MAGNA PARK
LUTTERWORTH

IDI Gazeley
Brookfield Logistics Properties

IDI Gazeley Brookfield Logistics Properties

# Magna Park Extension: Hybrid Application

## Supplementary Transport Assessment

Final Report

| Author/Amended by: | Authorised by | Date: | Version: |
|---|---|---|---|
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# 1 INTRODUCTION

## General

1.1 This Supplementary Transport Assessment has been prepared in response to a request for further information set out in AECOM's Technical Note 4 (TN 4) dated 2 November 2015 which has been prepared on behalf of Highways England.

1.2 The original Transport Assessment was submitted as part of the supporting information for a hybrid planning application that was validated by Harborough District Council on 2 October 2015. The application is for the proposed extension of Magna Park near Lutterworth onto 220 hectares of land adjoining Magna Park to the north west and onto seven hectares of land adjoining Magna Park to the south of the A4303. The site location is shown on a plan in **Appendix A**.

1.3 The additional information requested by Highways England can be summarised as follows:

- To recalculate the trip generation for students attending the Logistics Institute based on 50% travelling by bus rather than 75% that was assumed in the original Transport Assessment. The remaining trips to be allocated to car driver and escorted car passenger trips.
- To provide a plan showing the distribution of student trips referenced in paragraph 6.52 of the original Transport Assessment.
- To reassess junction impacts based on the revised trip generation, at the A5 northern site access, A5 Cross in Hand roundabout, A5 Gibbet Hill roundabout, A426/ A4303 roundabout and M1 Junction 20.
- To provide a suitable mitigation scheme at the Gibbet Hill roundabout in the event that the conditioned improvements as part of DIRFT III is delayed; or accept a condition that no more than 100,844m$^2$ of B8 (DHL detailed application) will be occupied at Magna Park before the improvements to Gibbet Hill as part of DIRFT III have been delivered.

1.4 A copy of AECOM's Technical Note 4 is presented in **Appendix B**.

## Report Layout

1.5 Following this Introduction Section 2 reviews the student trip generation at the Logistics Institute of Technology.

1.6 Section 3 discusses proposals to improve the Gibbet Hill roundabout to partial signalisation.

1.7 Section 4 presents the revised 2026 assessment including amendments to the student trip generation at the Logistics Institute described in Section 3. An assessment including traffic generated by symmetry park is also undertaken.

1.8 The conclusions are set out in Section 5.

# 2 LOGISTICS INSTITUTE OF TECHNOLOGY – REVISED STUDENT TRIP GENERATION

2.1 The request to reassess the junction impacts based on a reduction in the number of students travelling by bus from 75% to 50% has been undertaken 'without prejudice' as IDI Gazeley has reaffirmed its commitment to providing a comprehensive bus network that it is anticipated will result in at least three quarters of students travelling to and from the Logistics Institute by bus.

2.2 There are two key factors that will limit the number of students driving to the Logistics Institute. The first is a lack of on-site parking which for students will be limited to 20 spaces with the stipulation that parking permits will only be provided to student drivers who commit to participating in a car sharing arrangement that guarantees that no car will arrive or depart with less than three students on board. The scheme will be monitored on a daily basis and persistent breaches may result in permits being withdrawn. The second is a lack of alternative parking either within Magna Park or on the surrounding highway network.

2.3 All roads at Magna Park are privately owned and parking is not allowed at any time on the Park's road network. This applies to all vehicles and non-compliance may result in wheel clamping and future entry to the Park may be refused. The restrictions are controlled by Magna Park Management. This management function will be extended to the new development to ensure that overspill parking does not occur.

2.4 The surrounding highway network is not conducive to facilitating on-street parking. The A5 and the A426 are either designated as clearways or have double yellow lines where parking or waiting is prohibited at all times. Other roads including Mere Lane are narrow rural roads where parking is not practicable. In summary on-street parking does not currently occur on the roads surrounding Magna Park and this situation is expected to continue with the proposed development.

2.5 Notwithstanding the parking restrictions set out above, the trip generation for students has been recalculated based on a reduction in the number of students travelling by bus from 75% to 50%. The table below summarises the revised number of vehicle trips associated with student travel based on a reduction in the number of students travelling by bus.

**Table 2-1: Revised Vehicle Trip Generation at Proposed Logistics Institute**

| Mode of Travel | Students (Proportion) | AM Peak | | | | PM Peak | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Arrive | | Depart | | Arrive | | Depart | |
| | | Car | Coach | Car | Coach | Car | Coach | Car | Coach |
| Coach/Bus | 200 (50%) | 0 | 10 | 0 | 10 | 0 | 10 | 0 | 10 |
| Car Driver | 20 (5%) | 20 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| Car Passenger (car share) | 40 (10%) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Car Passenger (other) | 140 (35%) | 140 | 0 | 140 | 0 | 140 | 0 | 140 | 0 |

2.6 For the purposes of this assessment it has been assumed that car passengers that do not share with other students will be driven to and from the Logistics Institute and that leg of the journey will be part of a linked or return trip. In some cases it is likely that the car trip will already be on the network and will form part of a diverted or pass-by trip. In these circumstances the additional impact will be very localised, often only affecting the turning movements at the site access junction, and therefore the revised assessment is very much a worst case.

2.7 The revised peak hour trips for students at the Logistics Institute are shown in Figures 2.1 and 2.2 and the revised 2026 'with development' flows and the sensitivity test flows including symmetry park are shown in Figures 2.3 to 2.6. Traffic flow diagrams are presented in **Appendix C**.

2.8 A plan showing the distribution of student trips referenced in paragraph 6.52 of the original Transport Assessment is presented in **Appendix D**.

# 3 GIBBET HILL JUNCTION IMPROVEMENTS

3.1 In relation to Gibbet Hill roundabout IDI Gazeley does not wish to accept a condition that limits the amount of development that can be occupied at Magna Park prior to improvements being made to the junction. At the same time IDI Gazeley does not wish to rely on other developers to provide the necessary improvements at Gibbet Hill as this may delay the desired rate of occupation at Magna Park. IDI Gazeley is therefore proposing to partially signalise the Gibbet Hill roundabout to accommodate the proposed extension at Magna Park. A copy of the proposed layout is presented in **Appendix E**.

3.2 There is a committed scheme as part of DIRFT III to upgrade Gibbet Hill to a signalised roundabout. It is understood that the scheme has been approved by Highways England. It is also understood that the Development Consent Order for DIRFT III stipulates that the improvements are to be implemented prior to the occupation of no more than 305,000m$^2$ of the development. This is less than half of the total floorspace (731,000m$^2$) and based on completion of the first building at the end of 2016 ProLogis Website (http://www.dirft.com) and a 17-year build out programme, the expectation is that the junction will have been upgraded by 2023.

3.3 db symmetry is also proposing to upgrade the Gibbet Hill roundabout to partial signalisation as part of its proposals for development to the south of the A4303. The Transport Assessment prepared in support of the application does not identify when the improvement would be provided should planning permission be granted. However in its formal response to the planning application to Harborough District Council, Highways England proposes a condition whereby the Gibbet Hill junction improvements must be constructed prior to first occupation of the development.

3.4 IDI Gazeley is also aware that a sum of £100,000 has been contributed by the Rugby Gateway development towards improvements at the Gibbet Hill junction by way of its Section 106 obligation. This sum is to be held by Warwickshire County Council and used as a contribution towards upgrading to partial signalisation of the junction. It is also understood that the Rugby Radio Mast site is not required to contribute towards improvements at the Gibbet Hill junction.

3.5 The scheme being proposed by IDI Gazeley should be viewed within the context of the committed improvement to partially signalise the roundabout as part of DIRFT III, a committed contribution of £100,000 towards improvements as part of the Rugby Gateway development and a further proposal for partial signalisation as part of the db symmetry proposals. Within this context IDI Gazeley is willing to consider a cost sharing arrangement to deliver the improvements at the Gibbet Hill roundabout. The details of the arrangement are to be determined but could be based on the proportional impact of each consented development at the Gibbet Hill junction.

# 4 REVISED HIGHWAY IMPACT ASSESSMENTS

## General

4.1 In this section the impact of the additional traffic movements associated with the revised student trip generation at the Logistics Institute are assessed. As requested by Highways England, assessments have been undertaken at the following junctions:

- Northern A5 Site Access
- A5/A4303 Cross In Hand Roundabout
- A426/A4303 Roundabout
- M1 Junction 20
- A5/A426 Gibbet Hill Roundabout

4.2 Assessments have been undertaken in 2026 'with development' using the traffic flows presented in Figures 2.3 and 2.4. As a sensitivity test, an assessment including symmetry park has also been undertaken using the traffic flows presented in Figures 2.5 and 2.6.

## A5 Northern Site Access

4.3 In AECOM's TN 4 it is reported that;

*The approach to the roundabout from the north is shown to operate at capacity in the 2026 scenario. For both the effective operation of the SRN and the benefit of Magna Park users, it is recommended that the developer considers a layout which will allow the junction to operate suitably within capacity. Considering its status as a new junction on the network, it should not be approaching its design capacity so close to its delivery.*

4.4 In light of the reported capacity problem on the A5 north approach arm, the geometric parameters that were input to the original ARCADY model have been revisited to verify the values. Upon further inspection it was found that there were a number of errors the most significant of which was the entry radius which had been measured incorrectly on each entry arm. Minor changes to other parameters have also been made and the table below shows both the original and revised ARCADY geometric parameters.

**Table 4-1: Original and Revised Geometric Parameters used in ARCADY**

| | Original Measurement | | | Revised Measurement | | |
|---|---|---|---|---|---|---|
| **Geometric Parameter** | **A5 Nth** | **Access** | **A5 Sth** | **A5 Nth** | **Access** | **A5 Sth** |
| Approach Half Width (m) | 6.5 | 3.75 | 6.5 | 7.3 | 4.0 | 7.3 |
| Entry Width (m) | 8.0 | 8.0 | 8.0 | 8.0 | 7.0 | 7.5 |
| Flare Length (m) | 9 | 6 | 5 | 5 | 25 | 5 |
| Entry Radius (m) | 5 | 8 | 9 | 26 | 30 | 18 |
| Inscribed Circle Diameter (m) | 60 | 60 | 60 | 58 | 58 | 58 |
| Entry Angle (deg) | 42 | 38 | 40 | 40 | 36 | 47 |

4.5 For clarification the assessments reported in the tables below are based on the revised measurements.

4.6 The results of the ARCADY assessment in 2026 'with development' at the proposed northern site access on the A5 are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

**Table 4-2: Summary of Main Performance Indicators at New A5 North Access – 2026 With Development**

| | AM Peak | | PM Peak | |
|---|---|---|---|---|
| **Approach Arm** | **RFC** | **Queue** | **RFC** | **Queue** |
| A5 North | 0.687 | 2 | 0.323 | 0 |
| Proposed Access | 0.148 | 0 | 0.205 | 0 |
| A5 South | 0.508 | 1 | 0.606 | 2 |

4.7 Table 4-2 indicates that the new roundabout on the A5 would operate within capacity in 2026 with a maximum RFC of 0.687 on the A5 north during the morning peak. It is apparent therefore that the revised geometry has resolved the capacity problems that were reported in the original Transport Assessment.

4.8 The results of the ARCADY assessment in 2026 'with development' and with symmetry park are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

**Table 4-3: Summary of Main Performance Indicators at New A5 North Access – 2026 With Development and Symmetry Park**

| | AM Peak | | PM Peak | |
|---|---|---|---|---|
| **Approach Arm** | **RFC** | **Queue** | **RFC** | **Queue** |
| A5 North | 0.727 | 3 | 0.336 | 1 |
| Proposed Access | 0.156 | 0 | 0.208 | 0 |
| A5 South | 0.520 | 1 | 0.638 | 2 |

4.9 Table 4-3 indicates that the new roundabout on the A5 would continue to operate within capacity with the addition of symmetry park.

## Cross In Hand Roundabout

4.10 The results of the ARCADY assessment in 2026 'with development' are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

**Table 4-4: Summary of the Main Performance Indicators at the Cross In Hand Roundabout – 2026 With Development**

| | AM Peak | | PM Peak | |
|---|---|---|---|---|
| **Approach Arm** | **RFC** | **Queue** | **RFC** | **Queue** |
| A5 North | 0.931 | 11 | 0.735 | 3 |
| A4303 | 0.716 | 2 | 0.657 | 2 |
| A5 South | 0.685 | 2 | 0.730 | 3 |
| B4027 Lutterworth Rd | 0.367 | 1 | 0.509 | 1 |
| Coal Pit Lane | 0.703 | 2 | 0.411 | 1 |

4.11 Table 4-4 indicates that the Cross In Hand roundabout would operate within capacity in 2026 with development albeit with an RFC of 0.931 on the A5 north during the morning peak. The maximum RFC during the evening peak is 0.735 also on the A5 north.

4.12 The results of the ARCADY assessment in 2026 'with development' and with symmetry park are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

**Table 4-5: Summary of the Main Performance Indicators at the Cross In Hand Roundabout – 2026 With Development and Symmetry Park**

| | AM Peak | | PM Peak | |
|---|---|---|---|---|
| **Approach Arm** | **RFC** | **Queue** | **RFC** | **Queue** |
| A5 North | 0.904 | 8 | 0.662 | 2 |
| A4303 | 0.784 | 3 | 0.760 | 3 |
| A5 South | 0.853 | 5 | 0.883 | 7 |
| B4027 Lutterworth Rd | 0.378 | 1 | 0.516 | 1 |
| Coal Pit Lane | 0.873 | 6 | 0.489 | 1 |

4.13 Table 4-5 indicates that the Cross in Hand roundabout would operate within capacity with symmetry park albeit with RFCs in excess of the desirable maximum value on the A5 north during the morning peak and on the A5 south during the evening peak.

## A4303/ A426

4.14 The results of the ARCADY assessment in 2026 'with development' are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

4.15 It should be noted that this assessment is based on junction improvements that were presented in the original Transport Assessment as Drawing No. 47066811/A008/SK14.

| Table 4-6: Summary of the Main Performance Indicators at the A4303/ A426 Roundabout – 2026 With Development & Junction Improvements | | | | |
|---|---|---|---|---|
| | AM Peak | | PM Peak | |
| Approach Arm | RFC | Queue | RFC | Queue |
| A426 North | 0.833 | 5 | 0.752 | 3 |
| A4303 East | 0.997 | 31 | 0.770 | 3 |
| A426 South | 0.719 | 2 | 0.659 | 2 |
| A4303 West | 0.546 | 1 | 0.758 | 3 |

4.16 Table 4-6 indicates that the A4303/ A426 roundabout would be operating close to capacity in 2026 with development with an RFC of 0.997 on the A4303 east during the morning peak. The corresponding queue is 31 vehicles which when spread over two lanes would extend to around 90 metres. The distance between the A4303/A426 roundabout and M1 junction 20 is around 350 metres and therefore the queue on the A4303 east approach should not extend to the Motorway junction even if queues were to form unequally on the approach.

4.17 The results of the ARCADY assessment in 2026 'with development' and with symmetry park are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

| Table 4-7: Summary of the Main Performance Indicators at the A4303/ A426 Roundabout – 2026 With Development & Symmetry Park | | | | |
|---|---|---|---|---|
| | AM Peak | | PM Peak | |
| Approach Arm | RFC | Queue | RFC | Queue |
| A426 North | 0.866 | 6 | 0.808 | 4 |
| A4303 East | 1.083 | 100 | 0.796 | 4 |
| A426 South | 0.752 | 3 | 0.678 | 2 |
| A4303 West | 0.573 | 1 | 0.851 | 5 |

4.18 Table 4-7 indicates that with the addition of symmetry park the junction would be operating in excess of capacity in the morning peak with an RFC of 1.083 on the A4303 east. The corresponding queue is 100 vehicles. Assuming the queue is spread more or less equally over two lanes it would extend to almost 300 metres.

## M1 Junction 20

4.19 The results of the ARCADY assessment in 2026 'with development' are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

**Table 4-8: Summary of the Main Performance Indicators at M1 Junction 20 – 2026 With Development**

| | AM Peak | | PM Peak | |
|---|---|---|---|---|
| **Approach Arm** | **RFC** | **Queue** | **RFC** | **Queue** |
| M1 Southbound off-slip | 0.544 | 1 | 0.523 | 1 |
| A4304 | 0.830 | 5 | 0.494 | 1 |
| M1 Northbound off-slip | 0.479 | 1 | 0.356 | 1 |
| A4303 | 0.640 | 2 | 0.754 | 3 |

4.20 Table 4-8 indicates that M1 Junction 20 would be operating within capacity during both peaks in 2026.

4.21 The results of the ARCADY assessment in 2026 'with development' and with symmetry park are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

**Table 4-9: Summary of the Main Performance Indicators at M1 Junction 20 – 2026 With Development & Symmetry Park**

| | AM Peak | | PM Peak | |
|---|---|---|---|---|
| **Approach Arm** | **RFC** | **Queue** | **RFC** | **Queue** |
| M1 Southbound off-slip | 0.772 | 3 | 0.722 | 3 |
| A4304 | 0.770 | 3 | 0.432 | 1 |
| M1 Northbound off-slip | 0.610 | 2 | 0.405 | 1 |
| A4303 | 0.733 | 3 | 0.892 | 8 |

4.22 Table 4-9 indicates that M1 Junction 20 would operate within capacity with the addition of symmetry park traffic albeit with an RFC in excess of the 0.85 threshold on the A4303 during the evening peak.

## Gibbet Hill Roundabout

4.23 This assessment is based on junction improvements that are being proposed by IDI Gazeley in support of the Hybrid planning application at Magna Park. The scheme includes carriageway widening, improved carriageway markings and the signalisation of the approach and circulatory carriageways of the A426 north, A426 south, A5 north and A5 south. The improvements are shown on a drawing presented in **Appendix E** (Drawing No. 60470988/A001/SK32).

4.24 The improved layout has been modelled using TRANSYT and the TRANSYT link/node diagram is presented in **Appendix G**. The results of the assessment in 2026 are summarised in the tables below. Approach links are shown in italics.

4.25 The results of the TRANSYT assessment in 2026 with development are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

**Table 4-10: Summary of the Main Performance Indicators at Gibbet Hill Roundabout – 2026 With Development & Junction Improvements**

| Link | | AM Peak | | PM Peak | |
|---|---|---|---|---|---|
| **No.** | **Description** | **Sat %** | **Queue** | **Sat %** | **Queue** |
| *10* | *A5 north – inside lane* | 83 | 9 | 82 | 7 |
| *11* | *A5 north – outside lane* | 82 | 9 | 79 | 7 |
| 12 | Circulating – inside lane | 68 | 3 | 72 | 4 |
| 13 | Circulating – outside lane | 18 | 1 | 17 | 0 |
| *20* | *A426 north – inside lane* | 79 | 6 | 81 | 6 |
| *21* | *A426 north – outside lane* | 74 | 6 | 76 | 5 |
| 22 | Circulating – inside lane | 61 | 3 | 55 | 2 |
| 23 | Circulating – outside lane | 48 | 5 | 40 | 3 |
| *30* | *Gibbet Lane – all lanes* | 23 | 1 | 16 | 0 |
| 31 | Circulating – all lanes | 33 | 0 | 29 | 0 |
| *40* | *A5 south – inside lane* | 85 | 9 | 88 | 10 |
| *41* | *A5 south – outside lane* | 25 | 2 | 28 | 2 |
| 42 | Circulating – inside lane | 55 | 4 | 54 | 4 |
| 43 | Circulating – outside lane | 61 | 4 | 61 | 3 |
| *50* | *A426 south – all lanes* | 85 | 14 | 90 | 15 |
| 51 | Circulating – inside lane | 54 | 1 | 64 | 1 |
| 52 | Circulating – outside lane | 23 | 1 | 25 | 0 |

4.26 Table 4-10 indicates that the Gibbet Hill roundabout would operate within capacity during both peaks with the development traffic. It is apparent therefore that the proposed roundabout improvements would provide the necessary capacity to accommodate the traffic associated with all committed development and the proposed development.

4.27 The results of the TRANSYT assessment in 2026 'with development' and with symmetry park are summarised in the table below. Full model printouts from this analysis are presented in **Appendix F**.

| Table 4-11: Summary of the Main Performance Indicators at Gibbet Hill Roundabout – 2026 With Development & Symmetry Park | | | | | |
|---|---|---|---|---|---|
| **Link** | | **AM Peak** | | **PM Peak** | |
| **No.** | **Description** | **Sat %** | **Queue** | **Sat %** | **Queue** |
| *10* | *A5 north – inside lane* | 84 | 9 | 77 | 6 |
| *11* | *A5 north – outside lane* | 86 | 10 | 83 | 8 |
| 12 | Circulating – inside lane | 68 | 4 | 76 | 4 |
| 13 | Circulating – outside lane | 18 | 1 | 18 | 0 |
| *20* | *A426 north – inside lane* | 79 | 6 | 81 | 6 |
| *21* | *A426 north – outside lane* | 74 | 6 | 76 | 5 |
| 22 | Circulating – inside lane | 61 | 3 | 56 | 2 |
| 23 | Circulating – outside lane | 50 | 5 | 46 | 3 |
| *30* | *Gibbet Lane – all lanes* | 24 | 1 | 17 | 0 |
| 31 | Circulating – all lanes | 33 | 0 | 31 | 0 |
| *40* | *A5 south – inside lane* | 87 | 10 | 88 | 10 |
| *41* | *A5 south – outside lane* | 25 | 2 | 28 | 2 |
| 42 | Circulating – inside lane | 56 | 4 | 58 | 4 |
| 43 | Circulating – outside lane | 62 | 4 | 65 | 4 |
| *50* | *A426 south – all lanes* | 88 | 16 | 92 | 16 |
| 51 | Circulating – inside lane | 58 | 1 | 65 | 1 |
| 52 | Circulating – outside lane | 25 | 1 | 25 | 0 |

4.28 Table 4-11 indicates that the Gibbet Hill roundabout would continue to operate within capacity during both peaks with the addition of traffic generated by symmetry park.

# 5 CONCLUSIONS

5.1 This Supplementary Transport Assessment has been prepared to respond to a request from Highways England for further information with regard to the original Transport Assessment that was submitted in October 2015 to support a hybrid planning application for the proposed extension of Magna Park onto 220 hectares of land adjoining Magna Park to the north west and onto seven hectares of land adjoining Magna Park to the south of the A4303.

5.2 The additional information requested by Highways England can be summarised as follows:

- To recalculate the trip generation for students attending the Logistics Institute based on 50% travelling by bus rather than 75% that was assumed in the original Transport Assessment.
- To provide a plan showing the distribution of student trips referenced in paragraph 6.52 of the original Transport Assessment.
- To reassess the impact of the development at key junctions based on the revised trip generation.
- To provide a suitable mitigation scheme at the Gibbet Hill roundabout in the event that the conditioned improvements as part of DIRFT III are delayed; or accept a condition that no more than 100,844m$^2$ of B8 (DHL detailed application) will be occupied at Magna Park before the improvements to Gibbet Hill as part of DIRFT III have been delivered.

5.3 The trip generation for students attending the Logistics Academy has been recalculated based on 50% of students travelling by bus. It has been done 'without prejudice' as IDI Gazeley has confirmed its commitment to providing a comprehensive bus network that will result in the majority of students travelling by bus. The high numbers of students expected to travel by bus will be influenced by a lack of on-site student parking and a lack of alternative parking opportunities either within Magna Park or on the surrounding highway network.

5.4 A scheme to partially signalise the Gibbet Hill roundabout is being proposed as IDI Gazeley does not wish to accept a condition that limits the amount of development that can be occupied at Magna Park prior to improvements being made at the junction. The scheme is proposed within the context of a committed improvement to partially signalise the roundabout as part of DIRFT III and a further proposal for partial signalisation as part of the db symmetry proposals.

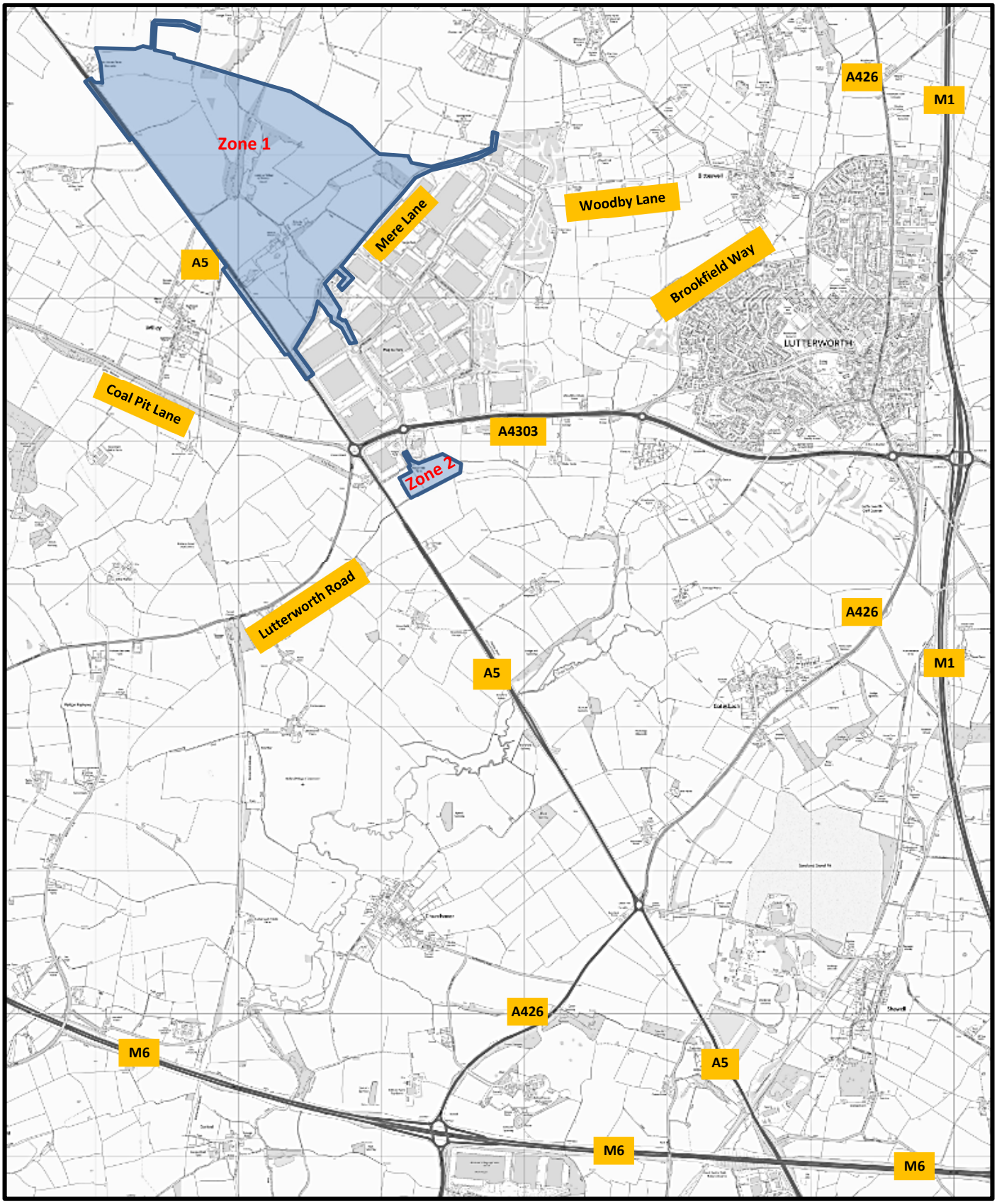
5.5 The revised capacity assessments indicate that the proposed development could be accommodated at each junction under consideration albeit with some junctions operating above the desirable RFC threshold of 0.85 although below the theoretical capacity of 1.0.

5.6 With the addition of trips generated by symmetry park the network is also expected to generally be operating within capacity with the exception of the A4303/A426 roundabout where a queue of 100 vehicles is predicted on the A4303 eastern arm during the morning peak. This assessment is based on the junction improvements being proposed by IDI Gazeley to support the detailed application for DHL Supply Chain.

5.7 It is therefore concluded that the changes to student trip generation at the Logistics Institute as requested by Highways England, will not have a detrimental impact on the operation of the surrounding highway network.

# Magna Park Extension: Hybrid Application
## Supplementary Transport Assessment

**Appendix A – Site Location Plan**




# Appendix A- Site Location Plan

# Magna Park Extension: Hybrid Application
## Supplementary Transport Assessment

**Appendix B – AECOM Technical Note 4**

| | | | |
|---|---|---|---|
| Project: | **Highways England Spatial Planning Arrangement** | Job No: | **60343293** |
| Subject: | **A5 – Magna Park Extension** | Date: | **2nd November 2015** |
| HA ref: | **EM3 Leics-Lincs-Rut** | Task: | **L0003** |

## 1. Introduction

This Technical Note (TN) reviews the Magna Park Extension: Hybrid Application – Transport Assessment (TA) dated 28th September 2015, prepared by URS on behalf of IDI Gazeley in support of the outline planning application reference 15/01531/OUT for the extension of Magna Park in Lutterworth, Leicestershire.

URS (now AECOM, though will be referred to as URS throughout for consistency) have prepared the TA as part of the supporting documentation for a hybrid planning application for the proposed extension of Magna Park near Lutterworth onto 220 hectares of land adjoining Magna Park to the north west (Zone 1) and onto 7 hectares of land adjoining Magna Park to the south of the A4303 (Zone 2).

Zone 1 (220 ha) comprises:

- Distribution warehousing and ancillary office space (Use Classes B8 and B1a): up to 427,350m² (including 100,844m² for DHL Supply Chain that is the subject of a detailed planning application – reference 15/00919/FUL – that was submitted in June 2015)
- Logistics Institute of Technology (Use Class D1): up to 3,700m² together with its campus
- Estate office with heritage exhibition centre and conference facility (Use Class D1): up to 300m²
- Holovis expansion building (Use Class B1a, B1b): up to 7,000m²
- Innovation Centre (Use Class B1a): up to 2,325m²
- Public park and meadowland: approximately 70 hectare

Zone 2 (7 ha) comprises:

- Rail freight shuttle terminal
- 134 HGV parking spaces
- HGV driver training centre
- LPG or GNP fuel island and vehicle wash facility

The principal points of contact with the Strategic Road Network (SRN) are:

- The proposed new A5 junction to the north of the site;
- New A5 / Mere Lane roundabout;
- A5 / A4303 junction;
- A5 / A426 junction.

Other SRN junctions of interest include M1 Junction 20, M6 Junction 1 and M69 Junction 1.

## 2. Background

AECOM has previously provided advice regarding this site during scoping discussions in AECOM's TN1 (dated 8th May 2015), after the application submission for the DHL facility in AECOM's TN2 (dated 30th June 2015), and TN3 (dated 14th August 2015).

AECOM reviewed the TA submitted by DHL for the development of a 100,844m² distribution centre (application reference 15/00919/FUL) which is included in the 427,350m² of this Magna Park application. Highways England raised no objections to the proposal on condition of the developer providing mitigation at the A5 / Mere Lane Watling Street junction as shown on URS drawing 47066811/A008/SK12.

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In an email of 21st August 2015 AECOM recommended that HGV factor of 2.2 be used for the Magna Park extension application, as stated in the TRANSYT 12 User Guide (Appendix F - Glossary, page 269).

Zone 2 benefits from an extant planning permission for 140 HGV parking spaces, 170 car parking spaces and several ancillary uses including a gatehouse, a small office, a vehicle maintenance unit, a fuel island and vehicle wash (planning reference 12/00851/FUL). IDI Gazeley is in the process of discharging the pre-commencement conditions relating to the approved HGV parking scheme and will begin the development once the requisite approvals have been secured.

## 3. Network Performance

All junctions within the agreed scope of assessment have been modelled for the 2014 scenario as reported on in the TA of June 2015 for the DHL development. This base year assessment was reviewed in AECOM TN3 and deemed acceptable.

## 4. Committed Developments

Committed developments are as per the June 2015 TA submitted in support of the DHL development. These were reviewed and accepted in AECOM TN2.

## 5. Trip Generation and Distribution

*B8 units*

Average trip rates for the B8 units are as per the June 2015 TA submitted in support of the DHL development, however the assessment went on to apply the 85th percentile trip rate to determine trip generation.

The method adopted in this TA using average trip rates for the entire site results in a generation of **810** and **671** two-way trips respectively for the AM and PM peak hours.

**Table 1** determines trip generation based on the agreed 85th percentile method for the DHL unit, and using average trip rates for the remaining B8 units.

| Trip rate method | Development description | AM Peak | PM peak |
|---|---|---|---|
| Average trip rates | Total B8 minus DHL (427,350m² - 100,844m² = 326,506m²) | 617 | 513 |
| 85th percentile | DHL (100,844m²) | 220 | 170 |
| | **Total** | **837** | **683** |

**Table 1 – AECOM B8 Trip Generation**

AECOM comment that, whilst the methodology utilised in this TA for the B8 trip generation is not preferred, the total trip generation is comparable (810 vs. 837 and 671 vs. 683). This means URS's B8 trip generation figures are suitable for use.

Distribution of the B8 trips has been determined using LLITM, with proportions given equal to those for the June 2015 TA in support of the DHL development, and agreed in AECOM TN1. It is assumed that all trips to B8 units north of the Magna Park Hub will use the new A5 roundabout towards the north of the site boundary. Trips to units south of the Magna Park Hub will use the existing Hunter Boulevard roundabout if travelling from the east, and from elsewhere will use the new A5 / Mere Lane roundabout. This distribution is considered acceptable.

*B1 Innovation Centre*

Trip generation for this 2,325m² development has been determined using the TRICS database, which produces 63 AM and 47 PM peak hour two-way vehicle trips. These trips have been distributed using

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the same proportions as determined from LLITM for the above B8 units, with trips from the east all using the existing Hunter Boulevard roundabout, and all trips from elsewhere using the new A5 Mere Lane roundabout, which is acceptable.

*B1 Holovis*

Given this development's bespoke nature, and as it already exists, it is proposed that trip generation for its expansion from 2,787m² to 7,000m² will be more accurately determined based on a survey of existing trips as opposed to using the TRICS database.

Traffic counts undertaken in April 2015 have been used to determine trip generation for the proposed expansion. To avoid double counting, it is proposed that the new development trips will be based on the difference in floor area of 4,213m². The expansion of this site is proposed to generate a further 46 AM and 33 PM two-way vehicle trips.

These trips have been distributed using the same proportions as determined from LLITM for the above B8 units, with trips from the east all using the existing Hunter Boulevard roundabout, and all trips from elsewhere using the new A5 Mere Lane roundabout. This is considered suitable.

*D1 Logistics Institute of Technology – Students*

The 3,700m² institute is proposed to have 400 attending students with ages ranging from 16-22. Coaches running contract services to the site and public buses are considered the principal mode of transport for the students.

In determining student trips, a target participation in coach / bus travel has been assumed at 75%, resulting in 20 two-way coach / bus trips in each peak hour. Based on permit holder restrictions and car share arrangements promoted by the Institute, it is assumed that 5% of students will drive to site, with 10% of the site's students as passengers, resulting in 20 two-way car trips in each peak hour.

This leaves a further 10% of students to be accounted for, for which it is assumed will be driven to and from the site, resulting in 80 two-way car trips in each peak hour, however a significant proportion of these can be considered to be already existing on the network in the form of pass-by and diverted trips.

Though it is a respectable aim for the Institute, allocating 300 of the 400 students to travel by coach / bus is not considered a realistic representation of site trip generation for conducting junction impact assessments. Until such evidence of progress for the provision of a dedicated bus service can be provided, a robust method is expected for determining potential site trip generation. Based on this we request that the developer consider a reduction in coach / bus trips to 50%. The remainder would be allocated to car driver and passenger trips as although car sharing can be promoted, it is not envisaged that this can be enforced, and in due course students will find alternative parking arrangements.

AECOM checks carried out have shown the implications of the reduced coach / bus trips to be significant on junction impacts.

A reduction from 10 to 7 coach services results in 210 of the total 400 students being accounted for by coach / bus trips as opposed to the proposed 300. This imposes a further 90 trips to be made by car, although as stated above a significant proportion will be pass-by or diverted trips.

It is predicted that this further generation of car trips will generate the following increases in traffic flows:

- 78 vehicles at M1 junction 20
- 64 vehicles at the A5 Cross In Hand roundabout
- 64 vehicles at the new proposed A5 / Mere Lane roundabout

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- 38 vehicles at the A5 Gibbet Hill roundabout
- 36 vehicles at the new proposed A5 northern site access roundabout

It is proposed that the Logistics Institute will have a wider catchment area than a secondary school, and so the distribution of the students has been based on a gravity model.

To identify the spread of students it has been assumed that the maximum journey time by car would 50 minutes. Based on this, the catchment area has been determined and number of people in the 16-22 age range recorded from Census 2011 data.

From review of the gravity model files provided in Appendix W, the number of likely students from the surrounding local authorities as shown in Table 6.12 appears to be reasonable. However, as the plan showing distribution of the student trips referenced in paragraph 6.52 has not been provided, the suitability of the proposed distributions of student trips on the road network as shown in Table 6.13 cannot be determined.

*D1 Logistics Institute of Technology – Teaching Staff*

It has been assumed that 80% of teaching staff will travel to and from work during the peak hours and that they will all travel by car at an occupancy rate of 1.2. This assumption is based on experience of similar facilities, although no supporting evidence has been provided.

It is assumed that one third of maintenance staff will travel to and from the Institute during peak hours, as single car occupants.

Based on 40 teaching staff and 30 maintenance staff, the site is predicted to generate 37 two-way trips in each of the AM and PM peak periods. This is reasonable.

Staff trips have been distributed using the same proportions as determined from LLITM for the above, with trips from the east all using the existing Hunter Boulevard roundabout, and all trips from elsewhere using the new A5 Mere Lane roundabout, which is acceptable.

*Rail Freight Shuttle Terminal*

As this development will only be available to Magna Park occupiers, it is stated that outside of the Magna Park site boundary, the HGV trips generated will only impact on the Hunter Boulevard roundabout.

In terms of freight travelling from outside into the shuttle terminal, it is stated in paragraph 3.45 that Magna Park does not benefit from a direct rail connection, and thus a shuttle service to nearby railheads is proposed. With Rugby and DIRFT being the nearest options, it is clear that HGV trips will not only impact the Hunter Boulevard roundabout. It is considered therefore that freight collection should occur outside of the peak hours.

*HGV Training Centre*

It is proposed there will be 16 car park spaces associated with the HGV training area and there will be a small two-storey office within the gatehouse to administer and manage the training facility. With no further details regarding the size and scale of this development, its appropriateness cannot be determined.

*HGV Parking Facility*

The consented HGV park (planning reference 12/00851/FUL) for which IDI Gazeley is in the process of discharging the pre-commencement conditions has been included in the 2026 'with development'

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scenario. With significantly higher trip generation of 86 AM and 103 PM peak hour trips, it is considered a more robust approach to base the assessment on the consented development as opposed to the new proposals.

AECOM requests that trip generation for the B8 units and for the students attending the Logistics Institute be revisited, as detailed above.

**6. Highway Impacts**

AECOM has reviewed the impact assessments conducted across several junctions in the Magna Park area. Modelled using ARCADY and TRANSYT junction simulation software, these consist of:

- A5 northern site access (new junction)
- A5 / Mere Lane roundabout (new junction)
- A4303 / Hunter Boulevard roundabout
- A5 / A4303 Cross In Hand roundabout
- A5 / A426 Gibbet Hill roundabout
- A4303 / A426 roundabout
- M1 Junction 20
- M69 Junction 1
- M6 Junction 1

Combined with the concerns already stated regarding potentially underestimated trip generation from the B8 developments and the students travelling to the Logistics Institute, it is considered likely that the impacts shown to already cause junctions to be operating close to or over capacity will be worsened further. These are investigated below.

*A5 northern site access (new junction)*

This new roundabout is proposed by IDI Gazeley in support of the development proposals, and AECOM are content with the method of impact assessment which considers that this junction will serve the northern plots within the development and the A5 / Mere Lane roundabout will serve the southern plots.

The approach to the roundabout from the north is shown to operate at capacity in the 2026 scenario. For both the effective operation of the SRN and the benefit of Magna Park users, it is recommended that the developer considers a layout which will allow the junction to operate suitably within capacity. Considering its status as a new junction on the network, it should not be approaching its design capacity so close to its delivery.

Whilst the initial assessment appears to indicate that this junction will operate within capacity, URS need to re-assess this junction with the suggested revision to the Logistics Institute student trip generation.

*A5 / Mere Lane roundabout (new junction)*

In the 2026 assessment scenario, the proposed new junction on the A5 is seen to operate satisfactorily, with a ratio of flow to capacity of between 0.7 and 0.8.

A4303 / Hunter Boulevard roundabout

This junction shows no sign of capacity issues in 2026 as all approaches operate below the limit of 0.85, and maximum queue lengths are at 4PCUs.

*A5 Cross In Hand roundabout*

This roundabout on the A5 appears to operate within capacity, with the exception of the A5 northern approach in the AM peak hour which operates at a ratio of flow to capacity of 0.88 and 0.91 in the

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respective without and with development 2026 scenarios. The effects result in a queue length increase from 7 to 9 PCUs, which is not considered to be significant.

Traffic flows on this junction however show it to be highly sensitive to development impacts, with an increase of 367 vehicles in the AM peak hour and 402 in the PM. This development traffic will increase further when accounting for the revised Logistics Institute development trips and this should be identified.

*A5 / A426 Gibbet Hill roundabout*

The A5 approaches to the junction are shown to operate over capacity in the 2026 scenario with development, with an increase in flows on the southern approach of 41 and the northern approach of 87. However, the 2026 scenario without development shows the junction to be already slightly over capacity.

It is understood that DIRFT III is to provide mitigation at the Gibbet Hill roundabout, including widening and signalisation of the A5 approaches, and so this scheme has been included in the assessments carried out in this TA. There is a significant risk that should DIRFT III and its conditioned highway improvements not be delivered according to current plans, approval of this Magna Park application would be detrimental to the operation of this roundabout and the SRN. Based on this it will be necessary to apply a condition to the Magna Park application that no more than the 100,844m² of B8 previously reviewed in application 15/00919/FUL for the DHL development will be occupied until the Gibbet Hill roundabout improvement has been delivered.

In the event of the conditioned DIRFT III proposals changing or being postponed, it will be necessary to determine mitigation requirements to be conditioned to the Magna Park development.

A4303 / A426 roundabout

The roundabout is situated approximately 340m to the west of M1 junction 20 as shown in **Figure 1**, and appears to operate over capacity in the 2026 scenario. The approach from the west, critical to the operation of the SRN, operates at a maximum ratio of flow to capacity of 0.98, with queues of 23 PCUs – approximately 130m in length.

AECOM would recommend that a form of queue detection is installed at the A4303 / A426 to protect the operation of M1 J20.

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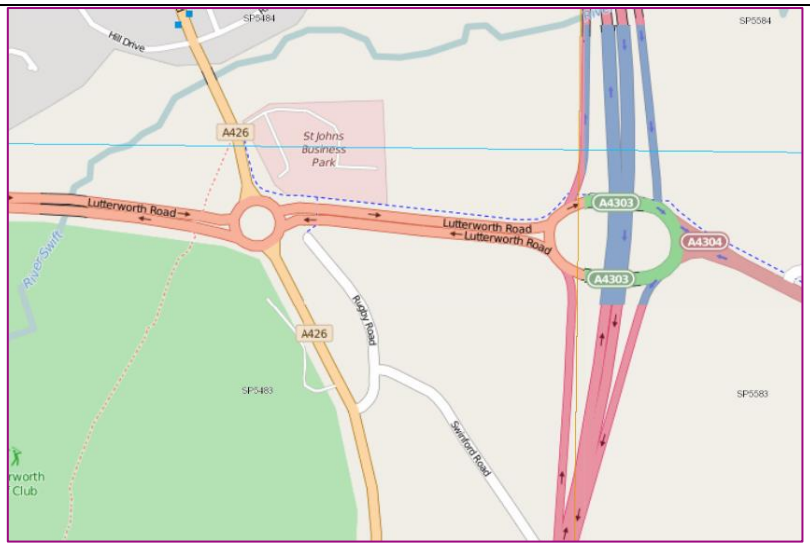


**Figure 1 – Location of M1 J20 and A4303 / A426**

*M1 Junction 20*

The operation of the junction appears to be well within capacity in the 2026 'with development' scenario, with worst case ratio of flow to capacity of 0.529 on the M1 off-slips. Reviewing the Magna Park flows however shows the junction to be sensitive to development impacts, with 251 trips in the AM peak hour.

*M69 Junction 1*

Although the junction appears relatively unaffected by development impacts on the A5 approaches and M69 off-slips, these are all operating over capacity in the 2026 scenarios. Maximum queue lengths on the A5 are shown to be 36 PCUs – an increase from 20 in the 'without development' scenario, whilst the M69 shows a maximum queue of 18PCUs in both scenarios. This is not considered a significant concern regarding the M69 mainline flow.

The 'with development' scenario shows the B4109 Rugby Rd approach to be operating over capacity with a Degree of Saturation (DoS) of 156% and MMQ close to 300. Although not a concern to the operation of the SRN, it is considered that the local authority will not accept this level of congestion.

*M6 Junction 1*

There appears to be no impact on this junction imposed by the development, with approaches unaffected in the 2026 'with development' scenario. Operational capacity raises no concerns, showing maximum queues of 14PCUs.

Combining the re-evaluation of trip generation with the increases in traffic from the Logistics Institute, **Table 2** shows the predicted additional trips expected on the nine junctions for the worst case AM peak hour:

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| Junction | Predicted trip increase |
|---|---|
| | Logistics Institute |
| M1 Junction 20 | 78 |
| A426 / A4303 roundabout | 78 |
| A5 Cross In Hand roundabout | 64 |
| Proposed A5 / Mere Lane roundabout | 64 |
| A5 Gibbet Hill roundabout | 38 |
| Proposed A5 northern site access | 36 |
| M6 Junction 1 | 38 |
| M69 Junction 1 | 16 |

**Table 2 – AECOM Predicted Increase in Trips**

Considering the predicted trip increases along with capacity concerns raised above at the proposed A5 northern site access, A5 Cross In Hand roundabout, A5 Gibbet Hill roundabout, A426 / A4303 roundabout, reassessing junction impacts will be necessary.

## 7. Highway Impacts – Sensitivity Case

In order to provide a robust assessment of junction impacts, the TA considers the combined effects on the road network of the proposed Magna Park development and Symmetry Park.

Symmetry Park, application reference 15/00865/OUT, is a site comprising 278,709m² of B8, B2 and B1 use classes, which is yet to be determined. This development proposes mitigation works at the Cross In Hand roundabout at the A5 approaches, Gibbet Hill roundabout at the A426 and A5 north approaches, A4303 / A426 roundabout, and M1 Junction 20 at the A4304 approach, which have been accounted for in the junction capacity assessments.

The sensitivity case assessments have shown that:

- The proposed A5 roundabout serving the northern plots within Magna Park is shown to be operating over capacity with DoS of 89% on the northern approach, reinforcing the case for revising the roundabout design.
- Including the mitigation as proposed by the Symmetry Park developer at the Cross In Hand roundabout, the A5 north and A5 south approaches appear to operate slightly over capacity in the respective AM and PM peak hours.
- Capacities of M69 Junction 1 approaches appear in general unaffected by the Symmetry Park development, though it is worth noting the potential unacceptable capacity of the B1409 Rugby Road approach, with DoS of 174% and queues of 345 PCUs.
- The sensitivity case shows the Gibbet Hill roundabout with Symmetry Park improvements to operate at a similar level to that in the Magna Park assessment, with the A5 approaches operating within DoS of 84-91%.
- M6 westbound off-slip operates with DoS of 91%, equal to that in the Magna Park assessment, though this junction is not considered to be significantly affected by these developments.

The results of this sensitivity assessment are provided as an informative note, such that all parties are aware of the likely operation of the road network surrounding Magna Park and Symmetry Park.

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## 8. Conclusions

It will be necessary to reassess junction impacts once revised trip generation for student trip generation at the Logistics Institute have been recalculated.

The plan showing distribution of the student trips referenced in paragraph 6.52 of the TA should be provided for review to allow its suitability to be determined.

There is a significant risk that should DIRFT III and its conditioned road improvements to the A5 Gibbet Hill roundabout not be delivered according to current plans, approval of this Magna Park application would be detrimental to the operation of this roundabout and the SRN. Based on this, a condition to the Magna Park application should be applied ensuring that no more than the 100,844m² of B8 previously reviewed in application 15/00919/FUL for the DHL development will be occupied until the improvement as conditioned to the DIRFT III development has been delivered.

In the event of the conditioned DIRFT III proposals changing or being postponed, it will be necessary to determine mitigation requirements to be conditioned to the Magna Park development.

With no phasing plan for the road network mitigation schemes proposed for the wider development outside of the 100,844m² DHL site, it will be necessary to condition the developer to deliver the mitigation proposals prior to occupation of any more of the development than the previously reviewed DHL site.

If a proposed phasing plan is submitted, a trigger point schedule for the delivery of the mitigation works can be investigated and agreed upon in consultation with the developer.

AECOM suggest that URS will need to submit the following supporting documents related to all highway improvement proposals schemes:

- A Stage 1 Road Safety Audit.
- A standards review.
- A Non-Motorised-User (NMU) Audit Context Report.

## 9. Recommendation

From the above conclusions, AECOM suggest that a holding recommendation be issued by Highways England for the period of 3 months, to allow the developer to address the concerns raised.

It is recommended that this note is forwarded on to URS so they may take note of the comments.

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Checked by:.....
Daniel Bent
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Approved by:.....
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# Magna Park Extension: Hybrid Application
## Supplementary Transport Assessment

**Appendix C – Traffic Flow Diagrams**

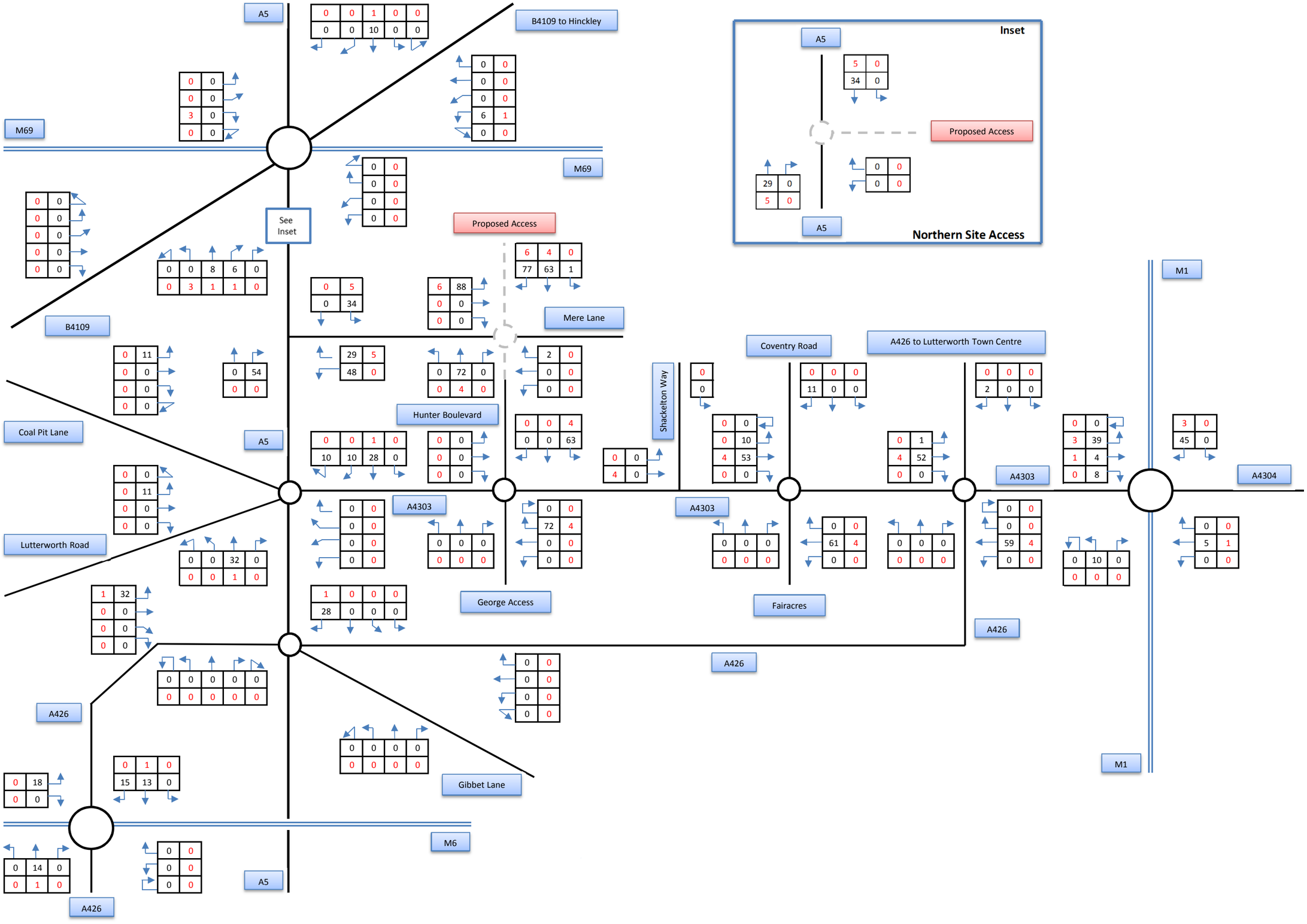



**Figure 2.1: Revised AM Peak Hour Student Trips at Logistics Institute**

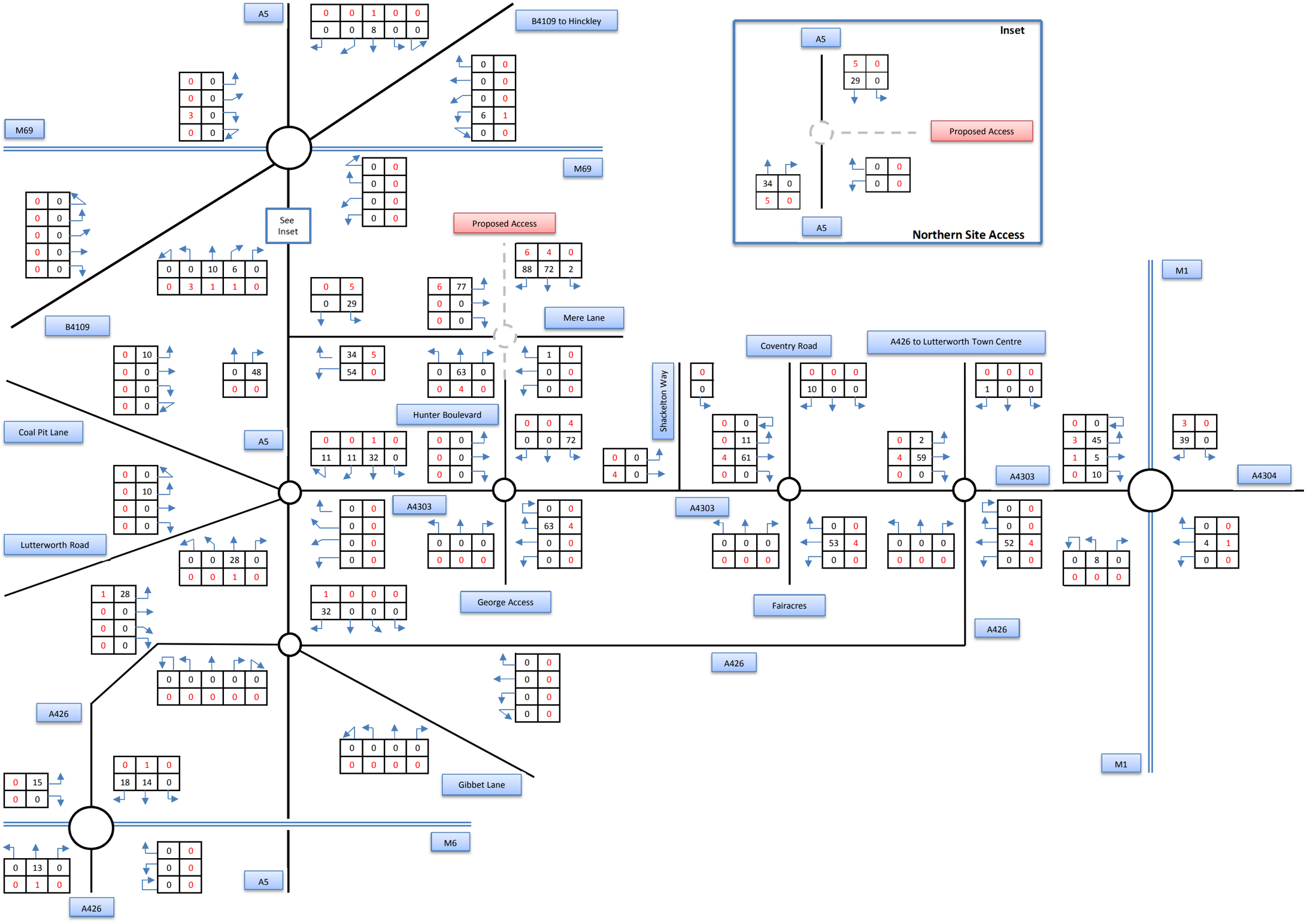



**Figure 2.2: Revised PM Peak Hour Student Trips at Logistics Institute**

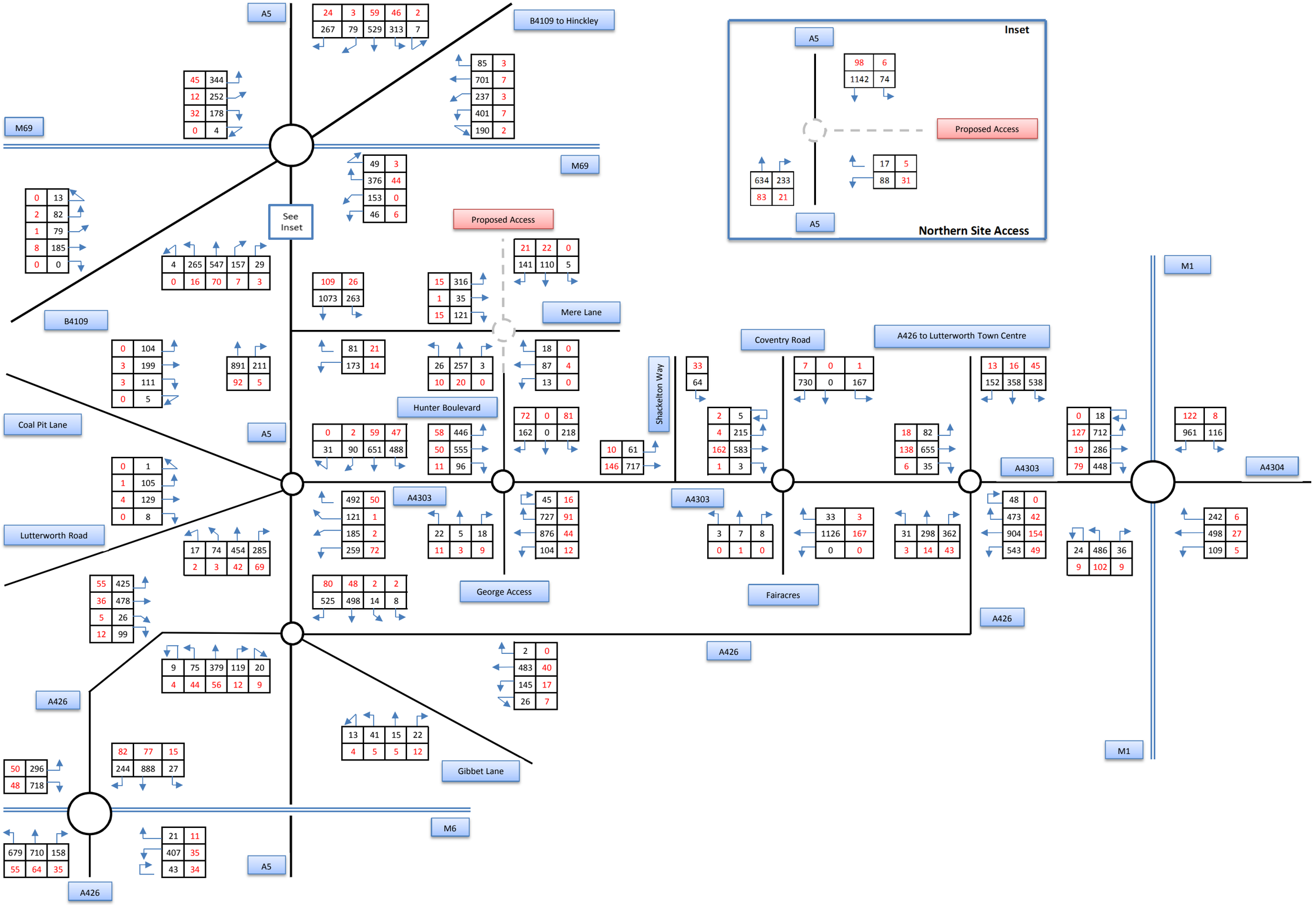



**Figure 2.3: Revised 2026 AM Peak Hour With Development Flows**

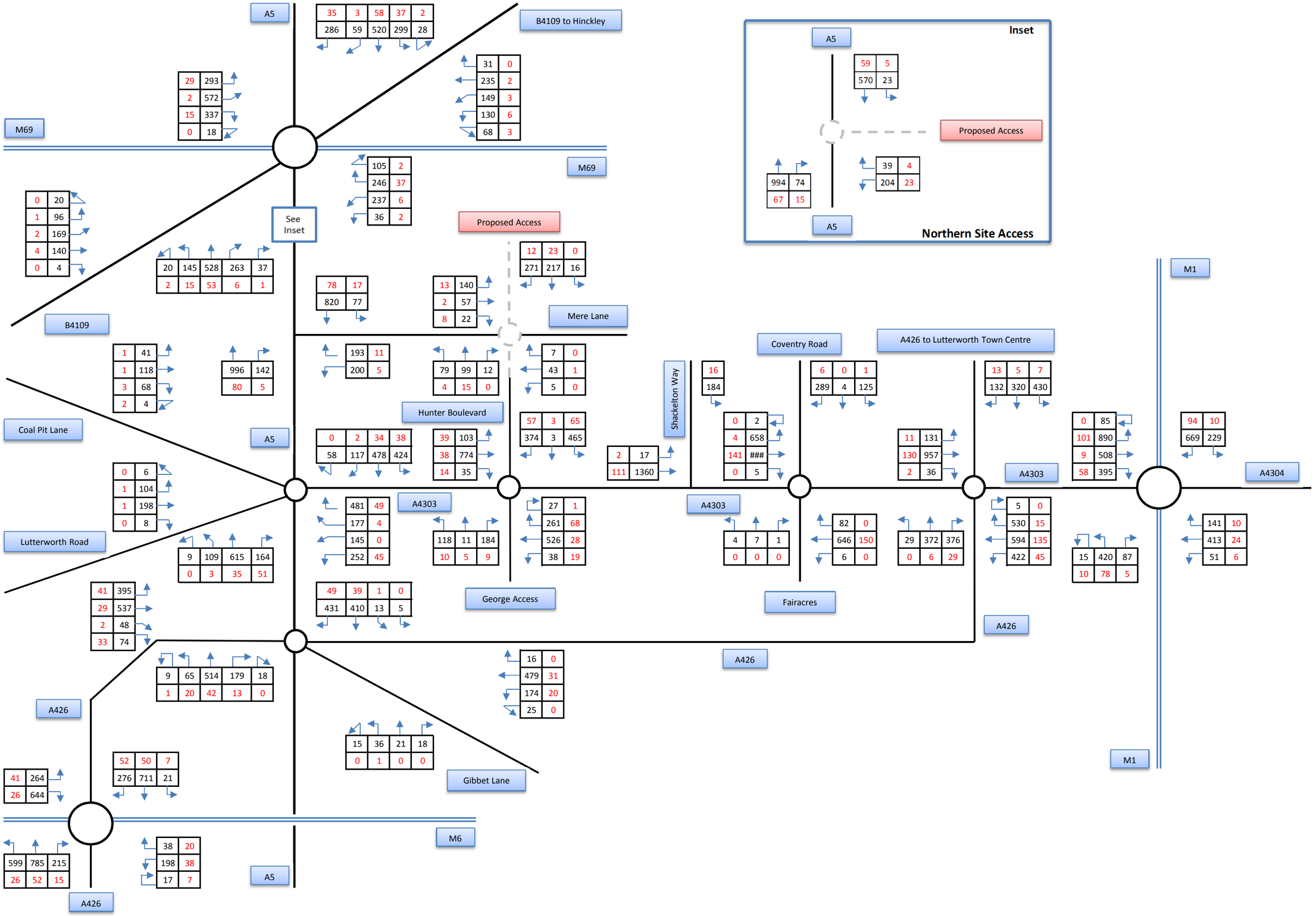



**Figure 2.4: Revised 2026 PM Peak Hour With Development Flows**

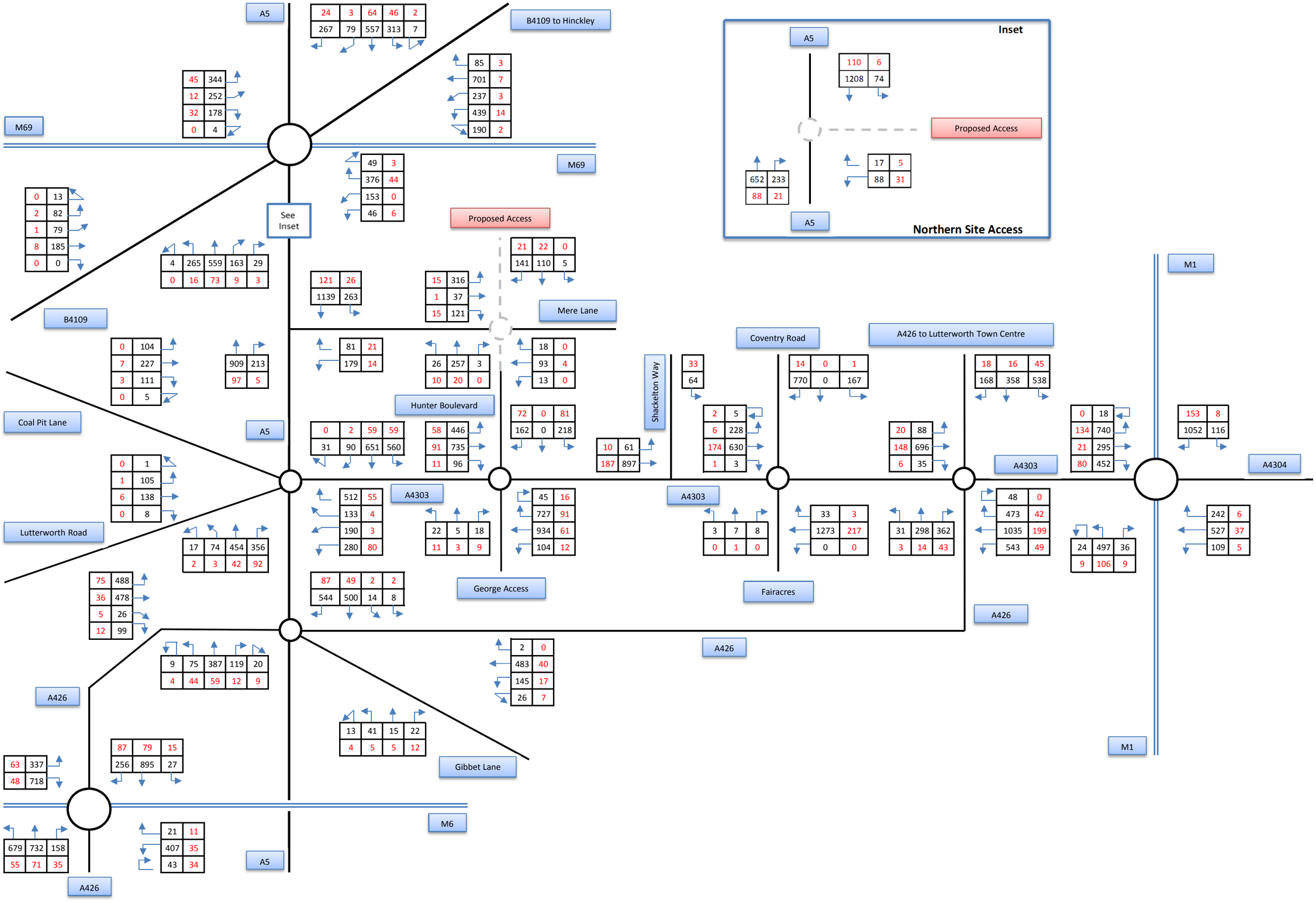



**Figure 2.5: Revised 2026 AM Peak Hour With Development Flows Plus Symmetry Park**

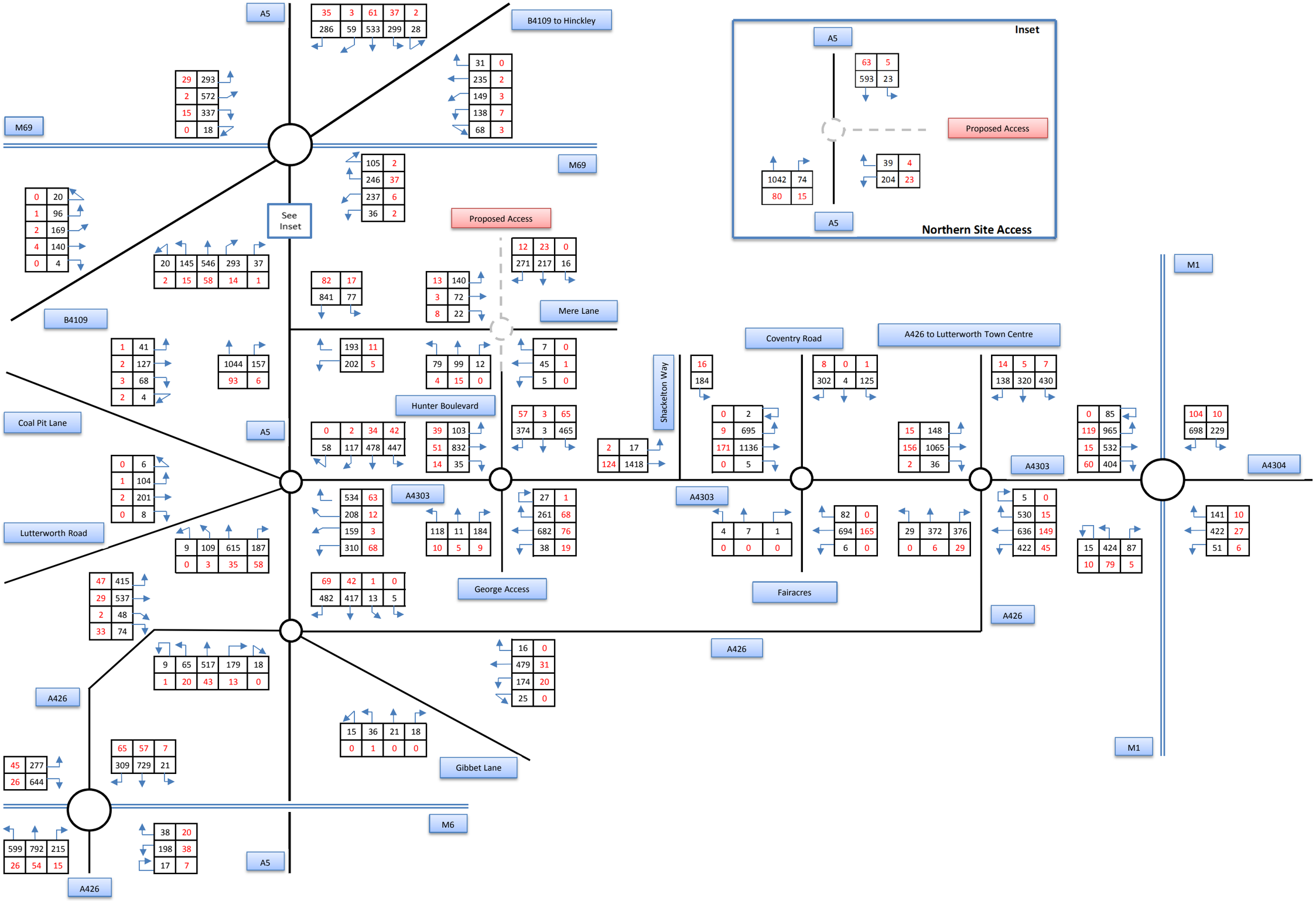
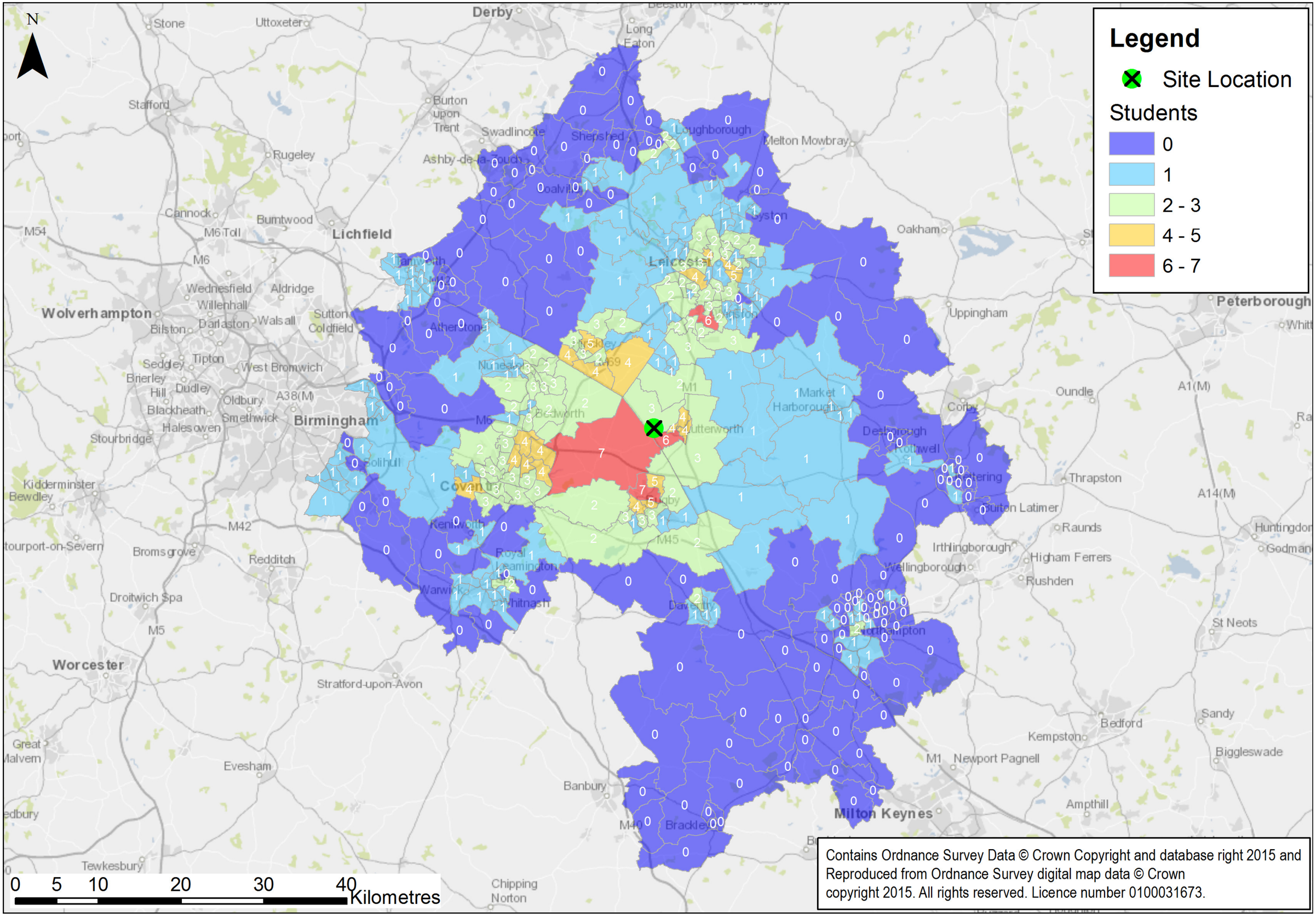



**Figure 2.6: Revised 2026 PM Peak Hour With Development Flows Plus Symmetry Park**

# Magna Park Extension: Hybrid Application
## Supplementary Transport Assessment

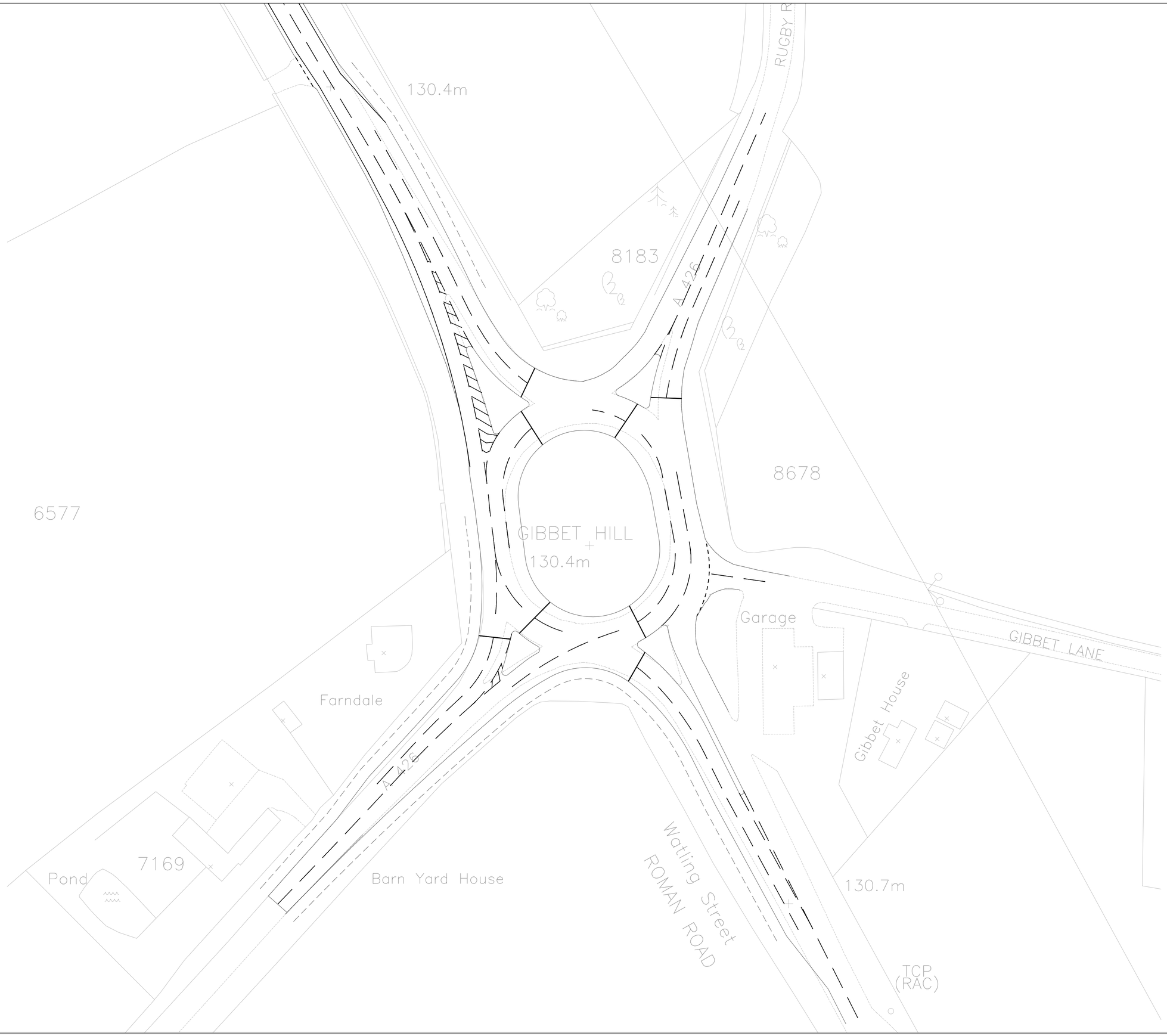
**Appendix D – Distribution of Student Trips**



# Magna Park Extension: Hybrid Application

## Supplementary Transport Assessment

### Appendix E – Proposed Junction Improvements at Gibbet Hill Roundabout

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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROPRIATE METHOD STATEMENT.

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

| Revision Details | By / Check | Date | Suffix |
|---|---|---|---|

Purpose of issue

INFORMATION

Client

IDI Gazeley
Brookfield Logistics Properties™

Project Title

MAGNA PARK EXTENSION
HYBRID APPLICATION

Drawing Title

GIBBET HILL ROUNDABOUT
PROPOSED IMPROVEMENTS

| Designed | Drawn | Checked | Approved | Date |
|---|---|---|---|---|
| SDW | ASR | JRA | SCPF | 01/02/16 |

| AECOM Internal Project No. | Suitability |
|---|---|
| 60470988 | |
| Scale @ A1 | Zone |
| 1:500 | |



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| Drawing Number | Rev |
|---|---|
| 60470988/A001/SK32 | |

Plot Date: 21/2016 11:00 AM
File Name: SK32

# Magna Park Extension: Hybrid Application
## Supplementary Transport Assessment

**Appendix F – Output from Capacity Assessments**

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



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Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\New A5 North Rbt\
Dec 2015 Update Highways England\S4 2026 AM Peak Base+CD+PD.vai"
(drive-on-the-left ) at 09:36:13 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: New A5 North Access- S4 2026 AM Base + PD + CD
LOCATION: New A5 North Roundabout
DATE: 09/01/15
CLIENT: IDI Gazeley
ENUMERATOR: JM
JOB NUMBER: 47071103
STATUS: Final Version
DESCRIPTION:

## INPUT DATA

ARM A - A5 North
ARM B - Proposed Access
ARM C - A5 South

## GEOMETRIC DATA

T5

| I ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| I ARM A | 7.30 | 8.00 | 5.00 | 26.00 | 58.00 | 40.0 | 0.668 | 38.386 |
| I ARM B | 4.00 | 7.00 | 25.00 | 30.00 | 58.00 | 36.0 | 0.595 | 31.006 |
| I ARM C | 7.30 | 7.50 | 5.00 | 18.00 | 58.00 | 47.0 | 0.625 | 35.328 |

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

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | FLOW SCALE(%) |
|---|---|
| I A | 100 |
| I B | 100 |
| I C | 100 |

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: New A5 North Access- S3 2026 Base Plus Proposed Development

T15

| I ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE | TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| I ARM A | 15.00 | 45.00 | 75.00 | 15.20 | 22.80 | 15.20 |
| I ARM B | 15.00 | 45.00 | 75.00 | 1.31 | 1.97 | 1.31 |
| I ARM C | 15.00 | 45.00 | 75.00 | 10.84 | 16.26 | 10.84 |

DEMAND SET TITLE: New A5 North Access- S3 2026 Base Plus Proposed Development

T33

| TIME | FROM/T | ARM A | ARM B | ARM C |
|---|---|---|---|---|
| 07.15 - 08.45 | | | | |
| | ARM A | 0.000 | 0.061 | 0.939 |
| | | 0.0 | 74.0 | 1142.0 |
| | | ( 0.0) | ( 8.1) | ( 8.6) |
| | ARM B | 0.162 | 0.000 | 0.838 |
| | | 17.0 | 0.0 | 88.0 |
| | | ( 29.4) | ( 0.0) | ( 35.2) |
| | ARM C | 0.731 | 0.269 | 0.000 |
| | | 634.0 | 233.0 | 0.0 |
| | | ( 13.1) | ( 9.0) | ( 0.0) |

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

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 07.15-07.30 | | | | | | | | | |
| ARM A | 15.26 | 33.40 | 0.457 | - - - | 0.0 | 0.8 | 12.2 | - | 0.055 |
| ARM B | 1.32 | 16.22 | 0.081 | - - - | 0.0 | 0.1 | 1.3 | - | 0.067 |
| ARM C | 10.88 | 31.39 | 0.347 | - - - | 0.0 | 0.5 | 7.8 | - | 0.049 |
| 07.30-07.45 | | | | | | | | | |
| ARM A | 18.22 | 33.02 | 0.552 | - - - | 0.8 | 1.2 | 17.8 | - | 0.067 |
| ARM B | 1.57 | 14.87 | 0.106 | - - - | 0.1 | 0.1 | 1.7 | - | 0.075 |
| ARM C | 12.99 | 31.36 | 0.414 | - - - | 0.5 | 0.7 | 10.4 | - | 0.054 |
| 07.45-08.00 | | | | | | | | | |
| ARM A | 22.31 | 32.49 | 0.687 | - - - | 1.2 | 2.1 | 30.8 | - | 0.097 |
| ARM B | 1.93 | 13.03 | 0.148 | - - - | 0.1 | 0.2 | 2.5 | - | 0.090 |
| ARM C | 15.91 | 31.32 | 0.508 | - - - | 0.7 | 1.0 | 15.0 | - | 0.065 |
| 08.00-08.15 | | | | | | | | | |
| ARM A | 22.31 | 32.49 | 0.687 | - - - | 2.1 | 2.2 | 32.4 | - | 0.098 |
| ARM B | 1.93 | 13.00 | 0.148 | - - - | 0.2 | 0.2 | 2.6 | - | 0.090 |
| ARM C | 15.91 | 31.32 | 0.508 | - - - | 1.0 | 1.0 | 15.4 | - | 0.065 |
| 08.15-08.30 | | | | | | | | | |
| ARM A | 18.22 | 33.01 | 0.552 | - - - | 2.2 | 1.2 | 19.3 | - | 0.068 |
| ARM B | 1.57 | 14.83 | 0.106 | - - - | 0.2 | 0.1 | 1.8 | - | 0.075 |
| ARM C | 12.99 | 31.36 | 0.414 | - - - | 1.0 | 0.7 | 10.9 | - | 0.055 |
| 08.30-08.45 | | | | | | | | | |
| ARM A | 15.26 | 33.39 | 0.457 | - - - | 1.2 | 0.8 | 13.0 | - | 0.055 |
| ARM B | 1.32 | 16.18 | 0.081 | - - - | 0.1 | 0.1 | 1.4 | - | 0.067 |
| ARM C | 10.88 | 31.39 | 0.347 | - - - | 0.7 | 0.5 | 8.1 | - | 0.049 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.8 | * |
| 07.45 | 1.2 | * |
| 08.00 | 2.1 | ** |
| 08.15 | 2.2 | ** |
| 08.30 | 1.2 | * |
| 08.45 | 0.8 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---|---|
| 07.30 | 0.1 |
| 07.45 | 0.1 |
| 08.00 | 0.2 |
| 08.15 | 0.2 |
| 08.30 | 0.1 |
| 08.45 | 0.1 |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.5 | * |
| 07.45 | 0.7 | * |
| 08.00 | 1.0 | * |
| 08.15 | 1.0 | * |
| 08.30 | 0.7 | * |
| 08.45 | 0.5 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 1673.7 | 1115.8 | 125.5 | 0.07 | 125.5 | 0.07 |
| B | 144.5 | 96.3 | 11.3 | 0.08 | 11.3 | 0.08 |
| C | 1193.4 | 795.6 | 67.5 | 0.06 | 67.5 | 0.06 |
| ALL | 3011.6 | 2007.7 | 204.4 | 0.07 | 204.4 | 0.07 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:48:18 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
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Nine Mile Ride Email: software@trl.co.uk
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RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\New A5 North Rbt\
Dec 2015 Update Highways England\S4 2026 PM Peak Base+CD+PD.vai"
(drive-on-the-left ) at 09:39:44 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: New A5 North Access- S4 2026 PM Base + PD + CD
LOCATION: New A5 North Roundabout
DATE: 09/01/15
CLIENT: IDI Gazeley
ENUMERATOR: JM
JOB NUMBER: 47071103
STATUS: Final Version
DESCRIPTION:

## INPUT DATA

ARM A - A5 North
ARM B - Proposed Access
ARM C - A5 South

## GEOMETRIC DATA

T5

| I ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| I ARM A | 7.30 | 8.00 | 5.00 | 26.00 | 58.00 | 40.0 | 0.668 | 38.386 |
| I ARM B | 4.00 | 7.00 | 25.00 | 30.00 | 58.00 | 36.0 | 0.595 | 31.006 |
| I ARM C | 7.30 | 7.50 | 5.00 | 18.00 | 58.00 | 47.0 | 0.625 | 35.328 |

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

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 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 THE TURNING COUNT DATA

DEMAND SET TITLE: New A5 North Access- S3 2026 Base Plus Proposed Development

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE | NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED | NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | RATE OF FLOW (VEH/MIN) AT TOP OF PEAK | RATE OF FLOW (VEH/MIN) AFTER PEAK |
|---|---|---|---|---|---|---|
| I ARM A | 15.00 | 45.00 | 75.00 | 7.41 | 11.12 | 7.41 |
| I ARM B | 15.00 | 45.00 | 75.00 | 3.04 | 4.56 | 3.04 |
| I ARM C | 15.00 | 45.00 | 75.00 | 13.35 | 20.03 | 13.35 |

DEMAND SET TITLE: New A5 North Access- S3 2026 Base Plus Proposed Development

T33

| TIME | FROM/T | ARM A | ARM B | ARM C |
|---|---|---|---|---|
| 16.45 - 18.15 | | | | |
| | ARM A | 0.000 | 0.039 | 0.961 |
| | | 0.0 | 23.0 | 570.0 |
| | | ( 0.0) | ( 21.7) | ( 10.4) |
| | ARM B | 0.160 | 0.000 | 0.840 |
| | | 39.0 | 0.0 | 204.0 |
| | | ( 10.3) | ( 0.0) | ( 11.3) |
| | ARM C | 0.931 | 0.069 | 0.000 |
| | | 994.0 | 74.0 | 0.0 |
| | | ( 6.7) | ( 20.3) | ( 0.0) |

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

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| 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 | 7.44 | 33.96 | 0.219 | - - - | 0.0 | 0.3 | 4.1 | - | 0.038 |
| ARM B | 3.05 | 23.68 | 0.129 | - - - | 0.0 | 0.1 | 2.2 | - | 0.048 |
| ARM C | 13.40 | 32.51 | 0.412 | - - - | 0.0 | 0.7 | 10.2 | - | 0.052 |
| 17.00-17.15 | | | | | | | | | |
| ARM A | 8.88 | 33.83 | 0.263 | - - - | 0.3 | 0.4 | 5.3 | - | 0.040 |
| ARM B | 3.64 | 22.85 | 0.159 | - - - | 0.1 | 0.2 | 2.8 | - | 0.052 |
| ARM C | 16.00 | 32.45 | 0.493 | - - - | 0.7 | 1.0 | 14.2 | - | 0.061 |
| 17.15-17.30 | | | | | | | | | |
| ARM A | 10.88 | 33.65 | 0.323 | - - - | 0.4 | 0.5 | 7.0 | - | 0.044 |
| ARM B | 4.46 | 21.72 | 0.205 | - - - | 0.2 | 0.3 | 3.8 | - | 0.058 |
| ARM C | 19.60 | 32.36 | 0.606 | - - - | 1.0 | 1.5 | 22.0 | - | 0.078 |
| 17.30-17.45 | | | | | | | | | |
| ARM A | 10.88 | 33.65 | 0.323 | - - - | 0.5 | 0.5 | 7.1 | - | 0.044 |
| ARM B | 4.46 | 21.71 | 0.205 | - - - | 0.3 | 0.3 | 3.9 | - | 0.058 |
| ARM C | 19.60 | 32.36 | 0.606 | - - - | 1.5 | 1.5 | 22.8 | - | 0.078 |
| 17.45-18.00 | | | | | | | | | |
| ARM A | 8.88 | 33.83 | 0.263 | - - - | 0.5 | 0.4 | 5.4 | - | 0.040 |
| ARM B | 3.64 | 22.84 | 0.159 | - - - | 0.3 | 0.2 | 2.9 | - | 0.052 |
| ARM C | 16.00 | 32.44 | 0.493 | - - - | 1.5 | 1.0 | 15.1 | - | 0.061 |
| 18.00-18.15 | | | | | | | | | |
| ARM A | 7.44 | 33.96 | 0.219 | - - - | 0.4 | 0.3 | 4.3 | - | 0.038 |
| ARM B | 3.05 | 23.67 | 0.129 | - - - | 0.2 | 0.1 | 2.3 | - | 0.049 |
| ARM C | 13.40 | 32.51 | 0.412 | - - - | 1.0 | 0.7 | 10.8 | - | 0.052 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---|---|
| 17.00 | 0.3 |
| 17.15 | 0.4 |
| 17.30 | 0.5 |
| 17.45 | 0.5 |
| 18.00 | 0.4 |
| 18.15 | 0.3 |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---|---|
| 17.00 | 0.1 |
| 17.15 | 0.2 |
| 17.30 | 0.3 |
| 17.45 | 0.3 |
| 18.00 | 0.2 |
| 18.15 | 0.1 |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.7 | * |
| 17.15 | 1.0 | * |
| 17.30 | 1.5 | ** |
| 17.45 | 1.5 | ** |
| 18.00 | 1.0 | * |
| 18.15 | 0.7 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 816.2 | 544.1 | 33.3 | 0.04 | 33.3 | 0.04 |
| B | 334.5 | 223.0 | 17.8 | 0.05 | 17.8 | 0.05 |
| C | 1470.0 | 980.0 | 95.1 | 0.06 | 95.1 | 0.06 |
| ALL | 2620.7 | 1747.1 | 146.2 | 0.06 | 146.2 | 0.06 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:49:00 on 01/02/2016]

# A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



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RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\New A5 North Rbt\
Dec 2015 Update Highways England\S5 2026 AM Peak Base+CD+PD+Symmetry.vai"
(drive-on-the-left ) at 09:44:53 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: New A5 North Access- S5 2026 AM Base + PD + CD + Symmetry Park
LOCATION: New A5 North Roundabout
DATE: 09/01/15
CLIENT: IDI Gazeley
ENUMERATOR: JM
JOB NUMBER: 47071103
STATUS: Final Version
DESCRIPTION:

## INPUT DATA

ARM A - A5 North
ARM B - Proposed Access
ARM C - A5 South

## GEOMETRIC DATA

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 7.30 | 8.00 | 5.00 | 26.00 | 58.00 | 40.0 | 0.668 | 38.386 |
| ARM B | 4.00 | 7.00 | 25.00 | 30.00 | 58.00 | 36.0 | 0.595 | 31.006 |
| ARM C | 7.30 | 7.50 | 5.00 | 18.00 | 58.00 | 47.0 | 0.625 | 35.328 |

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

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 100 |

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: New A5 North Access- S3 2026 Base Plus Proposed Development

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK | FLOW STOPS | RATE OF FLOW (VEH/MIN) BEFORE | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| | TO RISE | IS REACHED | FALLING | PEAK | | |
| ARM A | 15.00 | 45.00 | 75.00 | 16.02 | 24.04 | 16.02 |
| ARM B | 15.00 | 45.00 | 75.00 | 1.31 | 1.97 | 1.31 |
| ARM C | 15.00 | 45.00 | 75.00 | 11.06 | 16.59 | 11.06 |

DEMAND SET TITLE: New A5 North Access- S3 2026 Base Plus Proposed Development

T33

| TIME | FROM/T | ARM A | ARM B | ARM C |
|---|---|---|---|---|
| 07.15 - 08.45 | | | | |
| | ARM A | 0.000 | 0.058 | 0.942 |
| | | 0.0 | 74.0 | 1208.0 |
| | | ( 0.0) | ( 8.1) | ( 9.1) |
| | ARM B | 0.162 | 0.000 | 0.838 |
| | | 17.0 | 0.0 | 88.0 |
| | | ( 29.4) | ( 0.0) | ( 35.2) |
| | ARM C | 0.737 | 0.263 | 0.000 |
| | | 652.0 | 233.0 | 0.0 |
| | | ( 13.5) | ( 9.0) | ( 0.0) |

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

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 07.15-07.30 | | | | | | | | | |
| ARM A | 16.09 | 33.26 | 0.484 | - - - | 0.0 | 0.9 | 13.6 | - | 0.058 |
| ARM B | 1.32 | 15.79 | 0.083 | - - - | 0.0 | 0.1 | 1.3 | - | 0.069 |
| ARM C | 11.10 | 31.30 | 0.355 | - - - | 0.0 | 0.5 | 8.0 | - | 0.049 |
| 07.30-07.45 | | | | | | | | | |
| ARM A | 19.21 | 32.87 | 0.584 | - - - | 0.9 | 1.4 | 20.3 | - | 0.073 |
| ARM B | 1.57 | 14.35 | 0.110 | - - - | 0.1 | 0.1 | 1.8 | - | 0.078 |
| ARM C | 13.26 | 31.27 | 0.424 | - - - | 0.5 | 0.7 | 10.8 | - | 0.055 |
| 07.45-08.00 | | | | | | | | | |
| ARM A | 23.53 | 32.35 | 0.727 | - - - | 1.4 | 2.6 | 36.9 | - | 0.111 |
| ARM B | 1.93 | 12.41 | 0.155 | - - - | 0.1 | 0.2 | 2.7 | - | 0.095 |
| ARM C | 16.24 | 31.23 | 0.520 | - - - | 0.7 | 1.1 | 15.7 | - | 0.066 |
| 08.00-08.15 | | | | | | | | | |
| ARM A | 23.53 | 32.35 | 0.727 | - - - | 2.6 | 2.6 | 39.3 | - | 0.113 |
| ARM B | 1.93 | 12.37 | 0.156 | - - - | 0.2 | 0.2 | 2.7 | - | 0.096 |
| ARM C | 16.24 | 31.23 | 0.520 | - - - | 1.1 | 1.1 | 16.1 | - | 0.067 |
| 08.15-08.30 | | | | | | | | | |
| ARM A | 19.21 | 32.87 | 0.584 | - - - | 2.6 | 1.4 | 22.1 | - | 0.074 |
| ARM B | 1.57 | 14.30 | 0.110 | - - - | 0.2 | 0.1 | 1.9 | - | 0.079 |
| ARM C | 13.26 | 31.27 | 0.424 | - - - | 1.1 | 0.7 | 11.3 | - | 0.056 |
| 08.30-08.45 | | | | | | | | | |
| ARM A | 16.09 | 33.25 | 0.484 | - - - | 1.4 | 0.9 | 14.5 | - | 0.058 |
| ARM B | 1.32 | 15.75 | 0.084 | - - - | 0.1 | 0.1 | 1.4 | - | 0.069 |
| ARM C | 11.10 | 31.30 | 0.355 | - - - | 0.7 | 0.6 | 8.4 | - | 0.050 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.9 | * |
| 07.45 | 1.4 | * |
| 08.00 | 2.6 | *** |
| 08.15 | 2.6 | *** |
| 08.30 | 1.4 | * |
| 08.45 | 0.9 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.1 | |
| 07.45 | 0.1 | |
| 08.00 | 0.2 | |
| 08.15 | 0.2 | |
| 08.30 | 0.1 | |
| 08.45 | 0.1 | |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.5 | * |
| 07.45 | 0.7 | * |
| 08.00 | 1.1 | * |
| 08.15 | 1.1 | * |
| 08.30 | 0.7 | * |
| 08.45 | 0.6 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 1764.6 | 1176.4 | 146.5 | 0.08 | 146.6 | 0.08 |
| B | 144.5 | 96.3 | 11.9 | 0.08 | 11.9 | 0.08 |
| C | 1218.1 | 812.1 | 70.4 | 0.06 | 70.5 | 0.06 |
| ALL | 3127.2 | 2084.8 | 228.9 | 0.07 | 228.9 | 0.07 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:49:26 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



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Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\New A5 North Rbt\
Dec 2015 Update Highways England\S5 2026 PM Peak Base+CD+PD+Symmetry.vai"
(drive-on-the-left ) at 09:47:27 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: New A5 North Access- S5 2026 PM Base + PD + CD + Symmetry Park
LOCATION: New A5 North Roundabout
DATE: 01/09/15
CLIENT: IDI Gazeley
ENUMERATOR: JM
JOB NUMBER: 47071103
STATUS: Final Version
DESCRIPTION:

## INPUT DATA

ARM A - A5 North
ARM B - Proposed Access
ARM C - A5 South

## GEOMETRIC DATA

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 7.30 | 8.00 | 5.00 | 26.00 | 58.00 | 40.0 | 0.668 | 38.386 |
| ARM B | 4.00 | 7.00 | 25.00 | 30.00 | 58.00 | 36.0 | 0.595 | 31.006 |
| ARM C | 7.30 | 7.50 | 5.00 | 18.00 | 58.00 | 47.0 | 0.625 | 35.328 |

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

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 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 THE TURNING COUNT DATA

DEMAND SET TITLE: New A5 North Access- S3 2026 Base Plus Proposed Development

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK | TO RISE | FLOW STOPS | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | IS REACHED | 75.00 | 7.70 | 11.55 | 7.70 |
| ARM B | 15.00 | 45.00 | | 75.00 | 3.04 | 4.56 | 3.04 |
| ARM C | 15.00 | 45.00 | | 75.00 | 13.95 | 20.92 | 13.95 |

DEMAND SET TITLE: New A5 North Access- S3 2026 Base Plus Proposed Development

T33

| TIME | FROM/T | ARM A | ARM B | ARM C |
|---|---|---|---|---|
| 16.45 - 18.15 | | | | |
| | ARM A | 0.000 | 0.037 | 0.963 |
| | | 0.0 | 23.0 | 593.0 |
| | | ( 0.0) | ( 21.7) | ( 10.6) |
| | ARM B | 0.160 | 0.000 | 0.840 |
| | | 39.0 | 0.0 | 204.0 |
| | | ( 10.3) | ( 0.0) | ( 11.3) |
| | ARM C | 0.934 | 0.066 | 0.000 |
| | | 1042.0 | 74.0 | 0.0 |
| | | ( 7.7) | ( 20.3) | ( 0.0) |

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

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| 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 | 7.73 | 33.91 | 0.228 | - - - | 0.0 | 0.3 | 4.3 | - | 0.038 |
| ARM B | 3.05 | 23.50 | 0.130 | - - - | 0.0 | 0.1 | 2.2 | - | 0.049 |
| ARM C | 14.00 | 32.24 | 0.434 | - - - | 0.0 | 0.8 | 11.2 | - | 0.054 |
| 17.00-17.15 | | | | | | | | | |
| ARM A | 9.23 | 33.78 | 0.273 | - - - | 0.3 | 0.4 | 5.6 | - | 0.041 |
| ARM B | 3.64 | 22.64 | 0.161 | - - - | 0.1 | 0.2 | 2.8 | - | 0.053 |
| ARM C | 16.72 | 32.18 | 0.520 | - - - | 0.8 | 1.1 | 15.7 | - | 0.065 |
| 17.15-17.30 | | | | | | | | | |
| ARM A | 11.30 | 33.60 | 0.336 | - - - | 0.4 | 0.5 | 7.5 | - | 0.045 |
| ARM B | 4.46 | 21.46 | 0.208 | - - - | 0.2 | 0.3 | 3.9 | - | 0.059 |
| ARM C | 20.48 | 32.10 | 0.638 | - - - | 1.1 | 1.7 | 25.1 | - | 0.085 |
| 17.30-17.45 | | | | | | | | | |
| ARM A | 11.30 | 33.59 | 0.336 | - - - | 0.5 | 0.5 | 7.6 | - | 0.045 |
| ARM B | 4.46 | 21.45 | 0.208 | - - - | 0.3 | 0.3 | 3.9 | - | 0.059 |
| ARM C | 20.48 | 32.09 | 0.638 | - - - | 1.7 | 1.7 | 26.2 | - | 0.086 |
| 17.45-18.00 | | | | | | | | | |
| ARM A | 9.23 | 33.77 | 0.273 | - - - | 0.5 | 0.4 | 5.7 | - | 0.041 |
| ARM B | 3.64 | 22.63 | 0.161 | - - - | 0.3 | 0.2 | 2.9 | - | 0.053 |
| ARM C | 16.72 | 32.18 | 0.520 | - - - | 1.7 | 1.1 | 16.8 | - | 0.065 |
| 18.00-18.15 | | | | | | | | | |
| ARM A | 7.73 | 33.90 | 0.228 | - - - | 0.4 | 0.3 | 4.5 | - | 0.038 |
| ARM B | 3.05 | 23.49 | 0.130 | - - - | 0.2 | 0.1 | 2.3 | - | 0.049 |
| ARM C | 14.00 | 32.24 | 0.434 | - - - | 1.1 | 0.8 | 11.8 | - | 0.055 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.3 | |
| 17.15 | 0.4 | |
| 17.30 | 0.5 | * |
| 17.45 | 0.5 | * |
| 18.00 | 0.4 | |
| 18.15 | 0.3 | |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.1 | |
| 17.15 | 0.2 | |
| 17.30 | 0.3 | |
| 17.45 | 0.3 | |
| 18.00 | 0.2 | |
| 18.15 | 0.1 | |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.8 | * |
| 17.15 | 1.1 | * |
| 17.30 | 1.7 | ** |
| 17.45 | 1.7 | ** |
| 18.00 | 1.1 | * |
| 18.15 | 0.8 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 847.9 | 565.3 | 35.2 | 0.04 | 35.2 | 0.04 |
| B | 334.5 | 223.0 | 18.0 | 0.05 | 18.0 | 0.05 |
| C | 1536.1 | 1024.1 | 106.8 | 0.07 | 106.8 | 0.07 |
| ALL | 2718.4 | 1812.3 | 160.0 | 0.06 | 160.0 | 0.06 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:49:48 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

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Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\Cross in Hand A5_A4303\
Dec 2015 Update Highways England\S4 2026 AM Peak Base+CD+PD.vai"
(drive-on-the-left ) at 09:53:52 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S4 Cross in Hand Roundabout AM Peak 2026 Base + CD + PD
LOCATION: Cross In Hand Roundabout
DATE: 31/07/14
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - A5 North
ARM B - A4303
ARM C - A5 South
ARM D - B4027
ARM E - Coal Pit Lane

## GEOMETRIC DATA

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 4.70 | 7.50 | 47.00 | 45.00 | 98.00 | 48.0 | 0.494 | 34.354 |
| ARM B | 7.10 | 8.80 | 25.00 | 35.00 | 79.00 | 54.0 | 0.566 | 40.232 |
| ARM C | 5.10 | 7.50 | 50.00 | 37.00 | 98.00 | 54.0 | 0.486 | 34.056 |
| ARM D | 3.20 | 6.20 | 24.00 | 40.00 | 88.00 | 64.0 | 0.405 | 24.458 |
| ARM E | 3.50 | 7.20 | 9.00 | 19.00 | 88.00 | 64.0 | 0.384 | 22.641 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START TO FLOW STARTS TO RISE | NUMBER OF MINUTES FROM START TO TOP OF PEAK IS REACHED | NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | RATE OF FLOW (VEH/MIN) AT TOP OF PEAK | RATE OF FLOW (VEH/MIN) AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 15.75 | 23.63 | 15.75 |
| ARM B | 15.00 | 45.00 | 75.00 | 13.21 | 19.82 | 13.21 |
| ARM C | 15.00 | 45.00 | 75.00 | 10.38 | 15.56 | 10.38 |
| ARM D | 15.00 | 45.00 | 75.00 | 3.04 | 4.56 | 3.04 |
| ARM E | 15.00 | 45.00 | 75.00 | 5.24 | 7.86 | 5.24 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/TO | ARM A | ARM B | ARM C | ARM D | ARM E |
|---|---|---|---|---|---|---|
| 07.15 - 08.45 | | TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) | | | | |
| | ARM A | 0.000<br>0.0<br>( 0.0) | 0.387<br>488.0<br>( 9.6) | 0.517<br>651.0<br>( 9.1) | 0.071<br>90.0<br>( 2.2) | 0.025<br>31.0<br>( 0.0) |
| | ARM B | 0.465<br>492.0<br>( 10.2) | 0.000<br>0.0<br>( 0.0) | 0.245<br>259.0<br>( 27.8) | 0.175<br>185.0<br>( 1.1) | 0.114<br>121.0<br>( 0.8) |
| | ARM C | 0.547<br>454.0<br>( 9.3) | 0.343<br>285.0<br>( 24.2) | 0.000<br>0.0<br>( 0.0) | 0.020<br>17.0<br>( 11.8) | 0.089<br>74.0<br>( 4.1) |
| | ARM D | 0.432<br>105.0<br>( 1.0) | 0.531<br>129.0<br>( 3.1) | 0.033<br>8.0<br>( 0.0) | 0.000<br>0.0<br>( 0.0) | 0.004<br>1.0<br>( 0.0) |
| | ARM E | 0.248<br>104.0<br>( 0.0) | 0.475<br>199.0<br>( 1.5) | 0.265<br>111.0<br>( 2.7) | 0.012<br>5.0<br>( 0.0) | 0.000<br>0.0<br>( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 07.15-07.30 | | | | | | | | | |
| ARM A | 15.81 | 27.01 | 0.585 | - - | 0.0 | 1.4 | 20.0 | - | 0.088 |
| ARM B | 13.26 | 29.91 | 0.443 | - - | 0.0 | 0.8 | 11.5 | - | 0.060 |
| ARM C | 10.41 | 24.66 | 0.422 | - - | 0.0 | 0.7 | 10.6 | - | 0.070 |
| ARM D | 3.05 | 15.92 | 0.192 | - - | 0.0 | 0.2 | 3.4 | - | 0.078 |
| ARM E | 5.26 | 14.58 | 0.361 | - - | 0.0 | 0.6 | 8.1 | - | 0.106 |
| 07.30-07.45 | | | | | | | | | |
| ARM A | 18.88 | 26.10 | 0.723 | - - | 1.4 | 2.5 | 35.8 | - | 0.135 |
| ARM B | 15.84 | 28.72 | 0.551 | - - | 0.8 | 1.2 | 17.7 | - | 0.077 |
| ARM C | 12.44 | 23.64 | 0.526 | - - | 0.7 | 1.1 | 16.0 | - | 0.089 |
| ARM D | 3.64 | 14.33 | 0.254 | - - | 0.2 | 0.3 | 5.0 | - | 0.093 |
| ARM E | 6.28 | 13.05 | 0.481 | - - | 0.6 | 0.9 | 13.1 | - | 0.147 |
| 07.45-08.00 | | | | | | | | | |
| ARM A | 23.12 | 24.88 | 0.929 | - - | 2.5 | 9.5 | 112.7 | - | 0.387 |
| ARM B | 19.40 | 27.23 | 0.712 | - - | 1.2 | 2.4 | 34.1 | - | 0.125 |
| ARM C | 15.23 | 22.27 | 0.684 | - - | 1.1 | 2.1 | 29.8 | - | 0.139 |
| ARM D | 4.46 | 12.20 | 0.365 | - - | 0.3 | 0.6 | 8.2 | - | 0.128 |
| ARM E | 7.69 | 10.99 | 0.700 | - - | 0.9 | 2.2 | 29.8 | - | 0.288 |
| 08.00-08.15 | | | | | | | | | |
| ARM A | 23.12 | 24.84 | 0.931 | - - | 9.5 | 10.9 | 154.7 | - | 0.504 |
| ARM B | 19.40 | 27.09 | 0.716 | - - | 2.4 | 2.5 | 36.8 | - | 0.130 |
| ARM C | 15.23 | 22.22 | 0.685 | - - | 2.1 | 2.1 | 31.9 | - | 0.143 |
| ARM D | 4.46 | 12.15 | 0.367 | - - | 0.6 | 0.6 | 8.6 | - | 0.130 |
| ARM E | 7.69 | 10.94 | 0.703 | - - | 2.2 | 2.3 | 33.7 | - | 0.306 |
| 08.15-08.30 | | | | | | | | | |
| ARM A | 18.88 | 26.03 | 0.725 | - - | 10.9 | 2.7 | 49.8 | - | 0.163 |
| ARM B | 15.84 | 28.49 | 0.556 | - - | 2.5 | 1.3 | 19.7 | - | 0.080 |
| ARM C | 12.44 | 23.57 | 0.528 | - - | 2.1 | 1.1 | 17.6 | - | 0.091 |
| ARM D | 3.64 | 14.26 | 0.255 | - - | 0.6 | 0.3 | 5.3 | - | 0.094 |
| ARM E | 6.28 | 12.98 | 0.484 | - - | 2.3 | 1.0 | 15.2 | - | 0.153 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 08.30-08.45 | | | | | | | | | |
| ARM A | 15.81 | 26.97 | 0.586 | - - | - | 2.7 | 1.4 | 22.5 | - | 0.091 |
| ARM B | 13.26 | 29.84 | 0.444 | - - | - | 1.3 | 0.8 | 12.4 | - | 0.061 |
| ARM C | 10.41 | 24.62 | 0.423 | - - | - | 1.1 | 0.7 | 11.4 | - | 0.071 |
| ARM D | 3.05 | 15.86 | 0.192 | - - | - | 0.3 | 0.2 | 3.7 | - | 0.078 |
| ARM E | 5.26 | 14.52 | 0.362 | - - | - | 1.0 | 0.6 | 8.9 | - | 0.109 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 1.4 | * |
| 07.45 | 2.5 | *** |
| 08.00 | 9.5 | ********* |
| 08.15 | 10.9 | ********** |
| 08.30 | 2.7 | *** |
| 08.45 | 1.4 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.8 | * |
| 07.45 | 1.2 | * |
| 08.00 | 2.4 | ** |
| 08.15 | 2.5 | ** |
| 08.30 | 1.3 | * |
| 08.45 | 0.8 | * |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.7 | * |
| 07.45 | 1.1 | * |
| 08.00 | 2.1 | ** |
| 08.15 | 2.1 | ** |
| 08.30 | 1.1 | * |
| 08.45 | 0.7 | * |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.2 | |
| 07.45 | 0.3 | |
| 08.00 | 0.6 | * |
| 08.15 | 0.6 | * |
| 08.30 | 0.3 | |
| 08.45 | 0.2 | |

QUEUE AT ARM E

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.6 | * |
| 07.45 | 0.9 | * |
| 08.00 | 2.2 | ** |
| 08.15 | 2.3 | ** |
| 08.30 | 1.0 | * |
| 08.45 | 0.6 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND | | * QUEUEING * DELAY * | | * INCLUSIVE QUEUEING * DELAY * | |
|---|---|---|---|---|---|---|
| | (VEH) | (VEH/H) | (MIN) | (MIN/VEH) | (MIN) | (MIN/VEH) |
| A | 1734.3 | 1156.2 | 395.4 | 0.23 | 395.4 | 0.23 |
| B | 1454.9 | 969.9 | 132.2 | 0.09 | 132.2 | 0.09 |
| C | 1142.4 | 761.6 | 117.2 | 0.10 | 117.2 | 0.10 |
| D | 334.5 | 223.0 | 34.2 | 0.10 | 34.2 | 0.10 |
| E | 576.7 | 384.5 | 108.7 | 0.19 | 108.7 | 0.19 |
| ALL | 5242.8 | 3495.2 | 787.6 | 0.15 | 787.7 | 0.15 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:50:25 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

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Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
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RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\Cross in Hand A5_A4303\
Dec 2015 Update Highways England\S4 2026 PM Peak Base+CD+PD.vai"
(drive-on-the-left ) at 09:58:43 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S4 Cross in Hand Roundabout PM Peak 2026 Base + CD + PD
LOCATION: Cross In Hand Roundabout
DATE: 31/07/14
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - A5 North
ARM B - A4303
ARM C - A5 South
ARM D - B4027
ARM E - Coal Pit Lane

## GEOMETRIC DATA

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 4.70 | 7.50 | 47.00 | 45.00 | 98.00 | 48.0 | 0.494 | 34.354 |
| ARM B | 7.10 | 8.80 | 25.00 | 35.00 | 79.00 | 54.0 | 0.566 | 40.232 |
| ARM C | 5.10 | 7.50 | 50.00 | 37.00 | 98.00 | 54.0 | 0.486 | 34.056 |
| ARM D | 3.20 | 6.20 | 24.00 | 40.00 | 88.00 | 64.0 | 0.405 | 24.458 |
| ARM E | 3.50 | 7.20 | 9.00 | 19.00 | 88.00 | 64.0 | 0.384 | 22.641 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 100 |
| D | 100 |
| E | 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 THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 13.46 | 20.19 | 13.46 |
| ARM B | 15.00 | 45.00 | 75.00 | 13.19 | 19.78 | 13.19 |
| ARM C | 15.00 | 45.00 | 75.00 | 11.21 | 16.82 | 11.21 |
| ARM D | 15.00 | 45.00 | 75.00 | 3.95 | 5.93 | 3.95 |
| ARM E | 15.00 | 45.00 | 75.00 | 2.89 | 4.33 | 2.89 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

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

| TIME | FROM/TO | ARM A | ARM B | ARM C | ARM D | ARM E |
|---|---|---|---|---|---|---|
| 16.45 - 18.15 | ARM A | 0.000 | 0.394 | 0.444 | 0.109 | 0.054 |
| | | 0.0 | 424.0 | 478.0 | 117.0 | 58.0 |
| | | ( 0.0) | ( 9.0) | ( 7.1) | ( 1.7) | ( 0.0) |
| | ARM B | 0.456 | 0.000 | 0.239 | 0.137 | 0.168 |
| | | 481.0 | 0.0 | 252.0 | 145.0 | 177.0 |
| | | ( 10.2) | ( 0.0) | ( 17.9) | ( 0.0) | ( 2.3) |
| | ARM C | 0.686 | 0.183 | 0.000 | 0.010 | 0.122 |
| | | 615.0 | 164.0 | 0.0 | 9.0 | 109.0 |
| | | ( 5.7) | ( 31.1) | ( 0.0) | ( 0.0) | ( 2.8) |
| | ARM D | 0.329 | 0.627 | 0.025 | 0.000 | 0.019 |
| | | 104.0 | 198.0 | 8.0 | 0.0 | 6.0 |
| | | ( 1.0) | ( 0.6) | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM E | 0.177 | 0.511 | 0.294 | 0.017 | 0.000 |
| | | 41.0 | 118.0 | 68.0 | 4.0 | 0.0 |
| | | ( 2.4) | ( 0.8) | ( 4.4) | ( 50.0) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| 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 | 13.51 | 28.58 | 0.473 | - - | 0.0 | 0.9 | 12.9 | - | 0.066 |
| ARM B | 13.24 | 31.80 | 0.416 | - - | 0.0 | 0.7 | 10.4 | - | 0.054 |
| ARM C | 11.26 | 25.24 | 0.446 | - - | 0.0 | 0.8 | 11.6 | - | 0.071 |
| ARM D | 3.97 | 15.51 | 0.256 | - - | 0.0 | 0.3 | 5.0 | - | 0.086 |
| ARM E | 2.90 | 14.04 | 0.206 | - - | 0.0 | 0.3 | 3.8 | - | 0.089 |
| 17.00-17.15 | | | | | | | | | |
| ARM A | 16.14 | 27.88 | 0.579 | - - | 0.9 | 1.4 | 19.7 | - | 0.085 |
| ARM B | 15.81 | 30.81 | 0.513 | - - | 0.7 | 1.0 | 15.3 | - | 0.066 |
| ARM C | 13.44 | 24.11 | 0.557 | - - | 0.8 | 1.2 | 18.0 | - | 0.093 |
| ARM D | 4.73 | 13.78 | 0.344 | - - | 0.3 | 0.5 | 7.5 | - | 0.110 |
| ARM E | 3.46 | 12.47 | 0.278 | - - | 0.3 | 0.4 | 5.6 | - | 0.111 |
| 17.15-17.30 | | | | | | | | | |
| ARM A | 19.76 | 26.93 | 0.734 | - - | 1.4 | 2.7 | 37.5 | - | 0.136 |
| ARM B | 19.36 | 29.48 | 0.657 | - - | 1.0 | 1.9 | 27.0 | - | 0.098 |
| ARM C | 16.46 | 22.58 | 0.729 | - - | 1.2 | 2.6 | 36.2 | - | 0.159 |
| ARM D | 5.80 | 11.46 | 0.506 | - - | 0.5 | 1.0 | 14.3 | - | 0.175 |
| ARM E | 4.24 | 10.37 | 0.409 | - - | 0.4 | 0.7 | 9.8 | - | 0.162 |
| 17.30-17.45 | | | | | | | | | |
| ARM A | 19.76 | 26.91 | 0.735 | - - | 2.7 | 2.7 | 40.5 | - | 0.140 |
| ARM B | 19.36 | 29.45 | 0.657 | - - | 1.9 | 1.9 | 28.4 | - | 0.099 |
| ARM C | 16.46 | 22.55 | 0.730 | - - | 2.6 | 2.6 | 39.4 | - | 0.164 |
| ARM D | 5.80 | 11.40 | 0.509 | - - | 1.0 | 1.0 | 15.2 | - | 0.179 |
| ARM E | 4.24 | 10.31 | 0.411 | - - | 0.7 | 0.7 | 10.3 | - | 0.165 |
| 17.45-18.00 | | | | | | | | | |
| ARM A | 16.14 | 27.84 | 0.580 | - - | 2.7 | 1.4 | 21.8 | - | 0.087 |
| ARM B | 15.81 | 30.77 | 0.514 | - - | 1.9 | 1.1 | 16.5 | - | 0.067 |
| ARM C | 13.44 | 24.07 | 0.558 | - - | 2.6 | 1.3 | 20.1 | - | 0.096 |
| ARM D | 4.73 | 13.71 | 0.345 | - - | 1.0 | 0.5 | 8.3 | - | 0.112 |
| ARM E | 3.46 | 12.40 | 0.279 | - - | 0.7 | 0.4 | 6.1 | - | 0.112 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 18.00-18.15 | | | | | | | | | |
| ARM A | 13.51 | 28.55 | 0.473 | - - - | 1.4 | 0.9 | 13.9 | - | 0.067 |
| ARM B | 13.24 | 31.76 | 0.417 | - - - | 1.1 | 0.7 | 11.0 | - | 0.054 |
| ARM C | 11.26 | 25.21 | 0.447 | - - - | 1.3 | 0.8 | 12.5 | - | 0.072 |
| ARM D | 3.97 | 15.45 | 0.257 | - - - | 0.5 | 0.3 | 5.3 | - | 0.087 |
| ARM E | 2.90 | 13.98 | 0.207 | - - - | 0.4 | 0.3 | 4.0 | - | 0.090 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.9 | * |
| 17.15 | 1.4 | * |
| 17.30 | 2.7 | *** |
| 17.45 | 2.7 | *** |
| 18.00 | 1.4 | * |
| 18.15 | 0.9 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.7 | * |
| 17.15 | 1.0 | * |
| 17.30 | 1.9 | ** |
| 17.45 | 1.9 | ** |
| 18.00 | 1.1 | * |
| 18.15 | 0.7 | * |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.8 | * |
| 17.15 | 1.2 | * |
| 17.30 | 2.6 | *** |
| 17.45 | 2.6 | *** |
| 18.00 | 1.3 | * |
| 18.15 | 0.8 | * |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.3 | |
| 17.15 | 0.5 | * |
| 17.30 | 1.0 | * |
| 17.45 | 1.0 | * |
| 18.00 | 0.5 | * |
| 18.15 | 0.3 | |

QUEUE AT ARM E

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.3 | |
| 17.15 | 0.4 | |
| 17.30 | 0.7 | * |
| 17.45 | 0.7 | * |
| 18.00 | 0.4 | |
| 18.15 | 0.3 | |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 1482.4 | 988.3 | 146.4 | 0.10 | 146.4 | 0.10 |
| B | 1452.1 | 968.1 | 108.5 | 0.07 | 108.5 | 0.07 |
| C | 1234.7 | 823.1 | 137.8 | 0.11 | 137.8 | 0.11 |
| D | 435.0 | 290.0 | 55.6 | 0.13 | 55.6 | 0.13 |
| E | 318.0 | 212.0 | 39.5 | 0.12 | 39.5 | 0.12 |
| ALL | 4922.1 | 3281.4 | 487.7 | 0.10 | 487.8 | 0.10 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:50:48 on 01/02/2016]

# A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\Cross in Hand A5_A4303\
Dec 2015 Update Highways England\S5 2026 AM Peak Base+CD+PD+Symmetry.vai"
(drive-on-the-left ) at 10:02:24 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S5 Cross in Hand Roundabout AM Peak 2026 Base + CD + PD + Symmetry Park
LOCATION: Cross In Hand Roundabout
DATE: 14/07/31
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - A5 North
ARM B - A4303
ARM C - A5 South
ARM D - B4027
ARM E - Coal Pit Lane

## GEOMETRIC DATA

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 5.00 | 8.60 | 60.00 | 60.00 | 73.00 | 44.0 | 0.596 | 39.854 |
| ARM B | 7.00 | 8.60 | 29.50 | 48.00 | 80.00 | 47.0 | 0.577 | 40.948 |
| ARM C | 4.50 | 7.00 | 23.00 | 48.00 | 80.00 | 41.0 | 0.500 | 31.782 |
| ARM D | 3.50 | 6.00 | 18.00 | 70.00 | 80.00 | 20.0 | 0.487 | 28.255 |
| ARM E | 3.00 | 7.00 | 14.00 | 23.00 | 73.00 | 56.0 | 0.430 | 23.547 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TOP OF PEAK | FLOW STOPS TO RISE | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 16.65 | 24.97 | 16.65 |
| ARM B | 15.00 | 45.00 | 75.00 | 13.94 | 20.91 | 13.94 |
| ARM C | 15.00 | 45.00 | 75.00 | 11.26 | 16.89 | 11.26 |
| ARM D | 15.00 | 45.00 | 75.00 | 3.15 | 4.73 | 3.15 |
| ARM E | 15.00 | 45.00 | 75.00 | 5.59 | 8.38 | 5.59 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/T | ARM A | ARM B | ARM C | ARM D | ARM E |
|---|---|---|---|---|---|---|
| 07.15 - 08.45 | | | | | | |
| | ARM A | 0.000 | 0.420 | 0.489 | 0.068 | 0.023 |
| | | 0.0 | 560.0 | 651.0 | 90.0 | 31.0 |
| | | ( 0.0) | ( 10.5) | ( 9.1) | ( 2.2) | ( 0.0) |
| | ARM B | 0.459 | 0.000 | 0.251 | 0.170 | 0.119 |
| | | 512.0 | 0.0 | 280.0 | 190.0 | 133.0 |
| | | ( 10.7) | ( 0.0) | ( 28.6) | ( 1.6) | ( 3.0) |
| | ARM C | 0.504 | 0.395 | 0.000 | 0.019 | 0.082 |
| | | 454.0 | 356.0 | 0.0 | 17.0 | 74.0 |
| | | ( 9.3) | ( 25.8) | ( 0.0) | ( 11.8) | ( 4.1) |
| | ARM D | 0.417 | 0.548 | 0.032 | 0.000 | 0.004 |
| | | 105.0 | 138.0 | 8.0 | 0.0 | 1.0 |
| | | ( 1.0) | ( 4.3) | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM E | 0.233 | 0.508 | 0.248 | 0.011 | 0.000 |
| | | 104.0 | 227.0 | 111.0 | 5.0 | 0.0 |
| | | ( 0.0) | ( 3.1) | ( 2.7) | ( 0.0) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 07.15-07.30 | | | | | | | | | |
| ARM A | 16.71 | 30.07 | 0.556 | - - - | 0.0 | 1.2 | 17.9 | - | 0.074 |
| ARM B | 13.99 | 30.20 | 0.463 | - - - | 0.0 | 0.9 | 12.5 | - | 0.061 |
| ARM C | 11.31 | 21.98 | 0.514 | - - - | 0.0 | 1.0 | 15.0 | - | 0.092 |
| ARM D | 3.16 | 17.11 | 0.185 | - - - | 0.0 | 0.2 | 3.3 | - | 0.072 |
| ARM E | 5.61 | 13.75 | 0.408 | - - - | 0.0 | 0.7 | 9.7 | - | 0.122 |
| 07.30-07.45 | | | | | | | | | |
| ARM A | 19.96 | 28.79 | 0.693 | - - - | 1.2 | 2.2 | 31.5 | - | 0.111 |
| ARM B | 16.71 | 28.99 | 0.576 | - - - | 0.9 | 1.3 | 19.5 | - | 0.081 |
| ARM C | 13.50 | 20.89 | 0.646 | - - - | 1.0 | 1.8 | 25.4 | - | 0.133 |
| ARM D | 3.78 | 15.06 | 0.251 | - - - | 0.2 | 0.3 | 4.9 | - | 0.089 |
| ARM E | 6.70 | 11.92 | 0.562 | - - - | 0.7 | 1.2 | 17.7 | - | 0.189 |
| 07.45-08.00 | | | | | | | | | |
| ARM A | 24.44 | 27.17 | 0.900 | - - - | 2.2 | 7.5 | 93.1 | - | 0.297 |
| ARM B | 20.46 | 27.46 | 0.745 | - - - | 1.3 | 2.8 | 39.5 | - | 0.139 |
| ARM C | 16.53 | 19.43 | 0.851 | - - - | 1.8 | 5.0 | 65.0 | - | 0.303 |
| ARM D | 4.62 | 12.37 | 0.374 | - - - | 0.3 | 0.6 | 8.5 | - | 0.128 |
| ARM E | 8.20 | 9.51 | 0.863 | - - - | 1.2 | 4.9 | 58.7 | - | 0.575 |
| 08.00-08.15 | | | | | | | | | |
| ARM A | 24.44 | 27.03 | 0.904 | - - - | 7.5 | 8.3 | 119.7 | - | 0.362 |
| ARM B | 20.46 | 27.34 | 0.748 | - - - | 2.8 | 2.9 | 43.2 | - | 0.145 |
| ARM C | 16.53 | 19.38 | 0.853 | - - - | 5.0 | 5.4 | 78.7 | - | 0.341 |
| ARM D | 4.62 | 12.24 | 0.378 | - - - | 0.6 | 0.6 | 9.0 | - | 0.131 |
| ARM E | 8.20 | 9.40 | 0.873 | - - - | 4.9 | 5.7 | 80.2 | - | 0.745 |
| 08.15-08.30 | | | | | | | | | |
| ARM A | 19.96 | 28.57 | 0.699 | - - - | 8.3 | 2.4 | 40.5 | - | 0.127 |
| ARM B | 16.71 | 28.80 | 0.580 | - - - | 2.9 | 1.4 | 21.9 | - | 0.084 |
| ARM C | 13.50 | 20.82 | 0.648 | - - - | 5.4 | 1.9 | 31.2 | - | 0.145 |
| ARM D | 3.78 | 14.87 | 0.254 | - - - | 0.6 | 0.3 | 5.3 | - | 0.090 |
| ARM E | 6.70 | 11.76 | 0.570 | - - - | 5.7 | 1.4 | 24.4 | - | 0.222 |
| 08.30-08.45 | | | | | | | | | |
| ARM A | 16.71 | 29.99 | 0.557 | - - - | 2.4 | 1.3 | 19.8 | - | 0.076 |
| ARM B | 13.99 | 30.13 | 0.464 | - - - | 1.4 | 0.9 | 13.4 | - | 0.062 |
| ARM C | 11.31 | 21.94 | 0.515 | - - - | 1.9 | 1.1 | 16.8 | - | 0.095 |
| ARM D | 3.16 | 17.01 | 0.186 | - - - | 0.3 | 0.2 | 3.5 | - | 0.072 |
| ARM E | 5.61 | 13.67 | 0.410 | - - - | 1.4 | 0.7 | 11.0 | - | 0.125 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 1.2 | * |
| 07.45 | 2.2 | ** |
| 08.00 | 7.5 | ******* |
| 08.15 | 8.3 | ******** |
| 08.30 | 2.4 | ** |
| 08.45 | 1.3 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.9 | * |
| 07.45 | 1.3 | * |
| 08.00 | 2.8 | *** |
| 08.15 | 2.9 | *** |
| 08.30 | 1.4 | * |
| 08.45 | 0.9 | * |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 1.0 | * |
| 07.45 | 1.8 | ** |
| 08.00 | 5.0 | ***** |
| 08.15 | 5.4 | ***** |
| 08.30 | 1.9 | ** |
| 08.45 | 1.1 | * |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.2 | |
| 07.45 | 0.3 | |
| 08.00 | 0.6 | * |
| 08.15 | 0.6 | * |
| 08.30 | 0.3 | |
| 08.45 | 0.2 | |

QUEUE AT ARM E

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.7 | * |
| 07.45 | 1.2 | * |
| 08.00 | 4.9 | ***** |
| 08.15 | 5.7 | ****** |
| 08.30 | 1.4 | * |
| 08.45 | 0.7 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 1833.4 | 1222.3 | 322.4 | 0.18 | 322.5 | 0.18 |
| B | 1534.7 | 1023.1 | 150.0 | 0.10 | 150.0 | 0.10 |
| C | 1240.2 | 826.8 | 232.1 | 0.19 | 232.1 | 0.19 |
| D | 346.9 | 231.2 | 34.5 | 0.10 | 34.5 | 0.10 |
| E | 615.3 | 410.2 | 201.8 | 0.33 | 201.8 | 0.33 |
| ALL | 5570.4 | 3713.6 | 940.8 | 0.17 | 940.9 | 0.17 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:51:12 on 01/02/2016]

# A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\Cross in Hand A5_A4303\
Dec 2015 Update Highways England\S5 2026 PM Peak Base+CD+PD+Symmetry.vai"
(drive-on-the-left ) at 10:09:11 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S5 Cross in Hand Roundabout PM Peak 2026 Base + CD + PD + Symmetry Park
LOCATION: Cross In Hand Roundabout
DATE: 14/07/31
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - A5 North
ARM B - A4303
ARM C - A5 South
ARM D - B4027
ARM E - Coal Pit Lane

## GEOMETRIC DATA

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 5.00 | 8.60 | 60.00 | 60.00 | 73.00 | 44.0 | 0.596 | 39.854 |
| ARM B | 7.00 | 8.60 | 29.50 | 48.00 | 80.00 | 47.0 | 0.577 | 40.948 |
| ARM C | 4.50 | 7.00 | 23.00 | 48.00 | 80.00 | 41.0 | 0.500 | 31.782 |
| ARM D | 3.50 | 6.00 | 18.00 | 70.00 | 80.00 | 20.0 | 0.487 | 28.255 |
| ARM E | 3.00 | 7.00 | 14.00 | 23.00 | 73.00 | 56.0 | 0.430 | 23.547 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 100 |
| D | 100 |
| E | 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 THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED | NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | RATE OF FLOW (VEH/MIN) AT TOP OF PEAK | RATE OF FLOW (VEH/MIN) AFTER PEAK |
|---|---|---|---|---|---|---|
| | TO RISE | | | | | |
| ARM A | 15.00 | 45.00 | 75.00 | 13.75 | 20.63 | 13.75 |
| ARM B | 15.00 | 45.00 | 75.00 | 15.14 | 22.71 | 15.14 |
| ARM C | 15.00 | 45.00 | 75.00 | 11.50 | 17.25 | 11.50 |
| ARM D | 15.00 | 45.00 | 75.00 | 3.99 | 5.98 | 3.99 |
| ARM E | 15.00 | 45.00 | 75.00 | 3.00 | 4.50 | 3.00 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

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

| TIME | FROM/T | ARM A | ARM B | ARM C | ARM D | ARM E |
|---|---|---|---|---|---|---|
| 16.45 - 18.15 | | | | | | |
| | ARM A | 0.000 | 0.406 | 0.435 | 0.106 | 0.053 |
| | | 0.0 | 447.0 | 478.0 | 117.0 | 58.0 |
| | | ( 0.0) | ( 9.4) | ( 7.1) | ( 1.7) | ( 0.0) |
| | ARM B | 0.441 | 0.000 | 0.256 | 0.131 | 0.172 |
| | | 534.0 | 0.0 | 310.0 | 159.0 | 208.0 |
| | | ( 11.8) | ( 0.0) | ( 21.9) | ( 1.9) | ( 5.8) |
| | ARM C | 0.668 | 0.203 | 0.000 | 0.010 | 0.118 |
| | | 615.0 | 187.0 | 0.0 | 9.0 | 109.0 |
| | | ( 5.7) | ( 31.0) | ( 0.0) | ( 0.0) | ( 2.8) |
| | ARM D | 0.326 | 0.630 | 0.025 | 0.000 | 0.019 |
| | | 104.0 | 201.0 | 8.0 | 0.0 | 6.0 |
| | | ( 1.0) | ( 1.0) | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM E | 0.171 | 0.529 | 0.283 | 0.017 | 0.000 |
| | | 41.0 | 127.0 | 68.0 | 4.0 | 0.0 |
| | | ( 2.4) | ( 1.6) | ( 4.4) | ( 50.0) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| 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 | 13.80 | 32.62 | 0.423 | - - - | 0.0 | 0.7 | 10.7 | - | 0.053 |
| ARM B | 15.20 | 31.57 | 0.481 | - - - | 0.0 | 0.9 | 13.4 | - | 0.061 |
| ARM C | 11.54 | 22.20 | 0.520 | - - - | 0.0 | 1.1 | 15.4 | - | 0.093 |
| ARM D | 4.00 | 16.65 | 0.240 | - - - | 0.0 | 0.3 | 4.6 | - | 0.079 |
| ARM E | 3.01 | 13.40 | 0.225 | - - - | 0.0 | 0.3 | 4.2 | - | 0.096 |
| 17.00-17.15 | | | | | | | | | |
| ARM A | 16.48 | 31.72 | 0.520 | - - - | 0.7 | 1.1 | 15.7 | - | 0.065 |
| ARM B | 18.14 | 30.59 | 0.593 | - - - | 0.9 | 1.4 | 20.9 | - | 0.080 |
| ARM C | 13.78 | 20.90 | 0.659 | - - - | 1.1 | 1.9 | 26.8 | - | 0.138 |
| ARM D | 4.78 | 14.42 | 0.331 | - - - | 0.3 | 0.5 | 7.2 | - | 0.103 |
| ARM E | 3.60 | 11.55 | 0.311 | - - - | 0.3 | 0.4 | 6.5 | - | 0.125 |
| 17.15-17.30 | | | | | | | | | |
| ARM A | 20.19 | 30.53 | 0.661 | - - - | 1.1 | 1.9 | 27.5 | - | 0.096 |
| ARM B | 22.22 | 29.26 | 0.759 | - - - | 1.4 | 3.0 | 42.5 | - | 0.138 |
| ARM C | 16.88 | 19.16 | 0.881 | - - - | 1.9 | 6.2 | 77.0 | - | 0.357 |
| ARM D | 5.85 | 11.52 | 0.508 | - - - | 0.5 | 1.0 | 14.4 | - | 0.174 |
| ARM E | 4.40 | 9.14 | 0.482 | - - - | 0.4 | 0.9 | 12.8 | - | 0.208 |
| 17.30-17.45 | | | | | | | | | |
| ARM A | 20.19 | 30.47 | 0.662 | - - - | 1.9 | 1.9 | 29.0 | - | 0.097 |
| ARM B | 22.22 | 29.24 | 0.760 | - - - | 3.0 | 3.1 | 46.2 | - | 0.142 |
| ARM C | 16.88 | 19.12 | 0.883 | - - - | 6.2 | 6.8 | 97.7 | - | 0.424 |
| ARM D | 5.85 | 11.35 | 0.516 | - - - | 1.0 | 1.0 | 15.5 | - | 0.182 |
| ARM E | 4.40 | 9.01 | 0.489 | - - - | 0.9 | 0.9 | 13.9 | - | 0.217 |
| 17.45-18.00 | | | | | | | | | |
| ARM A | 16.48 | 31.62 | 0.521 | - - - | 1.9 | 1.1 | 17.0 | - | 0.066 |
| ARM B | 18.14 | 30.55 | 0.594 | - - - | 3.1 | 1.5 | 23.2 | - | 0.082 |
| ARM C | 13.78 | 20.84 | 0.661 | - - - | 6.8 | 2.0 | 34.1 | - | 0.155 |
| ARM D | 4.78 | 14.18 | 0.337 | - - - | 1.0 | 0.5 | 8.0 | - | 0.107 |
| ARM E | 3.60 | 11.36 | 0.317 | - - - | 0.9 | 0.5 | 7.3 | - | 0.130 |
| 18.00-18.15 | | | | | | | | | |
| ARM A | 13.80 | 32.58 | 0.424 | - - - | 1.1 | 0.7 | 11.3 | - | 0.053 |
| ARM B | 15.20 | 31.54 | 0.482 | - - - | 1.5 | 0.9 | 14.4 | - | 0.061 |
| ARM C | 11.54 | 22.15 | 0.521 | - - - | 2.0 | 1.1 | 17.2 | - | 0.095 |
| ARM D | 4.00 | 16.55 | 0.242 | - - - | 0.5 | 0.3 | 4.9 | - | 0.080 |
| ARM E | 3.01 | 13.31 | 0.226 | - - - | 0.5 | 0.3 | 4.5 | - | 0.097 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.7 | * |
| 17.15 | 1.1 | * |
| 17.30 | 1.9 | ** |
| 17.45 | 1.9 | ** |
| 18.00 | 1.1 | * |
| 18.15 | 0.7 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.9 | * |
| 17.15 | 1.4 | * |
| 17.30 | 3.0 | *** |
| 17.45 | 3.1 | *** |
| 18.00 | 1.5 | * |
| 18.15 | 0.9 | * |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 1.1 | * |
| 17.15 | 1.9 | ** |
| 17.30 | 6.2 | ****** |
| 17.45 | 6.8 | ******* |
| 18.00 | 2.0 | ** |
| 18.15 | 1.1 | * |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.3 | |
| 17.15 | 0.5 | |
| 17.30 | 1.0 | * |
| 17.45 | 1.0 | * |
| 18.00 | 0.5 | * |
| 18.15 | 0.3 | |

QUEUE AT ARM E

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.3 | |
| 17.15 | 0.4 | |
| 17.30 | 0.9 | * |
| 17.45 | 0.9 | * |
| 18.00 | 0.5 | |
| 18.15 | 0.3 | |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND | | * QUEUEING * DELAY * | | * INCLUSIVE QUEUEING * DELAY * | |
|---|---|---|---|---|---|---|
| | (VEH) | (VEH/H) | (MIN) | (MIN/VEH) | (MIN) | (MIN/VEH) |
| A | 1514.1 | 1009.4 | 111.1 | 0.07 | 111.2 | 0.07 |
| B | 1666.9 | 1111.2 | 160.7 | 0.10 | 160.7 | 0.10 |
| C | 1266.3 | 844.2 | 268.2 | 0.21 | 268.2 | 0.21 |
| D | 439.1 | 292.7 | 54.5 | 0.12 | 54.5 | 0.12 |
| E | 330.3 | 220.2 | 49.3 | 0.15 | 49.3 | 0.15 |
| ALL | 5216.7 | 3477.8 | 643.8 | 0.12 | 643.8 | 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

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

Printed at 16:51:37 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
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RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\A4303_A426\
Dec 2015 Update Highways England\S4 AM 2026 Base+CD+PD+Imps.vai"
(drive-on-the-left ) at 14:45:57 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S4 A4303/ A426 Roundabout AM Peak 2026 Base + CD + PD + Improvements
LOCATION: A4303_Rugby Road
DATE: 14/07/31
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - Rugby Road
ARM B - A4303 East
ARM C - A426 South
ARM D - A4303 West

## GEOMETRIC DATA

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 3.30 | 10.50 | 41.00 | 22.00 | 74.00 | 44.0 | 0.570 | 38.181 |
| ARM B | 7.30 | 10.50 | 41.00 | 20.00 | 74.00 | 42.0 | 0.657 | 47.722 |
| ARM C | 3.20 | 10.50 | 40.00 | 22.00 | 74.00 | 48.0 | 0.557 | 37.146 |
| ARM D | 7.30 | 10.50 | 30.00 | 22.00 | 74.00 | 46.0 | 0.643 | 46.415 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM B Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 13.10 | 19.65 | 13.10 |
| ARM B | 15.00 | 45.00 | 75.00 | 24.60 | 36.90 | 24.60 |
| ARM C | 15.00 | 45.00 | 75.00 | 8.64 | 12.96 | 8.64 |
| ARM D | 15.00 | 45.00 | 75.00 | 9.65 | 14.47 | 9.65 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/T | ARM A | ARM B | ARM C | ARM D |
|---|---|---|---|---|---|
| 07.15 - 08.45 | | TURNING PROPORTIONS | | | |
| | ARM A | 0.000 | 0.513 | 0.342 | 0.145 |
| | | TURNING COUNTS | | | |
| | | 0.0 | 538.0 | 358.0 | 152.0 |
| | | (PERCENTAGE OF H.V.S) | | | |
| | | ( 0.0) | ( 8.4) | ( 4.5) | ( 8.6) |
| | ARM B | 0.240 | 0.024 | 0.276 | 0.459 |
| | | 473.0 | 48.0 | 543.0 | 904.0 |
| | | ( 8.9) | ( 0.0) | ( 9.0) | ( 17.0) |
| | ARM C | 0.431 | 0.524 | 0.000 | 0.045 |
| | | 298.0 | 362.0 | 0.0 | 31.0 |
| | | ( 4.7) | ( 11.9) | ( 0.0) | ( 9.7) |
| | ARM D | 0.106 | 0.848 | 0.045 | 0.000 |
| | | 82.0 | 655.0 | 35.0 | 0.0 |
| | | ( 22.0) | ( 21.1) | ( 17.1) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 07.15-07.30 | | | | | | | | | |
| ARM A | 13.15 | 27.09 | 0.485 | - - | 0.0 | 0.9 | 13.6 | - | 0.071 |
| ARM B | 24.69 | 38.21 | 0.646 | - - | 0.0 | 1.8 | 25.9 | - | 0.073 |
| ARM C | 8.67 | 22.75 | 0.381 | - - | 0.0 | 0.6 | 8.9 | - | 0.071 |
| ARM D | 9.69 | 29.86 | 0.324 | - - | 0.0 | 0.5 | 7.0 | - | 0.049 |
| 07.30-07.45 | | | | | | | | | |
| ARM A | 15.70 | 25.41 | 0.618 | - - | 0.9 | 1.6 | 22.9 | - | 0.102 |
| ARM B | 29.49 | 37.38 | 0.789 | - - | 1.8 | 3.6 | 50.3 | - | 0.123 |
| ARM C | 10.35 | 20.52 | 0.505 | - - | 0.6 | 1.0 | 14.6 | - | 0.098 |
| ARM D | 11.57 | 28.19 | 0.410 | - - | 0.5 | 0.7 | 10.2 | - | 0.060 |
| 07.45-08.00 | | | | | | | | | |
| ARM A | 19.23 | 23.15 | 0.831 | - - | 1.6 | 4.5 | 59.5 | - | 0.233 |
| ARM B | 36.11 | 36.28 | 0.995 | - - | 3.6 | 21.9 | 225.6 | - | 0.502 |
| ARM C | 12.68 | 17.92 | 0.708 | - - | 1.0 | 2.3 | 32.3 | - | 0.185 |
| ARM D | 14.17 | 26.10 | 0.543 | - - | 0.7 | 1.2 | 17.0 | - | 0.083 |
| 08.00-08.15 | | | | | | | | | |
| ARM A | 19.23 | 23.10 | 0.833 | - - | 4.5 | 4.7 | 69.5 | - | 0.256 |
| ARM B | 36.11 | 36.23 | 0.997 | - - | 21.9 | 30.8 | 399.2 | - | 0.852 |
| ARM C | 12.68 | 17.64 | 0.719 | - - | 2.3 | 2.5 | 36.4 | - | 0.200 |
| ARM D | 14.17 | 25.96 | 0.546 | - - | 1.2 | 1.2 | 17.8 | - | 0.085 |
| 08.15-08.30 | | | | | | | | | |
| ARM A | 15.70 | 25.32 | 0.620 | - - | 4.7 | 1.7 | 26.8 | - | 0.108 |
| ARM B | 29.49 | 37.30 | 0.790 | - - | 30.8 | 4.0 | 116.4 | - | 0.215 |
| ARM C | 10.35 | 19.70 | 0.526 | - - | 2.5 | 1.1 | 17.7 | - | 0.109 |
| ARM D | 11.57 | 27.84 | 0.415 | - - | 1.2 | 0.7 | 11.0 | - | 0.062 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 08.30-08.45 | | | | | | | | | |
| ARM A | 13.15 | 27.04 | 0.486 | - - | - | 1.7 | 1.0 | 14.8 | - | 0.072 |
| ARM B | 24.69 | 38.17 | 0.647 | - - | - | 4.0 | 1.9 | 29.1 | - | 0.076 |
| ARM C | 8.67 | 22.63 | 0.383 | - - | - | 1.1 | 0.6 | 9.6 | - | 0.072 |
| ARM D | 9.69 | 29.78 | 0.325 | - - | - | 0.7 | 0.5 | 7.4 | - | 0.050 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.9 | * |
| 07.45 | 1.6 | ** |
| 08.00 | 4.5 | **** |
| 08.15 | 4.7 | ***** |
| 08.30 | 1.7 | ** |
| 08.45 | 1.0 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 1.8 | ** |
| 07.45 | 3.6 | **** |
| 08.00 | 21.9 | ********** |
| 08.15 | 30.8 | ********** |
| 08.30 | 4.0 | **** |
| 08.45 | 1.9 | ** |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.6 | * |
| 07.45 | 1.0 | * |
| 08.00 | 2.3 | ** |
| 08.15 | 2.5 | ** |
| 08.30 | 1.1 | * |
| 08.45 | 0.6 | * |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.5 | |
| 07.45 | 0.7 | * |
| 08.00 | 1.2 | * |
| 08.15 | 1.2 | * |
| 08.30 | 0.7 | * |
| 08.45 | 0.5 | |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND | | * QUEUEING * DELAY * | | * INCLUSIVE QUEUEING * DELAY * | |
|---|---|---|---|---|---|---|
| | (VEH) | (VEH/H) | (MIN) | (MIN/VEH) | (MIN) | (MIN/VEH) |
| A | 1442.5 | 961.7 | 207.1 | 0.14 | 207.1 | 0.14 |
| B | 2708.8 | 1805.9 | 846.5 | 0.31 | 846.5 | 0.31 |
| C | 951.1 | 634.1 | 119.5 | 0.13 | 119.5 | 0.13 |
| D | 1062.6 | 708.4 | 70.4 | 0.07 | 70.4 | 0.07 |
| ALL | 6165.0 | 4110.0 | 1243.5 | 0.20 | 1243.6 | 0.20 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:52:15 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

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Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\A4303_A426\
Dec 2015 Update Highways England\S4 PM 2026 Base+CD+PD+Imps.vai"
(drive-on-the-left ) at 14:48:47 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S4 A4303/ A426 Roundabout PM Peak 2026 Base + CD + PD + Improvements
LOCATION: A4303_Rugby Road
DATE: 14/07/31
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - Rugby Road
ARM B - A4303 East
ARM C - A426 South
ARM D - A4303 West

## GEOMETRIC DATA

T5

| I ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| I ARM A I | 3.30 | 10.50 | 41.00 | 22.00 | 74.00 | 44.0 | 0.570 | 38.181 |
| I ARM B I | 7.30 | 10.50 | 41.00 | 20.00 | 74.00 | 42.0 | 0.657 | 47.722 |
| I ARM C I | 3.20 | 10.50 | 40.00 | 22.00 | 74.00 | 48.0 | 0.557 | 37.146 |
| I ARM D I | 7.30 | 10.50 | 30.00 | 22.00 | 74.00 | 46.0 | 0.643 | 46.415 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM B Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | 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 THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE | TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 11.02 | 16.54 | 11.02 |
| ARM B | 15.00 | 45.00 | 75.00 | 19.39 | 29.08 | 19.39 |
| ARM C | 15.00 | 45.00 | 75.00 | 9.71 | 14.57 | 9.71 |
| ARM D | 15.00 | 45.00 | 75.00 | 14.05 | 21.08 | 14.05 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

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

| TIME | FROM/T | ARM A | ARM B | ARM C | ARM D |
|---|---|---|---|---|---|
| 16.45 - 18.15 | ARM A | 0.000 | 0.488 | 0.363 | 0.150 |
| | | 0.0 | 430.0 | 320.0 | 132.0 |
| | | ( 0.0) | ( 1.6) | ( 1.6) | ( 9.9) |
| | ARM B | 0.342 | 0.003 | 0.272 | 0.383 |
| | | 530.0 | 5.0 | 422.0 | 594.0 |
| | | ( 2.8) | ( 0.0) | ( 10.7) | ( 22.7) |
| | ARM C | 0.479 | 0.484 | 0.000 | 0.037 |
| | | 372.0 | 376.0 | 0.0 | 29.0 |
| | | ( 1.6) | ( 7.7) | ( 0.0) | ( 0.0) |
| | ARM D | 0.117 | 0.851 | 0.032 | 0.000 |
| | | 131.0 | 957.0 | 36.0 | 0.0 |
| | | ( 8.4) | ( 13.6) | ( 5.6) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| 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 | 11.07 | 26.50 | 0.418 | - - - | 0.0 | 0.7 | 10.4 | - | 0.064 |
| ARM B | 19.46 | 38.69 | 0.503 | - - - | 0.0 | 1.0 | 14.7 | - | 0.052 |
| ARM C | 9.75 | 26.06 | 0.374 | - - - | 0.0 | 0.6 | 8.7 | - | 0.061 |
| ARM D | 14.10 | 31.67 | 0.445 | - - - | 0.0 | 0.8 | 11.7 | - | 0.057 |
| 17.00-17.15 | | | | | | | | | |
| ARM A | 13.21 | 24.41 | 0.541 | - - - | 0.7 | 1.2 | 16.9 | - | 0.089 |
| ARM B | 23.24 | 37.96 | 0.612 | - - - | 1.0 | 1.6 | 22.7 | - | 0.068 |
| ARM C | 11.64 | 24.20 | 0.481 | - - - | 0.6 | 0.9 | 13.4 | - | 0.079 |
| ARM D | 16.84 | 29.80 | 0.565 | - - - | 0.8 | 1.3 | 18.7 | - | 0.077 |
| 17.15-17.30 | | | | | | | | | |
| ARM A | 16.18 | 21.61 | 0.749 | - - - | 1.2 | 2.9 | 39.3 | - | 0.177 |
| ARM B | 28.46 | 36.99 | 0.769 | - - - | 1.6 | 3.2 | 45.4 | - | 0.114 |
| ARM C | 14.26 | 21.69 | 0.658 | - - - | 0.9 | 1.9 | 26.6 | - | 0.132 |
| ARM D | 20.63 | 27.28 | 0.756 | - - - | 1.3 | 3.0 | 41.5 | - | 0.145 |
| 17.30-17.45 | | | | | | | | | |
| ARM A | 16.18 | 21.53 | 0.752 | - - - | 2.9 | 2.9 | 43.7 | - | 0.187 |
| ARM B | 28.46 | 36.95 | 0.770 | - - - | 3.2 | 3.3 | 49.0 | - | 0.117 |
| ARM C | 14.26 | 21.63 | 0.659 | - - - | 1.9 | 1.9 | 28.4 | - | 0.136 |
| ARM D | 20.63 | 27.22 | 0.758 | - - - | 3.0 | 3.1 | 45.5 | - | 0.151 |
| 17.45-18.00 | | | | | | | | | |
| ARM A | 13.21 | 24.31 | 0.544 | - - - | 2.9 | 1.2 | 19.0 | - | 0.092 |
| ARM B | 23.24 | 37.91 | 0.613 | - - - | 3.3 | 1.6 | 25.0 | - | 0.069 |
| ARM C | 11.64 | 24.12 | 0.483 | - - - | 1.9 | 0.9 | 14.6 | - | 0.081 |
| ARM D | 16.84 | 29.72 | 0.567 | - - - | 3.1 | 1.3 | 20.7 | - | 0.079 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 18.00-18.15 | | | | | | | | | |
| ARM A | 11.07 | 26.43 | 0.419 | - - - | 1.2 | 0.7 | 11.2 | - | 0.065 |
| ARM B | 19.46 | 38.66 | 0.503 | - - - | 1.6 | 1.0 | 15.7 | - | 0.052 |
| ARM C | 9.75 | 26.01 | 0.375 | - - - | 0.9 | 0.6 | 9.3 | - | 0.062 |
| ARM D | 14.10 | 31.61 | 0.446 | - - - | 1.3 | 0.8 | 12.5 | - | 0.057 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.7 | * |
| 17.15 | 1.2 | * |
| 17.30 | 2.9 | *** |
| 17.45 | 2.9 | *** |
| 18.00 | 1.2 | * |
| 18.15 | 0.7 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 1.0 | * |
| 17.15 | 1.6 | ** |
| 17.30 | 3.2 | *** |
| 17.45 | 3.3 | *** |
| 18.00 | 1.6 | ** |
| 18.15 | 1.0 | * |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.6 | * |
| 17.15 | 0.9 | * |
| 17.30 | 1.9 | ** |
| 17.45 | 1.9 | ** |
| 18.00 | 0.9 | * |
| 18.15 | 0.6 | * |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.8 | * |
| 17.15 | 1.3 | * |
| 17.30 | 3.0 | *** |
| 17.45 | 3.1 | *** |
| 18.00 | 1.3 | * |
| 18.15 | 0.8 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND | | * QUEUEING * DELAY * | | * INCLUSIVE QUEUEING * DELAY * | |
|---|---|---|---|---|---|---|
| | (VEH) | (VEH/H) | (MIN) | (MIN/VEH) | (MIN) | (MIN/VEH) |
| A | 1214.0 | 809.3 | 140.4 | 0.12 | 140.5 | 0.12 |
| B | 2134.8 | 1423.2 | 172.5 | 0.08 | 172.5 | 0.08 |
| C | 1069.5 | 713.0 | 100.9 | 0.09 | 100.9 | 0.09 |
| D | 1547.1 | 1031.4 | 150.5 | 0.10 | 150.5 | 0.10 |
| ALL | 5965.4 | 3977.0 | 564.4 | 0.09 | 564.4 | 0.09 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:52:39 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\A4303_A426\
Dec 2015 Update Highways England\S5 AM 2026 Base+CD+PD+Symmetry+Imps.vai"
(drive-on-the-left ) at 14:51:44 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S5 A4303/ A426 Roundabout AM Peak 2026 Base + CD + PD + Symmetry Park + Improvem
LOCATION: A4303_Rugby Road
DATE: 14/07/31
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - Rugby Road
ARM B - A4303 East
ARM C - A426 South
ARM D - A4303 West

## GEOMETRIC DATA

T5

| I ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 3.30 | 10.50 | 41.00 | 22.00 | 74.00 | 44.0 | 0.570 | 38.181 |
| ARM B | 7.30 | 10.50 | 41.00 | 20.00 | 74.00 | 42.0 | 0.657 | 47.722 |
| ARM C | 3.20 | 10.50 | 40.00 | 22.00 | 74.00 | 48.0 | 0.557 | 37.146 |
| ARM D | 7.30 | 10.50 | 30.00 | 22.00 | 74.00 | 46.0 | 0.643 | 46.415 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM B Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 13.30 | 19.95 | 13.30 |
| ARM B | 15.00 | 45.00 | 75.00 | 26.24 | 39.36 | 26.24 |
| ARM C | 15.00 | 45.00 | 75.00 | 8.64 | 12.96 | 8.64 |
| ARM D | 15.00 | 45.00 | 75.00 | 10.24 | 15.36 | 10.24 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/T | ARM A | ARM B | ARM C | ARM D |
|---|---|---|---|---|---|
| 07.15 - 08.45 | | | | | |
| | ARM A | 0.000 | 0.506 | 0.336 | 0.158 |
| | | 0.0 | 538.0 | 358.0 | 168.0 |
| | | ( 0.0) | ( 8.4) | ( 4.5) | ( 10.7) |
| | ARM B | 0.225 | 0.023 | 0.259 | 0.493 |
| | | 473.0 | 48.0 | 543.0 | 1035.0 |
| | | ( 8.9) | ( 0.0) | ( 9.0) | ( 19.2) |
| | ARM C | 0.431 | 0.524 | 0.000 | 0.045 |
| | | 298.0 | 362.0 | 0.0 | 31.0 |
| | | ( 4.7) | ( 11.9) | ( 0.0) | ( 9.7) |
| | ARM D | 0.107 | 0.850 | 0.043 | 0.000 |
| | | 88.0 | 696.0 | 35.0 | 0.0 |
| | | ( 22.7) | ( 21.3) | ( 17.1) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 07.15-07.30 | | | | | | | | | |
| ARM A | 13.35 | 26.67 | 0.501 | - - | 0.0 | 1.0 | 14.4 | - | 0.074 |
| ARM B | 26.34 | 37.60 | 0.700 | - - | 0.0 | 2.3 | 32.6 | - | 0.086 |
| ARM C | 8.67 | 21.50 | 0.403 | - - | 0.0 | 0.7 | 9.7 | - | 0.077 |
| ARM D | 10.28 | 29.80 | 0.345 | - - | 0.0 | 0.5 | 7.7 | - | 0.051 |
| 07.30-07.45 | | | | | | | | | |
| ARM A | 15.94 | 24.93 | 0.640 | - - | 1.0 | 1.7 | 24.9 | - | 0.110 |
| ARM B | 31.45 | 36.75 | 0.856 | - - | 2.3 | 5.5 | 73.8 | - | 0.175 |
| ARM C | 10.35 | 19.05 | 0.543 | - - | 0.7 | 1.2 | 16.9 | - | 0.114 |
| ARM D | 12.27 | 28.15 | 0.436 | - - | 0.5 | 0.8 | 11.3 | - | 0.063 |
| 07.45-08.00 | | | | | | | | | |
| ARM A | 19.52 | 22.61 | 0.863 | - - | 1.7 | 5.6 | 71.4 | - | 0.279 |
| ARM B | 38.52 | 35.65 | 1.081 | - - | 5.5 | 54.9 | 475.6 | - | 1.000 |
| ARM C | 12.68 | 17.00 | 0.746 | - - | 1.2 | 2.8 | 38.0 | - | 0.221 |
| ARM D | 15.03 | 26.34 | 0.571 | - - | 0.8 | 1.3 | 19.0 | - | 0.088 |
| 08.00-08.15 | | | | | | | | | |
| ARM A | 19.52 | 22.56 | 0.866 | - - | 5.6 | 6.0 | 87.0 | - | 0.322 |
| ARM B | 38.52 | 35.58 | 1.083 | - - | 54.9 | 100.0 | 1163.3 | - | 2.278 |
| ARM C | 12.68 | 16.85 | 0.752 | - - | 2.8 | 2.9 | 43.1 | - | 0.238 |
| ARM D | 15.03 | 26.25 | 0.573 | - - | 1.3 | 1.3 | 19.8 | - | 0.089 |
| 08.15-08.30 | | | | | | | | | |
| ARM A | 15.94 | 24.80 | 0.643 | - - | 6.0 | 1.8 | 30.3 | - | 0.120 |
| ARM B | 31.45 | 36.65 | 0.858 | - - | 100.0 | 27.5 | 955.9 | - | 1.804 |
| ARM C | 10.35 | 16.81 | 0.616 | - - | 2.9 | 1.6 | 26.2 | - | 0.159 |
| ARM D | 12.27 | 27.37 | 0.448 | - - | 1.3 | 0.8 | 12.6 | - | 0.066 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 08.30-08.45 | | | | | | | | | |
| ARM A | 13.35 | 26.58 | 0.502 | - - - | 1.8 | 1.0 | 15.8 | - | 0.076 |
| ARM B | 26.34 | 37.56 | 0.701 | - - - | 27.5 | 2.4 | 69.2 | - | 0.124 |
| ARM C | 8.67 | 20.69 | 0.419 | - - - | 1.6 | 0.7 | 11.3 | - | 0.084 |
| ARM D | 10.28 | 29.48 | 0.349 | - - - | 0.8 | 0.5 | 8.2 | - | 0.052 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 1.0 | * |
| 07.45 | 1.7 | ** |
| 08.00 | 5.6 | ****** |
| 08.15 | 6.0 | ****** |
| 08.30 | 1.8 | ** |
| 08.45 | 1.0 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 2.3 | ** |
| 07.45 | 5.5 | ***** |
| 08.00 | 54.9 | ********** |
| 08.15 | 100.0 | ********** |
| 08.30 | 27.5 | ********** |
| 08.45 | 2.4 | ** |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.7 | * |
| 07.45 | 1.2 | * |
| 08.00 | 2.8 | *** |
| 08.15 | 2.9 | *** |
| 08.30 | 1.6 | ** |
| 08.45 | 0.7 | * |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.5 | * |
| 07.45 | 0.8 | * |
| 08.00 | 1.3 | * |
| 08.15 | 1.3 | * |
| 08.30 | 0.8 | * |
| 08.45 | 0.5 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 1464.5 | 976.3 | 243.8 | 0.17 | 243.8 | 0.17 |
| B | 2889.1 | 1926.1 | 2770.3 | 0.96 | 2770.4 | 0.96 |
| C | 951.1 | 634.1 | 145.2 | 0.15 | 145.2 | 0.15 |
| D | 1127.3 | 751.5 | 78.6 | 0.07 | 78.6 | 0.07 |
| ALL | 6432.0 | 4288.0 | 3237.9 | 0.50 | 3238.0 | 0.50 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

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# A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

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Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\A4303_A426\
Dec 2015 Update Highways England\S5 PM 2026 Base+CD+PD+Symmetry+Imps.vai"
(drive-on-the-left ) at 14:58:10 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S5 A4303/ A426 Roundabout PM Peak 2026 Base + CD + PD + Symmetry + Improvements
LOCATION: A4303_Rugby Road
DATE: 14/07/31
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - Rugby Road
ARM B - A4303 East
ARM C - A426 South
ARM D - A4303 West

## GEOMETRIC DATA

T5

| I ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| I ARM A I | 3.30 | 10.50 | 41.00 | 22.00 | 74.00 | 44.0 | 0.570 | 38.181 |
| I ARM B I | 7.30 | 10.50 | 41.00 | 20.00 | 74.00 | 42.0 | 0.657 | 47.722 |
| I ARM C I | 3.20 | 10.50 | 40.00 | 22.00 | 74.00 | 48.0 | 0.557 | 37.146 |
| I ARM D I | 7.30 | 10.50 | 30.00 | 22.00 | 74.00 | 46.0 | 0.643 | 46.415 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM B Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | 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 THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 11.10 | 16.65 | 11.10 |
| ARM B | 15.00 | 45.00 | 75.00 | 19.91 | 29.87 | 19.91 |
| ARM C | 15.00 | 45.00 | 75.00 | 9.71 | 14.57 | 9.71 |
| ARM D | 15.00 | 45.00 | 75.00 | 15.61 | 23.42 | 15.61 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/T | ARM A | ARM B | ARM C | ARM D |
|---|---|---|---|---|---|
| 16.45 - 18.15 | | TURNING PROPORTIONS | | | |
| | ARM A | 0.000 | 0.484 | 0.360 | 0.155 |
| | | TURNING COUNTS | | | |
| | | 0.0 | 430.0 | 320.0 | 138.0 |
| | | (PERCENTAGE OF H.V.S) | | | |
| | | ( 0.0) | ( 1.6) | ( 1.6) | ( 10.1) |
| | ARM B | 0.333 | 0.003 | 0.265 | 0.399 |
| | | 530.0 | 5.0 | 422.0 | 636.0 |
| | | ( 2.8) | ( 0.0) | ( 10.7) | ( 23.4) |
| | ARM C | 0.479 | 0.484 | 0.000 | 0.037 |
| | | 372.0 | 376.0 | 0.0 | 29.0 |
| | | ( 1.6) | ( 7.7) | ( 0.0) | ( 0.0) |
| | ARM D | 0.118 | 0.853 | 0.029 | 0.000 |
| | | 148.0 | 1065.0 | 36.0 | 0.0 |
| | | ( 10.1) | ( 14.7) | ( 5.6) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| 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 | 11.14 | 25.55 | 0.436 | - - | 0.0 | 0.8 | 11.2 | - | 0.069 |
| ARM B | 19.99 | 38.45 | 0.520 | - - | 0.0 | 1.1 | 15.7 | - | 0.054 |
| ARM C | 9.75 | 25.64 | 0.380 | - - | 0.0 | 0.6 | 8.9 | - | 0.063 |
| ARM D | 15.67 | 31.35 | 0.500 | - - | 0.0 | 1.0 | 14.4 | - | 0.063 |
| 17.00-17.15 | | | | | | | | | |
| ARM A | 13.30 | 23.29 | 0.571 | - - | 0.8 | 1.3 | 19.0 | - | 0.099 |
| ARM B | 23.87 | 37.72 | 0.633 | - - | 1.1 | 1.7 | 24.7 | - | 0.072 |
| ARM C | 11.64 | 23.70 | 0.491 | - - | 0.6 | 1.0 | 13.9 | - | 0.083 |
| ARM D | 18.71 | 29.50 | 0.634 | - - | 1.0 | 1.7 | 24.6 | - | 0.092 |
| 17.15-17.30 | | | | | | | | | |
| ARM A | 16.30 | 20.30 | 0.803 | - - | 1.3 | 3.8 | 50.5 | - | 0.232 |
| ARM B | 29.23 | 36.76 | 0.795 | - - | 1.7 | 3.7 | 51.9 | - | 0.128 |
| ARM C | 14.26 | 21.09 | 0.676 | - - | 1.0 | 2.0 | 28.6 | - | 0.143 |
| ARM D | 22.92 | 27.01 | 0.849 | - - | 1.7 | 5.1 | 67.3 | - | 0.221 |
| 17.30-17.45 | | | | | | | | | |
| ARM A | 16.30 | 20.16 | 0.808 | - - | 3.8 | 4.0 | 58.9 | - | 0.255 |
| ARM B | 29.23 | 36.71 | 0.796 | - - | 3.7 | 3.8 | 56.8 | - | 0.133 |
| ARM C | 14.26 | 21.02 | 0.678 | - - | 2.0 | 2.1 | 30.9 | - | 0.147 |
| ARM D | 22.92 | 26.95 | 0.851 | - - | 5.1 | 5.4 | 79.2 | - | 0.245 |
| 17.45-18.00 | | | | | | | | | |
| ARM A | 13.30 | 23.10 | 0.576 | - - | 4.0 | 1.4 | 22.1 | - | 0.106 |
| ARM B | 23.87 | 37.65 | 0.634 | - - | 3.8 | 1.8 | 27.5 | - | 0.074 |
| ARM C | 11.64 | 23.60 | 0.493 | - - | 2.1 | 1.0 | 15.3 | - | 0.085 |
| ARM D | 18.71 | 29.41 | 0.636 | - - | 5.4 | 1.8 | 28.8 | - | 0.098 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 18.00-18.15 | | | | | | | | | |
| ARM A | 11.14 | 25.47 | 0.437 | - - - | 1.4 | 0.8 | 12.1 | - | 0.070 |
| ARM B | 19.99 | 38.42 | 0.520 | - - - | 1.8 | 1.1 | 16.8 | - | 0.055 |
| ARM C | 9.75 | 25.58 | 0.381 | - - - | 1.0 | 0.6 | 9.5 | - | 0.063 |
| ARM D | 15.67 | 31.29 | 0.501 | - - - | 1.8 | 1.0 | 15.6 | - | 0.064 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.8 | * |
| 17.15 | 1.3 | * |
| 17.30 | 3.8 | **** |
| 17.45 | 4.0 | **** |
| 18.00 | 1.4 | * |
| 18.15 | 0.8 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 1.1 | * |
| 17.15 | 1.7 | ** |
| 17.30 | 3.7 | **** |
| 17.45 | 3.8 | **** |
| 18.00 | 1.8 | ** |
| 18.15 | 1.1 | * |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.6 | * |
| 17.15 | 1.0 | * |
| 17.30 | 2.0 | ** |
| 17.45 | 2.1 | ** |
| 18.00 | 1.0 | * |
| 18.15 | 0.6 | * |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 1.0 | * |
| 17.15 | 1.7 | ** |
| 17.30 | 5.1 | ***** |
| 17.45 | 5.4 | ***** |
| 18.00 | 1.8 | ** |
| 18.15 | 1.0 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 1222.3 | 814.8 | 173.7 | 0.14 | 173.7 | 0.14 |
| B | 2192.6 | 1461.8 | 193.4 | 0.09 | 193.4 | 0.09 |
| C | 1069.5 | 713.0 | 107.1 | 0.10 | 107.1 | 0.10 |
| D | 1719.2 | 1146.1 | 229.8 | 0.13 | 229.9 | 0.13 |
| ALL | 6203.6 | 4135.7 | 704.0 | 0.11 | 704.1 | 0.11 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:53:26 on 01/02/2016]

# A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\M1 Junction 20\
Dec 2015 Update Highways England\S4 2026 AM Peak Base+CD+PD.vai"
(drive-on-the-left ) at 15:06:35 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S4 M1 Junction 20 AM Peak 2026 Base + CD + PD
LOCATION: M1 Junction 20
DATE: 14/07/31
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - M1 North
ARM B - A4304
ARM C - M1 South
ARM D - A4303

## GEOMETRIC DATA

GRADE SEPARATED / MOTORWAY FACTORS APPLY TO ALL ARMS

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 7.30 | 12.70 | 35.00 | 45.00 | 103.00 | 43.0 | 1.171 | 60.667 |
| ARM B | 3.50 | 7.70 | 51.00 | 45.00 | 176.00 | 40.0 | 0.749 | 42.425 |
| ARM C | 7.30 | 12.00 | 49.00 | 50.00 | 103.00 | 41.0 | 0.920 | 57.132 |
| ARM D | 7.30 | 8.90 | 7.00 | 50.00 | 176.00 | 35.0 | 1.125 | 55.156 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM B Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

DATA FOR VERY LARGE ROUNDABOUTS

| ARM | CIRFLO | SEP |
|---|---|---|
| A | 16.0 | 120.0 |
| B | 27.0 | 0.0 |
| C | 33.0 | 120.0 |
| D | 6.0 | 0.0 |

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 13.46 | 20.19 | 13.46 |
| ARM B | 15.00 | 45.00 | 75.00 | 10.61 | 15.92 | 10.61 |
| ARM C | 15.00 | 45.00 | 75.00 | 6.82 | 10.24 | 6.82 |
| ARM D | 15.00 | 45.00 | 75.00 | 18.30 | 27.45 | 18.30 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/TO | ARM A | ARM B | ARM C | ARM D |
|---|---|---|---|---|---|
| 07.15 - 08.45 | | | | | |
| | ARM A | 0.000 | 0.108 | 0.000 | 0.892 |
| | | 0.0 | 116.0 | 0.0 | 961.0 |
| | | ( 0.0) | ( 6.9) | ( 0.0) | ( 12.7) |
| | ARM B | 0.285 | 0.000 | 0.128 | 0.587 |
| | | 242.0 | 0.0 | 109.0 | 498.0 |
| | | ( 2.5) | ( 0.0) | ( 4.6) | ( 5.4) |
| | ARM C | 0.000 | 0.066 | 0.044 | 0.890 |
| | | 0.0 | 36.0 | 24.0 | 486.0 |
| | | ( 0.0) | ( 25.0) | ( 37.5) | ( 21.0) |
| | ARM D | 0.486 | 0.195 | 0.306 | 0.012 |
| | | 712.0 | 286.0 | 448.0 | 18.0 |
| | | ( 17.8) | ( 6.6) | ( 17.6) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 07.15-07.30 | | | | | | | | | |
| ARM A | 13.51 | 42.00 | 0.322 | - - | 0.0 | 0.5 | 7.0 | - | 0.035 |
| ARM B | 10.65 | 25.71 | 0.414 | - - | 0.0 | 0.7 | 10.2 | - | 0.066 |
| ARM C | 6.85 | 29.16 | 0.235 | - - | 0.0 | 0.3 | 4.5 | - | 0.045 |
| ARM D | 18.37 | 43.85 | 0.419 | - - | 0.0 | 0.7 | 10.6 | - | 0.039 |
| 07.30-07.45 | | | | | | | | | |
| ARM A | 16.14 | 39.62 | 0.407 | - - | 0.5 | 0.7 | 10.1 | - | 0.043 |
| ARM B | 12.72 | 22.79 | 0.558 | - - | 0.7 | 1.2 | 18.0 | - | 0.099 |
| ARM C | 8.18 | 25.69 | 0.318 | - - | 0.3 | 0.5 | 6.8 | - | 0.057 |
| ARM D | 21.94 | 43.07 | 0.509 | - - | 0.7 | 1.0 | 15.2 | - | 0.047 |
| 07.45-08.00 | | | | | | | | | |
| ARM A | 19.76 | 36.38 | 0.543 | - - | 0.7 | 1.2 | 17.2 | - | 0.060 |
| ARM B | 15.58 | 18.81 | 0.828 | - - | 1.2 | 4.4 | 56.7 | - | 0.275 |
| ARM C | 10.02 | 21.07 | 0.475 | - - | 0.5 | 0.9 | 13.0 | - | 0.090 |
| ARM D | 26.86 | 42.05 | 0.639 | - - | 1.0 | 1.7 | 25.4 | - | 0.065 |
| 08.00-08.15 | | | | | | | | | |
| ARM A | 19.76 | 36.34 | 0.544 | - - | 1.2 | 1.2 | 17.8 | - | 0.060 |
| ARM B | 15.58 | 18.77 | 0.830 | - - | 4.4 | 4.6 | 67.6 | - | 0.308 |
| ARM C | 10.02 | 20.92 | 0.479 | - - | 0.9 | 0.9 | 13.6 | - | 0.092 |
| ARM D | 26.86 | 41.99 | 0.640 | - - | 1.7 | 1.8 | 26.4 | - | 0.066 |
| 08.15-08.30 | | | | | | | | | |
| ARM A | 16.14 | 39.57 | 0.408 | - - | 1.2 | 0.7 | 10.6 | - | 0.043 |
| ARM B | 12.72 | 22.74 | 0.559 | - - | 4.6 | 1.3 | 21.0 | - | 0.104 |
| ARM C | 8.18 | 25.48 | 0.321 | - - | 0.9 | 0.5 | 7.3 | - | 0.058 |
| ARM D | 21.94 | 42.99 | 0.510 | - - | 1.8 | 1.0 | 16.1 | - | 0.048 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 08.30-08.45 | | | | | | | | | |
| ARM A | 13.51 | 41.95 | 0.322 | - - - | 0.7 | 0.5 | 7.2 | - | 0.035 |
| ARM B | 10.65 | 25.66 | 0.415 | - - - | 1.3 | 0.7 | 11.0 | - | 0.067 |
| ARM C | 6.85 | 29.06 | 0.236 | - - - | 0.5 | 0.3 | 4.7 | - | 0.045 |
| ARM D | 18.37 | 43.82 | 0.419 | - - - | 1.0 | 0.7 | 11.1 | - | 0.039 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.5 | |
| 07.45 | 0.7 | * |
| 08.00 | 1.2 | * |
| 08.15 | 1.2 | * |
| 08.30 | 0.7 | * |
| 08.45 | 0.5 | |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.7 | * |
| 07.45 | 1.2 | * |
| 08.00 | 4.4 | **** |
| 08.15 | 4.6 | ***** |
| 08.30 | 1.3 | * |
| 08.45 | 0.7 | * |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.3 | |
| 07.45 | 0.5 | |
| 08.00 | 0.9 | * |
| 08.15 | 0.9 | * |
| 08.30 | 0.5 | |
| 08.45 | 0.3 | |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.7 | * |
| 07.45 | 1.0 | * |
| 08.00 | 1.7 | ** |
| 08.15 | 1.8 | ** |
| 08.30 | 1.0 | * |
| 08.45 | 0.7 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| A | 1482.4 | 988.3 | 69.9 | 0.05 | 69.9 | 0.05 |
| B | 1168.6 | 779.1 | 184.5 | 0.16 | 184.5 | 0.16 |
| C | 751.5 | 501.0 | 50.0 | 0.07 | 50.0 | 0.07 |
| D | 2015.1 | 1343.4 | 104.7 | 0.05 | 104.7 | 0.05 |
| ALL | 5417.6 | 3611.7 | 409.1 | 0.08 | 409.1 | 0.08 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:54:01 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

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Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
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RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\M1 Junction 20\
Dec 2015 Update Highways England\S4 2026 PM Peak Base+CD+PD.vai"
(drive-on-the-left ) at 15:10:11 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S4 M1 Junction 20 PM Peak 2026 Base + CD + PD
LOCATION: M1 Junction 20
DATE: 31/07/14
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - M1 North
ARM B - A4304
ARM C - M1 South
ARM D - A4303

## GEOMETRIC DATA

GRADE SEPARATED / MOTORWAY FACTORS APPLY TO ALL ARMS

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 7.30 | 12.70 | 35.00 | 45.00 | 103.00 | 43.0 | 1.217 | 61.363 |
| ARM B | 3.50 | 7.70 | 51.00 | 45.00 | 176.00 | 40.0 | 0.817 | 43.817 |
| ARM C | 7.30 | 12.00 | 49.00 | 50.00 | 103.00 | 41.0 | 1.027 | 58.756 |
| ARM D | 7.30 | 8.90 | 7.00 | 50.00 | 176.00 | 35.0 | 1.138 | 55.388 |

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

**WARNING** ARM A Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM B Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

DATA FOR VERY LARGE ROUNDABOUTS

| ARM | CIRFLO | SEP |
|---|---|---|
| A | 13.0 | 120.0 |
| B | 21.0 | 0.0 |
| C | 26.0 | 120.0 |
| D | 5.0 | 0.0 |

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | 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 THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED | NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | RATE OF FLOW (VEH/MIN) AT TOP OF PEAK | RATE OF FLOW (VEH/MIN) AFTER PEAK |
|---|---|---|---|---|---|---|
| | TO RISE | | | | | |
| ARM A | 15.00 | 45.00 | 75.00 | 11.23 | 16.84 | 11.23 |
| ARM B | 15.00 | 45.00 | 75.00 | 7.56 | 11.34 | 7.56 |
| ARM C | 15.00 | 45.00 | 75.00 | 6.53 | 9.79 | 6.53 |
| ARM D | 15.00 | 45.00 | 75.00 | 23.48 | 35.21 | 23.48 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/TO | TURNING PROPORTIONS / TURNING COUNTS / (PERCENTAGE OF H.V.S) ARM A | ARM B | ARM C | ARM D |
|---|---|---|---|---|---|
| 16.45 - 18.15 | ARM A | 0.000 | 0.255 | 0.000 | 0.745 |
| | | 0.0 | 229.0 | 0.0 | 669.0 |
| | | ( 0.0) | ( 4.4) | ( 0.0) | ( 14.1) |
| | ARM B | 0.233 | 0.000 | 0.084 | 0.683 |
| | | 141.0 | 0.0 | 51.0 | 413.0 |
| | | ( 7.1) | ( 0.0) | ( 11.8) | ( 5.8) |
| | ARM C | 0.000 | 0.167 | 0.029 | 0.805 |
| | | 0.0 | 87.0 | 15.0 | 420.0 |
| | | ( 0.0) | ( 5.7) | ( 66.7) | ( 18.6) |
| | ARM D | 0.474 | 0.271 | 0.210 | 0.045 |
| | | 890.0 | 508.0 | 395.0 | 85.0 |
| | | ( 11.4) | ( 1.8) | ( 14.7) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| 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 | 11.27 | 38.99 | 0.289 | - - - | 0.0 | 0.4 | 6.0 | - | 0.036 |
| ARM B | 7.59 | 28.38 | 0.267 | - - - | 0.0 | 0.4 | 5.3 | - | 0.048 |
| ARM C | 6.55 | 34.20 | 0.192 | - - - | 0.0 | 0.2 | 3.5 | - | 0.036 |
| ARM D | 23.56 | 47.32 | 0.498 | - - - | 0.0 | 1.0 | 14.5 | - | 0.042 |
| 17.00-17.15 | | | | | | | | | |
| ARM A | 13.45 | 35.85 | 0.375 | - - - | 0.4 | 0.6 | 8.8 | - | 0.045 |
| ARM B | 9.06 | 25.89 | 0.350 | - - - | 0.4 | 0.5 | 7.9 | - | 0.059 |
| ARM C | 7.82 | 31.12 | 0.251 | - - - | 0.2 | 0.3 | 5.0 | - | 0.043 |
| ARM D | 28.14 | 46.63 | 0.603 | - - - | 1.0 | 1.5 | 22.1 | - | 0.054 |
| 17.15-17.30 | | | | | | | | | |
| ARM A | 16.48 | 31.59 | 0.522 | - - - | 0.6 | 1.1 | 15.8 | - | 0.066 |
| ARM B | 11.10 | 22.50 | 0.493 | - - - | 0.5 | 1.0 | 14.0 | - | 0.087 |
| ARM C | 9.58 | 26.94 | 0.356 | - - - | 0.3 | 0.5 | 8.1 | - | 0.058 |
| ARM D | 34.46 | 45.70 | 0.754 | - - - | 1.5 | 3.0 | 42.7 | - | 0.087 |
| 17.30-17.45 | | | | | | | | | |
| ARM A | 16.48 | 31.53 | 0.523 | - - - | 1.1 | 1.1 | 16.3 | - | 0.066 |
| ARM B | 11.10 | 22.46 | 0.494 | - - - | 1.0 | 1.0 | 14.5 | - | 0.088 |
| ARM C | 9.58 | 26.89 | 0.356 | - - - | 0.5 | 0.6 | 8.3 | - | 0.058 |
| ARM D | 34.46 | 45.69 | 0.754 | - - - | 3.0 | 3.0 | 45.3 | - | 0.089 |
| 17.45-18.00 | | | | | | | | | |
| ARM A | 13.45 | 35.77 | 0.376 | - - - | 1.1 | 0.6 | 9.3 | - | 0.045 |
| ARM B | 9.06 | 25.83 | 0.351 | - - - | 1.0 | 0.5 | 8.3 | - | 0.060 |
| ARM C | 7.82 | 31.05 | 0.252 | - - - | 0.6 | 0.3 | 5.1 | - | 0.043 |
| ARM D | 28.14 | 46.62 | 0.604 | - - - | 3.0 | 1.5 | 23.8 | - | 0.055 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 18.00-18.15 | | | | | | | | | |
| ARM A | 11.27 | 38.92 | 0.290 | - - - | 0.6 | 0.4 | 6.2 | - | 0.036 |
| ARM B | 7.59 | 28.33 | 0.268 | - - - | 0.5 | 0.4 | 5.6 | - | 0.048 |
| ARM C | 6.55 | 34.13 | 0.192 | - - - | 0.3 | 0.2 | 3.6 | - | 0.036 |
| ARM D | 23.56 | 47.31 | 0.498 | - - - | 1.5 | 1.0 | 15.3 | - | 0.042 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.4 | |
| 17.15 | 0.6 | * |
| 17.30 | 1.1 | * |
| 17.45 | 1.1 | * |
| 18.00 | 0.6 | * |
| 18.15 | 0.4 | |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.4 | |
| 17.15 | 0.5 | * |
| 17.30 | 1.0 | * |
| 17.45 | 1.0 | * |
| 18.00 | 0.5 | * |
| 18.15 | 0.4 | |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.2 | |
| 17.15 | 0.3 | |
| 17.30 | 0.5 | * |
| 17.45 | 0.6 | * |
| 18.00 | 0.3 | |
| 18.15 | 0.2 | |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 1.0 | * |
| 17.15 | 1.5 | ** |
| 17.30 | 3.0 | *** |
| 17.45 | 3.0 | *** |
| 18.00 | 1.5 | ** |
| 18.15 | 1.0 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND | | * QUEUEING * DELAY * | | * INCLUSIVE QUEUEING * DELAY * | |
|---|---|---|---|---|---|---|
| | (VEH) | (VEH/H) | (MIN) | (MIN/VEH) | (MIN) | (MIN/VEH) |
| A | 1236.0 | 824.0 | 62.3 | 0.05 | 62.4 | 0.05 |
| B | 832.7 | 555.2 | 55.7 | 0.07 | 55.7 | 0.07 |
| C | 718.5 | 479.0 | 33.5 | 0.05 | 33.5 | 0.05 |
| D | 2584.9 | 1723.3 | 163.5 | 0.06 | 163.5 | 0.06 |
| ALL | 5372.2 | 3581.5 | 315.1 | 0.06 | 315.1 | 0.06 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:54:22 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770758
Crowthorne House Fax: +44 (0) 1344 770356
Nine Mile Ride Email: software@trl.co.uk
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RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\M1 Junction 20\
Dec 2015 Update Highways England\S5 2026 AM Peak Base+CD+PD+Symmetry.vai"
(drive-on-the-left ) at 15:13:54 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S5 M1 Junction 20 AM Peak 2026 Base + CD + PD + Symmetry Park
LOCATION: M1 Junction 20
DATE: 31/07/14
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - M1 North
ARM B - A4304
ARM C - M1 South
ARM D - A4303

## GEOMETRIC DATA

GRADE SEPARATED / MOTORWAY FACTORS APPLY TO ALL ARMS

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 7.00 | 13.00 | 6.50 | 50.00 | 98.00 | 42.0 | 1.005 | 48.972 |
| ARM B | 3.25 | 9.00 | 150.00 | 70.00 | 100.00 | 45.0 | 0.846 | 49.806 |
| ARM C | 6.00 | 11.00 | 70.00 | 70.00 | 100.00 | 41.0 | 0.879 | 53.264 |
| ARM D | 7.00 | 8.00 | 2.00 | 70.00 | 100.00 | 45.0 | 1.033 | 49.758 |

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

**WARNING** ARM B Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

DATA FOR VERY LARGE ROUNDABOUTS

| ARM | CIRFLO | SEP |
|---|---|---|
| A | 16.0 | 120.0 |
| B | 27.0 | 0.0 |
| C | 33.0 | 120.0 |
| D | 6.0 | 0.0 |

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 14.60 | 21.90 | 14.60 |
| ARM B | 15.00 | 45.00 | 75.00 | 10.98 | 16.46 | 10.98 |
| ARM C | 15.00 | 45.00 | 75.00 | 6.96 | 10.44 | 6.96 |
| ARM D | 15.00 | 45.00 | 75.00 | 18.81 | 28.22 | 18.81 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/T | ARM A | ARM B | ARM C | ARM D |
|---|---|---|---|---|---|
| 07.15 - 08.45 | | | | | |
| | ARM A | 0.000 | 0.099 | 0.000 | 0.901 |
| | | 0.0 | 116.0 | 0.0 | 1052.0 |
| | | ( 0.0) | ( 6.9) | ( 0.0) | ( 14.5) |
| | ARM B | 0.276 | 0.000 | 0.124 | 0.600 |
| | | 242.0 | 0.0 | 109.0 | 527.0 |
| | | ( 2.5) | ( 0.0) | ( 4.6) | ( 7.0) |
| | ARM C | 0.000 | 0.065 | 0.043 | 0.892 |
| | | 0.0 | 36.0 | 24.0 | 497.0 |
| | | ( 0.0) | ( 25.0) | ( 37.5) | ( 21.3) |
| | ARM D | 0.492 | 0.196 | 0.300 | 0.012 |
| | | 740.0 | 295.0 | 452.0 | 18.0 |
| | | ( 18.1) | ( 7.1) | ( 17.7) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 07.15-07.30 | | | | | | | | | |
| ARM A | 14.66 | 32.63 | 0.449 | - - | 0.0 | 0.8 | 11.8 | - | 0.055 |
| ARM B | 11.02 | 29.30 | 0.376 | - - | 0.0 | 0.6 | 8.8 | - | 0.054 |
| ARM C | 6.99 | 25.28 | 0.276 | - - | 0.0 | 0.4 | 5.6 | - | 0.054 |
| ARM D | 18.88 | 39.40 | 0.479 | - - | 0.0 | 0.9 | 13.4 | - | 0.048 |
| 07.30-07.45 | | | | | | | | | |
| ARM A | 17.50 | 30.58 | 0.572 | - - | 0.8 | 1.3 | 19.2 | - | 0.076 |
| ARM B | 13.16 | 25.78 | 0.510 | - - | 0.6 | 1.0 | 15.0 | - | 0.079 |
| ARM C | 8.35 | 21.70 | 0.385 | - - | 0.4 | 0.6 | 9.1 | - | 0.075 |
| ARM D | 22.55 | 38.69 | 0.583 | - - | 0.9 | 1.4 | 20.2 | - | 0.062 |
| 07.45-08.00 | | | | | | | | | |
| ARM A | 21.43 | 27.81 | 0.771 | - - | 1.3 | 3.2 | 44.6 | - | 0.151 |
| ARM B | 16.11 | 21.05 | 0.765 | - - | 1.0 | 3.1 | 42.2 | - | 0.192 |
| ARM C | 10.22 | 16.92 | 0.604 | - - | 0.6 | 1.5 | 21.1 | - | 0.147 |
| ARM D | 27.62 | 37.74 | 0.732 | - - | 1.4 | 2.7 | 37.9 | - | 0.097 |
| 08.00-08.15 | | | | | | | | | |
| ARM A | 21.43 | 27.76 | 0.772 | - - | 3.2 | 3.3 | 49.1 | - | 0.157 |
| ARM B | 16.11 | 20.92 | 0.770 | - - | 3.1 | 3.2 | 47.8 | - | 0.207 |
| ARM C | 10.22 | 16.74 | 0.610 | - - | 1.5 | 1.5 | 22.8 | - | 0.153 |
| ARM D | 27.62 | 37.70 | 0.733 | - - | 2.7 | 2.7 | 40.3 | - | 0.099 |
| 08.15-08.30 | | | | | | | | | |
| ARM A | 17.50 | 30.51 | 0.574 | - - | 3.3 | 1.4 | 21.3 | - | 0.078 |
| ARM B | 13.16 | 25.61 | 0.514 | - - | 3.2 | 1.1 | 16.9 | - | 0.082 |
| ARM C | 8.35 | 21.46 | 0.389 | - - | 1.5 | 0.6 | 10.0 | - | 0.077 |
| ARM D | 22.55 | 38.63 | 0.584 | - - | 2.7 | 1.4 | 21.9 | - | 0.063 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 08.30-08.45 | | | | | | | | | |
| ARM A | 14.66 | 32.58 | 0.450 | - - - | 1.4 | 0.8 | 12.6 | - | 0.056 |
| ARM B | 11.02 | 29.19 | 0.377 | - - - | 1.1 | 0.6 | 9.3 | - | 0.055 |
| ARM C | 6.99 | 25.17 | 0.278 | - - - | 0.6 | 0.4 | 5.9 | - | 0.055 |
| ARM D | 18.88 | 39.38 | 0.480 | - - - | 1.4 | 0.9 | 14.2 | - | 0.049 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.8 | * |
| 07.45 | 1.3 | * |
| 08.00 | 3.2 | *** |
| 08.15 | 3.3 | *** |
| 08.30 | 1.4 | * |
| 08.45 | 0.8 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.6 | * |
| 07.45 | 1.0 | * |
| 08.00 | 3.1 | *** |
| 08.15 | 3.2 | *** |
| 08.30 | 1.1 | * |
| 08.45 | 0.6 | * |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.4 | |
| 07.45 | 0.6 | * |
| 08.00 | 1.5 | * |
| 08.15 | 1.5 | ** |
| 08.30 | 0.6 | * |
| 08.45 | 0.4 | |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 07.30 | 0.9 | * |
| 07.45 | 1.4 | * |
| 08.00 | 2.7 | *** |
| 08.15 | 2.7 | *** |
| 08.30 | 1.4 | * |
| 08.45 | 0.9 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND | | * QUEUEING * DELAY * | | * INCLUSIVE QUEUEING * DELAY * | |
|---|---|---|---|---|---|---|
| | (VEH) | (VEH/H) | (MIN) | (MIN/VEH) | (MIN) | (MIN/VEH) |
| A | 1607.7 | 1071.8 | 158.8 | 0.10 | 158.8 | 0.10 |
| B | 1208.5 | 805.7 | 140.0 | 0.12 | 140.0 | 0.12 |
| C | 766.7 | 511.1 | 74.5 | 0.10 | 74.5 | 0.10 |
| D | 2071.5 | 1381.0 | 148.0 | 0.07 | 148.0 | 0.07 |
| ALL | 5654.4 | 3769.6 | 521.2 | 0.09 | 521.3 | 0.09 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:54:41 on 01/02/2016]

# ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)



For sales and distribution information,
program advice and maintenance, contact:

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RG40 3GA,UK



Run with file:-
"j:\Gazeley UK Ltd\47071103 Magna Park Phase 4\Technical\11 Junction Assessments Outline\M1 Junction 20\
Dec 2015 Update Highways England\S5 2026 PM Peak Base+CD+PD+Symmetry.vai"
(drive-on-the-left ) at 15:16:54 on Friday, 4 December 2015

## FILE PROPERTIES

RUN TITLE: S5 M1 Junction 20 PM Peak 2026 Base + CD + PD + Symmetry
LOCATION: M1 Junction 20
DATE: 14/07/31
CLIENT: IDI Gazeley
ENUMERATOR: jon_ashcroft [UKBEDFLT06027]
JOB NUMBER: 47071103
STATUS:
DESCRIPTION:

## INPUT DATA

ARM A - M1 North
ARM B - A4304
ARM C - M1 South
ARM D - A4303

## GEOMETRIC DATA

GRADE SEPARATED / MOTORWAY FACTORS APPLY TO ALL ARMS

T5

| ARM | V (M) | E (M) | L (M) | R (M) | D (M) | PHI (DEG) | SLOPE | INTERCEPT (PCU/MIN) |
|---|---|---|---|---|---|---|---|---|
| ARM A | 7.00 | 13.00 | 6.50 | 50.00 | 98.00 | 42.0 | 1.044 | 49.668 |
| ARM B | 3.25 | 9.00 | 150.00 | 70.00 | 100.00 | 45.0 | 0.923 | 51.198 |
| ARM C | 6.00 | 11.00 | 70.00 | 70.00 | 100.00 | 41.0 | 0.982 | 54.888 |
| ARM D | 7.00 | 8.00 | 2.00 | 70.00 | 100.00 | 45.0 | 1.045 | 49.990 |

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

**WARNING** ARM B Effective flare length is outside normal range.
Treat capacities with increasing caution.

**WARNING** ARM C Effective flare length is outside normal range.
Treat capacities with increasing caution.

DATA FOR VERY LARGE ROUNDABOUTS

| ARM | CIRFLO | SEP |
|---|---|---|
| A | 13.0 | 120.0 |
| B | 21.0 | 0.0 |
| C | 26.0 | 120.0 |
| D | 5.0 | 0.0 |

## TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

| IARM | 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 THE TURNING COUNT DATA

DEMAND SET TITLE: AM Peak 2006 Base Flows

T15

| ARM | NUMBER OF MINUTES FROM START WHEN FLOW STARTS | TO TOP OF PEAK IS REACHED | FLOW STOPS FALLING | RATE OF FLOW (VEH/MIN) BEFORE PEAK | AT TOP OF PEAK | AFTER PEAK |
|---|---|---|---|---|---|---|
| ARM A | 15.00 | 45.00 | 75.00 | 11.59 | 17.38 | 11.59 |
| ARM B | 15.00 | 45.00 | 75.00 | 7.68 | 11.51 | 7.68 |
| ARM C | 15.00 | 45.00 | 75.00 | 6.57 | 9.86 | 6.57 |
| ARM D | 15.00 | 45.00 | 75.00 | 24.83 | 37.24 | 24.83 |

DEMAND SET TITLE: AM Peak 2006 Base Flows

T33

| TIME | FROM/T | ARM A | ARM B | ARM C | ARM D |
|---|---|---|---|---|---|
| 16.45 - 18.15 | | TURNING PROPORTIONS / TURNING COUNTS / (PERCENTAGE OF H.V.S) | | | |
| | ARM A | 0.000 | 0.247 | 0.000 | 0.753 |
| | | 0.0 | 229.0 | 0.0 | 698.0 |
| | | ( 0.0) | ( 4.4) | ( 0.0) | ( 14.9) |
| | ARM B | 0.230 | 0.000 | 0.083 | 0.687 |
| | | 141.0 | 0.0 | 51.0 | 422.0 |
| | | ( 7.1) | ( 0.0) | ( 11.8) | ( 6.4) |
| | ARM C | 0.000 | 0.165 | 0.029 | 0.806 |
| | | 0.0 | 87.0 | 15.0 | 424.0 |
| | | ( 0.0) | ( 5.7) | ( 66.7) | ( 18.6) |
| | ARM D | 0.486 | 0.268 | 0.203 | 0.043 |
| | | 965.0 | 532.0 | 404.0 | 85.0 |
| | | ( 12.3) | ( 2.8) | ( 14.9) | ( 0.0) |

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

| 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 | 11.63 | 30.13 | 0.386 | - - | 0.0 | 0.6 | 9.2 | - | 0.054 |
| ARM B | 7.70 | 33.01 | 0.233 | - - | 0.0 | 0.3 | 4.5 | - | 0.039 |
| ARM C | 6.60 | 31.09 | 0.212 | - - | 0.0 | 0.3 | 4.0 | - | 0.041 |
| ARM D | 24.92 | 42.35 | 0.588 | - - | 0.0 | 1.4 | 20.6 | - | 0.057 |
| 17.00-17.15 | | | | | | | | | |
| ARM A | 13.89 | 27.37 | 0.507 | - - | 0.6 | 1.0 | 14.9 | - | 0.074 |
| ARM B | 9.20 | 30.10 | 0.306 | - - | 0.3 | 0.4 | 6.5 | - | 0.048 |
| ARM C | 7.88 | 28.05 | 0.281 | - - | 0.3 | 0.4 | 5.7 | - | 0.050 |
| ARM D | 29.76 | 41.73 | 0.713 | - - | 1.4 | 2.4 | 35.1 | - | 0.083 |
| 17.15-17.30 | | | | | | | | | |
| ARM A | 17.01 | 23.71 | 0.717 | - - | 1.0 | 2.5 | 34.4 | - | 0.145 |
| ARM B | 11.27 | 26.22 | 0.430 | - - | 0.4 | 0.7 | 11.0 | - | 0.067 |
| ARM C | 9.65 | 23.95 | 0.403 | - - | 0.4 | 0.7 | 9.8 | - | 0.070 |
| ARM D | 36.44 | 40.88 | 0.892 | - - | 2.4 | 7.3 | 95.2 | - | 0.198 |
| 17.30-17.45 | | | | | | | | | |
| ARM A | 17.01 | 23.55 | 0.722 | - - | 2.5 | 2.5 | 37.7 | - | 0.152 |
| ARM B | 11.27 | 26.08 | 0.432 | - - | 0.7 | 0.8 | 11.3 | - | 0.067 |
| ARM C | 9.65 | 23.86 | 0.405 | - - | 0.7 | 0.7 | 10.1 | - | 0.070 |
| ARM D | 36.44 | 40.87 | 0.892 | - - | 7.3 | 7.7 | 113.5 | - | 0.222 |
| 17.45-18.00 | | | | | | | | | |
| ARM A | 13.89 | 27.15 | 0.511 | - - | 2.5 | 1.1 | 16.5 | - | 0.076 |
| ARM B | 9.20 | 29.90 | 0.308 | - - | 0.8 | 0.4 | 6.8 | - | 0.048 |
| ARM C | 7.88 | 27.92 | 0.282 | - - | 0.7 | 0.4 | 6.0 | - | 0.050 |
| ARM D | 29.76 | 41.72 | 0.713 | - - | 7.7 | 2.5 | 41.4 | - | 0.088 |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 18.00-18.15 | | | | | | | | | |
| ARM A | 11.63 | 30.04 | 0.387 | - - - | 1.1 | 0.6 | 9.7 | - | 0.054 |
| ARM B | 7.70 | 32.91 | 0.234 | - - - | 0.4 | 0.3 | 4.7 | - | 0.040 |
| ARM C | 6.60 | 31.01 | 0.213 | - - - | 0.4 | 0.3 | 4.1 | - | 0.041 |
| ARM D | 24.92 | 42.34 | 0.589 | - - - | 2.5 | 1.4 | 22.3 | - | 0.058 |

QUEUE AT ARM A

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.6 | * |
| 17.15 | 1.0 | * |
| 17.30 | 2.5 | ** |
| 17.45 | 2.5 | *** |
| 18.00 | 1.1 | * |
| 18.15 | 0.6 | * |

QUEUE AT ARM B

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.3 | |
| 17.15 | 0.4 | |
| 17.30 | 0.7 | * |
| 17.45 | 0.8 | * |
| 18.00 | 0.4 | |
| 18.15 | 0.3 | |

QUEUE AT ARM C

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 0.3 | |
| 17.15 | 0.4 | |
| 17.30 | 0.7 | * |
| 17.45 | 0.7 | * |
| 18.00 | 0.4 | |
| 18.15 | 0.3 | |

QUEUE AT ARM D

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE | |
|---|---|---|
| 17.00 | 1.4 | * |
| 17.15 | 2.4 | ** |
| 17.30 | 7.3 | ******* |
| 17.45 | 7.7 | ******** |
| 18.00 | 2.5 | *** |
| 18.15 | 1.4 | * |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

| ARM | TOTAL DEMAND | | * QUEUEING * DELAY * | | * INCLUSIVE QUEUEING * DELAY * | |
|---|---|---|---|---|---|---|
| | (VEH) | (VEH/H) | (MIN) | (MIN/VEH) | (MIN) | (MIN/VEH) |
| A | 1275.9 | 850.6 | 122.3 | 0.10 | 122.3 | 0.10 |
| B | 845.1 | 563.4 | 44.7 | 0.05 | 44.7 | 0.05 |
| C | 724.0 | 482.7 | 39.8 | 0.05 | 39.8 | 0.05 |
| D | 2733.6 | 1822.4 | 328.0 | 0.12 | 328.0 | 0.12 |
| ALL | 5578.7 | 3719.1 | 534.8 | 0.10 | 534.8 | 0.10 |

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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

Printed at 16:55:01 on 01/02/2016]

T R A N S Y T 12

Traffic Network Study Tool

Analysis Program Release 7 (July 2010)


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Run with file:- "2026 AM+DEV.DAT" at 17:28 on 20160112

TRANSYT 12.0

Gibbet Hill Rbout 2026 AM Peak + Development Dec 15 HE Amends

PARAMETERS CONTROLLING DIMENSIONS OF PROBLEM :

| | |
|---|---|
| NUMBER OF NODES | = 4 |
| NUMBER OF LINKS | = 32 |
| NUMBER OF OPTIMISED NODES | = 4 |
| MAXIMUM NUMBER OF GRAPHIC PLOTS | = 0 |
| NUMBER OF STEPS IN CYCLE | = 45 |
| MAXIMUM NUMBER OF SHARED STOPLINES | = 4 |
| MAXIMUM NUMBER OF TIMING POINTS | = 2 |
| MAXIMUM LINKS AT ANY NODE | = 11 |

CORE REQUESTED = 8366 WORDS
CORE AVAILABLE = 72000 WORDS

DATA INPUT :-

( 1)= TITLE:- Gibbet Hill Rbout 2026 AM Peak + Development Dec 15 HE Amends

| CARD NO. | CARD TYPE | CYCLE TIME (SEC) | NO. OF STEPS PER CYCLE | TIME PERIOD 1-1200 MINS. | EFFECTIVE-GREEN DISPLACEMENTS START (SEC) | EFFECTIVE-GREEN DISPLACEMENTS END (SEC) | EQUISAT SETTINGS 0=UNEQUAL 1=EQUAL 0=NO 1=YES | FLOW CYCLE 10-200 % | CRUISE-SPEEDS SCALE 50-200 % | CARD32 0=TIMES 1=SPEEDS | OPTIMISE 0=NONE 1=O/SET 2=FULL | EXTRA COPIES FINAL OUTPUT | HILL-CLIMB OUTPUT 1=FULL | DELAY VALUE P PER PCU-H | STOP VALUE P PER 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2)= | 1 | 45 | 45 | 60 | 2 | 3 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 1420 | 260 |

| CARD NO. | CARD TYPE | LIST OF NODES TO BE OPTIMISED | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3)= | 2 | 1 | 2 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

LINKS HAVING SHARED STOPLINES

| CARD NO. | CARD TYPE | FIRST SET..... | | | | SECOND SET..... | | | | THIRD SET..... | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4)= | 7 | 12 | 14 | 15 | 0 | 0 | 13 | 16 | 0 | 0 | 0 | 22 | 24 | 25 | 0 | 0 |
| 5)= | 7 | 31 | 32 | 33 | 34 | 0 | 42 | 44 | 45 | 0 | 0 | 43 | 46 | 47 | 0 | 0 |
| 6)= | 7 | 51 | 54 | 55 | 0 | 0 | 52 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NODE CARDS: MINIMUM STAGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7)= | 10 | 1 | 7 | 7 | | | | | | | | |
| 8)= | 10 | 2 | 7 | 7 | | | | | | | | |
| 9)= | 10 | 4 | 7 | 7 | | | | | | | | |
| 10)= | 10 | 5 | 7 | 7 | | | | | | | | |

NODE CARDS: PRECEDING INTERSTAGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11)= | 11 | 1 | 5 | 5 | | | | | | | | |
| 12)= | 11 | 2 | 5 | 5 | | | | | | | | |
| 13)= | 11 | 4 | 5 | 5 | | | | | | | | |
| 14)= | 11 | 5 | 5 | 5 | | | | | | | | |

NODE CARDS: STAGE CHANGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | Sgl/Dbl Cycled | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15)= | 12 | 1 | 1 | 0 | 0 | | | | | | | | |
| 16)= | 12 | 2 | 1 | 0 | 0 | | | | | | | | |
| 17)= | 12 | 4 | 1 | 0 | 0 | | | | | | | | |
| 18)= | 12 | 5 | 1 | 0 | 0 | | | | | | | | |

LINK CARDS: GIVEWAY DATA

| CARD NO. | CARD TYPE | LINK NO. | PRIORITY LINKS LINK1 NO. | PRIORITY LINKS LINK2 NO. | LINK1 GIVEWAY COEFFS. ONLY % FLOW | A1 X100 | A2 X100 | | | | LINK LENGTH | STOP WT.X100 | MAX FLOW | DELAY WT.X100 | DISPSN X100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19)= | 30 | 30 | 31 | 0 | 0 | 41 | 100 | 0 | 0 | 0 | 0 | 200 | 0 | 1169 | 0 | 0 |

LINK CARDS: FIXED DATA

| CARD NO. | CARD TYPE | LINK NO. | EXIT NODE | FIRST GREEN START STAGE | FIRST GREEN START LAG | FIRST GREEN END STAGE | FIRST GREEN END LAG | SECOND GREEN START STAGE | SECOND GREEN START LAG | SECOND GREEN END STAGE | SECOND GREEN END LAG | LINK LENGTH | STOP WT.X100 | SAT FLOW | DELAY WT.X100 | DISPSN X100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20)= | 31 | 10 | 1 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2065 | 60 | 0 |
| 21)= | 31 | 11 | 1 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2205 | 60 | 0 |
| 22)= | 31 | 12 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 2050 | 500 | 0 |
| 23)= | 31 | 13 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 2100 | 500 | 0 |
| 24)= | 31 | 14 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 25)= | 31 | 15 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 26)= | 31 | 16 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 27)= | 31 | 20 | 2 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2040 | 60 | 0 |
| 28)= | 31 | 21 | 2 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2180 | 60 | 0 |
| 29)= | 31 | 22 | 2 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 2050 | 500 | 0 |
| 30)= | 31 | 23 | 2 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 2100 | 500 | 0 |
| 31)= | 31 | 24 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 32)= | 31 | 25 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 33)= | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 6000 | 0 | 0 |
| 34)= | 31 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 35)= | 31 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 36)= | 31 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 37)= | 31 | 40 | 4 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2090 | 60 | 0 |
| 38)= | 31 | 41 | 4 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2230 | 60 | 0 |
| 39)= | 31 | 42 | 4 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 2050 | 500 | 0 |
| 40)= | 31 | 43 | 4 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 2100 | 500 | 0 |
| 41)= | 31 | 44 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 42)= | 31 | 45 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 43)= | 31 | 46 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 44)= | 31 | 47 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 45)= | 31 | 50 | 5 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2155 | 60 | 0 |
| 46)= | 31 | 51 | 5 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 2050 | 500 | 0 |
| 47)= | 31 | 52 | 5 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 2100 | 500 | 0 |
| 48)= | 31 | 53 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 49)= | 31 | 54 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 50)= | 31 | 55 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |

LINK CARDS: FLOW DATA

| CARD NO. | CARD TYPE | LINK NO. | TOTAL FLOW | UNIFORM FLOW | ENTRY 1 LINK NO. | ENTRY 1 CRUISE FLOW | ENTRY 1 CRUISE SPEED | ENTRY 2 LINK NO. | ENTRY 2 CRUISE FLOW | ENTRY 2 CRUISE SPEED | ENTRY 3 LINK NO. | ENTRY 3 CRUISE FLOW | ENTRY 3 CRUISE SPEED | ENTRY 4 LINK NO. | ENTRY 4 CRUISE FLOW | ENTRY 4 CRUISE SPEED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51)= | 32 | 10 | 572 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 52)= | 32 | 11 | 605 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 53)= | 32 | 12 | 514 | 0 | 50 | 514 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 54)= | 32 | 13 | 142 | 0 | 50 | 142 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 55)= | 32 | 14 | 34 | 0 | 53 | 34 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 56)= | 32 | 15 | 131 | 0 | 51 | 131 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57)= | 32 | 16 | 42 | 0 | 51 | 42 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 58)= | 32 | 20 | 360 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59)= | 32 | 21 | 360 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60)= | 32 | 22 | 562 | 0 | 10 | 562 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 61)= | 32 | 23 | 605 | 0 | 11 | 605 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62)= | 32 | 24 | 42 | 0 | 16 | 42 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63)= | 32 | 25 | 142 | 0 | 13 | 142 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64)= | 32 | 30 | 117 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65)= | 32 | 31 | 687 | 0 | 20 | 327 | 43 | 21 | 360 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| 66)= | 32 | 32 | 1151 | 0 | 22 | 546 | 43 | 23 | 605 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67)= | 32 | 33 | 13 | 0 | 24 | 13 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68)= | 32 | 34 | 111 | 0 | 25 | 111 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69)= | 32 | 40 | 554 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70)= | 32 | 41 | 173 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71)= | 32 | 42 | 66 | 0 | 30 | 66 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72)= | 32 | 43 | 34 | 0 | 30 | 34 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73)= | 32 | 44 | 302 | 0 | 32 | 302 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74)= | 32 | 45 | 209 | 0 | 31 | 209 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75)= | 32 | 46 | 303 | 0 | 32 | 303 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 76)= | 32 | 47 | 316 | 0 | 31 | 316 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77)= | 32 | 50 | 1136 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78)= | 32 | 51 | 435 | 0 | 40 | 435 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 79)= | 32 | 52 | 173 | 0 | 41 | 173 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80)= | 32 | 53 | 34 | 0 | 43 | 34 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81)= | 32 | 54 | 20 | 0 | 42 | 20 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 82)= | 32 | 55 | 10 | 0 | 47 | 10 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

LINK CARDS : FLARE SATURATION FLOW DATA

| | CARD TYPE | LINK NO. | ..LANE 1.. SAT. FLOW | CAPAC VEH. | ..LANE 2.. SAT. FLOW | CAPAC VEH. | ..LANE 3.. SAT. FLOW | CAPAC VEH. |
|---|---|---|---|---|---|---|---|---|
| 83)= | 33 | 50 | 2155 | 6 | 0 | 0 | 0 | 0 |

LINK DATA: QUEUE CONSTRAINTS

| CARD NO. | CARD TYPE | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 84)= | 38 | 12 | 5 | 4500 | 13 | 5 | 4500 | 22 | 1 | 4500 | 23 | 1 | 4500 | 42 | 2 | 4500 |
| 85)= | 38 | 43 | 2 | 4500 | 51 | 1 | 4500 | 52 | 1 | 4500 | 0 | 0 | 0 | 0 | 0 | 0 |

*****END OF SUBROUTINE TINPUT****

45 SECOND CYCLE 45 STEPS

INITIAL SETTINGS
- (SECONDS)

| NODE NO | NUMBER OF STAGES | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 | STAGE 6 | STAGE 7 | STAGE 8 | STAGE 9 | STAGE 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 0 | 21 | | | | | | | | |
| 2 | 2 | 0 | 16 | | | | | | | | |
| 4 | 2 | 0 | 21 | | | | | | | | |
| 5 | 2 | 0 | 27 | | | | | | | | |

| LINK NUMBER | FLOW INTO LINK (PCU/H) | SAT FLOW (PCU/H) | DEGREE OF SAT (%) | MEAN TIMES PER PCU CRUISE (SEC) | DELAY (SEC) | DELAY (U+R+O=MEAN Q) (PCU-H/H) | COST OF DELAY ($/H) | STOPS MEAN STOPS /PCU (%) | STOPS COST OF STOPS ($/H) | QUEUE MEAN MAX. (PCU) | QUEUE AVERAGE EXCESS (PCU) | PERFORMANCE INDEX. WEIGHTED SUM OF ( ) VALUES ($/H) | EXIT NODE | GREEN TIMES START 1ST (SECONDS) | GREEN TIMES START 2ND (SECONDS) | GREEN TIMES END 1ST (SECONDS) | GREEN TIMES END 2ND (SECONDS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 572 | 2065 | 73 | 16.7 | 20.6 | 1.9 + 1.4 | ( 46.5)* | 97 | ( 14.3) | 7 | | 27.9 | 1 | 5 | 21 | | |
| 11 | 605 | 2205 | 73 | 16.7 | 19.8 | 2.0 + 1.3 | ( 47.3)* | 96 | ( 14.9) | 8 | | 28.4 | 1 | 5 | 21 | | |
| 12 | 513 | 2050S | 75 | 4.6 | 21.7 | 2.0 + 1.1 | ( 43.8)* | 115 | ( 15.2) | 8 | ( 1.1)* | 282.6 | 1 | 26 | 0 | | |
| 13 | 143 | 2100S | 20 | 4.6 | 12.1 | 0.4 + 0.1 | ( 6.8)* | 90 | ( 3.3) | 2 | ( 0.0)* | 37.4 | 1 | 26 | 0 | | |
| 14 | 34 | 12L | 75 | 4.6 | 13.5 | 0.1 + 0.1 | ( 1.8) | 47 | ( 0.4) | 8 | + | 2.2 | 1 | 26 | 0 | | |
| 15 | 132 | 12L | 75 | 4.6 | 10.6 | 0.1 + 0.3 | ( 5.5) | 33 | ( 1.1) | 8 | + | 6.7 | 1 | 26 | 0 | | |
| 16 | 42 | 13L | 20 | 4.6 | 5.3 | 0.0 + 0.0 | ( 0.9) | 18 | ( 0.2) | 2 | | 1.1 | 1 | 26 | 0 | | |
| 20 | 360 | 2040 | 66 | 16.7 | 24.4 | 1.5 + 1.0 | ( 34.6)* | 103 | ( 9.6) | 5 | | 20.8 | 2 | 5 | 16 | | |
| 21 | 360 | 2180 | 62 | 16.7 | 22.6 | 1.5 + 0.8 | ( 32.1)* | 99 | ( 9.2) | 5 | | 19.2 | 2 | 5 | 16 | | |
| 22 | 562 | 2050S | 66 | 2.6 | 17.7 | 2.1 + 0.7 | ( 39.3)* | 110 | ( 15.9) | 10 | ( 3.8)* | 382.3 | 2 | 21 | 0 | | |
| 23 | 605 | 2100 | 52 | 2.6 | 16.5 | 2.2 + 0.5 | ( 39.3)* | 107 | ( 16.7) | 8 | ( 3.0)* | 347.1 | 2 | 21 | 0 | | |
| 24 | 42 | 22L | 66 | 2.6 | 10.1 | 0.1 + 0.1 | ( 1.7) | 47 | ( 0.5) | 10 | + | 2.2 | 2 | 21 | 0 | | |
| 25 | 143 | 22L | 66 | 2.6 | 9.2 | 0.2 + 0.2 | ( 5.2) | 93 | ( 3.4) | 10 | + | 8.6 | 2 | 21 | 0 | | |
| 30 | 117 | 1169 | 23 | 16.7 | 7.6 | 0.1 + 0.1 | ( 3.5) | 63 | ( 1.9) | 1 | | 5.4 | | | | | |
| 31 | 687 | 6000S | 33 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.2) | 1 | ( 0.2) | 0 | | 1.4 | | | | | |
| 32 | 1151 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.1 | ( 2.0) | 1 | ( 0.3) | 0 | | 2.3 | | | | | |
| 33 | 13 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.0) | 1 | ( 0.0) | 0 | | 0.0 | | | | | |
| 34 | 112 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.2) | 1 | ( 0.0) | 0 | | 0.2 | | | | | |
| 40 | 554 | 2090 | 70 | 16.7 | 19.4 | 1.8 + 1.2 | ( 42.4)* | 94 | ( 13.4) | 7 | | 25.5 | 4 | 5 | 21 | | |
| 41 | 173 | 2230 | 21 | 16.7 | 12.2 | 0.5 + 0.1 | ( 8.3)* | 68 | ( 3.0) | 2 | | 5.0 | 4 | 5 | 21 | | |
| 42 | 66 | 2050S | 63 | 2.1 | 13.7 | 0.2 + 0.1 | ( 3.6)* | 70 | ( 1.2) | 6 | ( 0.9)* | 61.7 | 4 | 26 | 0 | | |
| 43 | 34 | 2100S | 70 | 2.1 | 15.3 | 0.1 + 0.1 | ( 2.1)* | 73 | ( 0.6) | 8 | ( 2.0)* | 100.1 | 4 | 26 | 0 | | |
| 44 | 302 | 42L | 63 | 2.1 | 6.6 | 0.1 + 0.4 | ( 7.8) | 45 | ( 3.5) | 6 | + | 11.3 | 4 | 26 | 0 | | |
| 45 | 209 | 42L | 63 | 2.1 | 18.2 | 0.7 + 0.3 | ( 15.0) | 111 | ( 6.0) | 6 | + | 21.0 | 4 | 26 | 0 | | |
| 46 | 304 | 43L | 70 | 2.1 | 8.9 | 0.2 + 0.5 | ( 10.6) | 70 | ( 5.4) | 8 | + | 16.1 | 4 | 26 | 0 | | |
| 47 | 316 | 43L | 70 | 2.1 | 20.1 | 1.2 + 0.6 | ( 25.1) | 114 | ( 9.2) | 8 | + | 34.3 | 4 | 26 | 0 | | |
| 50 | 1136 | 3094f | 72 | 16.7 | 11.3 | 2.3 + 1.3 | ( 50.7)* | 68 | ( 19.9) | 10 | | 30.4 | 5 | 5 | 27 | | |
| 51 | 435 | 2050S | 73 | 2.7 | 33.1 | 2.8 + 1.2 | ( 56.8)* | 122 | ( 13.6) | 7 | ( 3.9)* | 471.3 | 5 | 32 | 0 | | |
| 52 | 173 | 2100S | 32 | 2.7 | 26.3 | 1.1 + 0.2 | ( 18.0)* | 109 | ( 4.8) | 3 | ( 0.8)* | 129.3 | 5 | 32 | 0 | | |
| 53 | 34 | 52L | 32 | 2.7 | 10.7 | 0.1 + 0.0 | ( 1.4) | 63 | ( 0.6) | 3 | + | 2.0 | 5 | 32 | 0 | | |
| 54 | 20 | 51L | 73 | 2.7 | 20.9 | 0.1 + 0.1 | ( 1.7) | 96 | ( 0.5) | 7 | + | 2.1 | 5 | 32 | 0 | | |
| 55 | 10 | 51L | 73 | 2.7 | 20.0 | 0.0 + 0.0 | ( 0.8) | 120 | ( 0.3) | 7 | + | 1.1 | 5 | 32 | 0 | | |

*** f - average saturation flow for flared link ***

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 62.8 | 16.2 | 25.1 | 14.0 | (1289.8) + ( 104.8) | + ( 692.4) | = 2087.1 | TOTALS | |

| | CRUISE LITRES PER HOUR | | DELAY LITRES PER HOUR | | STOPS LITRES PER HOUR | | TOTALS LITRES PER HOUR |
|---|---|---|---|---|---|---|---|
| FUEL CONSUMPTION PREDICTIONS | 54.4 | + | 45.0 | + | 86.2 | = | 185.7 |

NO. OF ENTRIES TO SUBPT = 1
NO. OF LINKS RECALCULATED= 56

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 18 | 39 |
| 2 | 2 | 0 | 16 |
| 4 | 2 | 24 | 0 |
| 5 | 2 | 0 | 27 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 54.9 | 18.5 | 17.3 | 14.0 | ( 678.7) + ( 56.4) | + ( 226.7) | = 961.8 | TOTALS | |

NO. OF ENTRIES TO SUBPT = 14
NO. OF LINKS RECALCULATED= 328

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 18 | 39 |
| 2 | 2 | 0 | 16 |
| 4 | 2 | 24 | 0 |
| 5 | 2 | 0 | 27 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 54.9 | 18.5 | 17.3 | 14.0 | ( 678.7) + ( | 56.4) + ( | 226.7) = | 961.8 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 253

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 21 | 41 |
| 2 | 2 | 2 | 16 |
| 4 | 2 | 26 | 43 |
| 5 | 2 | 3 | 25 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 60.9 | 16.7 | 18.1 | 19.2 | ( 601.8) + ( | 43.4) + ( | 91.6) = | 736.8 | TOTALS |

NO. OF ENTRIES TO SUBPT = 31
NO. OF LINKS RECALCULATED= 697

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1 6
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 27 | 2 |
| 2 | 2 | 2 | 16 |
| 4 | 2 | 26 | 43 |
| 5 | 2 | 3 | 25 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 59.7 | 17.0 | 16.9 | 19.2 | ( 559.0) + ( | 38.6) + ( | 64.9) = | 662.5 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 261

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1 6 18
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 27 | 2 |
| 2 | 2 | 2 | 16 |
| 4 | 2 | 26 | 43 |
| 5 | 2 | 3 | 25 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 59.7 | 17.0 | 16.9 | 19.2 | ( 559.0) + ( | 38.6) + ( | 64.9) = | 662.5 | TOTALS |

NO. OF ENTRIES TO SUBPT = 10
NO. OF LINKS RECALCULATED= 308

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1 6 18 1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 26 | 1 |
| 2 | 2 | 4 | 18 |
| 4 | 2 | 23 | 40 |
| 5 | 2 | 0 | 22 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 59.3 | 17.1 | 16.5 | 19.2 | ( 526.9) + ( | 35.2) + ( | 53.1) = | 615.2 | TOTALS |

NO. OF ENTRIES TO SUBPT = 17
NO. OF LINKS RECALCULATED= 450

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1 6 18 1 -1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 27 | 1 |
| 2 | 2 | 4 | 18 |
| 4 | 2 | 23 | 41 |
| 5 | 2 | 0 | 22 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 58.5 | 17.3 | 16.6 | 18.4 | ( 511.3) + ( | 35.1) + ( | 58.9) = | 605.3 | TOTALS |

NO. OF ENTRIES TO SUBPT = 19
NO. OF LINKS RECALCULATED= 526

45 SECOND CYCLE 45 STEPS

FINAL SETTINGS OBTAINED WITH INCREMENTS :- 6 18 -1 6 18 1 -1 1
- (SECONDS)

| NODE NO | NUMBER OF STAGES | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 | STAGE 6 | STAGE 7 | STAGE 8 | STAGE 9 | STAGE 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 27 | 1 | | | | | | | | |
| 2 | 2 | 3 | 17 | | | | | | | | |
| 4 | 2 | 22 | 40 | | | | | | | | |
| 5 | 2 | 0 | 22 | | | | | | | | |

| LINK NUMBER | FLOW INTO LINK (PCU/H) | SAT FLOW (PCU/H) | DEGREE OF SAT (%) | MEAN TIMES PER PCU CRUISE (SEC) | DELAY (SEC) | DELAY UNIFORM (U+R+O=MEAN Q) (PCU-H/H) | DELAY RANDOM+ OVERSAT (MEAN Q) DELAY ($/H) | COST OF DELAY ($/H) | MEAN STOPS /PCU (%) | COST OF STOPS ($/H) | QUEUE MEAN MAX. (PCU) | QUEUE AVERAGE EXCESS (PCU) | PERFORMANCE INDEX. WEIGHTED SUM OF ( ) VALUES ($/H) | EXIT NODE | GREEN TIMES START 1ST (SECONDS) | GREEN TIMES START 2ND (SECONDS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 572 | 2065 | 83 | 16.7 | 28.7 | 2.2 + | 2.4 ( 64.8)* | 116 | ( 17.1) | 9 | | 38.9 | 1 | 32 | 1 |
| 11 | 605 | 2205 | 82 | 16.7 | 27.2 | 2.3 + | 2.2 ( 64.8)* | 113 | ( 17.6) | 9 | | 38.9 | 1 | 32 | 1 |
| 12 | 513 | 2050S | 68 | 4.6 | 6.0 | 0.1 + | 0.8 ( 12.1)* | 15 | ( 2.0) | 3 | ( 0.0)* | 62.3 | 1 | 6 | 27 |
| 13 | 143 | 2100S | 18 | 4.6 | 2.5 | 0.0 + | 0.1 ( 1.4)* | 7 | ( 0.2) | 1 | ( 0.0)* | 7.4 | 1 | 6 | 27 |
| 14 | 34 | 12L | 68 | 4.6 | 24.2 | 0.2 + | 0.1 ( 3.2) | 112 | ( 1.0) | 3 | | 4.2 | 1 | 6 | 27 |
| 15 | 132 | 12L | 68 | 4.6 | 17.7 | 0.4 + | 0.2 ( 9.2) | 111 | ( 3.7) | 3 | | 13.0 | 1 | 6 | 27 |
| 16 | 42 | 13L | 18 | 4.6 | 12.5 | 0.1 + | 0.0 ( 2.1) | 99 | ( 1.1) | 1 | | 3.1 | 1 | 6 | 27 |
| 20 | 360 | 2040 | 79 | 16.7 | 35.1 | 1.7 + | 1.9 ( 49.8)* | 126 | ( 11.7) | 6 | | 29.9 | 2 | 8 | 17 |
| 21 | 360 | 2180 | 74 | 16.7 | 30.5 | 1.6 + | 1.4 ( 43.2)* | 116 | ( 10.7) | 6 | | 25.9 | 2 | 8 | 17 |
| 22 | 562 | 2050S | 61 | 2.6 | 4.0 | 0.0 + | 0.6 ( 8.9)* | 10 | ( 1.4) | 3 | ( 0.4)* | 64.4 | 2 | 22 | 3 |
| 23 | 605 | 2100 | 48 | 2.6 | 3.2 | 0.1 + | 0.5 ( 7.5)* | 13 | ( 2.1) | 5 | ( 0.4)* | 57.3 | 2 | 22 | 3 |
| 24 | 42 | 22L | 61 | 2.6 | 17.1 | 0.2 + | 0.0 ( 2.8) | 107 | ( 1.2) | 3 | + | 4.0 | 2 | 22 | 3 |
| 25 | 143 | 22L | 61 | 2.6 | 9.5 | 0.2 + | 0.1 ( 5.3) | 85 | ( 3.1) | 3 | + | 8.4 | 2 | 22 | 3 |
| 30 | 117 | 1169 | 23 | 16.7 | 7.3 | 0.1 + | 0.2 ( 3.4) | 59 | ( 1.8) | 1 | | 5.1 | | | |
| 31 | 687 | 6000S | 33 | 4.2 | 0.4 | 0.0 + | 0.1 ( 1.2) | 1 | ( 0.2) | 0 | | 1.4 | | | |
| 32 | 1151 | 31L | 33 | 4.2 | 0.4 | 0.0 + | 0.1 ( 2.0) | 1 | ( 0.3) | 0 | | 2.3 | | | |
| 33 | 13 | 31L | 33 | 4.2 | 0.4 | 0.0 + | 0.0 ( 0.0) | 1 | ( 0.0) | 0 | | 0.0 | | | |
| 34 | 112 | 31L | 33 | 4.2 | 0.4 | 0.0 + | 0.0 ( 0.2) | 1 | ( 0.0) | 0 | | 0.2 | | | |
| 40 | 554 | 2090 | 85 | 16.7 | 32.2 | 2.2 + | 2.7 ( 70.4)* | 123 | ( 17.5) | 9 | | 42.3 | 4 | 27 | 40 |
| 41 | 173 | 2230 | 25 | 16.7 | 15.1 | 0.6 + | 0.2 ( 10.3)* | 77 | ( 3.4) | 2 | | 6.2 | 4 | 27 | 40 |
| 42 | 66 | 2050S | 55 | 2.1 | 10.3 | 0.1 + | 0.1 ( 2.7)* | 53 | ( 0.9) | 4 | ( 0.2)* | 23.0 | 4 | 0 | 22 |
| 43 | 34 | 2100S | 61 | 2.1 | 10.7 | 0.1 + | 0.0 ( 1.4)* | 54 | ( 0.5) | 4 | ( 0.2)* | 15.0 | 4 | 0 | 22 |
| 44 | 302 | 42L | 55 | 2.1 | 6.1 | 0.2 + | 0.3 ( 7.3) | 58 | ( 4.5) | 4 | + | 11.8 | 4 | 0 | 22 |
| 45 | 209 | 42L | 55 | 2.1 | 5.5 | 0.1 + | 0.2 ( 4.5) | 16 | ( 0.9) | 4 | + | 5.4 | 4 | 0 | 22 |
| 46 | 304 | 43L | 61 | 2.1 | 6.4 | 0.2 + | 0.4 ( 7.7) | 56 | ( 4.4) | 4 | + | 12.1 | 4 | 0 | 22 |
| 47 | 316 | 43L | 61 | 2.1 | 5.9 | 0.1 + | 0.4 ( 7.4) | 17 | ( 1.4) | 4 | + | 8.8 | 4 | 0 | 22 |
| 50 | 1136 | 3355f | 85 | 16.7 | 19.5 | 3.5 + | 2.7 ( 87.5)* | 93 | ( 27.1) | 14 | | 52.5 | 5 | 5 | 22 |
| 51 | 435 | 2050S | 54 | 2.7 | 4.5 | 0.0 + | 0.5 ( 7.8)* | 10 | ( 1.1) | 1 | ( 0.0)* | 39.9 | 5 | 27 | 0 |
| 52 | 173 | 2100S | 23 | 2.7 | 2.7 | 0.0 + | 0.1 ( 1.8)* | 6 | ( 0.3) | 1 | ( 0.0)* | 9.4 | 5 | 27 | 0 |
| 53 | 34 | 52L | 23 | 2.7 | 19.8 | 0.2 + | 0.0 ( 2.7) | 101 | ( 0.9) | 1 | | 3.5 | 5 | 27 | 0 |
| 54 | 20 | 51L | 54 | 2.7 | 21.7 | 0.1 + | 0.0 ( 1.7) | 105 | ( 0.5) | 1 | | 2.3 | 5 | 27 | 0 |
| 55 | 10 | 51L | 54 | 2.7 | 12.7 | 0.0 + | 0.0 ( 0.5) | 100 | ( 0.3) | 1 | | 0.8 | 5 | 27 | 0 |

*** f - average saturation flow for flared link ***

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1015.1 | 58.5 | 17.3 | 16.6 | 18.4 | ( 514.0) + ( | 33.7) + ( | 52.1) = | 599.8 | TOTALS |

ROUTE

| | CRUISE LITRES PER HOUR | | DELAY LITRES PER HOUR | | STOPS LITRES PER HOUR | | TOTALS LITRES PER HOUR |
|---|---|---|---|---|---|---|---|
| FUEL CONSUMPTION PREDICTIONS | 54.4 | + | 40.2 | + | 63.3 | = | 157.9 |

NO. OF ENTRIES TO SUBPT = 11
NO. OF LINKS RECALCULATED= 333

PROGRAM TRANSYT FINISHED
========== end of file ==========

Printed at 16:56:02 on 01/02/2016]

# T R A N S Y T 12

Traffic Network Study Tool

Analysis Program Release 7 (July 2010)


For sales and distribution information,
program advice and maintenance, contact:

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Run with file:- "2026 PM+DEV.DAT" at 17:33 on 20160112

TRANSYT 12.0

Gibbet Hill Rbout 2026 PM Peak + Developemnt Dec 15 HE Amends

PARAMETERS CONTROLLING DIMENSIONS OF PROBLEM :

| | |
|---|---|
| NUMBER OF NODES | = 4 |
| NUMBER OF LINKS | = 32 |
| NUMBER OF OPTIMISED NODES | = 4 |
| MAXIMUM NUMBER OF GRAPHIC PLOTS | = 0 |
| NUMBER OF STEPS IN CYCLE | = 40 |
| MAXIMUM NUMBER OF SHARED STOPLINES | = 4 |
| MAXIMUM NUMBER OF TIMING POINTS | = 2 |
| MAXIMUM LINKS AT ANY NODE | = 11 |

CORE REQUESTED = 8146 WORDS
CORE AVAILABLE = 72000 WORDS

DATA INPUT :-

( 1)= TITLE:- Gibbet Hill Rbout 2026 PM Peak + Developemnt Dec 15 HE Amends

| CARD NO. | CARD TYPE | CYCLE TIME (SEC) | NO. OF STEPS PER CYCLE | TIME PERIOD 1-1200 MINS. | EFFECTIVE-GREEN DISPLACEMENTS START (SEC) | EFFECTIVE-GREEN DISPLACEMENTS END (SEC) | EQUISAT SETTINGS 0=UNEQUAL 1=EQUAL 0=NO 1=YES | FLOW CYCLE 10-200 % | CRUISE-SPEEDS SCALE 50-200 % | CARD32 0=TIMES 1=SPEEDS | OPTIMISE 0=NONE 1=O/SET 2=FULL | EXTRA COPIES FINAL OUTPUT | HILL-CLIMB OUTPUT 1=FULL | DELAY VALUE P PER PCU-H | STOP VALUE P PER 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2)= | 1 | 40 | 40 | 60 | 2 | 3 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 1420 | 260 |

| CARD NO. | CARD TYPE | LIST OF NODES TO BE OPTIMISED | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3)= | 2 | 1 | 2 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

LINKS HAVING SHARED STOPLINES

| CARD NO. | CARD TYPE | FIRST SET..... | | | | SECOND SET..... | | | | THIRD SET..... | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4)= | 7 | 12 | 14 | 15 | 0 | 0 | 13 | 16 | 0 | 0 | 0 | 22 | 24 | 25 | 0 | 0 |
| 5)= | 7 | 31 | 32 | 33 | 34 | 0 | 42 | 44 | 45 | 0 | 0 | 43 | 46 | 47 | 0 | 0 |
| 6)= | 7 | 51 | 54 | 55 | 0 | 0 | 52 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NODE CARDS: MINIMUM STAGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7)= | 10 | 1 | 7 | 7 | | | | | | | | |
| 8)= | 10 | 2 | 7 | 7 | | | | | | | | |
| 9)= | 10 | 4 | 7 | 7 | | | | | | | | |
| 10)= | 10 | 5 | 7 | 7 | | | | | | | | |

NODE CARDS: PRECEDING INTERSTAGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11)= | 11 | 1 | 5 | 5 | | | | | | | | |
| 12)= | 11 | 2 | 5 | 5 | | | | | | | | |
| 13)= | 11 | 4 | 5 | 5 | | | | | | | | |
| 14)= | 11 | 5 | 5 | 5 | | | | | | | | |

NODE CARDS: STAGE CHANGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | Sgl/Dbl Cycled | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15)= | 12 | 1 | 1 | 0 | 0 | | | | | | | | |
| 16)= | 12 | 2 | 1 | 0 | 0 | | | | | | | | |
| 17)= | 12 | 4 | 1 | 0 | 0 | | | | | | | | |
| 18)= | 12 | 5 | 1 | 0 | 0 | | | | | | | | |

LINK CARDS: GIVEWAY DATA

| CARD NO. | CARD TYPE | LINK NO. | PRIORITY LINKS LINK1 NO. | PRIORITY LINKS LINK2 NO. | LINK1 GIVEWAY COEFFS. ONLY % FLOW | LINK1 GIVEWAY COEFFS. A1 X100 | LINK1 GIVEWAY COEFFS. A2 X100 | | | | | LINK LENGTH | STOP WT.X100 | MAX FLOW | DELAY WT.X100 | DISPSN X100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19)= | 30 | 30 | 31 | 0 | 0 | 41 | 100 | 0 | 0 | 0 | 0 | 200 | 0 | 1169 | 0 | 0 |

LINK CARDS: FIXED DATA

| CARD NO. | CARD TYPE | LINK NO. | EXIT NODE | FIRST GREEN START STAGE | FIRST GREEN START LAG | FIRST GREEN END STAGE | FIRST GREEN END LAG | SECOND GREEN START STAGE | SECOND GREEN START LAG | SECOND GREEN END STAGE | SECOND GREEN END LAG | LINK LENGTH | STOP WT.X100 | SAT FLOW | DELAY WT.X100 | DISPSN X100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20)= | 31 | 10 | 1 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2065 | 60 | 0 |
| 21)= | 31 | 11 | 1 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2205 | 60 | 0 |
| 22)= | 31 | 12 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 2050 | 500 | 0 |
| 23)= | 31 | 13 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 2100 | 500 | 0 |
| 24)= | 31 | 14 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 25)= | 31 | 15 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 26)= | 31 | 16 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 27)= | 31 | 20 | 2 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2040 | 60 | 0 |
| 28)= | 31 | 21 | 2 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2180 | 60 | 0 |
| 29)= | 31 | 22 | 2 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 2050 | 500 | 0 |
| 30)= | 31 | 23 | 2 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 2100 | 500 | 0 |
| 31)= | 31 | 24 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 32)= | 31 | 25 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 33)= | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 6000 | 0 | 0 |
| 34)= | 31 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 35)= | 31 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 36)= | 31 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 37)= | 31 | 40 | 4 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2090 | 60 | 0 |
| 38)= | 31 | 41 | 4 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2230 | 60 | 0 |
| 39)= | 31 | 42 | 4 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 2050 | 500 | 0 |
| 40)= | 31 | 43 | 4 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 2100 | 500 | 0 |
| 41)= | 31 | 44 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 42)= | 31 | 45 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 43)= | 31 | 46 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 44)= | 31 | 47 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 45)= | 31 | 50 | 5 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2155 | 60 | 0 |
| 46)= | 31 | 51 | 5 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 2050 | 500 | 0 |
| 47)= | 31 | 52 | 5 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 2100 | 500 | 0 |
| 48)= | 31 | 53 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 49)= | 31 | 54 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 50)= | 31 | 55 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |

LINK CARDS: FLOW DATA

| CARD NO. | CARD TYPE | LINK NO. | TOTAL FLOW | UNIFORM FLOW | ENTRY 1 ..... LINK NO. | ENTRY 1 ..... FLOW | ENTRY 1 ..... CRUISE SPEED | ENTRY 2 ..... LINK NO. | ENTRY 2 ..... FLOW | ENTRY 2 ..... CRUISE SPEED | ENTRY 3 ..... LINK NO. | ENTRY 3 ..... FLOW | ENTRY 3 ..... CRUISE SPEED | ENTRY 4 ..... LINK NO. | ENTRY 4 ..... FLOW | ENTRY 4 ..... CRUISE SPEED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51)= | 32 | 10 | 468 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 52)= | 32 | 11 | 480 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 53)= | 32 | 12 | 566 | 0 | 50 | 566 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 54)= | 32 | 13 | 157 | 0 | 50 | 157 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 55)= | 32 | 14 | 18 | 0 | 53 | 18 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 56)= | 32 | 15 | 192 | 0 | 51 | 192 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57)= | 32 | 16 | 28 | 0 | 51 | 28 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 58)= | 32 | 20 | 373 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59)= | 32 | 21 | 372 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60)= | 32 | 22 | 463 | 0 | 10 | 463 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 61)= | 32 | 23 | 480 | 0 | 11 | 480 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62)= | 32 | 24 | 28 | 0 | 16 | 28 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63)= | 32 | 25 | 157 | 0 | 13 | 157 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64)= | 32 | 30 | 91 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65)= | 32 | 31 | 720 | 0 | 20 | 348 | 43 | 21 | 372 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| 66)= | 32 | 32 | 929 | 0 | 22 | 449 | 43 | 23 | 480 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67)= | 32 | 33 | 10 | 0 | 24 | 10 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68)= | 32 | 34 | 107 | 0 | 25 | 107 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69)= | 32 | 40 | 641 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70)= | 32 | 41 | 220 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71)= | 32 | 42 | 58 | 0 | 30 | 58 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72)= | 32 | 43 | 18 | 0 | 30 | 18 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73)= | 32 | 44 | 240 | 0 | 32 | 240 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74)= | 32 | 45 | 204 | 0 | 31 | 204 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75)= | 32 | 46 | 240 | 0 | 32 | 240 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 76)= | 32 | 47 | 322 | 0 | 31 | 322 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77)= | 32 | 50 | 1159 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78)= | 32 | 51 | 556 | 0 | 40 | 556 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 79)= | 32 | 52 | 220 | 0 | 41 | 220 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80)= | 32 | 53 | 18 | 0 | 43 | 18 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81)= | 32 | 54 | 21 | 0 | 42 | 21 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 82)= | 32 | 55 | 16 | 0 | 47 | 16 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

LINK CARDS : FLARE SATURATION FLOW DATA

| | CARD TYPE | LINK NO. | ..LANE 1.. SAT. FLOW | CAPAC VEH. | ..LANE 2.. SAT. FLOW | CAPAC VEH. | ..LANE 3.. SAT. FLOW | CAPAC VEH. |
|---|---|---|---|---|---|---|---|---|
| 83)= | 33 | 50 | 2155 | 6 | 0 | 0 | 0 | 0 |

LINK DATA: QUEUE CONSTRAINTS

| CARD NO. | CARD TYPE | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 84)= | 38 | 12 | 5 | 4500 | 13 | 5 | 4500 | 22 | 1 | 4500 | 23 | 1 | 4500 | 42 | 2 | 4500 |
| 85)= | 38 | 43 | 2 | 4500 | 51 | 1 | 4500 | 52 | 1 | 4500 | 0 | 0 | 0 | 0 | 0 | 0 |

*****END OF SUBROUTINE TINPUT****

40 SECOND CYCLE 40 STEPS

INITIAL SETTINGS
- (SECONDS)

| NODE NO | NUMBER OF STAGES | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 | STAGE 6 | STAGE 7 | STAGE 8 | STAGE 9 | STAGE 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 0 | 16 | | | | | | | | |
| 2 | 2 | 0 | 16 | | | | | | | | |
| 4 | 2 | 0 | 21 | | | | | | | | |
| 5 | 2 | 0 | 21 | | | | | | | | |

| LINK NUMBER | FLOW INTO LINK (PCU/H) | SAT FLOW (PCU/H) | DEGREE OF SAT (%) | MEAN TIMES PER PCU CRUISE (SEC) | DELAY (SEC) | DELAY (U+R+O=MEAN Q) (PCU-H/H) | OVERSAT OF DELAY ($/H) | STOPS MEAN STOPS /PCU (%) | STOPS COST OF STOPS ($/H) | QUEUE MEAN MAX. (PCU) | QUEUE AVERAGE EXCESS (PCU) | PERFORMANCE INDEX. WEIGHTED SUM OF ( ) VALUES ($/H) | EXIT NODE | GREEN TIMES START 1ST (SECONDS) | GREEN TIMES START 2ND (SECONDS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 468 | 2065 | 76 | 16.7 | 24.3 | 1.6 + 1.5 | ( 44.9)* | 110 | ( 13.3) | 6 | | 26.9 | 1 | 5 | 16 |
| 11 | 480 | 2205 | 73 | 16.7 | 22.3 | 1.7 + 1.3 | ( 42.2)* | 105 | ( 13.0) | 6 | | 25.3 | 1 | 5 | 16 |
| 12 | 566 | 2050S | 76 | 4.6 | 17.8 | 1.7 + 1.1 | ( 39.6)* | 115 | ( 16.8) | 9 | ( 1.1)* | 263.2 | 1 | 21 | 0 |
| 13 | 158 | 2100S | 18 | 4.6 | 8.4 | 0.3 + 0.1 | ( 5.2)* | 85 | ( 3.4) | 2 | ( 0.0)* | 29.6 | 1 | 21 | 0 |
| 14 | 18 | 12L | 76 | 4.6 | 12.0 | 0.0 + 0.0 | ( 0.9) | 51 | ( 0.2) | 9 | + | 1.1 | 1 | 21 | 0 |
| 15 | 193 | 12L | 76 | 4.6 | 9.6 | 0.1 + 0.4 | ( 7.3) | 38 | ( 1.9) | 9 | + | 9.2 | 1 | 21 | 0 |
| 16 | 28 | 13L | 18 | 4.6 | 4.4 | 0.0 + 0.0 | ( 0.5) | 17 | ( 0.1) | 2 | | 0.6 | 1 | 21 | 0 |
| 20 | 373 | 2040 | 61 | 16.7 | 19.5 | 1.2 + 0.8 | ( 28.7)* | 97 | ( 9.3) | 4 | | 17.2 | 2 | 5 | 16 |
| 21 | 372 | 2180 | 57 | 16.7 | 18.2 | 1.2 + 0.7 | ( 26.7)* | 93 | ( 8.9) | 4 | | 16.0 | 2 | 5 | 16 |
| 22 | 463 | 2050S | 63 | 2.6 | 18.0 | 1.7 + 0.6 | ( 33.0)* | 112 | ( 13.3) | 8 | ( 3.0)* | 314.7 | 2 | 21 | 0 |
| 23 | 480 | 2100 | 46 | 2.6 | 16.5 | 1.8 + 0.4 | ( 31.2)* | 108 | ( 13.3) | 6 | ( 2.1)* | 264.3 | 2 | 21 | 0 |
| 24 | 28 | 22L | 63 | 2.6 | 10.2 | 0.0 + 0.0 | ( 1.1) | 48 | ( 0.3) | 8 | + | 1.5 | 2 | 21 | 0 |
| 25 | 158 | 22L | 63 | 2.6 | 11.0 | 0.3 + 0.2 | ( 6.9) | 102 | ( 4.1) | 8 | + | 11.0 | 2 | 21 | 0 |
| 30 | 91 | 1169 | 16 | 16.7 | 5.7 | 0.0 + 0.1 | ( 2.0) | 51 | ( 1.2) | 0 | | 3.2 | | | |
| 31 | 720 | 6000S | 29 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.2) | 1 | ( 0.2) | 0 | | 1.4 | | | |
| 32 | 929 | 31L | 29 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.6) | 1 | ( 0.3) | 0 | | 1.8 | | | |
| 33 | 10 | 31L | 29 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.0) | 1 | ( 0.0) | 0 | | 0.0 | | | |
| 34 | 107 | 31L | 29 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.2) | 1 | ( 0.0) | 0 | | 0.2 | | | |
| 40 | 641 | 2090 | 72 | 16.7 | 16.7 | 1.7 + 1.3 | ( 42.3)* | 92 | ( 15.2) | 7 | | 25.4 | 4 | 5 | 21 |
| 41 | 220 | 2230 | 23 | 16.7 | 9.8 | 0.5 + 0.2 | ( 8.5)* | 64 | ( 3.6) | 2 | | 5.1 | 4 | 5 | 21 |
| 42 | 58 | 2050S | 65 | 2.1 | 16.0 | 0.1 + 0.1 | ( 3.7)* | 82 | ( 1.2) | 5 | ( 0.8)* | 53.5 | 4 | 26 | 0 |
| 43 | 18 | 2100S | 74 | 2.1 | 18.5 | 0.0 + 0.0 | ( 1.3)* | 87 | ( 0.4) | 7 | ( 1.8)* | 89.1 | 4 | 26 | 0 |
| 44 | 240 | 42L | 65 | 2.1 | 8.0 | 0.1 + 0.4 | ( 7.6) | 51 | ( 3.2) | 5 | + | 10.8 | 4 | 26 | 0 |
| 45 | 204 | 42L | 65 | 2.1 | 19.5 | 0.7 + 0.4 | ( 15.7) | 116 | ( 6.1) | 5 | + | 21.7 | 4 | 26 | 0 |
| 46 | 240 | 43L | 74 | 2.1 | 11.2 | 0.2 + 0.6 | ( 10.6) | 81 | ( 5.0) | 7 | + | 15.6 | 4 | 26 | 0 |
| 47 | 322 | 43L | 74 | 2.1 | 22.2 | 1.2 + 0.8 | ( 28.1) | 120 | ( 10.0) | 7 | + | 38.1 | 4 | 26 | 0 |
| 50 | 1159 | 3425f | 80 | 16.7 | 15.0 | 2.9 + 1.9 | ( 68.8)* | 86 | ( 25.5) | 12 | | 41.3 | 5 | 5 | 21 |
| 51 | 556 | 2050S | 77 | 2.7 | 27.3 | 2.7 + 1.6 | ( 60.0)* | 124 | ( 17.7) | 8 | ( 4.3)* | 511.7 | 5 | 26 | 0 |
| 52 | 220 | 2100S | 30 | 2.7 | 19.4 | 1.0 + 0.2 | ( 16.8)* | 107 | ( 6.1) | 3 | ( 0.7)* | 121.3 | 5 | 26 | 0 |
| 53 | 18 | 52L | 30 | 2.7 | 7.3 | 0.0 + 0.0 | ( 0.5) | 37 | ( 0.2) | 3 | + | 0.7 | 5 | 26 | 0 |
| 54 | 21 | 51L | 77 | 2.7 | 17.8 | 0.0 + 0.1 | ( 1.5) | 98 | ( 0.5) | 8 | + | 2.0 | 5 | 26 | 0 |
| 55 | 16 | 51L | 77 | 2.7 | 15.7 | 0.0 + 0.0 | ( 1.0) | 109 | ( 0.5) | 8 | + | 1.4 | 5 | 26 | 0 |

*** f - average saturation flow for flared link ***

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 61.0 | 16.2 | 23.0 | 15.0 | (1198.0) + ( 106.1) | + ( 621.1) | = 1925.1 | TOTALS | |

| | CRUISE LITRES PER HOUR | | DELAY LITRES PER HOUR | | STOPS LITRES PER HOUR | | TOTALS LITRES PER HOUR |
|---|---|---|---|---|---|---|---|
| FUEL CONSUMPTION PREDICTIONS | 53.1 | + | 43.7 | + | 88.8 | = | 185.6 |

NO. OF ENTRIES TO SUBPT = 1
NO. OF LINKS RECALCULATED= 56

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 18 | 34 |
| 2 | 2 | 0 | 16 |
| 4 | 2 | 18 | 39 |
| 5 | 2 | 0 | 21 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 53.5 | 18.5 | 15.5 | 15.0 | ( 647.5) + ( 56.0) | + ( 182.2) | = 885.8 | TOTALS | |

NO. OF ENTRIES TO SUBPT = 13
NO. OF LINKS RECALCULATED= 307

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 18 | 34 |
| 2 | 2 | 0 | 16 |
| 4 | 2 | 18 | 39 |
| 5 | 2 | 0 | 21 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 53.5 | 18.5 | 15.5 | 15.0 | ( 647.5) + ( | 56.0) + ( | 182.2) = | 885.8 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 234

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 20 | 35 |
| 2 | 2 | 0 | 13 |
| 4 | 2 | 20 | 38 |
| 5 | 2 | 2 | 20 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 59.2 | 16.7 | 15.9 | 20.3 | ( 568.8) + ( | 38.5) + ( | 40.9) = | 648.2 | TOTALS |

NO. OF ENTRIES TO SUBPT = 26
NO. OF LINKS RECALCULATED= 587

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1 6
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 20 | 35 |
| 2 | 2 | 0 | 13 |
| 4 | 2 | 20 | 38 |
| 5 | 2 | 2 | 20 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 59.2 | 16.7 | 15.9 | 20.3 | ( 568.7) + ( | 38.5) + ( | 40.9) = | 648.1 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 271

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1 6 16
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 20 | 35 |
| 2 | 2 | 0 | 13 |
| 4 | 2 | 20 | 38 |
| 5 | 2 | 2 | 20 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 59.2 | 16.7 | 15.9 | 20.3 | ( 568.8) + ( | 38.5) + ( | 40.9) = | 648.2 | TOTALS |

NO. OF ENTRIES TO SUBPT = 10
NO. OF LINKS RECALCULATED= 304

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1 6 16 1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 23 | 38 |
| 2 | 2 | 1 | 14 |
| 4 | 2 | 20 | 38 |
| 5 | 2 | 1 | 19 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 58.4 | 17.0 | 15.1 | 20.3 | ( 527.1) + ( | 34.5) + ( | 30.5) = | 592.2 | TOTALS |

NO. OF ENTRIES TO SUBPT = 12
NO. OF LINKS RECALCULATED= 352

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1 6 16 1 -1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 23 | 38 |
| 2 | 2 | 1 | 14 |
| 4 | 2 | 20 | 38 |
| 5 | 2 | 1 | 19 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 58.4 | 17.0 | 15.1 | 20.3 | ( 527.1) + ( | 34.5) + ( | 30.5) = | 592.2 | TOTALS |

NO. OF ENTRIES TO SUBPT = 17
NO. OF LINKS RECALCULATED= 473

40 SECOND CYCLE 40 STEPS

FINAL SETTINGS OBTAINED WITH INCREMENTS :- 6 16 -1 6 16 1 -1 1
- (SECONDS)

| NODE NO | NUMBER OF STAGES | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 | STAGE 6 | STAGE 7 | STAGE 8 | STAGE 9 | STAGE 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 24 | 39 | | | | | | | | |
| 2 | 2 | 1 | 14 | | | | | | | | |
| 4 | 2 | 19 | 37 | | | | | | | | |
| 5 | 2 | 1 | 19 | | | | | | | | |

| LINK NUMBER | FLOW INTO LINK (PCU/H) | SAT FLOW (PCU/H) | DEGREE OF SAT (%) | MEAN TIMES PER PCU CRUISE (SEC) | DELAY (SEC) | DELAY UNIFORM (U+R+O=MEAN Q) (PCU-H/H) | DELAY OVERSAT (PCU-H/H) | COST OF DELAY ($/H) | STOPS MEAN STOPS /PCU (%) | STOPS COST OF STOPS ($/H) | QUEUE MEAN MAX. (PCU) | QUEUE AVERAGE EXCESS (PCU) | PERFORMANCE INDEX. WEIGHTED SUM OF ( ) VALUES ($/H) | EXIT NODE | GREEN TIMES START 1ST (SECONDS) | GREEN TIMES START 2ND (SECONDS) | GREEN TIMES END 1ST (SECONDS) | GREEN TIMES END 2ND (SECONDS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 468 | 2065 | 82 | 16.7 | 30.9 | 1.8 + | 2.2 | ( 57.0)* | 125 | ( 15.1) | 7 | | 34.2 | 1 | 29 | | 39 | |
| 11 | 480 | 2205 | 79 | 16.7 | 27.3 | 1.8 + | 1.8 | ( 51.6)* | 117 | ( 14.5) | 7 | | 31.0 | 1 | 29 | | 39 | |
| 12 | 566 | 2050S | 72 | 4.6 | 6.4 | 0.1 + | 0.9 | ( 14.3)* | 17 | ( 2.5) | 4 | ( 0.0)* | 73.9 | 1 | 4 | | 24 | |
| 13 | 158 | 2100S | 17 | 4.6 | 2.4 | 0.0 + | 0.1 | ( 1.5)* | 7 | ( 0.3) | 0 | ( 0.0)* | 7.8 | 1 | 4 | | 24 | |
| 14 | 18 | 12L | 72 | 4.6 | 20.7 | 0.1 + | 0.0 | ( 1.5) | 114 | ( 0.5) | 4 | | 2.0 | 1 | 4 | | 24 | |
| 15 | 193 | 12L | 72 | 4.6 | 14.2 | 0.4 + | 0.3 | ( 10.8) | 107 | ( 5.3) | 4 | | 16.1 | 1 | 4 | | 24 | |
| 16 | 28 | 13L | 17 | 4.6 | 8.3 | 0.0 + | 0.0 | ( 0.9) | 84 | ( 0.6) | 0 | | 1.5 | 1 | 4 | | 24 | |
| 20 | 373 | 2040 | 81 | 16.7 | 34.7 | 1.5 + | 2.1 | ( 51.0)* | 132 | ( 12.7) | 6 | | 30.6 | 2 | 6 | | 14 | |
| 21 | 372 | 2180 | 76 | 16.7 | 29.3 | 1.5 + | 1.5 | ( 43.0)* | 121 | ( 11.6) | 5 | | 25.8 | 2 | 6 | | 14 | |
| 22 | 463 | 2050S | 55 | 2.6 | 3.8 | 0.1 + | 0.4 | ( 6.9)* | 11 | ( 1.3) | 2 | ( 0.2)* | 44.2 | 2 | 19 | | 1 | |
| 23 | 480 | 2100 | 40 | 2.6 | 2.9 | 0.1 + | 0.3 | ( 5.5)* | 11 | ( 1.4) | 3 | ( 0.1)* | 32.7 | 2 | 19 | | 1 | |
| 24 | 28 | 22L | 55 | 2.6 | 15.5 | 0.1 + | 0.0 | ( 1.7) | 107 | ( 0.8) | 2 | + | 2.5 | 2 | 19 | | 1 | |
| 25 | 158 | 22L | 55 | 2.6 | 6.0 | 0.1 + | 0.1 | ( 3.8) | 60 | ( 2.4) | 2 | + | 6.2 | 2 | 19 | | 1 | |
| 30 | 91 | 1169 | 16 | 16.7 | 5.5 | 0.0 + | 0.1 | ( 2.0) | 49 | ( 1.2) | 0 | | 3.1 | | | | | |
| 31 | 720 | 6000S | 29 | 4.2 | 0.4 | 0.0 + | 0.1 | ( 1.2) | 1 | ( 0.2) | 0 | | 1.4 | | | | | |
| 32 | 929 | 31L | 29 | 4.2 | 0.4 | 0.0 + | 0.1 | ( 1.6) | 1 | ( 0.3) | 0 | | 1.8 | | | | | |
| 33 | 10 | 31L | 29 | 4.2 | 0.4 | 0.0 + | 0.0 | ( 0.0) | 1 | ( 0.0) | 0 | | 0.0 | | | | | |
| 34 | 108 | 31L | 29 | 4.2 | 0.4 | 0.0 + | 0.0 | ( 0.2) | 1 | ( 0.0) | 0 | | 0.2 | | | | | |
| 40 | 641 | 2090 | 88 | 16.7 | 30.7 | 2.2 + | 3.3 | ( 77.7)* | 127 | ( 21.0) | 10 | | 46.6 | 4 | 24 | | 37 | |
| 41 | 220 | 2230 | 28 | 16.7 | 12.6 | 0.6 + | 0.2 | ( 10.9)* | 73 | ( 4.2) | 2 | | 6.6 | 4 | 24 | | 37 | |
| 42 | 58 | 2050S | 54 | 2.1 | 11.5 | 0.1 + | 0.1 | ( 2.6)* | 63 | ( 0.9) | 4 | ( 0.1)* | 20.8 | 4 | 2 | | 19 | |
| 43 | 18 | 2100S | 61 | 2.1 | 12.1 | 0.0 + | 0.0 | ( 0.9)* | 62 | ( 0.3) | 3 | ( 0.1)* | 10.1 | 4 | 2 | | 19 | |
| 44 | 240 | 42L | 54 | 2.1 | 7.3 | 0.2 + | 0.3 | ( 6.9) | 73 | ( 4.5) | 4 | + | 11.4 | 4 | 2 | | 19 | |
| 45 | 204 | 42L | 54 | 2.1 | 6.4 | 0.1 + | 0.2 | ( 5.1) | 20 | ( 1.1) | 4 | + | 6.2 | 4 | 2 | | 19 | |
| 46 | 240 | 43L | 61 | 2.1 | 7.7 | 0.2 + | 0.3 | ( 7.3) | 71 | ( 4.4) | 3 | + | 11.7 | 4 | 2 | | 19 | |
| 47 | 322 | 43L | 61 | 2.1 | 7.0 | 0.2 + | 0.4 | ( 8.9) | 22 | ( 1.8) | 3 | + | 10.7 | 4 | 2 | | 19 | |
| 50 | 1159 | 3697f | 90 | 16.7 | 24.1 | 3.7 + | 4.0 | (110.3)* | 110 | ( 33.0) | 15 | | 66.2 | 5 | 6 | | 19 | |
| 51 | 556 | 2050S | 64 | 2.7 | 5.5 | 0.0 + | 0.8 | ( 12.1)* | 14 | ( 1.9) | 1 | ( 0.1)* | 65.7 | 5 | 24 | | 1 | |
| 52 | 220 | 2100S | 25 | 2.7 | 2.6 | 0.0 + | 0.2 | ( 2.3)* | 7 | ( 0.4) | 0 | ( 0.0)* | 11.7 | 5 | 24 | | 1 | |
| 53 | 18 | 52L | 25 | 2.7 | 17.4 | 0.1 + | 0.0 | ( 1.2) | 102 | ( 0.5) | 0 | | 1.7 | 5 | 24 | | 1 | |
| 54 | 21 | 51L | 64 | 2.7 | 20.2 | 0.1 + | 0.0 | ( 1.7) | 108 | ( 0.6) | 1 | + | 2.3 | 5 | 24 | | 1 | |
| 55 | 16 | 51L | 64 | 2.7 | 12.9 | 0.0 + | 0.0 | ( 0.8) | 102 | ( 0.4) | 1 | + | 1.2 | 5 | 24 | | 1 | |

*** f - average saturation flow for flared link ***

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 990.6 | 58.5 | 16.9 | 15.1 | 20.3 | ( 526.8) + ( | 33.5) + ( | 27.5) = | 587.8 | TOTALS |

ROUTE

| | CRUISE LITRES PER HOUR | | DELAY LITRES PER HOUR | | STOPS LITRES PER HOUR | | TOTALS LITRES PER HOUR |
|---|---|---|---|---|---|---|---|
| FUEL CONSUMPTION PREDICTIONS | 53.1 | + | 40.7 | + | 66.3 | = | 160.2 |

NO. OF ENTRIES TO SUBPT = 10
NO. OF LINKS RECALCULATED= 313

PROGRAM TRANSYT FINISHED
========== end of file ==========

Printed at 16:56:30 on 01/02/2016]

# T R A N S Y T 12

Traffic Network Study Tool

Analysis Program Release 7 (July 2010)


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Run with file:- "2026 AM+DEV+SP.DAT" at 17:37 on 20160112

TRANSYT 12.0

Gibbet Hill Rbout 2026 AM Peak + Development + Symmetry Park Dec 15 HE Amends

PARAMETERS CONTROLLING DIMENSIONS OF PROBLEM :

| | |
|---|---|
| NUMBER OF NODES | = 4 |
| NUMBER OF LINKS | = 32 |
| NUMBER OF OPTIMISED NODES | = 4 |
| MAXIMUM NUMBER OF GRAPHIC PLOTS | = 0 |
| NUMBER OF STEPS IN CYCLE | = 45 |
| MAXIMUM NUMBER OF SHARED STOPLINES | = 4 |
| MAXIMUM NUMBER OF TIMING POINTS | = 2 |
| MAXIMUM LINKS AT ANY NODE | = 11 |

CORE REQUESTED = 8366 WORDS
CORE AVAILABLE = 72000 WORDS

DATA INPUT :-

( 1)= TITLE:- Gibbet Hill Rbout 2026 AM Peak + Development + Symmetry Park Dec 15 HE Amends

| CARD NO. | CARD TYPE | CYCLE TIME (SEC) | NO. OF STEPS PER CYCLE | TIME PERIOD 1-1200 MINS. | EFFECTIVE-GREEN DISPLACEMENTS START (SEC) | EFFECTIVE-GREEN DISPLACEMENTS END (SEC) | EQUISAT SETTINGS 0=UNEQUAL 1=EQUAL 0=NO 1=YES | FLOW CYCLE 10-200 % | CRUISE-SPEEDS SCALE 50-200 % | CARD32 0=TIMES 1=SPEEDS | OPTIMISE 0=NONE 1=O/SET 2=FULL | EXTRA COPIES FINAL OUTPUT | HILL-CLIMB OUTPUT 1=FULL | DELAY VALUE P PER PCU-H | STOP VALUE P PER 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2)= | 1 | 45 | 45 | 60 | 2 | 3 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 1420 | 260 |

| CARD NO. | CARD TYPE | LIST OF NODES TO BE OPTIMISED | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3)= | 2 | 1 | 2 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

LINKS HAVING SHARED STOPLINES

| CARD NO. | CARD TYPE | FIRST SET..... | | | | SECOND SET..... | | | | THIRD SET..... | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4)= | 7 | 12 | 14 | 15 | 0 | 0 | 13 | 16 | 0 | 0 | 0 | 22 | 24 | 25 | 0 | 0 |
| 5)= | 7 | 31 | 32 | 33 | 34 | 0 | 42 | 44 | 45 | 0 | 0 | 43 | 46 | 47 | 0 | 0 |
| 6)= | 7 | 51 | 54 | 55 | 0 | 0 | 52 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NODE CARDS: MINIMUM STAGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7)= | 10 | 1 | 7 | 7 | | | | | | | | |
| 8)= | 10 | 2 | 7 | 7 | | | | | | | | |
| 9)= | 10 | 4 | 7 | 7 | | | | | | | | |
| 10)= | 10 | 5 | 7 | 7 | | | | | | | | |

NODE CARDS: PRECEDING INTERSTAGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11)= | 11 | 1 | 5 | 5 | | | | | | | | |
| 12)= | 11 | 2 | 5 | 5 | | | | | | | | |
| 13)= | 11 | 4 | 5 | 5 | | | | | | | | |
| 14)= | 11 | 5 | 5 | 5 | | | | | | | | |

NODE CARDS: STAGE CHANGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | Sgl/Dbl Cycled | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15)= | 12 | 1 | 1 | 0 | 0 | | | | | | | | |
| 16)= | 12 | 2 | 1 | 0 | 0 | | | | | | | | |
| 17)= | 12 | 4 | 1 | 0 | 0 | | | | | | | | |
| 18)= | 12 | 5 | 1 | 0 | 0 | | | | | | | | |

LINK CARDS: GIVEWAY DATA

| CARD NO. | CARD TYPE | LINK NO. | PRIORITY LINKS LINK1 NO. | PRIORITY LINKS LINK2 NO. | LINK1 GIVEWAY COEFFS. ONLY % FLOW | LINK1 GIVEWAY COEFFS. A1 X100 | LINK1 GIVEWAY COEFFS. A2 X100 | | | | | LINK LENGTH | STOP WT.X100 | MAX FLOW | DELAY WT.X100 | DISPSN X100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19)= | 30 | 30 | 31 | 0 | 0 | 41 | 100 | 0 | 0 | 0 | 0 | 200 | 0 | 1169 | 0 | 0 |

LINK CARDS: FIXED DATA

| CARD NO. | CARD TYPE | LINK NO. | EXIT NODE | FIRST GREEN START STAGE | FIRST GREEN START LAG | FIRST GREEN END STAGE | FIRST GREEN END LAG | SECOND GREEN START STAGE | SECOND GREEN START LAG | SECOND GREEN END STAGE | SECOND GREEN END LAG | LINK LENGTH | STOP WT.X100 | SAT FLOW | DELAY WT.X100 | DISPSN X100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20)= | 31 | 10 | 1 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2065 | 60 | 0 |
| 21)= | 31 | 11 | 1 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2205 | 60 | 0 |
| 22)= | 31 | 12 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 2050 | 500 | 0 |
| 23)= | 31 | 13 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 2100 | 500 | 0 |
| 24)= | 31 | 14 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 25)= | 31 | 15 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 26)= | 31 | 16 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 27)= | 31 | 20 | 2 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2040 | 60 | 0 |
| 28)= | 31 | 21 | 2 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2180 | 60 | 0 |
| 29)= | 31 | 22 | 2 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 2050 | 500 | 0 |
| 30)= | 31 | 23 | 2 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 2100 | 500 | 0 |
| 31)= | 31 | 24 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 32)= | 31 | 25 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 33)= | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 6000 | 0 | 0 |
| 34)= | 31 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 35)= | 31 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 36)= | 31 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 37)= | 31 | 40 | 4 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2090 | 60 | 0 |
| 38)= | 31 | 41 | 4 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2230 | 60 | 0 |
| 39)= | 31 | 42 | 4 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 2050 | 500 | 0 |
| 40)= | 31 | 43 | 4 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 2100 | 500 | 0 |
| 41)= | 31 | 44 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 42)= | 31 | 45 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 43)= | 31 | 46 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 44)= | 31 | 47 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 45)= | 31 | 50 | 5 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2155 | 60 | 0 |
| 46)= | 31 | 51 | 5 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 2050 | 500 | 0 |
| 47)= | 31 | 52 | 5 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 2100 | 500 | 0 |
| 48)= | 31 | 53 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 49)= | 31 | 54 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 50)= | 31 | 55 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |

LINK CARDS: FLOW DATA

| CARD NO. | CARD TYPE | LINK NO. | TOTAL FLOW | UNIFORM FLOW | ENTRY 1 LINK NO. | ENTRY 1 CRUISE FLOW | ENTRY 1 CRUISE SPEED | ENTRY 2 LINK NO. | ENTRY 2 CRUISE FLOW | ENTRY 2 CRUISE SPEED | ENTRY 3 LINK NO. | ENTRY 3 CRUISE FLOW | ENTRY 3 CRUISE SPEED | ENTRY 4 LINK NO. | ENTRY 4 CRUISE FLOW | ENTRY 4 CRUISE SPEED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51)= | 32 | 10 | 575 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 52)= | 32 | 11 | 631 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 53)= | 32 | 12 | 514 | 0 | 50 | 514 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 54)= | 32 | 13 | 142 | 0 | 50 | 142 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 55)= | 32 | 14 | 34 | 0 | 53 | 34 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 56)= | 32 | 15 | 131 | 0 | 51 | 131 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57)= | 32 | 16 | 42 | 0 | 51 | 42 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 58)= | 32 | 20 | 360 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59)= | 32 | 21 | 360 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60)= | 32 | 22 | 565 | 0 | 10 | 565 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 61)= | 32 | 23 | 631 | 0 | 11 | 631 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62)= | 32 | 24 | 42 | 0 | 16 | 42 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63)= | 32 | 25 | 142 | 0 | 13 | 142 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64)= | 32 | 30 | 117 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65)= | 32 | 31 | 687 | 0 | 20 | 327 | 43 | 21 | 360 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| 66)= | 32 | 32 | 1180 | 0 | 22 | 549 | 43 | 23 | 631 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67)= | 32 | 33 | 13 | 0 | 24 | 13 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68)= | 32 | 34 | 111 | 0 | 25 | 111 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69)= | 32 | 40 | 565 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70)= | 32 | 41 | 173 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71)= | 32 | 42 | 66 | 0 | 30 | 66 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72)= | 32 | 43 | 34 | 0 | 30 | 34 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73)= | 32 | 44 | 315 | 0 | 32 | 315 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74)= | 32 | 45 | 209 | 0 | 31 | 209 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75)= | 32 | 46 | 316 | 0 | 32 | 316 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 76)= | 32 | 47 | 316 | 0 | 31 | 316 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77)= | 32 | 50 | 1219 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78)= | 32 | 51 | 446 | 0 | 40 | 446 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 79)= | 32 | 52 | 173 | 0 | 41 | 173 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80)= | 32 | 53 | 34 | 0 | 43 | 34 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81)= | 32 | 54 | 20 | 0 | 42 | 20 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 82)= | 32 | 55 | 10 | 0 | 47 | 10 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

LINK CARDS : FLARE SATURATION FLOW DATA

| | CARD TYPE | LINK NO. | ..LANE 1.. SAT. FLOW | CAPAC VEH. | ..LANE 2.. SAT. FLOW | CAPAC VEH. | ..LANE 3.. SAT. FLOW | CAPAC VEH. |
|---|---|---|---|---|---|---|---|---|
| 83)= | 33 | 50 | 2155 | 6 | 0 | 0 | 0 | 0 |

LINK DATA: QUEUE CONSTRAINTS

| CARD NO. | CARD TYPE | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 84)= | 38 | 12 | 5 | 4500 | 13 | 5 | 4500 | 22 | 1 | 4500 | 23 | 1 | 4500 | 42 | 2 | 4500 |
| 85)= | 38 | 43 | 2 | 4500 | 51 | 1 | 4500 | 52 | 1 | 4500 | 0 | 0 | 0 | 0 | 0 | 0 |

*****END OF SUBROUTINE TINPUT****

45 SECOND CYCLE 45 STEPS

INITIAL SETTINGS
- (SECONDS)

| NODE NO | NUMBER OF STAGES | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 | STAGE 6 | STAGE 7 | STAGE 8 | STAGE 9 | STAGE 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 0 | 21 | | | | | | | | |
| 2 | 2 | 0 | 16 | | | | | | | | |
| 4 | 2 | 0 | 21 | | | | | | | | |
| 5 | 2 | 0 | 27 | | | | | | | | |

| LINK NUMBER | FLOW INTO LINK (PCU/H) | SAT FLOW (PCU/H) | DEGREE OF SAT (%) | MEAN TIMES PER PCU CRUISE (SEC) | DELAY (SEC) | DELAY (U+R+O=MEAN Q) (PCU-H/H) | COST OF DELAY ($/H) | STOPS MEAN /PCU (%) | STOPS COST OF STOPS ($/H) | QUEUE MEAN MAX. (PCU) | QUEUE AVERAGE EXCESS (PCU) | PERFORMANCE INDEX. WEIGHTED SUM OF ( ) VALUES ($/H) | EXIT NODE | GREEN TIMES START 1ST (SECONDS) | GREEN TIMES START 2ND (SECONDS) | GREEN TIMES END 1ST (SECONDS) | GREEN TIMES END 2ND (SECONDS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 575 | 2065 | 74 | 16.7 | 20.7 | 1.9 + 1.4 | ( 47.0)* | 98 | ( 14.5) | 7 | | 28.2 | 1 | 5 | 21 | | |
| 11 | 631 | 2205 | 76 | 16.7 | 21.0 | 2.1 + 1.5 | ( 52.2)* | 99 | ( 16.1) | 8 | | 31.3 | 1 | 5 | 21 | | |
| 12 | 514 | 2050S | 75 | 4.6 | 21.5 | 2.0 + 1.1 | ( 43.6)* | 115 | ( 15.2) | 8 | ( 1.1)* | 281.6 | 1 | 26 | 0 | | |
| 13 | 141 | 2100S | 20 | 4.6 | 11.9 | 0.4 + 0.1 | ( 6.6)* | 88 | ( 3.2) | 2 | ( 0.0)* | 36.4 | 1 | 26 | 0 | | |
| 14 | 34 | 12L | 75 | 4.6 | 13.0 | 0.1 + 0.1 | ( 1.7) | 46 | ( 0.4) | 8 | + | 2.2 | 1 | 26 | 0 | | |
| 15 | 131 | 12L | 75 | 4.6 | 11.0 | 0.1 + 0.3 | ( 5.7) | 35 | ( 1.2) | 8 | + | 6.9 | 1 | 26 | 0 | | |
| 16 | 42 | 13L | 20 | 4.6 | 5.6 | 0.0 + 0.0 | ( 0.9) | 19 | ( 0.2) | 2 | | 1.1 | 1 | 26 | 0 | | |
| 20 | 360 | 2040 | 66 | 16.7 | 24.4 | 1.5 + 1.0 | ( 34.6)* | 103 | ( 9.6) | 5 | | 20.8 | 2 | 5 | 16 | | |
| 21 | 360 | 2180 | 62 | 16.7 | 22.6 | 1.5 + 0.8 | ( 32.1)* | 99 | ( 9.2) | 5 | | 19.2 | 2 | 5 | 16 | | |
| 22 | 565 | 2050S | 66 | 2.6 | 17.7 | 2.1 + 0.7 | ( 39.5)* | 110 | ( 16.0) | 10 | ( 3.8)* | 384.6 | 2 | 21 | 0 | | |
| 23 | 631 | 2100 | 54 | 2.6 | 16.7 | 2.3 + 0.6 | ( 41.6)* | 107 | ( 17.4) | 8 | ( 3.3)* | 372.8 | 2 | 21 | 0 | | |
| 24 | 42 | 22L | 66 | 2.6 | 10.3 | 0.1 + 0.1 | ( 1.7) | 48 | ( 0.5) | 10 | + | 2.2 | 2 | 21 | 0 | | |
| 25 | 141 | 22L | 66 | 2.6 | 9.3 | 0.2 + 0.2 | ( 5.2) | 92 | ( 3.4) | 10 | + | 8.5 | 2 | 21 | 0 | | |
| 30 | 117 | 1169 | 23 | 16.7 | 7.8 | 0.1 + 0.1 | ( 3.6) | 63 | ( 1.9) | 1 | | 5.5 | | | | | |
| 31 | 687 | 6000S | 33 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.2) | 1 | ( 0.2) | 0 | | 1.4 | | | | | |
| 32 | 1180 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.1 | ( 2.1) | 1 | ( 0.3) | 0 | | 2.4 | | | | | |
| 33 | 13 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.0) | 1 | ( 0.0) | 0 | | 0.0 | | | | | |
| 34 | 111 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.2) | 1 | ( 0.0) | 0 | | 0.2 | | | | | |
| 40 | 565 | 2090 | 72 | 16.7 | 19.9 | 1.9 + 1.2 | ( 44.3)* | 95 | ( 13.9) | 7 | | 26.6 | 4 | 5 | 21 | | |
| 41 | 173 | 2230 | 21 | 16.7 | 12.2 | 0.5 + 0.1 | ( 8.3)* | 68 | ( 3.0) | 2 | | 5.0 | 4 | 5 | 21 | | |
| 42 | 66 | 2050S | 65 | 2.1 | 14.0 | 0.2 + 0.1 | ( 3.6)* | 71 | ( 1.2) | 6 | ( 1.0)* | 63.9 | 4 | 26 | 0 | | |
| 43 | 34 | 2100S | 71 | 2.1 | 15.7 | 0.1 + 0.1 | ( 2.1)* | 74 | ( 0.6) | 9 | ( 2.0)* | 103.0 | 4 | 26 | 0 | | |
| 44 | 314 | 42L | 65 | 2.1 | 6.8 | 0.1 + 0.5 | ( 8.4) | 45 | ( 3.6) | 6 | + | 12.0 | 4 | 26 | 0 | | |
| 45 | 209 | 42L | 65 | 2.1 | 18.4 | 0.7 + 0.3 | ( 15.2) | 111 | ( 6.0) | 6 | + | 21.2 | 4 | 26 | 0 | | |
| 46 | 316 | 43L | 71 | 2.1 | 9.2 | 0.2 + 0.6 | ( 11.4) | 70 | ( 5.7) | 9 | + | 17.1 | 4 | 26 | 0 | | |
| 47 | 316 | 43L | 71 | 2.1 | 20.4 | 1.2 + 0.6 | ( 25.5) | 114 | ( 9.3) | 9 | + | 34.8 | 4 | 26 | 0 | | |
| 50 | 1219 | 3094f | 77 | 16.7 | 12.4 | 2.5 + 1.7 | ( 59.7)* | 72 | ( 22.6) | 12 | | 35.8 | 5 | 5 | 27 | | |
| 51 | 446 | 2050S | 75 | 2.7 | 33.8 | 2.8 + 1.4 | ( 59.5)* | 123 | ( 14.1) | 7 | ( 4.1)* | 494.0 | 5 | 32 | 0 | | |
| 52 | 173 | 2100S | 32 | 2.7 | 26.3 | 1.1 + 0.2 | ( 18.0)* | 109 | ( 4.8) | 3 | ( 0.8)* | 129.6 | 5 | 32 | 0 | | |
| 53 | 34 | 52L | 32 | 2.7 | 11.4 | 0.1 + 0.0 | ( 1.5) | 66 | ( 0.6) | 3 | + | 2.1 | 5 | 32 | 0 | | |
| 54 | 20 | 51L | 75 | 2.7 | 22.6 | 0.1 + 0.1 | ( 1.8) | 100 | ( 0.5) | 7 | + | 2.3 | 5 | 32 | 0 | | |
| 55 | 10 | 51L | 75 | 2.7 | 21.2 | 0.0 + 0.0 | ( 0.8) | 122 | ( 0.3) | 7 | + | 1.2 | 5 | 32 | 0 | | |

*** f - average saturation flow for flared link ***

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 65.1 | 16.0 | 25.8 | 15.1 | (1326.8) + | ( 106.8) + | ( 720.3) = | 2153.9 | TOTALS |

| | CRUISE LITRES PER HOUR | | DELAY LITRES PER HOUR | | STOPS LITRES PER HOUR | | TOTALS LITRES PER HOUR |
|---|---|---|---|---|---|---|---|
| FUEL CONSUMPTION PREDICTIONS | 55.9 | + | 47.0 | + | 89.1 | = | 192.0 |

NO. OF ENTRIES TO SUBPT = 1
NO. OF LINKS RECALCULATED= 56

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 18 | 39 |
| 2 | 2 | 0 | 16 |
| 4 | 2 | 24 | 0 |
| 5 | 2 | 0 | 27 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 57.3 | 18.2 | 17.9 | 15.1 | ( 709.7) + | ( 59.1) + | ( 254.6) = | 1023.4 | TOTALS |

NO. OF ENTRIES TO SUBPT = 14
NO. OF LINKS RECALCULATED= 336

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 18 | 39 |
| 2 | 2 | 0 | 16 |
| 4 | 2 | 24 | 0 |
| 5 | 2 | 0 | 27 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 57.3 | 18.2 | 17.9 | 15.1 | ( 709.7) + ( 59.1) | + | ( 254.6) | = 1023.4 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 253

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 20 | 40 |
| 2 | 2 | 2 | 16 |
| 4 | 2 | 26 | 43 |
| 5 | 2 | 2 | 25 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 64.4 | 16.2 | 18.7 | 21.5 | ( 648.1) + ( 44.9) | + | ( 104.6) | = 797.6 | TOTALS |

NO. OF ENTRIES TO SUBPT = 28
NO. OF LINKS RECALCULATED= 629

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1 6
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 26 | 1 |
| 2 | 2 | 2 | 16 |
| 4 | 2 | 26 | 43 |
| 5 | 2 | 2 | 25 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 63.0 | 16.6 | 17.3 | 21.5 | ( 592.3) + ( 40.3) | + | ( 72.2) | = 704.7 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 258

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1 6 18
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 26 | 1 |
| 2 | 2 | 2 | 16 |
| 4 | 2 | 26 | 43 |
| 5 | 2 | 2 | 25 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 63.0 | 16.6 | 17.3 | 21.5 | ( 592.3) + ( 40.3) | + | ( 72.2) | = 704.7 | TOTALS |

NO. OF ENTRIES TO SUBPT = 10
NO. OF LINKS RECALCULATED= 308

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1 6 18 1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 26 | 1 |
| 2 | 2 | 4 | 18 |
| 4 | 2 | 23 | 40 |
| 5 | 2 | 44 | 22 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 62.6 | 16.7 | 16.9 | 21.5 | ( 563.4) + ( 37.4) | + | ( 60.9) | = 661.7 | TOTALS |

NO. OF ENTRIES TO SUBPT = 16
NO. OF LINKS RECALCULATED= 428

45 SECOND CYCLE 45 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 18 -1 6 18 1 -1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 27 | 1 |
| 2 | 2 | 4 | 18 |
| 4 | 2 | 22 | 40 |
| 5 | 2 | 44 | 22 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 61.8 | 16.9 | 17.1 | 20.4 | ( 549.9) + ( | 36.9) + ( | 60.8) = | 647.5 | TOTALS |

NO. OF ENTRIES TO SUBPT = 18
NO. OF LINKS RECALCULATED= 498

45 SECOND CYCLE 45 STEPS

FINAL SETTINGS OBTAINED WITH INCREMENTS :- 6 18 -1 6 18 1 -1 1
- (SECONDS)

| NODE NO | NUMBER OF STAGES | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 | STAGE 6 | STAGE 7 | STAGE 8 | STAGE 9 | STAGE 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 27 | 1 | | | | | | | | |
| 2 | 2 | 3 | 17 | | | | | | | | |
| 4 | 2 | 22 | 40 | | | | | | | | |
| 5 | 2 | 0 | 23 | | | | | | | | |

| LINK NUMBER | FLOW INTO LINK (PCU/H) | SAT FLOW (PCU/H) | DEGREE OF SAT (%) | MEAN TIMES PER PCU CRUISE (SEC) | DELAY (SEC) | DELAY UNIFORM (U+R+O=MEAN Q) (PCU-H/H) | DELAY OVERSAT RANDOM+ COST OF DELAY ($/H) | STOPS MEAN STOPS /PCU (%) | STOPS COST OF STOPS ($/H) | QUEUE MEAN MAX. (PCU) | QUEUE AVERAGE EXCESS (PCU) | PERFORMANCE INDEX. WEIGHTED SUM OF ( ) VALUES ($/H) | EXIT NODE | GREEN TIMES START 1ST | GREEN TIMES START 2ND | GREEN TIMES END 1ST | GREEN TIMES END 2ND |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | (SECONDS) | | | |
| 10 | 575 | 2065 | 84 | 16.7 | 29.1 | 2.2 + 2.4 | ( 66.0)* | 117 | ( 17.3) | 9 | | 39.6 | 1 | 32 | 1 | | |
| 11 | 631 | 2205 | 86 | 16.7 | 30.4 | 2.5 + 2.9 | ( 75.7)* | 119 | ( 19.4) | 10 | | 45.4 | 1 | 32 | 1 | | |
| 12 | 514 | 2050S | 68 | 4.6 | 6.3 | 0.1 + 0.8 | ( 12.7)* | 17 | ( 2.2) | 4 | ( 0.0)* | 65.8 | 1 | 6 | 27 | | |
| 13 | 141 | 2100S | 18 | 4.6 | 2.8 | 0.0 + 0.1 | ( 1.6)* | 8 | ( 0.3) | 1 | ( 0.0)* | 8.2 | 1 | 6 | 27 | | |
| 14 | 34 | 12L | 68 | 4.6 | 23.4 | 0.2 + 0.1 | ( 3.1) | 112 | ( 1.0) | 4 | | 4.1 | 1 | 6 | 27 | | |
| 15 | 131 | 12L | 68 | 4.6 | 17.8 | 0.4 + 0.2 | ( 9.2) | 110 | ( 3.7) | 4 | | 12.9 | 1 | 6 | 27 | | |
| 16 | 42 | 13L | 18 | 4.6 | 12.4 | 0.1 + 0.0 | ( 2.1) | 99 | ( 1.1) | 1 | | 3.1 | 1 | 6 | 27 | | |
| 20 | 360 | 2040 | 79 | 16.7 | 35.1 | 1.7 + 1.9 | ( 49.8)* | 126 | ( 11.7) | 6 | | 29.9 | 2 | 8 | 17 | | |
| 21 | 360 | 2180 | 74 | 16.7 | 30.5 | 1.6 + 1.4 | ( 43.2)* | 116 | ( 10.7) | 6 | | 25.9 | 2 | 8 | 17 | | |
| 22 | 565 | 2050S | 61 | 2.6 | 4.0 | 0.0 + 0.6 | ( 9.0)* | 10 | ( 1.4) | 3 | ( 0.4)* | 64.6 | 2 | 22 | 3 | | |
| 23 | 631 | 2100 | 50 | 2.6 | 3.3 | 0.1 + 0.5 | ( 8.2)* | 15 | ( 2.4) | 5 | ( 0.4)* | 61.6 | 2 | 22 | 3 | | |
| 24 | 42 | 22L | 61 | 2.6 | 17.2 | 0.2 + 0.0 | ( 2.9) | 108 | ( 1.2) | 3 | + | 4.0 | 2 | 22 | 3 | | |
| 25 | 141 | 22L | 61 | 2.6 | 9.3 | 0.2 + 0.1 | ( 5.2) | 82 | ( 3.0) | 3 | + | 8.2 | 2 | 22 | 3 | | |
| 30 | 117 | 1169 | 24 | 16.7 | 7.5 | 0.1 + 0.2 | ( 3.4) | 60 | ( 1.8) | 1 | | 5.3 | | | | | |
| 31 | 687 | 6000S | 33 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.2) | 1 | ( 0.2) | 0 | | 1.4 | | | | | |
| 32 | 1180 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.1 | ( 2.1) | 1 | ( 0.3) | 0 | | 2.4 | | | | | |
| 33 | 13 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.0) | 1 | ( 0.0) | 0 | | 0.0 | | | | | |
| 34 | 111 | 31L | 33 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.2) | 1 | ( 0.0) | 0 | | 0.2 | | | | | |
| 40 | 565 | 2090 | 87 | 16.7 | 34.3 | 2.3 + 3.1 | ( 76.5)* | 127 | ( 18.5) | 10 | | 45.9 | 4 | 27 | 40 | | |
| 41 | 173 | 2230 | 25 | 16.7 | 15.1 | 0.6 + 0.2 | ( 10.3)* | 77 | ( 3.4) | 2 | | 6.2 | 4 | 27 | 40 | | |
| 42 | 66 | 2050S | 56 | 2.1 | 10.4 | 0.1 + 0.1 | ( 2.7)* | 53 | ( 0.9) | 4 | ( 0.2)* | 23.6 | 4 | 0 | 22 | | |
| 43 | 34 | 2100S | 62 | 2.1 | 10.8 | 0.1 + 0.0 | ( 1.4)* | 54 | ( 0.5) | 4 | ( 0.2)* | 15.5 | 4 | 0 | 22 | | |
| 44 | 314 | 42L | 56 | 2.1 | 6.2 | 0.2 + 0.3 | ( 7.7) | 58 | ( 4.7) | 4 | + | 12.4 | 4 | 0 | 22 | | |
| 45 | 209 | 42L | 56 | 2.1 | 5.6 | 0.1 + 0.2 | ( 4.6) | 16 | ( 0.9) | 4 | + | 5.5 | 4 | 0 | 22 | | |
| 46 | 316 | 43L | 62 | 2.1 | 6.6 | 0.2 + 0.4 | ( 8.2) | 56 | ( 4.6) | 4 | + | 12.8 | 4 | 0 | 22 | | |
| 47 | 316 | 43L | 62 | 2.1 | 6.1 | 0.1 + 0.4 | ( 7.5) | 18 | ( 1.4) | 4 | + | 9.0 | 4 | 0 | 22 | | |
| 50 | 1219 | 3291f | 88 | 16.7 | 20.6 | 3.5 + 3.4 | ( 99.1)* | 95 | ( 29.8) | 16 | | 59.4 | 5 | 5 | 23 | | |
| 51 | 446 | 2050S | 58 | 2.7 | 5.3 | 0.0 + 0.6 | ( 9.3)* | 11 | ( 1.3) | 1 | ( 0.0)* | 47.9 | 5 | 28 | 0 | | |
| 52 | 173 | 2100S | 25 | 2.7 | 2.9 | 0.0 + 0.1 | ( 2.0)* | 6 | ( 0.3) | 1 | ( 0.0)* | 10.1 | 5 | 28 | 0 | | |
| 53 | 34 | 52L | 25 | 2.7 | 20.9 | 0.2 + 0.0 | ( 2.8) | 103 | ( 0.9) | 1 | | 3.7 | 5 | 28 | 0 | | |
| 54 | 20 | 51L | 58 | 2.7 | 23.3 | 0.1 + 0.0 | ( 1.8) | 108 | ( 0.6) | 1 | | 2.4 | 5 | 28 | 0 | | |
| 55 | 10 | 51L | 58 | 2.7 | 14.4 | 0.0 + 0.0 | ( 0.6) | 105 | ( 0.3) | 1 | | 0.8 | 5 | 28 | 0 | | |

*** f - average saturation flow for flared link ***

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1043.1 | 61.6 | 16.9 | 16.9 | 20.4 | ( 549.3) + ( | 34.9) + ( | 53.6) = | 637.8 | TOTALS |

ROUTE

| | CRUISE LITRES PER HOUR | | DELAY LITRES PER HOUR | | STOPS LITRES PER HOUR | | TOTALS LITRES PER HOUR |
|---|---|---|---|---|---|---|---|
| FUEL CONSUMPTION PREDICTIONS | 55.9 | + | 42.9 | + | 66.4 | = | 165.3 |

NO. OF ENTRIES TO SUBPT = 10
NO. OF LINKS RECALCULATED= 309

PROGRAM TRANSYT FINISHED
========== end of file ==========

Printed at 16:56:55 on 01/02/2016]

T R A N S Y T 12

Traffic Network Study Tool

Analysis Program Release 7 (July 2010)


For sales and distribution information,
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Run with file:- "2026 PM+DEV+SP.DAT" at 17:41 on 20160112

TRANSYT 12.0

Gibbet Hill Rbout 2026 PM Peak + Developemnt + Symmetry Park Dec 15 HE Amends

PARAMETERS CONTROLLING DIMENSIONS OF PROBLEM :

| | |
|---|---|
| NUMBER OF NODES | = 4 |
| NUMBER OF LINKS | = 32 |
| NUMBER OF OPTIMISED NODES | = 4 |
| MAXIMUM NUMBER OF GRAPHIC PLOTS | = 0 |
| NUMBER OF STEPS IN CYCLE | = 40 |
| MAXIMUM NUMBER OF SHARED STOPLINES | = 4 |
| MAXIMUM NUMBER OF TIMING POINTS | = 2 |
| MAXIMUM LINKS AT ANY NODE | = 11 |

CORE REQUESTED = 8146 WORDS
CORE AVAILABLE = 72000 WORDS

DATA INPUT :-

CARD NO. 1 TYPE = TITLE:- Gibbet Hill Rbout 2026 PM Peak + Developemnt + Symmetry Park Dec 15 HE Amends

| CARD NO. | CARD TYPE | CYCLE TIME (SEC) | NO. OF STEPS PER CYCLE | TIME PERIOD 1-1200 MINS. | EFFECTIVE-GREEN DISPLACEMENTS START (SEC) | EFFECTIVE-GREEN DISPLACEMENTS END (SEC) | EQUISAT SETTINGS 0=NO 1=YES | 0=UNEQUAL FLOW CYCLE 1=EQUAL CYCLE | CRUISE-SPEEDS 10-200 % | CRUISE-SPEEDS 50-200 % | CARD32 0=TIMES 1=SPEEDS | OPTIMISE 0=NONE 1=O/SET 2=FULL | EXTRA COPIES FINAL OUTPUT | HILL-CLIMB OUTPUT 1=FULL | DELAY VALUE P PER PCU-H | STOP VALUE P PER 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2) = | 1 | 40 | 40 | 60 | 2 | 3 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1420 | 260 |

CARD NO. 3 TYPE = 2 — LIST OF NODES TO BE OPTIMISED

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3) = | 2 | 1 | 2 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

LINKS HAVING SHARED STOPLINES

| CARD NO. | CARD TYPE | FIRST SET..... | | | | SECOND SET..... | | | | THIRD SET..... | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4) = | 7 | 12 | 14 | 15 | 0 | 0 | 13 | 16 | 0 | 0 | 0 | 22 | 24 | 25 | 0 | 0 |
| 5) = | 7 | 31 | 32 | 33 | 34 | 0 | 42 | 44 | 45 | 0 | 0 | 43 | 46 | 47 | 0 | 0 |
| 6) = | 7 | 51 | 54 | 55 | 0 | 0 | 52 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NODE CARDS: MINIMUM STAGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7) = | 10 | 1 | 7 | 7 | | | | | | | | |
| 8) = | 10 | 2 | 7 | 7 | | | | | | | | |
| 9) = | 10 | 4 | 7 | 7 | | | | | | | | |
| 10) = | 10 | 5 | 7 | 7 | | | | | | | | |

NODE CARDS: PRECEDING INTERSTAGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11) = | 11 | 1 | 5 | 5 | | | | | | | | |
| 12) = | 11 | 2 | 5 | 5 | | | | | | | | |
| 13) = | 11 | 4 | 5 | 5 | | | | | | | | |
| 14) = | 11 | 5 | 5 | 5 | | | | | | | | |

NODE CARDS: STAGE CHANGE TIMES (WORKING)

| CARD NO. | CARD TYPE | NODE NO. | Sgl/Dbl Cycled | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15) = | 12 | 1 | 1 | 0 | 0 | | | | | | | | |
| 16) = | 12 | 2 | 1 | 0 | 0 | | | | | | | | |
| 17) = | 12 | 4 | 1 | 0 | 0 | | | | | | | | |
| 18) = | 12 | 5 | 1 | 0 | 0 | | | | | | | | |

LINK CARDS: GIVEWAY DATA

| CARD NO. | CARD TYPE | LINK NO. | PRIORITY LINKS LINK1 NO. | PRIORITY LINKS LINK2 NO. | LINK1 GIVEWAY COEFFS. ONLY % FLOW | LINK1 GIVEWAY COEFFS. A1 X100 | LINK1 GIVEWAY COEFFS. A2 X100 | | | | | LINK LENGTH | STOP WT.X100 | MAX FLOW | DELAY WT.X100 | DISPSN X100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19) = | 30 | 30 | 31 | 0 | 0 | 41 | 100 | 0 | 0 | 0 | 0 | 200 | 0 | 1169 | 0 | 0 |

LINK CARDS: FIXED DATA

| CARD NO. | CARD TYPE | LINK NO. | EXIT NODE | FIRST GREEN START STAGE | FIRST GREEN START LAG | FIRST GREEN END STAGE | FIRST GREEN END LAG | SECOND GREEN START STAGE | SECOND GREEN START LAG | SECOND GREEN END STAGE | SECOND GREEN END LAG | LINK LENGTH | STOP WT.X100 | SAT FLOW | DELAY WT.X100 | DISPSN X100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20) = | 31 | 10 | 1 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2065 | 60 | 0 |
| 21) = | 31 | 11 | 1 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2205 | 60 | 0 |
| 22) = | 31 | 12 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 2050 | 500 | 0 |
| 23) = | 31 | 13 | 1 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 2100 | 500 | 0 |
| 24) = | 31 | 14 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 25) = | 31 | 15 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 26) = | 31 | 16 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| 27) = | 31 | 20 | 2 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2040 | 60 | 0 |
| 28) = | 31 | 21 | 2 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2180 | 60 | 0 |
| 29) = | 31 | 22 | 2 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 2050 | 500 | 0 |
| 30) = | 31 | 23 | 2 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 2100 | 500 | 0 |
| 31) = | 31 | 24 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 32) = | 31 | 25 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| 33) = | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 6000 | 0 | 0 |
| 34) = | 31 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 35) = | 31 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 36) = | 31 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| 37) = | 31 | 40 | 4 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2090 | 60 | 0 |
| 38) = | 31 | 41 | 4 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2230 | 60 | 0 |
| 39) = | 31 | 42 | 4 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 2050 | 500 | 0 |
| 40) = | 31 | 43 | 4 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 2100 | 500 | 0 |
| 41) = | 31 | 44 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 42) = | 31 | 45 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 43) = | 31 | 46 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 44) = | 31 | 47 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| 45) = | 31 | 50 | 5 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 200 | -9999 | 2155 | 60 | 0 |
| 46) = | 31 | 51 | 5 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 2050 | 500 | 0 |
| 47) = | 31 | 52 | 5 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 2100 | 500 | 0 |
| 48) = | 31 | 53 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 49) = | 31 | 54 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| 50) = | 31 | 55 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |

LINK CARDS: FLOW DATA

| CARD NO. | CARD TYPE | LINK NO. | TOTAL FLOW | UNIFORM FLOW | ENTRY 1 LINK NO. | ENTRY 1 CRUISE FLOW | ENTRY 1 CRUISE SPEED | ENTRY 2 LINK NO. | ENTRY 2 CRUISE FLOW | ENTRY 2 CRUISE SPEED | ENTRY 3 LINK NO. | ENTRY 3 CRUISE FLOW | ENTRY 3 CRUISE SPEED | ENTRY 4 LINK NO. | ENTRY 4 CRUISE FLOW | ENTRY 4 CRUISE SPEED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51) = | 32 | 10 | 478 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 52) = | 32 | 11 | 551 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 53) = | 32 | 12 | 566 | 0 | 50 | 566 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 54) = | 32 | 13 | 157 | 0 | 50 | 157 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 55) = | 32 | 14 | 18 | 0 | 53 | 18 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 56) = | 32 | 15 | 192 | 0 | 51 | 192 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57) = | 32 | 16 | 28 | 0 | 51 | 28 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 58) = | 32 | 20 | 373 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 59) = | 32 | 21 | 372 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60) = | 32 | 22 | 473 | 0 | 10 | 473 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 61) = | 32 | 23 | 551 | 0 | 11 | 551 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 62) = | 32 | 24 | 28 | 0 | 16 | 28 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 63) = | 32 | 25 | 157 | 0 | 13 | 157 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64) = | 32 | 30 | 91 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65) = | 32 | 31 | 720 | 0 | 20 | 348 | 43 | 21 | 372 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| 66) = | 32 | 32 | 1010 | 0 | 22 | 459 | 43 | 23 | 551 | 43 | 0 | 0 | 0 | 0 | 0 | 0 |
| 67) = | 32 | 33 | 10 | 0 | 24 | 10 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 68) = | 32 | 34 | 107 | 0 | 25 | 107 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 69) = | 32 | 40 | 645 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 70) = | 32 | 41 | 220 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71) = | 32 | 42 | 58 | 0 | 30 | 58 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72) = | 32 | 43 | 18 | 0 | 30 | 18 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73) = | 32 | 44 | 275 | 0 | 32 | 275 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 74) = | 32 | 45 | 204 | 0 | 31 | 204 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75) = | 32 | 46 | 276 | 0 | 32 | 276 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 76) = | 32 | 47 | 322 | 0 | 31 | 322 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 77) = | 32 | 50 | 1185 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78) = | 32 | 51 | 560 | 0 | 40 | 560 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 79) = | 32 | 52 | 220 | 0 | 41 | 220 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80) = | 32 | 53 | 18 | 0 | 43 | 18 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81) = | 32 | 54 | 21 | 0 | 42 | 21 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 82) = | 32 | 55 | 16 | 0 | 47 | 16 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

LINK CARDS : FLARE SATURATION FLOW DATA

| | CARD TYPE | LINK NO. | ..LANE 1.. SAT. FLOW | CAPAC VEH. | ..LANE 2.. SAT. FLOW | CAPAC VEH. | ..LANE 3.. SAT. FLOW | CAPAC VEH. |
|---|---|---|---|---|---|---|---|---|
| 83)= | 33 | 50 | 2155 | 6 | 0 | 0 | 0 | 0 |

LINK DATA: QUEUE CONSTRAINTS

| CARD NO. | CARD TYPE | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT | LINK NO. | LIMIT QUEUE | QUEUE WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 84)= | 38 | 12 | 5 | 4500 | 13 | 5 | 4500 | 22 | 1 | 4500 | 23 | 1 | 4500 | 42 | 2 | 4500 |
| 85)= | 38 | 43 | 2 | 4500 | 51 | 1 | 4500 | 52 | 1 | 4500 | 0 | 0 | 0 | 0 | 0 | 0 |

*****END OF SUBROUTINE TINPUT****

40 SECOND CYCLE 40 STEPS

INITIAL SETTINGS
- (SECONDS)

| NODE NO | NUMBER OF STAGES | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 | STAGE 6 | STAGE 7 | STAGE 8 | STAGE 9 | STAGE 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 0 | 17 | | | | | | | | |
| 2 | 2 | 0 | 16 | | | | | | | | |
| 4 | 2 | 0 | 20 | | | | | | | | |
| 5 | 2 | 0 | 21 | | | | | | | | |

| LINK NUMBER | FLOW INTO LINK (PCU/H) | SAT FLOW (PCU/H) | DEGREE OF SAT (%) | MEAN TIMES PER PCU CRUISE (SEC) | DELAY (SEC) | DELAY (U+R+O=MEAN Q) (PCU-H/H) | COST OF DELAY ($/H) | STOPS MEAN STOPS /PCU (%) | STOPS COST OF STOPS ($/H) | QUEUE MEAN MAX. (PCU) | QUEUE AVERAGE EXCESS (PCU) | PERFORMANCE INDEX. WEIGHTED SUM OF ( ) VALUES ($/H) | EXIT NODE | GREEN TIMES START 1ST (SECONDS) | GREEN TIMES START 2ND (SECONDS) | GREEN TIMES END 1ST (SECONDS) | GREEN TIMES END 2ND (SECONDS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 478 | 2065 | 71 | 16.7 | 21.1 | 1.6 + 1.2 | ( 39.7)* | 102 | ( 12.6) | 6 | | 23.8 | 1 | 5 | 17 | | |
| 11 | 551 | 2205 | 77 | 16.7 | 22.8 | 1.9 + 1.6 | ( 49.6)* | 107 | ( 15.2) | 7 | | 29.7 | 1 | 5 | 17 | | |
| 12 | 566 | 2050S | 80 | 4.6 | 20.5 | 1.8 + 1.4 | ( 45.7)* | 120 | ( 17.5) | 9 | ( 1.3)* | 306.2 | 1 | 22 | 0 | | |
| 13 | 156 | 2100S | 18 | 4.6 | 9.4 | 0.3 + 0.1 | ( 5.8)* | 89 | ( 3.6) | 2 | ( 0.0)* | 32.5 | 1 | 22 | 0 | | |
| 14 | 18 | 12L | 80 | 4.6 | 12.2 | 0.0 + 0.0 | ( 0.9) | 49 | ( 0.2) | 9 | + | 1.1 | 1 | 22 | 0 | | |
| 15 | 191 | 12L | 80 | 4.6 | 11.9 | 0.2 + 0.5 | ( 9.0) | 48 | ( 2.4) | 9 | + | 11.4 | 1 | 22 | 0 | | |
| 16 | 28 | 13L | 18 | 4.6 | 4.8 | 0.0 + 0.0 | ( 0.5) | 18 | ( 0.1) | 2 | | 0.7 | 1 | 22 | 0 | | |
| 20 | 373 | 2040 | 61 | 16.7 | 19.5 | 1.2 + 0.8 | ( 28.7)* | 97 | ( 9.3) | 4 | | 17.2 | 2 | 5 | 16 | | |
| 21 | 372 | 2180 | 57 | 16.7 | 18.2 | 1.2 + 0.7 | ( 26.7)* | 93 | ( 8.9) | 4 | | 16.0 | 2 | 5 | 16 | | |
| 22 | 473 | 2050S | 64 | 2.6 | 18.1 | 1.7 + 0.6 | ( 33.7)* | 112 | ( 13.6) | 8 | ( 3.0)* | 319.5 | 2 | 21 | 0 | | |
| 23 | 551 | 2100 | 52 | 2.6 | 17.0 | 2.1 + 0.6 | ( 37.0)* | 109 | ( 15.4) | 7 | ( 2.6)* | 316.7 | 2 | 21 | 0 | | |
| 24 | 28 | 22L | 64 | 2.6 | 10.3 | 0.0 + 0.0 | ( 1.1) | 49 | ( 0.4) | 8 | + | 1.5 | 2 | 21 | 0 | | |
| 25 | 156 | 22L | 64 | 2.6 | 10.5 | 0.2 + 0.2 | ( 6.4) | 99 | ( 4.0) | 8 | + | 10.4 | 2 | 21 | 0 | | |
| 30 | 91 | 1169 | 17 | 16.7 | 6.1 | 0.1 + 0.1 | ( 2.2) | 55 | ( 1.3) | 0 | | 3.5 | | | | | |
| 31 | 720 | 6000S | 31 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.2) | 1 | ( 0.2) | 0 | | 1.4 | | | | | |
| 32 | 1010 | 31L | 31 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.7) | 1 | ( 0.3) | 0 | | 2.0 | | | | | |
| 33 | 10 | 31L | 31 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.0) | 1 | ( 0.0) | 0 | | 0.0 | | | | | |
| 34 | 107 | 31L | 31 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.2) | 1 | ( 0.0) | 0 | | 0.2 | | | | | |
| 40 | 645 | 2090 | 77 | 16.7 | 19.7 | 1.9 + 1.7 | ( 50.1)* | 100 | ( 16.7) | 8 | | 30.0 | 4 | 5 | 20 | | |
| 41 | 220 | 2230 | 25 | 16.7 | 10.7 | 0.5 + 0.2 | ( 9.3)* | 67 | ( 3.8) | 2 | | 5.6 | 4 | 5 | 20 | | |
| 42 | 58 | 2050S | 66 | 2.1 | 15.3 | 0.1 + 0.1 | ( 3.5)* | 81 | ( 1.2) | 5 | ( 0.7)* | 50.6 | 4 | 25 | 0 | | |
| 43 | 18 | 2100S | 73 | 2.1 | 17.6 | 0.0 + 0.0 | ( 1.2)* | 87 | ( 0.4) | 7 | ( 1.7)* | 83.5 | 4 | 25 | 0 | | |
| 44 | 275 | 42L | 66 | 2.1 | 7.2 | 0.1 + 0.5 | ( 7.8) | 37 | ( 2.6) | 5 | + | 10.3 | 4 | 25 | 0 | | |
| 45 | 204 | 42L | 66 | 2.1 | 18.1 | 0.7 + 0.4 | ( 14.6) | 114 | ( 6.0) | 5 | + | 20.6 | 4 | 25 | 0 | | |
| 46 | 277 | 43L | 73 | 2.1 | 9.8 | 0.1 + 0.6 | ( 10.7) | 64 | ( 4.5) | 7 | + | 15.2 | 4 | 25 | 0 | | |
| 47 | 322 | 43L | 73 | 2.1 | 20.6 | 1.1 + 0.7 | ( 26.2) | 119 | ( 9.8) | 7 | + | 36.0 | 4 | 25 | 0 | | |
| 50 | 1185 | 3425f | 81 | 16.7 | 15.7 | 3.0 + 2.2 | ( 73.2)* | 87 | ( 26.6) | 12 | | 43.9 | 5 | 5 | 21 | | |
| 51 | 560 | 2050S | 78 | 2.7 | 27.7 | 2.7 + 1.6 | ( 61.2)* | 124 | ( 17.9) | 8 | ( 4.4)* | 522.9 | 5 | 26 | 0 | | |
| 52 | 220 | 2100S | 30 | 2.7 | 19.7 | 1.0 + 0.2 | ( 17.1)* | 108 | ( 6.1) | 3 | ( 0.7)* | 124.4 | 5 | 26 | 0 | | |
| 53 | 18 | 52L | 30 | 2.7 | 9.2 | 0.0 + 0.0 | ( 0.7) | 48 | ( 0.2) | 3 | + | 0.9 | 5 | 26 | 0 | | |
| 54 | 21 | 51L | 78 | 2.7 | 20.5 | 0.1 + 0.1 | ( 1.7) | 109 | ( 0.6) | 8 | + | 2.3 | 5 | 26 | 0 | | |
| 55 | 16 | 51L | 78 | 2.7 | 17.0 | 0.0 + 0.0 | ( 1.1) | 114 | ( 0.5) | 8 | + | 1.5 | 5 | 26 | 0 | | |

*** f - average saturation flow for flared link ***

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 63.8 | 16.0 | 23.7 | 16.3 | (1278.5) + ( 109.0) | + ( 654.2) | = 2041.6 | TOTALS | |

| | CRUISE LITRES PER HOUR | | DELAY LITRES PER HOUR | | STOPS LITRES PER HOUR | | TOTALS LITRES PER HOUR |
|---|---|---|---|---|---|---|---|
| FUEL CONSUMPTION PREDICTIONS | 54.8 | + | 46.0 | + | 92.1 | = | 192.9 |

NO. OF ENTRIES TO SUBPT = 1
NO. OF LINKS RECALCULATED= 54

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 18 | 35 |
| 2 | 2 | 0 | 16 |
| 4 | 2 | 18 | 38 |
| 5 | 2 | 0 | 21 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 55.9 | 18.3 | 15.8 | 16.3 | ( 686.1) + ( 57.8) | + ( 190.8) | = 934.7 | TOTALS | |

NO. OF ENTRIES TO SUBPT = 13
NO. OF LINKS RECALCULATED= 312

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 18 | 35 |
| 2 | 2 | 0 | 16 |
| 4 | 2 | 18 | 38 |
| 5 | 2 | 0 | 21 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 55.9 | 18.3 | 15.8 | 16.3 | ( 686.1) + ( | 57.8) + ( | 190.8) = | 934.7 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 234

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 20 | 36 |
| 2 | 2 | 0 | 13 |
| 4 | 2 | 20 | 38 |
| 5 | 2 | 2 | 20 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 62.2 | 16.4 | 16.4 | 22.0 | ( 616.7) + ( | 42.3) + ( | 57.8) = | 716.8 | TOTALS |

NO. OF ENTRIES TO SUBPT = 26
NO. OF LINKS RECALCULATED= 587

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1 6
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 20 | 36 |
| 2 | 2 | 0 | 13 |
| 4 | 2 | 20 | 38 |
| 5 | 2 | 2 | 20 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 62.2 | 16.4 | 16.4 | 22.0 | ( 616.7) + ( | 42.3) + ( | 57.8) = | 716.8 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 271

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1 6 16
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 20 | 36 |
| 2 | 2 | 0 | 13 |
| 4 | 2 | 20 | 38 |
| 5 | 2 | 2 | 20 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 62.2 | 16.4 | 16.4 | 22.0 | ( 616.7) + ( | 42.3) + ( | 57.8) = | 716.8 | TOTALS |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 274

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1 6 16 1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 23 | 39 |
| 2 | 2 | 1 | 14 |
| 4 | 2 | 19 | 37 |
| 5 | 2 | 0 | 18 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 61.4 | 16.6 | 15.6 | 22.0 | ( 570.8) + ( | 38.2) + ( | 45.9) = | 654.8 | TOTALS |

NO. OF ENTRIES TO SUBPT = 14
NO. OF LINKS RECALCULATED= 405

40 SECOND CYCLE 40 STEPS

INTERMEDIATE SETTINGS - INCREMENTS SO FAR :- 6 16 -1 6 16 1 -1
- (SECONDS)

| | | | |
|---|---|---|---|
| 1 | 2 | 23 | 39 |
| 2 | 2 | 1 | 14 |
| 4 | 2 | 19 | 37 |
| 5 | 2 | 0 | 18 |

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 61.4 | 16.6 | 15.6 | 22.0 | ( 570.8) + ( | 38.2) + ( | 45.9) = | 654.8 | TOTALS |

NO. OF ENTRIES TO SUBPT = 17
NO. OF LINKS RECALCULATED= 471

40 SECOND CYCLE 40 STEPS

FINAL SETTINGS OBTAINED WITH INCREMENTS :- 6 16 -1 6 16 1 -1 1
- (SECONDS)

| NODE NO | NUMBER OF STAGES | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 | STAGE 6 | STAGE 7 | STAGE 8 | STAGE 9 | STAGE 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 23 | 39 | | | | | | | | |
| 2 | 2 | 1 | 14 | | | | | | | | |
| 4 | 2 | 19 | 37 | | | | | | | | |
| 5 | 2 | 0 | 18 | | | | | | | | |

| LINK NUMBER | FLOW INTO LINK (PCU/H) | SAT FLOW (PCU/H) | DEGREE OF SAT (%) | MEAN TIMES PER PCU CRUISE (SEC) | DELAY (SEC) | DELAY UNIFORM (U+R+O=MEAN Q) (PCU-H/H) | DELAY OVERSAT RANDOM+ COST OF DELAY ($/H) | STOPS MEAN STOPS /PCU (%) | STOPS COST OF STOPS ($/H) | QUEUE MEAN MAX. (PCU) | QUEUE AVERAGE EXCESS (PCU) | PERFORMANCE INDEX. WEIGHTED SUM OF ( ) VALUES ($/H) | EXIT NODE | GREEN TIMES START 1ST | GREEN TIMES START 2ND | GREEN TIMES END 1ST | GREEN TIMES END 2ND |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | (SECONDS) | | | |
| 10 | 478 | 2065 | 77 | 16.7 | 25.2 | 1.7 + 1.7 | ( 47.5)* | 113 | ( 13.9) | 6 | | 28.5 | 1 | 28 | | 39 | |
| 11 | 551 | 2205 | 83 | 16.7 | 28.7 | 2.0 + 2.4 | ( 62.3)* | 122 | ( 17.3) | 8 | | 37.4 | 1 | 28 | | 39 | |
| 12 | 566 | 2050S | 76 | 4.6 | 7.6 | 0.1 + 1.1 | ( 17.0)* | 20 | ( 2.9) | 4 | ( 0.0)* | 88.1 | 1 | 4 | | 23 | |
| 13 | 156 | 2100S | 18 | 4.6 | 2.6 | 0.0 + 0.1 | ( 1.6)* | 8 | ( 0.3) | 0 | ( 0.0)* | 8.2 | 1 | 4 | | 23 | |
| 14 | 18 | 12L | 76 | 4.6 | 22.8 | 0.1 + 0.0 | ( 1.6) | 117 | ( 0.5) | 4 | | 2.2 | 1 | 4 | | 23 | |
| 15 | 191 | 12L | 76 | 4.6 | 15.5 | 0.4 + 0.4 | ( 11.7) | 109 | ( 5.4) | 4 | | 17.1 | 1 | 4 | | 23 | |
| 16 | 28 | 13L | 18 | 4.6 | 8.5 | 0.1 + 0.0 | ( 0.9) | 85 | ( 0.6) | 0 | | 1.6 | 1 | 4 | | 23 | |
| 20 | 373 | 2040 | 81 | 16.7 | 34.7 | 1.5 + 2.1 | ( 51.0)* | 132 | ( 12.7) | 6 | | 30.6 | 2 | 6 | | 14 | |
| 21 | 372 | 2180 | 76 | 16.7 | 29.3 | 1.5 + 1.5 | ( 43.0)* | 121 | ( 11.6) | 5 | | 25.8 | 2 | 6 | | 14 | |
| 22 | 473 | 2050S | 56 | 2.6 | 3.8 | 0.0 + 0.5 | ( 7.0)* | 10 | ( 1.3) | 2 | ( 0.2)* | 46.1 | 2 | 19 | | 1 | |
| 23 | 551 | 2100 | 46 | 2.6 | 3.2 | 0.1 + 0.4 | ( 6.9)* | 13 | ( 1.8) | 3 | ( 0.2)* | 43.4 | 2 | 19 | | 1 | |
| 24 | 28 | 22L | 56 | 2.6 | 15.6 | 0.1 + 0.0 | ( 1.7) | 108 | ( 0.8) | 2 | + | 2.5 | 2 | 19 | | 1 | |
| 25 | 156 | 22L | 56 | 2.6 | 6.8 | 0.1 + 0.1 | ( 4.2) | 69 | ( 2.8) | 2 | + | 7.0 | 2 | 19 | | 1 | |
| 30 | 91 | 1169 | 17 | 16.7 | 5.9 | 0.0 + 0.1 | ( 2.1) | 53 | ( 1.2) | 0 | | 3.4 | | | | | |
| 31 | 720 | 6000S | 31 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.2) | 1 | ( 0.2) | 0 | | 1.4 | | | | | |
| 32 | 1010 | 31L | 31 | 4.2 | 0.4 | 0.0 + 0.1 | ( 1.7) | 1 | ( 0.3) | 0 | | 2.0 | | | | | |
| 33 | 10 | 31L | 31 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.0) | 1 | ( 0.0) | 0 | | 0.0 | | | | | |
| 34 | 107 | 31L | 31 | 4.2 | 0.4 | 0.0 + 0.0 | ( 0.2) | 1 | ( 0.0) | 0 | | 0.2 | | | | | |
| 40 | 645 | 2090 | 88 | 16.7 | 31.5 | 2.2 + 3.5 | ( 80.1)* | 129 | ( 21.4) | 10 | | 48.1 | 4 | 24 | | 37 | |
| 41 | 220 | 2230 | 28 | 16.7 | 12.6 | 0.6 + 0.2 | ( 10.9)* | 73 | ( 4.2) | 2 | | 6.6 | 4 | 24 | | 37 | |
| 42 | 58 | 2050S | 58 | 2.1 | 11.9 | 0.1 + 0.1 | ( 2.7)* | 68 | ( 1.0) | 4 | ( 0.3)* | 27.7 | 4 | 2 | | 19 | |
| 43 | 18 | 2100S | 65 | 2.1 | 12.6 | 0.0 + 0.0 | ( 0.9)* | 66 | ( 0.3) | 4 | ( 0.3)* | 16.8 | 4 | 2 | | 19 | |
| 44 | 275 | 42L | 58 | 2.1 | 8.5 | 0.3 + 0.4 | ( 9.2) | 83 | ( 5.9) | 4 | + | 15.1 | 4 | 2 | | 19 | |
| 45 | 204 | 42L | 58 | 2.1 | 6.8 | 0.1 + 0.3 | ( 5.4) | 21 | ( 1.1) | 4 | + | 6.6 | 4 | 2 | | 19 | |
| 46 | 277 | 43L | 65 | 2.1 | 9.1 | 0.3 + 0.4 | ( 9.9) | 82 | ( 5.9) | 4 | + | 15.7 | 4 | 2 | | 19 | |
| 47 | 322 | 43L | 65 | 2.1 | 7.6 | 0.2 + 0.5 | ( 9.6) | 23 | ( 1.9) | 4 | + | 11.5 | 4 | 2 | | 19 | |
| 50 | 1185 | 3697f | 92 | 16.7 | 26.8 | 3.8 + 5.0 | (125.1)* | 116 | ( 35.4) | 16 | | 75.0 | 5 | 5 | | 18 | |
| 51 | 560 | 2050S | 65 | 2.7 | 5.7 | 0.0 + 0.9 | ( 12.6)* | 14 | ( 2.1) | 1 | ( 0.1)* | 69.2 | 5 | 23 | | 0 | |
| 52 | 220 | 2100S | 25 | 2.7 | 2.7 | 0.0 + 0.2 | ( 2.3)* | 7 | ( 0.4) | 0 | ( 0.0)* | 12.1 | 5 | 23 | | 0 | |
| 53 | 18 | 52L | 25 | 2.7 | 16.2 | 0.1 + 0.0 | ( 1.2) | 100 | ( 0.5) | 0 | | 1.6 | 5 | 23 | | 0 | |
| 54 | 21 | 51L | 65 | 2.7 | 19.1 | 0.1 + 0.0 | ( 1.6) | 107 | ( 0.6) | 1 | + | 2.2 | 5 | 23 | | 0 | |
| 55 | 16 | 51L | 65 | 2.7 | 12.0 | 0.0 + 0.0 | ( 0.8) | 97 | ( 0.4) | 1 | + | 1.2 | 5 | 23 | | 0 | |

*** f - average saturation flow for flared link ***

| TOTAL DISTANCE TRAVELLED (PCU-KM/H) | TOTAL TIME SPENT (PCU-H/H) | MEAN JOURNEY SPEED (KM/H) | TOTAL UNIFORM DELAY (PCU-H/H) | TOTAL RANDOM+ OVERSAT DELAY (PCU-H/H) | TOTAL COST OF DELAY ($/H) | TOTAL COST OF STOPS ($/H) | PENALTY FOR EXCESS QUEUES ($/H) | TOTAL PERFORMANCE INDEX ($/H) | |
|---|---|---|---|---|---|---|---|---|---|
| 1021.2 | 61.4 | 16.6 | 15.6 | 22.0 | ( 570.8) + ( | 38.2) + ( | 45.9) = | 654.8 | TOTALS |

ROUTE

| | CRUISE LITRES PER HOUR | | DELAY LITRES PER HOUR | | STOPS LITRES PER HOUR | | TOTALS LITRES PER HOUR |
|---|---|---|---|---|---|---|---|
| FUEL CONSUMPTION PREDICTIONS | 54.8 | + | 43.3 | + | 70.4 | = | 168.4 |

NO. OF ENTRIES TO SUBPT = 9
NO. OF LINKS RECALCULATED= 284

PROGRAM TRANSYT FINISHED
========== end of file ==========

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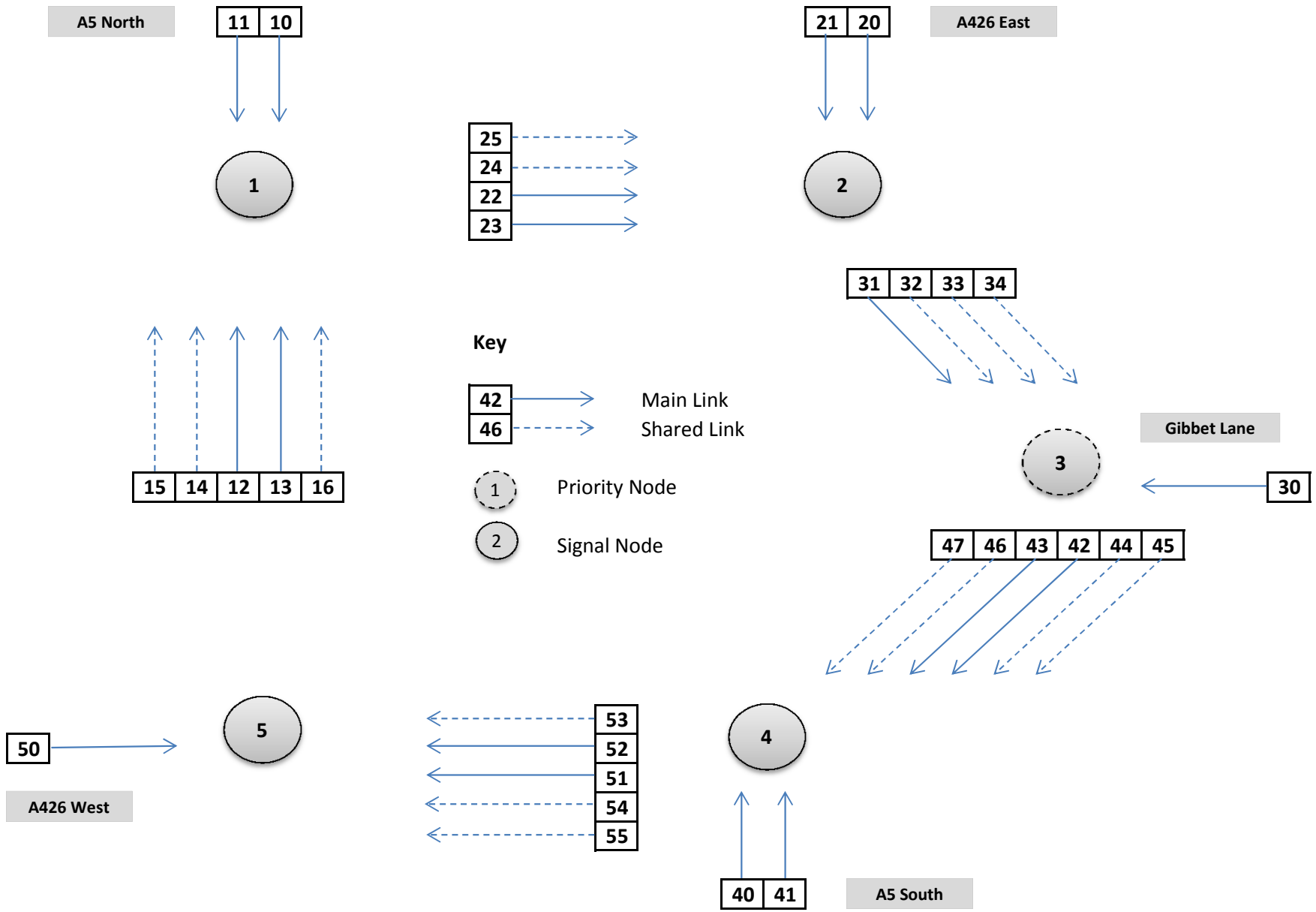
# Magna Park Extension: Hybrid Application
## Supplementary Transport Assessment

**Appendix G – TRANSYT Link/Node Diagram**




**Appendix G: Gibbet Hill Junction Improvements - TRANSYT Link/Node Diagram**