45	140
Nursling	350	0.15	0.456	53	163

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### 4. TRIP DISTRIBUTION AND ASSIGNMENT

- 4.1.1. The trip distribution and assignment methodology used in this Technical Note is the same as that adopted for the previous 2008 study. The methodology is reproduced below.
- 4.1.2. The likely distribution of development trips between settlements where development is proposed and other destinations has been estimated on the basis of journey to work data from 2001 census data. The resulting Origin - Destination trip matrix has been included in Appendix B of this report. This has enabled the proportion of trips between the different origin and destination pairs to be identified. It should be noted that the census data provides a distribution of work trips only. This will tend to overestimate the number of trips leaving the identified settlements and underestimate the number of trips remaining within a settlement that have a trip purpose other than journey to work. Hence the number of trips passing through North Baddesley from Romsey (and Nursling) is likely to be a 'worst case' assessment.
- 4.1.3. Once the journey to work trip proportions matrix was established, those trips likely to go through North Baddesley crossroads were identified and the most probable routing of trips through the crossroads was also determined. Turning move matrices were arrived at on this basis by considering only those O-D pairs which are likely to impact on the crossroads. Detailed trip matrices are provided in Appendix B of this report.
- 4.1.4. The previous 2008 Technical Note assessed the possible impacts of development at the base year (2008) and the end of the South East Plan (now withdrawn), 2026. For the purpose of this study three scenarios have been assessed:
- 2012 base + all Southern Test Valley (STV) development: The predicted current AM peak hour (2012) flows, plus all proposed STV development, to gauge the impact of the development relative to current conditions;
  - 2012 base + North Baddesley: The predicted current AM peak hour (2012) flows, plus proposed development in North Baddesley only, to gauge the impact of this development relative to current conditions; and
  - Future year (2031): Future 2031 AM peak hour flows based on DfT growth factors, with allowance for all development in the area, at the end of the Core Strategy period.
- 4.1.5. The resultant turning movement estimates for the different arms of the North Baddesley crossroads are shown in Tables 4.1, 4.2 and 4.3 overleaf.

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**Table 4-1 Predicted Turning Moves (2012 + all STV developments)**

	Existing Flows (2012)					Development Flows					Existing Flows + All STV Developments				
	A	B	C	D	Total	A	B	C	D	Total	A	B	C	D	Total
<b>A</b>	0	159	242	85	<b>486</b>	0	0	2	0	<b>2</b>	0	159	244	85	<b>488</b>
<b>B</b>	71	0	14	654	<b>739</b>	0	0	0	144	<b>144</b>	71	0	14	798	<b>883</b>
<b>C</b>	146	12	0	412	<b>570</b>	5	0	0	42	<b>47</b>	151	12	0	454	<b>617</b>
<b>D</b>	22	481	230	0	<b>733</b>	0	47	12	0	<b>59</b>	22	528	242	0	<b>792</b>
<b>Total</b>	<b>239</b>	<b>652</b>	<b>486</b>	<b>1151</b>	<b>2528</b>	<b>5</b>	<b>47</b>	<b>14</b>	<b>186</b>	<b>252</b>	<b>244</b>	<b>699</b>	<b>500</b>	<b>1337</b>	<b>2780</b>

Notes: [A] – Nutburn Road, [B] – Botley Road West, [C] – Rownhams Road, [D] - Botley Road East

**Table 4-2 Predicted Turning Moves (2012 + North Baddesley development)**

	Existing Flows (2012)					North Baddesley Development Flows					Existing Flows + North Baddesley Development				
	A	B	C	D	Total	A	B	C	D	Total	A	B	C	D	Total
<b>A</b>	0	159	242	85	<b>486</b>	0	0	2	0	<b>2</b>	0	159	244	85	<b>488</b>
<b>B</b>	71	0	14	654	<b>739</b>	0	0	0	0	<b>0</b>	71	0	14	654	<b>739</b>
<b>C</b>	146	12	0	412	<b>570</b>	5	0	0	42	<b>47</b>	151	12	0	454	<b>617</b>
<b>D</b>	22	481	230	0	<b>733</b>	0	0	12	0	<b>12</b>	22	481	242	0	<b>745</b>
<b>Total</b>	<b>239</b>	<b>652</b>	<b>486</b>	<b>1151</b>	<b>2528</b>	<b>5</b>	<b>0</b>	<b>14</b>	<b>42</b>	<b>61</b>	<b>244</b>	<b>652</b>	<b>500</b>	<b>1193</b>	<b>2589</b>

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Table 4-3 Predicted Turning Moves (Future 2031, all developments)

	Existing Flows (2012)					2031 Base Flows (Growth Factor=1.2315)				
	A	B	C	D	Total	A	B	C	D	Total
<b>A</b>	0	159	242	85	<b>486</b>	0	187	284	100	<b>571</b>
<b>B</b>	71	0	14	654	<b>739</b>	84	0	16	768	<b>868</b>
<b>C</b>	146	12	0	412	<b>569</b>	171	14	0	484	<b>669</b>
<b>D</b>	22	481	230	0	<b>733</b>	26	565	270	0	<b>861</b>
<b>Total</b>	<b>239</b>	<b>652</b>	<b>486</b>	<b>1151</b>	<b>2528</b>	<b>281</b>	<b>766</b>	<b>570</b>	<b>1352</b>	<b>2969</b>

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### 5. JUNCTION ANALYSIS

#### 5.1. Introduction

5.1.1. The effect of the development traffic on the crossroads has been assessed by inputting the various scenario flows into the LINSIG model, using the flows shown in Tables 4.1, 4.2 and 4.3. The 'Practical Reserve Capacity' (PRC) is also quoted in the following summary tables as it gives a measure of the overall capacity for the junction.

#### 5.2. 2012 Base Plus All STV Developments

5.2.1. Table 5.1 provides a comparison of the performance of the junction with the base (2012) flows and the base plus all STV development traffic. The full model outputs are attached in Appendix C.

**Table 5-1 LINSIG Modelling Output for 2012 and 2012+ Development**

Approach	2012 Base			2012 + All STV Development		
	Modelled Mean Max Queues	Degree of Saturation (%)	PRC %	Modelled Mean Max Queues	Degree of Saturation (%)	PRC %
Nutburn Road	21	93.1		34	104.4	
Botley Road West	32	96.4		67	107.1	
Rownhams Road	24	93.8	-7.1	45	105.5	-19
Botley Road East	24	78.5		25	78.9	

5.2.2. The LINSIG analysis demonstrates that, because the junction is predicted to be operating close to or at capacity without the proposed STV developments, the addition of this development traffic increases the degree of saturation and queue lengths. The overall effect is therefore to increase the likely delays for traffic. The most noticeable increase in queuing occurs on Botley Road west. As mentioned in the previous section, the large number of right turners and the lack of a dedicated lane for right turners affects the capacity of the Rownhams Road approach.

#### 5.3. 2012 Base Plus North Baddesley Development

5.3.1. The model has also been run with traffic flows generated by only the North Baddesley development proposals added to the base flows. This allows the impact of North Baddesley development on the crossroads to be viewed in isolation. Table 5.2 demonstrates that the junction may perform slightly worse than the base scenario with a PRC of - 9.5%. The junction is running close to capacity, with queuing similar to the situation without development, on all arms. This assessment indicates that the proposed development in North Baddesley, on its own, has only a marginal effect on the predicted queues compared with the existing situation. Hence it is the effect of development in other settlements that has the predominant impact.

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**Table 5-2 Modelling Output for Base and Base + North Baddesley Development**

Approach	2012 Base			2012 + North Baddesley		
	Modelled Mean Max Queues	Degree of Saturation (%)	PRC %	Modelled Mean Max Queues	Degree of Saturation (%)	PRC %
Nutburn Road	21	93.1		26	98.6	
Botley Road West	32	96.4	-7.1	32	96.4	-9.5
Rownhams Road	24	93.8		30	98.2	
Botley Road East	23	78.5		25	79.8	

### 5.4. Future (2031) Year Flows

- 5.4.1. As a sensitivity test, 2031 conditions were modelled by factoring the 2008 AM peak base flows by a growth factor of 1.232, calculated using TEMPRO (v6.2). This growth factor takes into account proposed development in the south Hampshire area (including those in STV), as it affects North Baddesley. Table 5.3 provides the model output for 2031 predictions. The predictions for 2026, from the previous Technical Note, are included in the Table for comparison.
- 5.4.2. The modelling results indicate that the junction would be operating over capacity with significant queuing on all arms in 2031, if traffic growth occurs as per current DfT predictions.

**Table 5-3 Modelling Output for 2031 Base**

Approach	Future - 2031			Future - 2026		
	Modelled Mean Max Queues	Degree of Saturation (%)	PRC %	Modelled Mean Max Queues	Degree of Saturation (%)	PRC %
Nutburn Road	50	109.4		35	102.9	
Botley Road West	87	113.2	-25.8	61	106.6	-18.4
Rownhams Road	62	110.2		41	103.7	
Botley Road East	33	92.2		28	86.8	

- 5.4.3. The comparison with the end year (2026) tested in the previous Technical Note shows that the modelled Mean Maximum Queues and the Degrees of Saturation for 2031, not surprisingly would be higher than in 2026. However, as discussed earlier, recent traffic data for the local area suggests that traffic levels have not been rising since 2008. The longer term effects on traffic growth of the current and future economic trends are



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uncertain at present. Also, there is evidence of a significant period of little or no traffic growth in the local area and this will tend to delay further traffic growth. This would suggest that the junction assessment predictions for 2031 are likely to be an overestimate. Hence it is likely that the level of impacts now predicted for 2031 will be similar to those previously predicted for 2026.

### 5.5. Mitigation Measures at the Junction

- 5.5.1. The junction operates under a current signal plan with a maximum overall cycle time of 120 seconds. Increasing the cycle time beyond this maximum accepted cycle time is not considered a viable option. Additional dedicated right turning lanes on Rownhams Road and Nutburn Road would improve the operation of the junction. This strategy would reduce queuing on the two minor roads, thereby making it possible for the reassignment of additional green times to the main Botley Road approaches.
- 5.5.2. The effect of adding an extra lane on the minor roads has been tested with the 2012 + all STV development demand flows. Table 5.4 provides a summary of this scenario. It is evident that this scenario provides a reduction in the predicted delays with development, returning the queue lengths to a level similar to the queues predicted for the 2012 base scenario. The full model outputs are attached in Appendix C of this report.

**Table 5-4 Modelling Output for Base + all STV Development, with Junction Improvement**

Approach	2012 Base (No Improvement)			2012 + All STV Developments (With Additional Lane on Minor Arms)		
	Modelled Mean Max Queues	Degree of Saturation (%)	PRC %	Modelled Mean Max Queues	Degree of Saturation (%)	PRC %
Nutburn Road	21	93.1		18	82	
Botley Road West	32	96.4		30	86.9	
Rownhams Road	24	93.8	-7.1	22	84.1	3.5
Botley Road East	23	78.5		21	64	

- 5.5.3. It is clear however from site observations that a significant improvement involving road widening would be difficult to achieve within the existing highway boundary. There may be opportunities for adjustments to the existing carriageways to provide short stacking areas for right turning vehicles on the Nutburn Road or Rownhams Road approaches, but this would require more detailed investigation.

### 5.6. Other Mitigation Measures

- 5.6.1. The assessment of the future performance of the North Baddesley crossroads has been based on traffic growth predictions, representing long term trends in prevailing car use behaviour and travel patterns. The proposed development in Southern Test Valley contained within the Core Strategy covers the period up to 2031.

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- 5.6.2. Test Valley Borough Council are actively promoting, and seeking to enable, more sustainable travel behaviour over this plan period. Major improvements in access to Romsey Railway Station have been implemented in 2010/11 with: improved car parking; a new ramped access for pedestrians and cyclists to the far platform linking to other cycle routes; a bus turning area; drop off points; and more disabled parking all being provided. A Station Travel Plan was prepared in 2010 and is in the process of being reviewed and updated to further improve access to and facilities at the station. The aim is to increase rail usage particularly between Romsey, Chandlers Ford, Eastleigh and Southampton. There is a cycle route between Romsey and Chandlers Ford. Bus quality partnerships are in place or being developed with the aim of improving bus services. Over time, these and other similar measures will contribute towards reductions in demands to travel by car.
- 5.6.3. Hence over the period of the Core Strategy, it is likely that many factors will influence traffic growth. Future car trip generation rates from new and existing development will reflect both national and local influences, including the measures being taken forward by the Borough Council.

### 5.7. Conclusions

- 5.7.1. An analysis of the performance of the existing North Baddesley crossroads, using DfT growth factors to derive 2012 base flows, predicts that the junction is currently operating close to or at capacity without the proposed development within STV. The addition of traffic generated by the STV development allocations is predicted to increase delays and queuing. However, local traffic count data indicates that there has been no real growth in traffic since the previous study which tested the crossroads on the basis of observed 2008 traffic flows. Hence, it is likely that the junction is currently operating in a manner similar to how it was operating in 2008. The predicted performance at 2012, with or without development is, therefore, likely to be a worst case prediction.
- 5.7.2. An assessment indicates that the proposed development in North Baddesley, on its own, has only a marginal effect on the predicted 2012 base queues compared with the existing situation. Hence it is the effect of development in other settlements that has the predominant impact.
- 5.7.3. A comparison with the end year (2026) assessed in the previous Technical Note shows that the modelled Mean Maximum Queues and the Degrees of Saturation for 2031, using the latest DfT traffic growth predictions are, not surprisingly, higher than those predicted for 2026. However, recent traffic data for the local area suggests that traffic levels have not been rising since 2008. The longer term effects on traffic growth of the current and future economic trends are uncertain at present. Also, there is evidence of a significant period of little or no traffic growth in the local area and this will tend to delay further traffic growth. This would suggest that the junction assessment predictions for 2031 are likely to be an overestimate. Hence it is likely that the level of impacts now predicted for 2031 may be similar to those previously predicted for 2026.
- 5.7.4. The predictions for 2031 highlight the fact that the absence of right turn lanes on the Rownhams Road and Nutburn Lane approaches to the crossroads affects the capacity of these arms and in turn affects the length of green signal time that can be allocated to the main west-east Botley Road route and the consequent levels of queuing. Provision of right turn lanes or short stacking areas for right turning vehicles would improve the performance of the junction, but there are land constraints for such modifications.

## **TVBC DEVELOPMENT IMPACT NORTH BADDESLEY CROSSROADS – 2012 UPDATE**

- 5.7.5. The assessment of the future performance of the North Baddesley crossroads has been based on traffic growth predictions, representing long term trends in prevailing car use behaviour and travel patterns. The proposed development in Southern Test Valley contained within the Core Strategy covers the period up to 2031. Test Valley Borough Council are actively promoting, and seeking to enable, more sustainable travel behaviour over this plan period.
- 5.7.6. It is considered therefore, that the general conclusions made in the previous report remain valid, i.e.:
- the crossroads are operating at or close to capacity without the planned future development in southern Test Valley;
  - the planned development is likely to increase the degree of saturation at the junction, but the proposed development in North Baddesley in isolation is predicted to have minimal effect;
  - by the end of the plan period (now 2031) the junction is predicted to be operating over capacity (if the current traffic growth predictions materialise);
  - the provision of right turn lanes or stacking space on the Rownhams Road and Nutburn Lane approaches would make a significant contribution towards improving the operation of the junction, but there are land constraints for such modifications;
  - The Borough Council is promoting a series of measures that will contribute towards less car use and more sustainable travel. Such measures will assist in reducing the traffic impacts of new development on locations such as North Baddesley.

## **TVBC DEVELOPMENT IMPACT NORTH BADDESLEY CROSSROADS – 2012 UPDATE**

### **APPENDICES**

APPENDIX A - TRAFFIC SURVEY RESULTS

APPENDIX B - TRIP MATRICES AND TURNING MOVEMENT CALCULATIONS

APPENDIX C - LINSIG OUTPUTS

**TVBC DEVELOPMENT IMPACT  
NORTH BADDESLEY CROSSROADS – 2012 UPDATE**

**APPENDIX A**

**TRAFFIC SURVEY RESULTS**

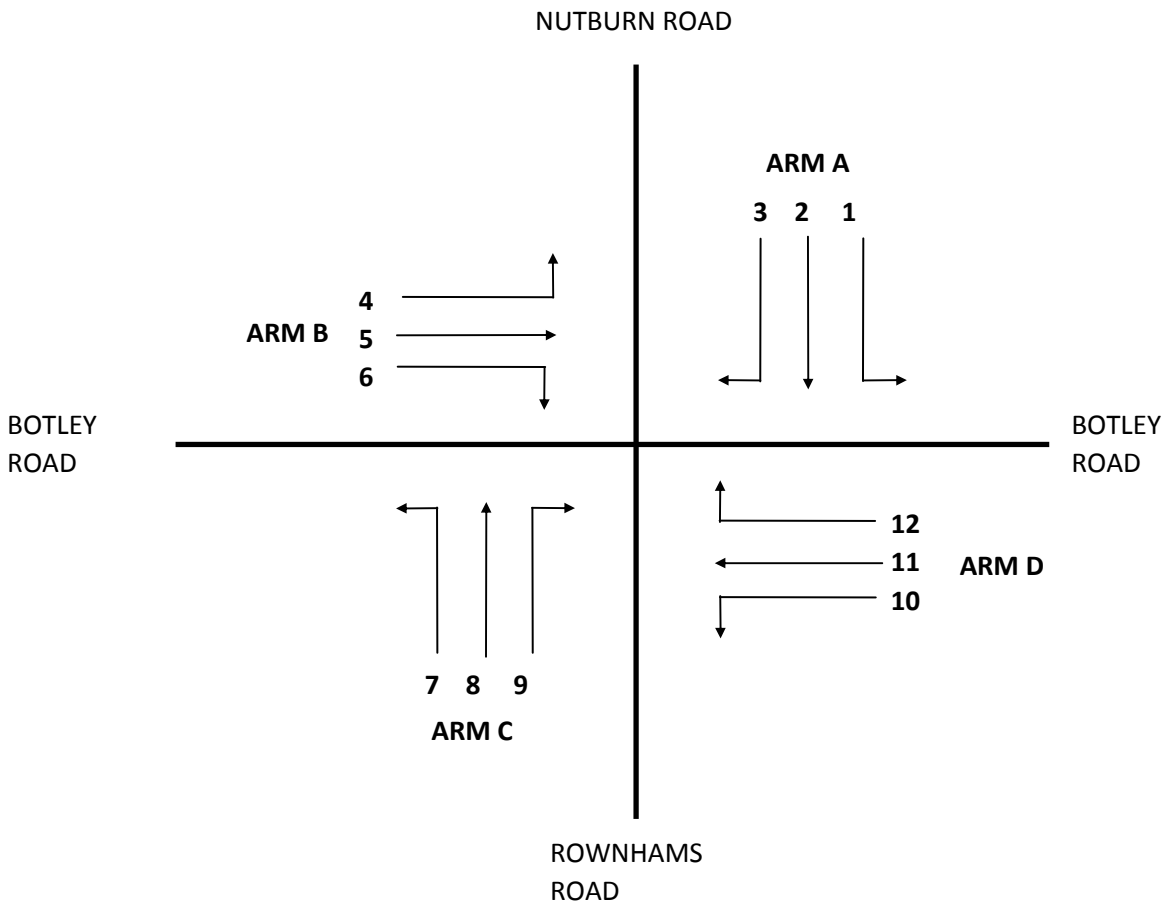
SITE: 1



DATE: 11TH MARCH 2008

LOCATION: BOTLEY ROAD /  
ROWNHAMS ROAD

DAY: THURSDAY



JOB TITLE: NORTH BADDESLEY

JOB NUMBER: 11187

# CLASSIFIED TURNING COUNTS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	MOVEMENT 1 FROM NUTBURN ROAD TO BOTLEY ROAD						MOVEMENT 2 FROM NUTBURN ROAD TO ROWNHAMS ROAD						MOVEMENT 3 FROM NUTBURN ROAD TO BOTLEY ROAD					
	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT
07:00	0	0	0	0	0	0	14	3	0	0	0	17	9	5	0	0	0	14
07:15	8	0	0	0	0	8	15	4	1	0	0	20	15	2	1	0	0	18
07:30	12	2	0	0	0	14	35	1	0	0	0	36	24	3	0	0	0	27
07:45	9	1	0	0	0	10	34	2	0	0	0	36	19	3	0	0	0	22
<b>H/TOT</b>	<b>29</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>32</b>	<b>98</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>109</b>	<b>67</b>	<b>13</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>81</b>
08:00	15	1	0	0	0	16	49	3	0	0	0	52	31	2	1	0	0	34
08:15	24	1	0	0	1	26	58	0	1	0	0	59	37	1	0	0	0	38
08:30	19	1	0	0	0	20	56	2	1	0	0	59	46	0	0	0	0	46
08:45	16	0	0	0	0	16	54	1	1	0	0	56	32	0	0	0	0	32
<b>H/TOT</b>	<b>74</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>78</b>	<b>217</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>226</b>	<b>146</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>150</b>
09:00	12	2	0	0	0	14	31	1	0	0	0	32	23	3	0	0	0	26
09:15	6	1	0	0	0	7	14	2	0	0	1	17	10	0	0	0	0	10
<b>HH/TOT</b>	<b>18</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>45</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>49</b>	<b>33</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>36</b>
<b>P/TOT</b>	<b>121</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>131</b>	<b>360</b>	<b>19</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>384</b>	<b>246</b>	<b>19</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>267</b>

# CLASSIFIED TURNING COUNTS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	MOVEMENT 4 FROM BOTLEY ROAD TO NUTBURN ROAD						MOVEMENT 5 FROM BOTLEY ROAD TO BOTLEY ROAD						MOVEMENT 6 FROM BOTLEY ROAD TO ROWNHAMS ROAD					
	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT
07:00	2	1	0	0	0	3	84	10	1	1	0	96	1	0	0	0	0	1
07:15	9	2	0	0	0	11	116	13	1	1	0	131	3	0	2	0	0	5
07:30	11	3	0	0	0	14	158	20	0	1	0	179	0	1	0	0	0	1
07:45	17	0	0	0	0	17	133	11	0	2	4	150	1	0	0	0	0	1
<b>H/TOT</b>	<b>39</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>45</b>	<b>491</b>	<b>54</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>556</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>8</b>
08:00	13	3	0	0	0	16	124	21	3	4	4	156	2	0	0	0	0	2
08:15	11	1	0	0	0	12	127	6	2	1	0	136	1	0	1	0	0	2
08:30	20	2	0	0	0	22	150	12	0	1	0	163	3	0	0	0	0	3
08:45	15	0	0	0	0	15	105	11	3	4	4	127	4	0	1	0	0	5
<b>H/TOT</b>	<b>59</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>65</b>	<b>506</b>	<b>50</b>	<b>8</b>	<b>10</b>	<b>8</b>	<b>582</b>	<b>10</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>12</b>
09:00	15	1	0	0	0	16	105	16	0	4	2	127	3	1	0	0	0	4
09:15	28	3	2	0	1	34	95	11	3	7	1	117	4	1	2	0	0	7
<b>HH/TOT</b>	<b>43</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>50</b>	<b>200</b>	<b>27</b>	<b>3</b>	<b>11</b>	<b>3</b>	<b>244</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>11</b>
<b>P/TOT</b>	<b>141</b>	<b>16</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>160</b>	<b>1197</b>	<b>131</b>	<b>13</b>	<b>26</b>	<b>15</b>	<b>1382</b>	<b>22</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>31</b>



# CLASSIFIED TURNING COUNTS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	MOVEMENT 7 FROM ROWNHAMS ROAD TO BOTLEY ROAD						MOVEMENT 8 FROM ROWNHAMS ROAD TO NUTBURN ROAD						MOVEMENT 9 FROM ROWNHAMS ROAD TO BOTLEY ROAD					
	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT
07:00	2	0	0	0	0	2	26	6	0	0	0	32	50	8	1	0	0	59
07:15	5	0	0	0	0	5	28	8	0	0	0	36	78	5	0	0	1	84
07:30	3	1	0	0	0	4	41	10	0	0	0	51	121	10	3	0	0	134
07:45	1	0	1	0	0	2	37	8	1	0	0	46	81	8	0	0	2	91
<b>H/TOT</b>	<b>11</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>132</b>	<b>32</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>165</b>	<b>330</b>	<b>31</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>368</b>
08:00	3	0	0	0	0	3	34	4	1	0	0	39	116	9	2	0	0	127
08:15	1	0	0	0	0	1	29	2	0	0	0	31	87	6	0	0	0	93
08:30	3	0	0	0	0	3	36	1	0	0	0	37	99	3	0	0	0	102
08:45	4	0	0	0	0	4	25	2	0	0	0	27	56	2	0	0	1	59
<b>H/TOT</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>124</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>134</b>	<b>358</b>	<b>20</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>381</b>
09:00	7	0	2	0	0	9	23	1	0	0	0	24	81	3	1	0	0	85
09:15	18	1	2	0	0	21	17	2	0	0	0	19	58	2	2	0	1	63
<b>HH/TOT</b>	<b>25</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>40</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>43</b>	<b>139</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>148</b>
<b>P/TOT</b>	<b>47</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>54</b>	<b>296</b>	<b>44</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>342</b>	<b>827</b>	<b>56</b>	<b>9</b>	<b>0</b>	<b>5</b>	<b>897</b>

# CLASSIFIED TURNING COUNTS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	MOVEMENT 10 FROM BOTLEY ROAD TO ROWNHAMS ROAD						MOVEMENT 11 FROM BOTLEY ROAD TO BOTLEY ROAD						MOVEMENT 12 FROM BOTLEY ROAD TO NUTBURN ROAD					
	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT
07:00	15	2	0	0	0	17	56	7	1	2	0	66	6	1	0	0	0	7
07:15	27	5	0	0	1	33	77	16	4	0	1	98	5	5	0	0	0	10
07:30	40	0	2	0	1	43	110	13	3	1	0	127	6	0	0	0	0	6
07:45	27	4	1	0	1	33	88	16	3	0	0	107	6	4	0	0	0	10
<b>H/TOT</b>	<b>109</b>	<b>11</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>126</b>	<b>331</b>	<b>52</b>	<b>11</b>	<b>3</b>	<b>1</b>	<b>398</b>	<b>23</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>
08:00	48	5	1	0	0	54	85	13	4	1	1	104	3	2	0	0	0	5
08:15	36	7	2	0	0	45	87	13	1	1	1	103	2	0	0	0	0	2
08:30	45	4	0	0	2	51	106	12	5	2	1	126	4	1	1	0	0	6
08:45	44	6	3	0	0	53	73	9	7	0	0	89	4	1	0	0	0	5
<b>H/TOT</b>	<b>173</b>	<b>22</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>203</b>	<b>351</b>	<b>47</b>	<b>17</b>	<b>4</b>	<b>3</b>	<b>422</b>	<b>13</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>18</b>
09:00	24	3	2	0	0	29	67	10	7	0	0	84	5	1	1	0	0	7
09:15	30	4	0	0	1	35	65	17	9	3	0	94	11	1	0	0	0	12
<b>HH/TOT</b>	<b>54</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>64</b>	<b>132</b>	<b>27</b>	<b>16</b>	<b>3</b>	<b>0</b>	<b>178</b>	<b>16</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>19</b>
<b>P/TOT</b>	<b>336</b>	<b>40</b>	<b>11</b>	<b>0</b>	<b>6</b>	<b>393</b>	<b>814</b>	<b>126</b>	<b>44</b>	<b>10</b>	<b>4</b>	<b>998</b>	<b>52</b>	<b>16</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>70</b>

# CLASSIFIED TURNING COUNTS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	TO ARM A NUTBURN ROAD						FROM ARM A NUTBURN ROAD					
	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT
07:00	34	8	0	0	0	42	23	8	0	0	0	31
07:15	42	15	0	0	0	57	38	6	2	0	0	46
07:30	58	13	0	0	0	71	71	6	0	0	0	77
07:45	60	12	1	0	0	73	62	6	0	0	0	68
<b>H/TOT</b>	194	48	1	0	0	243	194	26	2	0	0	222
08:00	50	9	1	0	0	60	95	6	1	0	0	102
08:15	42	3	0	0	0	45	119	2	1	0	1	123
08:30	60	4	1	0	0	65	121	3	1	0	0	125
08:45	44	3	0	0	0	47	102	1	1	0	0	104
<b>H/TOT</b>	196	19	2	0	0	217	437	12	4	0	1	454
09:00	43	3	1	0	0	47	66	6	0	0	0	72
09:15	56	6	2	0	1	65	30	3	0	0	1	34
<b>HH/TOT</b>	99	9	3	0	1	112	96	9	0	0	1	106
<b>P/TOT</b>	489	76	6	0	1	572	727	47	6	0	2	782

TO ARM A IS TOTAL OF MOVEMENTS 4, 8, 12  
 FROM ARM A IS TOTAL OF MOVEMENTS 1, 2, 3

# CLASSIFIED TURNING COUNTS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	TO ARM B BOTLEY ROAD						FROM ARM B BOTLEY ROAD					
	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT
07:00	67	12	1	2	0	82	87	11	1	1	0	100
07:15	97	18	5	0	1	121	128	15	3	1	0	147
07:30	137	17	3	1	0	158	169	24	0	1	0	194
07:45	108	19	4	0	0	131	151	11	0	2	4	168
<b>H/TOT</b>	<b>409</b>	<b>66</b>	<b>13</b>	<b>3</b>	<b>1</b>	<b>492</b>	<b>535</b>	<b>61</b>	<b>4</b>	<b>5</b>	<b>4</b>	<b>609</b>
08:00	119	15	5	1	1	141	139	24	3	4	4	174
08:15	125	14	1	1	1	142	139	7	3	1	0	150
08:30	155	12	5	2	1	175	173	14	0	1	0	188
08:45	109	9	7	0	0	125	124	11	4	4	4	147
<b>H/TOT</b>	<b>508</b>	<b>50</b>	<b>18</b>	<b>4</b>	<b>3</b>	<b>583</b>	<b>575</b>	<b>56</b>	<b>10</b>	<b>10</b>	<b>8</b>	<b>659</b>
09:00	97	13	9	0	0	119	123	18	0	4	2	147
09:15	93	18	11	3	0	125	127	15	7	7	2	158
<b>HH/TOT</b>	<b>190</b>	<b>31</b>	<b>20</b>	<b>3</b>	<b>0</b>	<b>244</b>	<b>250</b>	<b>33</b>	<b>7</b>	<b>11</b>	<b>4</b>	<b>305</b>
<b>P/TOT</b>	<b>1107</b>	<b>147</b>	<b>51</b>	<b>10</b>	<b>4</b>	<b>1319</b>	<b>1360</b>	<b>150</b>	<b>21</b>	<b>26</b>	<b>16</b>	<b>1573</b>

TO ARM B IS TOTAL OF MOVEMENTS 3, 7, 11  
 FROM ARM B IS TOTAL OF MOVEMENTS 4, 5, 6

# CLASSIFIED TURNING COUNTS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	TO ARM C ROWNHAMS ROAD						FROM ARM C ROWNHAMS ROAD					
	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT
07:00	30	5	0	0	0	35	78	14	1	0	0	93
07:15	45	9	3	0	1	58	111	13	0	0	1	125
07:30	75	2	2	0	1	80	165	21	3	0	0	189
07:45	62	6	1	0	1	70	119	16	2	0	2	139
<b>H/TOT</b>	<b>212</b>	<b>22</b>	<b>6</b>	<b>0</b>	<b>3</b>	<b>243</b>	<b>473</b>	<b>64</b>	<b>6</b>	<b>0</b>	<b>3</b>	<b>546</b>
08:00	99	8	1	0	0	108	153	13	3	0	0	169
08:15	95	7	4	0	0	106	117	8	0	0	0	125
08:30	104	6	1	0	2	113	138	4	0	0	0	142
08:45	102	7	5	0	0	114	85	4	0	0	1	90
<b>H/TOT</b>	<b>400</b>	<b>28</b>	<b>11</b>	<b>0</b>	<b>2</b>	<b>441</b>	<b>493</b>	<b>29</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>526</b>
09:00	58	5	2	0	0	65	111	4	3	0	0	118
09:15	48	7	2	0	2	59	93	5	4	0	1	103
<b>HH/TOT</b>	<b>106</b>	<b>12</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>124</b>	<b>204</b>	<b>9</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>221</b>
<b>P/TOT</b>	<b>718</b>	<b>62</b>	<b>21</b>	<b>0</b>	<b>7</b>	<b>808</b>	<b>1170</b>	<b>102</b>	<b>16</b>	<b>0</b>	<b>5</b>	<b>1293</b>

TO ARM C IS TOTAL OF MOVEMENTS 2, 6, 10  
FROM ARM C IS TOTAL OF MOVEMENTS 7, 8, 9

# CLASSIFIED TURNING COUNTS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	TO ARM D BOTLEY ROAD						FROM ARM D BOTLEY ROAD					
	CAR	LGV	OGV1	OGV2	PSV	TOT	CAR	LGV	OGV1	OGV2	PSV	TOT
07:00	134	18	2	1	0	155	77	10	1	2	0	90
07:15	202	18	1	1	1	223	109	26	4	0	2	141
07:30	291	32	3	1	0	327	156	13	5	1	1	176
07:45	223	20	0	2	6	251	121	24	4	0	1	150
<b>H/TOT</b>	<b>850</b>	<b>88</b>	<b>6</b>	<b>5</b>	<b>7</b>	<b>956</b>	<b>463</b>	<b>73</b>	<b>14</b>	<b>3</b>	<b>4</b>	<b>557</b>
08:00	255	31	5	4	4	299	136	20	5	1	1	163
08:15	238	13	2	1	1	255	125	20	3	1	1	150
08:30	268	16	0	1	0	285	155	17	6	2	3	183
08:45	177	13	3	4	5	202	121	16	10	0	0	147
<b>H/TOT</b>	<b>938</b>	<b>73</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>1041</b>	<b>537</b>	<b>73</b>	<b>24</b>	<b>4</b>	<b>5</b>	<b>643</b>
09:00	198	21	1	4	2	226	96	14	10	0	0	120
09:15	159	14	5	7	2	187	106	22	9	3	1	141
<b>HH/TOT</b>	<b>357</b>	<b>35</b>	<b>6</b>	<b>11</b>	<b>4</b>	<b>413</b>	<b>202</b>	<b>36</b>	<b>19</b>	<b>3</b>	<b>1</b>	<b>261</b>
<b>P/TOT</b>	<b>2145</b>	<b>196</b>	<b>22</b>	<b>26</b>	<b>21</b>	<b>2410</b>	<b>1202</b>	<b>182</b>	<b>57</b>	<b>10</b>	<b>10</b>	<b>1461</b>

TO ARM D IS TOTAL OF MOVEMENTS 1, 5, 9  
 FROM ARM C IS TOTAL OF MOVEMENTS 10, 11, 12

# QUEUE LENGTHS

SITE: 1

DATE: 11/03/2008



LOCATION: NUTBURN ROAD / BOTLEY ROAD / ROWNHAMS ROAD / BOTLEY ROAD

DAY: TUESDAY

TIME	ARM A - NUTBURN ROAD		ARM B - BOTLEY ROAD		ARM C - ROWNHAMS ROAD	ARM D - BOTLEY ROAD	
	LANE 1	LANE 2	LANE 1	LANE 2	LANE 1	LANE 1	LANE 2
07:00	3	0	2	1	5	2	2
07:05	2	0	8	1	5	7	2
07:10	2	0	4	1	10	4	2
07:15	1	0	8	4	10	12	1
07:20	5	0	14	3	11	16	4
07:25	3	0	18	3	12	18	3
07:30	4	2	9	2	24	6	1
07:35	7	2	25	3	25	14	3
07:40	6	2	25	3	23	24	3
07:45	9	2	19	3	18	15	2
07:50	8	2	16	1	28	10	2
07:55	10	2	24	2	31	18	3
08:00	10	2	29	4	24	19	3
08:05	12	1	40	2	25	16	2
08:10	15	3	38	2	28	19	3
08:15	16	3	44	4	30	22	3
08:20	12	2	36	1	32	18	1
08:25	9	1	25	2	40	16	2
08:30	8	2	31	1	38	16	2
08:35	8	0	26	3	30	19	2
08:40	16	2	24	1	15	15	1
08:45	9	1	21	2	14	16	1
08:50	4	2	30	1	13	15	2
08:55	6	2	30	2	20	10	1
09:00	9	2	28	2	18	8	1
09:05	4	2	27	2	19	7	2
09:10	5	0	26	2	14	5	1
09:15	4	0	11	1	17	8	2
09:20	3	1	13	3	12	8	4
09:25	2	0	12	2	10	14	3



**TVBC DEVELOPMENT IMPACT  
NORTH BADDESLEY CROSSROADS – 2012 UPDATE**

**APPENDIX B**

**TRIP MATRICES AND TURNING MOVEMENT CALCULATIONS**



**Table B1 2001 Census – Distribution of Trips**

	Romsey	N B W	N B E	Nursling	West Soton	East Soton	Totton & W'side	North Soton	Eastleigh	Other	Total
Romsey	966	12	24	52	598	419	225	36	463	2358	4948
N Baddesley E (development location)	85	3	99	30	214	136	42	12	139	462	1177
Nursling	9	3	9	49	170	96	52	6	59	180	609

Notes: This table shows the number of journey to work trips between the origins and destinations shown, extracted from the census. The actual number of trips contained within a settlement for all trip purposes is likely to be higher than that shown for journey to work trips only. The RMAS phase II study predicted that about 37% of all trips would be internal to the town. Hence the number of external trips is likely to be an overestimate or a 'worst case'. To derive all purpose proportions would require more detailed 'gravity' modelling.

The figures shown in the **white background** boxes represent those trips considered likely to pass through North Baddesley Crossroads. It is considered unlikely that Nursling trips will travel through Baddesley.

The census area for North Baddesley east is taken as the 'model' zone location for the proposed development in North Baddesley.

Abbreviations:  
 N Baddesley E and N B E – North Baddesley east (lower layer super output area from 2001 census data)  
 N B W – North Baddesley west; Sootn – Southampton; W'side – the Waterside settlements  
 Other – areas further afield outside the local/Southampton/Waterside areas  
 West Southampton and East Southampton are west and east of The Avenue respectively; North Southampton is Bassett, Chilworth and Swaythling

**Table B2 2001 Census – Proportional Distribution of Trips**

	Romsey	N B W	N B E	Nursling	West Soton	East Soton	Totton & W'side	North Soton	Eastleigh	Other
Romsey	0.20	0.00	0.00	0.01	0.12	0.08	0.05	0.01	0.09	0.44
N Baddesley E	0.07	0.00	0.08	0.03	0.18	0.12	0.04	0.01	0.12	0.35
Nursling	0.01	0.00	0.01	0.08	0.28	0.16	0.09	0.01	0.10	0.26

Notes: This table shows the proportional split of census derived trips between the origins and destinations shown, to 2 decimal places. See table 1 for abbreviations

**Table B3 – AM Peak Hour (0800-0900) Trips Generated by the proposed developments**

	Total	
	OUT	IN
Romsey	1070	345
North Baddesley	140	45
Nursling	163	53

Notes: This table shows the predicted total trip generation (internal and external) from each of the proposed developments. OUT means trips leaving the development; IN means trips arriving at the development

**Table B4 Routing Through the Crossroads**

	Romsey	N B W	<b>N B E</b>	Nursling	W Soton	E Soton	Totton & W	N Soton	Eastleigh	Other
Romsey						#[WE]		WE	WE	
N Baddesley W										
<b>N Baddesley E</b>						SE		SE	SE	**[SE,SN]
Nursling										
West Southampton										
East Southampton	#[EW]		ES							
Totton and Waterside										
North Southampton	EW		ES							
Eastleigh Fair Oak Bishopstoke	EW		ES							
Other			**[ES, NS]							
	[...] partial assignment									

Notes: This table shows the possible routing of trips through the crossroads  
 The figures shown in the **white background** boxes represent those trips considered likely to pass through North Baddesley Crossroads.  
 North Baddesley east as the model zone for the development in North Baddesley is assumed to be west of the settlement. Hence trips from for example Romsey West Southampton and Nursling will not pass through the crossroads  
 'WE' means west to east; SE, south to east; SN south to north; EW, ES and NS are the opposite movements  
 W stands for Botley Rd west; E for Botley Rd east; N for Nutburn Rd; S for Rownhams Rd  
 For Romsey - Southampton#[WE] and #[EW] for Romsey – Southampton, some traffic may travel through North Baddesley, but the majority are likely to use the M27. Hence for this assessment 40% are assumed to pass through North Baddesley. This may be an overestimate.  
 For 'other trips', to longer distance destinations traffic will tend to use major routes such as those through Romsey or reached via the M27 junction 3. Hence a minority of these trips will travel through the cross roads. For the purposes of this study, 25% of these trips are assumed to pass through the cross roads, 15% to/from Botley Road east, 10% to/from Nutburn Road.

**Table B5 Development Trips through the cross roads – OUTBOUND**

	Romsey	N B W	N B E	Nurs	W Soton	E Soton	Totton&W	N Soton	Eastleigh	Other	Other*	E Soton #	total
Romsey						91		8	100			36	1070
N Baddesley W													
N Baddesley E						16		1	17	50	13		140
Nursling													
West Southampton													
East Southampton													
Totton and Waterside													
North Southampton													
Eastleigh Fair Oak Bishopstoke													
Other													
* assumes 25% passes through junction, 15% SE, 10% SN (13 trips SE, 8 trips SN)						# assumes 40% passes through junction							

Notes: This table applies the proportions in table B2 to the number of outbound trips in table B3 to derive the estimated outbound (one way) trips from the developments likely to pass through the crossroads.  
 The East Soton and Other trips likely to pass through the crossroads have been estimated as shown in table B4 and accompanying notes

**Table B6 Morning Peak Hour Junction Trip Matrix for 'OUT' Trips by Turning Moves**

	Romsey	N B W	N B E	Nurs	W Soton	E Soton	Totton &W	N Soton	Eastleigh	Other				
Romsey						36		8	100				Total	
N Baddesley W														
N Baddesley E						16		1	17	8	5	WE	144	
Nursling												SE	42	
West Southampton												SN	5	
East Southampton														
Totton and Waterside														
North Southampton														
Eastleigh Fair Oak Bishopstoke														
Other														

Notes: This table shows the total outbound turning moves between arms for all developments, e.g. WE is west to east, derived from tables B4 and B5

**Table B7 Development Trips through the cross roads – INBOUND**

	Romsey	N B W	N B E	Nurs	W Soton	E Soton	Totton&W	N Soton	Eastleigh	Other	Other*	E Soton	total
Romsey						29		3	32			12	345
N Baddesley W													
N Baddesley E						5		0	5	16	4		45
Nursling													
West Southampton													
East Southampton													
Totton and Waterside													
North Southampton													
Eastleigh Fair Oak Bishopstoke													
Other													
						* assumes 25% passes through junction, 15% SE, 10% SN (13/8)							
						# assumes 40% passes through junction							

Notes: This table applies the proportions in table B2 to the number of inbound trips in table B3 to derive the estimated inbound (one way) trips to the developments likely to pass through the crossroads.

In this table the origins are shown in the column headings not the row headings

The East Soton and Other trips likely to pass through the crossroads have been estimated as shown in table B4 and accompanying notes

**Table B8 Morning Peak Hour Junction Trip Matrix for 'IN' Trips by Turning Moves**

	Romsey	N B W	N B E	Nurs	W Soton	E Soton	Totton & W	N Soton	Eastleigh	Other			
Romsey						12		3	32				Total
N Baddesley W												NS	2
N Baddesley E						5		0	5	2	2	EW	47
Nursling												ES	12
West Southampton													
East Southampton													
Totton and Waterside													
North Southampton													
Eastleigh Fair Oak Bishopstoke													
Other													

Notes: This table shows the total inbound turning moves between arms for all developments, e.g. EW is east to west, derived from table B4 and B7

**TVBC DEVELOPMENT IMPACT  
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**APPENDIX C**

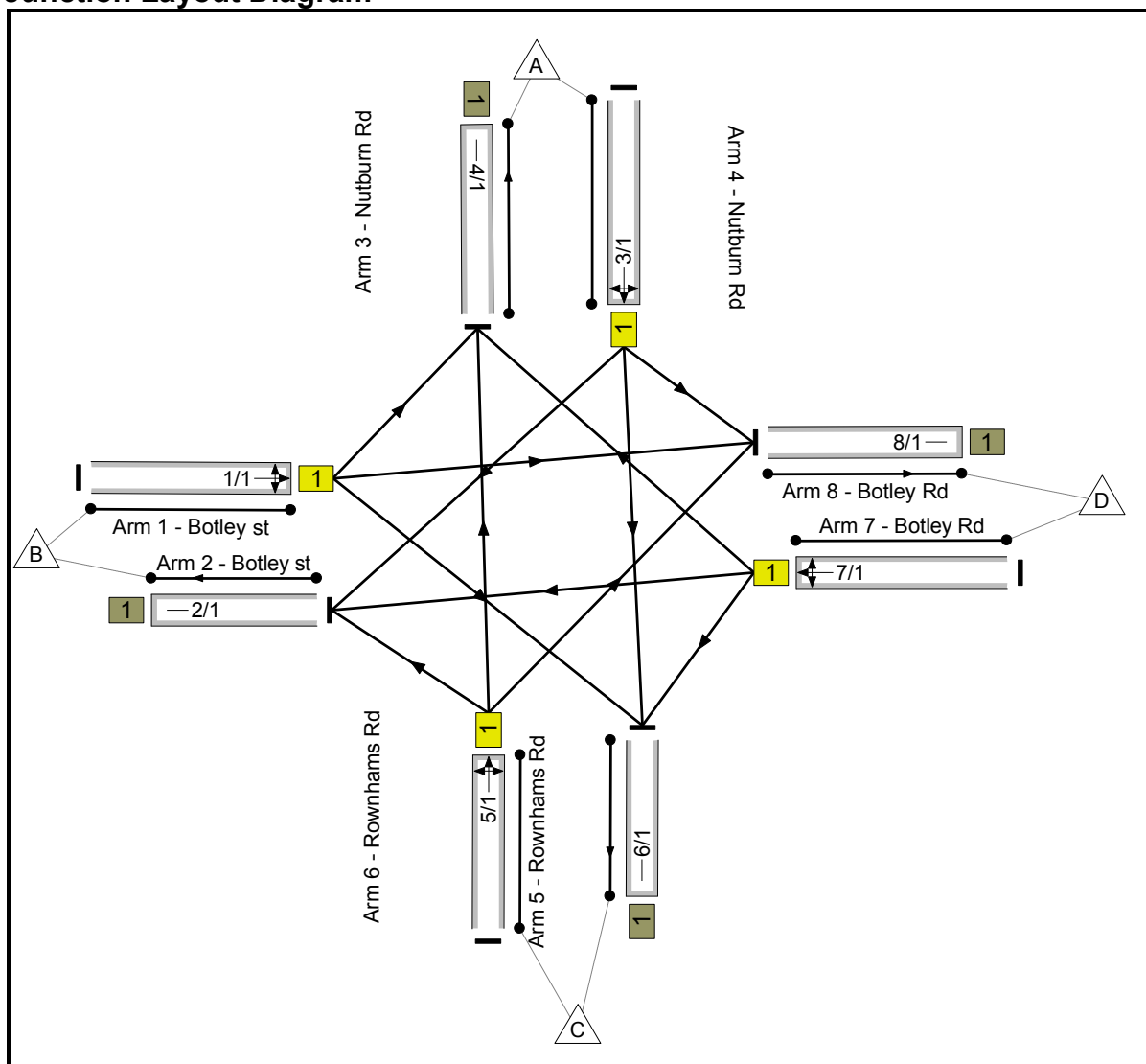
**LINSIG OUTPUTS**

## Full Input Data And Results

### User and Project Details

<b>Project:</b>	North Baddesley Cross Roads
<b>Title:</b>	
<b>Location:</b>	
<b>File name:</b>	NB Xrds_ all scenarios_2012.lsgx
<b>Author:</b>	N.J.George
<b>Company:</b>	
<b>Address:</b>	
<b>Controller:</b>	Generic
<b>SCN:</b>	
<b>Notes:</b>	

### Junction Layout Diagram





**Phase Diagram**



**Phase Input Data**

Phase Name	Phase type	Assoc Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Pedestrian		6	6
F	Pedestrian		6	6
G	Pedestrian		6	6
H	Pedestrian		6	6

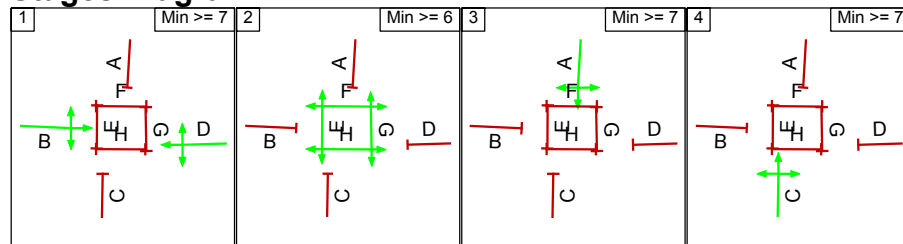
### Phase Intergrens Matrix

		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		7	7	7	7	7	7	7
	B	7		7	-	7	7	7	7
	C	7	7		7	7	7	7	7
	D	7	-	7		7	7	7	7
	E	9	9	9	9		-	-	-
	F	9	9	9	9	-		-	-
	G	9	9	9	9	-	-		-
	H	9	9	9	9	-	-	-	

### Phases in Stage

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

### Stages Diagram



### Phase Delays

There are no phase delays defined in this stage stream

### Prohibited Stage Changes

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

Full Input Data And Results

**Link Input Data**

Arm/ Link	Link Name	Link Type	Num Lanes	Phases	Start Disp.	End Disp.
1/1	Botley st Left Right Ahead	U	1	B	2	3
2/1	Botley st	U	1		2	3
3/1	Nutburn Rd Right Ahead Left	U	1	A	2	3
4/1	Nutburn Rd	U	1		2	3
5/1	Rownhams Rd Left Ahead Right	U	1	C	2	3
6/1	Rownhams Rd	U	1		2	3
7/1	Botley Rd Ahead Right Left	U	1	D	2	3
8/1	Botley Rd	U	1		2	3

**Give-Way Link Input Data Lane Input Data**

Arm/ Lane	Link Num	Physical Length (PCU)	Expected Usage (PCU)	Sat Flow Type	User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)
1/1 (Botley st Lane 1)	Link 1 (Botley st Left Right Ahead)	Inf	Inf	User	2300	4.00	0.00	N	Arm 4 Left (Nutburn Rd)	15.00
									Arm 6 Right (Rownhams Rd)	25.00
									Arm 8 Ahead (Botley Rd)	Inf
2/1 (Botley st Lane 1)	Link 1 (Botley st)	Inf	Inf	Inf (Exit)	1800	5.00	0.00	N		
3/1 (Nutburn Rd Lane 1)	Link 1 (Nutburn Rd Right Ahead Left)	Inf	Inf	User	3300	2.75	0.00	Y	Arm 2 Right (Botley st)	Inf
									Arm 6 Ahead (Rownhams Rd)	Inf
4/1 (Nutburn Rd Lane 1)	Link 1 (Nutburn Rd)	Inf	Inf	Inf (Exit)	1800	4.00	0.00	N		
5/1 (Rownhams Rd Lane 1)	Link 1 (Rownhams Rd Left Ahead Right)	Inf	Inf	User	2600	5.00	0.00	Y	Arm 8 Left (Botley Rd)	15.00
									Arm 2 Left (Botley st)	14.00
									Arm 4 Ahead (Nutburn Rd)	Inf
									Arm 8 Right (Botley Rd)	25.00
6/1 (Rownhams Rd Lane 1)	Link 1 (Rownhams Rd)	Inf	Inf	Inf (Exit)	1800	3.66	0.00	N		

Full Input Data And Results

7/1 (Botley Rd Lane 1)	Link 1 (Botley Rd Ahead Right Left)	Inf	Inf	User	2800	4.00	0.00	N	Arm 2 Ahead (Botley st)	Inf
									Arm 4 Right (Nutburn Rd)	25.00
									Arm 6 Left (Rownhams Rd)	15.00
8/1 (Botley Rd Lane 1)	Link 1 (Botley Rd)	Inf	Inf	Inf (Exit)	1800	3.25	0.00	Y		

**Traffic Flow Groups**

Flow Group	Start Time	End Time	Duration	Formula
1: '2008 AM peak'	08:00	09:00	01:00	
2: '2012 AM Peak + all dev'	08:00	09:00	01:00	
3: '2012 AM Peak + NB Dev only'	08:00	09:00	01:00	
4: '2031 Base'	08:00	09:00	01:00	F1*1.23145
5: '2012 AM peak'	08:00	09:00	01:00	F1*1.048063

**Flow Group 1: '2008 AM peak'**

**Traffic Flow Matrix**

**Desired Flow :**

	Destination					
	A	B	C	D	Tot.	
Origin	A	0	152	231	81	464
	B	68	0	13	624	705
	C	139	11	0	393	543
	D	21	459	219	0	699
	Tot.	228	622	463	1098	2411

**Link Traffic Flows**

Arm/Link	Flow Group 1: 2008 AM peak
1/1	705
2/1	622
3/1	464
4/1	228
5/1	543
6/1	463
7/1	699
8/1	1098

**Lane Saturation Flows**

Arm/ Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat flow (PCU/Hr)
1/1 (Botley st Lane 1)	This lane uses a directly entered Saturation Flow						2300
2/1 (Botley st Lane 1)	5.00	0.00	N				2255
3/1 (Nutburn Rd Lane 1)	This lane uses a directly entered Saturation Flow						3300
4/1 (Nutburn Rd Lane 1)	4.00	0.00	N				2155
5/1 (Rownhams Rd Lane 1)	This lane uses a directly entered Saturation Flow						2600
6/1 (Rownhams Rd Lane 1)	3.66	0.00	N				2121
7/1 (Botley Rd Lane 1)	This lane uses a directly entered Saturation Flow						2800
8/1 (Botley Rd Lane 1)	Infinite Saturation Flow (on Exit Link)						Inf

**Flow Group 2: '2012 AM Peak + all dev'****Traffic Flow Matrix****Desired Flow :**

	Destination					
		A	B	C	D	Tot.
Origin	A	0	159	244	85	488
	B	71	0	14	798	883
	C	151	12	0	454	617
	D	22	528	242	0	792
	Tot.	244	699	500	1337	2780

**Link Traffic Flows**

Arm/Link	Flow Group 2: 2012 AM Peak + all dev
1/1	883
2/1	699
3/1	488
4/1	244
5/1	617
6/1	500
7/1	792
8/1	1337

**Lane Saturation Flows**

Arm/Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat flow (PCU/Hr)
1/1 (Botley st Lane 1)	This lane uses a directly entered Saturation Flow						2300
2/1 (Botley st Lane 1)	5.00	0.00	N				2255
3/1 (Nutburn Rd Lane 1)	This lane uses a directly entered Saturation Flow						3300
4/1 (Nutburn Rd Lane 1)	4.00	0.00	N				2155
5/1 (Rownhams Rd Lane 1)	This lane uses a directly entered Saturation Flow						2600
6/1 (Rownhams Rd Lane 1)	3.66	0.00	N				2121
7/1 (Botley Rd Lane 1)	This lane uses a directly entered Saturation Flow						2800
8/1 (Botley Rd Lane 1)	Infinite Saturation Flow (on Exit Link)						Inf



**Flow Group 3: '2012 AM Peak + NB Dev only'**  
**Traffic Flow Matrix**  
**Desired Flow :**

		Destination				
		A	B	C	D	Tot.
Origin	A	0	159	244	85	488
	B	71	0	14	654	739
	C	151	12	0	454	617
	D	22	481	242	0	745
	Tot.	244	652	500	1193	2589

**Link Traffic Flows**

Arm/Link	Flow Group 3: 2012 AM Peak + NB Dev only
1/1	739
2/1	652
3/1	488
4/1	244
5/1	617
6/1	500
7/1	745
8/1	1193

**Lane Saturation Flows**

Arm/ Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat flow (PCU/Hr)
1/1 (Botley st Lane 1)	This lane uses a directly entered Saturation Flow						2300
2/1 (Botley st Lane 1)	5.00	0.00	N				2255
3/1 (Nutburn Rd Lane 1)	This lane uses a directly entered Saturation Flow						3300
4/1 (Nutburn Rd Lane 1)	4.00	0.00	N				2155
5/1 (Rownhams Rd Lane 1)	This lane uses a directly entered Saturation Flow						2600
6/1 (Rownhams Rd Lane 1)	3.66	0.00	N				2121
7/1 (Botley Rd Lane 1)	This lane uses a directly entered Saturation Flow						2800
8/1 (Botley Rd Lane 1)	Infinite Saturation Flow (on Exit Link)						Inf

**Flow Group 4: '2031 Base'**

**Traffic Flow Matrix**

**Desired Flow :**

	Destination					
	A	B	C	D	Tot.	
Origin	A	0	187	284	100	571
	B	84	0	16	768	868
	C	171	14	0	484	669
	D	26	565	270	0	861
	Tot.	281	766	570	1352	2969

**Link Traffic Flows**

Arm/Link	Flow Group 4: 2031 Base
1/1	868
2/1	766
3/1	571
4/1	281
5/1	669
6/1	570
7/1	861
8/1	1352

**Lane Saturation Flows**

Arm/Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat flow (PCU/Hr)
1/1 (Botley st Lane 1)	This lane uses a directly entered Saturation Flow						2300
2/1 (Botley st Lane 1)	5.00	0.00	N				2255
3/1 (Nutburn Rd Lane 1)	This lane uses a directly entered Saturation Flow						3300
4/1 (Nutburn Rd Lane 1)	4.00	0.00	N				2155
5/1 (Rownhams Rd Lane 1)	This lane uses a directly entered Saturation Flow						2600
6/1 (Rownhams Rd Lane 1)	3.66	0.00	N				2121
7/1 (Botley Rd Lane 1)	This lane uses a directly entered Saturation Flow						2800
8/1 (Botley Rd Lane 1)	Infinite Saturation Flow (on Exit Link)						Inf

**Flow Group 5: '2012 AM peak'**

**Traffic Flow Matrix**

**Desired Flow :**

		Destination				
		A	B	C	D	Tot.
Origin	A	0	159	242	85	486
	B	71	0	14	654	739
	C	146	12	0	412	569
	D	22	481	230	0	733
	Tot.	239	652	485	1151	2527

**Link Traffic Flows**

Arm/Link	Flow Group 5: 2012 AM peak
1/1	739
2/1	652
3/1	486
4/1	239
5/1	569
6/1	485
7/1	733
8/1	1151

### Lane Saturation Flows

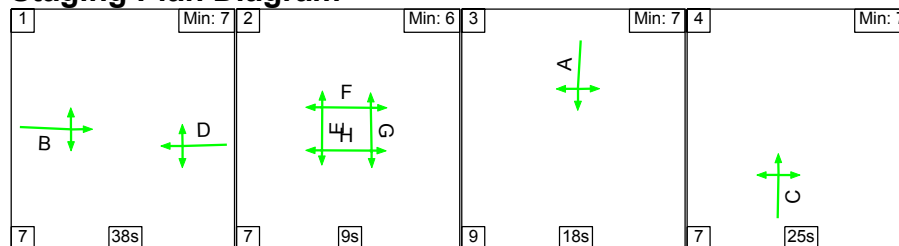
Arm/ Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat flow (PCU/Hr)
1/1 (Botley st Lane 1)	This lane uses a directly entered Saturation Flow						2300
2/1 (Botley st Lane 1)	5.00	0.00	N				2255
3/1 (Nutburn Rd Lane 1)	This lane uses a directly entered Saturation Flow						3300
4/1 (Nutburn Rd Lane 1)	4.00	0.00	N				2155
5/1 (Rownhams Rd Lane 1)	This lane uses a directly entered Saturation Flow						2600
6/1 (Rownhams Rd Lane 1)	3.66	0.00	N				2121
7/1 (Botley Rd Lane 1)	This lane uses a directly entered Saturation Flow						2800
8/1 (Botley Rd Lane 1)	Infinite Saturation Flow (on Exit Link)						Inf

### Scenario 1: '2008 AM Peak - Base'

Staging Plan 1: 'AM Peak - Base'

Flow Group 1: '2008 AM peak'

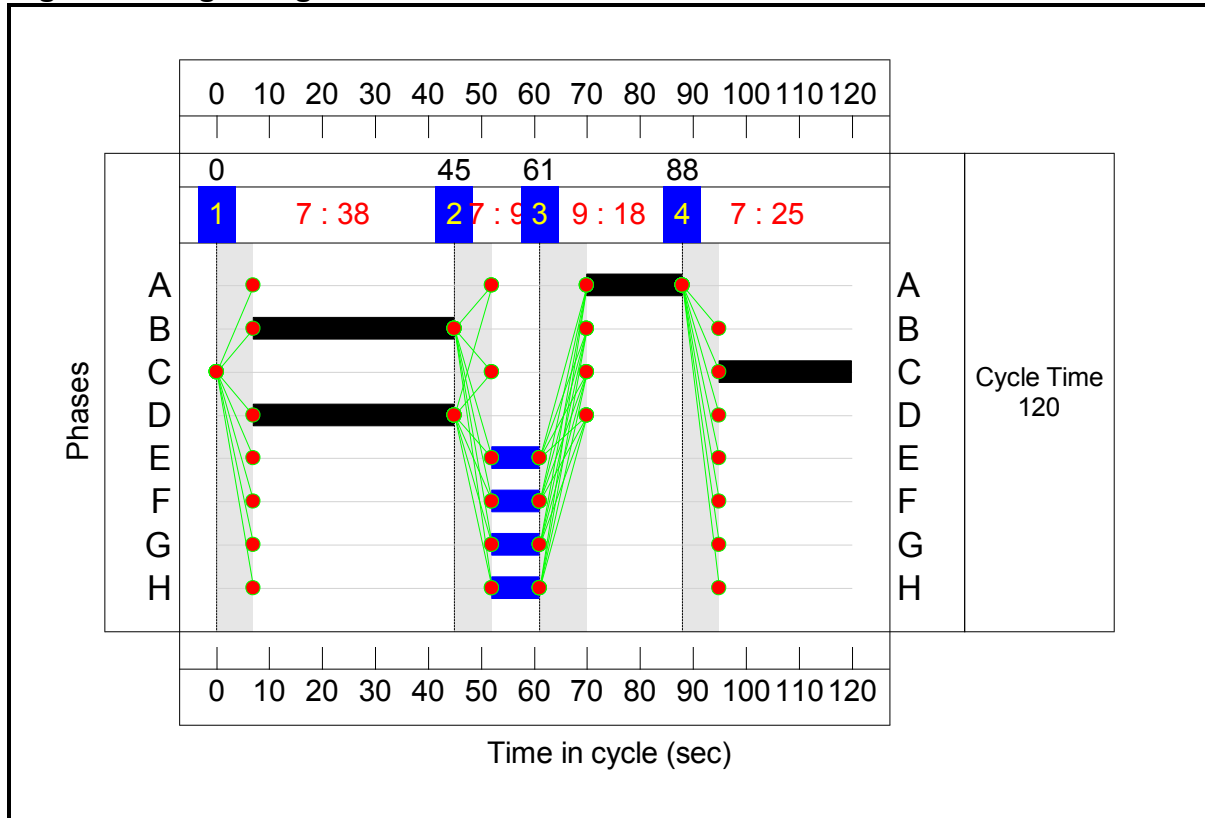
### Staging Plan Diagram



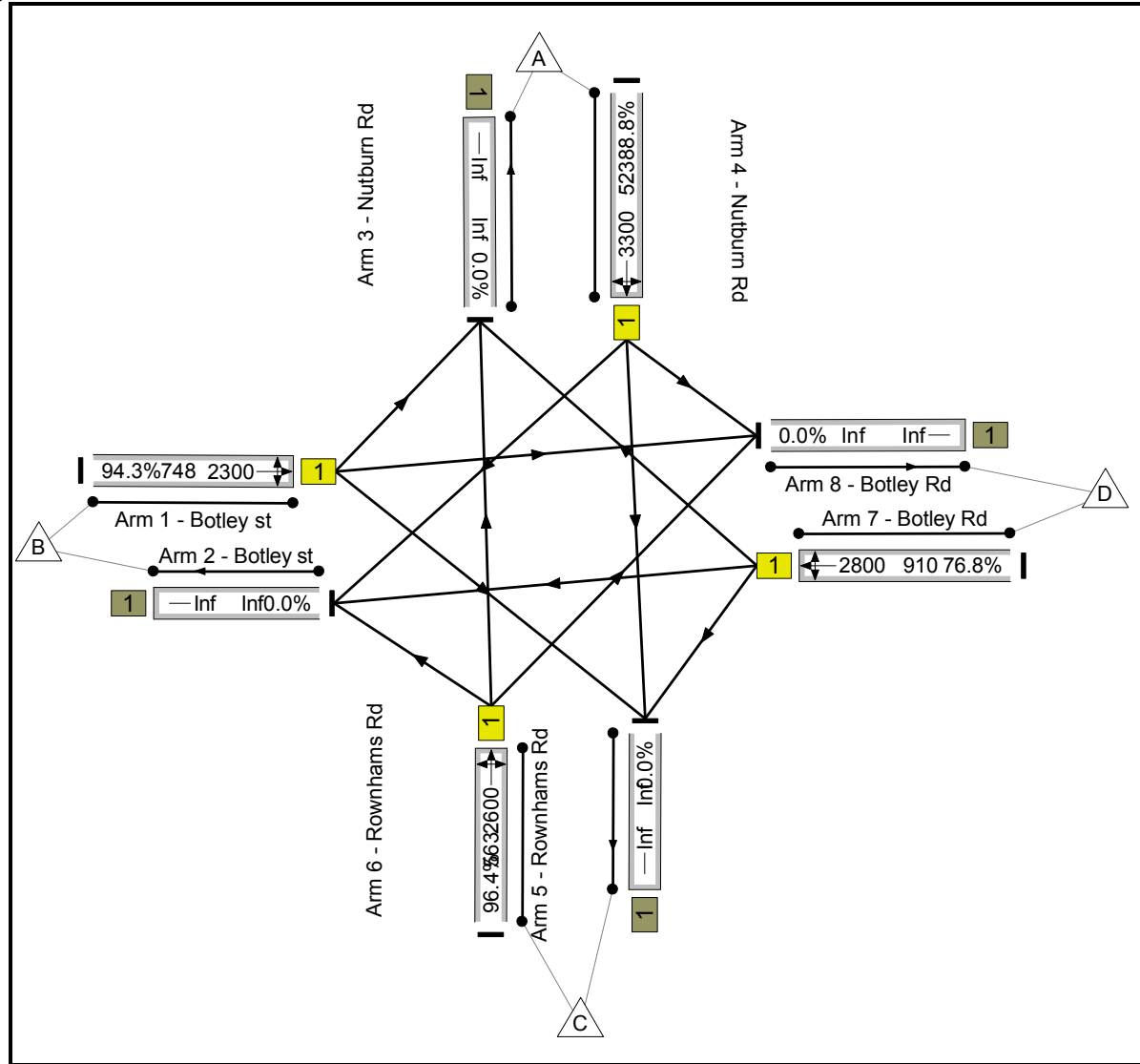
### Stage Timings

Stage	1	2	3	4
Duration	38	9	18	25
Change Point	0	45	61	88

### Signal Timings Diagram



### Junction Layout Diagram



Full Input Data And Results

**Link Results**

Link Num	Link Desc	Link Type	Stage Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Max Sat Flow (pcu/Hr)	Ave Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
1/1	Botley st Left Right Ahead	U	N/A	N/A	B		1	38	-	705	2300	2300	748	94.3
2/1	Botley st	U	N/A	N/A	-		-	-	-	622	Inf	Inf	Inf	0.0
3/1	Nutburn Rd Right Ahead Left	U	N/A	N/A	A		1	18	-	464	3300	3300	523	88.8
4/1	Nutburn Rd	U	N/A	N/A	-		-	-	-	228	Inf	Inf	Inf	0.0
5/1	Rownhams Rd Left Ahead Right	U	N/A	N/A	C		1	25	-	543	2600	2600	563	96.4
6/1	Rownhams Rd	U	N/A	N/A	-		-	-	-	463	Inf	Inf	Inf	0.0
7/1	Botley Rd Ahead Right Left	U	N/A	N/A	D		1	38	-	699	2800	2800	910	76.8
8/1	Botley Rd	U	N/A	N/A	-		-	-	-	1098	Inf	Inf	Inf	0.0



Full Input Data And Results

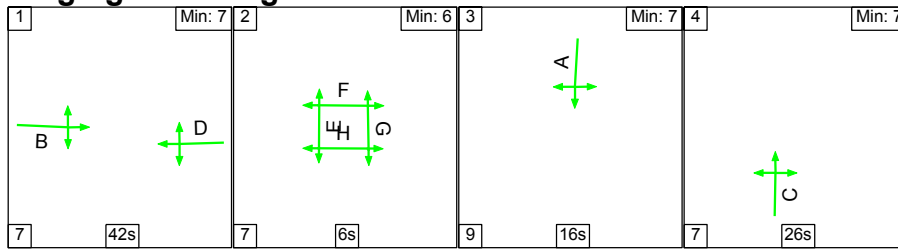
Link Num	Entering (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per Veh (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)		
1/1	705	705	-	-	-	7.7	6.4	-	14.1	72.0	22.7	6.4	29.1		
2/1	622	622	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
3/1	464	464	-	-	-	6.4	3.5	-	9.9	76.9	15.1	3.5	18.6		
4/1	228	228	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
5/1	543	543	-	-	-	7.0	7.6	-	14.6	97.1	17.8	7.6	25.4		
6/1	463	463	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
7/1	699	699	-	-	-	7.1	1.6	-	8.7	44.8	20.8	1.6	22.4		
8/1	1098	1098	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
PRC for Signalled Links (%):				-7.1	Total Delay for Signalled Links (pcuHr):				47.37						
PRC Over All Links (%):				-7.1	Total Delay Over All Links(pcuHr):				47.37	Cycle Time (s): 120					

**Scenario 2: '2012 AM Peak + All Dev'**

Staging Plan 1: 'AM Peak - Base'

Flow Group 2: '2012 AM Peak + all dev'

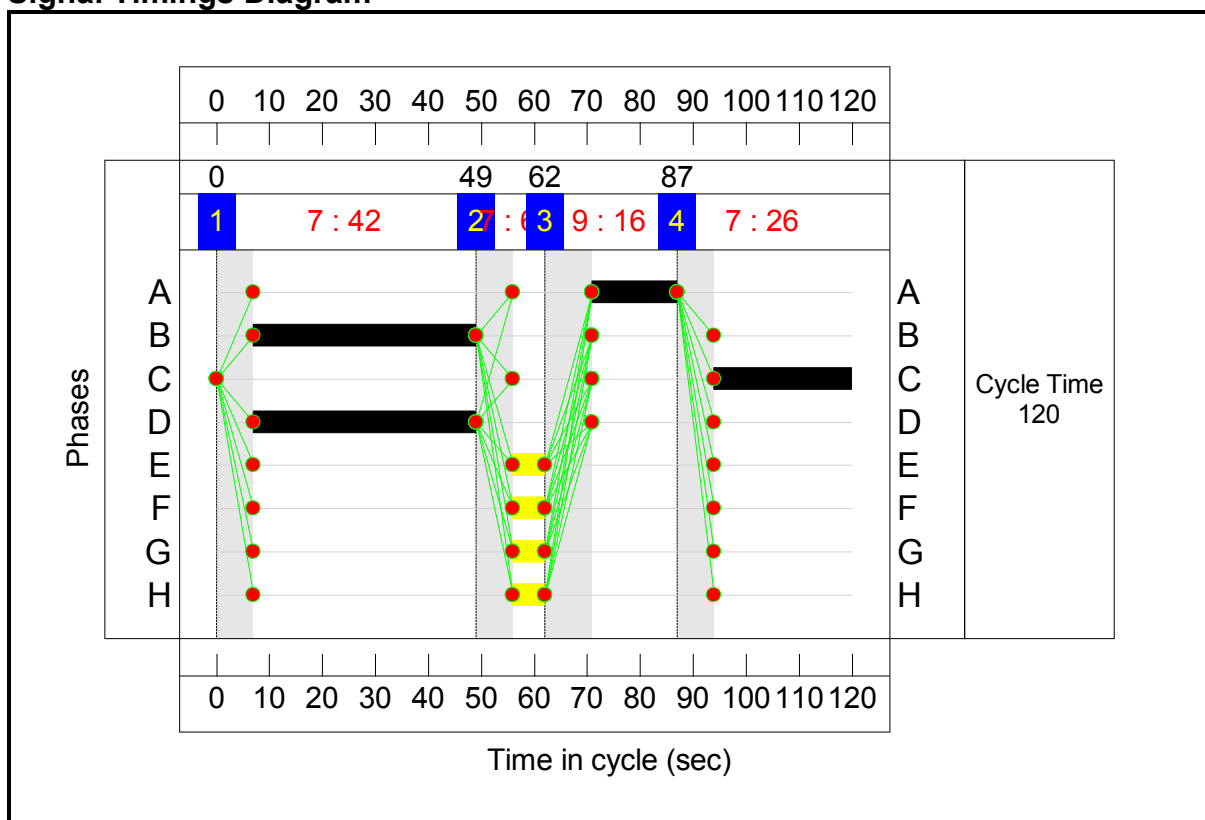
**Staging Plan Diagram**



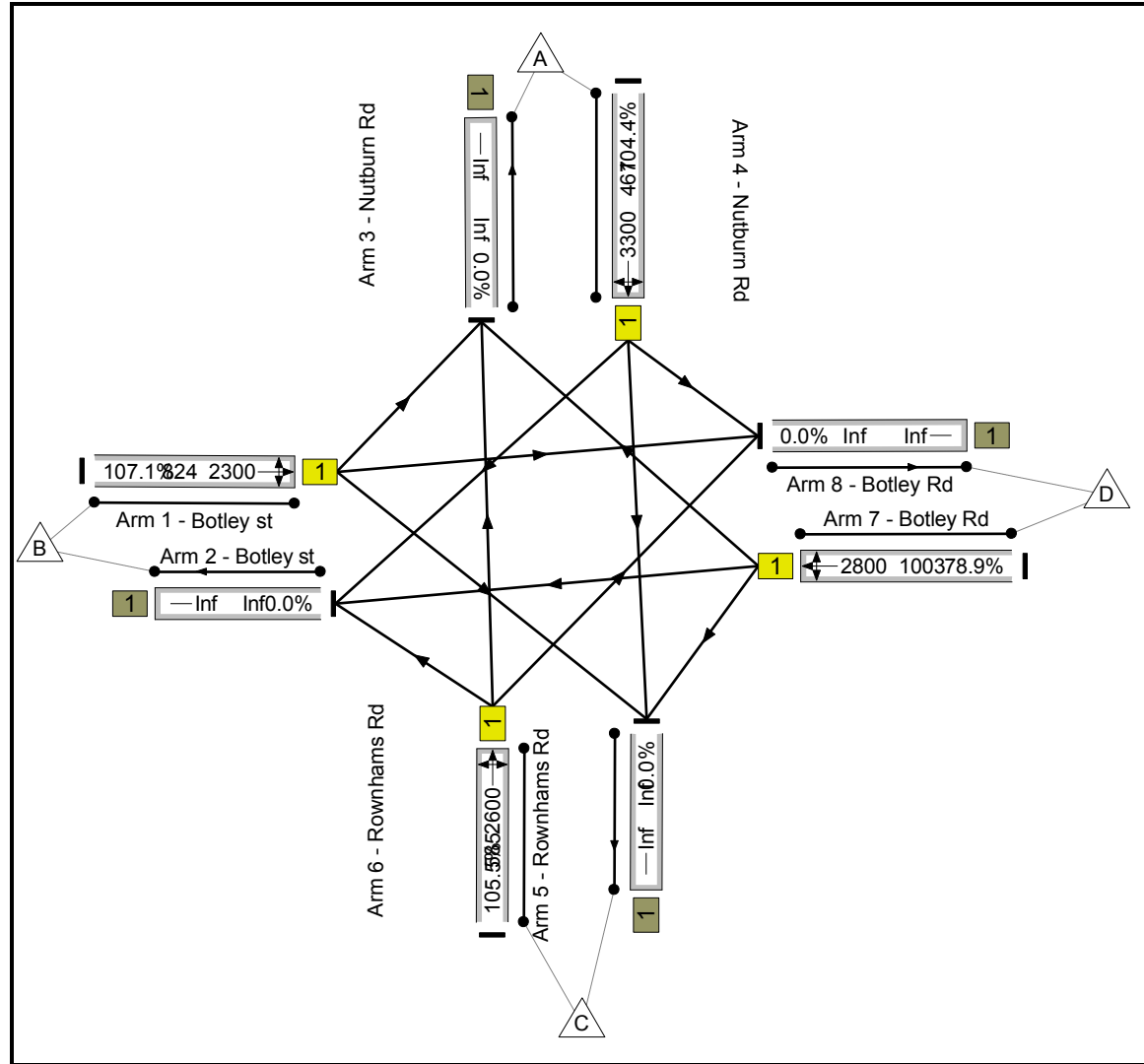
**Stage Timings**

Stage	1	2	3	4
Duration	42	6	16	26
Change Point	0	49	62	87

**Signal Timings Diagram**



### Junction Layout Diagram



Full Input Data And Results

**Link Results**

Link Num	Link Desc	Link Type	Stage Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Max Sat Flow (pcu/Hr)	Ave Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
1/1	Botley st Left Right Ahead	U	N/A	N/A	B		1	42	-	883	2300	2300	824	107.1
2/1	Botley st	U	N/A	N/A	-		-	-	-	699	Inf	Inf	Inf	0.0
3/1	Nutburn Rd Right Ahead Left	U	N/A	N/A	A		1	16	-	488	3300	3300	467	104.4
4/1	Nutburn Rd	U	N/A	N/A	-		-	-	-	244	Inf	Inf	Inf	0.0
5/1	Rownhams Rd Left Ahead Right	U	N/A	N/A	C		1	26	-	617	2600	2600	585	105.5
6/1	Rownhams Rd	U	N/A	N/A	-		-	-	-	500	Inf	Inf	Inf	0.0
7/1	Botley Rd Ahead Right Left	U	N/A	N/A	D		1	42	-	792	2800	2800	1003	78.9
8/1	Botley Rd	U	N/A	N/A	-		-	-	-	1337	Inf	Inf	Inf	0.0

Full Input Data And Results

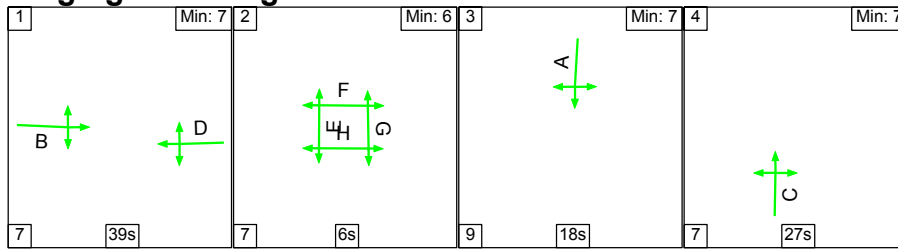
Link Num	Entering (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per Veh (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)	
1/1	883	824	-	-	-	12.9	35.6	-	48.5	197.7	31.4	35.6	67.0	
2/1	692	692	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
3/1	488	468	-	-	-	7.9	17.3	-	25.2	185.8	17.0	17.3	34.3	
4/1	231	231	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
5/1	617	585	-	-	-	10.2	22.8	-	33.0	192.4	22.2	22.8	45.0	
6/1	489	489	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
7/1	792	792	-	-	-	7.6	1.8	-	9.4	42.8	23.5	1.8	25.4	
8/1	1257	1257	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
PRC for Signalled Links (%):			-19.0		Total Delay for Signalled Links (pcuHr):			116.07						
PRC Over All Links (%):			-19.0		Total Delay Over All Links(pcuHr):			116.07		Cycle Time (s): 120				

**Scenario 3: '2031 Base'**

Staging Plan 1: 'AM Peak - Base'

Flow Group 4: '2031 Base'

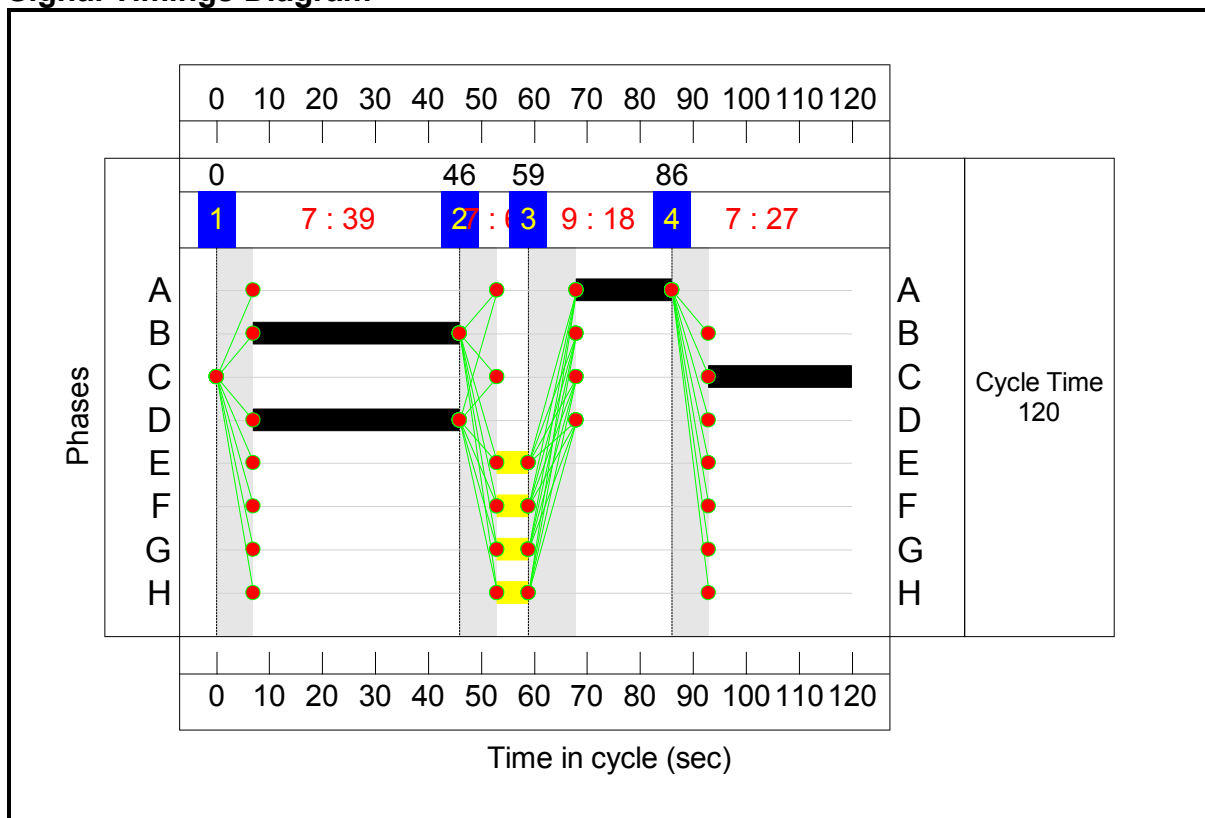
**Staging Plan Diagram**



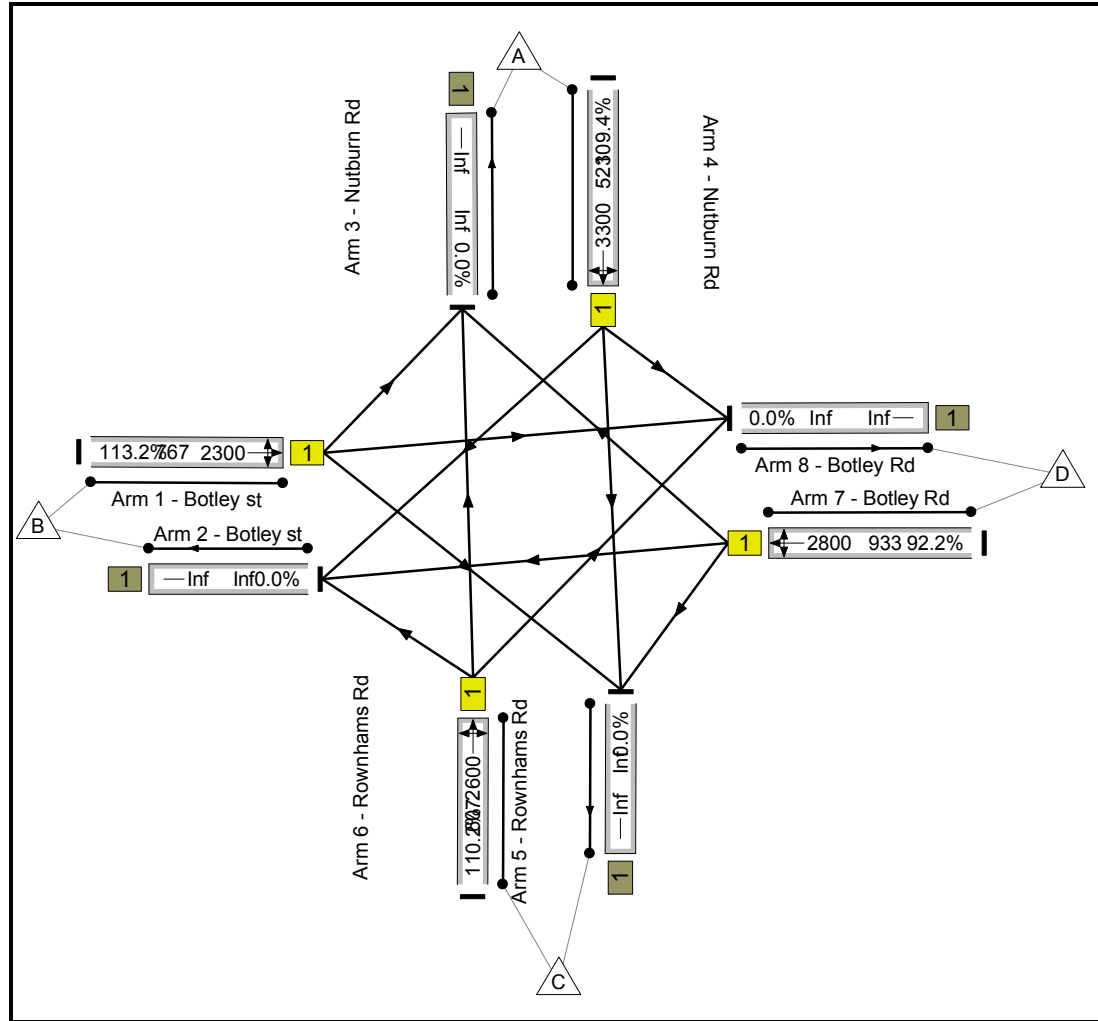
**Stage Timings**

Stage	1	2	3	4
Duration	39	6	18	27
Change Point	0	46	59	86

**Signal Timings Diagram**



### Junction Layout Diagram



Full Input Data And Results

**Link Results**

Link Num	Link Desc	Link Type	Stage Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Max Sat Flow (pcu/Hr)	Ave Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
1/1	Botley st Left Right Ahead	U	N/A	N/A	B		1	39	-	868	2300	2300	767	113.2
2/1	Botley st	U	N/A	N/A	-		-	-	-	766	Inf	Inf	Inf	0.0
3/1	Nutburn Rd Right Ahead Left	U	N/A	N/A	A		1	18	-	571	3300	3300	523	109.4
4/1	Nutburn Rd	U	N/A	N/A	-		-	-	-	281	Inf	Inf	Inf	0.0
5/1	Rownhams Rd Left Ahead Right	U	N/A	N/A	C		1	27	-	669	2600	2600	607	110.2
6/1	Rownhams Rd	U	N/A	N/A	-		-	-	-	570	Inf	Inf	Inf	0.0
7/1	Botley Rd Ahead Right Left	U	N/A	N/A	D		1	39	-	861	2800	2800	933	92.2
8/1	Botley Rd	U	N/A	N/A	-		-	-	-	1352	Inf	Inf	Inf	0.0



Full Input Data And Results

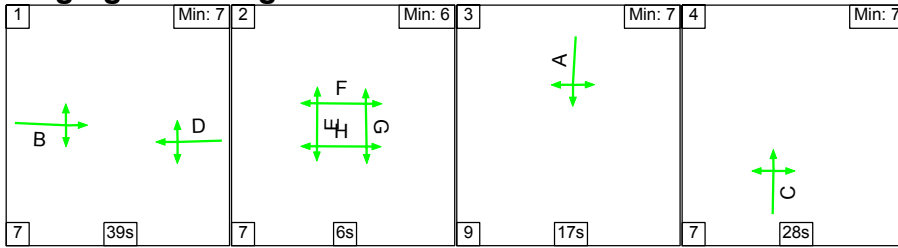
Link Num	Entering (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per Veh (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)	
1/1	868	767	-	-	-	15.6	54.7	-	70.3	291.6	32.3	54.7	87.0	
2/1	749	749	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
3/1	571	523	-	-	-	10.2	29.3	-	39.5	249.0	20.7	29.3	50.0	
4/1	255	255	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
5/1	669	607	-	-	-	12.9	35.7	-	48.6	261.5	25.9	35.7	61.6	
6/1	544	544	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
7/1	861	861	-	-	-	9.2	5.2	-	14.4	60.2	27.5	5.2	32.7	
8/1	1209	1209	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
PRC for Signalled Links (%):			-25.8		Total Delay for Signalled Links (pcuHr):			172.81						
PRC Over All Links (%):			-25.8		Total Delay Over All Links(pcuHr):			172.81		Cycle Time (s): 120				

**Scenario 4: '2012 AM peak + NB Dev'**

Staging Plan 1: 'AM Peak - Base'

Flow Group 3: '2012 AM Peak + NB Dev only'

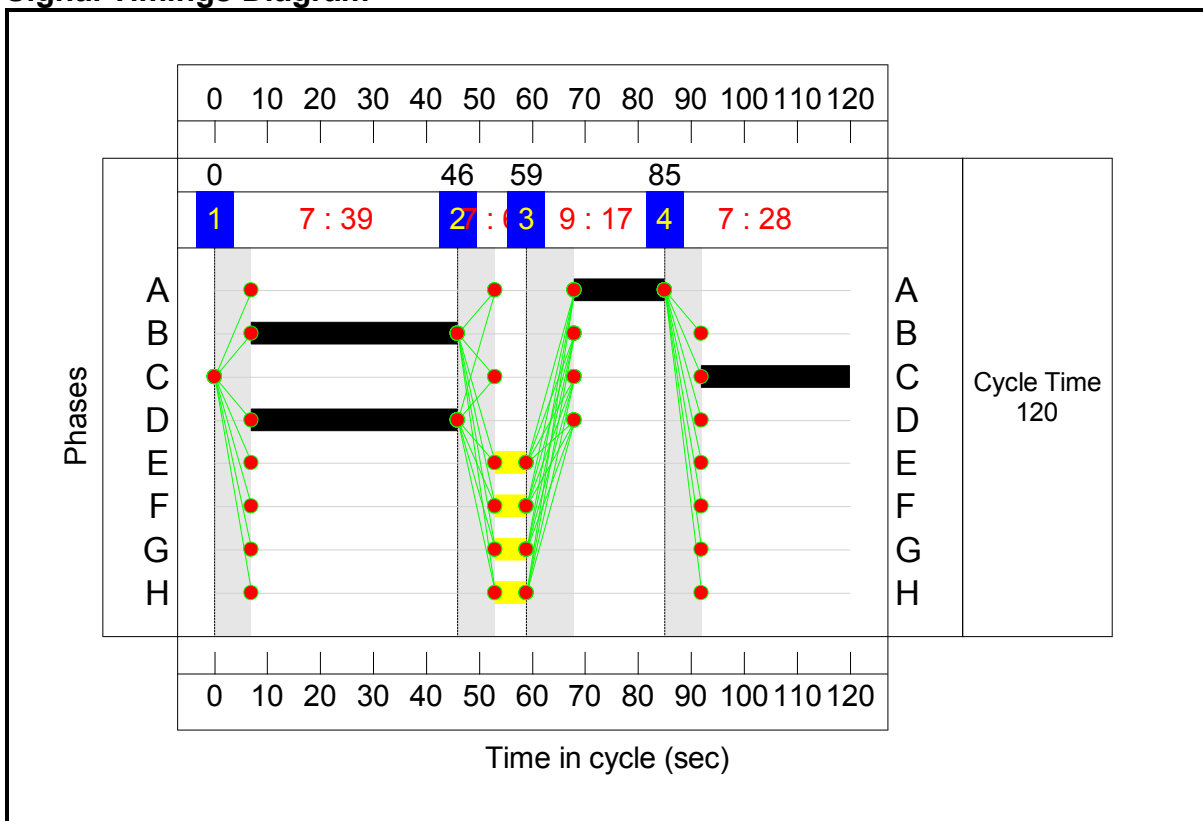
**Staging Plan Diagram**



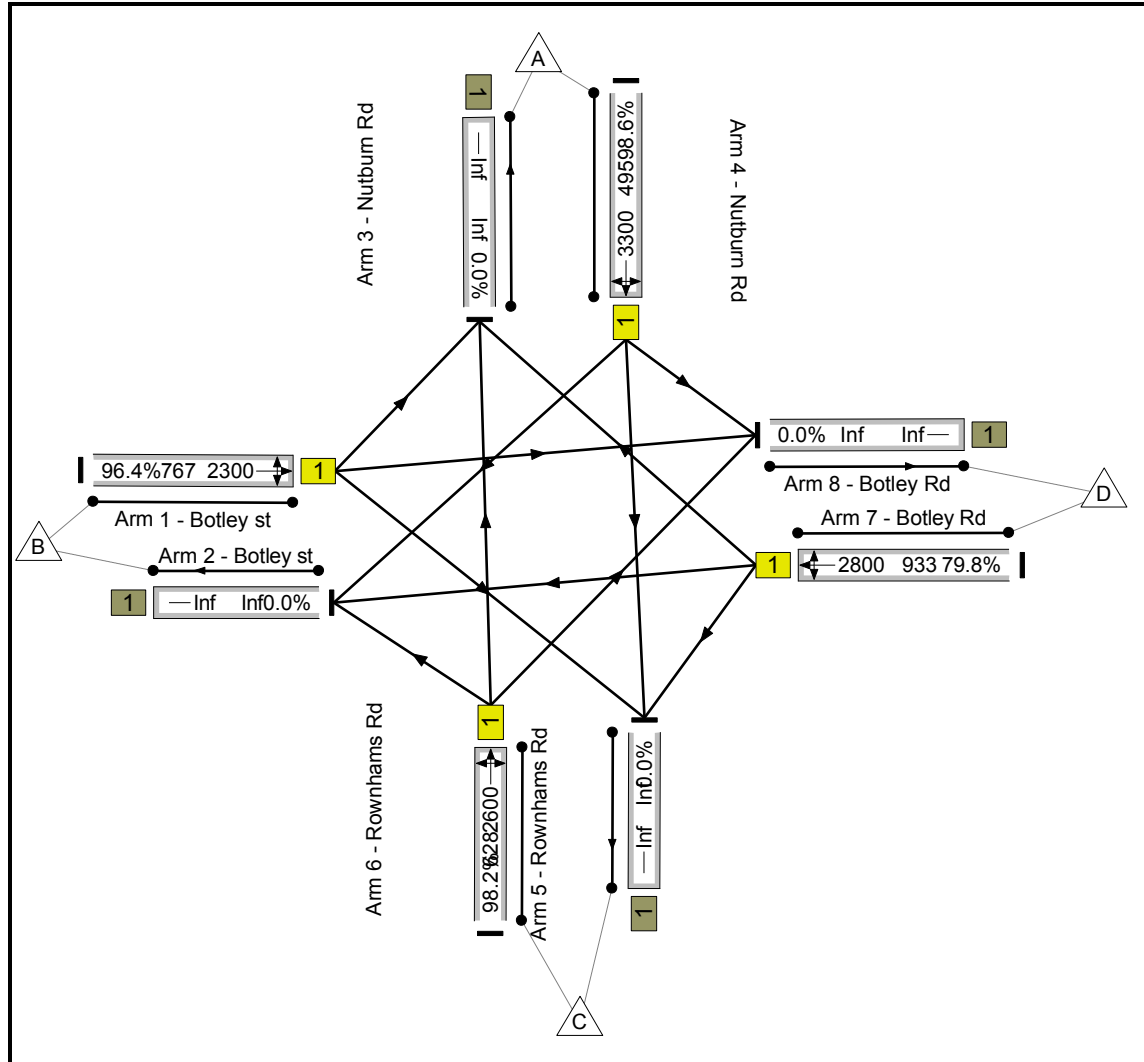
**Stage Timings**

Stage	1	2	3	4
Duration	39	6	17	28
Change Point	0	46	59	85

**Signal Timings Diagram**



### Junction Layout Diagram



Full Input Data And Results

**Link Results**

Link Num	Link Desc	Link Type	Stage Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Max Sat Flow (pcu/Hr)	Ave Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
1/1	Botley st Left Right Ahead	U	N/A	N/A	B		1	39	-	739	2300	2300	767	96.4
2/1	Botley st	U	N/A	N/A	-		-	-	-	652	Inf	Inf	Inf	0.0
3/1	Nutburn Rd Right Ahead Left	U	N/A	N/A	A		1	17	-	488	3300	3300	495	98.6
4/1	Nutburn Rd	U	N/A	N/A	-		-	-	-	244	Inf	Inf	Inf	0.0
5/1	Rownhams Rd Left Ahead Right	U	N/A	N/A	C		1	28	-	617	2600	2600	628	98.2
6/1	Rownhams Rd	U	N/A	N/A	-		-	-	-	500	Inf	Inf	Inf	0.0
7/1	Botley Rd Ahead Right Left	U	N/A	N/A	D		1	39	-	745	2800	2800	933	79.8
8/1	Botley Rd	U	N/A	N/A	-		-	-	-	1193	Inf	Inf	Inf	0.0

Full Input Data And Results

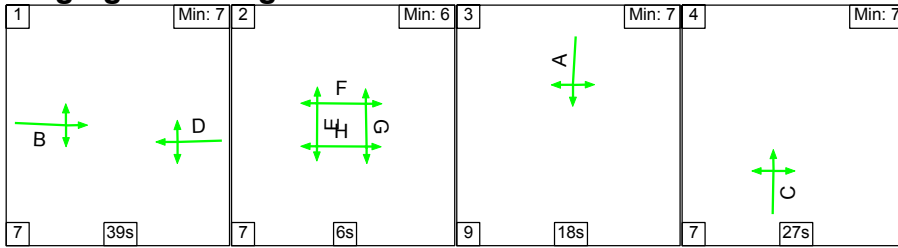
Link Num	Entering (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per Veh (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)		
1/1	739	739	-	-	-	8.1	8.3	-	16.4	79.9	24.0	8.3	32.4		
2/1	652	652	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
3/1	488	488	-	-	-	6.9	9.4	-	16.3	120.5	16.1	9.4	25.6		
4/1	244	244	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
5/1	617	617	-	-	-	7.8	9.9	-	17.7	103.0	20.4	9.9	30.3		
6/1	500	500	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
7/1	745	745	-	-	-	7.5	1.9	-	9.5	45.7	22.6	1.9	24.5		
8/1	1193	1193	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
PRC for Signalled Links (%):				-9.5	Total Delay for Signalled Links (pcuHr):				59.85						
PRC Over All Links (%):				-9.5	Total Delay Over All Links (pcuHr):				59.85	Cycle Time (s): 120					

**Scenario 5: '2012 AM Peak-Existing'**

Staging Plan 1: 'AM Peak - Base'

Flow Group 5: '2012 AM peak'

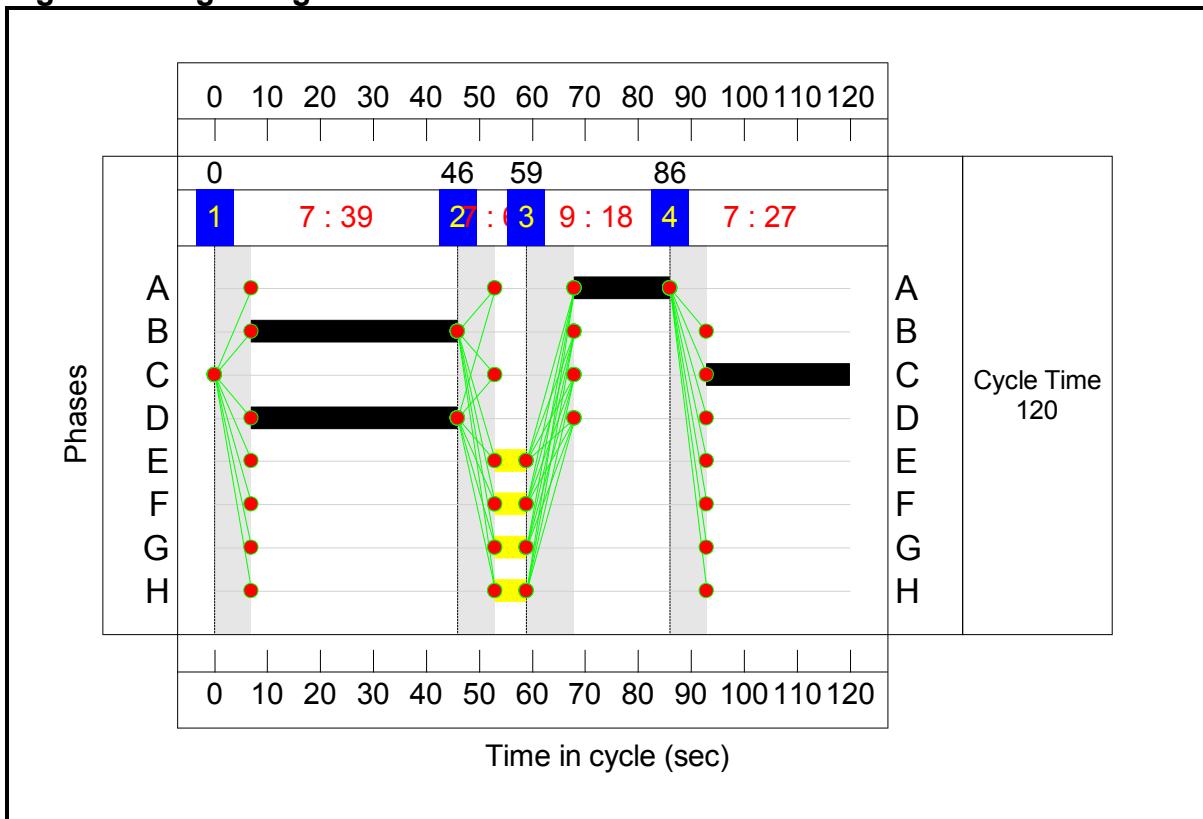
**Staging Plan Diagram**



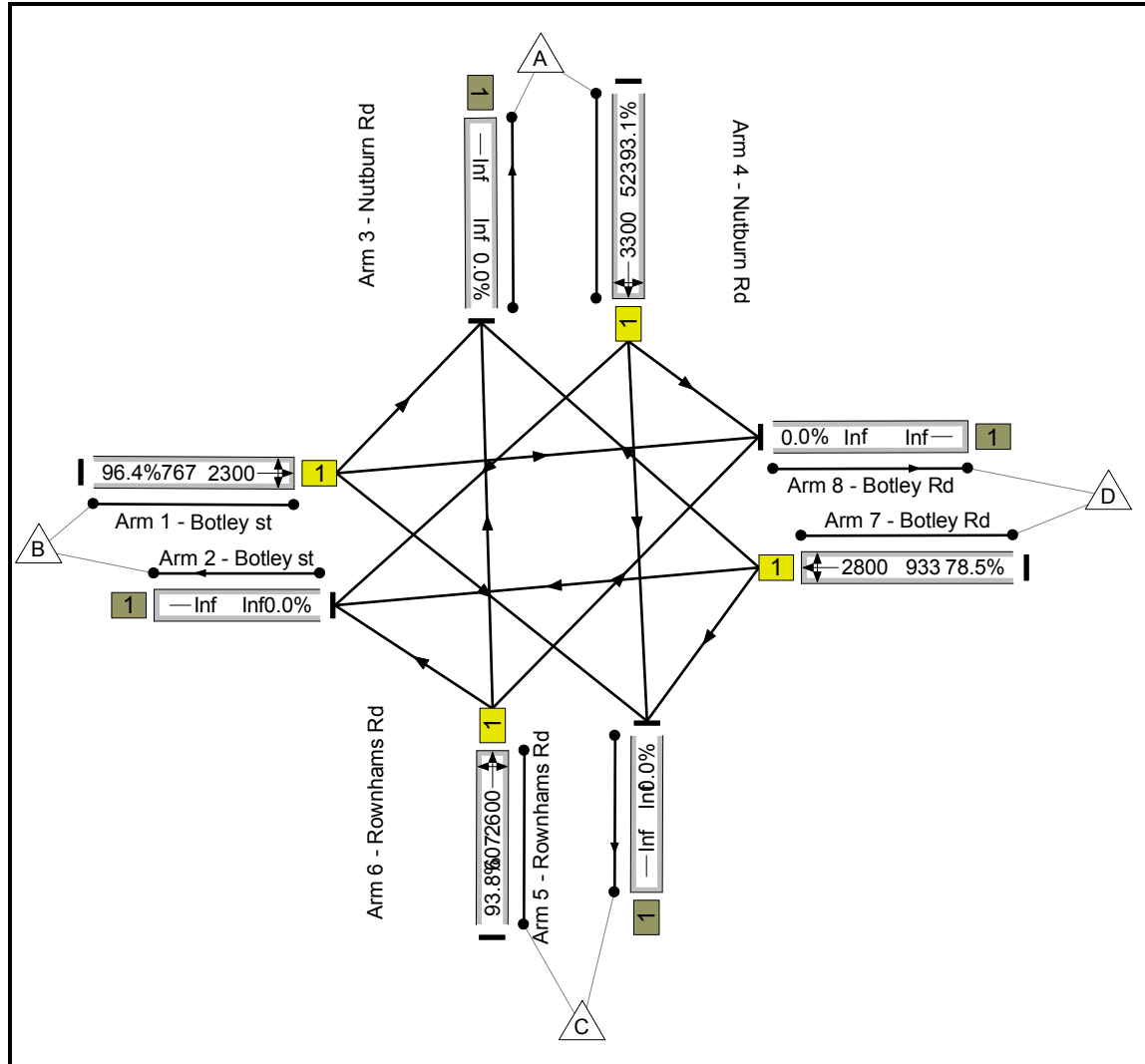
**Stage Timings**

Stage	1	2	3	4
Duration	39	6	18	27
Change Point	0	46	59	86

**Signal Timings Diagram**



### Junction Layout Diagram



Full Input Data And Results

**Link Results**

Link Num	Link Desc	Link Type	Stage Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Max Sat Flow (pcu/Hr)	Ave Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
1/1	Botley st Left Right Ahead	U	N/A	N/A	B		1	39	-	739	2300	2300	767	96.4
2/1	Botley st	U	N/A	N/A	-		-	-	-	652	Inf	Inf	Inf	0.0
3/1	Nutburn Rd Right Ahead Left	U	N/A	N/A	A		1	18	-	486	3300	3300	523	93.1
4/1	Nutburn Rd	U	N/A	N/A	-		-	-	-	239	Inf	Inf	Inf	0.0
5/1	Rownhams Rd Left Ahead Right	U	N/A	N/A	C		1	27	-	569	2600	2600	607	93.8
6/1	Rownhams Rd	U	N/A	N/A	-		-	-	-	485	Inf	Inf	Inf	0.0
7/1	Botley Rd Ahead Right Left	U	N/A	N/A	D		1	39	-	733	2800	2800	933	78.5
8/1	Botley Rd	U	N/A	N/A	-		-	-	-	1151	Inf	Inf	Inf	0.0



Full Input Data And Results

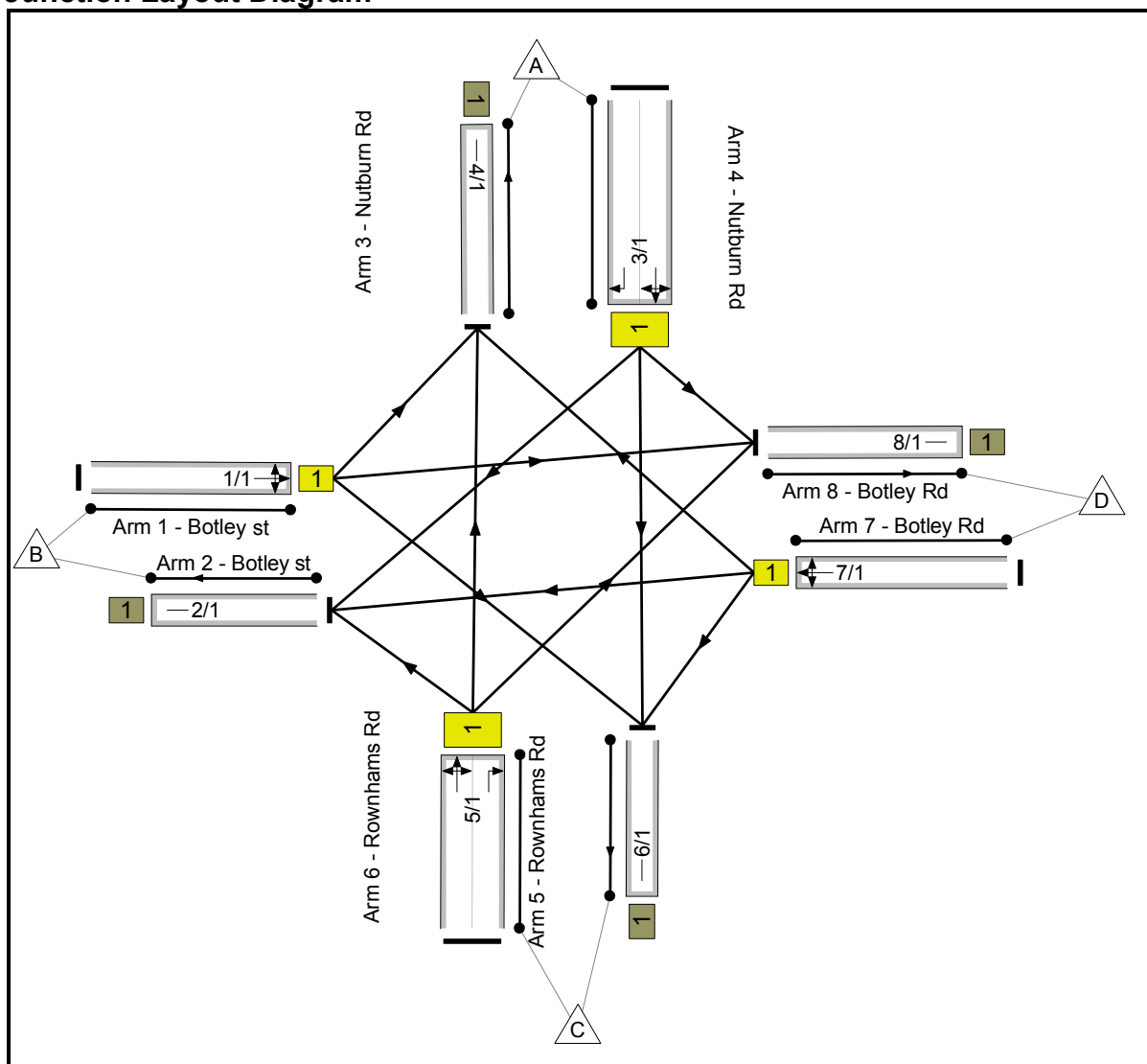
Link Num	Entering (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per Veh (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)		
1/1	739	739	-	-	-	8.1	8.3	-	16.4	79.8	24.0	8.3	32.3		
2/1	652	652	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
3/1	486	486	-	-	-	6.7	5.2	-	11.9	88.5	15.9	5.2	21.2		
4/1	239	239	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
5/1	569	569	-	-	-	7.1	5.8	-	12.9	81.8	18.5	5.8	24.3		
6/1	485	485	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
7/1	733	733	-	-	-	7.4	1.8	-	9.1	44.9	22.0	1.8	23.8		
8/1	1151	1151	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
PRC for Signalled Links (%):				-7.1	Total Delay for Signalled Links (pcuHr):				50.40						
PRC Over All Links (%):				-7.1	Total Delay Over All Links (pcuHr):				50.40	Cycle Time (s): 120					

## Full Input Data And Results

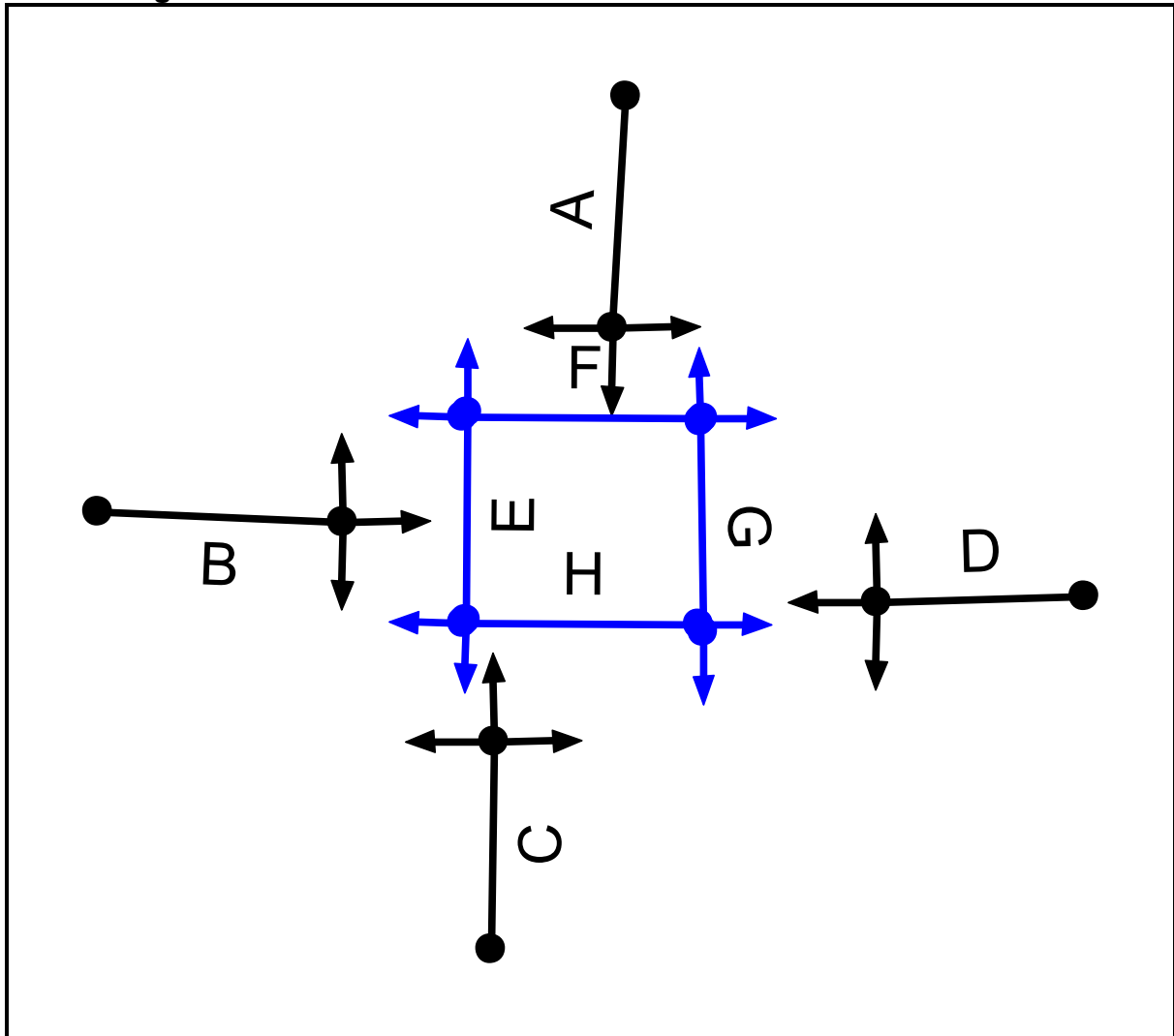
### User and Project Details

<b>Project:</b>	<b>North Baddesley Cross Roads</b>
<b>Title:</b>	<b>Rownhams Road/Nutburn Road Two Lane Scenario</b>
<b>Location:</b>	
<b>File name:</b>	2 lane scen_2012.lsgx
<b>Author:</b>	
<b>Company:</b>	
<b>Address:</b>	
<b>Controller:</b>	Generic
<b>SCN:</b>	
<b>Notes:</b>	

### Junction Layout Diagram



**Phase Diagram**



**Phase Input Data**

Phase Name	Phase type	Assoc Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Pedestrian		6	6
F	Pedestrian		6	6
G	Pedestrian		6	6
H	Pedestrian		6	6

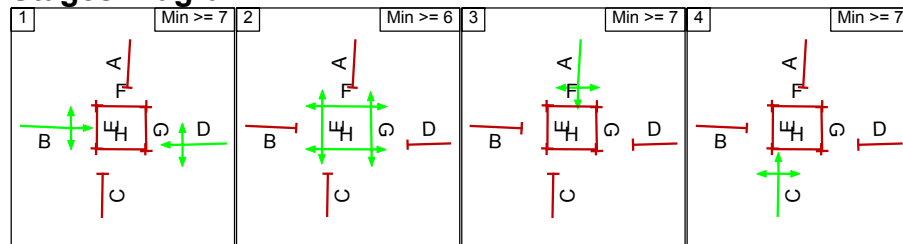
### Phase Intergrens Matrix

		Starting Phase							
		A	B	C	D	E	F	G	H
Terminating Phase	A		7	7	7	7	7	7	7
	B	7		7	-	7	7	7	7
	C	7	7		7	7	7	7	7
	D	7	-	7		7	7	7	7
	E	9	9	9	9		-	-	-
	F	9	9	9	9	-		-	-
	G	9	9	9	9	-	-		-
	H	9	9	9	9	-	-	-	

### Phases in Stage

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

### Stages Diagram



### Phase Delays

There are no phase delays defined in this stage stream

### Prohibited Stage Changes

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

Full Input Data And Results

**Link Input Data**

Arm/ Link	Link Name	Link Type	Num Lanes	Phases	Start Disp.	End Disp.
1/1	Botley st Left Right Ahead	U	1	B	2	3
2/1	Botley st	U	1		2	3
3/1	Nutburn Rd Right Ahead Left	U	2	A	2	3
4/1	Nutburn Rd	U	1		2	3
5/1	Rownhams Rd Left Ahead Right	U	2	C	2	3
6/1	Rownhams Rd	U	1		2	3
7/1	Botley Rd Ahead Right Left	U	1	D	2	3
8/1	Botley Rd	U	1		2	3

Full Input Data And Results

**Give-Way Link Input Data  
Lane Input Data**

Arm/ Lane	Link Num	Physical Length (PCU)	Expected Usage (PCU)	Sat Flow Type	User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)
1/1 (Botley st Lane 1)	Link 1 (Botley st Left Right Ahead)	Inf	Inf	User	2300	4.00	0.00	N	Arm 4 Left (Nutburn Rd)	15.00
2/1 (Botley st Lane 1)									Link 1 (Botley st)	Inf
									Arm 8 Ahead (Botley Rd)	Inf
3/1 (Nutburn Rd Lane 1)	Link 1 (Nutburn Rd Right Ahead Left)	Inf	Inf	User	3300	2.75	0.00	Y	Arm 2 Right (Botley st)	Inf
3/2 (Nutburn Rd Lane 2)									Link 1 (Nutburn Rd Right Ahead Left)	Inf
									Arm 8 Left (Botley Rd)	15.00
4/1 (Nutburn Rd Lane 1)	Link 1 (Nutburn Rd)	Inf	Inf	Inf (Exit)	1800	4.00	0.00	N	Arm 2 Right (Botley st)	Inf
5/1 (Rownhams Rd Lane 1)	Link 1 (Rownhams Rd Left Ahead Right)	Inf	Inf	User	2600	5.00	0.00	Y	Arm 2 Left (Botley st)	14.00
									Arm 4 Ahead (Nutburn Rd)	Inf
									Arm 8 Right (Botley Rd)	25.00

Full Input Data And Results

5/2 (Rownhams Rd Lane 2)	Link 1 (Rownhams Rd Left Ahead Right)	Inf	Inf	User	1800	3.25	0.00	Y	Arm 8 Right (Botley Rd)	Inf
6/1 (Rownhams Rd Lane 1)	Link 1 (Rownhams Rd)	Inf	Inf	Inf (Exit)	1800	3.66	0.00	N		
7/1 (Botley Rd Lane 1)	Link 1 (Botley Rd Ahead Right Left)	Inf	Inf	User	2800	4.00	0.00	N	Arm 2 Ahead (Botley st)	Inf
									Arm 4 Right (Nutburn Rd)	25.00
									Arm 6 Left (Rownhams Rd)	15.00
8/1 (Botley Rd Lane 1)	Link 1 (Botley Rd)	Inf	Inf	Inf (Exit)	1800	3.25	0.00	Y		

### Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2012 AM Peak + All DEv'	08:00	09:00	01:00	

### Flow Group 1: '2012 AM Peak + All DEv'

#### Traffic Flow Matrix

Desired Flow :

	Destination					
	A	B	C	D	Tot.	
Origin	A	0	159	244	85	488
	B	71	0	14	798	883
	C	151	12	0	454	617
	D	22	528	242	0	792
	Tot.	244	699	500	1337	2780

### Link Traffic Flows

Arm/Link	Flow Group 1: 2012 AM Peak + All DEv
1/1	883
2/1	699
3/1	488
4/1	244
5/1	617
6/1	500
7/1	792
8/1	1337



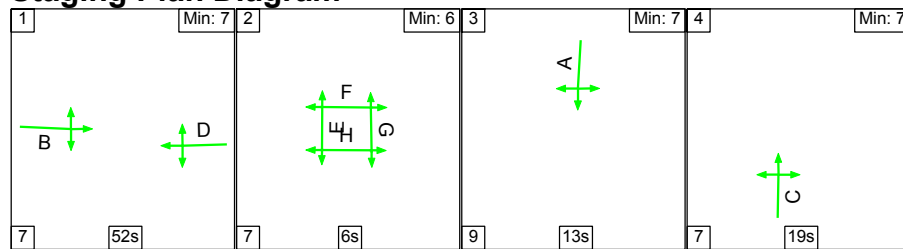
**Lane Saturation Flows**

Arm/ Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat flow (PCU/Hr)
1/1 (Botley st Lane 1)	This lane uses a directly entered Saturation Flow						2300
2/1 (Botley st Lane 1)	5.00	0.00	N				2255
3/1 (Nutburn Rd Lane 1)	This lane uses a directly entered Saturation Flow						3300
3/2 (Nutburn Rd Lane 2)	This lane uses a directly entered Saturation Flow						1800
4/1 (Nutburn Rd Lane 1)	4.00	0.00	N				2155
5/1 (Rownhams Rd Lane 1)	This lane uses a directly entered Saturation Flow						2600
5/2 (Rownhams Rd Lane 2)	This lane uses a directly entered Saturation Flow						1800
6/1 (Rownhams Rd Lane 1)	3.66	0.00	N				2121
7/1 (Botley Rd Lane 1)	This lane uses a directly entered Saturation Flow						2800
8/1 (Botley Rd Lane 1)	Infinite Saturation Flow (on Exit Link)						Inf

**Scenario 1: 'NB AM Peak - With Dev'**

Staging Plan 2: 'AM Peak - With Dev'  
Flow Group 1: '2012 AM Peak + All DEV'

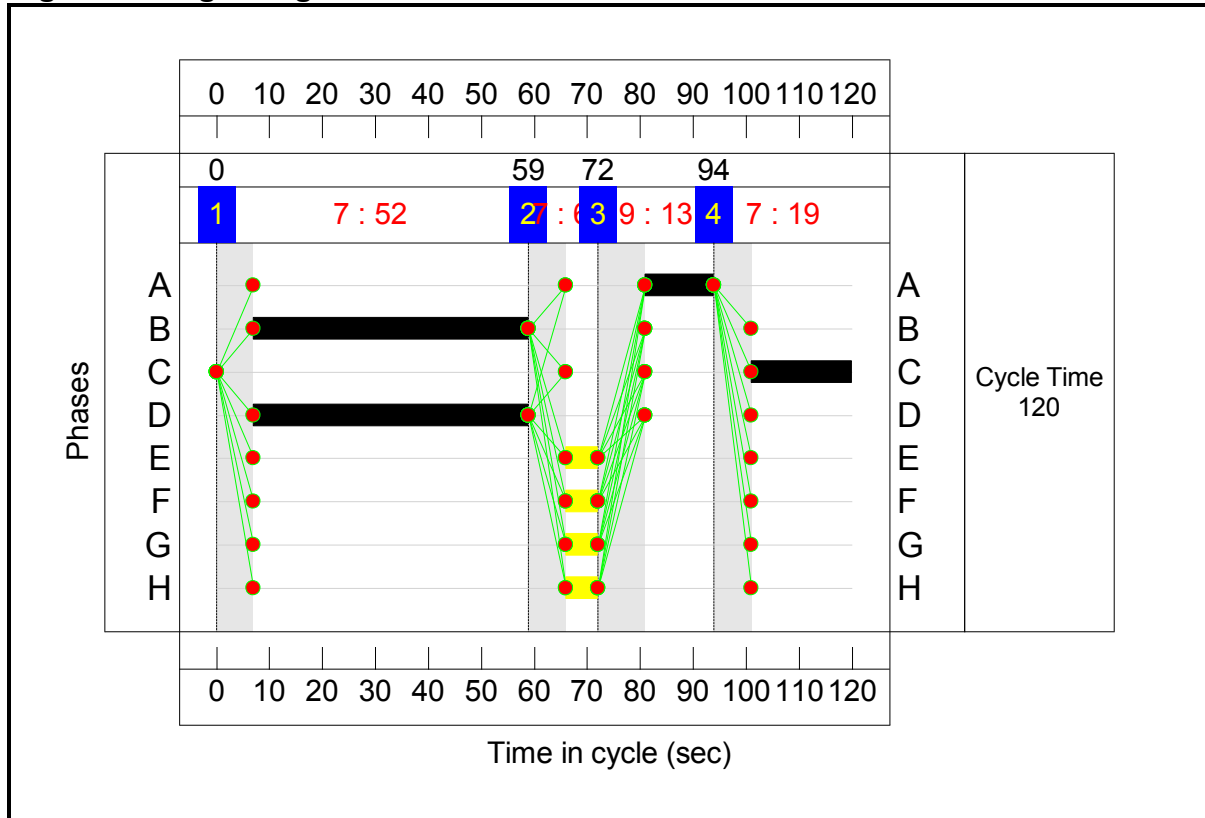
**Staging Plan Diagram**



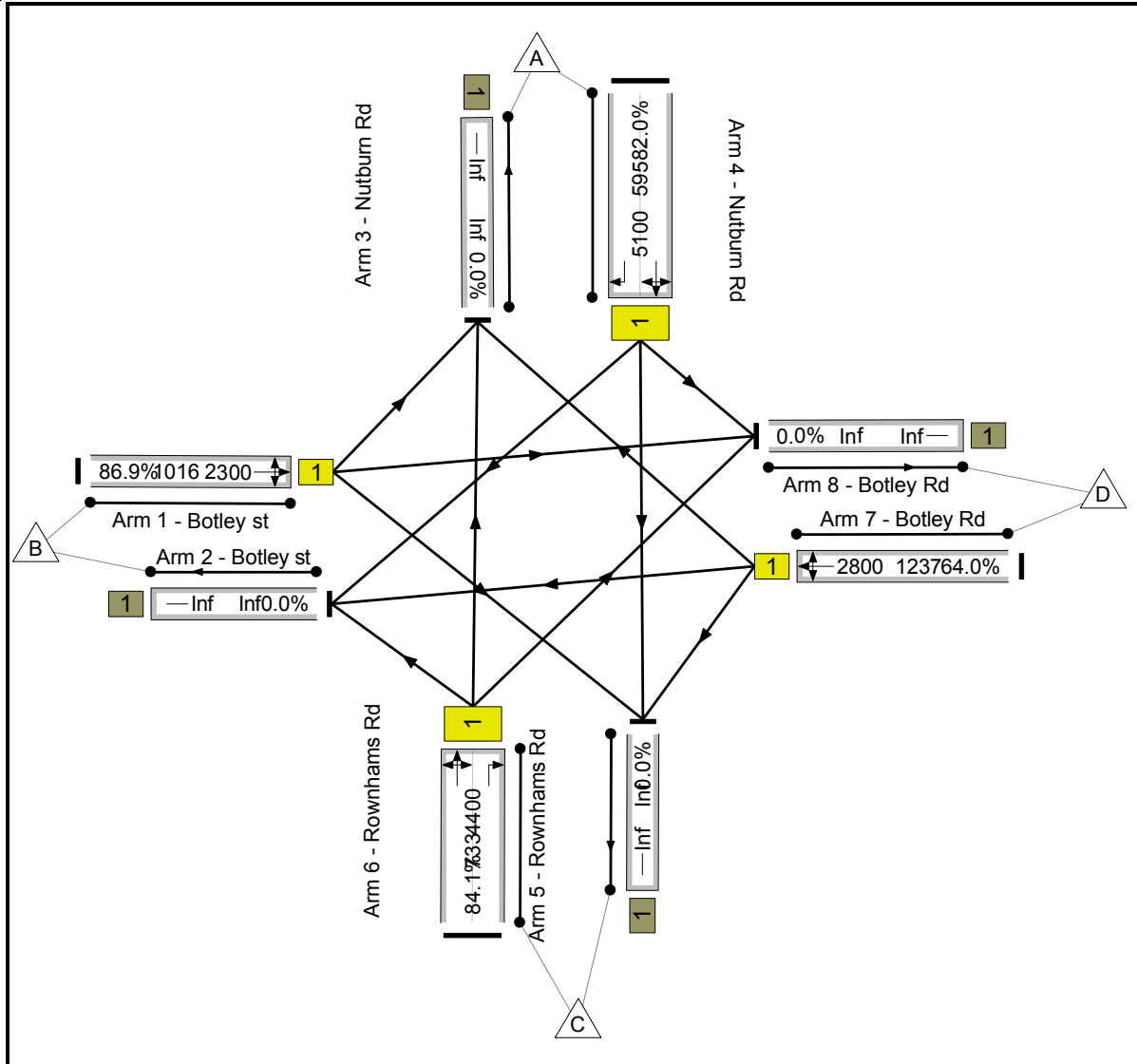
**Stage Timings**

Stage	1	2	3	4
Duration	52	6	13	19
Change Point	0	59	72	94

### Signal Timings Diagram



### Junction Layout Diagram



Full Input Data And Results

**Link Results**

Link Num	Link Desc	Link Type	Stage Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Max Sat Flow (pcu/Hr)	Ave Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
1/1	Botley st Left Right Ahead	U	N/A	N/A	B		1	52	-	883	2300	2300	1016	86.9
2/1	Botley st	U	N/A	N/A	-		-	-	-	699	Inf	Inf	Inf	0.0
3/1	Nutburn Rd Right Ahead Left	U	N/A	N/A	A		1	13	-	488	5100	5100	595	82.0
4/1	Nutburn Rd	U	N/A	N/A	-		-	-	-	244	Inf	Inf	Inf	0.0
5/1	Rownhams Rd Left Ahead Right	U	N/A	N/A	C		1	19	-	617	4400	4400	733	84.1
6/1	Rownhams Rd	U	N/A	N/A	-		-	-	-	500	Inf	Inf	Inf	0.0
7/1	Botley Rd Ahead Right Left	U	N/A	N/A	D		1	52	-	792	2800	2800	1237	64.0
8/1	Botley Rd	U	N/A	N/A	-		-	-	-	1337	Inf	Inf	Inf	0.0

Full Input Data And Results

Link Num	Entering (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per Veh (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)		
1/1	883	883	-	-	-	7.4	3.2	-	10.6	43.3	26.5	3.2	29.7		
2/1	699	699	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
3/1	488	488	-	-	-	7.0	2.2	-	9.2	67.9	15.9	2.2	18.1		
4/1	244	244	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
5/1	617	617	-	-	-	8.3	2.5	-	10.8	63.3	19.9	2.5	22.4		
6/1	500	500	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
7/1	792	792	-	-	-	5.7	0.9	-	6.6	30.1	20.5	0.9	21.3		
8/1	1337	1337	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0		
PRC for Signalled Links (%):				3.5	Total Delay for Signalled Links (pcuHr):				37.30						
PRC Over All Links (%):				3.5	Total Delay Over All Links(pcuHr):				37.30	Cycle Time (s): 120					