TRL LIMITED

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

PICADY 5.1 ANALYSIS PROGRAM
RELEASE 4.0 (SEPT 2008)

FOR SALES AND DISTRIBUTION INFORMATION,
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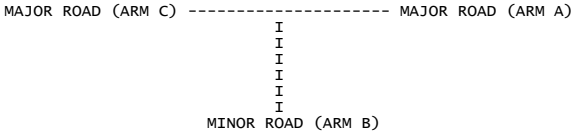
Run with file:-
"J:\122000\122374-00\4 Internal Project Data\4-40 Calculations\Transport\Junction Assessments\
15.Vere St_Gladstone Rise\Gladstone Rd_Holton Rd Priority\Gladstone_Holton Road Priority.vpi"
(drive-on-the-left) at 10:21:27 on Wednesday, 15 July 2009

.RUN INFORMATION

RUN TITLE	: Gladstone Road / Holton Road Priority
LOCATION	:
DATE	: 15/07/09
CLIENT	:
ENUMERATOR	: Ryan.Hopkins [WACCMSJQ2J]
JOB NUMBER	:
STATUS	:
DESCRIPTION	:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS Roundabout (E)
ARM B IS Holton Rd (W)
ARM C IS Gladstone Road (N)

.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) 9.53 M.
CENTRAL RESERVE WIDTH	(WCR) 3.36 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.
- VISIBILITY	(VC-B) 25.00 M.
- BLOCKS TRAFFIC	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 30.0 M.
- VISIBILITY TO RIGHT	(VB-A) 28.0 M.
- LANE 1 WIDTH	(WB-C) -
- LANE 2 WIDTH	(WB-A) -
WIDTH AT 0 M FROM JUNCTION	9.29 M.
WIDTH AT 5 M FROM JUNCTION	4.70 M.
WIDTH AT 10 M FROM JUNCTION	3.80 M.
WIDTH AT 15 M FROM JUNCTION	4.00 M.
WIDTH AT 20 M FROM JUNCTION	4.80 M.
- LENGTH OF FLARED SECTION	1 VEHS

.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
588.44	0.19	0.19

(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: AM 2020 Base

TIME PERIOD BEGINS 08.15 AND ENDS 09.45

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	8.48	12.71	8.48
ARM B	15.00	45.00	75.00	2.47	3.71	2.47
ARM C	15.00	45.00	75.00	6.35	9.52	6.35

.Demand set: AM 2020 Base

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

TIME	FROM/TO	ARM A	ARM B	ARM C
08.15 - 08.30				
	ARM A	0.000	0.432	0.568
		0.0	293.0	385.0
		(0.0)	(4.0)	(4.0)
	ARM B	0.924	0.000	0.076
		183.0	0.0	15.0
		(3.0)	(0.0)	(0.0)
	ARM C	1.000	0.000	0.000
		508.0	0.0	0.0
		(5.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

. QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET AM 2020 Base
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)
08.15-08.30									
B-C	0.19	7.82	0.024		0.00	0.02	0.4		0.13
B-A	2.30	7.60	0.302		0.00	0.43	6.0		0.19
C-A	6.37								
C-B	0.00	7.36	0.000		0.00	0.00	0.0		0.00
A-B	3.68								
A-C	4.83								

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-C	0.22	7.20	0.031		0.02	0.03	0.5		0.14
B-A	2.74	7.15	0.383		0.43	0.61	8.7		0.23
C-A	7.61								
C-B	0.00	7.06	0.000		0.00	0.00	0.0		0.00
A-B	4.39								
A-C	5.77								

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-C	0.28	6.11	0.045		0.03	0.05	0.7		0.17
B-A	3.36	6.53	0.515		0.61	1.02	14.3		0.31
C-A	9.32								
C-B	0.00	6.65	0.000		0.00	0.00	0.0		0.00
A-B	5.38								
A-C	7.06								

TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY

	(VEH/MIN)	(VEH/MIN)	CAPACITY (RFC)	FLOW (PEDS/MIN)	QUEUE (VEHS)	QUEUE (VEHS)	(VEH.MIN/ TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	0.28	6.08	0.045		0.05	0.05	0.7		0.17
B-A	3.36	6.53	0.515		1.02	1.04	15.5		0.32
C-A	9.32								
C-B	0.00	6.65	0.000		0.00	0.00	0.0		0.00
A-B	5.38								
A-C	7.06								

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-C	0.22	7.17	0.031		0.05	0.03	0.5		0.14
B-A	2.74	7.15	0.383		1.04	0.64	10.1		0.23
C-A	7.61								
C-B	0.00	7.06	0.000		0.00	0.00	0.0		0.00
A-B	4.39								
A-C	5.77								

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)
09.30-09.45									
B-C	0.19	7.80	0.024		0.03	0.02	0.4		0.13
B-A	2.30	7.60	0.302		0.64	0.44	6.9		0.19
C-A	6.37								
C-B	0.00	7.36	0.000		0.00	0.00	0.0		0.00
A-B	3.68								
A-C	4.83								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.30	0.0	
08.45	0.0	
09.00	0.0	
09.15	0.0	
09.30	0.0	
09.45	0.0	

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.30	0.4	
08.45	0.6	*
09.00	1.0	*
09.15	1.0	*
09.30	0.6	*
09.45	0.4	

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0
09.45	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-C	20.6	13.8	3.1	0.15	3.1	0.15
B-A	251.9	167.9	61.5	0.24	61.5	0.24
C-A	699.2	466.1				
C-B	0.0	0.0	0.0	0.00	0.0	0.00
A-B	403.3	268.9				
A-C	529.9	353.3				
ALL	1905.0	1270.0	64.6	0.03	64.6	0.03

* 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
588.44	0.19	0.19

(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 2020 Base

TIME PERIOD BEGINS 16.15 AND ENDS 17.45

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	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	10.64	15.96	10.64
ARM B	15.00	45.00	75.00	2.88	4.31	2.88
ARM C	15.00	45.00	75.00	5.16	7.74	5.16

.Demand set: PM 2020 Base

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

TIME	FROM/TO	ARM A	ARM B	ARM C
16.15 - 16.30	ARM A	0.000	0.398	0.602
		0.0	339.0	512.0
		(0.0)	(0.0)	(1.0)
	ARM B	0.917	0.000	0.083
		211.0	0.0	19.0
		(1.0)	(0.0)	(0.0)
	ARM C	1.000	0.000	0.000
		413.0	0.0	0.0
		(2.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

. QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET PM 2020 Base
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)
16.15-16.30									
B-C	0.24	7.34	0.032		0.00	0.03	0.5		0.14
B-A	2.65	7.58	0.349		0.00	0.53	7.4		0.20
C-A	5.18								
C-B	0.00	7.03	0.000		0.00	0.00	0.0		0.00
A-B	4.25								
A-C	6.42								

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)
16.30-16.45									
B-C	0.28	6.55	0.043		0.03	0.04	0.7		0.16
B-A	3.16	7.09	0.446		0.53	0.78	11.2		0.25
C-A	6.19								
C-B	0.00	6.67	0.000		0.00	0.00	0.0		0.00
A-B	5.08								
A-C	7.67								

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	0.35	5.09	0.069		0.04	0.07	1.0		0.21
B-A	3.87	6.40	0.605		0.78	1.44	19.8		0.38

C-A	7.58								
C-B	0.00	6.16	0.000		0.00	0.00	0.0		0.00
A-B	6.22								
A-C	9.40								

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)
17.00-17.15									
B-C	0.35	5.03	0.069		0.07	0.07	1.1		0.21
B-A	3.87	6.40	0.605		1.44	1.48	22.0		0.39
C-A	7.58								
C-B	0.00	6.16	0.000		0.00	0.00	0.0		0.00
A-B	6.22								
A-C	9.40								

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)
17.15-17.30									
B-C	0.28	6.49	0.044		0.07	0.05	0.7		0.16
B-A	3.16	7.09	0.446		1.48	0.83	13.3		0.26
C-A	6.19								
C-B	0.00	6.67	0.000		0.00	0.00	0.0		0.00
A-B	5.08								
A-C	7.67								

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	0.24	7.31	0.033		0.05	0.03	0.5		0.14
B-A	2.65	7.58	0.349		0.83	0.55	8.6		0.20
C-A	5.18								
C-B	0.00	7.03	0.000		0.00	0.00	0.0		0.00
A-B	4.25								
A-C	6.42								

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.30	0.0	
16.45	0.0	
17.00	0.1	
17.15	0.1	
17.30	0.0	
17.45	0.0	

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.30	0.5	*
16.45	0.8	*
17.00	1.4	*
17.15	1.5	*
17.30	0.8	*
17.45	0.5	*

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0
17.45	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-C	26.2	17.4	4.5	0.17	4.5	0.17
B-A	290.4	193.6	82.3	0.28	82.3	0.28
C-A	568.5	379.0				
C-B	0.0	0.0	0.0	0.00	0.0	0.00
A-B	466.6	311.1				
A-C	704.7	469.8				
ALL	2056.4	1370.9	86.8	0.04	86.8	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 RUN*******