

TRL LIMITED

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

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
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Run with file:-
"C:\E DRIVE DOCS\WORKING JOB FILES\Bicester\Oct 2010 onwards\Junction Capacity\Junc 1 & 2, Exem Access\
Priority Junctions\Junction 1 - Exemplar.vpi"
(drive-on-the-left) at 17:22:16 on Tuesday, 23 November 2010

RUN INFORMATION

RUN TITLE: Junction 1
LOCATION: Bicester
DATE: 08/11/10
CLIENT:
ENUMERATOR: mba24773 [HCL56181]
JOB NUMBER: UA001881
STATUS: Preliminary
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

MAJOR ROAD (ARM C) ----- MAJOR ROAD (ARM A)
I
I
I
I
I
I
MINOR ROAD (ARM B)

ARM A IS B4100 Banbury Rd (s)
ARM B IS Northern Site Access
ARM C IS B4100 Banbury Rd (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) 7.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.50 M.
- VISIBILITY	(VC-B) 215.0 M.
- BLOCKS TRAFFIC	NO
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 215.0 M.
- VISIBILITY TO RIGHT	(VB-A) 215.0 M.
- LANE 1 WIDTH	(WB-C) -
- LANE 2 WIDTH	(WB-A) -
- WIDTH AT 0 M FROM JUNC.	10.00 M.
- WIDTH AT 5 M FROM JUNC.	7.65 M.
- WIDTH AT 10 M FROM JUNC.	6.00 M.
- WIDTH AT 15 M FROM JUNC.	5.60 M.
- WIDTH AT 20 M FROM JUNC.	5.10 M.
- LENGTH OF FLARED SECTION	DERIVED: 3 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
698.47	0.26	0.10

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
610.77	0.27	0.11	0.17	0.38

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
797.29	0.30	0.30

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: 2016 + Exem AM Peak

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

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	6.63	9.94	6.63
ARM B	15.00	45.00	75.00	0.91	1.37	0.91
ARM C	15.00	45.00	75.00	11.55	17.33	11.55

I I I I I	I	TURNING PROPORTIONS						I I I I I
		TURNING COUNTS (VEH/HR)						
		(PERCENTAGE OF H.V.S)						
TIME		FROM/TO	ARM A	ARM B	ARM C			
I	07.45 - 09.15	I	I	I	I	I	I	
I		ARM A	I	0.000	I	0.064	I	0.936
I			I	0.0	I	34.0	I	496.0
I			I	(0.0)	I	(5.9)	I	(3.6)
I		I	I	I	I	I	I	I
I		ARM B	I	0.959	I	0.000	I	0.041
I			I	70.0	I	0.0	I	3.0
I			I	(0.0)	I	(0.0)	I	(7.1)
I		I	I	I	I	I	I	I
I		ARM C	I	0.999	I	0.001	I	0.000
I			I	923.0	I	1.0	I	0.0
I			I	(4.9)	I	(0.0)	I	(0.0)
I	I	I	I	I	I	I	I	

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 COMBINED DEMAND SETS
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)
07.45-08.00									
B-C	0.04	8.72	0.004		0.00	0.00	0.1		0.12
B-A	0.88	8.25	0.106		0.00	0.12	1.7		0.14
C-A	11.58								
C-B	0.01	11.25	0.001		0.00	0.00	0.0		0.09
A-B	0.43								
A-C	6.22								

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-C	0.04	8.34	0.005		0.00	0.01	0.1		0.12
B-A	1.05	7.28	0.144		0.12	0.17	2.4		0.16
C-A	13.83								
C-B	0.01	10.85	0.001		0.00	0.00	0.0		0.09
A-B	0.51								
A-C	7.43								

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	0.06	7.79	0.007		0.01	0.01	0.1		0.13
B-A	1.28	5.94	0.216		0.17	0.27	3.9		0.21
C-A	16.94								
C-B	0.02	10.31	0.002		0.00	0.00	0.0		0.10
A-B	0.62								
A-C	9.10								

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	0.06	7.79	0.007		0.01	0.01	0.1		0.13
B-A	1.28	5.94	0.216		0.27	0.27	4.1		0.21
C-A	16.94								
C-B	0.02	10.31	0.002		0.00	0.00	0.0		0.10
A-B	0.62								
A-C	9.10								

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	0.04	8.34	0.005		0.01	0.01	0.1		0.12
B-A	1.05	7.28	0.144		0.27	0.17	2.6		0.16
C-A	13.83								
C-B	0.01	10.85	0.001		0.00	0.00	0.0		0.09
A-B	0.51								
A-C	7.43								

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-C	0.04	8.72	0.004		0.01	0.00	0.1		0.12
B-A	0.88	8.25	0.106		0.17	0.12	1.9		0.14
C-A	11.58								
C-B	0.01	11.25	0.001		0.00	0.00	0.0		0.09
A-B	0.43								
A-C	6.22								

QUEUE FOR STREAM B-C	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM B-A	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.2
08.30	0.3
08.45	0.3
09.00	0.2
09.15	0.1

QUEUE FOR STREAM C-B	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL	I	DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I		I		I		I	* DELAY *	I	* DELAY *	I
I		I		I		I		I		I
I		I	(VEH)	I	(VEH/H)	I	(MIN)	I	(MIN/VEH)	I
I	B-C	I	4.1	I	2.8	I	0.5	I	0.12	I
I	B-A	I	96.3	I	64.2	I	16.6	I	0.17	I
I	C-A	I	1270.4	I	847.0	I		I		I
I	C-B	I	1.4	I	0.9	I	0.1	I	0.09	I
I	A-B	I	46.8	I	31.2	I		I		I
I	A-C	I	682.7	I	455.1	I		I		I
I	ALL	I	2101.8	I	1401.2	I	17.3	I	0.01	I

* 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 INTERCEPT

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

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-C	Stream	A-C	Stream	A-B	I
I	698.47		0.26		0.10	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-A	Stream	A-C	Stream	A-B	Stream	C-A	I
I	610.77		0.27		0.11		0.17	I
							0.38	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream C-B	Stream	A-C	Stream	A-B	I
I	797.29		0.30		0.30	I

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: 2016 + Exem PM peak

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

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	9.91	14.87	9.91
ARM B	15.00	45.00	75.00	0.46	0.69	0.46
ARM C	15.00	45.00	75.00	7.91	11.87	7.91

TIME	FROM/TO	ARM A	ARM B	ARM C
16.45 - 18.15	ARM A	0.000 0.0 (0.0)	0.066 52.0 (3.8)	0.934 741.0 (3.1)
	ARM B	0.973 36.0 (2.8)	0.000 0.0 (0.0)	0.027 1.0 (0.0)
	ARM C	0.998 632.0 (4.0)	0.002 1.0 (0.0)	0.000 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 COMBINED DEMAND SETS
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)
16.45-17.00									
B-C	0.01	8.64	0.001		0.00	0.00	0.0		0.12
B-A	0.45	7.77	0.058		0.00	0.06	0.9		0.14
C-A	7.93								
C-B	0.01	10.26	0.001		0.00	0.00	0.0		0.10
A-B	0.65								
A-C	9.30								

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	0.01	8.13	0.002		0.00	0.00	0.0		0.12
B-A	0.54	6.78	0.080		0.06	0.09	1.2		0.16
C-A	9.47								
C-B	0.01	9.67	0.002		0.00	0.00	0.0		0.10
A-B	0.78								
A-C	11.10								

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	0.02	7.40	0.002		0.00	0.00	0.0		0.14
B-A	0.66	5.40	0.122		0.09	0.14	2.0		0.21
C-A	11.60								
C-B	0.02	8.85	0.002		0.00	0.00	0.0		0.11
A-B	0.95								
A-C	13.60								

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	0.02	7.40	0.002		0.00	0.00	0.0		0.14
B-A	0.66	5.40	0.122		0.14	0.14	2.1		0.21
C-A	11.60								
C-B	0.02	8.85	0.002		0.00	0.00	0.0		0.11
A-B	0.95								
A-C	13.60								

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	0.01	8.13	0.002		0.00	0.00	0.0		0.12
B-A	0.54	6.78	0.080		0.14	0.09	1.4		0.16
C-A	9.47								
C-B	0.01	9.67	0.002		0.00	0.00	0.0		0.10
A-B	0.78								
A-C	11.10								

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	0.01	8.64	0.001		0.00	0.00	0.0		0.12
B-A	0.45	7.77	0.058		0.09	0.06	1.0		0.14
C-A	7.93								
C-B	0.01	10.26	0.001		0.00	0.00	0.0		0.10
A-B	0.65								
A-C	9.30								

QUEUE FOR STREAM B-C	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM B-A	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.1
17.45	0.1
18.00	0.1
18.15	0.1

QUEUE FOR STREAM C-B	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I		I		I	* DELAY *	I	* DELAY *	I
I		I		I		I		I
I		I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
I	B-C	I	1.4	0.9	0.2	0.13	0.2	0.13
I	B-A	I	49.6	33.0	8.5	0.17	8.5	0.17
I	C-A	I	869.9	579.9	I	I	I	I
I	C-B	I	1.4	0.9	0.1	0.11	0.1	0.11
I	A-B	I	71.6	47.7	I	I	I	I
I	A-C	I	1019.9	680.0	I	I	I	I
I	ALL	I	2013.7	1342.5	8.8	0.00	8.8	0.00

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 * 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 =====