

Appendix 1

Traffic Assessment on Key Junctions

Junction 1 Morning 2020 Without Development

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Visual OSCADY 4.01
*CT1* ---- RUN TITLE ----
Junction 1 Weekday Morning 2020 Without Development
*
*CT2* ---- RUN PARAMETERS ----
* TIMES FOR FIXED TIME OPTIMISATION, QUEUE/DELAY CALCULATIONS, DEMAND DATA.
&PARAM START=0715, FINISH=0815, INTERV=15, DSTART=0715, DFINISH=0815,
  FSCALE=100, &END
*
*CT3* ---- RUN OPTIONS ----
* JUNCTION, DEMAND, VEHICLES, TURNING, QUEUES AND DELAYS, ACCIDENT, SATURATION.
&OPTION TEE=T,DIRECT=T,TIMINP=T,VDEF=T,TPTIME=T,QUEDEL=T,T2=T,URB=T,APR=T,
  &END
*
*CT4* ---- ARM NAMES ----
Triq Birzebbuga (North)
Triq Marsaxlokk
Triq Birzebbuga (South)
*
*CT5* ---- GEOMETRIC DATA ----
* ARM GRAD LANES PERMITTED MOVEMENTS FOR LANE .... EXIT
*      A 00.0      2      1      2      ..3      ..4      ..5      WIDTH
      B 00.0      2      1      3
      C 00.0      2      2      2
      D
      50.10
      50.10
*
*CT6* LANE WIDTHS.
      A03.50      03.50
      B03.50      03.50
      C03.50      03.50
*
*CT7* LEFT TURN RADII.
      A005.0
      B005.0
*
*CT8* RIGHT TURN DETAILS.                      NON-BLOCKING      OPPOSING
*      RIGHT TURN RADII.                      STORAGE      TRAFFIC
      B      005.0
*NO CT9*
*NO CT10*
*NO CT11*
*NO CT12*
*
*CT13* ---- SIGNAL DATA ---- FOR SIGNAL TIMING SET 1
*      NO.OF MAX FIXED EFF GRN DISPLACEMENTS
*      TRIGGER STAGES CYCLE OR CYCLE START END CONTROL KEYWORDS
      02      1.4      2.9 FIXED TIME NSETS=1
*
*CT14* STAGING DATA FOR SET 1
*      LANES ON GREEN FOR ARM .... SPLITS .....
*      STAGE A B C D INTERSTAGE MIN/FIXED GREEN
      01      12      12      12      05.0      007.0
      02      1      12      05.0      007.0
*NO CT15*
*NO CT16*
*NO CT17*
*NO CT18*
*
*CT19* ---- DIRECT DEMAND DATA ---- ENTRY FLOWS BY ARM
*      FROM A FROM B FROM C FROM D
**      1 0014.50 0005.50 0015.10
**
**      1 0016.80 0006.00 0016.60
**
**      1 0014.60 0006.70 0016.40
**
**      1 0013.40 0005.00 0018.90
*NO CT20*
*NO CT21*
*NO CT22*
*NO CT23*
*NO CT24*
*NO CT25*
*
*CT26* ---- TURNING PROPORTIONS --- FOR EACH TIME SEGMENT
*      TO A TO B TO C TO D
      0.000 0.102 0.307
      0.143 0.000 0.011
      0.427 0.000 0.000
**
      0.000 0.115 0.360
      0.162 0.000 0.008
      0.469 0.000 0.000
**
      0.000 0.115 0.298
      0.181 0.000 0.009

```

**	0.463	0.000	0.000
	0.000	0.122	0.256
	0.139	0.000	0.002
	0.535	0.000	0.000
**			
NO	CT27		
NO	CT28		
NO	CT29		
NO	CT30		
NO	CT31		
NO	CT32		
NO	CT33		
NO	CT34		
NO	CT35		
NO	CT36		
NO	CT37		
NO	CT38		
NO	CT39		
NO	CT40		
NO	CT41		
NO	CT42		
NO	CT43		
NO	CT44		
NO	CT45		
NO	CT46		

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OPTIMISED SIGNAL CAPACITY AND DELAY

Visual OSCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (MAR 1999)

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*****

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.Run with file:- "c:\Program Files\Junction\OSCADY4\j1nd20m.voi" at 00:39:25 on Tuesday, 19 April 2011

RUN TITLE

Junction 1 Weekday Morning 2020 Without Development

*** ERROR AND WARNING MESSAGES ***

No errors or warnings in the data.

.TRAFFIC SIGNAL JUNCTION ANALYSIS

INPUT DATA

```

          TO A ---->
ARM C----- TEE ----- ARM A
          <----- FROM A
          I
          I
          I
          I
          I
          I
          I
          ARM B

```

ARM A IS Triq Birzebuga (North)
ARM B IS Triq Marsaxlokk
ARM C IS Triq Birzebuga (South)

.GEOMETRIC DATA

I	DATA ITEM	I	ARM A	I	ARM B	I	ARM C	I
I	GRADIENT	I	0.0 %	I	0.0 %	I	0.0 %	I
I		I		I		I		I
I	NUMBER OF LANES	I	2	I	2	I	2	I
I		I		I		I		I
I	PERMITTED MOVEMENTS	I	L	I	L	I	S	I
I	LANE 2	I	S	I	R	I	S	I
I		I		I		I		I
I	TOTAL EXIT WIDTH FOR STRAIGHT-	I		I		I		I
I	AHEAD VEHICLES FROM THIS ARM	I	N/A	I	N/A	I	N/A	I
I		I		I		I		I
I	LANE WIDTHS	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 2	I	3.50 M	I	3.50 M	I	3.50 M	I
I		I		I		I		I
I	LEFT TURN RADII	I	5.0 M	I	5.0 M	I	N/A	I
I		I		I		I		I
I	RIGHT TURN RADII	I	N/A	I	5.0 M	I	N/A	I
I		I		I		I		I

EXIT WIDTH FOR IMAGINARY ARM D = 50.10

.TRAFFIC DEMAND DATA

DEMAND DATA ARE INPUT USING THE ** DIRECT ** OPTION

DEFAULT VEHICLE TYPE PROPORTIONS ARE USED

DEMAND DATA SUPPLIED BETWEEN TIMES - 07.15 TO 08.15
PERIOD OF INTEREST (FOR QUEUE AND DELAY CALCULATIONS) - 07.15 TO 08.15

THE FOLLOWING DATA HAS BEEN INPUT
+ / DEFAULTED

TRAFFIC SCALING FACTOR HAS BEEN SET TO 100 %

I	TIME PERIOD	I	ARM	I	CARS AND	MEDIUM	VEHICLE TYPE	PROPORTIONS	MOTOR	PEDAL	I
I		I		I	LIGHT GOODS	GOODS	HEAVY	BUSES AND	COACHES	CYCLES	CYCLES
I	ALL	I	ALL	I	0.927	0.041	0.016	0.016	0.000	0.000	I

I	TIME PERIOD	I	FROM/TO	I	ARM A	I	ARM B	I	ARM C	I
I	07.15-07.30	I	ARM A GROUP 1	I	0.000	I	0.249	I	0.751	I
I		I	ARM B GROUP 1	I	0.929	I	0.000	I	0.071	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	07.30-07.45	I	ARM A GROUP 1	I	0.000	I	0.242	I	0.758	I
I		I	ARM B GROUP 1	I	0.953	I	0.000	I	0.047	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	07.45-08.00	I	ARM A GROUP 1	I	0.000	I	0.278	I	0.722	I
I		I	ARM B GROUP 1	I	0.953	I	0.000	I	0.047	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	08.00-08.15	I	ARM A GROUP 1	I	0.000	I	0.323	I	0.677	I
I		I	ARM B GROUP 1	I	0.986	I	0.000	I	0.014	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I

.SIGNAL TIMING DETAILS FOR SIGNAL SET 1

TIMING OPTION- FIXED MODE: TIMINGS ARE PROVIDED BY USER

FIXED CYCLE TIME- 24.0 SECONDS
PERIODS FOR WHICH THESE SETTINGS APPLY- 07.15-08.15

GLOBAL EFFECTIVE GREEN DISPLACEMENTS - START = 1.4
END = 2.9

I	DATA ITEM	I	STAGE 1	I	STAGE 2	I
I	LANES ON GREEN: ARM A	I	1 2	I	1	I
I	B	I		I	1 2	I
I	C	I	1 2	I		I
I		I		I		I
I	GREEN TIME (SECS)	I	7.0	I	7.0	I
I		I		I		I
I	PRECEDING INTERSTAGE	I	5.0	I	5.0	I

.DEMAND AND CAPACITY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 07.15 AND 08.15
=====

I	TIME	MOVEMENT	DEMAND	SAT FLOW	SAT FLOW	EFFECTIVE GREEN-TIME	CAPACITY	I
I			(VEHS/MIN)	(PCU/HR)	(VEHS/MIN)	TRUE FLARE+NOTIONL	(VEHS	I
I	ARM	LANES				(SECS)	/MIN)	I
I	07.15-07.30							I
I	A	1	L	3.62	1511.5	23.83	23.83	I
I		2	S	10.88	2105.0	33.18	11.75	I
I	B	1	L	0.39	1511.5	23.83	8.44	I
I		2	R	5.11	1619.2	25.52	9.04	I
I	C	12	S	15.10	4070.0	64.16	22.72	I

I	07.30-07.45						I
I	A 1	L	4.07	1511.5	23.83	24.0	23.83
I	2	S	12.73	2105.0	33.18	8.5	11.75
I	B 1	L	0.28	1511.5	23.83	8.5	8.44
I	2	R	5.72	1619.2	25.52	8.5	9.04
I	C 12	S	16.60	4070.0	64.16	8.5	22.72

I	07.45-08.00						I
I	A 1	L	4.07	1511.5	23.83	24.0	23.83
I	2	S	10.53	2105.0	33.18	8.5	11.75
I	B 1	L	0.32	1511.5	23.83	8.5	8.44
I	2	R	6.38	1619.2	25.52	8.5	9.04
I	C 12	S	16.40	4070.0	64.16	8.5	22.72

I	08.00-08.15						I
I	A 1	L	4.32	1511.5	23.83	24.0	23.83
I	2	S	9.08	2105.0	33.18	8.5	11.75
I	B 1	L	0.07	1511.5	23.83	8.5	8.44
I	2	R	4.93	1619.2	25.52	8.5	9.04
I	C 12	S	18.90	4070.0	64.16	8.5	22.72

QUEUE AND DELAY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 07.15 AND 08.15

=====											
I	TIME	MOVEMENT	DEMAND	CAPACITY	DEGREE	QUEUE AT END OF SEGMENT		QUEUEING	GEOMETRIC	I	
I	ARM	LANES	EXCL	(VEHS/MIN)	OF SAT			DELAY	DELAY	I	
I			2-WHEEL		(RFC)	MEAN (PHASE	MAXIMUM	(VEH.MIN/	(VEH.MIN/	I	
I			(VEHS/MIN)			AVERAGED)	(END OF RED)	TIME SEGMENT)	TIME SEGMENT)	I	
I						(VEHS/LANE)	(VEHS/LANE)			I	

I	07.15-07.30										I
I	A	1	L	3.62	23.83	0.152	0.0	0.0	0.2	I	
I		2	S	10.88	11.75	0.926	6.1	7.6	79.3	I	
I	B	1	L	0.39	8.44	0.047	0.0	0.1	0.5	I	
I		2	R	5.11	9.04	0.565	1.0	1.8	14.4	I	
I	C	12	S	15.10	22.72	0.665	1.2	2.3	36.2	I	

I	07.30-07.45										I
I	A	1	L	4.07	23.83	0.171	0.0	0.0	0.3	I	
I		2	S	12.73	11.75	1.083	23.6	25.1	253.0	I	
I	B	1	L	0.28	8.44	0.033	0.0	0.1	0.4	I	
I		2	R	5.72	9.04	0.632	1.3	2.1	18.8	I	
I	C	12	S	16.60	22.72	0.731	1.5	2.7	45.6	I	

I	07.45-08.00										I
I	A	1	L	4.07	23.83	0.171	0.0	0.0	0.3	I	
I		2	S	10.53	11.75	0.896	9.3	10.8	263.1	I	
I	B	1	L	0.32	8.44	0.038	0.0	0.1	0.4	I	
I		2	R	6.38	9.04	0.706	1.7	2.6	25.4	I	
I	C	12	S	16.40	22.72	0.722	1.5	2.7	44.4	I	

I	08.00-08.15										I
I	A	1	L	4.32	23.83	0.182	0.0	0.0	0.4	I	
I		2	S	9.08	11.75	0.772	2.7	4.0	52.8	I	
I	B	1	L	0.07	8.44	0.008	0.0	0.0	0.1	I	
I		2	R	4.93	9.04	0.545	0.9	1.7	13.8	I	
I	C	12	S	18.90	22.72	0.832	2.3	3.6	68.5	I	

QUEUES FOR ARM A

TIME	LANE	NUMBER OF VEHICLES IN QUEUE		
SEGMENT		MEAN	MAXIMUM	
ENDING		(PHASE	(AT END	
		AVERAGED)	OF RED)	
		*	+	
07.30	2	6.1	7.6	*****+
	1	0.0	0.0	
07.45	2	23.6	25.1	*****+
	1	0.0	0.0	
08.00	2	9.3	10.8	*****+
	1	0.0	0.0	
08.15	2	2.7	4.0	***+
	1	0.0	0.0	

QUEUES FOR ARM B

TIME	LANE	NUMBER OF VEHICLES IN QUEUE		
SEGMENT		MEAN	MAXIMUM	
ENDING		(PHASE	(AT END	
		AVERAGED)	OF RED)	

		*	+	
07.30	2	1.0	1.8	*+
	1	0.0	0.1	
07.45	2	1.3	2.1	*+
	1	0.0	0.1	
08.00	2	1.7	2.6	***
	1	0.0	0.1	
08.15	2	0.9	1.7	*+
	1	0.0	0.0	

.QUEUES FOR ARM C

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES MEAN (PHASE AVERAGED)	IN QUEUE MAXIMUM (AT END OF RED)	
		*	+	
07.30	2	1.2	2.3	*+
	1	1.2	2.3	*+
07.45	2	1.5	2.7	***
	1	1.5	2.7	***
08.00	2	1.5	2.7	***
	1	1.5	2.7	***
08.15	2	2.3	3.6	****
	1	2.3	3.6	****

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD (07.15-08.15)

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I	I	I	(EXCL 2-WHEEL)	I	* DELAY *	I	* DELAY *	I
I	I	I	(VEH)	I	(VEH/H)	I	(MIN)	I
I	I	I	(VEH)	I	(VEH/H)	I	(MIN)	I
I	A-B	I	241.1	I	241.1	I	1.2	I
I	A-C	I	648.4	I	648.4	I	1.00	I
I	B-C	I	16.0	I	16.0	I	0.09	I
I	B-A	I	332.0	I	332.0	I	0.22	I
I	C-A	I	1005.0	I	1005.0	I	0.19	I
I	C-B	I	0.0	I	0.0	I	0.00	I
I	ALL	I	2242.5	I	2242.5	I	0.41	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 BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

* TOTAL GEOMETRIC DELAY INCLUDES DELAY SUFFERED BY VEHICLES STILL QUEUEING AT THE END OF THE WHOLE TIME PERIOD.

* THE SUM OF DELAYS FOR EACH SEGMENT AND THE TOTAL GEOMETRIC DELAY WILL BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS

* A LARGE QUEUE AT THE END OF THE TIME PERIOD.

***** OSCADY 4 run completed

Junction 1 Evening 2020 Without Development

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Visual OSCADY 4.01
*CT1* ---- RUN TITLE ----
Junction 1 Weekday Evening 2020 Without Development
*
*CT2* ---- RUN PARAMETERS ----
* TIMES FOR FIXED TIME OPTIMISATION, QUEUE/DELAY CALCULATIONS, DEMAND DATA.
&PARAM START=1600, FINISH=1700, INTERV=15, DSTART=1600, DFINISH=1700,
  FSCALE=100, &END
*
*CT3* ---- RUN OPTIONS ----
* JUNCTION, DEMAND, VEHICLES, TURNING, QUEUES AND DELAYS, ACCIDENT, SATURATION.
&OPTION TEE=T,DIRECT=T,TIMINP=T,VDEF=T,TPTIME=T,QUEDEL=T,T2=T,URB=T,APR=T,
  &END
*
*CT4* ---- ARM NAMES ----
Triq Birzebbuga (North)
Triq Marsaxlokk
Triq Birzebbuga (South)
*
*CT5* ---- GEOMETRIC DATA ----
* ARM GRAD LANES PERMITTED MOVEMENTS FOR LANE .... EXIT
* ..1 ..2 ..3 ..4 ..5 WIDTH
  A 00.0 2 1 2 3 50.10
  B 00.0 2 1 3 50.10
  C 00.0 2 2 2 50.10
  D 50.10
*
*CT6* LANE WIDTHS.
  A03.50 03.50
  B03.50 03.50
  C03.50 03.50
*
*CT7* LEFT TURN RADII.
  A005.0
  B005.0
*
*CT8* RIGHT TURN DETAILS. NON-BLOCKING OPPOSING
* RIGHT TURN RADII. STORAGE TRAFFIC
  B 005.0
*NO CT9*
*NO CT10*
*NO CT11*
*NO CT12*
*
*CT13* ---- SIGNAL DATA ---- FOR SIGNAL TIMING SET 1
* NO.OF MAX FIXED EFF GRN DISPLACEMENTS
* TRIGGER STAGES CYCLE OR CYCLE START END CONTROL KEYWORDS
  02 1.4 2.9 FIXED TIME NSETS=1
*
*CT14* STAGING DATA FOR SET 1
* LANES ON GREEN FOR ARM .... SPLITS .....
* STAGE A B C D INTERSTAGE MIN/FIXED GREEN
  01 12 12 05.0 007.0
  02 1 12 05.0 007.0
*NO CT15*
*NO CT16*
*NO CT17*
*NO CT18*
*
*CT19* ---- DIRECT DEMAND DATA ---- ENTRY FLOWS BY ARM
* FROM A FROM B FROM C FROM D
  1 0016.50 0006.30 0015.70
**
  1 0019.70 0004.40 0013.50
**
  1 0017.90 0004.50 0015.90
**
  1 0021.10 0004.30 0014.50
*NO CT20*
*NO CT21*
*NO CT22*
*NO CT23*
*NO CT24*
*NO CT25*
*
*CT26* ---- TURNING PROPORTIONS --- FOR EACH TIME SEGMENT
* TO A TO B TO C TO D
  0.000 0.129 0.296
  0.156 0.000 0.007
  0.404 0.000 0.000
**
  0.000 0.158 0.362
  0.105 0.000 0.011
  0.357 0.000 0.000
**

```


	0.000	0.128	0.335
	0.109	0.000	0.007
	0.413	0.000	0.000
**			
	0.000	0.139	0.385
	0.094	0.000	0.013
	0.360	0.000	0.000
**			
NO CT27			
NO CT28			
NO CT29			
NO CT30			
NO CT30			
NO CT31			
NO CT32			
NO CT33			
NO CT34			
NO CT35			
NO CT36			
NO CT37			
NO CT38			
NO CT39			
NO CT40			
NO CT41			
NO CT42			
NO CT43			
NO CT44			
NO CT45			
NO CT46			

T R A N S P O R T R E S E A R C H L A B O R A T O R Y

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OPTIMISED SIGNAL CAPACITY AND DELAY

Visual OSCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (MAR 1999)

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NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

.Run with file:- "c:\Program Files\Junction\OSCADY4\j1nd20e.voi" at 01:16:22 on Tuesday, 19 April 2011

RUN TITLE

Junction 1 Weekday Evening 2020 Without Development

**** ERROR AND WARNING MESSAGES ****

=====

No errors or warnings in the data.

.TRAFFIC SIGNAL JUNCTION ANALYSIS

INPUT DATA

```

          TO A ----->
ARM C----- TEE ----- ARM A
          <----- FROM A
          I
          I
          I
          I
          I
          I
          I
          ARM B

```

ARM A IS Triq Birzebbuga (North)

ARM B IS Triq Marsaxlokk

ARM C IS Triq Birzebbuga (South)

.GEOMETRIC DATA

DATA ITEM		I	ARM A	I	ARM B	I	ARM C	I
I	GRADIENT	I	0.0 %	I	0.0 %	I	0.0 %	I
I		I		I		I		I
I	NUMBER OF LANES	I	2	I	2	I	2	I
I		I		I		I		I
I	PERMITTED MOVEMENTS	I	L	I	L	I	S	I
I	LANE 2	I	S	I	R	I	S	I
I		I		I		I		I
I	TOTAL EXIT WIDTH FOR STRAIGHT-	I		I		I		I
I	AHEAD VEHICLES FROM THIS ARM	I	N/A	I	N/A	I	N/A	I
I		I		I		I		I
I	LANE WIDTHS	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 2	I	3.50 M	I	3.50 M	I	3.50 M	I
I		I		I		I		I
I	LEFT TURN RADII	I	5.0 M	I	5.0 M	I	N/A	I
I		I		I		I		I
I	RIGHT TURN RADII	I	N/A	I	5.0 M	I	N/A	I

I I I I I

EXIT WIDTH FOR IMAGINARY ARM D = 50.10

.TRAFFIC DEMAND DATA

DEMAND DATA ARE INPUT USING THE ** DIRECT ** OPTION

DEFAULT VEHICLE TYPE PROPORTIONS ARE USED

DEMAND DATA SUPPLIED BETWEEN TIMES - 16.00 TO 17.00
PERIOD OF INTEREST (FOR QUEUE AND DELAY CALCULATIONS) - 16.00 TO 17.00

THE FOLLOWING DATA HAS BEEN INPUT
+ / DEFAULTED

TRAFFIC SCALING FACTOR HAS BEEN SET TO 100 %

I	TIME PERIOD	I	ARM	I	CARS AND LIGHT GOODS	MEDIUM GOODS	VEHICLE TYPE HEAVY GOODS	PROPORTIONS BUSES AND COACHES	MOTOR CYCLES	PEDAL CYCLES	I
I	ALL	I	ALL	I	0.927	0.041	0.016	0.016	0.000	0.000	I

I	TIME PERIOD	I	FROM/TO	I	ARM A	I	ARM B	I	ARM C	I
I	16.00-16.15	I	ARM A GROUP 1	I	0.000	I	0.304	I	0.696	I
I		I	ARM B GROUP 1	I	0.957	I	0.000	I	0.043	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	16.15-16.30	I	ARM A GROUP 1	I	0.000	I	0.304	I	0.696	I
I		I	ARM B GROUP 1	I	0.905	I	0.000	I	0.095	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	16.30-16.45	I	ARM A GROUP 1	I	0.000	I	0.276	I	0.724	I
I		I	ARM B GROUP 1	I	0.940	I	0.000	I	0.060	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	16.45-17.00	I	ARM A GROUP 1	I	0.000	I	0.265	I	0.735	I
I		I	ARM B GROUP 1	I	0.879	I	0.000	I	0.121	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I

.SIGNAL TIMING DETAILS FOR SIGNAL SET 1

TIMING OPTION- FIXED MODE:

TIMINGS ARE PROVIDED BY USER

FIXED CYCLE TIME- 24.0 SECONDS
PERIODS FOR WHICH THESE SETTINGS APPLY- 16.00-17.00

GLOBAL EFFECTIVE GREEN DISPLACEMENTS - START = 1.4
END = 2.9

I	DATA ITEM	I	STAGE 1	I	STAGE 2	I
I	LANES ON GREEN: ARM A	I	1 2	I	1	I
I	B	I		I	1 2	I
I	C	I	1 2	I		I
I		I		I		I
I	GREEN TIME (SECS)	I	7.0	I	7.0	I
I		I		I		I
I	PRECEDING INTERSTAGE	I	5.0	I	5.0	I

.DEMAND AND CAPACITY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 16.00 AND 17.00

I	TIME	MOVEMENT	DEMAND (VEHS/MIN)	SAT FLOW (PCU/HR)	SAT FLOW (VEHS/MIN)	EFFECTIVE GREEN-TIME TRUE FLARE+NOTIONL (SECS)	CAPACITY (VEHS /MIN)	I
I	16.00-16.15							I
I	A 1	L	5.01	1511.5	23.83	24.0	23.83	I

I		2	S	11.49	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.27	1511.5	23.83	8.5	8.44	I
I		2	R	6.03	1619.2	25.52	8.5	9.04	I
I	C	12	S	15.70	4070.0	64.16	8.5	22.72	I

I	16.15-16.30								
I	A	1	L	5.99	1511.5	23.83	24.0	23.83	I
I		2	S	13.71	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.42	1511.5	23.83	8.5	8.44	I
I		2	R	3.98	1619.2	25.52	8.5	9.04	I
I	C	12	S	13.50	4070.0	64.16	8.5	22.72	I

I	16.30-16.45								
I	A	1	L	4.95	1511.5	23.83	24.0	23.83	I
I		2	S	12.95	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.27	1511.5	23.83	8.5	8.44	I
I		2	R	4.23	1619.2	25.52	8.5	9.04	I
I	C	12	S	15.90	4070.0	64.16	8.5	22.72	I

I	16.45-17.00								
I	A	1	L	5.60	1511.5	23.83	24.0	23.83	I
I		2	S	15.50	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.52	1511.5	23.83	8.5	8.44	I
I		2	R	3.78	1619.2	25.52	8.5	9.04	I
I	C	12	S	14.50	4070.0	64.16	8.5	22.72	I

.QUEUE AND DELAY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 16.00 AND 17.00

=====

I	TIME	MOVEMENT	DEMAND EXCL 2-WHEEL (VEHS/MIN)	CAPACITY (VEHS/MIN)	DEGREE OF SAT (RFC)	QUEUE AT END OF SEGMENT MEAN (PHASE AVERAGED) (VEHS/LANE)	MAXIMUM (END OF RED) (VEHS/LANE)	QUEUEING DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	ARM	LANES								I

I	16.00-16.15									I
I	A	1	L	5.01	23.83	0.210	0.0	0.0	0.5	I
I		2	S	11.49	11.75	0.978	9.3	10.8	108.0	I
I	B	1	L	0.27	8.44	0.032	0.0	0.1	0.4	I
I		2	R	6.03	9.04	0.667	1.4	2.3	21.1	I
I	C	12	S	15.70	22.72	0.691	1.3	2.5	39.5	I

I	16.15-16.30									I
I	A	1	L	5.99	23.83	0.251	0.1	0.1	0.8	I
I		2	S	13.71	11.75	1.167	39.8	41.3	391.9	I
I	B	1	L	0.42	8.44	0.049	0.0	0.1	0.6	I
I		2	R	3.98	9.04	0.441	0.6	1.2	9.2	I
I	C	12	S	13.50	22.72	0.594	1.0	2.0	29.3	I

I	16.30-16.45									I
I	A	1	L	4.95	23.83	0.208	0.0	0.0	0.5	I
I		2	S	12.95	11.75	1.102	58.0	59.5	747.2	I
I	B	1	L	0.27	8.44	0.032	0.0	0.1	0.4	I
I		2	R	4.23	9.04	0.468	0.7	1.3	10.0	I
I	C	12	S	15.90	22.72	0.700	1.4	2.5	40.9	I

I	16.45-17.00									I
I	A	1	L	5.60	23.83	0.235	0.0	0.0	0.6	I
I		2	S	15.50	11.75	1.319	114.3	115.8	1301.3	I
I	B	1	L	0.52	8.44	0.062	0.0	0.1	0.7	I
I		2	R	3.78	9.04	0.418	0.6	1.2	8.3	I
I	C	12	S	14.50	22.72	0.638	1.1	2.2	33.7	I

.QUEUES FOR ARM A

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	
16.15	2	9.3	10.8	*****++
	1	0.0	0.0	
16.30	2	39.8	41.3	*****++
	1	0.1	0.1	
16.45	2	58.0	59.5	*****++
	1	0.0	0.0	
17.00	2	114.3	115.8	*****
	1	0.0	0.0	

.QUEUES FOR ARM B

TIME SEGMENT ENDING	LANE	NUMBER OF MEAN (PHASE AVERAGED) *	VEHICLES IN QUEUE MAXIMUM (AT END OF RED) +	
16.15	2	1.4	2.3	*+
	1	0.0	0.1	
16.30	2	0.6	1.2	*
	1	0.0	0.1	
16.45	2	0.7	1.3	*
	1	0.0	0.1	
17.00	2	0.6	1.2	*
	1	0.0	0.1	

.QUEUES FOR ARM C

TIME SEGMENT ENDING	LANE	NUMBER OF MEAN (PHASE AVERAGED) *	VEHICLES IN QUEUE MAXIMUM (AT END OF RED) +	
16.15	2	1.3	2.5	*+
	1	1.3	2.5	*+
16.30	2	1.0	2.0	*+
	1	1.0	2.0	*+
16.45	2	1.4	2.5	***
	1	1.4	2.5	***
17.00	2	1.1	2.2	*+
	1	1.1	2.2	*+

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD (16.00-17.00)

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I	
I		I	(EXCL 2-WHEEL)	I	* DELAY *	I	* DELAY *	I	
I		I		I		I		I	
I		I	(VEH)	I	(VEH/H)	I	(MIN)	I	
I		I		I	(MIN/VEH)	I	(MIN)	I	
I		I		I		I	(MIN/VEH)	I	
I	A-B	I	323.1	I	323.1	I	2.4	I	0.01
I	A-C	I	804.9	I	804.9	I	2548.4	I	3.17
I	B-C	I	22.2	I	22.2	I	2.0	I	0.09
I	B-A	I	270.3	I	270.3	I	48.6	I	0.18
I	C-A	I	894.0	I	894.0	I	143.4	I	0.16
I	C-B	I	0.0	I	0.0	I	0.00	I	0.00
I	ALL	I	2314.5	I	2314.5	I	2744.8	I	1.19
			</						

* 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 BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

* TOTAL GEOMETRIC DELAY INCLUDES DELAY SUFFERED BY VEHICLES STILL QUEUEING AT THE END OF THE WHOLE TIME PERIOD.

* THE SUM OF DELAYS FOR EACH SEGMENT AND THE TOTAL GEOMETRIC DELAY WILL BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS

* A LARGE QUEUE AT THE END OF THE TIME PERIOD.

.
***** OSCADY 4 run completed

Junction 1 Morning 2020 With Development

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Visual OSCADY 4.01
*CT1* ---- RUN TITLE ----
Junction 1 Weekday Morning 2020 With Development
*
*CT2* ---- RUN PARAMETERS ----
* TIMES FOR FIXED TIME OPTIMISATION, QUEUE/DELAY CALCULATIONS, DEMAND DATA.
&PARAM START=0715, FINISH=0815, INTERV=15, DSTART=0715, DFINISH=0815,
  FSCALE=100, &END
*
*CT3* ---- RUN OPTIONS ----
* JUNCTION, DEMAND, VEHICLES, TURNING, QUEUES AND DELAYS, ACCIDENT, SATURATION.
&OPTION TEE=T,DIRECT=T,TIMINP=T,VDEF=T,TPTIME=T,QUEDEL=T,T2=T,URB=T,APR=T,
  &END
*
*CT4* ---- ARM NAMES ----
Triq Birzebbuga (North)
Triq Marsaxlokk
Triq Birzebbuga (South)
*
*CT5* ---- GEOMETRIC DATA ----
* ARM GRAD LANES PERMITTED MOVEMENTS FOR LANE .... EXIT
* ..1 ..2 ..3 ..4 ..5 WIDTH
  A 00.0 2 1 2 3 50.10
  B 00.0 2 1 3 50.10
  C 00.0 2 2 2 50.10
  D 50.10
*
*CT6* LANE WIDTHS.
  A03.50 03.50
  B03.50 03.50
  C03.50 03.50
*
*CT7* LEFT TURN RADII.
  A005.0
  B005.0
*
*CT8* RIGHT TURN DETAILS. NON-BLOCKING OPPOSING
* RIGHT TURN RADII. STORAGE TRAFFIC
  B 005.0
*NO CT9*
*NO CT10*
*NO CT11*
*NO CT12*
*
*CT13* ---- SIGNAL DATA ---- FOR SIGNAL TIMING SET 1
* NO.OF MAX FIXED EFF GRN DISPLACEMENTS
* TRIGGER STAGES CYCLE OR CYCLE START END CONTROL KEYWORDS
  02 1.4 2.9 FIXED TIME NSETS=1
*
*CT14* STAGING DATA FOR SET 1
* LANES ON GREEN FOR ARM .... SPLITS .....
* STAGE A B C D INTERSTAGE MIN/FIXED GREEN
  01 12 12 05.0 007.0
  02 1 12 05.0 007.0
*NO CT15*
*NO CT16*
*NO CT17*
*NO CT18*
*
*CT19* ---- DIRECT DEMAND DATA ---- ENTRY FLOWS BY ARM
* FROM A FROM B FROM C FROM D
** 1 0014.60 0005.70 0015.10
**
** 1 0016.90 0006.10 0016.60
**
** 1 0014.70 0006.90 0016.40
**
** 1 0013.50 0005.10 0018.90
*NO CT20*
*NO CT21*
*NO CT22*
*NO CT23*
*NO CT24*
*NO CT25*
*
*CT26* ---- TURNING PROPORTIONS --- FOR EACH TIME SEGMENT
* TO A TO B TO C TO D
  0.000 0.105 0.307
  0.149 0.000 0.011
  0.427 0.000 0.000
**
  0.000 0.119 0.360
  0.166 0.000 0.008
  0.469 0.000 0.000
**

```

	0.000	0.119	0.298
	0.185	0.000	0.009
	0.463	0.000	0.000
**			
	0.000	0.126	0.256
	0.143	0.000	0.002
	0.535	0.000	0.000
**			
NO CT27			
NO CT28			
NO CT29			
NO CT30			
NO CT30			
NO CT31			
NO CT32			
NO CT33			
NO CT34			
NO CT35			
NO CT36			
NO CT37			
NO CT38			
NO CT39			
NO CT40			
NO CT41			
NO CT42			
NO CT43			
NO CT44			
NO CT45			
NO CT46			

TRANSPORT RESEARCH LABORATORY

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OPTIMISED SIGNAL CAPACITY AND DELAY

Visual OSCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (MAR 1999)

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*****
THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS IN
NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION
*****

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.Run with file:- "c:\Program Files\Junction\OSCADY4\j1wd20m.voi" at 00:35:07 on Tuesday, 19 April 2011

RUN TITLE

Junction 1 Weekday Morning 2020 With Development

*** ERROR AND WARNING MESSAGES ***

=====

No errors or warnings in the data.

.TRAFFIC SIGNAL JUNCTION ANALYSIS

INPUT DATA

```

          TO A ---->
ARM C----- TEE ----- ARM A
          <----- FROM A
          I
          I
          I
          I
          I
          I
          I
          ARM B

```

ARM A IS Triq Birzebuga (North)
ARM B IS Triq Marsaxlokk
ARM C IS Triq Birzebuga (South)

.GEOMETRIC DATA

I	DATA ITEM	I	ARM A	I	ARM B	I	ARM C	I
I	GRADIENT	I	0.0 %	I	0.0 %	I	0.0 %	I
I		I		I		I		I
I	NUMBER OF LANES	I	2	I	2	I	2	I
I		I		I		I		I
I	PERMITTED MOVEMENTS	I	L	I	L	I	S	I
I	LANE 1	I		I		I		I
I	LANE 2	I	S	I	R	I	S	I
I		I		I		I		I
I	TOTAL EXIT WIDTH FOR STRAIGHT-	I		I		I		I
I	AHEAD VEHICLES FROM THIS ARM	I	N/A	I	N/A	I	N/A	I
I		I		I		I		I
I	LANE WIDTHS	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 1	I		I		I		I
I	LANE 2	I	3.50 M	I	3.50 M	I	3.50 M	I
I		I		I		I		I
I	LEFT TURN RADII	I	5.0 M	I	5.0 M	I	N/A	I
I	LANE 1	I		I		I		I
I		I		I		I		I
I	RIGHT TURN RADII	I	N/A	I	5.0 M	I	N/A	I
I	LANE 2	I		I		I		I
I		I		I		I		I

EXIT WIDTH FOR IMAGINARY ARM D = 50.10

.TRAFFIC DEMAND DATA

DEMAND DATA ARE INPUT USING THE ** DIRECT ** OPTION

DEFAULT VEHICLE TYPE PROPORTIONS ARE USED

DEMAND DATA SUPPLIED BETWEEN TIMES - 07.15 TO 08.15
PERIOD OF INTEREST (FOR QUEUE AND DELAY CALCULATIONS) - 07.15 TO 08.15

THE FOLLOWING DATA HAS BEEN INPUT
+ / DEFAULTED

TRAFFIC SCALING FACTOR HAS BEEN SET TO 100 %

I	TIME PERIOD	I	ARM	I	CARS AND	MEDIUM	VEHICLE TYPE	PROPORTIONS	MOTOR	PEDAL	I
I		I		I	LIGHT GOODS	GOODS	HEAVY	BUSES AND	COACHES	CYCLES	CYCLES
I	ALL	I	ALL	I	0.927	0.041	0.016	0.016	0.000	0.000	I

I	TIME PERIOD	I	FROM/TO	I	ARM A	I	ARM B	I	ARM C	I
I	07.15-07.30	I	ARM A GROUP 1	I	0.000	I	0.255	I	0.745	I
I		I	ARM B GROUP 1	I	0.931	I	0.000	I	0.069	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	07.30-07.45	I	ARM A GROUP 1	I	0.000	I	0.248	I	0.752	I
I		I	ARM B GROUP 1	I	0.954	I	0.000	I	0.046	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	07.45-08.00	I	ARM A GROUP 1	I	0.000	I	0.285	I	0.715	I
I		I	ARM B GROUP 1	I	0.954	I	0.000	I	0.046	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	08.00-08.15	I	ARM A GROUP 1	I	0.000	I	0.330	I	0.670	I
I		I	ARM B GROUP 1	I	0.986	I	0.000	I	0.014	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I

.SIGNAL TIMING DETAILS FOR SIGNAL SET 1

TIMING OPTION- FIXED MODE: TIMINGS ARE PROVIDED BY USER

FIXED CYCLE TIME- 24.0 SECONDS
PERIODS FOR WHICH THESE SETTINGS APPLY- 07.15-08.15

GLOBAL EFFECTIVE GREEN DISPLACEMENTS - START = 1.4
END = 2.9

I	DATA ITEM	I	STAGE 1	I	STAGE 2	I
I	LANES ON GREEN: ARM A	I	1 2	I	1	I
I	B	I		I	1 2	I
I	C	I	1 2	I		I
I		I		I		I
I	GREEN TIME (SECS)	I	7.0	I	7.0	I
I		I		I		I
I	PRECEDING INTERSTAGE	I	5.0	I	5.0	I

.DEMAND AND CAPACITY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 07.15 AND 08.15
=====

I	TIME	MOVEMENT	DEMAND	SAT FLOW	SAT FLOW	EFFECTIVE GREEN-TIME	CAPACITY	I
I			(VEHS/MIN)	(PCU/HR)	(VEHS/MIN)	TRUE FLARE+NOTIONL	(VEHS	I
I	ARM	LANES				(SECS)	/MIN)	I
I	07.15-07.30							I
I	A	1 L	3.72	1511.5	23.83	24.0	23.83	I
I		2 S	10.88	2105.0	33.18	8.5	11.75	I
I	B	1 L	0.39	1511.5	23.83	8.5	8.44	I
I		2 R	5.31	1619.2	25.52	8.5	9.04	I
I	C	12 S	15.10	4070.0	64.16	8.5	22.72	I

I	07.30-07.45								
I	A	1	L	4.20	1511.5	23.83	24.0	23.83	I
I		2	S	12.70	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.28	1511.5	23.83	8.5	8.44	I
I		2	R	5.82	1619.2	25.52	8.5	9.04	I
I	C	12	S	16.60	4070.0	64.16	8.5	22.72	I
<hr/>									
I	07.45-08.00								I
I	A	1	L	4.19	1511.5	23.83	24.0	23.83	I
I		2	S	10.51	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.32	1511.5	23.83	8.5	8.44	I
I		2	R	6.58	1619.2	25.52	8.5	9.04	I
I	C	12	S	16.40	4070.0	64.16	8.5	22.72	I
<hr/>									
I	08.00-08.15								I
I	A	1	L	4.45	1511.5	23.83	24.0	23.83	I
I		2	S	9.05	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.07	1511.5	23.83	8.5	8.44	I
I		2	R	5.03	1619.2	25.52	8.5	9.04	I
I	C	12	S	18.90	4070.0	64.16	8.5	22.72	I

QUEUE AND DELAY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 07.15 AND 08.15

	TIME	MOVEMENT	DEMAND EXCL	CAPACITY (VEHS/MIN)	DEGREE OF SAT	QUEUE AT END OF SEGMENT	QUEUEING DELAY	GEOMETRIC DELAY	
	ARM	LANES	2-WHEEL (VEHS/MIN)		(RFC)	MEAN (PHASE AVERAGED) (VEHS/LANE)	MAXIMUM (END OF RED) (VEHS/LANE)	(VEH.MIN/ TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)
I	07.15-07.30								
I	A	1	L	3.72	23.83	0.156	0.0	0.0	0.3
I		2	S	10.88	11.75	0.926	6.1	7.6	79.1
I	B	1	L	0.39	8.44	0.046	0.0	0.1	0.5
I		2	R	5.31	9.04	0.587	1.0	1.9	15.6
I	C	12	S	15.10	22.72	0.665	1.2	2.3	36.2
I	07.30-07.45								
I	A	1	L	4.20	23.83	0.176	0.0	0.0	0.3
I		2	S	12.70	11.75	1.081	23.2	24.7	249.9
I	B	1	L	0.28	8.44	0.033	0.0	0.1	0.4
I		2	R	5.82	9.04	0.644	1.3	2.2	19.7
I	C	12	S	16.60	22.72	0.731	1.5	2.7	45.6
I	07.45-08.00								
I	A	1	L	4.19	23.83	0.176	0.0	0.0	0.3
I		2	S	10.51	11.75	0.894	8.7	10.2	254.9
I	B	1	L	0.32	8.44	0.038	0.0	0.1	0.4
I		2	R	6.58	9.04	0.728	1.9	2.8	27.9
I	C	12	S	16.40	22.72	0.722	1.5	2.7	44.4
I	08.00-08.15								
I	A	1	L	4.45	23.83	0.187	0.0	0.0	0.4
I		2	S	9.05	11.75	0.770	2.7	4.0	50.6
I	B	1	L	0.07	8.44	0.008	0.0	0.0	0.1
I		2	R	5.03	9.04	0.556	0.9	1.7	14.5
I	C	12	S	18.90	22.72	0.832	2.3	3.6	68.5

.QUEUES FOR ARM A

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE		
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	
		*	+	
07.30	2	6.1	7.6	+++++++
	1	0.0	0.0	
07.45	2	23.2	24.7	+++++++
	1	0.0	0.0	
08.00	2	8.7	10.2	+++++++
	1	0.0	0.0	
08.15	2	2.7	4.0	+++
	1	0.0	0.0	

.QUEUES FOR ARM B

TIME	LANE	NUMBER OF VEHICLES IN QUEUE	
SEGMENT		MEAN	MAXIMUM
ENDING		(PHASE	(AT END
		AVERAGED)	OF RED)

		*	+	
07.30	2	1.0	1.9	*+
	1	0.0	0.1	
07.45	2	1.3	2.2	*+
	1	0.0	0.1	
08.00	2	1.9	2.8	***
	1	0.0	0.1	
08.15	2	0.9	1.7	*+
	1	0.0	0.0	

 .QUEUES FOR ARM C

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE		
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	
		*	+	
07.30	2	1.2	2.3	*+
	1	1.2	2.3	*+
07.45	2	1.5	2.7	***
	1	1.5	2.7	***
08.00	2	1.5	2.7	***
	1	1.5	2.7	***
08.15	2	2.3	3.6	****
	1	2.3	3.6	****

 .QUEUEING DELAY INFORMATION OVER WHOLE PERIOD (07.15-08.15)

I I I I	STREAM I	I	TOTAL DEMAND (EXCL 2-WHEEL)	I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I				
					* DELAY	*		* DELAY	*					
			(VEH)	(VEH/H)	(MIN)	(MIN/VEH)		(MIN)	(MIN/VEH)					
I	A-B	I	248.5	I	248.5	I	1.3	I	0.01	I	1.3	I	0.01	I
I	A-C	I	647.0	I	647.0	I	634.5	I	0.98	I	634.8	I	0.98	I
I	B-C	I	15.9	I	15.9	I	1.4	I	0.09	I	1.4	I	0.09	I
I	B-A	I	341.1	I	341.1	I	77.7	I	0.23	I	77.8	I	0.23	I
I	C-A	I	1005.0	I	1005.0	I	194.7	I	0.19	I	195.2	I	0.19	I
I	C-B	I	0.0	I	0.0	I	0.0	I	0.00	I	0.0	I	0.00	I
I	ALL	I	2257.5	I	2257.5	I	909.7	I	0.40	I	910.5	I	0.40	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 BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

* TOTAL GEOMETRIC DELAY INCLUDES DELAY SUFFERED BY VEHICLES STILL QUEUEING AT THE END OF THE WHOLE TIME PERIOD.

* THE SUM OF DELAYS FOR EACH SEGMENT AND THE TOTAL GEOMETRIC DELAY WILL BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS

* A LARGE QUEUE AT THE END OF THE TIME PERIOD.

.
 ***** OSCADY 4 run completed

Junction 1 Evening 2020 With Development

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Visual OSCADY 4.01
*CT1* ---- RUN TITLE ----
Junction 1 Weekday Evening 2020 With Development
*
*CT2* ---- RUN PARAMETERS ----
* TIMES FOR FIXED TIME OPTIMISATION, QUEUE/DELAY CALCULATIONS, DEMAND DATA.
&PARAM START=1600, FINISH=1700, INTERV=15, DSTART=1600, DFINISH=1700,
  FSCALE=100, &END
*
*CT3* ---- RUN OPTIONS ----
* JUNCTION, DEMAND, VEHICLES, TURNING, QUEUES AND DELAYS, ACCIDENT, SATURATION.
&OPTION TEE=T,DIRECT=T,TIMINP=T,VDEF=T,TPTIME=T,QUEDEL=T,T2=T,URB=T,APR=T,
  &END
*
*CT4* ---- ARM NAMES ----
Triq Birzebbuga (North)
Triq Marsaxlokk
Triq Birzebbuga (South)
*
*CT5* ---- GEOMETRIC DATA ----
* ARM GRAD LANES PERMITTED MOVEMENTS FOR LANE .... EXIT
* ..1 ..2 ..3 ..4 ..5 WIDTH
  A 00.0 2 1 2 3 50.10
  B 00.0 2 1 3 50.10
  C 00.0 2 2 2 50.10
  D 50.10
*
*CT6* LANE WIDTHS.
  A03.50 03.50
  B03.50 03.50
  C03.50 03.50
*
*CT7* LEFT TURN RADII.
  A005.0
  B005.0
*
*CT8* RIGHT TURN DETAILS. NON-BLOCKING OPPOSING
* RIGHT TURN RADII. STORAGE TRAFFIC
  B 005.0
*NO CT9*
*NO CT10*
*NO CT11*
*NO CT12*
*
*CT13* ---- SIGNAL DATA ---- FOR SIGNAL TIMING SET 1
* NO.OF MAX FIXED EFF GRN DISPLACEMENTS
* TRIGGER STAGES CYCLE OR CYCLE START END CONTROL KEYWORDS
  02 1.4 2.9 FIXED TIME NSETS=1
*
*CT14* STAGING DATA FOR SET 1
* LANES ON GREEN FOR ARM .... SPLITS .....
* STAGE A B C D INTERSTAGE MIN/FIXED GREEN
  01 12 12 05.0 007.0
  02 1 12 05.0 007.0
*NO CT15*
*NO CT16*
*NO CT17*
*NO CT18*
*
*CT19* ---- DIRECT DEMAND DATA ---- ENTRY FLOWS BY ARM
* FROM A FROM B FROM C FROM D
** 1 0016.70 0006.50 0015.70
**
** 1 0019.90 0004.50 0013.50
**
** 1 0018.00 0004.70 0015.90
**
** 1 0021.30 0004.50 0014.50
*NO CT20*
*NO CT21*
*NO CT22*
*NO CT23*
*NO CT24*
*NO CT25*
*
*CT26* ---- TURNING PROPORTIONS --- FOR EACH TIME SEGMENT
* TO A TO B TO C TO D
  0.000 0.134 0.296
  0.160 0.000 0.007
  0.404 0.000 0.000
**
  0.000 0.162 0.362
  0.109 0.000 0.011
  0.357 0.000 0.000
**

```

	0.000	0.131	0.335
	0.114	0.000	0.007
	0.413	0.000	0.000
**			
	0.000	0.142	0.385
	0.099	0.000	0.013
	0.360	0.000	0.000
**			
NO CT27			
NO CT28			
NO CT29			
NO CT30			
NO CT30			
NO CT31			
NO CT32			
NO CT33			
NO CT34			
NO CT35			
NO CT36			
NO CT37			
NO CT38			
NO CT39			
NO CT40			
NO CT41			
NO CT42			
NO CT43			
NO CT44			
NO CT45			
NO CT46			

TRANSPORT RESEARCH LABORATORY

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OPTIMISED SIGNAL CAPACITY AND DELAY

Visual OSCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (MAR 1999)

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*****

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.Run with file:- "c:\Program Files\Junction\OSCADY4\j1wd20e.voi" at 01:14:30 on Tuesday, 19 April 2011

RUN TITLE

Junction 1 Weekday Evening 2020 With Development

*** ERROR AND WARNING MESSAGES ***

No errors or warnings in the data.

.TRAFFIC SIGNAL JUNCTION ANALYSIS

INPUT DATA

```

          TO A ---->
ARM C----- TEE ----- ARM A
          <----- FROM A
          I
          I
          I
          I
          I
          I
          I
          ARM B

```

ARM A IS Triq Birzebuga (North)
ARM B IS Triq Marsaxlokk
ARM C IS Triq Birzebuga (South)

.GEOMETRIC DATA

I	DATA ITEM	I	ARM A	I	ARM B	I	ARM C	I
I	GRADIENT	I	0.0 %	I	0.0 %	I	0.0 %	I
I		I		I		I		I
I	NUMBER OF LANES	I	2	I	2	I	2	I
I		I		I		I		I
I	PERMITTED MOVEMENTS LANE 1	I	L	I	L	I	S	I
I	LANE 2	I	S	I	R	I	S	I
I		I		I		I		I
I	TOTAL EXIT WIDTH FOR STRAIGHT-	I		I		I		I
I	AHEAD VEHICLES FROM THIS ARM	I	N/A	I	N/A	I	N/A	I
I		I		I		I		I
I	LANE WIDTHS LANE 1	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 2	I	3.50 M	I	3.50 M	I	3.50 M	I
I		I		I		I		I
I	LEFT TURN RADII LANE 1	I	5.0 M	I	5.0 M	I	N/A	I
I		I		I		I		I
I	RIGHT TURN RADII LANE 2	I	N/A	I	5.0 M	I	N/A	I
I		I		I		I		I

EXIT WIDTH FOR IMAGINARY ARM D = 50.10

.TRAFFIC DEMAND DATA

DEMAND DATA ARE INPUT USING THE ** DIRECT ** OPTION

DEFAULT VEHICLE TYPE PROPORTIONS ARE USED

DEMAND DATA SUPPLIED BETWEEN TIMES - 16.00 TO 17.00
PERIOD OF INTEREST (FOR QUEUE AND DELAY CALCULATIONS) - 16.00 TO 17.00

THE FOLLOWING DATA HAS BEEN INPUT
+ / DEFAULTED

TRAFFIC SCALING FACTOR HAS BEEN SET TO 100 %

I	TIME PERIOD	I	ARM	I	CARS AND	MEDIUM	VEHICLE TYPE	PROPORTIONS	MOTOR	PEDAL	I
I		I		I	LIGHT GOODS	GOODS	HEAVY	BUSES AND	CYCLES	CYCLES	I
I		I		I			GOODS	COACHES			I
I	ALL	I	ALL	I	0.927	0.041	0.016	0.016	0.000	0.000	I

I	TIME PERIOD	I	FROM/TO	I	ARM A	I	ARM B	I	ARM C	I
I	16.00-16.15	I	ARM A GROUP 1	I	0.000	I	0.312	I	0.688	I
I		I	ARM B GROUP 1	I	0.958	I	0.000	I	0.042	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	16.15-16.30	I	ARM A GROUP 1	I	0.000	I	0.309	I	0.691	I
I		I	ARM B GROUP 1	I	0.908	I	0.000	I	0.092	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	16.30-16.45	I	ARM A GROUP 1	I	0.000	I	0.281	I	0.719	I
I		I	ARM B GROUP 1	I	0.942	I	0.000	I	0.058	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I
I	16.45-17.00	I	ARM A GROUP 1	I	0.000	I	0.269	I	0.731	I
I		I	ARM B GROUP 1	I	0.884	I	0.000	I	0.116	I
I		I	ARM C GROUP 1	I	1.000	I	0.000	I	0.000	I

.SIGNAL TIMING DETAILS FOR SIGNAL SET 1

TIMING OPTION- FIXED MODE: TIMINGS ARE PROVIDED BY USER

FIXED CYCLE TIME- 24.0 SECONDS
PERIODS FOR WHICH THESE SETTINGS APPLY- 16.00-17.00

GLOBAL EFFECTIVE GREEN DISPLACEMENTS - START = 1.4
END = 2.9

I	DATA ITEM	I	STAGE 1	I	STAGE 2	I
I	LANES ON GREEN: ARM A	I	1 2	I	1	I
I	B	I		I	1 2	I
I	C	I	1 2	I		I
I		I		I		I
I	GREEN TIME (SECS)	I	7.0	I	7.0	I
I		I		I		I
I	PRECEDING INTERSTAGE	I	5.0	I	5.0	I

.DEMAND AND CAPACITY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 16.00 AND 17.00
=====

I	TIME	MOVEMENT	DEMAND	SAT FLOW	SAT FLOW	EFFECTIVE GREEN-TIME	CAPACITY	I
I			(VEHS/MIN)	(PCU/HR)	(VEHS/MIN)	TRUE FLARE+NOTIONL	(VEHS	I
I	ARM	LANES				(SECS)	/MIN)	I
I	16.00-16.15							I
I	A	1 L	5.20	1511.5	23.83	24.0	23.83	I
I		2 S	11.50	2105.0	33.18	8.5	11.75	I
I	B	1 L	0.27	1511.5	23.83	8.5	8.44	I
I		2 R	6.23	1619.2	25.52	8.5	9.04	I
I	C	12 S	15.70	4070.0	64.16	8.5	22.72	I

I	16.15-16.30								I
I	A	1	L	6.15	1511.5	23.83	24.0	23.83	I
I		2	S	13.75	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.41	1511.5	23.83	8.5	8.44	I
I		2	R	4.09	1619.2	25.52	8.5	9.04	I
I	C	12	S	13.50	4070.0	64.16	8.5	22.72	I

I	16.30-16.45								I
I	A	1	L	5.06	1511.5	23.83	24.0	23.83	I
I		2	S	12.94	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.27	1511.5	23.83	8.5	8.44	I
I		2	R	4.43	1619.2	25.52	8.5	9.04	I
I	C	12	S	15.90	4070.0	64.16	8.5	22.72	I

I	16.45-17.00								I
I	A	1	L	5.74	1511.5	23.83	24.0	23.83	I
I		2	S	15.56	2105.0	33.18	8.5	11.75	I
I	B	1	L	0.52	1511.5	23.83	8.5	8.44	I
I		2	R	3.98	1619.2	25.52	8.5	9.04	I
I	C	12	S	14.50	4070.0	64.16	8.5	22.72	I

QUEUE AND DELAY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 16.00 AND 17.00

=====

I	TIME	MOVEMENT	DEMAND EXCL (VEHS/MIN)	CAPACITY (VEHS/MIN)	DEGREE OF SAT (RFC)	QUEUE AT END OF SEGMENT		QUEUEING DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	ARM	LANES				MEAN (PHASE AVERAGED) (VEHS/LANE)	MAXIMUM (END OF RED) (VEHS/LANE)			I

I	16.00-16.15									I
I	A	1	L	5.20	23.83	0.218	0.0	0.0	0.5	I
I		2	S	11.50	11.75	0.978	9.3	10.8	108.2	I
I	B	1	L	0.27	8.44	0.032	0.0	0.1	0.4	I
I		2	R	6.23	9.04	0.689	1.6	2.5	23.0	I
I	C	12	S	15.70	22.72	0.691	1.3	2.5	39.5	I

I	16.15-16.30									I
I	A	1	L	6.15	23.83	0.258	0.1	0.1	0.8	I
I		2	S	13.75	11.75	1.170	40.3	41.8	395.8	I
I	B	1	L	0.41	8.44	0.049	0.0	0.1	0.5	I
I		2	R	4.09	9.04	0.452	0.6	1.3	9.7	I
I	C	12	S	13.50	22.72	0.594	1.0	2.0	29.3	I

I	16.30-16.45									I
I	A	1	L	5.06	23.83	0.212	0.0	0.0	0.5	I
I		2	S	12.94	11.75	1.101	58.3	59.9	753.4	I
I	B	1	L	0.27	8.44	0.032	0.0	0.1	0.4	I
I		2	R	4.43	9.04	0.490	0.7	1.4	10.9	I
I	C	12	S	15.90	22.72	0.700	1.4	2.5	40.9	I

I	16.45-17.00									I
I	A	1	L	5.74	23.83	0.241	0.0	0.0	0.7	I
I		2	S	15.56	11.75	1.324	115.5	117.0	1312.7	I
I	B	1	L	0.52	8.44	0.062	0.0	0.1	0.7	I
I		2	R	3.98	9.04	0.440	0.6	1.2	9.0	I
I	C	12	S	14.50	22.72	0.638	1.1	2.2	33.7	I

QUEUES FOR ARM A

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE		
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	

16.15	2	9.3	10.8	*****++
	1	0.0	0.0	
16.30	2	40.3	41.8	*****++
	1	0.1	0.1	
16.45	2	58.3	59.9	*****++
	1	0.0	0.0	
17.00	2	115.5	117.0	*****
	1	0.0	0.0	

QUEUES FOR ARM B

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE		
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	

		*	+	
16.15	2	1.6	2.5	**
	1	0.0	0.1	
16.30	2	0.6	1.3	*
	1	0.0	0.1	
16.45	2	0.7	1.4	*
	1	0.0	0.1	
17.00	2	0.6	1.2	*
	1	0.0	0.1	

 .QUEUES FOR ARM C

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE		
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	
		*	+	
16.15	2	1.3	2.5	*+
	1	1.3	2.5	*+
16.30	2	1.0	2.0	*+
	1	1.0	2.0	*+
16.45	2	1.4	2.5	***
	1	1.4	2.5	***
17.00	2	1.1	2.2	*+
	1	1.1	2.2	*+

 .QUEUEING DELAY INFORMATION OVER WHOLE PERIOD (16.00-17.00)

I	STREAM	I	TOTAL DEMAND (EXCL 2-WHEEL)	I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I				
					* DELAY	*		* DELAY	*					
I		I		I	(MIN)	(MIN/VEH)	I	(MIN)	(MIN/VEH)	I				
I		I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)	(MIN/VEH)	I			
I	A-B	I	332.3	I	332.3	I	2.6	I	0.01	I	2.6	I	0.01	I
I	A-C	I	806.2	I	806.2	I	2570.2	I	3.19	I	3137.9	I	3.89	I
I	B-C	I	22.2	I	22.2	I	2.0	I	0.09	I	2.0	I	0.09	I
I	B-A	I	280.8	I	280.8	I	52.6	I	0.19	I	52.6	I	0.19	I
I	C-A	I	894.0	I	894.0	I	143.4	I	0.16	I	143.5	I	0.16	I
I	C-B	I	0.0	I	0.0	I	0.0	I	0.00	I	0.0	I	0.00	I
I	ALL	I	2335.5	I	2335.5	I	2770.7	I	1.19	I	3338.5	I	1.43	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 BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

* TOTAL GEOMETRIC DELAY INCLUDES DELAY SUFFERED BY VEHICLES STILL QUEUEING AT THE END OF THE WHOLE TIME PERIOD.

* THE SUM OF DELAYS FOR EACH SEGMENT AND THE TOTAL GEOMETRIC DELAY WILL BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS

* A LARGE QUEUE AT THE END OF THE TIME PERIOD.

.
 ***** OSCADY 4 run completed

Junction 2 Morning 2020 Without Development

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Visual ARCADY 4.00
Junction 2 Weekday morning 2020 without development
&PARAM NARMS=4,START=0715,FINISH=0815,INTERV= 15 &END
&OPTION HVDEF=T,TPTIME=T,TPENT=T,DIRECT=T, &END
Triq iz-Zejtun
Triq Birzebbuga
Triq Hal-Ghaxaq
Triq tal-Barrani
* CT5      V      E      L      R      D      PHI
      006.00    007.00    025.00    054.00    043.00    038.0
      007.00    008.00    025.00    106.00    043.00    028.0
      007.00    008.00    025.00    054.00    043.00    028.0
      007.00    008.00    025.00    054.00    043.00    028.0
* ENTRY DEMAND. VEHICLES/MINUTE
*      A      B      C      D
      012.270    019.270    005.670    014.870
      014.470    017.000    009.400    013.530
      014.870    019.870    010.870    013.870
      012.470    019.600    008.000    015.070
* TURNING PROPORTIONS TCT24
0000.000    0011.000    0104.000    0069.000
0020.000    0000.000    0078.000    0191.000
0044.000    0031.000    0000.000    0010.000
0026.000    0154.000    0043.000    0000.000
0000.000    0012.000    0143.000    0062.000
0013.000    0001.000    0067.000    0174.000
0059.000    0056.000    0000.000    0026.000
0016.000    0135.000    0051.000    0001.000
0000.000    0044.000    0100.000    0079.000
0016.000    0000.000    0066.000    0216.000
0063.000    0057.000    0000.000    0043.000
0027.000    0117.000    0060.000    0004.000
0000.000    0027.000    0087.000    0073.000
0029.000    0001.000    0045.000    0216.000
0032.000    0063.000    0000.000    0025.000
0022.000    0142.000    0057.000    0005.000

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TRANSPORT RESEARCH LABORATORY

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CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

Visual ARCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (OCT 1998)

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Run with file:- "c:\junction\arcady4\samples\J2m20nd.vai" at 02:14:46 on Wednesday, 20 April 2011

.ROUNDABOUT CAPACITY AND DELAY
*****

RUN TITLE
*****
Junction 2 Weekday morning 2020 without development

.INPUT DATA
*****
ARM A - Triq iz-Zejtun
ARM B - Triq Birzebbuga
ARM C - Triq Hal-Ghaxaq
ARM D - Triq tal-Barrani

.GEOMETRIC DATA
-----

I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I
I ARM A I 6.00 I 7.00 I 25.00 I 54.00 I 43.00 I 38.0 I 0.712 I 34.882 I
I ARM B I 7.00 I 8.00 I 25.00 I 106.00 I 43.00 I 28.0 I 0.806 I 41.683 I
I ARM C I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
I ARM D I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I

.TRAFFIC DEMAND DATA
-----

TIME PERIOD BEGINS 07.15 AND ENDS 08.15
.LENGTH OF TIME PERIOD - 60 MINUTES.
.LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

-----
I TURNING PROPORTIONS I
I TURNING COUNTS I
I (PERCENTAGE OF H.V.S) I
I TIME I FROM/TO I ARM A I ARM B I ARM C I ARM D I
I 07.15 - 07.30 I
I ARM A I 0.000 I 0.060 I 0.565 I 0.375 I
I I 0.0 I 11.0 I 104.0 I 69.0 I
I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I ARM B I 0.069 I 0.000 I 0.270 I 0.661 I
I I 20.0 I 0.0 I 78.0 I 191.0 I
I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I ARM C I 0.518 I 0.365 I 0.000 I 0.118 I
I I 44.0 I 31.0 I 0.0 I 10.0 I
I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I ARM D I 0.117 I 0.691 I 0.193 I 0.000 I
I I 26.0 I 154.0 I 43.0 I 0.0 I
I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I 07.30 - 07.45 I
I ARM A I 0.000 I 0.055 I 0.659 I 0.286 I
I I 0.0 I 12.0 I 143.0 I 62.0 I
I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I ARM B I 0.051 I 0.004 I 0.263 I 0.682 I
I I 13.0 I 1.0 I 67.0 I 174.0 I
I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I

```

I		I	I	I	I	I
I	ARM C	I	0.418	I	0.397	I
I		I	59.0	I	56.0	I
I		I	(10.0)	I	(10.0)	I
I		I		I		I
I	ARM D	I	0.079	I	0.665	I
I		I	16.0	I	135.0	I
I		I	(10.0)	I	(10.0)	I
I		I		I		I

		TURNING PROPORTIONS TURNING COUNTS (PERCENTAGE OF H.V.S)								
TIME		FROM/TO	ARM A	ARM B	ARM C	ARM D				
07.45 - 08.00		ARM A	0.000 0.0 (10.0)	0.197 44.0 (10.0)	0.448 100.0 (10.0)	0.354 79.0 (10.0)				
		ARM B	0.054 16.0 (10.0)	0.000 0.0 (10.0)	0.221 66.0 (10.0)	0.725 216.0 (10.0)				
		ARM C	0.387 63.0 (10.0)	0.350 57.0 (10.0)	0.000 0.0 (10.0)	0.264 43.0 (10.0)				
		ARM D	0.130 27.0 (10.0)	0.563 117.0 (10.0)	0.288 60.0 (10.0)	0.019 4.0 (10.0)				
08.00 - 08.15		ARM A	0.000 0.0 (10.0)	0.144 27.0 (10.0)	0.465 87.0 (10.0)	0.390 73.0 (10.0)				
		ARM B	0.100 29.0 (10.0)	0.003 1.0 (10.0)	0.155 45.0 (10.0)	0.742 216.0 (10.0)				
		ARM C	0.267 32.0 (10.0)	0.525 63.0 (10.0)	0.000 0.0 (10.0)	0.208 25.0 (10.0)				
		ARM D	0.097 22.0 (10.0)	0.628 142.0 (10.0)	0.252 57.0 (10.0)	0.022 5.0 (10.0)				

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
 THE TURNING PROPORTIONS USED VARY BETWEEN TIME SEGMENTS
 DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	07.15-07.30									I
I	ARM A	12.27	20.92	0.587		0.0	1.4	19.8		I
I	ARM B	19.27	26.36	0.731		0.0	2.6	36.4		I
I	ARM C	5.67	22.78	0.249		0.0	0.3	4.8		I
I	ARM D	14.87	32.53	0.457		0.0	0.8	12.2		I
I										I
I	07.30-07.45									I
I	ARM A	14.47	20.13	0.719		1.4	2.5	34.5		I
I	ARM B	17.00	24.14	0.704		2.6	2.4	37.3		I
I	ARM C	9.40	24.21	0.388		0.3	0.6	9.2		I
I	ARM D	13.53	30.71	0.441		0.8	0.8	12.0		I
I										I
I	07.45-08.00									I
I	ARM A	14.87	20.41	0.729		2.5	2.6	38.4		I
I	ARM B	19.87	24.83	0.800		2.4	3.8	52.5		I

I	ARM C	10.87	20.87	0.521		0.6	1.1	15.5		I
I	ARM D	13.87	30.34	0.457		0.8	0.8	12.4		I
I										I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	08.00-08.15									I
I	ARM A	12.47	18.99	0.657		2.6	2.0	30.9		I
I	ARM B	19.60	25.94	0.756		3.8	3.2	50.0		I
I	ARM C	8.00	20.16	0.397		1.1	0.7	10.2		I
I	ARM D	15.07	30.89	0.488		0.8	0.9	14.0		I
I										I

.QUEUE AT ARM A

TIME SEGMENT	NO. OF	
ENDING	VEHICLES	
	IN QUEUE	
07.30	1.4	*
07.45	2.5	**
08.00	2.6	***
08.15	2.0	**

.QUEUE AT ARM B

TIME SEGMENT	NO. OF	
ENDING	VEHICLES	
	IN QUEUE	
07.30	2.6	***
07.45	2.4	**
08.00	3.8	****
08.15	3.2	***

.QUEUE AT ARM C

TIME SEGMENT	NO. OF	
ENDING	VEHICLES	
	IN QUEUE	
07.30	0.3	
07.45	0.6	*
08.00	1.1	*
08.15	0.7	*

.QUEUE AT ARM D

TIME SEGMENT	NO. OF	
ENDING	VEHICLES	
	IN QUEUE	
07.30	0.8	*
07.45	0.8	*
08.00	0.8	*
08.15	0.9	*

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	ARM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I		I		I	* DELAY *	I	* DELAY *	I
I		I		I		I		I
I		I	(VEH)	I	(MIN)	I	(MIN)	I
I	A	I	811.2	I	123.5	I	123.6	I
I	B	I	1136.1	I	176.3	I	176.5	I
I	C	I	509.1	I	39.9	I	39.9	I
I	D	I	860.1	I	50.6	I	50.6	I
I	ALL	I	3316.5	I	390.2	I	390.6	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

Junction 2 Morning 2020 With Development

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Visual ARCADY 4.00
Junction 2 Weekday morning 2020 with development
&PARAM NARMS=4,START=0715,FINISH=0815,INTERV= 15 &END
&OPTION HVDEF=T,TPTIME=T,TPENT=T,DIRECT=T, &END
Triq iz-Zejtun
Triq Birzebbuga
Triq Hal-Ghaxaq
Triq tal-Barrani
* CT5 V E L R D PHI
006.00 007.00 025.00 054.00 043.00 038.0
007.00 008.00 025.00 106.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
* ENTRY DEMAND. VEHICLES/MINUTE
* A B C D
012.270 019.470 005.670 015.070
014.470 017.200 009.400 013.670
014.870 020.070 010.870 014.070
012.470 019.730 008.000 015.270
* TURNING PROPORTIONS TCT24
0000.000 0011.000 0104.000 0069.000
0020.000 0000.000 0078.000 0194.000
0044.000 0031.000 0000.000 0010.000
0026.000 0157.000 0043.000 0000.000
0000.000 0012.000 0143.000 0062.000
0013.000 0001.000 0067.000 0177.000
0059.000 0056.000 0000.000 0026.000
0016.000 0137.000 0051.000 0001.000
0000.000 0044.000 0100.000 0079.000
0016.000 0000.000 0066.000 0219.000
0063.000 0057.000 0000.000 0043.000
0027.000 0120.000 0060.000 0004.000
0000.000 0027.000 0087.000 0073.000
0029.000 0001.000 0045.000 0221.000
0032.000 0063.000 0000.000 0025.000
0022.000 0145.000 0057.000 0005.000

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TRANSPORT RESEARCH LABORATORY

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CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

Visual ARCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (OCT 1998)

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

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THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "c:\junction\arcady4\samples\J2m20wd.vai" at 02:12:07 on Wednesday, 20 April 2011

.ROUNDABOUT CAPACITY AND DELAY
*****

RUN TITLE
*****
Junction 2 Weekday morning 2020 with development

.INPUT DATA
*****
ARM A - Triq iz-Zejtun
ARM B - Triq Birzebbuga
ARM C - Triq Hal-Ghaxaq
ARM D - Triq tal-Barrani

.GEOMETRIC DATA
-----

I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I
I ARM A I 6.00 I 7.00 I 25.00 I 54.00 I 43.00 I 38.0 I 0.712 I 34.882 I
I ARM B I 7.00 I 8.00 I 25.00 I 106.00 I 43.00 I 28.0 I 0.806 I 41.683 I
I ARM C I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
I ARM D I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I

.TRAFFIC DEMAND DATA
-----

TIME PERIOD BEGINS 07.15 AND ENDS 08.15
.LENGTH OF TIME PERIOD - 60 MINUTES.
.LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

-----
I I TURNING PROPORTIONS I
I I TURNING COUNTS I
I I (PERCENTAGE OF H.V.S) I
I I
I TIME I FROM/TO I ARM A I ARM B I ARM C I ARM D I
I 07.15 - 07.30 I I I I I I
I I ARM A I 0.000 I 0.060 I 0.565 I 0.375 I
I I I 0.0 I 11.0 I 104.0 I 69.0 I
I I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I I ARM B I 0.068 I 0.000 I 0.267 I 0.664 I
I I I 20.0 I 0.0 I 78.0 I 194.0 I
I I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I I ARM C I 0.518 I 0.365 I 0.000 I 0.118 I
I I I 44.0 I 31.0 I 0.0 I 10.0 I
I I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I I ARM D I 0.115 I 0.695 I 0.190 I 0.000 I
I I I 26.0 I 157.0 I 43.0 I 0.0 I
I I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I 07.30 - 07.45 I I I I I I
I I ARM A I 0.000 I 0.055 I 0.659 I 0.286 I
I I I 0.0 I 12.0 I 143.0 I 62.0 I
I I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I
I I ARM B I 0.050 I 0.004 I 0.260 I 0.686 I
I I I 13.0 I 1.0 I 67.0 I 177.0 I
I I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I

```

I		I	I	I	I	I
I	ARM C	I	0.418	I	0.397	I
I		I	59.0	I	56.0	I
I		I	(10.0)	I	(10.0)	I
I		I		I		I
I	ARM D	I	0.078	I	0.668	I
I		I	16.0	I	137.0	I
I		I	(10.0)	I	(10.0)	I
I		I		I		I

		TURNING PROPORTIONS TURNING COUNTS (PERCENTAGE OF H.V.S)								
TIME		FROM/TO	ARM A	ARM B	ARM C	ARM D				
07.45 - 08.00		ARM A	0.000 0.0 (10.0)	0.197 44.0 (10.0)	0.448 100.0 (10.0)	0.354 79.0 (10.0)				
		ARM B	0.053 16.0 (10.0)	0.000 0.0 (10.0)	0.219 66.0 (10.0)	0.728 219.0 (10.0)				
		ARM C	0.387 63.0 (10.0)	0.350 57.0 (10.0)	0.000 0.0 (10.0)	0.264 43.0 (10.0)				
		ARM D	0.128 27.0 (10.0)	0.569 120.0 (10.0)	0.284 60.0 (10.0)	0.019 4.0 (10.0)				
08.00 - 08.15		ARM A	0.000 0.0 (10.0)	0.144 27.0 (10.0)	0.465 87.0 (10.0)	0.390 73.0 (10.0)				
		ARM B	0.098 29.0 (10.0)	0.003 1.0 (10.0)	0.152 45.0 (10.0)	0.747 221.0 (10.0)				
		ARM C	0.267 32.0 (10.0)	0.525 63.0 (10.0)	0.000 0.0 (10.0)	0.208 25.0 (10.0)				
		ARM D	0.096 22.0 (10.0)	0.633 145.0 (10.0)	0.249 57.0 (10.0)	0.022 5.0 (10.0)				

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE TURNING PROPORTIONS USED VARY BETWEEN TIME SEGMENTS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	07.15-07.30									I
I	ARM A	12.27	20.78	0.591		0.0	1.4	20.1		I
I	ARM B	19.47	26.37	0.738		0.0	2.7	37.7		I
I	ARM C	5.67	22.63	0.251		0.0	0.3	4.9		I
I	ARM D	15.07	32.53	0.463		0.0	0.9	12.5		I
I										I
I	07.30-07.45									I
I	ARM A	14.47	20.03	0.722		1.4	2.5	35.0		I
I	ARM B	17.20	24.14	0.712		2.7	2.5	38.9		I
I	ARM C	9.40	24.05	0.391		0.3	0.6	9.3		I
I	ARM D	13.67	30.71	0.445		0.9	0.8	12.2		I
I										I
I	07.45-08.00									I
I	ARM A	14.87	20.27	0.734		2.5	2.7	39.2		I
I	ARM B	20.07	24.83	0.808		2.5	4.0	54.9		I

I ARM C	10.87	20.71	0.525		0.6	1.1	15.8		I
I ARM D	14.07	30.35	0.464		0.8	0.9	12.7		I
I									I

I	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)	I
I	08.00-08.15									I
I	ARM A	12.47	18.84	0.662		2.7	2.0	31.6		I
I	ARM B	19.73	25.94	0.761		4.0	3.3	51.6		I
I	ARM C	8.00	20.03	0.399		1.1	0.7	10.4		I
I	ARM D	15.27	30.91	0.494		0.9	1.0	14.3		I
I										I

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	1.4	*
07.45	2.5	***
08.00	2.7	***
08.15	2.0	**

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	2.7	***
07.45	2.5	***
08.00	4.0	****
08.15	3.3	***

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.3	
07.45	0.6	*
08.00	1.1	*
08.15	0.7	*

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.9	*
07.45	0.8	*
08.00	0.9	*
08.15	1.0	*

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	ARM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I	
I	I	I	I	I	* DELAY *	I	* DELAY *	I	
I	I	I	I	I	I	I	I	I	
I	I	I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	
I	A	I	811.2	I	811.2	I	126.0	I	0.16
I	B	I	1147.0	I	1147.0	I	183.0	I	0.16
I	C	I	509.1	I	509.1	I	40.3	I	0.08
I	D	I	871.2	I	871.2	I	51.8	I	0.06
I	ALL	I	3338.5	I	3338.5	I	401.2	I	0.12

* 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

Junction 2 Evening 2020 Without Development

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Visual ARCADY 4.00
Junction 2 Weekday evening 2020 without development
&PARAM NARMS=4,START=1600,FINISH=1700,INTERV= 15 &END
&OPTION HVDEF=T,TPTIME=T,TPENT=T,DIRECT=T, &END
Triq iz-Zejtun
Triq Birzebbuga
Triq Hal-Ghaxaq
Triq tal-Barrani
* CT5      V      E      L      R      D      PHI
    006.00    007.00    025.00    054.00    043.00    038.0
    007.00    008.00    025.00    106.00    043.00    028.0
    007.00    008.00    025.00    054.00    043.00    028.0
    007.00    008.00    025.00    054.00    043.00    028.0
* ENTRY DEMAND. VEHICLES/MINUTE
*      A      B      C      D
    006.930    018.600    013.400    019.530
    006.130    016.070    012.270    013.330
    007.670    018.730    012.130    013.730
    007.470    018.200    011.400    012.670
* TURNING PROPORTIONS TCT24
    0002.000    0033.000    0049.000    0020.000
    0055.000    0001.000    0038.000    0185.000
    0103.000    0054.000    0000.000    0044.000
    0085.000    0154.000    0054.000    0000.000
    0000.000    0041.000    0037.000    0014.000
    0038.000    0001.000    0055.000    0147.000
    0099.000    0053.000    0000.000    0032.000
    0060.000    0122.000    0017.000    0001.000
    0000.000    0048.000    0050.000    0017.000
    0055.000    0000.000    0056.000    0170.000
    0088.000    0062.000    0002.000    0030.000
    0071.000    0086.000    0049.000    0000.000
    0000.000    0041.000    0048.000    0023.000
    0048.000    0004.000    0065.000    0155.000
    0079.000    0061.000    0000.000    0031.000
    0074.000    0090.000    0026.000    0000.000

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TRANSPORT RESEARCH LABORATORY

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CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

Visual ARCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (OCT 1998)

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

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THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "c:\junction\arcady4\samples\J2e20nd.vai" at 02:18:56 on Wednesday, 20 April 2011

.ROUNDABOUT CAPACITY AND DELAY
*****

RUN TITLE
*****
Junction 2 Weekday evening 2020 without development

.INPUT DATA
*****
ARM A - Triq iz-Zejtun
ARM B - Triq Birzebbuga
ARM C - Triq Hal-Ghaxaq
ARM D - Triq tal-Barrani

.GEOMETRIC DATA
-----

I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I
I ARM A I 6.00 I 7.00 I 25.00 I 54.00 I 43.00 I 38.0 I 0.712 I 34.882 I
I ARM B I 7.00 I 8.00 I 25.00 I 106.00 I 43.00 I 28.0 I 0.806 I 41.683 I
I ARM C I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
I ARM D I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I

.TRAFFIC DEMAND DATA
-----

TIME PERIOD BEGINS 16.00 AND ENDS 17.00
LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

-----
I I TURNING PROPORTIONS I I
I I TURNING COUNTS I I
I I (PERCENTAGE OF H.V.S) I I
I I ----- I I
I TIME I FROM/TO I ARM A I ARM B I ARM C I ARM D I
I 16.00 - 16.15 I I I I I I I
I I ARM A I 0.019 I 0.317 I 0.471 I 0.192 I
I I I 2.0 I 33.0 I 49.0 I 20.0 I
I I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I I
I I ARM B I 0.197 I 0.004 I 0.136 I 0.663 I
I I I 55.0 I 1.0 I 38.0 I 185.0 I
I I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I I
I I ARM C I 0.512 I 0.269 I 0.000 I 0.219 I
I I I 103.0 I 54.0 I 0.0 I 44.0 I
I I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I I
I I ARM D I 0.290 I 0.526 I 0.184 I 0.000 I
I I I 85.0 I 154.0 I 54.0 I 0.0 I
I I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I I
I 16.15 - 16.30 I I I I I I I
I I ARM A I 0.000 I 0.446 I 0.402 I 0.152 I
I I I 0.0 I 41.0 I 37.0 I 14.0 I
I I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I I
I I ARM B I 0.158 I 0.004 I 0.228 I 0.610 I
I I I 38.0 I 1.0 I 55.0 I 147.0 I
I I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I

```

I		I		I		I		I		I		I
I		I	ARM C	I	0.538	I	0.288	I	0.000	I	0.174	I
I		I		I	99.0	I	53.0	I	0.0	I	32.0	I
I		I		I	(10.0)	I	(10.0)	I	(10.0)	I	(10.0)	I
I		I		I		I		I		I		I
I		I	ARM D	I	0.300	I	0.610	I	0.085	I	0.005	I
I		I		I	60.0	I	122.0	I	17.0	I	1.0	I
I		I		I	(10.0)	I	(10.0)	I	(10.0)	I	(10.0)	I
I		I		I		I		I		I		I

		TURNING PROPORTIONS TURNING COUNTS (PERCENTAGE OF H.V.S)										
TIME		FROM/TO	ARM A	ARM B	ARM C	ARM D						
16.30 - 16.45		ARM A	0.000 0.0 (10.0)	0.417 48.0 (10.0)	0.435 50.0 (10.0)	0.148 17.0 (10.0)						
		ARM B	0.196 55.0 (10.0)	0.000 0.0 (10.0)	0.199 56.0 (10.0)	0.605 170.0 (10.0)						
		ARM C	0.484 88.0 (10.0)	0.341 62.0 (10.0)	0.011 2.0 (10.0)	0.165 30.0 (10.0)						
		ARM D	0.345 71.0 (10.0)	0.417 86.0 (10.0)	0.238 49.0 (10.0)	0.000 0.0 (10.0)						
16.45 - 17.00		ARM A	0.000 0.0 (10.0)	0.366 41.0 (10.0)	0.429 48.0 (10.0)	0.205 23.0 (10.0)						
		ARM B	0.176 48.0 (10.0)	0.015 4.0 (10.0)	0.239 65.0 (10.0)	0.570 155.0 (10.0)						
		ARM C	0.462 79.0 (10.0)	0.357 61.0 (10.0)	0.000 0.0 (10.0)	0.181 31.0 (10.0)						
		ARM D	0.389 74.0 (10.0)	0.474 90.0 (10.0)	0.137 26.0 (10.0)	0.000 0.0 (10.0)						

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
 THE TURNING PROPORTIONS USED VARY BETWEEN TIME SEGMENTS
 DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	16.00-16.15									I
I	ARM A	6.93	19.33	0.358		0.0	0.6	8.1		I
I	ARM B	18.60	31.23	0.596		0.0	1.5	20.9		I
I	ARM C	13.40	23.64	0.567		0.0	1.3	18.5		I
I	ARM D	19.53	26.19	0.746		0.0	2.8	38.9		I
I										I
I	16.15-16.30									I
I	ARM A	6.13	22.43	0.273		0.6	0.4	5.8		I
I	ARM B	16.07	34.16	0.470		1.5	0.9	13.7		I
I	ARM C	12.27	26.83	0.457		1.3	0.8	13.1		I
I	ARM D	13.33	27.37	0.487		2.8	1.0	15.0		I
I										I
I	16.30-16.45									I
I	ARM A	7.67	22.27	0.344		0.4	0.5	7.7		I
I	ARM B	18.73	31.57	0.593		0.9	1.4	20.9		I

I	ARM C	12.13	24.71	0.491		0.8	1.0	14.1		I
I	ARM D	13.73	26.56	0.517		1.0	1.1	15.6		I
I										I

I	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)	I
I	16.45-17.00									I
I	ARM A	7.47	23.10	0.323		0.5	0.5	7.3		I
I	ARM B	18.20	32.67	0.557		1.4	1.3	19.4		I
I	ARM C	11.40	25.27	0.451		1.0	0.8	12.6		I
I	ARM D	12.67	27.33	0.464		1.1	0.9	13.3		I
I										I

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.15	0.6	*
16.30	0.4	
16.45	0.5	*
17.00	0.5	

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.15	1.5	*
16.30	0.9	*
16.45	1.4	*
17.00	1.3	*

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.15	1.3	*
16.30	0.8	*
16.45	1.0	*
17.00	0.8	*

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.15	2.8	***
16.30	1.0	*
16.45	1.1	*
17.00	0.9	*

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	ARM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I	I	I	I	I	* DELAY *	I	* DELAY *	I
I	I	I	I	I	I	I	I	I
I	I	I	(VEH)	I	(MIN)	I	(MIN)	I
I	I	I	(VEH/H)	I	(MIN/VEH)	I	(MIN/VEH)	I
I	A	I	423.0	I	28.8	I	28.8	I
I	B	I	1074.0	I	75.0	I	75.0	I
I	C	I	738.0	I	58.3	I	58.3	I
I	D	I	888.9	I	82.9	I	82.9	I
I	ALL	I	3123.9	I	245.0	I	245.1	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

Junction 2 Weekday Evening 2020 With Development

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Visual ARCADY 4.00
Junction 2 Weekday evening 2020 with development
&PARAM NARMS=4,START=1600,FINISH=1700,INTERV= 15 &END
&OPTION HVDEF=T,TPIME=T,TPENT=T,DIRECT=T, &END
Triq iz-Zejtun
Triq Birzebbuga
Triq Hal-Ghaxaq
Triq tal-Barrani
* CT5 V E L R D PHI
006.00 007.00 025.00 054.00 043.00 038.0
007.00 008.00 025.00 106.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
* ENTRY DEMAND. VEHICLES/MINUTE
* A B C D
006.930 018.800 013.400 019.730
006.130 016.200 012.270 013.470
007.670 018.870 012.130 013.870
007.470 018.400 011.400 012.800
* TURNING PROPORTIONS TCT24
0002.000 0033.000 0049.000 0020.000
0055.000 0001.000 0038.000 0188.000
0103.000 0054.000 0000.000 0044.000
0085.000 0157.000 0054.000 0000.000
0000.000 0041.000 0037.000 0014.000
0038.000 0001.000 0055.000 0149.000
0099.000 0053.000 0000.000 0032.000
0060.000 0124.000 0017.000 0001.000
0000.000 0048.000 0050.000 0017.000
0055.000 0000.000 0056.000 0172.000
0088.000 0062.000 0002.000 0030.000
0071.000 0088.000 0049.000 0000.000
0000.000 0041.000 0048.000 0023.000
0048.000 0004.000 0065.000 0158.000
0079.000 0061.000 0000.000 0031.000
0074.000 0092.000 0026.000 0000.000

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TRANSPORT RESEARCH LABORATORY

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CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

Visual ARCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (OCT 1998)

ADAPTED FROM ARCADY/3 WHICH IS CROWN COPYRIGHT
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IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "c:\junction\arcady4\samples\J2e20wd.vai" at 02:21:11 on Wednesday, 20 April 2011

.ROUNDABOUT CAPACITY AND DELAY
*****

RUN TITLE
*****
Junction 2 Weekday evening 2020 with development

.INPUT DATA
*****
ARM A - Triq iz-Zejtun
ARM B - Triq Birzebbuga
ARM C - Triq Hal-Ghaxaq
ARM D - Triq tal-Barrani

.GEOMETRIC DATA
-----

I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I
I ARM A I 6.00 I 7.00 I 25.00 I 54.00 I 43.00 I 38.0 I 0.712 I 34.882 I
I ARM B I 7.00 I 8.00 I 25.00 I 106.00 I 43.00 I 28.0 I 0.806 I 41.683 I
I ARM C I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
I ARM D I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I

.TRAFFIC DEMAND DATA
-----

TIME PERIOD BEGINS 16.00 AND ENDS 17.00
.LENGTH OF TIME PERIOD - 60 MINUTES.
.LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

-----
I TURNING PROPORTIONS I
I TURNING COUNTS I
I (PERCENTAGE OF H.V.S) I
I TIME I FROM/TO I ARM A I ARM B I ARM C I ARM D I
I 16.00 - 16.15 I
I ARM A I 0.019 I 0.317 I 0.471 I 0.192 I
I I 2.0 I 33.0 I 49.0 I 20.0 I
I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I
I ARM B I 0.195 I 0.004 I 0.135 I 0.667 I
I I 55.0 I 1.0 I 38.0 I 188.0 I
I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I
I ARM C I 0.512 I 0.269 I 0.000 I 0.219 I
I I 103.0 I 54.0 I 0.0 I 44.0 I
I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I
I ARM D I 0.287 I 0.530 I 0.182 I 0.000 I
I I 85.0 I 157.0 I 54.0 I 0.0 I
I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I
I 16.15 - 16.30 I
I ARM A I 0.000 I 0.446 I 0.402 I 0.152 I
I I 0.0 I 41.0 I 37.0 I 14.0 I
I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I
I I I I I I
I ARM B I 0.156 I 0.004 I 0.226 I 0.613 I
I I 38.0 I 1.0 I 55.0 I 149.0 I
I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I

```

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE TURNING PROPORTIONS USED VARY BETWEEN TIME SEGMENTS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

I	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)	DELAY (VEH.MIN/ TIME SEGMENT)
I	16.00-16.15									
I	ARM A	6.93	19.20	0.361		0.0	0.6	8.1		
I	ARM B	18.80	31.23	0.602		0.0	1.5	21.5		
I	ARM C	13.40	23.48	0.571		0.0	1.3	18.7		
I	ARM D	19.73	26.19	0.753		0.0	2.9	40.3		
I										
I	16.15-16.30									
I	ARM A	6.13	22.33	0.275		0.6	0.4	5.8		
I	ARM B	16.20	34.15	0.474		1.5	0.9	14.0		
I	ARM C	12.27	26.72	0.459		1.3	0.9	13.2		
I	ARM D	13.47	27.37	0.492		2.9	1.0	15.4		
I										
I	16.30-16.45									
I	ARM A	7.67	22.17	0.346		0.4	0.5	7.7		
I	ARM B	18.87	31.57	0.598		0.9	1.5	21.3		

I	ARM C	12.13	24.60	0.493		0.9	1.0	14.2	I
I	ARM D	13.87	26.56	0.522		1.0	1.1	16.0	I
I									I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	16.45-17.00									I
I	ARM A	7.47	23.01	0.325		0.5	0.5	7.3		I
I	ARM B	18.40	32.67	0.563		1.5	1.3	19.9		I
I	ARM C	11.40	25.11	0.454		1.0	0.8	12.8		I
I	ARM D	12.80	27.33	0.468		1.1	0.9	13.6		I
I										I

.QUEUE AT ARM A

TIME SEGMENT	NO. OF
ENDING	VEHICLES
	IN QUEUE
16.15	0.6 *
16.30	0.4
16.45	0.5 *
17.00	0.5

.QUEUE AT ARM B

TIME SEGMENT	NO. OF
ENDING	VEHICLES
	IN QUEUE
16.15	1.5 *
16.30	0.9 *
16.45	1.5 *
17.00	1.3 *

.QUEUE AT ARM C

TIME SEGMENT	NO. OF
ENDING	VEHICLES
	IN QUEUE
16.15	1.3 *
16.30	0.9 *
16.45	1.0 *
17.00	0.8 *

.QUEUE AT ARM D

TIME SEGMENT	NO. OF
ENDING	VEHICLES
	IN QUEUE
16.15	2.9 ***
16.30	1.0 *
16.45	1.1 *
17.00	0.9 *

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	ARM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I		I		I	* DELAY *	I	* DELAY *	I
I		I		I		I		I
I		I	(VEH)	I	(MIN)	I	(MIN)	I
I	A	I	423.0	I	29.0	I	29.0	I
I	B	I	1084.1	I	76.6	I	76.6	I
I	C	I	738.0	I	58.9	I	58.9	I
I	D	I	898.0	I	85.2	I	85.3	I
I	ALL	I	3143.1	I	249.8	I	249.9	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

Junction 3 Weekday Morning 2020 Without Development

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Visual OSCADY 4.01
*CT1* ---- RUN TITLE ----
Junction 3 Weekday Morning 2020 Without Development
*
*CT2* ---- RUN PARAMETERS ----
* TIMES FOR FIXED TIME OPTIMISATION, QUEUE/DELAY CALCULATIONS, DEMAND DATA.
&PARAM START=0715, FINISH=0815, INTERV=15, DSTART=0715, DFINISH=0815,
  FSCALE=100, &END
*
*CT3* ---- RUN OPTIONS ----
* JUNCTION, DEMAND, VEHICLES, TURNING, QUEUES AND DELAYS, ACCIDENT, SATURATION.
&OPTION TEE=T,DIRECT=T,TIMINP=T,VDEF=T,TPTIME=T,QUEDEL=T,T2=T,URB=T,APR=T,
  &END
*
*CT4* ---- ARM NAMES ----
Triq tal-Barrani (East)
Triq Hal-Tarxien
Triq tal-Barrani (West)
*
*CT5* ---- GEOMETRIC DATA ----
* ARM GRAD LANES PERMITTED MOVEMENTS FOR LANE .... EXIT
* ..1 ..2 ..3 ..4 ..5 WIDTH
  A 00.0 3 1 2 2 ..4 50.10
  B 00.0 3 1 3 3 50.10
  C 00.0 3 2 2 3 50.10
  D 50.10
*
*CT6* LANE WIDTHS.
  A03.50 03.50 03.50
  B03.50 03.50 03.50
  C03.50 03.50 03.50
*
*CT7* LEFT TURN RADII.
  A005.0
  B005.0
*
*CT8* RIGHT TURN DETAILS. NON-BLOCKING OPPOSING
* RIGHT TURN RADII. STORAGE TRAFFIC
  B 005.0 005.0
  C 005.0 3 00.0
*NO CT9*
*NO CT10*
*NO CT11*
*NO CT12*
*
*CT13* ---- SIGNAL DATA ---- FOR SIGNAL TIMING SET 1
* NO.OF MAX FIXED EFF GRN DISPLACEMENTS
* TRIGGER STAGES CYCLE OR CYCLE START END CONTROL KEYWORDS
  03 1.4 2.9 FIXED TIME NSETS=1
*
*CT14* STAGING DATA FOR SET 1
* LANES ON GREEN FOR ARM .... SPLITS .....
* STAGE A B C D INTERSTAGE MIN/FIXED GREEN
  01 123 12 05.0 007.0
  02 1 23 05.0 007.0
  03 1 3 05.0 007.0
*NO CT15*
*NO CT16*
*NO CT17*
*NO CT18*
*
*CT19* ---- DIRECT DEMAND DATA ---- ENTRY FLOWS BY ARM
* FROM A FROM B FROM C FROM D
  1 0028.80 0010.00 0023.90
**
  1 0034.50 0010.70 0031.50
**
  1 0026.50 0013.10 0031.20
**
  1 0028.90 0011.60 0031.00
*NO CT20*
*NO CT21*
*NO CT22*
*NO CT23*
*NO CT24*
*NO CT25*
*
*CT26* ---- TURNING PROPORTIONS --- FOR EACH TIME SEGMENT
* TO A TO B TO C TO D
  0.000 0.054 0.405
  0.097 0.000 0.063
  0.344 0.037 0.000
**

```

	0.000	0.081	0.370
	0.109	0.000	0.030
	0.370	0.041	0.000
**			
	0.000	0.054	0.321
	0.115	0.000	0.070
	0.399	0.041	0.000
**			
	0.000	0.035	0.369
	0.117	0.000	0.046
	0.387	0.047	0.000
**			
NO CT27			
NO CT28			
NO CT29			
NO CT30			
NO CT30			
NO CT31			
NO CT32			
NO CT33			
NO CT34			
NO CT35			
NO CT36			
NO CT37			
NO CT38			
NO CT39			
NO CT40			
NO CT41			
NO CT42			
NO CT43			
NO CT44			
NO CT45			
NO CT46			

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OPTIMISED SIGNAL CAPACITY AND DELAY

Visual OSCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (MAR 1999)

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|-----|

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THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS IN
NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

.Run with file:- "c:\Program Files\Junction\OSCADY4\j3nd20m.voi" at 01:08:34 on Tuesday, 19 April 2011

RUN TITLE

Junction 3 Weekday Morning 2020 Without Development

**** ERROR AND WARNING MESSAGES ****

=====

*** WARNING *** Arm C:Warning on CT14: Opposed right-turners -
CT08/CT14 contradiction
[Opposing traffic / Lanes on green]

*** WARNING *** Warnings in data - check output carefully

.TRAFFIC SIGNAL JUNCTION ANALYSIS

INPUT DATA

```

                                TO A ---->
ARM C----- TEE ----- ARM A
                                <----- FROM A
                                I
                                I
                                I
                                I
                                I
                                I
                                I
                                ARM B

```

ARM A IS Triq tal-Barrani (East)

ARM B IS Triq Hal-Tarxien

ARM C IS Triq tal-Barrani (West)

.GEOMETRIC DATA

DATA ITEM		I	ARM A	I	ARM B	I	ARM C	I
I	GRADIENT	I	0.0 %	I	0.0 %	I	0.0 %	I
I		I		I		I		I
I	NUMBER OF LANES	I	3	I	3	I	3	I
I		I		I		I		I
I	PERMITTED MOVEMENTS	I	L	I	L	I	S	I
I	LANE 1	I	S	I	R	I	S	I
I	LANE 2	I	S	I	R	I	R	I
I	LANE 3	I		I		I		I
I		I		I		I		I
I	TOTAL EXIT WIDTH FOR STRAIGHT-	I		I		I		I
I	AHEAD VEHICLES FROM THIS ARM	I	N/A	I	N/A	I	N/A	I
I		I		I		I		I
I	LANE WIDTHS	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 1	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 2	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 3	I		I		I		I
I		I		I		I		I
I	LEFT TURN RADII	I	5.0 M	I	5.0 M	I	N/A	I
I	LANE 1	I		I		I		I
I		I		I		I		I
I	RIGHT TURN RADII	I	N/A	I	5.0 M	I	N/A	I
I	LANE 2	I	N/A	I	5.0 M	I	5.0 M	I
I	LANE 3	I		I		I		I
I		I		I		I		I
I	OPPOSING TRAFFIC MOVEMENTS	I		I		I	STRAIGHT	I

```

I      I      I      I
I  STORAGE BEYOND  LANE 3  I  0.0 VEHS  I  0.0 VEHS  I  0.0 VEHS  I
I  STOPLINE      I      I      I      I      I      I
-----

```

EXIT WIDTH FOR IMAGINARY ARM D = 50.10

.TRAFFIC DEMAND DATA

DEMAND DATA ARE INPUT USING THE ** DIRECT ** OPTION

DEFAULT VEHICLE TYPE PROPORTIONS ARE USED

DEMAND DATA SUPPLIED BETWEEN TIMES - 07.15 TO 08.15
 PERIOD OF INTEREST (FOR QUEUE AND DELAY CALCULATIONS) - 07.15 TO 08.15

THE FOLLOWING DATA HAS BEEN INPUT

+ / DEFAULTED

TRAFFIC SCALING FACTOR HAS BEEN SET TO 100 %

```

-----
I  TIME PERIOD  I  ARM  I  CARS AND  MEDIUM  HEAVY  BUSES AND  MOTOR  PEDAL  I
I              I      I  LIGHT GOODS  GOODS  GOODS  COACHES  CYCLES  CYCLES  I
I              I      I              I              I              I              I
I      ALL      I  ALL  I  0.927  0.041  0.016  0.016  0.000  0.000  I
-----

```

```

-----
I              I  TURNING  PROPORTIONS  I
I  TIME PERIOD  I  FROM/TO  I  ARM A  I  ARM B  I  ARM C  I
I  07.15-07.30  I  ARM A GROUP 1  I  0.000  I  0.118  I  0.882  I
I              I  ARM B GROUP 1  I  0.606  I  0.000  I  0.394  I
I              I  ARM C GROUP 1  I  0.903  I  0.097  I  0.000  I
I  07.30-07.45  I  ARM A GROUP 1  I  0.000  I  0.180  I  0.820  I
I              I  ARM B GROUP 1  I  0.784  I  0.000  I  0.216  I
I              I  ARM C GROUP 1  I  0.900  I  0.100  I  0.000  I
I  07.45-08.00  I  ARM A GROUP 1  I  0.000  I  0.144  I  0.856  I
I              I  ARM B GROUP 1  I  0.622  I  0.000  I  0.378  I
I              I  ARM C GROUP 1  I  0.907  I  0.093  I  0.000  I
I  08.00-08.15  I  ARM A GROUP 1  I  0.000  I  0.087  I  0.913  I
I              I  ARM B GROUP 1  I  0.718  I  0.000  I  0.282  I
I              I  ARM C GROUP 1  I  0.892  I  0.108  I  0.000  I
-----

```

.SIGNAL TIMING DETAILS FOR SIGNAL SET 1

TIMING OPTION- FIXED MODE:

TIMINGS ARE PROVIDED BY USER

FIXED CYCLE TIME- 36.0 SECONDS
 PERIODS FOR WHICH THESE SETTINGS APPLY- 07.15-08.15

GLOBAL EFFECTIVE GREEN DISPLACEMENTS - START = 1.4
 END = 2.9

```

-----
I  DATA ITEM  I  STAGE 1  I  STAGE 2  I  STAGE 3  I
I  LANES ON GREEN: ARM A  I  1 2 3  I  1  I  I  I
I  B  I  I  2 3  I  1  I  I  I
I  C  I  1 2  I  I  3  I  I  I
I  GREEN TIME (SECS)  I  7.0  I  7.0  I  7.0  I
I  PRECEDING INTERSTAGE  I  5.0  I  5.0  I  5.0  I
-----

```

.DEMAND AND CAPACITY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 07.15 AND 08.15

```

-----
I  TIME  MOVEMENT  DEMAND  SAT FLOW  SAT FLOW  EFFECTIVE GREEN-TIME  CAPACITY  I
I              (VEHS/MIN)  (PCU/HR)  (VEHS/MIN)  TRUE  FLARE+NOTIONL  (VEHS  I
I  ARM LANES  (SECS)  (SECS)  (SECS)  /MIN)  I
-----

```

I	07.15-07.30								I
I	A	1	L	3.39	1511.5	23.83	20.5	13.57	I
I		23	S	25.41	4210.0	66.36	8.5	15.67	I
I	B	1	L	3.94	1511.5	23.83	8.5	5.63	I
I		23	R	6.06	3238.5	51.05	8.5	12.05	I
I	C	12	S	21.58	4070.0	64.16	8.5	15.15	I
I		3	R	2.32	1619.2	25.52	8.5	6.03	I

I	07.30-07.45								I
I	A	1	L	6.20	1511.5	23.83	20.5	13.57	I
I		23	S	28.30	4210.0	66.36	8.5	15.67	I
I	B	1	L	2.31	1511.5	23.83	8.5	5.63	I
I		23	R	8.39	3238.5	51.05	8.5	12.05	I
I	C	12	S	28.36	4070.0	64.16	8.5	15.15	I
I		3	R	3.14	1619.2	25.52	8.5	6.03	I

I	07.45-08.00								I
I	A	1	L	3.82	1511.5	23.83	20.5	13.57	I
I		23	S	22.68	4210.0	66.36	8.5	15.67	I
I	B	1	L	4.96	1511.5	23.83	8.5	5.63	I
I		23	R	8.14	3238.5	51.05	8.5	12.05	I
I	C	12	S	28.29	4070.0	64.16	8.5	15.15	I
I		3	R	2.91	1619.2	25.52	8.5	6.03	I

I	08.00-08.15								I
I	A	1	L	2.50	1511.5	23.83	20.5	13.57	I
I		23	S	26.40	4210.0	66.36	8.5	15.67	I
I	B	1	L	3.27	1511.5	23.83	8.5	5.63	I
I		23	R	8.33	3238.5	51.05	8.5	12.05	I
I	C	12	S	27.64	4070.0	64.16	8.5	15.15	I
I		3	R	3.36	1619.2	25.52	8.5	6.03	I

QUEUE AND DELAY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 07.15 AND 08.15

=====

I	TIME	MOVEMENT	DEMAND EXCL 2-WHEEL (VEHS/MIN)	CAPACITY (VEHS/MIN)	DEGREE OF SAT (RFC)	QUEUE AT END OF SEGMENT		QUEUEING DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	ARM	LANES				MEAN (PHASE AVERAGED) (VEHS/LANE)	MAXIMUM (END OF RED) (VEHS/LANE)			I

I	07.15-07.30									I
I	A	1	L	3.39	13.57	0.250	0.3	0.9	4.0	I
I		23	S	25.41	15.67	1.622	75.3	77.1	1164.0	I
I	B	1	L	3.94	5.63	0.700	1.7	2.7	25.3	I
I		23	R	6.06	12.05	0.503	0.8	1.5	22.6	I
I	C	12	S	21.58	15.15	1.425	50.7	52.4	795.7	I
I		3	R	2.32	6.03	0.385	0.6	1.2	8.8	I

I	07.30-07.45									I
I	A	1	L	6.20	13.57	0.457	0.7	1.8	10.4	I
I		23	S	28.30	15.67	1.806	170.1	171.9	3685.9	I
I	B	1	L	2.31	5.63	0.410	0.6	1.2	9.6	I
I		23	R	8.39	12.05	0.696	1.3	2.4	40.1	I
I	C	12	S	28.36	15.15	1.872	149.7	151.5	3010.9	I
I		3	R	3.14	6.03	0.521	1.0	1.8	14.4	I

I	07.45-08.00									I
I	A	1	L	3.82	13.57	0.281	0.3	1.1	4.8	I
I		23	S	22.68	15.67	1.448	222.7	224.5	5894.9	I
I	B	1	L	4.96	5.63	0.881	3.9	5.1	52.4	I
I		23	R	8.14	12.05	0.676	1.3	2.3	38.2	I
I	C	12	S	28.29	15.15	1.868	248.3	250.1	5973.2	I
I		3	R	2.91	6.03	0.482	0.8	1.6	12.7	I

I	08.00-08.15									I
I	A	1	L	2.50	13.57	0.185	0.2	0.7	2.7	I
I		23	S	26.40	15.67	1.685	303.2	305.0	7890.2	I
I	B	1	L	3.27	5.63	0.582	1.2	2.0	19.8	I
I		23	R	8.33	12.05	0.691	1.3	2.4	40.0	I
I	C	12	S	27.64	15.15	1.825	342.0	343.8	8856.8	I
I		3	R	3.36	6.03	0.557	1.1	1.9	16.3	I

QUEUES FOR ARM A

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE	
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)
		*	+

07.30	3	75.3	77.1
	2	75.3	77.1
	1	0.3	0.9

07.45	3	170.1	171.9
	2	170.1	171.9

```

      1      0.7      1.8      *+
08.00  3      222.7      224.5      *****
      2      222.7      224.5      *****
      1      0.3      1.1      +
08.15  3      303.2      305.0      *****
      2      303.2      305.0      *****
      1      0.2      0.7      +

```

.QUEUES FOR ARM B

TIME SEGMENT ENDING	LANE	NUMBER OF MEAN (PHASE AVERAGED) *	VEHICLES MAXIMUM (AT END OF RED) +	IN QUEUE
07.30	3	0.8	1.5	*+
	2	0.8	1.5	*+
	1	1.7	2.7	***
07.45	3	1.3	2.4	*+
	2	1.3	2.4	*+
	1	0.6	1.2	*
08.00	3	1.3	2.3	*+
	2	1.3	2.3	*+
	1	3.9	5.1	****+
08.15	3	1.3	2.4	*+
	2	1.3	2.4	*+
	1	1.2	2.0	*+

.QUEUES FOR ARM C

TIME SEGMENT ENDING	LANE	NUMBER OF MEAN (PHASE AVERAGED) *	VEHICLES MAXIMUM (AT END OF RED) +	IN QUEUE
07.30	3	0.6	1.2	*
	2	50.7	52.4	*****+
	1	50.7	52.4	*****+
07.45	3	1.0	1.8	*+
	2	149.7	151.5	*****
	1	149.7	151.5	*****
08.00	3	0.8	1.6	*+
	2	248.3	250.1	*****
	1	248.3	250.1	*****
08.15	3	1.1	1.9	*+
	2	342.0	343.8	*****
	1	342.0	343.8	*****

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD (07.15-08.15)

I	STREAM	I	TOTAL DEMAND (EXCL 2-WHEEL)	I	* QUEUEING * DELAY	I	* INCLUSIVE QUEUEING * DELAY	I
I	I	I	(VEH)	I	(MIN)	I	(MIN)	I
I	A-B	I	238.6	I	238.6	I	21.9	I
I	A-C	I	1541.9	I	1541.9	I	12.09	I
I	B-C	I	217.2	I	217.2	I	0.49	I
I	B-A	I	463.8	I	463.8	I	0.30	I
I	C-A	I	1588.1	I	1588.1	I	11.74	I
I	C-B	I	175.9	I	175.9	I	0.30	I
I	ALL	I	4225.5	I	4225.5	I	8.90	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 BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

* TOTAL GEOMETRIC DELAY INCLUDES DELAY SUFFERED BY VEHICLES STILL QUEUEING AT THE END OF THE WHOLE TIME PERIOD.

* THE SUM OF DELAYS FOR EACH SEGMENT AND THE TOTAL GEOMETRIC DELAY WILL BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS

* A LARGE QUEUE AT THE END OF THE TIME PERIOD.

.
***** OSCADY 4 run completed

Junction 3 Weekday Morning 2020 With Development

```

Visual OSCADY 4.01
*CT1* ---- RUN TITLE ----
Junction 3 Weekday Morning 2020 With Development
*
*CT2* ---- RUN PARAMETERS ----
* TIMES FOR FIXED TIME OPTIMISATION, QUEUE/DELAY CALCULATIONS, DEMAND DATA.
&PARAM START=0715, FINISH=0815, INTERV=15, DSTART=0715, DFINISH=0815,
  FSCALE=100, &END
*
*CT3* ---- RUN OPTIONS ----
* JUNCTION, DEMAND, VEHICLES, TURNING, QUEUES AND DELAYS, ACCIDENT, SATURATION.
&OPTION TEE=T,DIRECT=T,TIMINP=T,VDEF=T,TPTIME=T,QUEDEL=T,T2=T,URB=T,APR=T,
  &END
*
*CT4* ---- ARM NAMES ----
Triq tal-Barrani (East)
Triq Hal-Tarxien
Triq tal-Barrani (West)
*
*CT5* ---- GEOMETRIC DATA ----
* ARM GRAD LANES PERMITTED MOVEMENTS FOR LANE .... EXIT
* ..1 ..2 ..3 ..4 ..5 WIDTH
  A 00.0 3 1 2 2 ..4 50.10
  B 00.0 3 1 3 3
  C 00.0 3 2 2 3 50.10
  D 50.10
*
*CT6* LANE WIDTHS.
  A03.50 03.50 03.50
  B03.50 03.50 03.50
  C03.50 03.50 03.50
*
*CT7* LEFT TURN RADII.
  A005.0
  B005.0
*
*CT8* RIGHT TURN DETAILS. NON-BLOCKING OPPOSING
* RIGHT TURN RADII. STORAGE TRAFFIC
  B 005.0 005.0
  C 005.0 3 00.0
*NO CT9*
*NO CT10*
*NO CT11*
*NO CT12*
*
*CT13* ---- SIGNAL DATA ---- FOR SIGNAL TIMING SET 1
* NO.OF MAX FIXED EFF GRN DISPLACEMENTS
* TRIGGER STAGES CYCLE OR CYCLE START END CONTROL KEYWORDS
  03 1.4 2.9 FIXED TIME NSETS=1
*
*CT14* STAGING DATA FOR SET 1
* LANES ON GREEN FOR ARM .... SPLITS .....
* STAGE A B C D INTERSTAGE MIN/FIXED GREEN
  01 123 12 05.0 007.0
  02 1 23 05.0 007.0
  03 1 3 05.0 007.0
*NO CT15*
*NO CT16*
*NO CT17*
*NO CT18*
*
*CT19* ---- DIRECT DEMAND DATA ---- ENTRY FLOWS BY ARM
* FROM A FROM B FROM C FROM D
  1 0029.00 0010.10 0023.90
**
  1 0034.70 0010.90 0031.50
**
  1 0026.70 0013.20 0031.20
**
  1 0029.00 0011.70 0031.00
*NO CT20*
*NO CT21*
*NO CT22*
*NO CT23*
*NO CT24*
*NO CT25*
*
*CT26* ---- TURNING PROPORTIONS --- FOR EACH TIME SEGMENT
* TO A TO B TO C TO D
  0.000 0.057 0.405
  0.099 0.000 0.063
  0.344 0.037 0.000
**

```


	0.000	0.083	0.370
	0.111	0.000	0.030
	0.370	0.041	0.000
**			
	0.000	0.056	0.321
	0.117	0.000	0.070
	0.399	0.041	0.000
**			
	0.000	0.036	0.369
	0.118	0.000	0.046
	0.387	0.047	0.000
**			
NO CT27			
NO CT28			
NO CT29			
NO CT30			
NO CT30			
NO CT31			
NO CT32			
NO CT33			
NO CT34			
NO CT35			
NO CT36			
NO CT37			
NO CT38			
NO CT39			
NO CT40			
NO CT41			
NO CT42			
NO CT43			
NO CT44			
NO CT45			
NO CT46			

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OPTIMISED SIGNAL CAPACITY AND DELAY

Visual OSCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (MAR 1999)

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-----
|   FOR SALES AND DISTRIBUTION INFORMATION,   |
|   PROGRAM ADVICE AND MAINTENANCE CONTACT:   |
|                                     TRL LTD   |
| TEL: CROWTHORNE (01344) 770018, FAX: 770864 |
|-----|

```

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS IN
NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

.Run with file:- "c:\Program Files\Junction\OSCADY4\j3wd20m.voi" at 01:11:38 on Tuesday, 19 April 2011

RUN TITLE

Junction 3 Weekday Morning 2020 With Development

**** ERROR AND WARNING MESSAGES ****

=====

*** WARNING *** Arm C:Warning on CT14: Opposed right-turners -
CT08/CT14 contradiction
[Opposing traffic / Lanes on green]

*** WARNING *** Warnings in data - check output carefully

.TRAFFIC SIGNAL JUNCTION ANALYSIS

INPUT DATA

```

                                TO A ---->
ARM C----- TEE ----- ARM A
                                <----- FROM A
                                I
                                I
                                I
                                I
                                I
                                I
                                I
                                ARM B

```

ARM A IS Triq tal-Barrani (East)

ARM B IS Triq Hal-Tarxien

ARM C IS Triq tal-Barrani (West)

.GEOMETRIC DATA

DATA ITEM		I	ARM A	I	ARM B	I	ARM C	I
I	GRADIENT	I	0.0 %	I	0.0 %	I	0.0 %	I
I		I		I		I		I
I	NUMBER OF LANES	I	3	I	3	I	3	I
I		I		I		I		I
I	PERMITTED MOVEMENTS	I	L	I	L	I	S	I
I	LANE 1	I	S	I	R	I	S	I
I	LANE 2	I	S	I	R	I	R	I
I	LANE 3	I		I		I		I
I		I		I		I		I
I	TOTAL EXIT WIDTH FOR STRAIGHT-	I		I		I		I
I	AHEAD VEHICLES FROM THIS ARM	I	N/A	I	N/A	I	N/A	I
I		I		I		I		I
I	LANE WIDTHS	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 1	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 2	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 3	I		I		I		I
I		I		I		I		I
I	LEFT TURN RADII	I	5.0 M	I	5.0 M	I	N/A	I
I	LANE 1	I		I		I		I
I		I		I		I		I
I	RIGHT TURN RADII	I	N/A	I	5.0 M	I	N/A	I
I	LANE 2	I	N/A	I	5.0 M	I	5.0 M	I
I	LANE 3	I		I		I		I
I		I		I		I		I
I	OPPOSING TRAFFIC MOVEMENTS	I		I		I	STRAIGHT	I

```

I      I      I      I      I
I  STORAGE BEYOND  LANE 3  I  0.0 VEHS  I  0.0 VEHS  I  0.0 VEHS  I
I  STOPLINE      I      I      I      I
-----

```

EXIT WIDTH FOR IMAGINARY ARM D = 50.10

.TRAFFIC DEMAND DATA

DEMAND DATA ARE INPUT USING THE ** DIRECT ** OPTION

DEFAULT VEHICLE TYPE PROPORTIONS ARE USED

DEMAND DATA SUPPLIED BETWEEN TIMES - 07.15 TO 08.15
 PERIOD OF INTEREST (FOR QUEUE AND DELAY CALCULATIONS) - 07.15 TO 08.15

THE FOLLOWING DATA HAS BEEN INPUT
 + / DEFAULTED

TRAFFIC SCALING FACTOR HAS BEEN SET TO 100 %

```

-----
I  TIME PERIOD  I  ARM  I  CARS AND  MEDIUM  VEHICLE TYPE  PROPORTIONS  MOTOR  PEDAL  I
I              I      I  LIGHT GOODS  GOODS      GOODS      BUSES AND  COACHES  CYCLES  CYCLES  I
I              I      I              I              I              I              I
-----
I      ALL      I  ALL  I  0.927  0.041  0.016  0.016  0.000  0.000  I
-----

```

```

-----
I              I  TURNING  PROPORTIONS  I
I  TIME PERIOD  I  FROM/TO  I  ARM A  I  ARM B  I  ARM C  I
-----
I  07.15-07.30  I  ARM A GROUP 1  I  0.000  I  0.123  I  0.877  I
I              I  ARM B GROUP 1  I  0.611  I  0.000  I  0.389  I
I              I  ARM C GROUP 1  I  0.903  I  0.097  I  0.000  I
-----
I  07.30-07.45  I  ARM A GROUP 1  I  0.000  I  0.183  I  0.817  I
I              I  ARM B GROUP 1  I  0.787  I  0.000  I  0.213  I
I              I  ARM C GROUP 1  I  0.900  I  0.100  I  0.000  I
-----
I  07.45-08.00  I  ARM A GROUP 1  I  0.000  I  0.149  I  0.851  I
I              I  ARM B GROUP 1  I  0.626  I  0.000  I  0.374  I
I              I  ARM C GROUP 1  I  0.907  I  0.093  I  0.000  I
-----
I  08.00-08.15  I  ARM A GROUP 1  I  0.000  I  0.089  I  0.911  I
I              I  ARM B GROUP 1  I  0.720  I  0.000  I  0.280  I
I              I  ARM C GROUP 1  I  0.892  I  0.108  I  0.000  I
-----

```

.SIGNAL TIMING DETAILS FOR SIGNAL SET 1

TIMING OPTION- FIXED MODE: TIMINGS ARE PROVIDED BY USER

FIXED CYCLE TIME- 36.0 SECONDS
 PERIODS FOR WHICH THESE SETTINGS APPLY- 07.15-08.15

GLOBAL EFFECTIVE GREEN DISPLACEMENTS - START = 1.4
 END = 2.9

```

-----
I  DATA ITEM  I  STAGE 1  I  STAGE 2  I  STAGE 3  I
-----
I  LANES ON GREEN: ARM A  I  1 2 3  I  1  I  I
I  B  I  I  2 3  I  1  I
I  C  I  1 2  I  I  3  I
I  I  I  I  I  I
I  GREEN TIME (SECS)  I  7.0  I  7.0  I  7.0  I
I  I  I  I  I  I
I  PRECEDING INTERSTAGE  I  5.0  I  5.0  I  5.0  I
-----

```

.DEMAND AND CAPACITY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 07.15 AND 08.15

```

-----
I  TIME  MOVEMENT  DEMAND  SAT FLOW  SAT FLOW  EFFECTIVE GREEN-TIME  CAPACITY  I
I      (VEHS/MIN)  (PCU/HR)  (VEHS/MIN)  TRUE  FLARE+NOTIONL  (VEHS  I
I  ARM  LANES      (SECS)  (SECS)  /MIN)  I
-----
I  07.15-07.30  I
I  A  1  L  3.58  1511.5  23.83  20.5  13.57  I
I      23  S  25.42  4210.0  66.36  8.5  15.67  I
-----

```

I	B	1	L	3.93	1511.5	23.83	8.5	5.63	I
I	A	23	S	6.17	3238.5	51.05	8.5	12.05	I
I	C	12	S	21.58	4070.0	64.16	8.5	15.15	I
I		3	R	2.32	1619.2	25.52	8.5	6.03	I

I	07.30-07.45								I
I	A	1	L	6.36	1511.5	23.83	20.5	13.57	I
I		23	S	28.34	4210.0	66.36	8.5	15.67	I
I	B	1	L	2.32	1511.5	23.83	8.5	5.63	I
I		23	R	8.58	3238.5	51.05	8.5	12.05	I
I	C	12	S	28.36	4070.0	64.16	8.5	15.15	I
I		3	R	3.14	1619.2	25.52	8.5	6.03	I

I	07.45-08.00								I
I	A	1	L	3.97	1511.5	23.83	20.5	13.57	I
I		23	S	22.73	4210.0	66.36	8.5	15.67	I
I	B	1	L	4.94	1511.5	23.83	8.5	5.63	I
I		23	R	8.26	3238.5	51.05	8.5	12.05	I
I	C	12	S	28.29	4070.0	64.16	8.5	15.15	I
I		3	R	2.91	1619.2	25.52	8.5	6.03	I

I	08.00-08.15								I
I	A	1	L	2.58	1511.5	23.83	20.5	13.57	I
I		23	S	26.42	4210.0	66.36	8.5	15.67	I
I	B	1	L	3.28	1511.5	23.83	8.5	5.63	I
I		23	R	8.42	3238.5	51.05	8.5	12.05	I
I	C	12	S	27.64	4070.0	64.16	8.5	15.15	I
I		3	R	3.36	1619.2	25.52	8.5	6.03	I

.QUEUE AND DELAY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 07.15 AND 08.15

	TIME	MOVEMENT	DEMAND EXCL 2-WHEEL (VEHS/MIN)	CAPACITY (VEHS/MIN)	DEGREE OF SAT (RFC)	QUEUE AT END OF SEGMENT MEAN (PHASE AVERAGED) (VEHS/LANE)	MAXIMUM (END OF RED) (VEHS/LANE)	QUEUEING DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
	07.15-07.30								
	A	1	L	3.58	13.57	0.264	0.3	1.0	4.4
		23	S	25.42	15.67	1.622	75.4	77.2	1165.1
	B	1	L	3.93	5.63	0.698	1.7	2.7	25.2
		23	R	6.17	12.05	0.512	0.8	1.6	23.2
	C	12	S	21.58	15.15	1.425	50.7	52.4	795.7
		3	R	2.32	6.03	0.385	0.6	1.2	8.8
	07.30-07.45								
	A	1	L	6.36	13.57	0.469	0.7	1.9	10.9
		23	S	28.34	15.67	1.809	170.5	172.3	3692.5
	B	1	L	2.32	5.63	0.412	0.6	1.2	9.6
		23	R	8.58	12.05	0.712	1.4	2.5	42.2
	C	12	S	28.36	15.15	1.872	149.7	151.5	3010.9
		3	R	3.14	6.03	0.521	1.0	1.8	14.4
	07.45-08.00								
	A	1	L	3.97	13.57	0.292	0.3	1.1	5.1
		23	S	22.73	15.67	1.451	223.5	225.2	5911.4
	B	1	L	4.94	5.63	0.878	3.9	5.0	51.8
		23	R	8.26	12.05	0.685	1.3	2.4	39.4
	C	12	S	28.29	15.15	1.868	248.3	250.1	5973.2
		3	R	2.91	6.03	0.482	0.8	1.6	12.7
	08.00-08.15								
	A	1	L	2.58	13.57	0.190	0.2	0.7	2.8
		23	S	26.42	15.67	1.686	304.1	305.9	7915.3
	B	1	L	3.28	5.63	0.583	1.2	2.0	19.9
		23	R	8.42	12.05	0.698	1.4	2.4	41.0
	C	12	S	27.64	15.15	1.825	342.0	343.8	8856.8
		3	R	3.36	6.03	0.557	1.1	1.9	16.3

.QUEUES FOR ARM A

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE MEAN (PHASE AVERAGED) *	MAXIMUM (AT END OF RED) +	

07.30	3	75.4	77.2	*****++
	2	75.4	77.2	*****++
	1	0.3	1.0	+
07.45	3	170.5	172.3	*****
	2	170.5	172.3	*****
	1	0.7	1.9	*+
08.00	3	223.5	225.2	*****
	2	223.5	225.2	*****

```

.QUEUES FOR ARM B
-----

```

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES MEAN (PHASE AVERAGED) *	IN QUEUE MAXIMUM (AT END OF RED) +	
07.30	3	0.8	1.6	++
	2	0.8	1.6	++
	1	1.7	2.7	+++
07.45	3	1.4	2.5	++
	2	1.4	2.5	++
	1	0.6	1.2	*
08.00	3	1.3	2.4	++
	2	1.3	2.4	++
	1	3.9	5.0	+++++
08.15	3	1.4	2.4	++
	2	1.4	2.4	++
	1	1.2	2.0	++

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE		
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	
		*	+	
07.30	3	0.6	1.2	*
	2	50.7	52.4	*****+
	1	50.7	52.4	*****+
07.45	3	1.0	1.8	*+
	2	149.7	151.5	*****
	1	149.7	151.5	*****
08.00	3	0.8	1.6	*+
	2	248.3	250.1	*****
	1	248.3	250.1	*****
08.15	3	1.1	1.9	*+
	2	342.0	343.8	*****
	1	342.0	343.8	*****

	I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I				
	I		I	(EXCL 2-WHEEL)	I	* DELAY *	I	* DELAY *	I				
	I		I		I		I		I				
	I		I	(VEH) (VEH/H)	I	(MIN) (MIN/VEH)	I	(MIN) (MIN/VEH)	I				
I A-B	I	247.2	I	247.2	I	23.2	I	0.09	I	23.2	I	0.09	I
I A-C	I	1543.8	I	1543.8	I	18684.4	I	12.10	I	30487.9	I	19.75	I
I B-C	I	217.0	I	217.0	I	106.5	I	0.49	I	106.6	I	0.49	I
I B-A	I	471.5	I	471.5	I	145.7	I	0.31	I	146.0	I	0.31	I
I C-A	I	1588.1	I	1588.1	I	18636.6	I	11.74	I	34081.5	I	21.46	I
I C-B	I	175.9	I	175.9	I	52.3	I	0.30	I	52.4	I	0.30	I
I ALL	I	4243.5	I	4243.5	I	37648.6	I	8.87	I	64897.6	I	15.29	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 BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

* TOTAL GEOMETRIC DELAY INCLUDES DELAY SUFFERED BY VEHICLES STILL QUEUEING AT THE END OF THE WHOLE TIME PERIOD.
* THE SUM OF DELAYS FOR EACH SEGMENT AND THE TOTAL GEOMETRIC DELAY WILL BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS
* A LARGE QUEUE AT THE END OF THE TIME PERIOD.

```
***** OSCADY 4 run completed
```

Junction 3 Evening 2020 Without Development

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Visual OSCADY 4.01
*CT1* ---- RUN TITLE ----
Junction 3 Weekday Evening 2020 Without Development
*
*CT2* ---- RUN PARAMETERS ----
* TIMES FOR FIXED TIME OPTIMISATION, QUEUE/DELAY CALCULATIONS, DEMAND DATA.
&PARAM START=1600, FINISH=1700, INTERV=15, DSTART=1600, DFINISH=1700,
  FSCALE=100, &END
*
*CT3* ---- RUN OPTIONS ----
* JUNCTION, DEMAND, VEHICLES, TURNING, QUEUES AND DELAYS, ACCIDENT, SATURATION.
&OPTION TEE=T,DIRECT=T,TIMINP=T,VDEF=T,TPTIME=T,QUEDEL=T,T2=T,URB=T,APR=T,
  &END
*
*CT4* ---- ARM NAMES ----
Triq tal-Barrani (East)
Triq Hal-Tarxien
Triq tal-Barrani (West)
*
*CT5* ---- GEOMETRIC DATA ----
* ARM GRAD LANES PERMITTED MOVEMENTS FOR LANE .... EXIT
* ..1 ..2 ..3 ..4 ..5 WIDTH
  A 00.0 3 1 2 2 50.10
  B 00.0 3 1 3 3
  C 00.0 3 2 2 3 50.10
  D 50.10
*
*CT6* LANE WIDTHS.
  A03.50 03.50 03.50
  B03.50 03.50 03.50
  C03.50 03.50 03.50
*
*CT7* LEFT TURN RADII.
  A005.0
  B005.0
*
*CT8* RIGHT TURN DETAILS. NON-BLOCKING OPPOSING
* RIGHT TURN RADII. STORAGE TRAFFIC
  B 005.0 005.0
  C 005.0 3 00.0
*NO CT9*
*NO CT10*
*NO CT11*
*NO CT12*
*
*CT13* ---- SIGNAL DATA ---- FOR SIGNAL TIMING SET 1
* NO.OF MAX FIXED EFF GRN DISPLACEMENTS
* TRIGGER STAGES CYCLE OR CYCLE START END CONTROL KEYWORDS
  03 1.4 2.9 FIXED TIME NSETS=1
*
*CT14* STAGING DATA FOR SET 1
* LANES ON GREEN FOR ARM .... SPLITS .....
* STAGE A B C D INTERSTAGE MIN/FIXED GREEN
  01 123 12 05.0 007.0
  02 1 23 05.0 007.0
  03 1 3 05.0 007.0
*NO CT15*
*NO CT16*
*NO CT17*
*NO CT18*
*
*CT19* ---- DIRECT DEMAND DATA ---- ENTRY FLOWS BY ARM
* FROM A FROM B FROM C FROM D
  1 0029.40 0012.20 0033.80
**
  1 0030.70 0013.30 0032.40
**
  1 0031.20 0013.60 0036.90
**
  1 0027.70 0010.80 0038.10
*NO CT20*
*NO CT21*
*NO CT22*
*NO CT23*
*NO CT24*
*NO CT25*
*
*CT26* ---- TURNING PROPORTIONS --- FOR EACH TIME SEGMENT
* TO A TO B TO C TO D
  0.000 0.040 0.350
  0.104 0.000 0.057
  0.416 0.033 0.000
**
  0.000 0.045 0.357
  0.117 0.000 0.057

```

**	0.385	0.039	0.000
	0.000	0.043	0.338
	0.110	0.000	0.056
	0.406	0.046	0.000
**	0.000	0.060	0.302
	0.091	0.000	0.050
	0.464	0.033	0.000
**			
NO	CT27		
NO	CT28		
NO	CT29		
NO	CT30		
NO	CT30		
NO	CT31		
NO	CT32		
NO	CT33		
NO	CT34		
NO	CT35		
NO	CT36		
NO	CT37		
NO	CT38		
NO	CT39		
NO	CT40		
NO	CT41		
NO	CT42		
NO	CT43		
NO	CT44		
NO	CT45		
NO	CT46		

TRANSPORT RESEARCH LABORATORY

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OPTIMISED SIGNAL CAPACITY AND DELAY

Visual OSCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (MAR 1999)

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|   FOR SALES AND DISTRIBUTION INFORMATION,   |
|   PROGRAM ADVICE AND MAINTENANCE CONTACT:   |
|               TRL LTD                       |
| TEL: CROWTHORNE (01344) 770018, FAX: 770864 |
|-----|

```

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS IN
NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

.Run with file:- "c:\Program Files\Junction\OSCADY4\j3nd20e.voi" at 01:03:38 on Tuesday, 19 April 2011

RUN TITLE

Junction 3 Weekday Evening 2020 Without Development

*** ERROR AND WARNING MESSAGES ***
=====

*** WARNING *** Arm C:Warning on CT14: Opposed right-turners -
CT08/CT14 contradiction
[Opposing traffic / Lanes on green]
*** WARNING *** Warnings in data - check output carefully

.TRAFFIC SIGNAL JUNCTION ANALYSIS

INPUT DATA

```

                                TO A ---->
ARM C----- TEE -----> ARM A
                                <----- FROM A
                                I
                                I
                                I
                                I
                                I
                                I
                                I
                                ARM B

```

ARM A IS Triq tal-Barrani (East)
ARM B IS Triq Hal-Tarxien
ARM C IS Triq tal-Barrani (West)

.GEOMETRIC DATA

I	DATA ITEM	I	ARM A	I	ARM B	I	ARM C	I
I	GRADIENT	I	0.0 %	I	0.0 %	I	0.0 %	I
I		I		I		I		I
I	NUMBER OF LANES	I	3	I	3	I	3	I
I		I		I		I		I
I	PERMITTED MOVEMENTS	I	L	I	L	I	S	I
I	LANE 1	I	S	I	R	I	S	I
I	LANE 2	I	S	I	R	I	R	I
I	LANE 3	I		I		I		I
I	TOTAL EXIT WIDTH FOR STRAIGHT-	I		I		I		I
I	AHEAD VEHICLES FROM THIS ARM	I	N/A	I	N/A	I	N/A	I
I		I		I		I		I
I	LANE WIDTHS	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 1	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 2	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 3	I		I		I		I
I	LEFT TURN RADII	I	5.0 M	I	5.0 M	I	N/A	I
I		I		I		I		I
I	RIGHT TURN RADII	I	N/A	I	5.0 M	I	N/A	I
I	LANE 1	I	N/A	I	5.0 M	I	5.0 M	I
I	LANE 2	I		I		I		I
I	LANE 3	I		I		I		I


```

I      I      I      I      I
I      OPPOSING TRAFFIC MOVEMENTS      I      I      I      STRAIGHT I
I      I      I      I      I      I
I      STORAGE BEYOND      LANE 3      I      0.0 VEHS I      0.0 VEHS I      0.0 VEHS I
I      STOPLINE      I      I      I      I      I
-----

```

EXIT WIDTH FOR IMAGINARY ARM D = 50.10

.TRAFFIC DEMAND DATA

DEMAND DATA ARE INPUT USING THE ** DIRECT ** OPTION

DEFAULT VEHICLE TYPE PROPORTIONS ARE USED

DEMAND DATA SUPPLIED BETWEEN TIMES - 16.00 TO 17.00

PERIOD OF INTEREST (FOR QUEUE AND DELAY CALCULATIONS) - 16.00 TO 17.00

THE FOLLOWING DATA HAS BEEN INPUT

+ / DEFAULTED

TRAFFIC SCALING FACTOR HAS BEEN SET TO 100 %

```

-----
I      I      I      I      I      I      I      I      I      I
I      TIME PERIOD      I      ARM      I      CARS AND      MEDIUM      VEHICLE TYPE      PROPORTIONS      I
I      I      I      I      LIGHT GOODS      GOODS      HEAVY      BUSES AND      MOTOR      PEDAL I
I      I      I      I      I      COACHES      COACHES      CYCLES      CYCLES I
-----
I      ALL      I      ALL      I      0.927      0.041      0.016      0.016      0.000      0.000 I
-----

```

```

-----
I      I      I      I      I      I      I      I      I      I
I      TIME PERIOD      I      FROM/TO      I      ARM A      I      ARM B      I      ARM C      I
-----
I      16.00-16.15      I      ARM A GROUP 1      I      0.000      I      0.103      I      0.897      I
I      I      ARM B GROUP 1      I      0.646      I      0.000      I      0.354      I
I      I      ARM C GROUP 1      I      0.927      I      0.073      I      0.000      I
-----
I      16.15-16.30      I      ARM A GROUP 1      I      0.000      I      0.112      I      0.888      I
I      I      ARM B GROUP 1      I      0.672      I      0.000      I      0.328      I
I      I      ARM C GROUP 1      I      0.908      I      0.092      I      0.000      I
-----
I      16.30-16.45      I      ARM A GROUP 1      I      0.000      I      0.113      I      0.887      I
I      I      ARM B GROUP 1      I      0.663      I      0.000      I      0.337      I
I      I      ARM C GROUP 1      I      0.898      I      0.102      I      0.000      I
-----
I      16.45-17.00      I      ARM A GROUP 1      I      0.000      I      0.166      I      0.834      I
I      I      ARM B GROUP 1      I      0.645      I      0.000      I      0.355      I
I      I      ARM C GROUP 1      I      0.934      I      0.066      I      0.000      I
-----

```

.SIGNAL TIMING DETAILS FOR SIGNAL SET 1

TIMING OPTION- FIXED MODE:

TIMINGS ARE PROVIDED BY USER

FIXED CYCLE TIME- 36.0 SECONDS
PERIODS FOR WHICH THESE SETTINGS APPLY- 16.00-17.00

GLOBAL EFFECTIVE GREEN DISPLACEMENTS - START = 1.4
END = 2.9

```

-----
I      DATA ITEM      I      STAGE 1      I      STAGE 2      I      STAGE 3      I
-----
I      LANES ON GREEN: ARM A      I      1 2 3      I      1      I      I      I
I      B      I      I      I      2 3      I      1      I
I      C      I      1 2      I      I      I      3      I
I      I      I      I      I      I      I      I
I      GREEN TIME (SECS)      I      7.0      I      7.0      I      7.0      I
I      I      I      I      I      I      I      I
I      PRECEDING INTERSTAGE      I      5.0      I      5.0      I      5.0      I
-----

```

.DEMAND AND CAPACITY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 16.00 AND 17.00

=====

```

I      TIME      MOVEMENT      DEMAND      SAT FLOW      SAT FLOW      EFFECTIVE GREEN-TIME      CAPACITY I
I      (VEHS/MIN)      (PCU/HR)      (VEHS/MIN)      TRUE      FLARE+NOTIONL      (VEHS I
I      ARM LANES      (SECS)      (SECS)      (SECS)      (SECS)      /MIN) I
-----

```

I	16.00-16.15								I
I	A	1	L	3.02	1511.5	23.83	20.5	13.57	I
I		23	S	26.38	4210.0	66.36	8.5	15.67	I
I	B	1	L	4.32	1511.5	23.83	8.5	5.63	I
I		23	R	7.88	3238.5	51.05	8.5	12.05	I
I	C	12	S	31.32	4070.0	64.16	8.5	15.15	I
I		3	R	2.48	1619.2	25.52	8.5	6.03	I

I	16.15-16.30								I
I	A	1	L	3.44	1511.5	23.83	20.5	13.57	I
I		23	S	27.26	4210.0	66.36	8.5	15.67	I
I	B	1	L	4.36	1511.5	23.83	8.5	5.63	I
I		23	R	8.94	3238.5	51.05	8.5	12.05	I
I	C	12	S	29.42	4070.0	64.16	8.5	15.15	I
I		3	R	2.98	1619.2	25.52	8.5	6.03	I

I	16.30-16.45								I
I	A	1	L	3.52	1511.5	23.83	20.5	13.57	I
I		23	S	27.68	4210.0	66.36	8.5	15.67	I
I	B	1	L	4.59	1511.5	23.83	8.5	5.63	I
I		23	R	9.01	3238.5	51.05	8.5	12.05	I
I	C	12	S	33.14	4070.0	64.16	8.5	15.15	I
I		3	R	3.76	1619.2	25.52	8.5	6.03	I

I	16.45-17.00								I
I	A	1	L	4.59	1511.5	23.83	20.5	13.57	I
I		23	S	23.11	4210.0	66.36	8.5	15.67	I
I	B	1	L	3.83	1511.5	23.83	8.5	5.63	I
I		23	R	6.97	3238.5	51.05	8.5	12.05	I
I	C	12	S	35.57	4070.0	64.16	8.5	15.15	I
I		3	R	2.53	1619.2	25.52	8.5	6.03	I

=====

QUEUE AND DELAY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 16.00 AND 17.00

=====

I	TIME	MOVEMENT	DEMAND EXCL 2-WHEEL (VEHS/MIN)	CAPACITY (VEHS/MIN)	DEGREE OF SAT (RFC)	QUEUE AT END OF SEGMENT		QUEUEING DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	ARM	LANES				MEAN (PHASE AVERAGED) (VEHS/LANE)	MAXIMUM (END OF RED) (VEHS/LANE)			I

I	16.00-16.15									I
I	A	1	L	3.02	13.57	0.222	0.2	0.8	3.4	I
I		23	S	26.38	15.67	1.684	82.6	84.4	1272.2	I
I	B	1	L	4.32	5.63	0.768	2.3	3.3	32.6	I
I		23	R	7.88	12.05	0.654	1.2	2.2	35.1	I
I	C	12	S	31.32	15.15	2.067	123.3	125.0	1879.2	I
I		3	R	2.48	6.03	0.412	0.7	1.3	9.8	I

I	16.15-16.30									I
I	A	1	L	3.44	13.57	0.253	0.3	0.9	4.1	I
I		23	S	27.26	15.67	1.740	169.6	171.3	3786.4	I
I	B	1	L	4.36	5.63	0.774	2.4	3.5	37.2	I
I		23	R	8.94	12.05	0.742	1.6	2.7	47.0	I
I	C	12	S	29.42	15.15	1.942	230.3	232.0	5306.6	I
I		3	R	2.98	6.03	0.495	0.9	1.7	13.1	I

I	16.30-16.45									I
I	A	1	L	3.52	13.57	0.260	0.3	1.0	4.3	I
I		23	S	27.68	15.67	1.766	259.6	261.4	6440.1	I
I	B	1	L	4.59	5.63	0.816	2.9	4.0	44.6	I
I		23	R	9.01	12.05	0.748	1.6	2.7	48.5	I
I	C	12	S	33.14	15.15	2.188	365.3	367.0	8935.6	I
I		3	R	3.76	6.03	0.623	1.4	2.3	20.5	I

I	16.45-17.00									I
I	A	1	L	4.59	13.57	0.338	0.4	1.3	6.3	I
I		23	S	23.11	15.67	1.475	315.4	317.2	8627.5	I
I	B	1	L	3.83	5.63	0.681	1.7	2.7	26.9	I
I		23	R	6.97	12.05	0.578	0.9	1.8	28.7	I
I	C	12	S	35.57	15.15	2.348	518.4	520.2	13257.2	I
I		3	R	2.53	6.03	0.420	0.7	1.3	10.3	I

QUEUES FOR ARM A

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE		
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	
		*	+	
16.15	3	82.6	84.4	*****+
	2	82.6	84.4	*****+
	1	0.2	0.8	+
16.30	3	169.6	171.3	*****
	2	169.6	171.3	*****

```

      1      0.3      0.9      +
16.45  3      259.6      261.4      *****
      2      259.6      261.4      *****
      1      0.3      1.0      +
17.00  3      315.4      317.2      *****
      2      315.4      317.2      *****
      1      0.4      1.3      +

```

.QUEUES FOR ARM B

TIME SEGMENT ENDING	LANE	NUMBER OF MEAN (PHASE AVERAGED) *	VEHICLES IN QUEUE MAXIMUM (AT END OF RED) +	
16.15	3	1.2	2.2	*+
	2	1.2	2.2	*+
	1	2.3	3.3	***
16.30	3	1.6	2.7	***
	2	1.6	2.7	***
	1	2.4	3.5	***
16.45	3	1.6	2.7	***
	2	1.6	2.7	***
	1	2.9	4.0	***+
17.00	3	0.9	1.8	*+
	2	0.9	1.8	*+
	1	1.7	2.7	***

.QUEUES FOR ARM C

TIME SEGMENT ENDING	LANE	NUMBER OF MEAN (PHASE AVERAGED) *	VEHICLES IN QUEUE MAXIMUM (AT END OF RED) +	
16.15	3	0.7	1.3	*
	2	123.3	125.0	*****
	1	123.3	125.0	*****
16.30	3	0.9	1.7	*+
	2	230.3	232.0	*****
	1	230.3	232.0	*****
16.45	3	1.4	2.3	*+
	2	365.3	367.0	*****
	1	365.3	367.0	*****
17.00	3	0.7	1.3	*
	2	518.4	520.2	*****
	1	518.4	520.2	*****

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD (16.00-17.00)

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I	I	(EXCL 2-WHEEL)	I	* DELAY *	I	* DELAY *	I	
I	I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)	I
I	A-B	I	218.5	I	218.5	I	18.1	I
I	A-C	I	1566.5	I	1566.5	I	20126.2	I
I	B-C	I	256.4	I	256.4	I	141.3	I
I	B-A	I	492.1	I	492.1	I	159.3	I
I	C-A	I	1941.8	I	1941.8	I	29378.6	I
I	C-B	I	176.2	I	176.2	I	53.7	I
I	ALL	I	4651.5	I	4651.5	I	49877.2	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 BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

* TOTAL GEOMETRIC DELAY INCLUDES DELAY SUFFERED BY VEHICLES STILL QUEUEING AT THE END OF THE WHOLE TIME PERIOD.

* THE SUM OF DELAYS FOR EACH SEGMENT AND THE TOTAL GEOMETRIC DELAY WILL BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS

* A LARGE QUEUE AT THE END OF THE TIME PERIOD.

.
***** OSCADY 4 run completed

	0.118	0.000	0.057
	0.383	0.039	0.000
**			
	0.000	0.045	0.337
	0.111	0.000	0.056
	0.405	0.046	0.000
**			
	0.000	0.062	0.300
	0.093	0.000	0.049
	0.462	0.033	0.000
**			
NO CT27			
NO CT28			
NO CT29			
NO CT30			
NO CT30			
NO CT31			
NO CT32			
NO CT33			
NO CT34			
NO CT35			
NO CT36			
NO CT37			
NO CT38			
NO CT39			
NO CT40			
NO CT41			
NO CT42			
NO CT43			
NO CT44			
NO CT45			
NO CT46			

TRANSPORT RESEARCH LABORATORY

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OPTIMISED SIGNAL CAPACITY AND DELAY

Visual OSCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (MAR 1999)

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|   FOR SALES AND DISTRIBUTION INFORMATION,   |
|   PROGRAM ADVICE AND MAINTENANCE CONTACT:   |
|               TRL LTD                       |
| TEL: CROWTHORNE (01344) 770018, FAX: 770864 |
|-----|

```

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS IN
NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

.Run with file:- "c:\Program Files\Junction\OSCADY4\j3wd20e.voi" at 00:57:38 on Tuesday, 19 April 2011

RUN TITLE

Junction 3 Weekday Evening 2020 With Development

*** ERROR AND WARNING MESSAGES ***
=====

*** WARNING *** Arm C:Warning on CT14: Opposed right-turners -
CT08/CT14 contradiction
[Opposing traffic / Lanes on green]
*** WARNING *** Warnings in data - check output carefully

.TRAFFIC SIGNAL JUNCTION ANALYSIS

INPUT DATA

```

                                TO A ---->
ARM C----- TEE -----> ARM A
                                <----- FROM A
                                I
                                I
                                I
                                I
                                I
                                I
                                I
                                ARM B

```

ARM A IS Triq tal-Barrani (East)
ARM B IS Triq Hal-Tarxien
ARM C IS Triq tal-Barrani (West)

.GEOMETRIC DATA

I	DATA ITEM	I	ARM A	I	ARM B	I	ARM C	I
I	GRADIENT	I	0.0 %	I	0.0 %	I	0.0 %	I
I		I		I		I		I
I	NUMBER OF LANES	I	3	I	3	I	3	I
I		I		I		I		I
I	PERMITTED MOVEMENTS	I	L	I	L	I	S	I
I	LANE 2	I	S	I	R	I	S	I
I	LANE 3	I	S	I	R	I	R	I
I		I		I		I		I
I	TOTAL EXIT WIDTH FOR STRAIGHT-	I		I		I		I
I	AHEAD VEHICLES FROM THIS ARM	I	N/A	I	N/A	I	N/A	I
I		I		I		I		I
I	LANE WIDTHS	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 2	I	3.50 M	I	3.50 M	I	3.50 M	I
I	LANE 3	I	3.50 M	I	3.50 M	I	3.50 M	I
I		I		I		I		I
I	LEFT TURN RADII	I	5.0 M	I	5.0 M	I	N/A	I
I		I		I		I		I
I	RIGHT TURN RADII	I	N/A	I	5.0 M	I	N/A	I
I	LANE 3	I	N/A	I	5.0 M	I	5.0 M	I

```

I      I      I      I      I
I      OPPOSING TRAFFIC MOVEMENTS      I      I      I      STRAIGHT I
I      I      I      I      I
I      STORAGE BEYOND      LANE 3      I      0.0 VEHS I      0.0 VEHS I      0.0 VEHS I
I      STOPLINE      I      I      I      I
-----

```

EXIT WIDTH FOR IMAGINARY ARM D = 50.10

.TRAFFIC DEMAND DATA

DEMAND DATA ARE INPUT USING THE ** DIRECT ** OPTION

DEFAULT VEHICLE TYPE PROPORTIONS ARE USED

DEMAND DATA SUPPLIED BETWEEN TIMES - 16.00 TO 17.00

PERIOD OF INTEREST (FOR QUEUE AND DELAY CALCULATIONS) - 16.00 TO 17.00

THE FOLLOWING DATA HAS BEEN INPUT

+ / DEFAULTED

TRAFFIC SCALING FACTOR HAS BEEN SET TO 100 %

```

-----
I TIME PERIOD I ARM I CARS AND MEDIUM VEHICLE TYPE PROPORTIONS I
I I I LIGHT GOODS GOODS HEAVY BUSES AND MOTOR PEDAL I
I I I COACHES CYCLES CYCLES I
-----
I ALL I ALL I 0.927 0.041 0.016 0.016 0.000 0.000 I
-----

```

```

-----
I TURNING PROPORTIONS I
I TIME PERIOD I FROM/TO I ARM A I ARM B I ARM C I
-----
I 16.00-16.15 I ARM A GROUP 1 I 0.000 I 0.108 I 0.892 I
I I ARM B GROUP 1 I 0.650 I 0.000 I 0.350 I
I I ARM C GROUP 1 I 0.926 I 0.074 I 0.000 I
-----
I 16.15-16.30 I ARM A GROUP 1 I 0.000 I 0.117 I 0.883 I
I I ARM B GROUP 1 I 0.674 I 0.000 I 0.326 I
I I ARM C GROUP 1 I 0.908 I 0.092 I 0.000 I
-----
I 16.30-16.45 I ARM A GROUP 1 I 0.000 I 0.118 I 0.882 I
I I ARM B GROUP 1 I 0.665 I 0.000 I 0.335 I
I I ARM C GROUP 1 I 0.898 I 0.102 I 0.000 I
-----
I 16.45-17.00 I ARM A GROUP 1 I 0.000 I 0.171 I 0.829 I
I I ARM B GROUP 1 I 0.655 I 0.000 I 0.345 I
I I ARM C GROUP 1 I 0.933 I 0.067 I 0.000 I
-----

```

.SIGNAL TIMING DETAILS FOR SIGNAL SET 1

TIMING OPTION- FIXED MODE:

TIMINGS ARE PROVIDED BY USER

FIXED CYCLE TIME- 36.0 SECONDS
PERIODS FOR WHICH THESE SETTINGS APPLY- 16.00-17.00

GLOBAL EFFECTIVE GREEN DISPLACEMENTS - START = 1.4
END = 2.9

```

-----
I DATA ITEM I STAGE 1 I STAGE 2 I STAGE 3 I
-----
I LANES ON GREEN: ARM A I 1 2 3 I 1 I I
I B I 2 3 I 1 I
I C I 1 2 I 3 I
I I I I
I GREEN TIME (SECS) I 7.0 I 7.0 I 7.0 I
I I I I
I PRECEDING INTERSTAGE I 5.0 I 5.0 I 5.0 I
-----

```

.DEMAND AND CAPACITY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 16.00 AND 17.00

=====

```

I TIME MOVEMENT DEMAND SAT FLOW SAT FLOW EFFECTIVE GREEN-TIME CAPACITY I
I I (VEHS/MIN) (PCU/HR) (VEHS/MIN) TRUE FLARE+NOTIONL (VEHS I
I ARM LANES (SECS) (SECS) /MIN) I
-----

```

I	16.00-16.15								I
I	A	1	L	3.19	1511.5	23.83	20.5	13.57	I
I		23	S	26.41	4210.0	66.36	8.5	15.67	I
I	B	1	L	4.34	1511.5	23.83	8.5	5.63	I
I		23	R	8.06	3238.5	51.05	8.5	12.05	I
I	C	12	S	31.30	4070.0	64.16	8.5	15.15	I
I		3	R	2.50	1619.2	25.52	8.5	6.03	I

I	16.15-16.30								I
I	A	1	L	3.60	1511.5	23.83	20.5	13.57	I
I		23	S	27.30	4210.0	66.36	8.5	15.67	I
I	B	1	L	4.36	1511.5	23.83	8.5	5.63	I
I		23	R	9.04	3238.5	51.05	8.5	12.05	I
I	C	12	S	29.41	4070.0	64.16	8.5	15.15	I
I		3	R	2.99	1619.2	25.52	8.5	6.03	I

I	16.30-16.45								I
I	A	1	L	3.69	1511.5	23.83	20.5	13.57	I
I		23	S	27.61	4210.0	66.36	8.5	15.67	I
I	B	1	L	4.59	1511.5	23.83	8.5	5.63	I
I		23	R	9.11	3238.5	51.05	8.5	12.05	I
I	C	12	S	33.14	4070.0	64.16	8.5	15.15	I
I		3	R	3.76	1619.2	25.52	8.5	6.03	I

I	16.45-17.00								I
I	A	1	L	4.78	1511.5	23.83	20.5	13.57	I
I		23	S	23.12	4210.0	66.36	8.5	15.67	I
I	B	1	L	3.80	1511.5	23.83	8.5	5.63	I
I		23	R	7.20	3238.5	51.05	8.5	12.05	I
I	C	12	S	35.56	4070.0	64.16	8.5	15.15	I
I		3	R	2.54	1619.2	25.52	8.5	6.03	I

=====

QUEUE AND DELAY INFORMATION FOR EACH 15 MINUTE TIME SEGMENT BETWEEN 16.00 AND 17.00

=====

I	TIME	MOVEMENT	DEMAND EXCL 2-WHEEL (VEHS/MIN)	CAPACITY (VEHS/MIN)	DEGREE OF SAT (RFC)	QUEUE AT END OF SEGMENT		QUEUEING DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	ARM	LANES				MEAN (PHASE AVERAGED) (VEHS/LANE)	MAXIMUM (END OF RED) (VEHS/LANE)			I

I	16.00-16.15									I
I	A	1	L	3.19	13.57	0.235	0.2	0.9	3.7	I
I		23	S	26.41	15.67	1.686	82.8	84.6	1275.3	I
I	B	1	L	4.34	5.63	0.771	2.3	3.4	33.0	I
I		23	R	8.06	12.05	0.669	1.2	2.2	36.7	I
I	C	12	S	31.30	15.15	2.066	123.1	124.9	1877.4	I
I		3	R	2.50	6.03	0.415	0.7	1.3	9.9	I

I	16.15-16.30									I
I	A	1	L	3.60	13.57	0.266	0.3	1.0	4.4	I
I		23	S	27.30	15.67	1.742	170.0	171.8	3796.3	I
I	B	1	L	4.36	5.63	0.776	2.4	3.5	37.5	I
I		23	R	9.04	12.05	0.750	1.6	2.7	48.3	I
I	C	12	S	29.41	15.15	1.941	230.1	231.8	5301.3	I
I		3	R	2.99	6.03	0.497	0.9	1.7	13.3	I

I	16.30-16.45									I
I	A	1	L	3.69	13.57	0.272	0.3	1.0	4.6	I
I		23	S	27.61	15.67	1.762	259.6	261.4	6446.3	I
I	B	1	L	4.59	5.63	0.817	2.9	4.0	44.8	I
I		23	R	9.11	12.05	0.755	1.6	2.8	50.0	I
I	C	12	S	33.14	15.15	2.187	365.0	366.7	8927.8	I
I		3	R	3.76	6.03	0.625	1.4	2.3	20.6	I

I	16.45-17.00									I
I	A	1	L	4.78	13.57	0.352	0.4	1.3	6.7	I
I		23	S	23.12	15.67	1.476	315.5	317.3	8627.7	I
I	B	1	L	3.80	5.63	0.675	1.7	2.6	26.3	I
I		23	R	7.20	12.05	0.598	1.0	1.9	30.4	I
I	C	12	S	35.56	15.15	2.347	518.1	519.8	13247.2	I
I		3	R	2.54	6.03	0.421	0.7	1.4	10.3	I

QUEUES FOR ARM A

TIME SEGMENT ENDING	LANE	NUMBER OF VEHICLES IN QUEUE		
		MEAN (PHASE AVERAGED)	MAXIMUM (AT END OF RED)	
		*	+	
16.15	3	82.8	84.6	*****++
	2	82.8	84.6	*****++
	1	0.2	0.9	+
16.30	3	170.0	171.8	*****
	2	170.0	171.8	*****


```

      1      0.3      1.0      +
16.45  3      259.6      261.4 *****
      2      259.6      261.4 *****
      1      0.3      1.0      +
17.00  3      315.5      317.3 *****
      2      315.5      317.3 *****
      1      0.4      1.3      +

```

.QUEUES FOR ARM B

```

-----
TIME   LANE   NUMBER OF VEHICLES IN QUEUE
SEGMENT LANE   MEAN   MAXIMUM
ENDING   (PHASE   (AT END
          AVERAGED) OF RED)
          *      +
16.15   3      1.2      2.2      *+
      2      1.2      2.2      *+
      1      2.3      3.4      ***
16.30   3      1.6      2.7      ***
      2      1.6      2.7      ***
      1      2.4      3.5      ***+
16.45   3      1.6      2.8      ***
      2      1.6      2.8      ***
      1      2.9      4.0      ***+
17.00   3      1.0      1.9      *+
      2      1.0      1.9      *+
      1      1.7      2.6      ***

```

.QUEUES FOR ARM C

```

-----
TIME   LANE   NUMBER OF VEHICLES IN QUEUE
SEGMENT LANE   MEAN   MAXIMUM
ENDING   (PHASE   (AT END
          AVERAGED) OF RED)
          *      +
16.15   3      0.7      1.3      *
      2      123.1      124.9 *****
      1      123.1      124.9 *****
16.30   3      0.9      1.7      *+
      2      230.1      231.8 *****
      1      230.1      231.8 *****
16.45   3      1.4      2.3      *+
      2      365.0      366.7 *****
      1      365.0      366.7 *****
17.00   3      0.7      1.4      *
      2      518.1      519.8 *****
      1      518.1      519.8 *****

```

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD (16.00-17.00)

```

-----
I STREAM I TOTAL DEMAND I * QUEUEING * I * INCLUSIVE QUEUEING * I
I I (EXCL 2-WHEEL) I * DELAY * I * DELAY * I
I I-----I
I I (VEH) (VEH/H) I (MIN) (MIN/VEH) I (MIN) (MIN/VEH) I
I A-B I 228.9 I 228.9 I 19.4 I 0.08 I 19.4 I 0.08 I
I A-C I 1566.6 I 1566.6 I 20145.5 I 12.86 I 32848.7 I 20.97 I
I B-C I 256.4 I 256.4 I 141.6 I 0.55 I 141.9 I 0.55 I
I B-A I 501.1 I 501.1 I 165.4 I 0.33 I 165.6 I 0.33 I
I C-A I 1941.0 I 1941.0 I 29353.6 I 15.12 I 64790.9 I 33.38 I
I C-B I 177.0 I 177.0 I 54.0 I 0.31 I 54.1 I 0.31 I
I ALL I 4671.0 I 4671.0 I 49879.5 I 10.68 I 98020.4 I 20.98 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 BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

* TOTAL GEOMETRIC DELAY INCLUDES DELAY SUFFERED BY VEHICLES STILL QUEUEING AT THE END OF THE WHOLE TIME PERIOD.

* THE SUM OF DELAYS FOR EACH SEGMENT AND THE TOTAL GEOMETRIC DELAY WILL BE SIGNIFICANTLY DIFFERENT ONLY IF THERE IS

* A LARGE QUEUE AT THE END OF THE TIME PERIOD.

.
***** OSCADY 4 run completed

Junction 4 Morning 2020 Without Development

```

Visual ARCADY 4.00
Junction 4 Weekday morning 2020 without development
&PARAM NARMS=4,START=0715,FINISH=0815,INTERV= 15 &END
&OPTION HVDEF=T,TPENT=T,TPBAL=T,DIRECT=T, &END
Dawret il-Gudja
Triq Hal-Far
Triq l-Industrija
Vjal l-Avjazzjoni
* CT5 V E L R D PHI
006.00 007.00 025.00 054.00 043.00 038.0
007.00 008.00 025.00 106.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
* ENTRY DEMAND. VEHICLES/MINUTE
* A B C D
020.800 008.270 018.470 033.200
019.200 011.130 022.800 031.000
023.000 011.270 019.130 037.200
016.470 013.130 018.870 035.070
* EXIT DATA
010.270 015.470 023.530 027.870
010.730 014.400 026.470 027.600
012.130 020.330 023.800 029.400
014.200 014.000 024.930 023.400

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TRANSPORT RESEARCH LABORATORY

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CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

Visual ARCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (OCT 1998)

ADAPTED FROM ARCADY/3 WHICH IS CROWN COPYRIGHT
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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:\junction\arcady4\samples\J4m20nd.vai" at 02:34:43 on Wednesday, 20 April 2011

.ROUNDABOUT CAPACITY AND DELAY
*****

RUN TITLE
*****
Junction 4 Weekday morning 2020 without development

.INPUT DATA
*****
ARM A - Dawret il-Gudja
ARM B - Triq Hal-Far
ARM C - Triq l-Industrija
ARM D - Vjal l-Avjazzjoni

.GEOMETRIC DATA
-----

I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I
I ARM A I 6.00 I 7.00 I 25.00 I 54.00 I 43.00 I 38.0 I 0.712 I 34.882 I
I ARM B I 7.00 I 8.00 I 25.00 I 106.00 I 43.00 I 28.0 I 0.806 I 41.683 I
I ARM C I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
I ARM D I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I

.TRAFFIC DEMAND DATA
-----

TIME PERIOD BEGINS 07.15 AND ENDS 08.15
.LENGTH OF TIME PERIOD - 60 MINUTES.
.LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

-----
I TIME INTERVAL I ARM A I ARM B I ARM C I ARM D I
I 07.15 - 07.30 I I I I I
I ENTRY I 20.8 I 8.3 I 18.5 I 33.2 I
I EXIT I 10.3 I 15.5 I 23.5 I 27.9 I
I 07.30 - 07.45 I I I I I
I ENTRY I 19.2 I 11.1 I 22.8 I 31.0 I
I EXIT I 10.7 I 14.4 I 26.5 I 27.6 I
I 07.45 - 08.00 I I I I I
I ENTRY I 23.0 I 11.3 I 19.1 I 37.2 I
I EXIT I 12.1 I 20.3 I 23.8 I 29.4 I
I 08.00 - 08.15 I I I I I
I ENTRY I 16.5 I 13.1 I 18.9 I 35.1 I
I EXIT I 14.2 I 14.0 I 24.9 I 23.4 I

-----
I TURNING PROPORTIONS I
I (PERCENTAGE OF H.V.S) I
I TIME I FROM/TO I ARM A I ARM B I ARM C I ARM D I
I 07.15 - 08.15 I I I I I I
I ARM A I 0.000 I 0.050 I 0.559 I 0.390 I
I I ( 10.0)I ( 10.0)I ( 10.0)I ( 10.0)I

```

I	I	I	I	I	I	I	I	I	I		
I	I	ARM B	I	0.042	I	0.000	I	0.105	I	0.853	I
I	I	I	I	(10.0)	I	(10.0)	I	(10.0)	I	(10.0)	I
I	I	I	I	I	I	I	I	I	I	I	I
I	I	ARM C	I	0.334	I	0.076	I	0.000	I	0.590	I
I	I	I	I	(10.0)	I	(10.0)	I	(10.0)	I	(10.0)	I
I	I	I	I	I	I	I	I	I	I	I	I
I	I	ARM D	I	0.162	I	0.427	I	0.411	I	0.000	I
I	I	I	I	(10.0)	I	(10.0)	I	(10.0)	I	(10.0)	I
I	I	I	I	I	I	I	I	I	I	I	I

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
 DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	07.15-07.30									I
I	ARM A	20.80	12.48	1.666		0.0	126.2	956.5		I
I	ARM B	8.27	18.30	0.452		0.0	0.8	11.7		I
I	ARM C	18.47	27.83	0.664		0.0	1.9	27.4		I
I	ARM D	33.20	31.30	1.061		0.0	40.0	345.7		I
I										I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	07.30-07.45									I
I	ARM A	19.20	12.76	1.505		126.2	222.9	2618.2		I
I	ARM B	11.13	18.30	0.608		0.8	1.5	21.6		I
I	ARM C	22.80	25.67	0.888		1.9	6.8	85.2		I
I	ARM D	31.00	29.85	1.039		40.0	59.6	748.9		I
I										I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	07.45-08.00									I
I	ARM A	23.00	12.25	1.878		222.9	384.1	4552.3		I
I	ARM B	11.27	18.31	0.615		1.5	1.6	23.3		I
I	ARM C	19.13	25.70	0.744		6.8	3.0	49.7		I
I	ARM D	37.20	30.86	1.206		59.6	155.0	1610.5		I
I										I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	08.00-08.15									I
I	ARM A	16.47	12.21	1.349		384.1	448.1	6241.5		I
I	ARM B	13.13	18.31	0.717		1.6	2.4	34.2		I
I	ARM C	18.87	24.42	0.773		3.0	3.3	48.0		I
I	ARM D	35.07	30.97	1.132		155.0	216.7	2787.8		I
I										I

QUEUE AT ARM A

TIME SEGMENT	NO. OF	
ENDING	VEHICLES	
	IN QUEUE	
07.30	126.2	*****
07.45	222.9	*****
08.00	384.1	*****
08.15	448.1	*****

QUEUE AT ARM B

TIME SEGMENT	NO. OF	
ENDING	VEHICLES	
	IN QUEUE	
07.30	0.8	*
07.45	1.5	**
08.00	1.6	**
08.15	2.4	**

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	1.9 **
07.45	6.8 *****
08.00	3.0 ***
08.15	3.3 ***

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	40.0 *****
07.45	59.6 *****
08.00	155.0 *****
08.15	216.7 *****

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	ARM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I	
I	I	I	I	I	* DELAY *	I	* DELAY *	I	
I	I	I	I	I	I	I	I	I	
I	I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)	(MIN/VEH)
I	A	I 1192.1	I 1192.1	I 14368.4	I 12.05	I 22593.4	I 18.95	I	
I	B	I 657.0	I 657.0	I 91.0	I 0.14	I 91.1	I 0.14	I	
I	C	I 1189.1	I 1189.1	I 210.2	I 0.18	I 210.4	I 0.18	I	
I	D	I 2047.0	I 2047.0	I 5492.9	I 2.68	I 6250.7	I 3.05	I	
I	ALL	I 5085.1	I 5085.1	I 20162.5	I 3.96	I 29145.7	I 5.73	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

Junction 4 Morning 2020 With Development

```

Visual ARCADY 4.00
Junction 4 Weekday morning 2020 with development
&PARAM NARMS=4,START=0715,FINISH=0815,INTERV= 15 &END
&OPTION HVDEF=T,TPENT=T,TPBAL=T,DIRECT=T, &END
Dawret il-Gudja
Triq Hal-Far
Triq l-Industrija
Vjal l-Avjazzjoni
* CT5 V E L R D PHI
006.00 007.00 025.00 054.00 043.00 038.0
007.00 008.00 025.00 106.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
* ENTRY DEMAND. VEHICLES/MINUTE
* A B C D
020.930 008.470 018.470 033.200
019.330 011.330 022.800 031.000
023.200 011.400 019.130 037.200
016.670 013.330 018.870 035.070
* EXIT DATA
010.470 015.600 023.530 027.870
010.930 014.600 026.470 027.600
012.270 020.470 023.800 029.400
014.330 014.200 024.930 023.400

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CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

Visual ARCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (OCT 1998)

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Run with file:- "c:\junction\arcady4\samples\J4m20wd.vai" at 02:36:22 on Wednesday, 20 April 2011

.ROUNDABOUT CAPACITY AND DELAY
*****

RUN TITLE
*****
Junction 4 Weekday morning 2020 with development

.INPUT DATA
*****
ARM A - Dawret il-Gudja
ARM B - Triq Hal-Far
ARM C - Triq l-Industrija
ARM D - Vjal l-Avjazzjoni

.GEOMETRIC DATA
-----

-----
I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I
-----
I ARM A I 6.00 I 7.00 I 25.00 I 54.00 I 43.00 I 38.0 I 0.712 I 34.882 I
I ARM B I 7.00 I 8.00 I 25.00 I 106.00 I 43.00 I 28.0 I 0.806 I 41.683 I
I ARM C I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
I ARM D I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
-----

.TRAFFIC DEMAND DATA
-----

TIME PERIOD BEGINS 07.15 AND ENDS 08.15
.LENGTH OF TIME PERIOD - 60 MINUTES.
.LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

-----
I TIME INTERVAL I ARM A I ARM B I ARM C I ARM D I
-----
I 07.15 - 07.30 I I I I I
I ENTRY I 20.9 I 8.5 I 18.5 I 33.2 I
I EXIT I 10.5 I 15.6 I 23.5 I 27.9 I
-----
I 07.30 - 07.45 I I I I I
I ENTRY I 19.3 I 11.3 I 22.8 I 31.0 I
I EXIT I 10.9 I 14.6 I 26.5 I 27.6 I
-----
I 07.45 - 08.00 I I I I I
I ENTRY I 23.2 I 11.4 I 19.1 I 37.2 I
I EXIT I 12.3 I 20.5 I 23.8 I 29.4 I
-----
I 08.00 - 08.15 I I I I I
I ENTRY I 16.7 I 13.3 I 18.9 I 35.1 I
I EXIT I 14.3 I 14.2 I 24.9 I 23.4 I
-----

-----
I TURNING PROPORTIONS I
I (PERCENTAGE OF H.V.S) I
I TIME I FROM/TO I ARM A I ARM B I ARM C I ARM D I
-----
I 07.15 - 08.15 I I I I I I
I ARM A I 0.000 I 0.051 I 0.561 I 0.388 I
I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I

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I      I      ARM B I 0.043 I 0.000 I 0.106 I 0.851 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I
I      I      ARM C I 0.339 I 0.077 I 0.000 I 0.583 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I
I      I      ARM D I 0.163 I 0.431 I 0.406 I 0.000 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I

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TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
 DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

 . QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

```

I  TIME      DEMAND  CAPACITY  DEMAND/  PEDESTRIAN  START  END      DELAY  GEOMETRIC DELAYI
I      (VEH/MIN) (VEH/MIN) CAPACITY  FLOW        QUEUE  QUEUE    (VEH.MIN/ (VEH.MIN/
I      (RFC)      (PDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT) I
I 07.15-07.30
I ARM A      20.93   12.55   1.668           0.0  127.2   964.0
I ARM B       8.47   18.41   0.460           0.0   0.8    12.1
I ARM C      18.47   27.71   0.667           0.0   2.0    27.7
I ARM D      33.20   31.18   1.065           0.0  41.4   355.3
I

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I  TIME      DEMAND  CAPACITY  DEMAND/  PEDESTRIAN  START  END      DELAY  GEOMETRIC DELAYI
I      (VEH/MIN) (VEH/MIN) CAPACITY  FLOW        QUEUE  QUEUE    (VEH.MIN/ (VEH.MIN/
I      (RFC)      (PDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT) I
I 07.30-07.45
I ARM A      19.33   12.84   1.506          127.2  224.6  2638.9
I ARM B      11.33   18.40   0.616           0.8   1.6    22.3
I ARM C      22.80   25.54   0.893           2.0   7.0    87.6
I ARM D      31.00   29.71   1.043           41.4  62.8   783.1
I

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I  TIME      DEMAND  CAPACITY  DEMAND/  PEDESTRIAN  START  END      DELAY  GEOMETRIC DELAYI
I      (VEH/MIN) (VEH/MIN) CAPACITY  FLOW        QUEUE  QUEUE    (VEH.MIN/ (VEH.MIN/
I      (RFC)      (PDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT) I
I 07.45-08.00
I ARM A      23.20   12.33   1.881          224.6  387.6  4591.9
I ARM B      11.40   18.42   0.619           1.6   1.6    23.8
I ARM C      19.13   25.61   0.747           7.0   3.1    50.6
I ARM D      37.20   30.73   1.211          62.8  160.2  1672.9
I

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I  TIME      DEMAND  CAPACITY  DEMAND/  PEDESTRIAN  START  END      DELAY  GEOMETRIC DELAYI
I      (VEH/MIN) (VEH/MIN) CAPACITY  FLOW        QUEUE  QUEUE    (VEH.MIN/ (VEH.MIN/
I      (RFC)      (PDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT) I
I 08.00-08.15
I ARM A      16.67   12.29   1.357          387.6  453.3  6307.3
I ARM B      13.33   18.41   0.724           1.6   2.5    35.3
I ARM C      18.87   24.29   0.777           3.1   3.4    48.9
I ARM D      35.07   30.84   1.137          160.2  223.7  2878.8
I

```

 .QUEUE AT ARM A

TIME SEGMENT NO. OF
 ENDING VEHICLES
 IN QUEUE

```

07.30      127.2 *****
07.45      224.6 *****
08.00      387.6 *****
08.15      453.3 *****

```

 .QUEUE AT ARM B

TIME SEGMENT NO. OF
 ENDING VEHICLES
 IN QUEUE

```

07.30      0.8 *
07.45      1.6 **
08.00      1.6 **
08.15      2.5 ***

```

 .QUEUE AT ARM C

TIME SEGMENT NO. OF

ENDING	VEHICLES IN QUEUE
07.30	2.0 **
07.45	7.0 *****
08.00	3.1 ***
08.15	3.4 ***

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	41.4 *****
07.45	62.8 *****
08.00	160.2 *****
08.15	223.7 *****

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	ARM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I	I	I	I	I	* DELAY *	I	* DELAY *	I
I	I	I	I	I	I	I	I	I
I	I	I	(VEH)	I	(MIN)	I	(MIN)	I
I	I	I	(VEH/H)	I	(MIN/VEH)	I	(MIN/VEH)	I
I	A	I	1201.9	I	1201.9	I	14502.2	I
I	B	I	668.0	I	668.0	I	93.5	I
I	C	I	1189.1	I	1189.1	I	214.8	I
I	D	I	2047.1	I	2047.1	I	5690.1	I
I	ALL	I	5106.0	I	5106.0	I	20500.6	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

Junction 4 Evening 2020 Without Development

```

Visual ARCADY 4.00
Junction 4 Weekday evening 2020 without development
&PARAM NARMS=4,START=1600,FINISH=1700,INTERV= 15 &END
&OPTION HVDEF=T,TPENT=T,TPBAL=T,DIRECT=T, &END
Dawret il-Gudja
Triq Hal-Far
Triq l-Industrija
Vjal l-Avjazzjoni
* CT5 V E L R D PHI
006.00 007.00 025.00 054.00 043.00 038.0
007.00 008.00 025.00 106.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
007.00 008.00 025.00 054.00 043.00 028.0
* ENTRY DEMAND. VEHICLES/MINUTE
* A B C D
016.470 021.800 026.400 034.330
011.870 019.870 017.870 031.870
012.200 016.330 018.530 028.870
012.800 016.070 018.800 031.530
* EXIT DATA
020.670 010.330 018.730 041.200
024.200 008.670 019.070 032.800
019.270 007.400 026.470 034.600
015.130 008.530 023.930 022.530

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CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

Visual ARCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (OCT 1998)

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IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "c:\junction\arcady4\samples\J4e20nd.vai" at 02:31:28 on Wednesday, 20 April 2011

.ROUNDABOUT CAPACITY AND DELAY
*****

RUN TITLE
*****
Junction 4 Weekday evening 2020 without development

.INPUT DATA
*****
ARM A - Dawret il-Gudja
ARM B - Triq Hal-Far
ARM C - Triq l-Industrija
ARM D - Vjal l-Avjazzjoni

.GEOMETRIC DATA
-----

-----
I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I
-----
I ARM A I 6.00 I 7.00 I 25.00 I 54.00 I 43.00 I 38.0 I 0.712 I 34.882 I
I ARM B I 7.00 I 8.00 I 25.00 I 106.00 I 43.00 I 28.0 I 0.806 I 41.683 I
I ARM C I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
I ARM D I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
-----

.TRAFFIC DEMAND DATA
-----

TIME PERIOD BEGINS 16.00 AND ENDS 17.00
.LENGTH OF TIME PERIOD - 60 MINUTES.
.LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

-----
I TIME INTERVAL I ARM A I ARM B I ARM C I ARM D I
-----
I 16.00 - 16.15 I I I I I
I ENTRY I 16.5 I 21.8 I 26.4 I 34.3 I
I EXIT I 20.7 I 10.3 I 18.7 I 41.2 I
-----
I 16.15 - 16.30 I I I I I
I ENTRY I 11.9 I 19.9 I 17.9 I 31.9 I
I EXIT I 24.2 I 8.7 I 19.1 I 32.8 I
-----
I 16.30 - 16.45 I I I I I
I ENTRY I 12.2 I 16.3 I 18.5 I 28.9 I
I EXIT I 19.3 I 7.4 I 26.5 I 34.6 I
-----
I 16.45 - 17.00 I I I I I
I ENTRY I 12.8 I 16.1 I 18.8 I 31.5 I
I EXIT I 15.1 I 8.5 I 23.9 I 22.5 I
-----

-----
I TURNING PROPORTIONS I
I (PERCENTAGE OF H.V.S) I
I TIME I FROM/TO I ARM A I ARM B I ARM C I ARM D I
-----
I 16.00 - 17.00 I I I I I I
I ARM A I 0.000 I 0.025 I 0.514 I 0.460 I
I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I

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I      I      ARM B I 0.060 I 0.000 I 0.083 I 0.858 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I
I      I      ARM C I 0.434 I 0.029 I 0.000 I 0.537 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I
I      I      ARM D I 0.316 I 0.248 I 0.436 I 0.000 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I

```

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
 DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

 . QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

```

I  TIME      DEMAND  CAPACITY  DEMAND/  PEDESTRIAN  START  END      DELAY  GEOMETRIC DELAYI
I      (VEH/MIN) (VEH/MIN) CAPACITY  FLOW  QUEUE  QUEUE  (VEH.MIN/ (VEH.MIN/
I      (RFC)      (PDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT) I
I 16.00-16.15
I ARM A      16.47   17.18   0.959           0.0   11.0   117.1      I
I ARM B      21.80   15.36   1.419           0.0   98.9   756.5      I
I ARM C      26.40   20.64   1.279           0.0   89.9   694.6      I
I ARM D      34.33   29.29   1.172           0.0   80.9   637.3      I
I

```

```

I  TIME      DEMAND  CAPACITY  DEMAND/  PEDESTRIAN  START  END      DELAY  GEOMETRIC DELAYI
I      (VEH/MIN) (VEH/MIN) CAPACITY  FLOW  QUEUE  QUEUE  (VEH.MIN/ (VEH.MIN/
I      (RFC)      (PDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT) I
I 16.15-16.30
I ARM A      11.87   16.97   0.700          11.0    2.4    48.5      I
I ARM B      19.87   17.79   1.117          98.9  130.3  1719.1     I
I ARM C      17.87   19.96   0.895          89.9   61.8  1137.4     I
I ARM D      31.87   29.42   1.083          80.9  118.2  1494.1     I
I

```

```

I  TIME      DEMAND  CAPACITY  DEMAND/  PEDESTRIAN  START  END      DELAY  GEOMETRIC DELAYI
I      (VEH/MIN) (VEH/MIN) CAPACITY  FLOW  QUEUE  QUEUE  (VEH.MIN/ (VEH.MIN/
I      (RFC)      (PDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT) I
I 16.30-16.45
I ARM A      12.20   17.06   0.715           2.4    2.5    36.8      I
I ARM B      16.33   18.05   0.905          130.3 106.5  1776.1     I
I ARM C      18.53   19.95   0.929           61.8   45.2   802.4     I
I ARM D      28.87   29.45   0.980          118.2 113.2  1735.9     I
I

```

```

I  TIME      DEMAND  CAPACITY  DEMAND/  PEDESTRIAN  START  END      DELAY  GEOMETRIC DELAYI
I      (VEH/MIN) (VEH/MIN) CAPACITY  FLOW  QUEUE  QUEUE  (VEH.MIN/ (VEH.MIN/
I      (RFC)      (PDS/MIN) (VEHS) (VEHS)  TIME SEGMENT)  TIME SEGMENT) I
I 16.45-17.00
I ARM A      12.80   16.95   0.755           2.5    2.9    42.0      I
I ARM B      16.07   17.52   0.917          106.5  87.3  1453.6     I
I ARM C      18.80   20.15   0.933           45.2   31.5   575.0     I
I ARM D      31.53   29.45   1.071          113.2 144.8  1935.7     I
I

```

 . QUEUE AT ARM A

```

TIME SEGMENT  NO. OF
ENDING        VEHICLES
              IN QUEUE

16.15         11.0 *****
16.30          2.4 **
16.45          2.5 **
17.00          2.9 ***

```

 . QUEUE AT ARM B

```

TIME SEGMENT  NO. OF
ENDING        VEHICLES
              IN QUEUE

16.15         98.9 *****
16.30        130.3 *****
16.45        106.5 *****
17.00         87.3 *****

```

 . QUEUE AT ARM C

```

TIME SEGMENT  NO. OF

```


Junction 4 Evening 2020 With Development

```

Visual ARCADY 4.00
Junction 4 Weekday evening 2020 with development
&PARAM NARMS=4,START=1600,FINISH=1700,INTERV= 15 &END
&OPTION HVDEF=T,TPENT=T,TPBAL=T,DIRECT=T, &END
Dawret il-Gudja
Triq Hal-Far
Triq l-Industrija
Vjal l-Avjazzjoni
* CT5      V      E      L      R      D      PHI
      006.00    007.00    025.00    054.00    043.00    038.0
      007.00    008.00    025.00    106.00    043.00    028.0
      007.00    008.00    025.00    054.00    043.00    028.0
      007.00    008.00    025.00    054.00    043.00    028.0
* ENTRY DEMAND. VEHICLES/MINUTE
*      A      B      C      D
      016.670    022.000    026.400    034.330
      012.000    020.000    017.870    031.870
      012.330    016.470    018.530    028.870
      013.000    016.270    018.800    031.530
* EXIT DATA
      020.800    010.530    018.730    041.200
      024.400    008.870    019.070    032.800
      019.470    007.600    026.470    034.600
      015.270    008.670    023.930    022.530

```

```

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CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

Visual ARCADY 4 ANALYSIS PROGRAM
RELEASE 2.1 (OCT 1998)

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

-----

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "c:\junction\arcady4\samples\J4e20wd.vai" at 02:29:12 on Wednesday, 20 April 2011

.ROUNDABOUT CAPACITY AND DELAY
*****

RUN TITLE
*****
Junction 4 Weekday evening 2020 with development

.INPUT DATA
*****
ARM A - Dawret il-Gudja
ARM B - Triq Hal-Far
ARM C - Triq l-Industrija
ARM D - Vjal l-Avjazzjoni

.GEOMETRIC DATA
-----

-----
I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I
-----
I ARM A I 6.00 I 7.00 I 25.00 I 54.00 I 43.00 I 38.0 I 0.712 I 34.882 I
I ARM B I 7.00 I 8.00 I 25.00 I 106.00 I 43.00 I 28.0 I 0.806 I 41.683 I
I ARM C I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
I ARM D I 7.00 I 8.00 I 25.00 I 54.00 I 43.00 I 28.0 I 0.799 I 41.330 I
-----

.TRAFFIC DEMAND DATA
-----

TIME PERIOD BEGINS 16.00 AND ENDS 17.00
.LENGTH OF TIME PERIOD - 60 MINUTES.
.LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

-----
I TIME INTERVAL I ARM A I ARM B I ARM C I ARM D I
-----
I 16.00 - 16.15 I I I I I
I ENTRY I 16.7 I 22.0 I 26.4 I 34.3 I
I EXIT I 20.8 I 10.5 I 18.7 I 41.2 I
-----
I 16.15 - 16.30 I I I I I
I ENTRY I 12.0 I 20.0 I 17.9 I 31.9 I
I EXIT I 24.4 I 8.9 I 19.1 I 32.8 I
-----
I 16.30 - 16.45 I I I I I
I ENTRY I 12.3 I 16.5 I 18.5 I 28.9 I
I EXIT I 19.5 I 7.6 I 26.5 I 34.6 I
-----
I 16.45 - 17.00 I I I I I
I ENTRY I 13.0 I 16.3 I 18.8 I 31.5 I
I EXIT I 15.3 I 8.7 I 23.9 I 22.5 I
-----

-----
I TURNING PROPORTIONS I
I (PERCENTAGE OF H.V.S) I
I TIME I FROM/TO I ARM A I ARM B I ARM C I ARM D I
-----
I 16.00 - 17.00 I I I I I I
I ARM A I 0.000 I 0.026 I 0.517 I 0.457 I
I I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I I I I I I

```

```

I      I      ARM B I 0.061 I 0.000 I 0.083 I 0.855 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I
I      I      ARM C I 0.440 I 0.030 I 0.000 I 0.530 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I
I      I      ARM D I 0.316 I 0.253 I 0.431 I 0.000 I
I      I      I      I ( 10.0) I ( 10.0) I ( 10.0) I ( 10.0) I
I      I      I      I      I      I      I      I

```

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
 DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

 . QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	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)	I
I	16.00-16.15									I
I	ARM A	16.67	17.22	0.968		0.0	11.8	124.3		I
I	ARM B	22.00	15.41	1.427		0.0	101.1	772.4		I
I	ARM C	26.40	20.60	1.282		0.0	90.4	698.5		I
I	ARM D	34.33	29.18	1.177		0.0	82.5	648.8		I

I	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)	I
I	16.15-16.30									I
I	ARM A	12.00	17.02	0.705		11.8	2.5	51.6		I
I	ARM B	20.00	17.81	1.123		101.1	134.0	1763.3		I
I	ARM C	17.87	19.93	0.897		90.4	62.8	1149.2		I
I	ARM D	31.87	29.30	1.088		82.5	121.5	1530.6		I

I	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)	I
I	16.30-16.45									I
I	ARM A	12.33	16.91	0.729		2.5	2.6	38.6	++	I
I	ARM B	16.47	17.97	0.917		134.0	113.6	1857.1	++	I
I	ARM C	18.53	20.01	0.926		62.8	45.3	810.9	++	I
I	ARM D	28.87	29.30	0.985		121.5	112.9	1749.7	++	I

I	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)	I
I	16.45-17.00									I
I	ARM A	13.00	17.00	0.765		2.6	3.1	44.2		I
I	ARM B	16.27	17.53	0.928		113.6	97.0	1579.6		I
I	ARM C	18.80	20.11	0.935		45.3	32.1	580.5		I
I	ARM D	31.53	29.33	1.075		112.9	146.2	1943.5		I

 .QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	11.8 *****
16.30	2.5 ***
16.45	2.6 ***
17.00	3.1 ***

 .QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	101.1 *****
16.30	134.0 *****
16.45	113.6 *****
17.00	97.0 *****

 .QUEUE AT ARM C

TIME SEGMENT	NO. OF
--------------	--------


```

ENDING      VEHICLES
            IN QUEUE

16.15      90.4 *****
16.30      62.8 *****
16.45      45.3 *****
17.00      32.1 *****

.QUEUE AT ARM D
-----

TIME SEGMENT NO. OF
ENDING      VEHICLES
            IN QUEUE

16.15      82.5 *****
16.30      121.5 *****
16.45      112.9 *****
17.00      146.2 *****

.
      QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
      -----

I  ARM  I  TOTAL DEMAND  I  * QUEUEING *  I  * INCLUSIVE QUEUEING *  I
I      I      I      I      * DELAY *  I      * DELAY *  I
I      I      I      I      I      I      I      I
I      I  (VEH)  (VEH/H)  I  (MIN)  (MIN/VEH)  I  (MIN)  (MIN/VEH)  I
-----
I  A  I  810.0  I  810.0  I  258.7  I  0.32  I  259.0  I  0.32  I
I  B  I  1121.1  I  1121.1  I  5972.3  I  5.33  I  6240.9  I  5.57  I
I  C  I  1224.0  I  1224.0  I  3239.0  I  2.65  I  3264.6  I  2.67  I
I  D  I  1899.0  I  1899.0  I  5872.6  I  3.09  I  6236.9  I  3.28  I
-----
I  ALL  I  5054.1  I  5054.1  I  15342.6  I  3.04  I  16001.4  I  3.17  I
-----

**WARNING** Entry flows in certain time segments (flagged ++ in
the tabulation) do not stabilise within the allocated
number of iterations and hence the results are unreliable
(AG24 REF 8.4.2(ii))

* 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

```