Church Street / St Edward Street Junction, Leek

Technical Report

Sainsbury's Supermarkets Limited

June 2013
Final Report
PB1027

Royal HaskoningDHV
Enhancing Society Together

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Date	June 2013
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DRAWINGS

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1 INTRODUCTION

1.1 Background

1.1.1 Royal HaskoningDHV has been commissioned by Sainsbury's Supermarkets Limited to provide highways and transport advice relating to revisions to the highway improvements in association with the consented mixed use development in Leek, Staffordshire.

1.1.2 In January 2010, Sainsbury's submitted a Planning Application for a mixed use development on the Churnet Works site on Macclesfield Road, Leek. The development included a Sainsbury's foodstore, bulky goods retail units, a Petrol Filling Station (PFS), employment and residential units, with associated access, parking facilities and public open space.

1.1.3 In association with the above planning application, and following detailed consultation with Staffordshire County Council (SCC), Sainsbury's were advised that improvements were required at three junctions within the town centre. The proposed improvements supported both Staffordshire County Council's (SCC) Leek Town Centre Masterplan and the Sainsbury's proposals.

1.1.4 The junctions to be improved were the A523 Church Street / A520 St Edward Street priority junction; the A523 Stockwell Street / Buxton Road / A53 Ball Haye Street / Ball Haye Road signal controlled junction; and the A53 Haywood Street / Ball Haye Street / A523 Ashbourne Road / Derby Street roundabout junction (known locally as the War Memorial Junction).

1.1.5 As part of the Leek Town Centre Masterplan, SCC required an Urban Traffic Control (UTC) system in the town. SCOOT (Split Cycle Offset Optimisation Technique) was identified as the preferred system. This has been installed as part of the consented and constructed scheme.

1.1.6 The improvements to the A523 Stockwell Street / Buxton Road / A53 Ball Haye Street / Ball Haye Road signal controlled junction and the War Memorial Junction have also been implemented.

1.1.7 The construction of the Sainsbury's foodstore, PFS and employment units was completed in January 2013 and the store opened on Wednesday 16th January 2013.

1.1.8 A plan of the local area showing key junctions can be seen in **Figure 1**.

1.2 Purpose of this Technical Report

1.2.1 The traffic flows in and around Leek have been monitored since the opening of the store in January 2013 and this report will seek to demonstrate that the planned amendments to the Church Street / St Edward Street junction are no longer required.

1.2.2 In addition, a review of Personal Injury Collision data (PIC) has been undertaken for the most recent five year period available, to demonstrate that the perceived safety concern relating to the lack of visibility is not justified in terms of the frequency and severity of collisions.

2 A523 CHURCH STREET / A520 ST EDWARD STREET

2.1 Existing Layout

2.1.1 In its current form, the Church Street / St Edward Street junction serves as a simple priority junction that permits all movements to and from the minor arm. However, historically the junction suffers from two main issues which are:

- The visibility from St Edward Street to the west is restricted due to the adjacent public house building and this is a safety concern to SCC; and
- The lack of space for right-turning vehicles into St Edward Street means that these vehicles block the through movement of the eastbound traffic, leading to queuing and delays along the A523.

2.1.2 SCC considered that, as a result of the anticipated increase in right turners and through movements at this junction resulting from the Churnet Works redevelopment, retaining the existing junction layout would not be appropriate.

2.2 Consented Junction Improvements

2.2.1 The consented improvements are to introduce turning restrictions to prevent right-turning traffic into and out of St Edward Street.

2.2.2 The banning of the right turn manoeuvre into St Edward Street would resolve the existing queuing problems caused by vehicles waiting to turn right blocking the flow of traffic travelling eastbound.

2.2.3 The banning of the right turn out of St Edward Street would remove SCC's safety concern caused by the restricted visibility of oncoming traffic on Church Street caused by the adjacent public house.

2.2.4 The consented improvement scheme is shown on **Drawing 9T7453 - SK016**.

2.3 Current Operational Performance

2.3.1 The current operational performance of the junction has been reviewed following the partial opening of the Churnet Works development.

2.3.2 Site visits were undertaken on Friday 7th June and Saturday 8th June 2013 with traffic flows recorded between 07:30-09:30 and 16:30-18:30 on the Friday and 11:30-13:30 on the Saturday.

2.3.3 During the surveys it was observed that the junction operated reasonably well over each period. During the Friday AM peak eastbound queues of typically 5-7 vehicles were observed on Church Street, caused by vehicles waiting to turn right into St Edward Street. During the Friday PM peak, queues of up to 12 vehicles were observed on this arm of the junction, and queues of up to nine vehicles were observed during the Saturday peak.

2.3.4 The 2013 observed traffic flows associated with the Friday AM and PM peaks and the Saturday peak are shown on **Figure 2**.

2.4 Comparison to Predicted Flows

2.4.1 The scenario against which it is suitable to compare the observed traffic is "*No Growth Assessment Traffic Flows"*, which was derived as part of the 2010 Transport Assessment to support the Churnet Works redevelopment. This scenario represents traffic flows on the local highway network based on 2009 surveys, in addition to the traffic generation associated with the full redevelopment of the site.

2.4.2 The traffic through the A523 Church Street / A520 St Edward Street junction in the "*No Growth Assessment Traffic Flows"* scenario for the AM, PM and Saturday peaks is shown in **Figure 3**.

2.4.3 A simple comparison of the total movements through the junction between the 2013 Observed Flows and the 2010 Assessment Scenario shows that over 400 fewer vehicles travelled through the junction during the weekday PM peak than originally predicted. During the Saturday peak 145 fewer vehicles travelled through the junction.

2.4.4 Although some elements of the development have yet to be constructed, accounting for a small number of additional trips, this is not enough to account for the difference between the predicted and observed traffic.

2.4.5 During both the weekday PM and the Saturday peak periods, the observed eastbound traffic flows on A523 Church Street are lower than predicted, thus resulting in improved operation of the junction.

Junction Assessments

2.4.6 In order to directly compare the operation of the junction under current traffic conditions to the previously assessed scenario, the junction has been modelled using the industry standard PICADY v5 software.

2.4.7 The results of the assessment are shown in **Table 2.1** below, and a full results output can be viewed at **Appendix A**.

Movement	Friday PM Peak		Saturday Peak	
	RFC	Queue	RFC	Queue
	2010 No Growth Assessment Traffic			
St Edward St - Left	1.000	12.95	0.730	2.14
St Edward St - Right	2.128	28.81	0.676	1.13
Church St W - Right/Ahead	1.232	108.50	1.147	76.27
	2013 Observed Traffic			
St Edward St - Left	0.532	1.12	0.421	0.92
St Edward St - Right	0.387	0.61	0.502	0.97
Church St W - Right/Ahead	0.728	4.48	0.623	2.95

Table 2.1: PICADY Output Summary

2.4.8 As can be seen above, under the Observed traffic conditions the junction operates well within capacity, with queues of 4 vehicles eastbound along Church Street predicted in the Friday PM peak and 3 vehicles in the Saturday peak.

2.4.9 In the 2010 Assessment Scenario all movements are shown to be operating over capacity in the Friday PM Peak and the eastbound Church Street movement is over capacity in the Saturday Peak. Above a Ratio of Flow to Capacity (RFC) value of 1.0, queues build up exponentially and cannot be accurately modelled.

2.4.10 The results under current traffic conditions show that the junction operates more effectively than under traffic flows forecast as part of the 2010 Transport Assessment.

2.5 Comparison to 2009 Observed Flows

2.5.1 In order to determine whether there has been an overall reduction in traffic since the application for the Churnet Works development was submitted in 2010, it is necessary to interrogate traffic data over a wider timeframe than the peak hour periods used for junction assessment purposes.

2.5.2 In order to obtain up-to-date traffic data, the installation of an Automatic Traffic Counter (ATC) on Church Street (west) was commissioned for a three week period between Wednesday 5th June and Tuesday 25th June 2013.

2.5.3 The data collected by the ATC provided an average daily 24 hour traffic flow in both directions along Church Street.

2.5.4 This has been compared against the traffic flow values originally predicted for this location as part of the Environmental Impact Assessment to support the Churnet Works redevelopment application. This data is based on ATCs placed in several locations for a week long period in 2009.

2.5.5 The suitable traffic flow value to represent the current scenario has been taken as the 2013 Base Annual Average Daily Traffic plus the Retail Development Annual Average Daily Traffic. The Retail Development comprises the Sainsbury's foodstore, petrol filling station and other retail units, and is as such a slight overestimation of the generation of the currently operational development.

2.5.6 The comparison of predicted and observed daily traffic can be seen in **Table 2.2** below:

Direction	Observed 2013 Average Daily Traffic	Predicted AADT (Base + Retail Development)
Eastbound	8,242	7,230
Westbound	7,700	11,462
2-Way	**15,942**	**18,692**

Table 2.2: Average Daily Traffic Comparison

2.5.7 As can be seen above, the observed daily traffic is significantly lower along Church Street than originally predicted. This difference is formed of a small increase in the eastbound direction but a large drop in traffic in the westbound direction.

2.6 Traffic Comparison Summary

2.6.1 Traffic flows through the junction have been recorded on both a peak hour and weekly basis. Both of these data sets demonstrate that traffic levels in this location are lower than were originally predicted as part of the 2010 planning application.

2.6.2 Whilst it is not possible to separate the base traffic from the 2013 measured flows, it is clear that levels of background traffic have fallen since the surveys were originally undertaken in 2009. This is believed to be the primary cause for the lower than anticipated traffic movements through this junction.

2.6.3 The operation of the junction has been assessed for the Friday PM and Saturday peaks, the results show that the junction is operating well within capacity and this has been supported by site observations.

2.6.4 As traffic levels are lower than originally predicted, and the junction is operating within capacity, it can be concluded that the banning of right turn manoeuvres at this junction would not benefit the local highway network at this point in time.

2.7 Junction Visibility

2.7.1 The restricted visibility from St Edward Street to the west has historically led to SCC voicing concerns regarding the safety of vehicles undertaking this manoeuvre.

2.7.2 Personal Injury Collision Data (PIC) has been obtained for the most recent five year period (01.03.2008 – 28.02.2013). This data includes all recorded collisions at this junction and its approaches resulting in slight, serious or fatal injury.

2.7.3 During the period studied, there have been a total of 8 collisions at or on the immediate approaches to the junction; of these 7 resulted in slight injury and 1 in serious injury.

2.7.4 Five of the collisions occurred as a result of right of way violations where vehicles have entered the carriageway across the path of another road user resulting in injury.

2.7.5 None of the collisions within the data studied occurred as a result of vehicles turning right out of St Edward Street across the path of vehicles travelling east along Church Street.

2.7.6 In order to determine whether there is a historical collision problem with this manoeuvre leading to the SCC concerns, PIC data for the previous five year period was also studied.

2.7.7 Between March 2004 and February 2009 there were a total of 2 PICs recorded at or on immediate approach to the Church Street / St Edward Street junction; both resulting in slight injury.

2.7.8 The first collision was as a result of a loss of control on the St Edward Street approach to the junction and the second was a rear end shunt on Church Street (westbound approach to the minor arm).

2.7.9 In summary, between March 2004 and February 2013 there have been a total of 10 PICs resulting in 9 slight injuries and 1 serious injury to a pedestrian. None of the collisions recorded within the available data can be attributed to the restricted visibility to the west.

2.8 Observed Driver Behaviour

2.8.1 During the 2013 peak hour traffic surveys, driver behaviour at the junction was observed. It was noted that drivers were courteous and polite, often allowing several vehicles to enter / leave the main carriageway before moving off.

2.8.2 Additionally, drivers who had been held up on the main road did not drive aggressively away from the junction when the road ahead became clear.

2.8.3 Drivers turning right out of St Edward Street did so cautiously and with care which is also confirmed by the lack of collisions occurring when undertaking this manoeuvre.

3 SUMMARY AND CONCLUSIONS

3.1 Summary

3.1.1 A number of highway improvements were proposed as part of the consented mixed use development at the former Churnet Works on Macclesfield Road, Leek.

3.1.2 The junctions to be improved were the A523 Church Street / A520 St Edward Street priority junction; the A523 Stockwell Street / Buxton Road / A53 Ball Haye Street / Ball Haye Road signal controlled junction; and the A53 Haywood Street / Ball Haye Street / A523 Ashbourne Road / Derby Street roundabout junction (known locally as the War Memorial Junction).

3.1.3 Additionally, as part of the Leek Town Centre Masterplan, SCC required an Urban Traffic Control (UTC) system in the town. SCOOT (Split Cycle Offset Optimisation Technique) was identified as the preferred system.

3.1.4 The improvements to the A523 Stockwell Street / Buxton Road / A53 Ball Haye Street / Ball Haye Road signal controlled junction and the War Memorial Junction and the installation of the SCOOT system have been implemented.

3.1.5 Junction improvements proposed for the A523 Church Street / A520 St Edward Street junction have not been implemented. The amendments to the junction included the banning of right turn manoeuvres into and out of St Edward Street. These were proposed in order to improve safety at the junction for vehicles turning right out of St Edward Street and to improve the post-development operational capacity of the junction.

3.1.6 Following the completion and opening of the Sainsbury's foodstore, PFS and employment units on the site, traffic flows have been monitored throughout the town and at the A523 Church Street / A520 St Edward Street junction.

3.1.7 Surveys undertaken in 2013 at the Church Street / St Edward Street junction have demonstrated an overall reduction in the levels of traffic that were predicted at the time of the original application in 2010. Traffic flows through the junction are more than 400 vehicles fewer than predicted for the weekday PM peak period and over 100 vehicles fewer during the Saturday peak.

3.1.8 Furthermore, daily traffic flows along Church Street are also lower than originally predicted.

3.1.9 Peak hour traffic flows through the junction have been assessed using PICADY junction modelling software, the results show the junction to operate effectively and within capacity, this has been backed up by site observations.

3.1.10 A review of PIC data also suggests that the perceived safety problem at the junction does not exist.

3.2 Conclusion

3.2.1 The predicted queues and delays at the A523 Church Street / A520 St Edward Street junction have not occurred. Observed traffic flows are significantly below the levels predicted during the previous assessments and the queues forecast by the modelling assessments have not occurred.

3.2.2 Under current traffic conditions, the consented junction amendments would not improve the performance of this junction and the local highway network.

3.2.3 It can therefore be concluded that the implementation of the highway improvements proposed at the A523 Church Street / A520 St Edward Street junction are no longer required as part of this permission.

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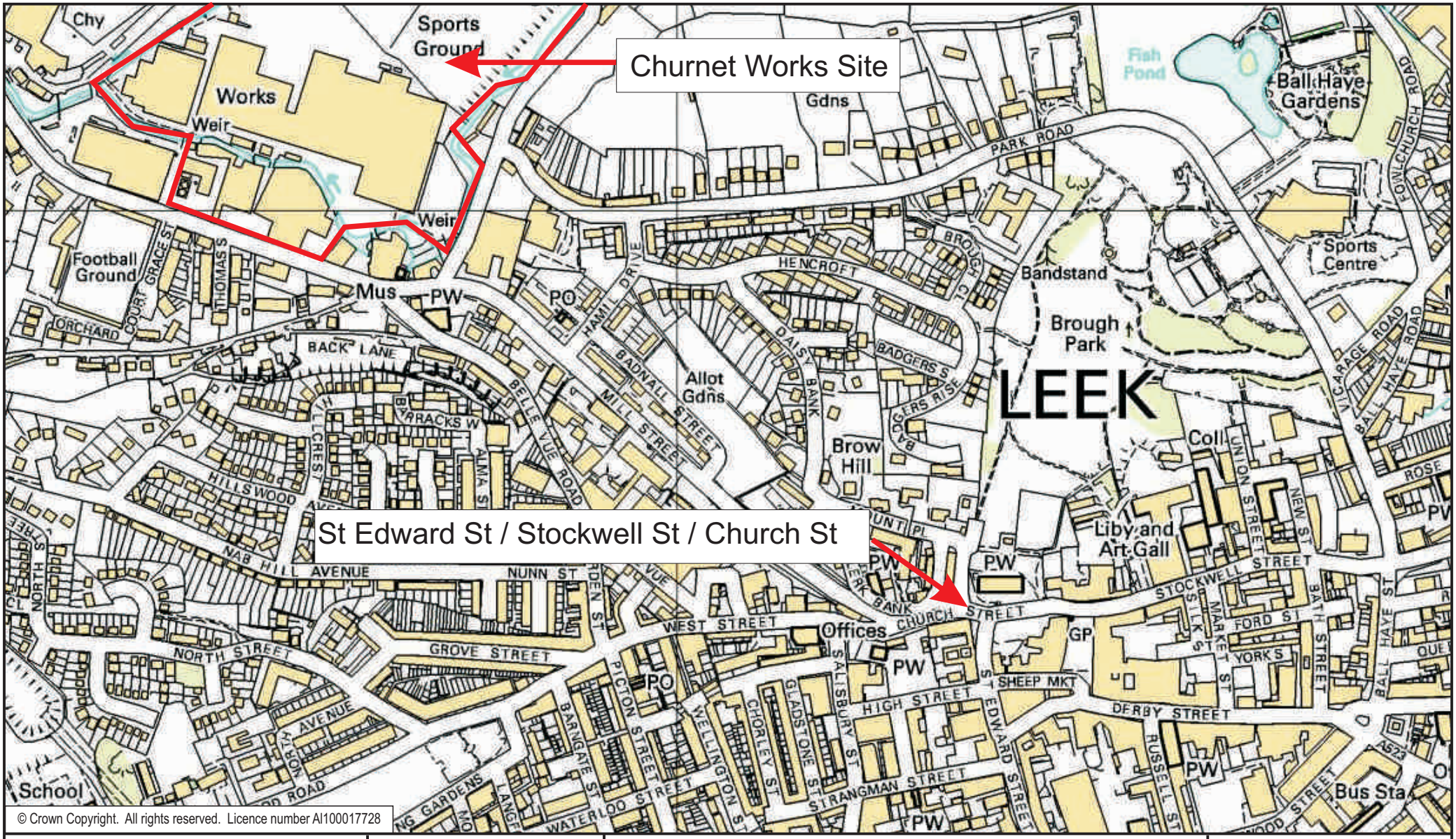
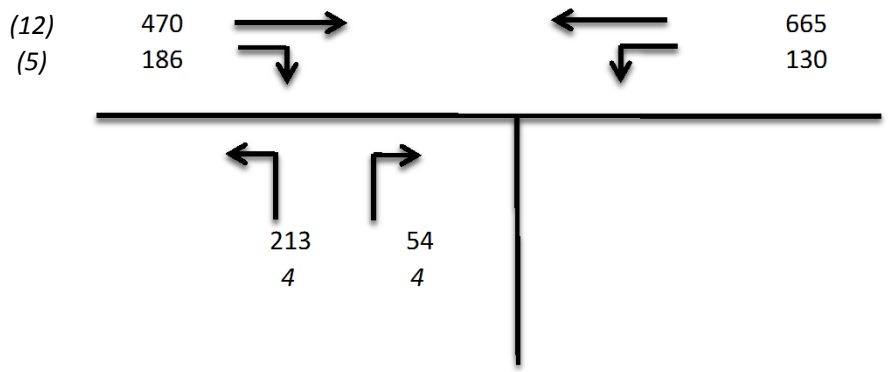
Figures

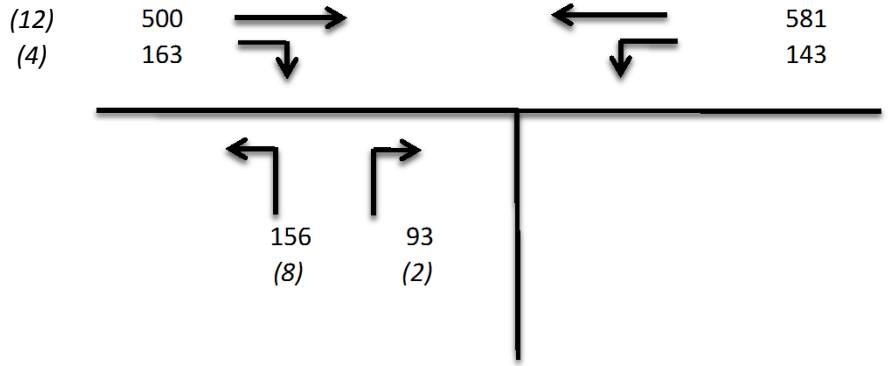


HASKONINGDHV UK LTD. **TRANSPORT & ASSET MANAGEMENT** Royal HaskoningDHV *Enhancing Society Together*	SCALE: **Not to Scale** DATE: **June 2013**	**Redevelopment of Churnet Works Site, Macclesfield Road, Leek** **St Edward Street / Church Street Junction**	**Figure 1**



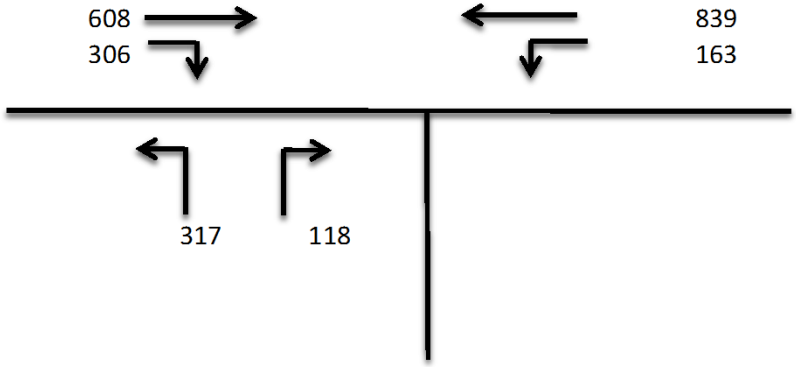
xx Cars / Vans
(xx) HGVs

PM Peak Traffic Flows



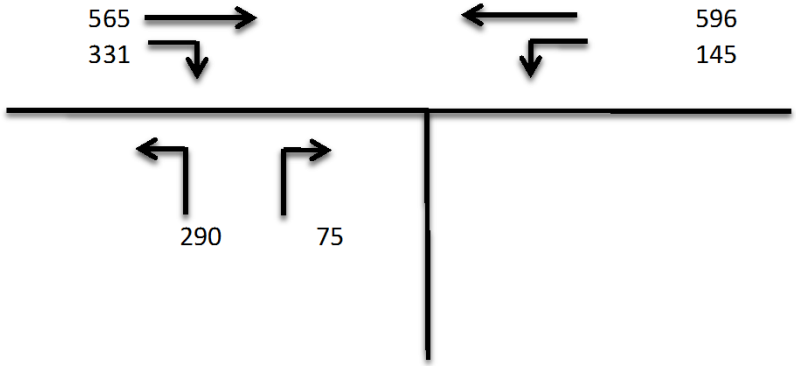
xx Cars / Vans
(xx) HGVs

Saturday Peak Traffic Flows



xx PCUs

PM Peak Traffic Flows



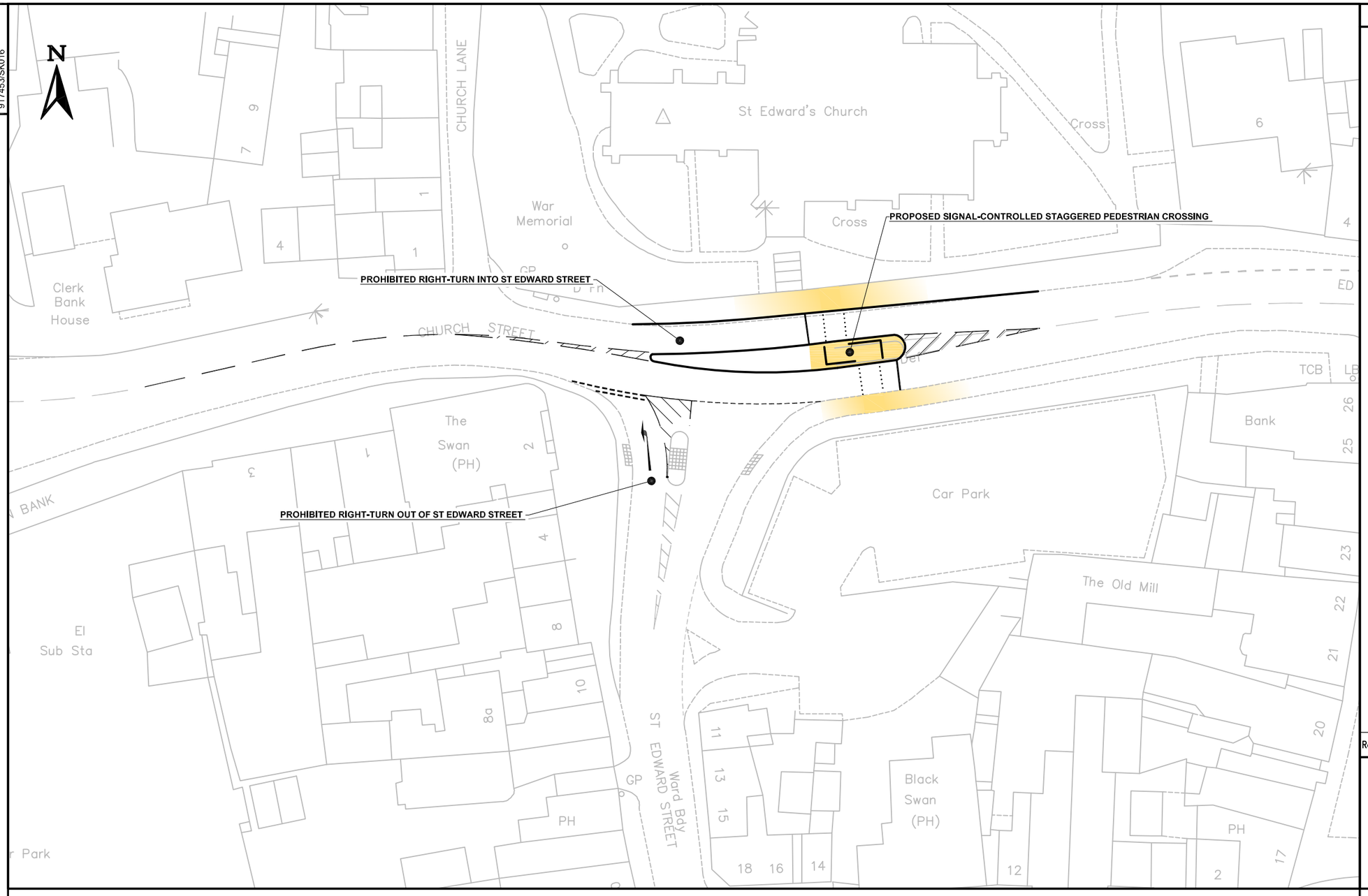
xx PCUs

Saturday Peak Traffic Flows

Drawings

9T7453 – SK016

Dwg No. 9T7453/SK016



NOTES

1. PROPOSED HIGHWAY IMPROVEMENTS SUBJECT TO DETAILED DESIGN AND LOCAL HIGHWAY AUTHORITY APPROVAL.

Rev	Amendment	Drawn	Chk'd	Apr'd	Date

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KEY

- EXISTING LAYOUT
- PROPOSED LAYOUT
- PROPOSED PEDESTRIAN FACILITIES

Sainsbury's

REDEVELOPMENT OF CHURNET WORKS SITE, MACCLESFIELD ROAD, LEEK

LEEK TOWN CENTRE

PROPOSED JUNCTION IMPROVEMENTS
A523 CHURCH ST / A520 ST EDWARD ST

Drawn	JW	Checked	PRS	Approved	RMT
Date	05/08/10	Date	06/08/10	Date	06/08/10
Scale	1:500 @A3	Status	FOR INFORMATION		Rev
Dwg No	9T7453/SK016				-

Appendix A

PICADY Output

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 5.0 (JUNE 2010) (Patch 15 Apr 2011)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE SALES
TEL: CROWTHORNE (01344) 770758, FAX: 770356
EMAIL: software@trl.co.uk

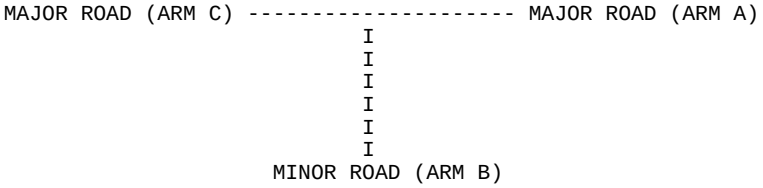
Run with file:-
"I:\PB1027\Technical_Data\E01 Calculations\Junction Assessments\
2013-06-26 jw St Edward St - Church St As Existing.vpi"
(drive-on-the-left) at 11:15:06 on Thursday, 27 June 2013

RUN INFORMATION

RUN TITLE	: Edward St / Church Street
LOCATION	: A523/A520
DATE	: 26/06/13
CLIENT	: SAINSBURY'S SUPERMARKETS LTD
ENUMERATOR	: 304037
JOB NUMBER	: PB1027
STATUS	: Final Version
DESCRIPTION	:

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS CHURCH STREET (E)
ARM B IS ST EDWARD STREET
ARM C IS CHURCH STREET (W)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.50 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.
- VISIBILITY	(VC-B)102.00 M.
- BLOCKS TRAFFIC (SPACES)	YES (0)
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 33.0 M.
- VISIBILITY TO RIGHT	(VB-A) 51.0 M.
- LANE 1 WIDTH	(WB-C) -
- LANE 2 WIDTH	(WB-A) -
WIDTH AT 0 M FROM JUNCTION	7.00 M.
WIDTH AT 5 M FROM JUNCTION	3.50 M.
WIDTH AT 10 M FROM JUNCTION	3.50 M.
WIDTH AT 15 M FROM JUNCTION	3.50 M.
WIDTH AT 20 M FROM JUNCTION	3.50 M.
- LENGTH OF FLARED SECTION	DERIVED: 0 PCU

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
0.00	0.00	0.00

* Due to the presence of a flare, data is not available

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
0.00	0.00	0.00	0.00	0.00

* Due to the presence of a flare, data is not available

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
633.03	0.22	0.22

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: PM PEAK - 2013 OBSERVED FLOWS

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	10.13	15.19	10.13
ARM B	15.00	45.00	75.00	3.59	5.38	3.59
ARM C	15.00	45.00	75.00	8.74	13.11	8.74

Demand set: PM PEAK - 2013 OBSERVED FLOWS

TIME	FROM/TO	ARM A	ARM B	ARM C
16.45 - 18.15				
	ARM A	0.000	0.167	0.833
		0.0	135.0	675.0
		(0.0)%	(0.0)%	(0.0)%
	ARM B	0.223	0.000	0.777
		64.0	0.0	223.0
		(0.0)%	(0.0)%	(0.0)%
	ARM C	0.715	0.285	0.000
		500.0	199.0	0.0
		(0.0)%	(0.0)%	(0.0)%

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET PM PEAK - 2013 OBSERVED FLOWS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-C	2.80	9.15	0.306		0.00	0.43	6.2		0.16
B-A	0.80	4.54	0.177		0.00	0.21	3.0		0.27
C-AB	4.86	12.85	0.378		0.00	0.94	13.8		0.12
C-A	3.91								
A-B	1.69								
A-C	8.47								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-C	3.34	8.57	0.390		0.43	0.63	9.0		0.19
B-A	0.96	3.92	0.245		0.21	0.32	4.5		0.34
C-AB	6.76	13.42	0.504		0.94	1.64	24.6		0.15
C-A	3.71								
A-B	2.02								
A-C	10.11								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-C	4.09	7.71	0.531		0.63	1.09	15.3		0.27
B-A	1.17	3.06	0.383		0.32	0.59	8.1		0.52
C-AB	10.33	14.28	0.724		1.64	4.21	61.8		0.25
C-A	2.50								
A-B	2.48								
A-C	12.39								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-C	4.09	7.69	0.532		1.09	1.12	16.6		0.28
B-A	1.17	3.03	0.387		0.59	0.61	9.1		0.54
C-AB	10.46	14.37	0.728		4.21	4.48	69.9		0.27
C-A	2.37								
A-B	2.48								
A-C	12.39								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-C	3.34	8.55	0.391		1.12	0.65	10.3		0.19
B-A	0.96	3.88	0.247		0.61	0.34	5.4		0.35
C-AB	6.88	13.54	0.508		4.48	1.79	29.1		0.16
C-A	3.60								
A-B	2.02								
A-C	10.11								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-C	2.80	9.14	0.306		0.65	0.45	7.0		0.16
B-A	0.80	4.52	0.178		0.34	0.22	3.5		0.27
C-AB	4.92	12.90	0.381		1.79	1.00	15.3		0.13
C-A	3.85								
A-B	1.69								
A-C	8.47								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.4	
17.15	0.6	*
17.30	1.1	*
17.45	1.1	*
18.00	0.7	*
18.15	0.4	

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.2	
17.15	0.3	
17.30	0.6	*
17.45	0.6	*
18.00	0.3	
18.15	0.2	

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.9	*
17.15	1.6	**
17.30	4.2	****
17.45	4.5	****
18.00	1.8	**
18.15	1.0	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	306.9	204.6	64.5	0.21	64.5	0.21
B-A	88.1	58.7	33.5	0.38	33.5	0.38
C-AB	663.2	442.1	214.5	0.32	214.5	0.32
C-A	298.9	199.3				
A-B	185.8	123.9				
A-C	929.1	619.4				
ALL	2472.1	1648.0	312.5	0.13	312.6	0.13

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
0.00	0.00	0.00

* Due to the presence of a flare, data is not available

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
0.00	0.00	0.00	0.00	0.00

* Due to the presence of a flare, data is not available

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
633.03	0.22	0.22

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: PM PEAK - TRANSPORT ASSESSMENT PREDICTED FLOWS

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	12.52	18.79	12.52
ARM B	15.00	45.00	75.00	5.44	8.16	5.44
ARM C	15.00	45.00	75.00	11.43	17.14	11.43

Demand set: PM PEAK - TRANSPORT ASSESSMENT PREDICTED FLOWS

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
16.45 - 18.15	ARM A	0.000	0.163	0.837
		0.0	163.0	839.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.271	0.000	0.729
		118.0	0.0	317.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.665	0.335	0.000
		608.0	306.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET PM PEAK - TRANSPORT ASSESSMENT PREDICTED FLOWS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-C	3.98	8.11	0.491		0.00	0.93	13.0		0.24
B-A	1.48	3.60	0.411		0.00	0.66	8.9		0.45
C-AB	8.83	13.43	0.657		0.00	2.90	40.9		0.21
C-A	2.64								
A-B	2.05								
A-C	10.53								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-C	4.75	7.11	0.668		0.93	1.87	25.3		0.40
B-A	1.77	2.77	0.638		0.66	1.52	19.6		0.90
C-AB	12.98	14.24	0.912		2.90	10.68	141.9		0.56
C-A	0.71								
A-B	2.44								
A-C	12.57								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-C	5.82	5.81	1.000		1.87	9.15	93.7		1.41
B-A	2.17	1.58	1.368		1.52	11.52	101.6		6.07
C-AB	16.77	13.60	1.233		10.68	60.73	580.7		2.80
C-A	0.00								
A-B	2.99								
A-C	15.40								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-C	5.82	5.81	1.000		9.15	12.95	167.4		2.29
B-A	2.17	1.02	2.128		11.52	28.81	302.7		16.13
C-AB	16.77	13.61	1.232		60.73	108.50	1295.1		6.24
C-A	0.00								
A-B	2.99								
A-C	15.40								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-C	4.75	6.37	0.745		12.95	3.48	92.6		1.23
B-A	1.77	1.58	1.122		28.81	31.84	454.9		18.19
C-AB	13.69	14.65	0.934		108.50	97.38	1545.3		6.98
C-A	0.00								
A-B	2.44								
A-C	12.57								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-C	3.98	6.78	0.587		3.48	1.50	25.4		0.39
B-A	1.48	2.50	0.593		31.84	17.72	371.7		10.37
C-AB	11.47	15.36	0.746		97.38	42.82	1062.1		4.61
C-A	0.00								
A-B	2.05								
A-C	10.53								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.9	*
17.15	1.9	**
17.30	9.2	*********
17.45	13.0	*************
18.00	3.5	***
18.15	1.5	*

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.7	*
17.15	1.5	**
17.30	11.5	***********
17.45	28.8	*****************************
18.00	31.8	********************************
18.15	17.7	******************

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	2.9	***
17.15	10.7	**********
17.30	60.7	**
17.45	108.5	**
18.00	97.4	**
18.15	42.8	**

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	436.3	290.9	417.2	0.96	417.4	0.96
B-A	162.4	108.3	1259.3	7.75	1322.2	8.14
C-AB	1207.8	805.2	4666.1	3.86	4725.8	3.91
C-A	50.3	33.5				
A-B	224.4	149.6				
A-C	1154.8	769.9				
ALL	3236.0	2157.3	6342.7	1.96	6465.4	2.00

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
0.00	0.00	0.00

* Due to the presence of a flare, data is not available

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
0.00	0.00	0.00	0.00	0.00

* Due to the presence of a flare, data is not available

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
633.03	0.22	0.22

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: SAT PEAK - 2013 OBSERVED FLOWS

TIME PERIOD BEGINS 11.15 AND ENDS 12.45

LENGTH OF TIME PERIOD - 90 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	9.21	13.82	9.21
ARM B	15.00	45.00	75.00	3.42	5.14	3.42
ARM C	15.00	45.00	75.00	8.79	13.18	8.79

Demand set: SAT PEAK - 2013 OBSERVED FLOWS

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
11.15 - 12.45	ARM A	0.000	0.198	0.802
		0.0	146.0	591.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.358	0.000	0.642
		98.0	0.0	176.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.754	0.246	0.000
		530.0	173.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET SAT PEAK - 2013 OBSERVED FLOWS
AND FOR TIME PERIOD 2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
11.15-11.30									
B-C	2.21	9.13	0.242		0.00	0.31	4.5		0.14
B-A	1.23	5.04	0.244		0.00	0.32	4.4		0.26
C-AB	4.33	13.28	0.326		0.00	0.78	11.5		0.11
C-A	4.49								
A-B	1.83								
A-C	7.42								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
11.30-11.45									
B-C	2.64	8.56	0.308		0.31	0.44	6.4		0.17
B-A	1.47	4.43	0.331		0.32	0.48	6.8		0.33
C-AB	6.03	13.92	0.433		0.78	1.29	19.4		0.13
C-A	4.50								
A-B	2.19								
A-C	8.85								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
11.45-12.00									
B-C	3.23	7.69	0.420		0.44	0.71	10.1		0.22
B-A	1.80	3.60	0.500		0.48	0.94	12.7		0.54
C-AB	9.23	14.88	0.620		1.29	2.85	42.4		0.18
C-A	3.67								
A-B	2.68								
A-C	10.85								

TIME (12.00-12.15)	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
B-C	3.23	7.67	0.421		0.71	0.72	10.7		0.23
B-A	1.80	3.58	0.502		0.94	0.97	14.4		0.56
C-AB	9.30	14.93	0.623		2.85	2.95	45.5		0.18
C-A	3.60								
A-B	2.68								
A-C	10.85								

TIME (12.15-12.30)	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
B-C	2.64	8.53	0.309		0.72	0.45	7.1		0.17
B-A	1.47	4.41	0.333		0.97	0.52	8.3		0.35
C-AB	6.10	14.00	0.436		2.95	1.38	21.5		0.13
C-A	4.43								
A-B	2.19								
A-C	8.85								

TIME (12.30-12.45)	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
B-C	2.21	9.11	0.242		0.45	0.32	5.0		0.15
B-A	1.23	5.03	0.245		0.52	0.33	5.2		0.27
C-AB	4.38	13.32	0.329		1.38	0.82	12.4		0.11
C-A	4.45								
A-B	1.83								
A-C	7.42								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
11.30	0.3	
11.45	0.4	
12.00	0.7	*
12.15	0.7	*
12.30	0.5	
12.45	0.3	

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
11.30	0.3	
11.45	0.5	
12.00	0.9	*
12.15	1.0	*
12.30	0.5	*
12.45	0.3	

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
11.30	0.8	*
11.45	1.3	*
12.00	2.8	***
12.15	3.0	***
12.30	1.4	*
12.45	0.8	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	242.3	161.5	43.8	0.18	43.8	0.18
B-A	134.9	89.9	51.9	0.38	51.9	0.38
C-AB	590.6	393.7	152.8	0.26	152.8	0.26
C-A	377.0	251.4				
A-B	201.0	134.0				
A-C	813.5	542.3				
ALL	2359.2	1572.8	248.4	0.11	248.5	0.11

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted)

Intercept For STREAM B-C	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
0.00	0.00	0.00

* Due to the presence of a flare, data is not available

Intercept For STREAM B-A	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B	Slope For Opposing STREAM C-A	Slope For Opposing STREAM C-B
0.00	0.00	0.00	0.00	0.00

* Due to the presence of a flare, data is not available

Intercept For STREAM C-B	Slope For Opposing STREAM A-C	Slope For Opposing STREAM A-B
633.03	0.22	0.22

(NB These values do not allow for any site specific corrections)

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: SAT PEAK - TRANSPORT ASSESSMENT PREDICTED FLOWS

TIME PERIOD BEGINS 11.15 AND ENDS 12.45

LENGTH OF TIME PERIOD - 90 MIN.
LENGTH OF TIME SEGMENT - 15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	9.26	13.89	9.26
ARM B	15.00	45.00	75.00	4.56	6.84	4.56
ARM C	15.00	45.00	75.00	11.20	16.80	11.20

Demand set: SAT PEAK - TRANSPORT ASSESSMENT PREDICTED FLOWS

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C
11.15 - 12.45	ARM A	0.000	0.196	0.804
		0.0	145.0	596.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.205	0.000	0.795
		75.0	0.0	290.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.631	0.369	0.000
		565.0	331.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET SAT PEAK - TRANSPORT ASSESSMENT PREDICTED FLOWS
AND FOR TIME PERIOD 2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
11.15-11.30									
B-C	3.64	9.25	0.393		0.00	0.64	9.0		0.18
B-A	0.94	4.18	0.225		0.00	0.28	4.0		0.31
C-AB	8.64	13.58	0.636		0.00	2.52	35.9		0.19
C-A	2.60								
A-B	1.82								
A-C	7.48								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
11.30-11.45									
B-C	4.35	8.64	0.503		0.64	0.98	14.0		0.23
B-A	1.12	3.46	0.325		0.28	0.46	6.5		0.42
C-AB	12.28	14.35	0.855		2.52	7.32	103.4		0.42
C-A	1.15								
A-B	2.17								
A-C	8.93								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
11.45-12.00									
B-C	5.32	7.61	0.700		0.98	2.14	28.7		0.41
B-A	1.38	2.46	0.560		0.46	1.13	14.7		0.86
C-AB	16.44	14.31	1.149		7.32	43.70	433.0		1.97
C-A	0.00								
A-B	2.66								
A-C	10.94								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
12.00-12.15									
B-C	5.32	7.29	0.730		2.14	2.49	35.6		0.49
B-A	1.38	2.03	0.676		1.13	1.71	22.7		1.35
C-AB	16.44	14.33	1.147		43.70	76.27	932.9		4.30
C-A	0.00								
A-B	2.66								
A-C	10.94								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
12.15-12.30									
B-C	4.35	8.29	0.524		2.49	1.14	18.6		0.26
B-A	1.12	2.60	0.432		1.71	0.82	13.9		0.73
C-AB	13.42	15.04	0.893		76.27	56.65	1001.6		4.44
C-A	0.00								
A-B	2.17								
A-C	8.93								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
12.30-12.45									
B-C	3.64	9.11	0.399		1.14	0.68	10.7		0.18
B-A	0.94	3.51	0.268		0.82	0.38	6.2		0.40
C-AB	10.86	15.29	0.710		56.65	4.57	440.9		1.86
C-A	0.39								
A-B	1.82								
A-C	7.48								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
11.30	0.6	*
11.45	1.0	*
12.00	2.1	**
12.15	2.5	**
12.30	1.1	*
12.45	0.7	*

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
11.30	0.3	
11.45	0.5	
12.00	1.1	*
12.15	1.7	**
12.30	0.8	*
12.45	0.4	

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
11.30	2.5	***
11.45	7.3	*******
12.00	43.7	**********
12.15	76.3	**********
12.30	56.6	**********
12.45	4.6	*****

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-C	399.2	266.1	116.5	0.29	116.5	0.29
B-A	103.2	68.8	68.0	0.66	68.0	0.66
C-AB	1171.3	780.9	2947.7	2.52	2948.4	2.52
C-A	62.0	41.3				
A-B	199.6	133.1				
A-C	820.3	546.9				
ALL	2755.6	1837.1	3132.2	1.14	3132.9	1.14

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******

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