GLOSSOP ROAD, GAMSELEY

TECHNICAL NOTE 1 – SITE ACCESS AMENDMENTS

26th October 2011

Prepared by: B Haddock
Authorised by: I Hughes

1. INTRODUCTION

Following on from a meeting on 26th October attended by Graham Hill (Highway Officer Derbyshire County Council, DCC) Alex Willis (BNP Paribas) and Ian Hughes (WSP), it was agreed WSP would present an alternative means of vehicular access, in the form of a staggered junction, for the Glossop Road residential site in order the Highway Authority may confirm to the Planning Authority that they have no objections with regard the development proposals.

This technical note seeks to introduce the revised access junction and provide technical evidence, including swept path analysis, as to its suitability.

2. REVISED ACCESS JUNCTION

In reference to the sites Transport Assessment dated 8th August 2011, vehicular access is to be taken directly from A626 Glossop Road, which connects to the A57 Manchester / Sheffield Road approximately 600m to the east of the development site, and runs along its northern border.

A626 Glossop Road is a single carriageway road with 30mph speed limit and has street lighting along the southern edge of the road. Along the section of A626 Glossop Road that runs along the site boundary, footways are currently provided on the northern side of the road but not on the side of the road adjacent to the site.

It was agreed at the meeting on the 26th October that vehicular access is to be taken in the form of a staggered junction with Melandra Castle Road.

As illustrated in Appendix A, the revised site access junction is a right / left staggered junction with the site access sited 30m from the existing Melandra Castle Road / A626 Glossop Road junction so as to ensure minimal conflict between turning vehicles.

Furthermore, ghost island right turn lanes for both arms are illustrated so that through movement is not impeded by turning traffic on the A626 Glossop Road and will be designed in accordance with TD 42/95 of the Design Manual for Roads and Bridges (DMRB).

Also as illustrated in Appendix A, the revised site access junction has been assessed using Autotrack for a standard sized refuse vehicles swept path. There are no geometric issues with the swept path and the standard sized refuse vehicle would not be restricted entering or exiting the proposed site as designed.

The revised site access junction will be sited to meet current standards with regard to visibility. DCC standards require a visibility distance at junctions, bends and vertical crests of 43m for light vehicles and 47m for HGVs and buses with an 85th percentile assessed speed of between 26mph and 30mph. An increase in 85th percentile speed to between 31mph and 35mph would require visibility distances of 54m and 59m for light vehicles and HGVs/buses respectively. Designs for the site access junction will comply fully with these requirements which DCC states in accordance with 'Manual for Streets' and the 'DMRB'.

3. CAPACITY ASSESSMENTS

The methodology for assessing the sites trip generation, distribution and assignment is outlined in the Transport Assessment and agreed with DCC during the scoping process.

In accordance with the agreed methodology and future traffic growth predictions, the revised site access junction has been assessed for the development's estimated year of opening of 2015 and for a future assessment year of 2020.

The assessments undertaken for the priority controlled staggered junction have been undertaken using PICADY software. The results of this assessment are summarised in ***Table 3.1*** below while the outputs from the assessment are included within Appendix B.

Table 3.1 – Revised Site Access Junction capacity assessment

Site Access Junction		Site Access		Glossop Road East Right Turn to Melandra Castle Road		Glossop Road West Right Turn to Site Access		Melandra Castle Road	
		RFC	Max Q	RFC	Max Q	RFC	Max Q	RFC	Max Q
AM Peak (0730 to 0830)	2015 With Development	0.113	0.13	0.089	0.10	0.013	0.01	0.342	0.51
PM Peak (1630 to 1730)	2015 With Development	0.057	0.06	0.288	0.40	0.043	0.05	0.279	0.38
AM Peak (0730 to 0830)	2020 With Development	0.116	0.13	0.097	0.11	0.013	0.01	0.369	0.58
PM Peak (1630 to 1730)	2020 With Development	0.059	0.06	0.312	0.45	0.044	0.05	0.308	0.44

The results show that the proposed site access junction operates well within its practical capacity in the baseline and future design years. It will be able to accommodate both the expected baseline traffic flows for the future design years in addition to the anticipated flow generated by the development.

4. SUSTAINABLE TRANSPORT

As stated in section 1, this note seeks only to provide specific details of the revised access junction as agreed with Highway Officers. However, in addition to vehicular access, further consideration is also required with regard pedestrian and cycle access and connectivity with the public transport network. It was agreed during the meeting of the 26th October that as the application is in outline only and the internal site layout is therefore likely to change, these matters are best dealt with at the reserved matters stage. It was agreed however to provide written details of the principles of access by these sustainable modes so as to guide the future development of the masterplan.

Pedestrian access should be provided to the site via pedestrian islands, similar to that situated some 250 metres to the east of the site on Glossop Road. The pedestrian islands may be situated within either the staggered ghost island vehicular access junction or in isolation depending on the layout of the reserved matters masterplan and how it relates to pedestrian desire lines and existing bus stops.

Cycle access will be provided from the vehicular access junction. Additional access points may be considered in tandem with pedestrian access routes to the site. These routes will need to be widened to 2.5 metres so as to ensure sufficient width for cyclists and pedestrians to pass safely. Once on Glossop Road it is proposed cyclists will then travel to their destination or one of the nearby National Cycle Routes on the road network.

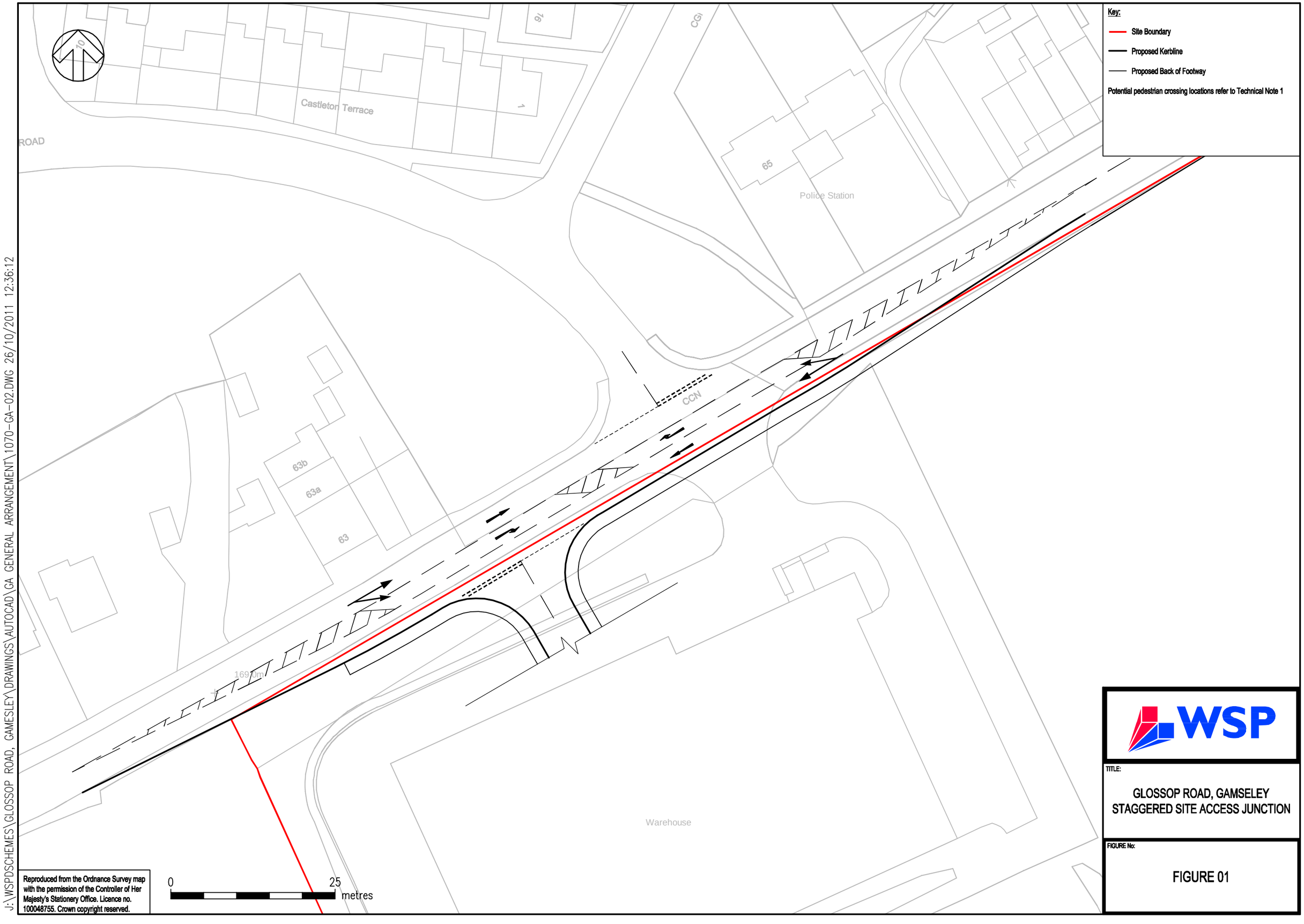
5. SUMMARY

Following discussions with the Highway Authority and mindful of the evidence presented in this Technical Note it is considered that there are no overriding reasons preventing the Highway Authority from recognising that the proposals are acceptable in transport terms.

Appendix A – Figures

Figure 01 – Revised Site Access Junction

Figure 02 – Revised Site Access Junction Autotrack



J:\WSPDSCHEMES\GLOSSOP ROAD, GAMESLEY\DRAWINGS\AUTOCAD\GA GENERAL ARRANGEMENT\1070-GA-02.DWG 26/10/2011 12:36:12

WSP

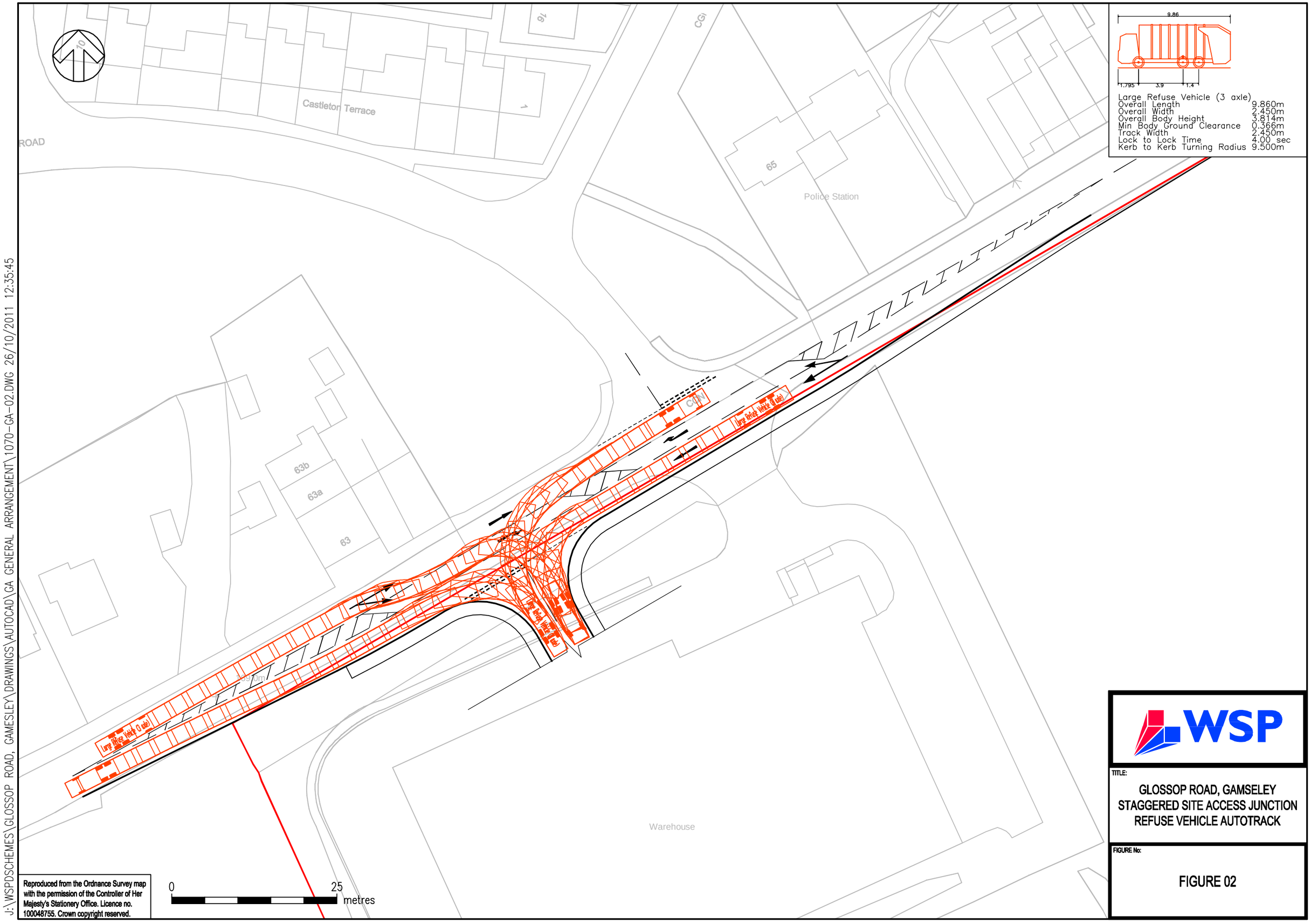
TITLE:

GLOSSOP ROAD, GAMSELEY
STAGGERED SITE ACCESS JUNCTION

FIGURE No:

FIGURE 01

J:\WSPDSCHEMES\GLOSSOP ROAD, GAMSELEY\DRAWINGS\AUTOCAD\GA GENERAL ARRANGEMENT\1070-GA-02.DWG 26/10/2011 12:35:45



WSP

TITLE:

GLOSSOP ROAD, GAMSELEY
STAGGERED SITE ACCESS JUNCTION
REFUSE VEHICLE AUTOTRACK

FIGURE No:

FIGURE 02

Appendix B – PICADY outputs

Revised site access;

- 2015 AM & PM
- 2020 AM & PM

TRL LIMITED

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

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
BY PERMISSION OF THE CONTROLLER OF HMSO

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

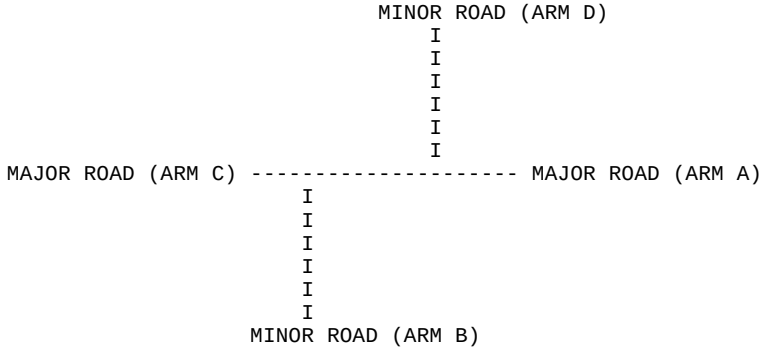
Run with file:-
"J:\WSPDSchemes\Glossop Road, Gamesley\ANALYSIS\PICADY\Site Access\01 - TN1 Assessments\
Site Access Base + Development - Staggered.vpi"
(drive-on-the-left) at 12:13:36 on Wednesday, 26 October 2011

RUN INFORMATION
****

RUN TITLE: Glossop Road - SIte Access Junction
LOCATION:
DATE: 06/07/11
CLIENT:
ENUMERATOR: ukgxc019 [W09UK0023]
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS Glossop Road East
ARM B IS Site Access
ARM C IS Glossop Road West
ARM D IS Melandra Castle Road

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	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 7.00 M.	(W) 7.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.50 M.	(WA-D) 2.50 M.
- VISIBILITY	(VC-B) 50.0 M.	(VA-D) 0.0 M.
- BLOCKS TRAFFIC	NO	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 26.0 M.	(VD-A) 26.0 M.
- VISIBILITY TO RIGHT	(VB-A) 22.0 M.	(VD-C) 23.0 M.
- LANE 1 WIDTH	(WB-C) 3.65 M.	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) 0.00 M.	(WD-C) 0.00 M.

.SLOPES AND INTERCPET

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

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
679.29	0.25	0.25	0.10	0.10

B-AD Stream

Intercept For Stream B-AD	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
529.16	0.23	0.23	0.09	0.09

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream C-B	Slope For Opposing
0.15	0.15	0.33	

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
679.96	0.25	0.25	0.10	0.10

D-BC Stream

Intercept For Stream D-BC	Slope For Opposing Stream C-A	Slope For Opposing Stream B-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-D
529.69	0.23	0.23	0.09	0.09

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream A-D	Slope For Opposing
0.15	0.15	0.33	

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-C	Slope For Opposing Stream D-B
622.60	0.23	0.23	0.23	0.23

A-D Stream

Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing

Stream A-D	Stream C-A	Stream C-D	Stream B-A	Stream B-D
622.60	0.22	0.22	0.22	0.22

TRAFFIC DEMAND DATA

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

Demand set: 2015 AM Peak

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

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

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	6.61	9.92	6.61
ARM B	15.00	45.00	75.00	0.51	0.77	0.51
ARM C	15.00	45.00	75.00	2.91	4.37	2.91
ARM D	15.00	45.00	75.00	1.77	2.66	1.77

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
08.00 - 09.30	ARM A	0.000	0.021	0.905	0.074
		0.0	11.0	479.0	39.0
		(0.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.341	0.000	0.659	0.000
		14.0	0.0	27.0	0.0
		(10.0)	(0.0)	(10.0)	(10.0)
	ARM C	0.931	0.021	0.000	0.047
		217.0	5.0	0.0	11.0
		(10.0)	(10.0)	(0.0)	(10.0)
	ARM D	0.697	0.000	0.303	0.000
		99.0	0.0	43.0	0.0
		(10.0)	(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2015 AM Peak
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)
08.00-08.15									
B-ACD	0.51	7.53	0.068		0.00	0.07	1.0		0.14
A-B	0.14								
A-C	6.01								
A-D	0.49	8.31	0.059		0.00	0.06	0.9		0.13
D-ABC	1.78	8.25	0.216		0.00	0.27	3.9		0.15
C-D	0.14								
C-A	2.72								
C-B	0.06	7.89	0.008		0.00	0.01	0.1		0.13

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)
08.15-08.30									
B-ACD	0.61	7.16	0.086		0.07	0.09	1.4		0.15
A-B	0.16								
A-C	7.18								
A-D	0.58	8.18	0.071		0.06	0.08	1.1		0.13
D-ABC	2.13	7.99	0.266		0.27	0.36	5.2		0.17
C-D	0.16								
C-A	3.25								
C-B	0.07	7.59	0.010		0.01	0.01	0.1		0.13

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)
08.30-08.45									
B-ACD	0.75	6.65	0.113		0.09	0.13	1.8		0.17
A-B	0.20								
A-C	8.79								
A-D	0.72	8.00	0.089		0.08	0.10	1.4		0.14
D-ABC	2.61	7.62	0.342		0.36	0.51	7.3		0.20
C-D	0.20								
C-A	3.98								
C-B	0.09	7.17	0.013		0.01	0.01	0.2		0.14

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)
08.45-09.00									
B-ACD	0.75	6.65	0.113		0.13	0.13	1.9		0.17
A-B	0.20								
A-C	8.79								
A-D	0.72	8.00	0.089		0.10	0.10	1.5		0.14
D-ABC	2.61	7.62	0.342		0.51	0.51	7.7		0.20
C-D	0.20								
C-A	3.98								
C-B	0.09	7.17	0.013		0.01	0.01	0.2		0.14

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)
09.00-09.15									
B-ACD	0.61	7.16	0.086		0.13	0.09	1.5		0.15
A-B	0.16								
A-C	7.18								
A-D	0.58	8.18	0.071		0.10	0.08	1.2		0.13
D-ABC	2.13	7.99	0.266		0.51	0.37	5.7		0.17
C-D	0.16								
C-A	3.25								
C-B	0.07	7.59	0.010		0.01	0.01	0.2		0.13

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)
09.15-09.30									
B-ACD	0.51	7.52	0.068		0.09	0.07	1.1		0.14
A-B	0.14								
A-C	6.01								
A-D	0.49	8.31	0.059		0.08	0.06	1.0		0.13
D-ABC	1.78	8.25	0.216		0.37	0.28	4.3		0.15
C-D	0.14								
C-A	2.72								
C-B	0.06	7.89	0.008		0.01	0.01	0.1		0.13

QUEUE FOR STREAM B-ACD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	0.1	
08.30	0.1	
08.45	0.1	
09.00	0.1	
09.15	0.1	
09.30	0.1	

QUEUE FOR STREAM A-D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	0.1	
08.30	0.1	
08.45	0.1	
09.00	0.1	
09.15	0.1	
09.30	0.1	

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	0.3	
08.30	0.4	
08.45	0.5	*
09.00	0.5	*
09.15	0.4	
09.30	0.3	

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-ACD	56.4	37.6	8.7	0.16	8.7	0.16
A-B	15.1	10.1				
A-C	659.3	439.5				
A-D	53.7	35.8	7.1	0.13	7.1	0.13
D-ABC	195.5	130.3	34.2	0.17	34.2	0.17
C-D	15.1	10.1				
C-A	298.7	199.1				
C-B	6.9	4.6	0.9	0.13	0.9	0.13
ALL	1300.7	867.1	50.9	0.04	50.9	0.04

* 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 JOB

.SLOPES AND INTERCPET

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

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
679.29	0.25	0.25	0.10	0.10

B-AD Stream

Intercept For Stream B-AD	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
529.16	0.23	0.23	0.09	0.09

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream C-B	Slope For Opposing
0.15	0.15	0.33	

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
679.96	0.25	0.25	0.10	0.10

D-BC Stream

Intercept For Stream D-BC	Slope For Opposing Stream C-A	Slope For Opposing Stream B-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-D
529.69	0.23	0.23	0.09	0.09

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream A-D	Slope For Opposing
0.15	0.15	0.33	

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-C	Slope For Opposing Stream D-B
622.60	0.23	0.23	0.23	0.23

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-A	Slope For Opposing Stream B-D
622.60	0.22	0.22	0.22	0.22

TRAFFIC DEMAND DATA

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

Demand set: 2020 AM Peak

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

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

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	7.05	10.58	7.05
ARM B	15.00	45.00	75.00	0.51	0.77	0.51
ARM C	15.00	45.00	75.00	3.10	4.65	3.10
ARM D	15.00	45.00	75.00	1.89	2.83	1.89

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
08.00 - 09.30	ARM A	0.000	0.020	0.906	0.074
		0.0	11.0	511.0	42.0
		(0.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.341	0.000	0.659	0.000
		14.0	0.0	27.0	0.0
		(10.0)	(0.0)	(10.0)	(10.0)
	ARM C	0.931	0.020	0.000	0.048
		231.0	5.0	0.0	12.0
		(10.0)	(10.0)	(0.0)	(10.0)
	ARM D	0.702	0.000	0.298	0.000
		106.0	0.0	45.0	0.0
		(10.0)	(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2020 AM Peak
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)
08.00-08.15									
B-ACD	0.51	7.41	0.069		0.00	0.07	1.1		0.14
A-B	0.14								
A-C	6.41								
A-D	0.53	8.27	0.064		0.00	0.07	1.0		0.13
D-ABC	1.89	8.18	0.232		0.00	0.30	4.3		0.16
C-D	0.15								
C-A	2.90								
C-B	0.06	7.79	0.008		0.00	0.01	0.1		0.13
08.15-08.30									
B-ACD	0.61	7.01	0.088		0.07	0.09	1.4		0.16
A-B	0.16								
A-C	7.66								
A-D	0.63	8.13	0.077		0.07	0.08	1.2		0.13
D-ABC	2.26	7.91	0.286		0.30	0.39	5.7		0.18
C-D	0.18								
C-A	3.46								
C-B	0.07	7.47	0.010		0.01	0.01	0.1		0.14
08.30-08.45									
B-ACD	0.75	6.46	0.116		0.09	0.13	1.9		0.17
A-B	0.20								
A-C	9.38								
A-D	0.77	7.94	0.097		0.08	0.11	1.6		0.14
D-ABC	2.77	7.52	0.369		0.39	0.57	8.2		0.21
C-D	0.22								
C-A	4.24								
C-B	0.09	7.03	0.013		0.01	0.01	0.2		0.14
08.45-09.00									
B-ACD	0.75	6.46	0.116		0.13	0.13	2.0		0.18
A-B	0.20								
A-C	9.38								
A-D	0.77	7.94	0.097		0.11	0.11	1.6		0.14
D-ABC	2.77	7.51	0.369		0.57	0.58	8.6		0.21
C-D	0.22								
C-A	4.24								
C-B	0.09	7.03	0.013		0.01	0.01	0.2		0.14

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)
09.00-09.15									
B-ACD	0.61	7.01	0.088		0.13	0.10	1.5		0.16
A-B	0.16								
A-C	7.66								
A-D	0.63	8.13	0.077		0.11	0.08	1.3		0.13
D-ABC	2.26	7.91	0.286		0.58	0.41	6.3		0.18
C-D	0.18								
C-A	3.46								
C-B	0.07	7.47	0.010		0.01	0.01	0.2		0.14

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)
09.15-09.30									
B-ACD	0.51	7.40	0.069		0.10	0.08	1.2		0.15
A-B	0.14								
A-C	6.41								
A-D	0.53	8.27	0.064		0.08	0.07	1.1		0.13
D-ABC	1.89	8.18	0.232		0.41	0.31	4.7		0.16
C-D	0.15								
C-A	2.90								
C-B	0.06	7.79	0.008		0.01	0.01	0.1		0.13

QUEUE FOR STREAM B-ACD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	0.1	
08.30	0.1	
08.45	0.1	
09.00	0.1	
09.15	0.1	
09.30	0.1	

QUEUE FOR STREAM A-D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	0.1	
08.30	0.1	
08.45	0.1	
09.00	0.1	
09.15	0.1	
09.30	0.1	

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.15	0.3	
08.30	0.4	
08.45	0.6	*
09.00	0.6	*
09.15	0.4	
09.30	0.3	

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-ACD	56.4	37.6	9.0	0.16	9.0	0.16
A-B	15.1	10.1				
A-C	703.4	468.9				
A-D	57.8	38.5	7.7	0.13	7.7	0.13
D-ABC	207.8	138.6	37.9	0.18	37.9	0.18
C-D	16.5	11.0				
C-A	318.0	212.0				
C-B	6.9	4.6	0.9	0.14	0.9	0.14
ALL	1381.9	921.3	55.5	0.04	55.5	0.04

* 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 JOB

.SLOPES AND INTERCPET

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

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
679.29	0.25	0.25	0.10	0.10

B-AD Stream

Intercept For Stream B-AD	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
529.16	0.23	0.23	0.09	0.09

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream C-B	Slope For Opposing
0.15	0.15	0.33	

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
679.96	0.25	0.25	0.10	0.10

D-BC Stream

Intercept For Stream D-BC	Slope For Opposing Stream C-A	Slope For Opposing Stream B-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-D
529.69	0.23	0.23	0.09	0.09

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream A-D	Slope For Opposing
0.15	0.15	0.33	

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-C	Slope For Opposing Stream D-B
622.60	0.23	0.23	0.23	0.23

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-A	Slope For Opposing Stream B-D
622.60	0.22	0.22	0.22	0.22

TRAFFIC DEMAND DATA

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

Demand set: 2015 PM Peak

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

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

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	5.20	7.80	5.20
ARM B	15.00	45.00	75.00	0.26	0.39	0.26
ARM C	15.00	45.00	75.00	4.84	7.26	4.84
ARM D	15.00	45.00	75.00	1.35	2.03	1.35

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
08.00 - 09.30	ARM A	0.000	0.043	0.675	0.281
		0.0	18.0	281.0	117.0
		(0.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.524	0.000	0.476	0.000
		11.0	0.0	10.0	0.0
		(10.0)	(0.0)	(10.0)	(10.0)
	ARM C	0.848	0.049	0.000	0.103
		328.0	19.0	0.0	40.0
		(10.0)	(10.0)	(0.0)	(10.0)
	ARM D	0.704	0.000	0.296	0.000
		76.0	0.0	32.0	0.0
		(10.0)	(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2015 PM Peak
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)
08.00-08.15									
B-ACD	0.26	7.46	0.035		0.00	0.04	0.5		0.14
A-B	0.23								
A-C	3.53								
A-D	1.47	7.94	0.185		0.00	0.22	3.2		0.15
D-ABC	1.36	7.91	0.171		0.00	0.20	2.9		0.15
C-D	0.50								
C-A	4.12								
C-B	0.24	8.48	0.028		0.00	0.03	0.4		0.12

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)
08.15-08.30									
B-ACD	0.31	7.15	0.044		0.04	0.05	0.7		0.15
A-B	0.27								
A-C	4.21								
A-D	1.75	7.73	0.227		0.22	0.29	4.2		0.17
D-ABC	1.62	7.58	0.214		0.20	0.27	3.9		0.17
C-D	0.60								
C-A	4.91								
C-B	0.28	8.29	0.034		0.03	0.04	0.5		0.12

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)
08.30-08.45									
B-ACD	0.39	6.73	0.057		0.05	0.06	0.9		0.16
A-B	0.33								
A-C	5.16								
A-D	2.15	7.45	0.288		0.29	0.40	5.8		0.19
D-ABC	1.98	7.10	0.279		0.27	0.38	5.5		0.19
C-D	0.73								
C-A	6.02								
C-B	0.35	8.03	0.043		0.04	0.04	0.7		0.13

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)
08.45-09.00									
B-ACD	0.39	6.73	0.057		0.06	0.06	0.9		0.16
A-B	0.33								
A-C	5.16								
A-D	2.15	7.45	0.288		0.40	0.40	6.0		0.19
D-ABC	1.98	7.10	0.279		0.38	0.38	5.7		0.20
C-D	0.73								
C-A	6.02								
C-B	0.35	8.03	0.043		0.04	0.05	0.7		0.13

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)
09.00-09.15									
B-ACD	0.31	7.15	0.044		0.06	0.05	0.7		0.15
A-B	0.27								
A-C	4.21								
A-D	1.75	7.73	0.227		0.40	0.30	4.6		0.17
D-ABC	1.62	7.57	0.214		0.38	0.28	4.3		0.17
C-D	0.60								
C-A	4.91								
C-B	0.28	8.29	0.034		0.05	0.04	0.5		0.12

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)
09.15-09.30									
B-ACD	0.26	7.45	0.035		0.05	0.04	0.6		0.14
A-B	0.23								
A-C	3.53								
A-D	1.47	7.94	0.185		0.30	0.23	3.5		0.15
D-ABC	1.36	7.90	0.171		0.28	0.21	3.2		0.15
C-D	0.50								
C-A	4.12								
C-B	0.24	8.47	0.028		0.04	0.03	0.4		0.12

QUEUE FOR STREAM B-ACD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.1
09.00	0.1
09.15	0.0
09.30	0.0

QUEUE FOR STREAM A-D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.2
08.30	0.3
08.45	0.4
09.00	0.4
09.15	0.3
09.30	0.2

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.2
08.30	0.3
08.45	0.4
09.00	0.4
09.15	0.3
09.30	0.2

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-ACD	28.9	19.3	4.3	0.15	4.3	0.15
A-B	24.8	16.5				
A-C	386.8	257.9				
A-D	161.0	107.4	27.4	0.17	27.4	0.17
D-ABC	148.7	99.1	25.6	0.17	25.6	0.17
C-D	55.1	36.7				
C-A	451.5	301.0				
C-B	26.2	17.4	3.3	0.13	3.3	0.13
ALL	1282.8	855.2	60.5	0.05	60.5	0.05

* 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 JOB

.SLOPES AND INTERCPET

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

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
679.29	0.25	0.25	0.10	0.10

B-AD Stream

Intercept For Stream B-AD	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
529.16	0.23	0.23	0.09	0.09

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream C-B	Slope For Opposing
0.15	0.15	0.33	

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
679.96	0.25	0.25	0.10	0.10

D-BC Stream

Intercept For Stream D-BC	Slope For Opposing Stream C-A	Slope For Opposing Stream B-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-D
529.69	0.23	0.23	0.09	0.09

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream A-D	Slope For Opposing
0.15	0.15	0.33	

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-C	Slope For Opposing Stream D-B
622.60	0.23	0.23	0.23	0.23

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-A	Slope For Opposing Stream B-D
622.60	0.22	0.22	0.22	0.22

TRAFFIC DEMAND DATA

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

Demand set: 2020 PM Peak

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

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

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	5.54	8.31	5.54
ARM B	15.00	45.00	75.00	0.26	0.39	0.26
ARM C	15.00	45.00	75.00	5.14	7.71	5.14
ARM D	15.00	45.00	75.00	1.45	2.18	1.45

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
08.00 - 09.30	ARM A	0.000	0.041	0.677	0.282
		0.0	18.0	300.0	125.0
		(0.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.524	0.000	0.476	0.000
		11.0	0.0	10.0	0.0
		(10.0)	(0.0)	(10.0)	(10.0)
	ARM C	0.852	0.046	0.000	0.102
		350.0	19.0	0.0	42.0
		(10.0)	(10.0)	(0.0)	(10.0)
	ARM D	0.698	0.000	0.302	0.000
		81.0	0.0	35.0	0.0
		(10.0)	(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2020 PM Peak
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)
08.00-08.15									
B-ACD	0.26	7.36	0.036		0.00	0.04	0.5		0.14
A-B	0.23								
A-C	3.76								
A-D	1.57	7.87	0.199		0.00	0.25	3.5		0.16
D-ABC	1.46	7.78	0.187		0.00	0.23	3.3		0.16
C-D	0.53								
C-A	4.39								
C-B	0.24	8.41	0.028		0.00	0.03	0.4		0.12

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)
08.15-08.30									
B-ACD	0.31	7.03	0.045		0.04	0.05	0.7		0.15
A-B	0.27								
A-C	4.49								
A-D	1.87	7.65	0.245		0.25	0.32	4.7		0.17
D-ABC	1.74	7.42	0.234		0.23	0.30	4.4		0.18
C-D	0.63								
C-A	5.24								
C-B	0.28	8.21	0.035		0.03	0.04	0.5		0.13

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)
08.30-08.45									
B-ACD	0.39	6.58	0.059		0.05	0.06	0.9		0.16
A-B	0.33								
A-C	5.51								
A-D	2.29	7.36	0.312		0.32	0.45	6.4		0.20
D-ABC	2.13	6.91	0.308		0.30	0.44	6.3		0.21
C-D	0.77								
C-A	6.42								
C-B	0.35	7.94	0.044		0.04	0.05	0.7		0.13

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)
08.45-09.00									
B-ACD	0.39	6.58	0.059		0.06	0.06	0.9		0.16
A-B	0.33								
A-C	5.51								
A-D	2.29	7.36	0.312		0.45	0.45	6.7		0.20
D-ABC	2.13	6.91	0.308		0.44	0.44	6.6		0.21
C-D	0.77								
C-A	6.42								
C-B	0.35	7.94	0.044		0.05	0.05	0.7		0.13

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)
09.00-09.15									
B-ACD	0.31	7.03	0.045		0.06	0.05	0.7		0.15
A-B	0.27								
A-C	4.49								
A-D	1.87	7.65	0.245		0.45	0.33	5.1		0.17
D-ABC	1.74	7.42	0.234		0.44	0.31	4.8		0.18
C-D	0.63								
C-A	5.24								
C-B	0.28	8.21	0.035		0.05	0.04	0.6		0.13

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)
09.15-09.30									
B-ACD	0.26	7.35	0.036		0.05	0.04	0.6		0.14
A-B	0.23								
A-C	3.76								
A-D	1.57	7.87	0.199		0.33	0.25	3.9		0.16
D-ABC	1.46	7.77	0.187		0.31	0.23	3.6		0.16
C-D	0.53								
C-A	4.39								
C-B	0.24	8.41	0.028		0.04	0.03	0.5		0.12

QUEUE FOR STREAM B-ACD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.1
09.00	0.1
09.15	0.0
09.30	0.0

QUEUE FOR STREAM A-D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.2
08.30	0.3
08.45	0.4
09.00	0.4
09.15	0.3
09.30	0.3

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.2
08.30	0.3
08.45	0.4
09.00	0.4
09.15	0.3
09.30	0.2

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-ACD	28.9	19.3	4.3	0.15	4.3	0.15
A-B	24.8	16.5				
A-C	412.9	275.3				
A-D	172.1	114.7	30.3	0.18	30.3	0.18
D-ABC	159.7	106.4	29.0	0.18	29.0	0.18
C-D	57.8	38.5				
C-A	481.7	321.2				
C-B	26.2	17.4	3.3	0.13	3.3	0.13
ALL	1364.0	909.4	66.9	0.05	66.9	0.05

* 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 JOB

========== end of file ==========

[Printed at 12:16:01 on 26/10/2011]