

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-  
"C:\E DRIVE DOCS\WORKING JOB FILES\Bicester\Oct 2010 onwards\Junction Capacity\Site 3\Existing Rnbt\  
Site 3 Banbury Road Lords Lane.vai"  
(drive-on-the-left ) at 09:42:10 on Wednesday, 24 November 2010

FILE PROPERTIES  
\*\*\*\*\*

RUN TITLE: Banbury Road Roundabout  
LOCATION: Bicester  
DATE: 05/07/10  
CLIENT:  
ENUMERATOR: mba24773 [HCL56181]  
JOB NUMBER: UA001881  
STATUS:  
DESCRIPTION:

INPUT DATA  
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ARM A - Arm Southwold Lane A4095  
ARM B - Banbury Road B4100 (South)  
ARM C - Lords Lane A4095  
ARM D - B4100 (North)

GEOMETRIC DATA  
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| 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 | 3.70  | I | 7.80  | I | 15.80 | I | 13.30 | I | 40.00 | I | 17.0      | I | 0.675 | I | 30.611              | I |
| I | ARM B | I | 3.65  | I | 7.40  | I | 20.40 | I | 14.50 | I | 40.00 | I | 24.0      | I | 0.668 | I | 30.425              | I |
| I | ARM C | I | 4.30  | I | 6.30  | I | 10.40 | I | 34.40 | I | 40.00 | I | 16.0      | I | 0.682 | I | 29.899              | I |
| I | ARM D | I | 3.30  | I | 7.10  | I | 19.30 | I | 21.20 | I | 40.00 | I | 10.0      | I | 0.690 | I | 30.490              | I |

V = approach half-width      L = effective flare length      D = inscribed circle diameter  
E = entry width      R = entry radius      PHI = entry angle

TRAFFIC DEMAND DATA  
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(Only sets included in the current run are shown)

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

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

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

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2016 No Dev PM

| ARM   | NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE | TOP OF PEAK IS REACHED | FLOW STOPS IF FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|-------|-------------------------------------------------------|------------------------|-----------------------|------------------------------------|----------------|------------|
| ARM A | 15.00                                                 | 45.00                  | 75.00                 | 13.46                              | 20.19          | 13.46      |
| ARM B | 15.00                                                 | 45.00                  | 75.00                 | 5.95                               | 8.92           | 5.95       |
| ARM C | 15.00                                                 | 45.00                  | 75.00                 | 9.05                               | 13.58          | 9.05       |
| ARM D | 15.00                                                 | 45.00                  | 75.00                 | 7.88                               | 11.81          | 7.88       |

DEMAND SET TITLE: 2016 No Dev PM

|  | TIME          | TURNING PROPORTIONS     |        |        |        |         |  |  |  |
|--|---------------|-------------------------|--------|--------|--------|---------|--|--|--|
|  |               | TURNING COUNTS (VEH/HR) |        |        |        |         |  |  |  |
|  |               | (PERCENTAGE OF H.V.S)   |        |        |        |         |  |  |  |
|  |               | FROM/TO                 | ARM A  | ARM B  | ARM C  | ARM D   |  |  |  |
|  | 16.45 - 18.15 |                         |        |        |        |         |  |  |  |
|  |               | ARM A                   | 0.017  | 0.147  | 0.409  | 0.427   |  |  |  |
|  |               |                         | 18.0   | 158.0  | 441.0  | 460.0   |  |  |  |
|  |               |                         | ( 0.0) | ( 2.0) | ( 1.0) | ( 5.0)  |  |  |  |
|  |               | ARM B                   | 0.382  | 0.000  | 0.183  | 0.435   |  |  |  |
|  |               |                         | 182.0  | 0.0    | 87.0   | 207.0   |  |  |  |
|  |               |                         | ( 1.0) | ( 0.0) | ( 0.0) | ( 0.0)  |  |  |  |
|  |               | ARM C                   | 0.782  | 0.124  | 0.000  | 0.094   |  |  |  |
|  |               |                         | 566.0  | 90.0   | 0.0    | 68.0    |  |  |  |
|  |               |                         | ( 1.0) | ( 0.0) | ( 0.0) | ( 0.0)  |  |  |  |
|  |               | ARM D                   | 0.544  | 0.286  | 0.163  | 0.006   |  |  |  |
|  |               |                         | 343.0  | 180.0  | 103.0  | 4.0     |  |  |  |
|  |               |                         | ( 6.0) | ( 1.0) | ( 1.0) | ( 25.0) |  |  |  |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

| TIME        | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|-------------|------------------|--------------------|-----------------------|----------------------------|--------------------|------------------|-------------------------------|-----------------------------------------|------------------------------------------|
| 16.45-17.00 |                  |                    |                       |                            |                    |                  |                               |                                         |                                          |
| ARM A       | 13.46            | 26.65              | 0.505                 |                            | 0.0                | 1.0              | 14.6                          |                                         | 0.08                                     |
| ARM B       | 5.95             | 21.58              | 0.276                 |                            | 0.0                | 0.4              | 5.5                           |                                         | 0.06                                     |
| ARM C       | 9.05             | 22.12              | 0.409                 |                            | 0.0                | 0.7              | 10.0                          |                                         | 0.08                                     |
| ARM D       | 7.88             | 22.22              | 0.354                 |                            | 0.0                | 0.5              | 8.0                           |                                         | 0.07                                     |

| TIME        | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE DELAY<br>PER ARRIVING<br>VEHICLE (MIN) |
|-------------|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|-----------------------------------------------|------------------------------------------------|
| 17.00-17.15 |                     |                       |                              |                                  |                          |                        |                                     |                                               |                                                |
| ARM A       | 16.08               | 26.04                 | 0.617                        |                                  | 1.0                      | 1.6                    | 22.9                                |                                               | 0.10                                           |
| ARM B       | 7.10                | 19.86                 | 0.358                        |                                  | 0.4                      | 0.6                    | 8.1                                 |                                               | 0.08                                           |
| ARM C       | 10.81               | 20.63                 | 0.524                        |                                  | 0.7                      | 1.1                    | 15.7                                |                                               | 0.10                                           |
| ARM D       | 9.40                | 20.82                 | 0.452                        |                                  | 0.5                      | 0.8                    | 11.9                                |                                               | 0.09                                           |

| TIME        | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE DELAY<br>PER ARRIVING<br>VEHICLE (MIN) |
|-------------|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|-----------------------------------------------|------------------------------------------------|
| 17.15-17.30 |                     |                       |                              |                                  |                          |                        |                                     |                                               |                                                |
| ARM A       | 19.69               | 25.22                 | 0.781                        |                                  | 1.6                      | 3.4                    | 46.7                                |                                               | 0.17                                           |
| ARM B       | 8.70                | 17.55                 | 0.496                        |                                  | 0.6                      | 1.0                    | 14.0                                |                                               | 0.11                                           |
| ARM C       | 13.24               | 18.63                 | 0.710                        |                                  | 1.1                      | 2.4                    | 32.8                                |                                               | 0.18                                           |
| ARM D       | 11.52               | 18.94                 | 0.608                        |                                  | 0.8                      | 1.5                    | 21.7                                |                                               | 0.13                                           |

| TIME        | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE DELAY<br>PER ARRIVING<br>VEHICLE (MIN) |
|-------------|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|-----------------------------------------------|------------------------------------------------|
| 17.30-17.45 |                     |                       |                              |                                  |                          |                        |                                     |                                               |                                                |
| ARM A       | 19.69               | 25.20                 | 0.781                        |                                  | 3.4                      | 3.5                    | 51.6                                |                                               | 0.18                                           |
| ARM B       | 8.70                | 17.48                 | 0.498                        |                                  | 1.0                      | 1.0                    | 14.7                                |                                               | 0.11                                           |
| ARM C       | 13.24               | 18.58                 | 0.712                        |                                  | 2.4                      | 2.4                    | 35.9                                |                                               | 0.19                                           |
| ARM D       | 11.52               | 18.88                 | 0.610                        |                                  | 1.5                      | 1.5                    | 23.0                                |                                               | 0.14                                           |

| TIME        | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE DELAY<br>PER ARRIVING<br>VEHICLE (MIN) |
|-------------|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|-----------------------------------------------|------------------------------------------------|
| 17.45-18.00 |                     |                       |                              |                                  |                          |                        |                                     |                                               |                                                |
| ARM A       | 16.08               | 26.01                 | 0.618                        |                                  | 3.5                      | 1.6                    | 26.0                                |                                               | 0.10                                           |
| ARM B       | 7.10                | 19.75                 | 0.360                        |                                  | 1.0                      | 0.6                    | 8.7                                 |                                               | 0.08                                           |
| ARM C       | 10.81               | 20.56                 | 0.526                        |                                  | 2.4                      | 1.1                    | 17.6                                |                                               | 0.10                                           |
| ARM D       | 9.40                | 20.74                 | 0.453                        |                                  | 1.5                      | 0.8                    | 13.0                                |                                               | 0.09                                           |

| TIME        | DEMAND<br>(VEH/MIN) | CAPACITY<br>(VEH/MIN) | DEMAND/<br>CAPACITY<br>(RFC) | PEDESTRIAN<br>FLOW<br>(PEDS/MIN) | START<br>QUEUE<br>(VEHS) | END<br>QUEUE<br>(VEHS) | DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | GEOMETRIC DELAY<br>(VEH.MIN/<br>TIME SEGMENT) | AVERAGE DELAY<br>PER ARRIVING<br>VEHICLE (MIN) |
|-------------|---------------------|-----------------------|------------------------------|----------------------------------|--------------------------|------------------------|-------------------------------------|-----------------------------------------------|------------------------------------------------|
| 18.00-18.15 |                     |                       |                              |                                  |                          |                        |                                     |                                               |                                                |
| ARM A       | 13.46               | 26.63                 | 0.506                        |                                  | 1.6                      | 1.0                    | 16.0                                |                                               | 0.08                                           |
| ARM B       | 5.95                | 21.51                 | 0.277                        |                                  | 0.6                      | 0.4                    | 5.9                                 |                                               | 0.06                                           |
| ARM C       | 9.05                | 22.07                 | 0.410                        |                                  | 1.1                      | 0.7                    | 10.8                                |                                               | 0.08                                           |
| ARM D       | 7.88                | 22.17                 | 0.355                        |                                  | 0.8                      | 0.6                    | 8.5                                 |                                               | 0.07                                           |

# QUEUE AT ARM A

| TIME SEGMENT<br>ENDING | NO. OF<br>VEHICLES<br>IN QUEUE |
|------------------------|--------------------------------|
| 17.00                  | 1.0 *                          |
| 17.15                  | 1.6 **                         |
| 17.30                  | 3.4 ***                        |
| 17.45                  | 3.5 ***                        |
| 18.00                  | 1.6 **                         |
| 18.15                  | 1.0 *                          |

QUEUE AT ARM B

| TIME SEGMENT<br>ENDING | NO. OF<br>VEHICLES<br>IN QUEUE |   |
|------------------------|--------------------------------|---|
| 17.00                  | 0.4                            |   |
| 17.15                  | 0.6                            | * |
| 17.30                  | 1.0                            | * |
| 17.45                  | 1.0                            | * |
| 18.00                  | 0.6                            | * |
| 18.15                  | 0.4                            |   |

QUEUE AT ARM C

| TIME SEGMENT<br>ENDING | NO. OF<br>VEHICLES<br>IN QUEUE |    |
|------------------------|--------------------------------|----|
| 17.00                  | 0.7                            | *  |
| 17.15                  | 1.1                            | *  |
| 17.30                  | 2.4                            | ** |
| 17.45                  | 2.4                            | ** |
| 18.00                  | 1.1                            | *  |
| 18.15                  | 0.7                            | *  |

QUEUE AT ARM D

| TIME SEGMENT<br>ENDING | NO. OF<br>VEHICLES<br>IN QUEUE |    |
|------------------------|--------------------------------|----|
| 17.00                  | 0.5                            | *  |
| 17.15                  | 0.8                            | *  |
| 17.30                  | 1.5                            | ** |
| 17.45                  | 1.5                            | ** |
| 18.00                  | 0.8                            | *  |
| 18.15                  | 0.6                            | *  |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

| I | ARM | I | TOTAL DEMAND | I | * QUEUEING *<br>* DELAY * | I | * INCLUSIVE QUEUEING *<br>* DELAY * | I |
|---|-----|---|--------------|---|---------------------------|---|-------------------------------------|---|
| I |     | I |              | I |                           | I |                                     | I |
| I |     | I | (VEH)        | I | (MIN)                     | I | (MIN)                               | I |
| I |     | I | (VEH/H)      | I | (MIN/VEH)                 | I | (MIN/VEH)                           | I |
| I | A   | I | 1476.8       | I | 177.8                     | I | 177.8                               | I |
| I | B   | I | 652.7        | I | 56.9                      | I | 56.9                                | I |
| I | C   | I | 992.8        | I | 122.9                     | I | 122.9                               | I |
| I | D   | I | 863.9        | I | 86.1                      | I | 86.1                                | I |
| I | ALL | I | 3986.1       | I | 443.6                     | I | 443.7                               | 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

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