RiverOak Strategic Partners

Transport Assessment Addendum and Appendices

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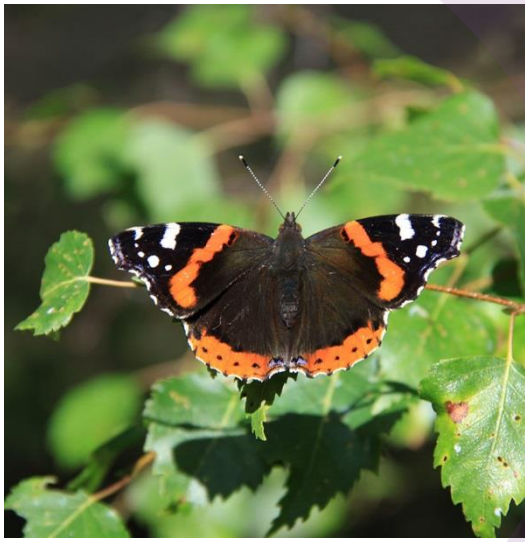
Manston Airport DCO

Transport Assessment Addendum



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Report for

George Yerrall
Partner
RiverOak Strategic Partners (RiverOak)

Main contributors

Glyn Price
Adam Guy
Chris Morris
Helen Harding
Bev Coupe

Issued by

.....[redacted]
Glyn Price

Approved

.....[redacted]
Bev Coupe

Wood

Floor 12
25 Canada Square
Canary Wharf
London E14 5LB
United Kingdom
Tel +44 (0) 203 215 1610

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1. Introduction

1.1 Background

1.1.1 RiverOak Strategic Partners Limited (hereafter referred to as 'RiverOak') is seeking to secure the future of Manston Airport (the 'Proposed Development') as a valuable regional and national asset by re-developing the existing Manston Airport site as a freight airport. The proposals will provide much needed additional air freight capacity to the United Kingdom and serve to relieve pressure from other, already heavily congested, London and South-East airports.

1.1.2 Under the *Planning Act 2008* (the '2008 Act') the re-development of Manston Airport as a freight airport is considered a Nationally Significant Infrastructure Project (NSIP). RiverOak made an application under the 2008 Act for a permission known as a 'Development Consent Order' (DCO) to reopen and operate Manston Airport. The application was submitted to the Planning Inspectorate on 17 July 2018 and was accepted for examination on 14 August 2018. The Examination began on 9 January 2019.

1.1.3 A Transport Assessment (TA) [APP-060, 061] was submitted in support of the DCO application, and comprised a suite of documents in addition to the assessment of transport implications. A number of these documents have been updated and provided as an appendix to this Addendum TA as follows:

- Preliminary Construction Traffic Management Plan (CTMP) [APP-071];
- Travel Plan [APP-071] – *Updated* – **Appendix L**;
- Public Rights of Way Management Strategy (PRoWMS) [APP-071] – *Updated* – **Appendix M**;
- Car Park Management Strategy [APP-071]- *Updated* – **Appendix N**;
- Airport Surface Access Strategy [APP-071] – *Updated* – **Appendix O**;
- Environmental Statement (ES) Chapter [APP-034] – *Updated*; and
- Traffic and Transport DCO Plans.

1.1.4 This TA Addendum has been produced following consultation with highways officers within Kent County Council (KCC) in the post DCO submission to address comments made on aspects of the TA. These include:

- Recognition of the draft Thanet Local Plan and draft Thanet Transport Strategy, specifically the Inner Circuit Route Improvement Strategy (ICRIS) which incorporates a new road link which affects the site, known as the Manston-Haine Link Road;
- Traffic generation and distribution;
- Use of KCC Thanet Strategic Traffic Model (TSTM); and
- Mitigation proposals.

1.1.5 The TA Addendum sets out clarifications, additional commentary and the supplementary work that has been undertaken in consultation with KCC.

1.2 Format of TA Addendum

1.1.6 The TA Addendum follows the same format of the TA. The following chapters have had updates in the light of the consultation.

- **Chapter 2: Planning Policy Context**;
- **Chapter 5**: **Junction Assessments – Baseline Validation**;
- **Chapter 6: Development Proposals and Traffic Generation**; and
- **Chapter 7: Traffic Impact Assessment**, including junction assessments for the junctions within the network scope.

2. Planning Policy Context

2.1 Introduction

1.1.7 Kent County Council (KCC) commented that the Transport Assessment (TA) did not recognise the Thanet Local Plan or the Thanet Transport Strategy which were emerging at the time of submission of the Development Consent Order (DCO).

1.1.8 Since the DCO submission, the new Draft Thanet Local Plan 2031 was approved at Committee for publication in July 2018 and was consulted on between 23 August and 4 October. The Local Plan will be subject to an Examination in Public (EiP) in April and May 2019. The Local Plan is supported by a Draft Thanet Transport Strategy.

2.2 Additional Policy Consideration

Draft Thanet Local Plan - 2031 (August 2018)

1.1.9 The Local Plan sets out the strategy for growth in the district up to 2031. This includes a minimum of 5,000 additional jobs and 17,140 additional homes.

1.1.10 The Manston Airport DCO process is recognised in the draft Local Plan and the site is not allocated for any specific purpose.

"Policy SP01 – Implementation: this sets out the requirement for all new development to fully meet its infrastructure requirements, directly on site or by contribution to that provision elsewhere, and to comply with the provisions of the Infrastructure Delivery Plan."

1.1.11 Strategic housing site allocations and infrastructure requirements are identified, with reference to the draft Transport Strategy in relation to highway links and improvements.

Thanet District Transport Strategy 2015-2031 (July 2018)

1.1.12 This Strategy replaces the former Thanet Transport Plan (2005). Its purpose is to provide a framework of transport policy to the year 2031 to support planned growth within the Thanet District. The draft Strategy is the result of joint working between Kent County Council and Thanet District Council. The main objectives of the strategy are;

- Provide a policy framework for the district which is consistent with existing National and Regional policy;
- Support delivery managed growth identified within Thanet District Council's (TDC) emerging Local Plan;
- Identify a package of robust transport improvements and interventions to enable the highway network to effectively accommodate the likely increase in travel demand across the plan period; and
- Propose a funding and delivery mechanism for identified interventions and actions.

1.1.13 The draft Transport Strategy includes the Thanet Parkway Rail Station which is proposed to be located off the A299 Hengist Way west of Cliffsend.

1.1.14 The draft Transport Strategy identifies that that existing traffic flows within Thanet are reasonably catered for, however, the road network generally lacks resilience to cope with future growth with a number of junctions that cause localised delays during peak hour demand. These are identified as follows:

- Spitfire Way/Manston Road;
- A28 / B2055 / B2051 - Marine Terrace / Marine Parade (Margate Seafront);
- A256 / A255 - Dane Court Roundabout;
- B2052 - Coffin House Corner;
- Westwood Cross;
- A254 / B2052 Victoria Traffic Signal Junction;
- A28 / Birchington Square;
- A255 St. Lawrence Junctions; and
- A256 Haine Road / Westwood Road Corridor.

1.1.15 To address concerns regarding road network resilience, the draft Transport Strategy includes the ICRIS which comprises a number of key highway interventions, which will be delivered in by the Strategic Housing Allocations.

1.1.16 The description of the ICRIS includes the following Manston-Haine link which is of direct relevance to the Proposed Development.

> "*9.3.17 Proposed development on Land Adjacent to Manston Court Road will be required to accommodate a new local distributor link road through the site, facilitating a new connection onto Manston Court Road. The section of Manston Court Road east of Valley Road could then be restricted. Further measures would be introduced to discourage the use of Vincent Road / Flete Road*".
>
> *"9.3.18 The remainder of Manston Court Road (between Valley Road and the B2050 Manston Road) will require significant improvements to widen the carriageway to form a local distributor road. It is anticipated that a new highway link would be created on the existing Northern Grass Area (part of the Former Manston Airport Site allocation). The nature and route of this link will depend on the final masterplan for this allocation site."*
>
> "*9.3.19 It will be necessary for any activity or development at the airport site and Land Adjacent to Manston Court Road to make significant improvements (or financial contributions if deemed appropriate) towards the road network in the locality. Such improvements would include a new direct highway link to and from Westwood and new/improved links to the existing dual carriageway on Spitfire Way fronting Manston Business Park*."

1.1.17 Bus provision has also been discussed and set out in the document with identification for service enhancements set out, with the three relevant proposals to the Proposed Development being:

- Manston Business Park – improvements to service 38* (Birchington – Ramsgate); and
- Former site – the ultimate long-term solution is likely to be a combination of an enhanced 9 to provide links both into Ramsgate and Westwood Cross and Canterbury and 38* as outlined above. An enhanced 9 would also provide a link to the proposed Thanet Parkway station; and
- Manston Court Road / EuroKent / Manston Green – likely to be served by a combination of diversions and/or enhancements to Loop/8/34, again providing links to Thanet Parkway station.

1.1.18 The draft Transport Strategy sets out that the outcome of transport modelling conducted to support the draft Local Plan. Three scenarios were tested:

- 2031 Do Nothing (extant permissions and growth);
- 2031 Do Something – (Do Nothing + draft Local Plan); and
- 2031 Do Maximum – (Do Something + draft Thanet Transport Strategy).

2.3 Transport Assessment Addendum

1.1.19 The TA Addendum includes supplementary assessments which are based upon output results of testing the Proposed Development using the KCC Thanet Strategic Traffic Model (TSTM), specifically the 2031 Do Maximum Scenario. The Addendum work therefore includes the draft Local Plan site allocations and the transport interventions identified in the draft Thanet Transport Strategy, which have been identified as a requirement to deliver the Local Plan.

1.1.20 With regards to the Manston-Haine link, the routeing through the Northern Grass Area (NGA) is not viable for the DCO proposal and an alternative link road has been investigated by RiverOak in consultation with KCC. This has resulted in an alignment which avoids routeing through the NGA, by cutting across the field to the north of the NGA and joining onto Manston Road to the west. A description of the alternative alignment is set out in **Chapter 5**. The alternative alignment has been included within the TSTM of the Proposed Development.

3. Junction Assessments – Baseline Validation

3.1 Introduction

1.1.21 This chapter of the Transport Assessment (TA) sets out the study area for the detailed assessment and detailed development of baseline models. It also describes how these have been validated against recorded data on the existing highways network.

1.1.22 The TA Addendum includes a revised study area based on the junctions included within the Thanet Strategic Traffic Model (TSTM).

3.2 Study Area

1.1.23 The study area has been revised based on the study area of the Kent County Councils (KCC) TSTM.

1.1.24 The following junctions were removed from the scope (agreed by KCC):

- Junction 1: A256 / Sandwich Road – is not included in the KCC TSTM scope;
- Junction 9: Park Lane/Manston Road/Acol Hill - is not included in the KCC TSTM scope;
- Junction 14: A28 (Canterbury Road)/B2052 – select link analysis indicates there are not trips associated with the Proposed Development routing through this junction;
- Junction 17: Ramsgate Road/Poorhole Road/Margate Road/Star Lane – select link analysis provided by KCC indicates only a minor amount of trips associated with the Proposed Development routing though the junction;
- Junction 18: Star Lane / Manston Court Road – the Manston to Haine Link Road results in a substantial decrease in traffic on Star Lane and assessment not considered necessary due to positive improvement in capacity;
- Junction 19: New Cross Road/A256 - select link analysis provided by KCC indicates only a minor amount of trips associated with the Proposed Development routing though the junction;
- Junction 22: Tivoli Road (B2052)/Beatrice Road- select link analysis provided by KCC indicates only a minor amount of trips associated with the Proposed Development routing though the junction;
- Junction 23: Park Lane/A28 (Canterbury Road) – both elements of the Park Lane/A28 (Canterbury Road)/Station Road junction are now combined in a linked junction model and are both considered part of Junction 8 (8a/8b);
- Junction 24: Star Lane Link/Nash Road - the Manston to Haine Link Road results in a substantial decrease in traffic on Star Lane and assessment not considered necessary due to positive improvement in capacity;
- Junction 25: Tescos Access/B2050 Manston Road - is not included in the KCC TSTM scope; and
- Junction 28; Wilfred Road/A255/Grange Road - is not included in the KCC TSTM scope;

1.1.25 The following junction has been added:

- Junction 29 - end of the Manston to Haine Link Road with the A256 and Haine Road.

1.1.26 The locations of the junctions that have been included in the assessment are shown in **Figure 3.1**.

1.1.27 The validation of the junctions has been checked by KCC's consultants and have been confirmed as satisfactory, as set out in the meeting notes included in **Appendix A**.

3.3 Future Year Junctions

1.1.28 It should be noted that junction 29 has not been assessed and validated for a 2017 base year, as this junction would only exist in the future year. The models used for this junction in future year assessments are based on KCC plans of the anticipated junction layouts from which geometric data was extracted.

1.1.29 In addition, there are other junctions that will be revised in accordance with the Draft Thanet Transport Strategy. KCC has provided layout plans, on which the junction models have been based:

- Junction 10 (A and B): Shottendane Road / Manston Road / Margate Hill – as part of the ICRIS this junction will be split into two junctions:
  - Aroundabout of Shottendane Road/Manston Road West and the New Columbus Way Extension. Margate Hill will be closed; and
  - To the south east of the roundabout will be a priority junction with Manston Road/Columbus Way Extension.
- Junction 12: Manston Road / B2050 / Spitfire Way – in the future year assessment this has been assessed with two differing layouts:
  - In the KCC 2039 Base year this is proposed as a four-arm roundabout; and
  - In the 2039 + Development scenario it has been assessed as a four-arm signalised crossroad junction and a four-arm roundabout;
- Junction 15: Manston Road / Hartsdown Road / Tivoli Road / College Road / Nash Road - this junction has been altered from a five-arm signalised junction to a four-arm signalised junction, with the closure of Nash Road to the junction;
- Junction 20: B2050 Manston Road/A256 – in the future year this junction will be changed from two adjacent junctions (roundabout and priority) to one large roundabout encompassing all movements;
- Junction 21A: Canterbury Road West / Haine Road/ – in the future year this three-arm roundabout will be amended to a four-arm roundabout with a new arm to the north of the junction linking to the B2050 Manston Road; and
- Junction 29 – Manston to Haine Link Road/Haine Road/A256 - in the future year this will be upgraded from a three-arm roundabout to a four-arm roundabout with the new Manston to Haine Link Road as the fourth-arm.

4. Development Proposals and Traffic Generation

4.1 Introduction

1.1.30 Kent County Council (KCC) made a number of comments regarding the traffic generation and distribution assumptions. This was discussed with KCC in the post Development Consent Order (DCO) submission period in late 2018. A technical note which sets out responses to KCC comments in included in **Appendix B**.

1.1.31 Clarifications and revisions to the assumptions are set out in this chapter of the Transport Assessment (TA) Addendum.

4.2 Freight HGV Traffic Generation

Assumption on HGV Loading Efficiency

1.1.32 The TA assumes that 30% of HGVs have freight load efficiencies on arrival and departure, i.e. HGVs arrive with freight and depart with freight, rather than empty on one leg of the journey.

1.1.33 This figure of 30% is considered robust when compared to the Domestic Road Freight Statistics from the DfT. These indicate that for all Heavy Goods Vehicle (HGV) traffic on UK Roads in 2004, only 27% run empty, and in 2014 that percentage had increased marginally to 29% and has not varied significantly in the preceding years. This indicates that around 70% of vehicles are loaded from origin to destination (working efficiently), while 30% are empty from origin to destination. On this basis, a higher proportion of efficient working, up to 70% could have been assumed, however, a robust approach has been adopted by identifying a lower proportion of 30%.

1.1.34 This has been accepted by KCC.

Assumption on HGV Daily Profile

1.1.35 The TA assumes arrivals and departures per day have been evenly split across the 24-hour period, with some slight tailing off in the 21:00 – 00:00 period as may be expected with overnight shift working.

1.1.36 At this stage in the process, there is no information about scheduling of air traffic movements (ATM). The optimum practice by freight operators is to for HGVs to travel outside of the peak hours in order to avoid risk and uncertainty of journey times caused by traffic congestion. Spreading the HGV traffic over a 24-hour period is considered to be a robust approach as it results in capturing HGV movements during the peak hour periods, rather than assuming no HGV movements.

1.1.37 This justification has been accepted by KCC.

4.3 Airport Passenger Traffic Generation

Passenger Arrivals Prior to Flight Departures

1.1.38 On the basis of discussions with KCC, passenger arrivals at the Proposed Development for departing flights have been revised as follows:

- 70% of departing passengers would arrive at the airport two hours before flight departure (previous assumption was 20%); and
- 30% of departing passengers would arrive at the airport three hours before flight departure previous assumption was 80%).

1.1.39 The resultant passenger movements are set out in **Appendix C.**

Passenger Mode Share

1.1.40 The passenger movements which arrive and depart the site would do so via differing transport modes. KCC did not agree that the shared taxi mode would be viable in Thanet district, even in the 2039 future year. This was therefore extracted from the mode share assumptions and re-distributed onto the other modes. This is shown in **Table 4.1** and **Table 4.2**, which have been accepted by KCC.

Table 4.1 Passenger Mode Share Estimates (Day)

Mode of Transport	Initial	10 years	20 years
Bus	3.3%	6.7%	10.0%
Taxi	5.3%	5.7%	6.0%
Car Parked	45.7%	41.3%	37.0%
Car drop off	45.7%	41.3%	37.0%
Rail (Then Bus)	0.0%	5.0%	10.0%

Table 4.2 Passenger Mode Share Estimates (Night)

Mode of Transport	Initial	10 years	20 years
Bus	N/A	N/A	N/A
Taxi	6.4%	9.6%	12.7%
Car Parked	46.8%	45.2%	43.7%
Car drop off	46.8%	45.2%	43.7%
Rail (Then Bus)	N/A	N/A	N/A

4.4 Fuel Tanker Trip Generation

1.1.41 The calculation of the fuel tanker trip assumptions in the TA was queried. In the TA, it is assumed that there would be 21 arrivals and 21 departures.

1.1.42 These figures have been based on the anticipated numbers of freight and passenger flights arriving and departing the Proposed Development and the refuelling requirements.

- Prediction for freight flights a fuel burn of 257,722 (Klitres) per year;
- Prediction for passenger flights a fuel burn of 27,898 (Klitres) per year;
- Total fuel burn (or fuel requirements) of 285,620 (Klitres) per year;
- Fuel tankers assumed to be able to carry 38,000 litres of fuel; and
- 285,620 (Klitres) of fuel requires 7,516 fuel tankers per year.

1.1.43 Fuel deliveries are anticipated to arrive in a uniform pattern across a period of 24-hours since the facility cannot accommodate multiple vehicles per hour. Tankers take some time to discharge the contents of the tanker and as such a 24-hour schedule is required.

1.1.44 KCC has accepted this clarification.

4.5 Airport Staff Trip Generation

Shift patterns

1.1.45 The TA assumes that staff shift patterns will start from 05.00, which was queried by KCC since it results in staff arrivals and/or departures generally being outside of background traffic peak hours.

1.1.46 By way of validation of the assumptions, first flights departing smaller airports typically depart between 06.30-07.00. Staff will be on site at 05.00. to open up and start processing passengers from 05.30. If an aircraft is based at the airport, the final return flight will typically be 22.00-23.00. with the terminal being clear of passengers at approximately 23.00. Typically, the final passenger processed for departure will be at approximately 20.00-21.00. having arrived at the airport from 19.00. onwards.

1.1.47 KCC has accepted this explanation.

4.6 Traffic Generation Summary

1.1.48 The table in **Appendix D** of this TA Addendum shows the hourly traffic generation over a 24-hour day for from Year 1 through to Year 20, when the Proposed Development is fully operational.

1.1.49 In summary, the Proposed Development will generate the following:

- Total Daily 24-Hour Traffic Generation:
  - Total Vehicles – 5,490 arrivals and 5,445 departures;
  - Light Vehicles – 5,041 arrivals and 4,997 departures; and
  - HGVS – 450 arrivals and 448 departures;
- Total AM Peak Traffic Generation (08:00 – 09:00):

- Total Vehicles – 5,95 arrivals and 1,99 departures;
- Light Vehicles – 574 arrivals and 176 departures; and
- HGVS – 21 arrivals and 23 departures:

- Total PM Peak Traffic Generation (17:00 – 18:00);
  - Total Vehicles – 158 arrivals and 515 departures;
  - Light Vehicles – 134 arrivals and 487 departures; and
  - HGVS – 24 arrivals and 28 departures.

4.7 Operational Airport Traffic Distribution

1.1.50 The TA set out traffic distribution assumptions. The passenger and freight distribution assumptions were based on market analysis of the South East area of EU actual ticketing data and 2011 CAA data. **Appendix E** shows the demand profile that the Proposed Development could generate, which was presented to the Airports Commission by the Applicant in 2014.

1.1.51 In summary, the data shows substantive market penetration in East Kent, modest from Mid Kent – Medway towns, Maidstone etc. and depending on rail access some minor penetration into the south east London market. There is little penetration above the River Thames because of the time and cost of travel to the Proposed Development and the presence of Stansted and Southend Airports. The Lower Thames Crossing could change this dynamic in the floating catchment, but not the core catchment. Any location in Kent which is within one hour's drive of London Gatwick will see most traffic gravitating there, only a small amount will be generated by the Proposed Development on routes London Gatwick does not serve (e.g. Manchester, Liverpool, and Newcastle) or where it offers cheaper, more convenient access to short haul leisure flights. The catchment boundary falls close to Maidstone, although concerns about journey time reliability on the M25 might extend this closer to Sevenoaks because the journey time to Manston would be much more certain.

Establishing a network scope

1.1.52 For the purpose of testing the Proposed Development in Thanet Strategic Traffic Model (TSTM), the gravity modelling identified in the TA was converted to a matrix of trips to and from the various accesses to the site, as set out below:

- Each super output area in Thanet has been modelled as a zone within the strategic model (Zones 1-84);
- Discovery Park has been modelled as a separate zone (85);
- Three external zones have been included:
  - A299 Thanet Way (Zone 86);
  - A28 (Zone 87); and
  - A256 (Zone 90).

1.1.53 Some elements of the super output areas around the Proposed Development have been broken down further for more detailed trip assignment such as follows:

- SOA A014 (Acol) – Zone 93;

- SOA A014 (Esmond Drive) – Zone 105;
- SOA A014 (Flete) – Zone 106; and
- SOA A014 (Manston Village) – Zone 107.

4.7.1.1 The airport was coded into four zones as follows:

- Zone 108 – Northern Grass Area (two accesses);
- Zone 109 – Cargo Facility (one access);
- Zone 110 – Passenger Terminal (one access); and
- Zone 111 – Fuel Farm (one access).

1.1.54 **Figure 1.1** in **Appendix F** to this document sets out a blank matrix setting out the locations.

Vehicular distribution for passenger trips

1.1.55 The TA identified the following distribution of passenger trips, based on the evidence presented to the Airports Commission in 2014:

- 7.5% to the London Boroughs;
- 12.5% to West Kent;
- 50% to East Kent; and
- 30% to Mid Kent.

1.1.56 The distribution of trips located in Kent was based on population densities to identify gravity modelling. For East Kent, within which the Proposed Development is located, a more detailed breakdown of areas of population was undertaken. These were broken down to super output areas from 2011 journey to work census data. For the purpose of the strategic transport modelling, this was used to distribute to the corresponding zones.

1.1.57 For locations outside of East Kent, trips were added to the zones for the external links (based on Google Maps journey planning software) from the centre of the population mass in that district or output area.

1.1.58 **Appendix F** sets out the details for the various matrices that were developed for each of the Proposed Development elements that will generate traffic. The passenger trips matrix is set out in six figures in **Appendix F,** as follows;

- Passenger Terminal – AM Peak – Light vehicles – **Figure 1.2**;
- Passenger Terminal - AM Peak – HGVs – **Figure 1.3**;
- Passenger Terminal – AM Peak – Total Vehicles – **Figure 1.4**;
- Passenger Terminal – PM Peak – Light Vehicles – **Figure 1.5**;
- Passenger Terminal - PM Peak – HGVs – **Figure 1.6**; and
- Passenger Terminal – PM Peak – Total Vehicles – **Figure 1.7**.

Vehicular distribution of freight trips

1.1.59 The vehicular distribution of freight trips included in the TA was based on the information provided to the Airports Commission in 2014. As set out in the TA, it is anticipated that the majority of freight trips generated by the proposed cargo activities at the Proposed Development would originate from London and the surrounding area.

1.1.60 Analysis has been undertaken in GIS software to understand the potential distribution of freight trips, based on two trucking times from the Proposed Development:

- 135 minutes (including a 15-minute delay for heavy traffic); and
- 150 minutes (including a 10-minute delay for rush hour traffic).

1.1.61 The results showed that the areas that can be reached in the 135-minute trucking time include all areas of Kent, areas along the M25 corridor to the M3 at Woking and to the M1 at St. Albans, along the M23/A23 corridor to Haywards heath in Sussex and to the north along the M11 corridor to Bishops Stortford.

1.1.62 The 150-minute trucking time would serve all areas in the 135 minute trucking time, with the addition of all junctions of the M25, The M1 corridor to Luton, the A1(M) to Stevenage, M11 to Stevenage, M23/A23 corridor to Brighton and the M3 to Farnborough.

1.1.63 The areas located within the trucking time zones have reasonable journey times to the Proposed Development. Air cargo trips generated in this area could serve the freight terminal at the Proposed Development.

1.1.64 **Appendix G** sets out the plans of the GIS assessment and the proportional distribution, routing and strategic model zone is set out in **Table 4.3**.

Table 4.3 Trip Distribution of Freight Trips

Location	Route	Strategic Model Zone	% Distribution
London and the Surrounding area	A299	86	95%
Dover and Folkstone Port	A256	90	2%
Ashford Freight Distribution Sites	A28	87	2%
Ramsgate Port	A299	17	1%

1.1.65 It should also be noted that of the total cargo facility HGVs that are generated, 50% of these are assumed to route to the adjacent Northern Grass Area (NGA) and will be on a fixed route to Zone 108 and vice versa.

1.1.66 **Figure 1.8** and **Figure 1.9** in **Appendix C** sets out the matrix for the distribution of freight trips.

Vehicular Distribution of Northern Grass Area Staff Trips

1.1.67 The trip distribution. as set out in **Table 6.32** of the TA was attached to one of the TSTM zones, as illustrated in **Figure 1.10-1.11** in **Appendix F.** This sets out the matrix that results from the distribution methodology from the two access points into the NGA. The NGA staff trips are set out in two figures in **Appendix F**, as follows;

- NGA Staff Trips – AM Peak – Light vehicles – **Figure 1.10**; and
- NGA Staff Trips – PM Peak – Light vehicles – **Figure 1.11**.

Vehicular distribution of Northern Grass Area HGV trips

1.1.68 The distribution is unchanged from the TA; however, it has been matched to the TSTM zones. The NGA HGV trips are set out in two figures in **Appendix F,** as follows;

- NGA HGV Trips – AM Peak – HGVs – **Figure 1.12**; and
- NGA HGV Trips – PM Peak – HGVs – **Figure 1.13**.

Vehicular distribution of museum trips

1.1.69 The distribution is unchanged from the TA but has been matched to the TSTM zones. The Museum trips are set out in one **Figure 1.14** in **Appendix F** for the PM peak, there are no trips generated by the museum in the AM peak.

Vehicular Distribution of Fuel Farm Trips

1.1.70 The distribution is unchanged from the TA, however, has been matched to the TSTM zones. The Fuel Farm HGV trips are set out in two figures in **Appendix F** as follows;

- Fuel Farm HGV Trips – AM Peak – HGVs – **Figure 1.15**; and
- Fuel Farm HGV Trips – PM Peak – HGVs – **Figure 1.16**.

Vehicular Distribution of Airport Site Staff Trips

1.1.71 The distribution is unchanged from the TA but has been matched to the TSTM zones. Two zonal matrices were identified:

- Cargo Terminal Staff (using the cargo access); and
- Passenger Terminal Staff (using the Passenger access).

4.7.1.2 The Cargo Terminal Staff will work in shift patterns which will not interact with the AM or PM peak hours and as such the flows are zero during these periods. The Passenger Terminal Staff are set out in two figures in **Appendix F**, as follows;

- Passenger Terminal Staff Trips – AM Peak – Light vehicles – **Figure 1.18**; and
- Passenger Terminal Staff Trips – PM Peak – Light vehicles – **Figure 1.19**.

Vehicular Distribution of Servicing Trips

1.1.72 The distribution is unchanged from the TA but has been matched to the TSTM zones as shown in **Figure 1.20** and **Figure 1.21** in **Appendix F**.

4.8 Aggregation of Matrix Traffic

4.8.1.1 With the traffic calculated and apportioned to matrices for the differing elements of the Proposed Development, these needed to be aggregated first by access points and then as a total matrix for the entire site. The following section sets out that process.

Northern Grass Area Accesses

4.8.1.2 The matrix for the NGA access has been calculated by adding the traffic together for the Museum and NGA development matrices. The matrices based on the NGA access points are set out in six figures in **Appendix F**, as follows;

- NGA Light Vehicle Trips – AM Peak – Light vehicles – **Figure 1.22**;
- NGA Heavy Vehicle Trips – AM Peak – Heavy vehicles – **Figure 1.23**;
- NGA Total Vehicle Trips – AM Peak – Total vehicles – **Figure 1.24;**
- NGA Light Vehicle Trips – PM Peak – Light vehicles – **Figure 1.25**;
- NGA Heavy Vehicle Trips – PM Peak – Heavy vehicles – **Figure 1.26**; and
- NGA Total Vehicle Trips – PM Peak – Total vehicles – **Figure 1.27**.

Cargo Access

4.8.1.3 The matrix for the cargo access has been calculated by adding the HGV traffic for the cargo access and the cargo facility staff matrices. The cargo access trips are set out in six figures in **Appendix F**, as follows;

- Cargo Access Light Vehicle Trips – AM Peak – Light vehicles – **Figure 1.28**;
- Cargo Access Heavy Vehicle Trips – AM Peak – Heavy vehicles – **Figure 1.29**;
- Cargo Access Total Vehicle Trips – AM Peak – Total vehicles – **Figure 1.30**;
- Cargo Access Vehicle Trips – PM Peak – Light vehicles – **Figure 1.31**;
- Cargo Access Heavy Vehicle Trips – PM Peak – Heavy vehicles – **Figure 1.32**; and
- Cargo Access Total Vehicle Trips – PM Peak – Total vehicles – **Figure 1.33**.

Passenger Terminal Access

4.8.1.4 The matrix for the passenger terminal access has been calculated by adding the HGV servicing traffic, passenger traffic and passenger terminal staff traffic matrices. The passenger terminal access trips are set out in six figures in **Appendix F,** as follows;

- Passenger Terminal Access trips – AM Peak – Light vehicles – **Figure 1.34**;
- Passenger Terminal Access trips – AM Peak – Heavy vehicles – **Figure 1.35**;
- Passenger Terminal Access trips – AM Peak – Total vehicles – **Figure 1.36**;

- Passenger Terminal Access trips – PM Peak – Light vehicles – **Figure 1.37**;
- Passenger Terminal Access trips – PM Peak – Heavy vehicles – **Figure 1.38**; and
- Passenger Terminal Access trips – PM Peak – Total vehicles – **Figure 1.39**.

Fuel Farm Access

4.8.1.5 No other traffic than the HGVs to the fuel arm is proposed to this access and as such no additional calculation was required. The AM and PM traffic matrices to this access are set out in **Figure 1.15** and **Figure 1.16** of **Appendix F**.

Total Manston Airport Matrix Calculations

4.8.1.6 All the traffic to the four accesses, as set out in paragraphs 4.8.2 to 4.85, has been added to create an overall matrix to be used within the strategic modelling these are set out in **Appendix F** as follows;

- Total Manston Airport Traffic - AM Peak – Light vehicles – **Figure 1.40**;
- Total Manston Airport Traffic - AM Peak – HGVs – **Figure 1.41**;
- Total Manston Airport Traffic - AM Peak – Total Vehicles – **Figure 1.42**;
- Total Manston Airport Traffic - PM Peak – Light Vehicles – **Figure 1.43**;
- Total Manston Airport Traffic - PM Peak – HGVs – **Figure 1.44**; and
- Total Manston Airport Traffic – PM Peak – Total Vehicles – **Figure 1.45**.

5. Manston-Haine Link

5.1 Introduction

5.1.1.1 The Manston-Haine Link is identified in paragraphs 9.3.17 – 9.3.19 of the draft Thanet Transport Strategy. In relation to the site, the following is identified in paragraph 9.3.19:

> *"It is anticipated that a new highway link would be created on the existing Northern Grass Area (part of the Former Manston Airport Site allocation). The nature and route of this link will depend on the final masterplan for this allocation site."*

5.1.1.2 As set out in the statement of need, the Northern Grass Area (NGA) is aviation related development that lies within the airport boundary. As aviation related development, it is undesirable to have a link road passing through the site due to the variety of uses that may be required on the site but are at this stage not fully known. It has therefore been necessary to consider a different option to the suggested routing set out in the Transport Strategy.

5.1.1.3 RiverOak has identified an alternative route (known as the 'alternative alignment'), which meets the highway standards for new roads and junctions set out in the Design Manual for Roads and Bridges (DMRB) and the design specification for the link road identified by KCC.

5.1.1.4 The alternative alignment route has been tested in the Thanet Strategic Traffic Model (TSTM) for the 'with Proposed Development' scenario.

5.2 Description of Alternative Alignment

5.2.1.1 The alternative alignment routes from Manston Court Road to the north-east of the NGA to Manston Road to the west via a field to the north of the NGA, as indicated in **Figure 5.1**. Manston Road would be widened, and an improvement scheme is required at the Spitfire Way/Manston Road junctions, which is needed to deliver the Proposed Development regardless of the link road.

5.2.1.2 RiverOak has discussed the alternative alignment with KCC and has based the connection with Manston Court Road on a KCC designs for the link road which had been produced for the purpose of costing the scheme. The design standard identified by KCC for the Manston-Haine Link Road is as an all-purpose Band A road comprising the following:

- 7.3m width;
- 40mph design speed; and
- Footway and cycle provision on one or both sides of the carriageway.

5.2.1.3 A feasibility design has been produced, which is included in **Appendix H**. A DMRB compliance sheet is also provided in **Appendix H**. Key aspects of the alignment are as follows:

- The design complies with the KCC design requirements and with DMRB standards. Two-step relaxations are necessary, but this is allowed for an all-purpose Band A road;
- A section of Manston Court Road south of the link road would be realigned to connect into the link road at a ghost island priority junction;
- A section of Manston Road north of the link road would be realigned to connect into the link road at a ghost island priority junction;

- A short section of Manston Road would become a cul-de-sac with a turning head; and
- The Spitfire Way/Manston Road staggered crossroads would become a signalised crossroads. It is acknowledged that the KCC preference is for a roundabout at this junction, however, based on capacity assessments, the signal junction works with adequate capacity by Year 20 of the Proposed Development, and is preferable as it controls traffic and provides safe pedestrian crossing opportunities. This is set out in further detail in the next section.

5.3 Conclusion

5.3.1.1 The feasibility work undertaken shows that the alternative alignment is design compliant. The wording in the draft Thanet Transport Strategy allows for flexibility of routeing and, given the constraints of the NGA, the alternative alignment is a viable proposition.

6. Traffic Impact Assessment

6.1 Introduction

i. At the time of submission of the Transport Assessment (TA), the Kent County Council (KCC) Thanet Strategic Transport Model (TSTM) (which supports the draft Thanet Local Plan) was being revised and was not available for third party use. Since the submission of the DCO, the Local Plan has been published and the TSTM completed. In consultation and agreement with KCC, KCC's transport model consultants were commissioned to undertake model runs of the Proposed Development.

ii. As set out in the TA, the peak traffic generation for the Proposed Development will be in Year 20, which is 2039. The TSTM for the Local Plan has a forecast year of 2031. Therefore, there has been a requirement to growth the output from the TSTM to 2039 to account for growth in background traffic between 2031 and 2039.

iii. This section sets out the approach and the results of the traffic impact assessment.

6.2 Assessment Scenarios

6.2.1.1 The future reference case (i.e. future baseline) has been based on the following scenario which was modelled for the Local Plan:

- 2031 Do Maximum – (extant permissions and growth + draft Local Plan + draft Thanet Transport Strategy). The '+ draft Local Plan' includes the proposed residential and employment site allocations, and the '+ draft Thanet Transport Strategy' includes the ICRIS, junction improvements and the Thanet Parkway Station.

6.2.1.2 The following Proposed Development scenarios were tested:

- 2031 Do Maximum (alternative Manston Haine Link alignment) + Manston Airport DCO. This assumes the Year 20 traffic generation and the alternative link road alignment; and
- 2031 Do Maximum (partial Manston Haine Link) + Manston Airport DCO. This assumes the Year 20 traffic generation and that the section from Manston Court Road to Manston Road through the NGA is not provided.

6.2.1.3 The following output from the TSTM was provided:

- Vehicle turning flows for the series of junctions and links defined above for each of the assessed scenarios; and
- Select link analysis which provided the development only traffic flows.

Development of Scenarios

6.2.1.4 The following was undertaken in preparation of data provision for the purpose of the TA and Environmental Statement (ES):

- Vehicle turning flow validation - the TSTM includes a 2016 baseline model, on which the forecast modelling is based. However, given the strategic nature of the modelling, the base flows in SATURN were not validated to the same level as a more local model (such as LinSig or VISSIM) and a number of the modelled turning flows are very different to the traffic counts;

There was therefore the need to validate the vehicle turning flow output to the KCC 2016 traffic counts, and the Wood 2017 traffic counts at junctions where there was no 2016 count;

- Calculation of HGV flows - the TSTM output flows are vehicles only, and for the purpose of the environmental impact assessment work, needed to be converted into light vehicle and HGV flows. A HGV percentage provided by KCC was used to understand the split of light vehicles and HGVs (based on traffic counts); and
- Growth of baseline traffic flows to 2039 - the TSTM future year is 2031 (end of Local Plan period). It was necessary to growth these base flows up to 2039 (Year 20 of construction/operation). It was agreed with KCC that a growth rate should be applied to the base flows, and this was calculated from TEMPRO, as shown in **Table 6.1**.

Table 6.1 2031 – 2039 Growth Rates

	Light Vehicles	HGV
AM	1.0452	1.0529
PM	1.0443	1.0520

Process for Calculations of Future Year Scenarios

6.2.1.5 The following process was used to develop the junction turning counts used in the assessment within this chapter based on the outputs of the strategic model scenarios.

Methodology for 2039 Reference Case Scenario

- The 2031 Reference Case (KCC 'Do Maximum' scenario) total vehicle traffic flows were split into light vehicle and HGVs using the HGV % figures provided by KCC or where not provided HGV % from the Wood 2017 junction turning counts; and
- The 2031 base light vehicle and HGV flows were growthed using the growth rates set out in **Table 5.1**.

Methodology for 2039 + Development Scenario

- The 2031 + Development total vehicle traffic flows were split into light vehicle and HGVs using the HGV % figures provided by KCC or where not provided HGV % from the Wood 2017 junction turning count;
- Select link analysis provided by KCC's consultants was used to identify the Proposed Development the traffic movements across the study area road network. This was disaggregated into light vehicles and HGVs based on the distribution of HGVs from the TA. The Proposed Development flows were then extracted from the data to leave 'background' traffic;
- The 2031 background traffic flows were growthed using the growth rates set out in **Table 6.1**; and
- The Proposed Development traffic was added back resulting in the 2039 + Development Scenario for use in the junction modelling.

Assessment Time Periods

1.1.73 Two time periods have been assessed which are also the modelled periods in the TSTM:

- AM peak hour (08:00 – 09:00); and
- PM peak hour (17:00 – 18:00).

6.3 Junction Capacity Assessments

6.3.1.1 The validated junction models have been used to model the following scenarios in order to understand the impact of the Proposed Development on the road network.

- 2039 Future Year Base based on the KCC 'Do Maximum' scenario which is based on the addition of the Local Plan site allocations and the draft Transport Strategy interventions; and
- 2039 + Manston Airport Development Traffic based on the alternative Manston-Haine Link alignment.

6.3.1.2 All priority and roundabout junctions have been modelled in Junctions 9 (PICADY/ARCADY respectively). Ratio of Flow to Capacity (RFC) is used to assess the junction's performance with a threshold of 0.85 RFC equating to the junction's theoretical capacity. Above this threshold queues and delays begin to build exponentially.

6.3.1.3 The capacity of signalised junctions has been modelled within LinSig 3. Signalled junctions can be considered to reach their theoretical capacity when the junctions total practical reserve capacity (PRC) becomes negative. In addition, individual arms are considered to reach their theoretical capacity when their Degree of Saturation (DoS) exceeds 90%.

6.3.1.4 The impact of the Proposed Development traffic and need for mitigation is based upon two conditions:

- Does the impact of the Proposed Development traffic result in the RFC exceeding the standard threshold of 0.85 at roundabouts and priority junctions, or 90% DoS for signalised junctions, and if so to what extent; and
- If the ratio of RFC is in excess of 0.85 at priority junctions or roundabouts, or 90% DoS at signal junctions, does the Proposed Development make the situation **significantly** worse

6.3.1.5 It must be noted that when considering the junctions, it is appropriate to take a holistic view of the available storage and queuing evident as it is common place for a junction to be used to regulate traffic flow through a network. Signalised junctions can therefore operate at capacity with large queues and delays provided they do not cause blocking back to strategic junctions and where the queues are transient and are discharged each cycle. They can therefore still be considered to operate satisfactorily if required as a regulator of flow onto the surrounding highway network.

6.3.1.6 The following sections set out the results from the junction modelling and include the 2017 baseline modelling results from the TA for reference.

6.3.2 Junction 2: A299 / A256 / Cottington Link Rd (Four-Arm Standard Roundabout)

6.3.2.1 The validated 2017 base model for Junction 2 uses the lane simulation option within Junctions 9 / ARCADY to more closely reflect unequal lane usage. As a consequence, the RFC value is not available as a model output. Average modelled queues are taken into consideration for comparing future scenario impact with results summarised in Table 6.2.

Table 6.2 Junction 2 - 2017 Base - Peak Hour Modelling Results

	AM Peak	PM Peak
	Average Queue	Average Queue
A299 Hengist Way (E)	9	3
A256	10	27
Cottington Link Rd	7	4
A299 Hengist Way (N)	2	1

6.3.2.2 During the AM peak, queues are fairly low, with the A256 queues building in the PM peak hour to 27 vehicles. Table 6.3 sets out the results for the 2039 Base scenario which shows that queues have significantly increased, particularly on the A299 Hengist Way (E) in the AM and on the A256 in the PM. Table 6.3 also shows the situation with the additional Proposed Development traffic and the difference between the 2039 Base scenario and the with development scenario.

Table 6.3 Junction 2 – 2039 Peak Hour Modelling Results

	2039 Baseline		2039 With Development	
	AM Peak Average Queue	PM Peak Average Queue	AM Peak Average Queue	PM Peak Average Queue
A299 Hengist Way (E)	147	3	130 (-17)	5 (+1)
A256	9	87	14 (+5)	114 (+27)
Cottington Link Rd	3	2	40 (+36)	2 (+1)
A299 Hengist Way (N)	3	1	3 (0)	1 (+/-0)

(Difference with 2039 baseline results are shown in brackets)

6.3.2.3 With the inclusion of the Proposed Development trips, a significant increase in queue numbers is noted on the A256 approach in the PM peak and Cottington Link Road in the AM peak. As such, a mitigation scheme is required.

6.3.3 Junction 3: A299 / Canterbury Rd / Hengist Way (Three-Arm Standard Roundabout)

6.3.3.1 The results of the validated model for the 2017 Base scenario are summarised in Table 6.4.

Table 6.4 Junction 3 - 2017 Base Line Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Canterbury Rd	0	0.29	0	0.21

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
A299 Hengist Way (S)	2	0.64	2	0.63
A299 Hengist Way (W)	1	0.58	2	0.67

6.3.3.2 The base model output shows the junction operates with minimal queueing and delays during the peak hour periods with all approaches evidencing RFCs well below the threshold value of 0.85. Table 6.5 sets out the results for the 2039 Base scenario, which shows that Junction 3 continues to operate with minimal queues and delays with all arms exhibiting RFCs below the 0.85 threshold. Table 6.5 also shows the with development scenario.

Table 6.5 Junction 3 – 2039 Peak Hour Modelling Result

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Canterbury Rd	0	0.07	0	0.03	0 (+/- 0)	0.12	0 (+/- 0)	0.03
A299 Hengist Way (S)	1	0.49	1	0.47	1 (+/- 0)	0.51	1 (+/- 0)	0.49
A299 Hengist Way (W)	1	0.50	1	0.42	1 (+/- 0)	0.51	1 (+/- 0)	0.47

(Difference with 2039 Baseline results is shown in brackets)

6.3.3.3 With the inclusion of the Proposed Development flows, Junction 3 continues to operate within theoretical capacity with minimal queues and delays. It is concluded that no physical mitigation works are required at this junction.

6.3.4 Junction 4: A299 / B2190 (Four-Arm Standard Roundabout)

6.3.4.1 The results of the validated model for the 2017 Baseline scenario are summarised in Table 6.6.

Table 6.6 Junction 4 - 2017 Baseline - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Hengist Way (E)	9	0.91	9	0.91
Tothill Street	9	0.94	9	0.93
A299 (W)	12	0.94	12	0.94
B2190 (N)	13	0.96	18	0.99

6.3.4.2 The base model shows queues and delays on all approaches with RFCs exceeding the theoretical threshold of 0.85 in both the AM and PM peaks. Table 6.7 shows that the situation worsens in the 2039 baseline scenario and the junction operates above at its theoretical capacity with significant queues and delays in all peak periods modelled, with exception of B2190 (N) in the PM. Table 6.7 also shows the with development scenario.

Table 6.7 Junction 4 – 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Hengist Way (E)	8	0.90	51 (+43)	1.05	51 (+43)	1.05	31 (+11)	1.02
Tothill Street	66	1.32	102 (+36)	1.49	102 (+36)	1.49	11 (+5)	0.98
A299 (W)	5	0.84	8 (+3)	0.90	8 (+3)	0.90	92 (+34)	1.10
B2190 (N)	54	1.08	88 (+32)	1.14	88 (+32)	1.14	5 (+2)	0.83

(Difference with 2039 Baseline results is shown in brackets)

6.3.4.3 With the inclusion of the development trips the junction is shown to operate without capacity with significant queues and delays. The impact of the Proposed Development therefore requires mitigation.

6.3.5 Junction 5: B2190 / Minster Rd (Three-Arm Standard Roundabout)

6.3.5.1 The results of the validated model for the 2017 Baseline scenario are summarised **Table 6.8**

Table 6.8 Junction 5 - 2017 Base - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
B2190 (East)	0	0.26	1	0.35
B2190 (South)	1	0.37	1	0.34
Minster Rd	1	0.33	0	0.24

6.3.5.2 The validated base model shows that the junction operates with minimal queueing and delays during the peak hour periods, with all RFCs well below the 0.85 threshold value. **Table 6.9** shows the 2039 baseline scenario which shows that the junction continues to operate with minimal queues and delays with all arms exhibiting RFCs below the 0.85 threshold. **Table 6.9** also shows the with development scenario.

Table 6.9 Junction 5 – 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
B2190 (East)	1	0.51	1	0.38	1 (+/- 0)	0.54	1 (+/- 0)	0.42
B2190 (South)	1	0.60	2	0.68	2 (+1)	0.68	2 (+/- 0)	0.70
Minster Rd	0	0.21	0	0.16	0 (+/- 0)	0.25	0 (+/- 0)	0.10

(Difference with 2039 baseline results shown in brackets)

6.3.5.3 With the addition of the Proposed Development traffic, the junction continues to operate with minimal queues and delays on all approaches, with RFCs less than 0.85 and no mitigation measures is needed.

6.3.6 Junction 6 - A299 / Seamark Rd / A253 / Willetts Hill (five-arm standard roundabout)

6.3.6.1 The results of the validated model for the 2017 Baseline scenario are summarised in **Table 6.10**.

Table 6.10 Junction 6 - 2017 Base - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
A299 (East)	4	0.79	4	0.79
Willetts Hill	0	0.13	0	0.08
A253 Canterbury Rd	4	0.81	6	0.88
A299 (North)	8	0.90	9	0.91
Seamark Rd	0	0.09	0	0.11

6.3.6.2 The base model indicates that the A299 (North) approach starts to experience queues during the AM peak hour. During the PM peak, both the A253 Canterbury Road and A299 North approaches are operating at capacity with queues and delays. **Table 6.11** shows the 2039 baseline scenario which shows that the junction operates with significant queues and delays, particularly on the A299 (North) and A253 Canterbury Road. **Table 6.11** also shows the with development scenario.

Table 6.11 Junction 6 – 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
A299 (East)	6	0.83	4	0.80	6 (+1)	0.87	5 (+1)	0.84
Willetts Hill	0	0.13	0	0.08	0 (+/- 0)	0.14	0 (+/- 0)	0.08
A253 Canterbury Rd	12	0.99	36	1.09	9 (-3)	0.95	40 (+4)	1.12
A299 (North)	11	093	15	0.96	18 (+7)	0.98	31 (+16)	1.02
Seamark Rd	0	0.04	0	0.04	0 (+/- 0)	0.04	0 (+/- 0)	0.05

(Difference with 2039 baseline results shown in brackets)

6.3.6.3 With the addition of the Proposed Development traffic, queues and delay increase and the junction performance worsens. In order to address the impact of the Proposed Development trips at this junction, a mitigation scheme is required.

6.3.7 Junction 7: A299 / A28 (Five-Arm Standard Roundabout)

6.3.7.1 The validated base model utilises the lane simulation option of ARCADY, with lane usage adjustments to reflect the unequal lane usage and as such only reports queues and not RFCs. The results of the 2017 baseline scenarios are set out in **Table 6.12**.

Table 6.12 Junction 7 - 2017 Base Peak Hour Modelling Results

	AM Peak	PM Peak
	Average Queue	Average Queue
A28 (East)	14	2
A299 (South)	8	5
Canterbury Rd	1	14
A299 (West)	7	17
Potten Street Rd	0	0

6.3.7.2 The validated base model shows relatively light levels of queuing on all approaches. **Table 6.13** shows the 2039 baseline scenario which indicates queues and delays are longer on various approaches in the AM and PM hour periods when compared to the 2017 results, except for on Potten Street Road. **Table 6.13** also shows the with development scenario.

Table 6.13 Junction 7 – 2039 Peak Hour Modelling Results

	2039 Baseline		2039 With Development	
	AM Peak Average Queue	PM Peak Average Queue	AM Peak Average Queue	PM Peak Average Queue
A28 (East)	112	4	109 -3)	5 (+1)
A299 (South)	12	6	15 (+3)	8 (+2)
Canterbury Rd	58	80	80 (+22)	101 (+21)
A299 (West)	7	32	8 (+1)	40 (+8)
Potten Street Rd	0	0	0 (+/- 0)	0 (+/- 0)

(Difference with 2039 baseline results shown in brackets)

6.3.7.3 With the addition of the Proposed Development traffic, queues and delay increase and the junction performance worsens. In order to address the impact of the Proposed Development trips at this junction a mitigation scheme is required.

6.3.8 Junction 8: A28 / Park Ln / Station Rd (Three-Arm Mini Roundabout and Left in/Left out Priority Junction)

6.3.8.1 The results of the validated model for the 2017 Baseline scenario are split into a three-arm roundabout (8a) and the priority junction (8b,) which together form Junction 8.

6.3.8.2 It should be noted that the draft Transport Strategy includes a scheme for the junction which comprises restricting Park Lane to a northbound only link. The implications of this scheme are reflected in the assessment of this junction in the 2039 assessment when compared to the 2017 baseline.

Junction 8a

6.3.8.3 **Table 6.14** shows the results for the 2017 baseline scenario.

Table 6.14 Junction 8(a) – Mini Roundabout - 2017 Base - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
A28 East	14	0.96	5	0.84
A28 South	3	0.75	9	0.92
Station Rd	19	1.02	6	0.88

6.3.8.4 The results show that the junction is operating at capacity in both the AM and PM peak hours with queues and delays beginning to develop. **Table 6.15** shows the 2039 baseline scenario which shows that the junction experiences significant queueing in both peaks in the 2039 baseline scenario. **Table 6.15** also shows the results of the modelling of the with development scenario

Table 6.15 Junction 8(a) – Mini roundabout - 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
A28 East	13	0.96	2	0.72	13 (+/-0)	0.96	3 (+1)	0.72
A28 South	5	0.86	7	0.89	6 (+/-0)	0.87	7 (+/-0)	0.89
Station Rd	84	1.28	27	1.06	87 (+2)	1.29	28 (+/-1)	1.06

(Difference with 2039 baseline results shown in brackets)

6.3.8.5 The inclusion of the Proposed Development trips results in a maximum of two extra vehicles on the Station Road arm in the AM peak. With such a minor impact from the development traffic no mitigation is proposed.

Junction 8b

6.3.8.6 **Table 6.16** shows the results for the 2017 baseline scenario.

Table 6.16 Junction 8(b) – Left in / Left out Priority Junction - 2017 Baseline - Peak Hour Modelling Results

	AM Peak	PM Peak
	Average Queue	Average Queue
A28 North	0	0
Park Ln	3	7
A28 South	2	1

6.3.8.7 Only minimal queues are recorded during the 2017 Baseline scenario. **Table 6.17** shows the 2039 baseline scenario which indicates a minor increase in queues on Park Lane in the AM but a minor decrease in the PM. It should also be noted that the A28 south queuing reduces to 0 with no ability to right into the Park Lane link as this will be an entry only link onto the junction as a result of the KCC scheme. **Table 6.17** also shows the results of the with development scenario.

Table 6.17 Junction 8(b) – Left in / Left out Priority Junction - 2039 Peak Hour Modelling Results

	2039 Baseline		2039 With Development	
	AM Peak Average Queue	PM Peak Average Queue	AM Peak Average Queue	PM Peak Average Queue
A28 North	0	0	0 (+/- 0)	0 (+/- 0)
Park Ln	9	2	9(0)	2 (0)
A28 South	0	0	0 (+/-0)	0 (+/- 0)

	2039 Baseline		2039 With Development	
	AM Peak Average Queue	PM Peak Average Queue	AM Peak Average Queue	PM Peak Average Queue
Total Difference			+0	+/-0

(Difference with 2039 baseline results shown in brackets)

6.3.8.8 The inclusion of the proposed development flows results in no change at the junction.

6.3.9 Junction 10: Shottendane Rd / Manston Rd / Margate Hill (Four-Arm Staggered Junction)

6.3.9.1 The results of the validated model for the 2017 Baseline scenario are summarised in **Table 6.18**.

Table 6.18 Junction 10 - 2017 Base - Peak Hour Modelling Results

	AM Peak Average Queue	PM Peak Average Queue
Margate Hill – all movement	1	6
Manston Rd (East) – all movement	0	1
Shottendane Rd to Manston Rd (East)	4	0
Shottendane Rd to Margate Hill & Manston Rd (West)	8	1

6.3.9.2 The base model shows that the junction experiences minor queues on Shottendane Road approach during the AM peak hour. **Table 6.19** shows the 2039 baseline scenario which includes a KCC scheme comprising the new Columbus Avenue extension and a new junction arrangement with Manston Road. This results in needing to assess the junction as a linked roundabout and a smaller priority junction within Junctions 9. The 2039 future year assessment indicates that the junction is proposed to remain broadly as in the 2017 scenario with the new junction arrangement resulting in minimal queuing. **Table 6.19** shows the results of the with development modelling

Table 6.19 Junction 10 – 2039 Peak Hour Modelling Results

	2039 Baseline		2039 With Development	
	AM Peak Average Queue	PM Peak Average Queue	AM Peak Average Queue	PM Peak Average Queue
J1 – Shottendane Rd	1	1	2 (+1)	1 (+/-0)
J1 – Columbus Ave	0	1	1 (+1)	1 (+/-0)
J1 – Manston Rd (west)	1	2	2 (+1)	2 (+/-0)
J2 – Columbus Ave (north)	0	0	0 (+/-0)	0 (+/-0)
J2 – Manston Rd	2	4	1 (-1)	3 (-1)
J2 – Columbus Ave (south)	0	0	0 (+/-0)	0 (+/-0)

(Difference with 2039 baseline results shown in brackets)

6.3.9.3 With the addition of the development trips through the proposed new junction layout at junction 10 as part of the KCC transport interventions the performance of the junction is unchanged and well below capacity thresholds. No transport mitigation scheme is required.

6.3.10 Junction 11: Columbus Avenue / Spitfire Way (Three-Arm Standard Roundabout)

6.3.10.1 The results of the validated model for the 2017 Baseline scenario are summarised in **Table 6.20**.

Table 6.20 Junction 11 - 2017 Base Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Spitfire Way	1	0.38	1	0.40
B2190 Columbus Avenue West	0	0.26	0	0.18
B2190 Columbus Avenue North	0	0.03	0	0.15

6.3.10.2 The 2017 validated base model is shown to operate with minimal queues and delays during the peak hour periods, performing well within the theoretical capacity of 0.85 RFC. **Table 6.21** shows the 2039 baseline scenario modelling results. The results show that the junction will continue to operate with minimal queues and delays performing well within the theoretical capacity of 0.85 RFC. **Table 6.21** shows the with development scenario results.

Table 6.21 Junction 11 - 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Spitfire Way	1	0.32	0	0.22	1 (+/- 0)	0.45	0 (+/-0)	0.24
B2190 Columbus Avenue West	1	0.58	1	0.39	2 (+1)	0.59	1 (+/- 0)	0.43
B2190 Columbus Avenue North	1	0.52	1	0.58	2 (+1)	0.63	1 (+/- 0)	0.59

(Difference with 2039 baseline results shown in brackets)

6.3.10.3 With the addition of the development traffic the junction is shown to continue to operate within its theoretical capacity with minimal queues and delays. No mitigation works are required at this junction.

6.3.11 Junction 12: Manston Road / B2050 / Spitfire Way (Four-Arm Staggered Priority Junction)

6.3.11.1 The validated 2017 base model results are presented in **Table 6.22**.

Table 6.22 Junction 12 - 2017 Base - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Spitfire Way to B2050 (West)	1	0.92	1	1.16
Spitfire Way to B2050 (East) / Manston Road (North)	8	0.93	40	1.15
B2050 (East)	1	0.18	0	0.09
Manston Road (North) to B2050 (East)	0	0.18	0	0.21
Manston Road (North) to Spitfire Way / B2050 (West)	4	0.81	3	0.80
B2050 (West)	0	0.08	0	0.02

6.3.11.2 The validated base model shows that the junction is experiencing queues and delays on the Spitfire Way approach, in particularly during the PM peak. A scheme has been identified for this junction which has been included in the strategic transport modelling. This is set out in the next section.

6.3.12 Junction 13: Manston Court Road / B2050 (Three-Arm Priority Junction)

6.3.12.1 The validated 2017 base model results are presented in **Table 6.23**.

Table 6.23 Junction 13 - 2017 Base - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Manston Court Road	2	0.67	3	0.75
B2050	0	0.02	0	0.03

6.3.12.2 The validated base model is shown to operate with minimal queues and delays during the 2017 base scenario. **Table 6.24** shows the 2039 baseline scenario which indicates queues will decrease on Manston Court Road. **Table 6.24** also shows the with development scenario.

Table 6.24 Junction 13 - 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Manston Court Road	0	0.0.8	0	0..08	0 (+/-0)	0.24	0 (+/-0)	0.19
B2050	0	0.04	0	0.06	0 (+/- 0)	0.16	0 (+/- 0)	0.16

(Difference with 2039 baseline results shown in brackets)

6.3.12.3 With the addition of the proposed development traffic and the changes as a result of the KCC link road route option and the River Oak option the overall junction performance at this junction remains relatively unchanged with the development traffic added to the junction. As such no mitigation scheme is required.

6.3.13 Junction 15: Manston Rd / Hartsdown Rd / Tivoli Rd / College Rd / Nash Rd (Five-Arm Signalised Junction)

1.1.74 The validated 2017 base model results are presented in **Table 6.25.**

Table 6.25 Junction 15 - 2017 Baseline - Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	**DoS**	**MMQ**	**DoS**
College Rd Lane 1 (3/1)	19	88.9%	21	89.0%
College Rd Lane 2 (3/2)				
Nash Rd (2/1)	8	53.6%	23	99.8%
Manston Rd Lane 1 (1/1)	15	89.4%	24	98.8%
Manston Rd Lane 2 (1/2)				
Hartsdown Rd (4/1)	18	89.0%	14	86.4%
PRC	0.7%		-10.9%	

6.3.13.1 The results show that junction already has queues and delays beyond the theoretical capacity in the PM peak.

6.3.13.2 The draft Transport Strategy includes a scheme at the junction, whereby Nash Road is proposed to be closed. This has been included in the strategic transport modelling and taken into account in the junction modelling. **Table 6.26** shows the results of the 2039 baseline scenario.

Table 6.26 Junction 15 - 2039 Baseline - Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	**DoS**	**MMQ**	**DoS**
College Rd Lane 1 (2/1)	43	116.4%	26	104.6%
College Rd Lane 2 (2/2)				
Manston Rd Lane 1 (1/1)	120	122.4%	68	106.5%
Manston Rd Lane 2 (1/2)				
Hartsdown Rd (3/1)	142	121.9%	45	104.7%
PRC	-36.9%		-18.4%	

6.3.13.3 During the future year scenario of 2039, the queues and delays are shown to increase significantly, and the junction is beyond its theoretical operating capacity. **Table 6.27** shows the results of the with development scenario.

Table 6.27 Junction 15 - 2039 Baseline Development -Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	DoS	MMQ	DoS
College Rd Lane 1 (2/1)	56 (+13)	120.2%	28 (+2)	107.9%
College Rd Lane 2 (2/2)				
Manston Rd Lane 2 (1/2)	133 (+13)	124.7%	69 (+1)	108.7%
Manston Rd Lane 2 (1/2)				
Hartsdown Rd (3/1)	147 (+5)	124.9%	57 (+12)	108.4%
PRC	-38.8		-20.8%	

(Difference with 2039 Baseline is shown in brackets)

6.3.13.4 With the addition of the development traffic the queues and delays increase, and the junction performance worsens. A mitigation scheme has been proposed, asset out in **Chapter 7**.

6.3.14 Junction 16: Ramsgate Rd / College Rd / A254 / Beatrice Rd (Five-Arm Signalised Junction)

6.3.14.1 The validated 2017 base model results are presented in **Table 6.28**.

Table 6.28 Junction 16 - 2017 Base - Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	DoS	MMQ	DoS
A254 (SB) Ramsgate Road (9/1)	14	70.7%	10	55.6%
A254 (SB) Ramsgate Road (9/2)		93.0%		96.3%
College Road B2052 (WB) (6/1)	25	98.9%	20	96.0%
A254 Ramsgate Road (NB) (1/1)	20	90.0%	28	94.8%
A254 Ramsgate Road (NB) (1/2)				
Beatrice Rd (4/1)	23	97.8%	21	97.8%
Beatrice Rd (4/2)				
PRC	-9.9%		-8.7%	

6.3.14.2 The junction is shown to operate with queues and Degrees of Saturation at the operational capacity limits during the 2017 base scenario in both the AM and PM peak periods. **Table 6.29** shows the results of the 2039 baseline modelling.

Table 6.29 Junction 16 - 2039 Baseline - Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	**DoS**	**MMQ**	**DoS**
A254 (SB) Ramsgate Road (9/1)	20	79.6%	20	78.5%
A254 (SB) Ramsgate Road (9/2)		79.6%		78.5%
College Road B2052 (WB) (6/1)	117	122.5%	87	127.1%
A254 Ramsgate Road (NB) (1/1)	73	123.5	107	130.8%
A254 Ramsgate Road (NB) (1/2)				
Beatrice Rd (4/1)	80	125.3	135	131.7%
Beatrice Rd (4/2)				
PRC	-39.3		-46.3	

6.3.14.3 In the 2039 Baseline scenario the junction modelling indicates that significant queues and delays would be present on all arms across all both time periods, with the exception of the A254 Ramsgate Road. **Table 6.30** shows the results of the with development scenario.

Table 6.30 Junction 16 - 2039 Baseline+ Development - Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	**DoS**	**MMQ**	**DoS**
A254 (SB) Ramsgate Road (9/1)	23 (+2)	86.5%	19 (-1)	78%
A254 (SB) Ramsgate Road (9/2)		86.5%		78%
College Road B2052 (WB) (6/1)	124 (+3)	134.0%	71 (-16)	120.7%
A254 Ramsgate Road (NB) (1/1)	92 (-2)	134.7%	123 (+15)	134.2%
A254 Ramsgate Road (NB) (1/2)				
Beatrice Rd (4/1)	59 (-14)	116.3	141 (+6)	133.1
Beatrice Rd (4/2)				
PRC	-49.6%		-49.1	

(Difference with 2039 Baseline is shown in brackets)

6.3.14.4 The addition of the development traffic results in increases in queueing and a worsening of the total junction performance. In order to address the impact of the proposed development trips at this junction a mitigation scheme is required.

6.3.15 Junction 20: A256 / Manston Road (East/West)

6.3.15.1 As set out in the baseline validation in the TA, Junction 20A is made up of one roundabout and one priority junction. **Table 6.31** shows the modelling results for the priority junction element and **Table 6.32** shows the roundabout.

Table 6.31 Junction 20 – Priority Junction Element - 2017 Baseline - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	**RFC**	**Average Queue**	**RFC**
A256 (North) to Manston Rd (East) (Left – B-AC)	0	0.23	1	0.34
A256 (S) to Manston Road East (Right Turn C-AB)	4	0.82	6	0.87
Manston Road East to A256 (S) (Left Turn B-AC)	9	0.92	17	1.01

6.3.15.2 The base 2017 scenario model is shown to operate with some queues and RFCs exceeding the theoretical capacity threshold of 0.85.

Table 6.32 Junction 20 – Roundabout Element - 2017 Base - Peak Hour Modelling Results

	AM Peak	PM Peak
	Average Queue	**Average Queue**
A256 North	3	4
A256 South	9	10
Manston Road West	4	4

6.3.15.3 The 2017 base model shows to operate with minimal queues and delays to all the approach roads.

6.3.15.4 As part of the Manston Green development, this junction would be replaced through the realignment of the Manston Road to join the A256/Haine Road roundabout to the south, and that Haine Road would likely be downgraded. Details of this junction layout were provided by KCC and a model created in Junctions using the geometric parameters. **Table 6.33** sets out the results of the 2039 baseline scenario on the proposed new junction layout. This indicates that in the base 2039 scenario the new junction arrangement will operate below capacity thresholds on all arms with minimal queuing. **Table 6.33** also sets out the results for the 2039 + Development scenario.

Table 6.33 Junction 20 – 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
A256 (N)	1	0.52	1	0.54	1(+/-0)	0.52	1(+/-0)	0.54
Manston Road (E)	1	0.58	1	0.55	2(+/-1)	0.60	1(+/-0)	0.54
A256 (S)	0	0.18	0	0.12	0(+/-0)	0.17	0(+/-0)	0.12
Manston Road (W)	0	0.30	1	0.32	6(+6)	0.86	8(+7)	0.89

6.3.15.5 The results show that the junction will continue to operate below capacity with the addition of the development traffic and as such no mitigation scheme is needed at this junction.

6.3.16 Junction 21A: Canterbury Road / Haine Road (Three-Arm Standard Roundabout) and Junction 21B: A299 / A256 / Sandwich Rd / Canterbury Rd E (Four-Arm Signal Junction)

6.3.16.1 Based on comments made by KCC, junctions 21A and 21B have been combined into a linked LinSig junction to reflect the interaction between the two junctions. In addition, the form of junction has been updated to reflect the draft Transport Strategy scheme which revises the northern junction to a roundabout with the addition of an extra arm to the north. As this is a new junction the model has been run with the 2039 future flows with and without the development trips. It is noted that the LinSig model does not directly account for blocking back and as such to ensure that the outputs are representative all internal queues have been checked to ensure that they do not exceed the available highway capacity.

6.3.16.2 The results of the linked LinSig model are presented in **Table 6.34**.

Table 6.34 Junction 21A & 21B 2039 Base with and without development - Peak Hour Modelling Results

	2039 Base		2039 Base + Dev		2039 Base + Dev Mitigation Model	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
	Average Queue	Average Queue	Average Queue	Average Queue	Average Queue	Average Queue
A256 Haine Road	0	0	0	0	0	0
A256 Canterbury Road	5	3	5	2	5	4
Canterbury Road West	0	0	0	0	0	0
New Arm (north)	1	1	1	1	1	1
A256 Lane 1 (5/1)	9	9	12	10	11	9
A256 Lane 2 (5/2)	9	5	8	7	6	6

	2039 Base		2039 Base + Dev		2039 Base + Dev Mitigation Model	
	AM Peak Average Queue	PM Peak Average Queue	AM Peak Average Queue	PM Peak Average Queue	AM Peak Average Queue	PM Peak Average Queue
Canterbury Rd East Lane 1 (7/1)	19	7	31	8	22	7
Canterbury Rd East Lane 2 (7/2)						
Sandwich Rd (3/1)	1	1	1	1	0	0
Hengist Way Lane 1 (1/1)	3	0	4	0	4	0
Hengist Way Lane 2 (1/2)						
Hengist Way Lane 3 (1/3)	5	0	7	0	7	0
Total Queue	52	26	69	29	56 (+4)	27 (+1)
PRC (%)	-7.0	18.8	-11.0	16.4	-8.4	21.4

6.3.16.3 The 2039 baseline model scenario is based on the validated signalled arrangement as defined previously with the addition of the KCC Local Plan roundabout amendment including the additional arm. The junction is shown to operate with minimal queues during the AM and PM peak hour period in the 2039 Base scenario. With the addition of the development trips the junction experiences marginal increased queues and slight reductions in the practical reserve capacity.

6.3.16.4 As mitigation, the junction staging has been altered such that each signalled node is controlled independently to increase the junctions' capacity. The impact of this signalled alteration is that the junction can be considered to operate with a minimal increase in queues in the AM peak hour and a marginally decrease in PRC. During the PM peak hour, the junction is shown to operate with greater practical reserve capacity and total queues which drivers could not differentiate between the 2039 base scenario. It is therefore considered that the proposed signalled alterations are sufficient to accommodate the impact of the development at this linked junction. It is noted that the implementation of MOVA could also improve this junction's capacity further but cannot be tested in LinSig.

6.3.17 Junction 26: Newington Road / Manston Road (Three-Arm Mini Roundabout)

6.3.17.1 The validated 2017 base model results are presented in **Table 6.35**.

Table 6.35 Junction 26 - 2017 Base - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Newington Road North	3	0.76	16	1.03
Newington Road South	4	0.80	2	0.70
Manston Road	5	0.86	17	1.01

6.3.17.2 The 2017 base model shows that the junction will operate with queues and delays developing at Newington Road North and Manston Road. Both peaks have arms with RFCs in excess of the 0.85 threshold. **Table 6.36** shows the 2039 baseline scenario which shows that the junction experiences significant queues and delays in all peak periods, particularly for Newington Road North and Manston Road. **Table 6.36** also shows the with development scenario.

Table 6.36 Junction 26 - 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Newington Road North	4	0.81	156	1.50	4 (+/-0)	0.82	125 (-31)	1.42
Newington Road South	5	0.84	2	0.64	5 (+/-0)	0.85	2 (+/-0)	0.64
Manston Road	160	1.48	91	1.27	151 (-9)	1.46	106 (+15)	1.30

(Difference with 2039 committed trips is shown in brackets)

6.3.17.3 With the addition of the development traffic scenario traffic the operation of the junction continues to be at an over capacity situation as in the base 2039 scenario. However, in both peaks the overall levels of queuing are less in the with development scenario and there is nil detriment as a result of the development. Therefore, it is considered that no mitigation as a result of the development will be required.

6.3.18 Junction 27: Newington Road / High Street (Three-Arm Mini Roundabout)

6.3.18.1 The validated 2017 base model results are presented in **Table 6.37**.

Table 6.37 Junction 27 - 2017 Base - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Newington Road North	9	0.92	12	0.96
High Street East	12	0.95	9	0.92
High Street South	8	0.91	11	0.94

6.3.18.2 The base 2017 model sets out that the junction operates with relatively small queues and delays on all approaches, however all approaches exceed the theoretical capacity threshold of 0.85 during the AM and PM peak hour. **Table 6.38** sets out the results from the 2039 baseline model which shows that the junction queues and delays have increased a significant amount from the 2017 base scenario across all three-time periods. All approaches now exceeding 0.85 in all peak periods. **Table 6.38** also shows the results of the with development scenario.

Table 6.38 Junction 27 - 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
Newington Road North	56	1.14	17	0.99	52 (-4)	1.13	20 (+14)	1.01
High Street East	64	1.11	37	1.05	72 (+8)	1.12	33 (-25)	1.03
High Street South	20	1.02	7	0.89	20 (+/-0)	1.02	8 (+/-0)	0.91

(Difference with 2039 committed trips is shown in brackets)

6.3.18.3 With the addition of the development traffic, overall junction performance relative to the RFC results on individual arms is not significantly changed and there is nil detriment as a result of the development. Therefore, a mitigation scheme is considered not to be required.

6.3.19 Junction 29: Manston to Haine Link Road / Haine Road / A256 (Four-Arm Standard Roundabout)

6.3.19.1 Junction 29 has only been assessed in the 2039 and 2039 + Development Scenario as this junction is only valid for assessment should the Manston to Haine Link Road be constructed. This junction forms the eastern end of the Manston to Haine Link Road where it would join Hain Road and the A256.

6.3.19.2 KCC provided details of the nature and proposed layout of this junction and this was used to create a four arm roundabout junction in Junctions 9. **Table 6.39** sets out the results of the assessment for the 2039 future year. This assessment indicates that the junction would operate at below capacity in the AM peak and slightly above in the PM Peak on New Haine Road. **Table 6.39** also presents the with development scenario.

Table 6.39 Junction 29 - 2039 Peak Hour Modelling Results

	2039 Baseline				2039 With Development			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC	Average Queue	RFC
A256 (N)	1	0.56	1	0.58	1 (+/-0)	0.56	1 (+/-0)	0.57
New Haine Road	3	0.74	15	0.97	3 (+/-0)	0.76	10 (-5)	0.93
Haine Road	0	0.11	0	0.17	0 (+/-0)	0.11	0 (+/-0)	0.19
New Link	4	0.78	2	0.64	3 (-1)	0.77	2 (+/-0)	0.66

(Difference with 2039 committed trips is shown in brackets

6.3.19.3 The results show little change in the junction performance in the AM peak and an improvement in the capacity on the New Haine Road arm, with reduced queues, in the PM peak.

6.3.20 Summary

6.3.20.1 The assessments above have indicated the need for mitigation at the following junctions:

- Junction 2 - A299/A256/Cottington Link Road;
- Junction 4 - A299/B2190;
- Junction 6 - A299/Seamark Road/A253/Willetts Hill;
- Junction 7 - A299/A28;
- Junction 12 - Manston Road/B2050/Spitfire Road;
- Junction 15 - Manston Road/Hartsdown Road/ Tivoli Road/College Road/Nash Road; and
- Junction 16 - Ramsgate Road/College Road/A254/Beatrice Road.

6.3.20.2 Mitigation proposals are set out in **Chapter 7**.

6.4 Site Access Assessments

6.4.1.1 In addition to the offsite junctions the proposed access to the site have also been assessed for. The design of these junctions has not changed since the previous DCO TA Submission.

6.4.2 Cargo Access Junction

6.4.2.1 **Table 6.40** sets out the results of the proposed Cargo Access.

Table 6.40 Cargo Access - 2039 With Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	**RFC**	**Average Queue**	**RFC**
Spitfire Way (E)	1	0.51	1	0.39
Cargo Access	0	0.11	0	0.02
Spitfire Way (W)	2	0.64	2	0.60

6.4.2.2 **Table 6.40** indicates that the proposed junction would operate with ample capacity thresholds in the peak hours. It should be noted that in addition to the design it is proposed that the surface of the old carriageway is removed to prevent the "see through" effect that might occur.

6.4.2.3 To supplement the design alignments provided in the TA Swept Path Assessments (SPAs) have been provided in this TA Addendum. This has used the largest design vehicle of a 16.5m articulated HGV. For the Cargo Access this is provided as **Figure 6.1. Appendix J** includes the initial Road Safety Audit (Stage 1) for the junction.

6.4.3 Northern Grass Area West Access Junction

6.4.3.1 **Table 6.41** sets out the results of the proposed NGA West Access.

Table 6.41 Northern Grass Areas West Access - 2039 With development - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	**RFC**	**Average Queue**	**RFC**
Stream B-C	0	0.06	0	0.17
Stream B-A	0	0.14	1	0.51
Stream C-AB	0	0.33	0	0.03

6.4.3.2 **Table 6.41** indicates that the proposed junction would operate within capacity thresholds in the peak hour.

6.4.3.3 To supplement the design alignments provided in the previous TA Swept Path Assessments (SPAs) have been provided in this TA Addendum. This has used the largest design vehicle of a 16.5m articulated HGV. For the NGA West Access this is provided as **Figure 6.2**.

6.4.3.4 **Appendix J** includes the initial Road Safety Audit (Stage 1) for the junction.

6.4.4 Passenger Airport Terminal and Northern Grass Area South Access Junctions

6.4.4.1 **Table 6.42** sets out the results of the proposed NGA South Access and Passenger Terminal Access.

Table 6.42 Passenger Airport Terminal and Northern Grass Area South Accesses - 2039 With Development - Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	DoS	MMQ	DoS
Southern Access Road (1/2+1/1)	2	25.8%	2	22.2%
Northern Access Road (2/1)	1	9.5%	4	34.6%
Manston Road (3/1)	5	31.1%	3	22.9%
Manston Road (4/1)	0	26.2%	0	33.5%
Manston Road (5/2+5/1)	2	23.7%	3	28.2%
Manston Road (6/1)	0	8.2%	0	12.1%
Manston Road (6/2)	0	16.2%	0	16.3%
PRC	189.6		155.4	

6.4.4.2 **Table 6.42** indicates that the proposed junction would operate within capacity thresholds in the peak hour.

6.4.4.3 To supplement the design alignments provided in the previous TA Swept Path Assessments (SPAs) have been provided in this TA Addendum. This has used the largest design vehicle of a 16.5m articulated HGV. For the NGA South Access this is provided as **Figure 6.3**.

6.4.4.4 **Appendix J** includes the initial Road Safety Audit (Stage 1) for the junction.

7. Offsite Junction Mitigation

7.1.1.1 This chapter of the report sets out the proposed offsite junction mitigation required to support the Manston Airport proposed development relative to capacity mitigation and highways safety mitigation. The model outputs are included in Appendix K.

7.2 Junction Capacity Mitigation

7.2.1 Mitigation proposal – Junction 2

7.2.1.1 The proposed mitigation scheme comprises widening on the eastern, southern and western arms and associated white line marking to enable a flared approach. White lining amendments to the gyratory in the form of spiral markings are proposed to guide drivers around the roundabout. The mitigation scheme is set out as **Figure 7.1**. The results of the traffic modelling are summarised in **Table 7.1**.

Table 7.1 Junction 2 - Mitigation Results Summary – 2039 Base Proposed Development - Peak Hour Modelling Results

	AM Peak Average Queue	PM Peak Average Queue
A299 Hengist Way (E)	15 (-133)	3 (-1)
A256	9 (0)	63 (-25)
Cottington Link Rd	23 (19)	1 (-1)
A299 Hengist Way (N)	2 (-1)	1 (0)
Total Difference	-115	-26

*Figures in brackets are the difference between the 2039 baseline (existing layout) and 2039 + Development (mitigation layout)

7.2.1.2 The results in the **Table 7.1** indicate that the proposed mitigation is considered to provide more than a nil detriment improvement scheme with significantly less total junction queues during the AM peak hour period and reduced total junction queues during the PM peak hour period. The impact of the development is therefore considered to be mitigated for with additional queue reductions and associated reduction in delays than during the without development scenario.

7.2.2 Mitigation Proposal – Junction 4

7.2.2.1 The proposed mitigation includes for a widening of the eastern arm to enable a flared approach. Improved white lining on the gyratory, entry and exits arms maximises the effective capacity of the roundabout with the results summarised in **Table 7.2**. The migration scheme us set out in **Figure 7.2.**

Table 7.2 Junction 4 – Mitigation Results Summary – 2039 Baseline + Proposed Development - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Hengist Way (E)	7 (-1)	0.88	7 (-9)	1
Tothill Street	69 (2)	1.39	4 (-1)	1
A299 (W)	5 (0)	0.83	29 (-30)	1
B2190 (N)	23 (-31)	1	3 (0)	1
Total Difference	-30		-145	

*Figures in brackets are the difference between the 2039 baseline (existing layout) and 2039 + Development (mitigation layout)

7.2.2.2 The results in the **Table 7.2** indicate that the proposed mitigation is considered to provide more than a nil detriment improvement scheme and would mitigate the impact of the proposed development trips.

7.2.3 Mitigation Proposal – Junction 6

7.2.3.1 The proposal involves widening on approach to the junction from on three arms to increase both the flared approaches and the entry widths into the junction. This increased the capacity at the giveway line and the ability for traffic to use this increase in capacity. The scheme drawing is provided as **Figure 7.3**. This formalisation acts to maximise the capacity at the junction with the results summarised in **Table 7.3**.

Table 7.3 Junction 6 – Mitigation Results Summary – 2039 Baseline + Proposed Development - Peak Hour Modelling Results

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
A299 (East)	3 (-3)	0.77	3 (-1)	0.74
Willetts Hill	0 (0)	0.14	0 (0)	0.08
A253 Canterbury Rd	7 (-5)	0.91	30 (-7)	1.07
A299 (North)	4 (-7)	0.81	5 (-10)	0.83
Seamark Rd	0 (0)	0.04	0 (0)	0.05
Total Difference	-14		-18	

*Figures in brackets are the difference between the 2039 baseline (existing layout) and 2039 + Development (mitigation layout)

7.2.3.2 The results in the **Table 7.3** indicate that the proposed mitigation is considered to provide a nil detriment improvement scheme which would mitigate the impact of the Proposed Development trips.

7.2.4 Mitigation proposal – Junction 7

7.2.4.1 On site observations and queue video surveys have shown that despite equal lane usage being possible on approach to the junction users of this roundabout do not equally use all lanes resulting in larger queues in the flow dominant lane. In order to address this inefficient driver behaviour, it is proposed that advanced information to drivers is provided in the form of both on carriageway markings and highway signage. This should enable drivers the confidence to fully utilise both lanes and as such return the junction capacity to its full potential. The scheme design is provided as **Figure 7.4.**

7.2.4.2 The results of the junction operating with equal lane usage due to the proposed markings / signage is set out in **Table 7.4**.

Table 7.4 Junction 7 – Mitigation Results Summary – 2039 Baseline + Proposed Development - Peak Hour Modelling Results

	AM Peak	PM Peak
	Average Queue	Average Queue
A28 (East)	44 (-68)	3 (-1)
A299 (South)	3 (-9)	3 (-3)
Canterbury Rd	12 (-46)	9 (-71)
A299 (West)	5 (-2)	29 (-4)
Potten Street Rd	0 (0)	0 (0)
Total Difference	-124	-79

**Figures in brackets are the difference between the 2039 baseline (existing layout) and 2039 + Development (mitigation layout)*

7.2.4.3 The results in the **Table 7.4** indicate that the proposed mitigation is considered to provide more than a nil detriment improvement scheme which would mitigate the impact of the Proposed Development trips.

7.2.5 Mitigation proposal – Junction 12

7.2.5.1 The proposed mitigation scheme at Manston Road/Spitfire Way has been assessed in two forms as follows;

- The RiverOak preferred alignment of a fully signalised crossroads junction; and
- The KCC preferred option of a roundabout alignment based on the Stone Hill Park roundabout design.

7.2.5.2 The signal scheme design are provided as **Figure 7.5** while the results are summarised in **Table 7.5 and 7.6**

Table 7.5 Junction 12 – Mitigation Results Summary – 2039 Base + Committed + Proposed Development Peak Hour Modelling Results – Signal Layout

	AM Peak		PM Peak	
	MMQ	DoS	MMQ	DoS
Spitfire Way (1/1+1/2)	28 (-487)	82.5%	19 (-556)	84.1%
Manston Road East (B2050) (4/1+4/2)	3 (-334)	26.0%	6 (-359)	82.6%
Manston Road North (3/1)	16 (-302)	62.2%	10 (-123)	65.8%
Manston Road West B2050 (2/1)	14 (14)	81.1%	5 (5)	62.5%
Total Difference	-1111		-1034	

*Figures in brackets are the difference between the 2039 baseline (existing layout) and 2039 + Development (mitigation layout)

7.2.5.3 The signalled layout is evidenced to operate within its theoretical capacity with all arms operating with degrees of saturation of less than 90% and positive practical reserve capacities. All queues discharge each cycle and as such the average delays to drivers is minimised. It is also noted that the signalled scheme provides signalled pedestrian crossings facilities to enable the crossing of this junction.

Table 7.6 Junction 12 – Mitigation Results Summary – 2039 Base + Committed + Proposed Development Peak Hour Modelling Results – Roundabout Layout

	AM Peak		PM Peak	
	Average Queue	RFC	Average Queue	RFC
Spitfire Way (1/1+1/2)	5 (-511)	0.84	2 (-562)	0.66
Manston Road East (B2050) (4/1+4/2)	0 (-337)	0.14	1 (-365)	0.34
Manston Road North (3/1)	9 (-309)	0.91	18 (-115)	0.98
Manston Road West B2050 (2/1)	2 (2)	0.69	1 (1)	0.33
Total Difference	-1155		-1053	

*Figures in brackets are the difference between the 2039 baseline (existing layout) and 2039 + Development (mitigation layout)

7.2.5.4 The roundabout junction has RFCs in excess of the theoretical capacity of 0.85 but can still be stated as providing total junction queues significantly less than the existing junction form. Unlike the signalled option the roundabout does not provide dedicated signalled pedestrian crossing facilities.

7.2.5.5 Both improvement schemes show large reductions in total queues during the peak AM and PM peak hours. Whilst the total queues are marginally greater for the signalled scheme it is noted that the average delay for drivers is less due to the queues discharging every cycle within the signals compared to users of the roundabout who on average are estimated to be delayed for longer. In addition, the roundabout scheme does not benefit from signalised crossing opportunities for pedestrians and this would need to be provided elsewhere on Manston Road and Spitfire Way, resulting in additional delay. Overall it is concluded that the signals provide more capacity for drivers and better crossing opportunities for pedestrians and cyclists.

7.2.5.6 The results in the **Tables 7.5** and **7.6** indicate that either mitigation proposal can be considered to provide betterment, exceeding nil detriment, and would mitigate the impact of the Proposed Development trips. It also provides a junction layout that can accommodate the Proposed Development traffic in 2039 within capacity thresholds.

7.2.6 Mitigation proposal – Junction 15

7.2.6.1 This junction is proposed to be amended as part of the KCCC Local plan to include for Nash Road being stopped up. As part of the mitigation proposals this scheme has been developed further and now benefits from a new signal head and rationalised stage sequence along with the removal of a central island to provide additional width to the offside lane (2.25m to 3.25m) on the southern approach to the junction (Manston Road). The KCC Local plan drawing is provided in Appendix K with the updated mitigation layout provided as **Figure 7.6**. The results are summarised in Table 7.7.

Table 7.7 Junction 15 – Mitigation Results Summary – 2039 Baseline + Proposed Development - Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	**DoS**	**MMQ**	**DoS**
College Rd Lane 1 (3/1)	62 (+20)	130%	47 (-19)	119%
College Rd Lane 2 (3/2)				
Manston Rd Lane 1 (1/1)	145 (-38)	129%	25 (-63)	98%
Manston Rd Lane 2 (1/2)				
Hartsdown Rd (2/1)	155 (-61)	130%	88 (-86)	121%
Total Difference	-79		-168	

*Figures in brackets are the difference between the 2039 baseline (existing layout) and 2039 + Development (mitigation layout)

7.2.6.2 The junction is shown to operate with less queues and delays with the mitigation measure in place than the existing layout in the growthed 2039 baseline and as such considered to provide more than a nil detriment solution.

7.2.7 Mitigation proposal – Junction 16

1.1.75 The mitigation proposal utilises new stop lines, signal head and pedestrian crossings to enable a more efficient stage sequence to be operated. The scheme drawing is provided as **Figure 7.7.** The results of the mitigation scheme are provided in **Table 7.8**.

Table 7.8 Junction 16 – Mitigation Results Summary – 2039 Baseline + Proposed Development - Peak Hour Modelling Results

	AM Peak		PM Peak	
	MMQ	**DoS**	**MMQ**	**DoS**
A254 (SB) Ramsgate Road (9/1)	21 (1)	80%	18 (-1)	71%
A254 (SB) Ramsgate Road (9/2)				

	AM Peak		PM Peak	
	MMQ	DoS	MMQ	DoS
College Road B2052 (WB) (6/1)	104 (-13)	125%	63 (-24)	116%
A254 Ramsgate Road (NB) (1/1)	68 (-5)	122%	70 (-37)	116%
A254 Ramsgate Road (NB) (1/2)				
Beatrice Rd (4/1)	31 (-49)	96%	73 (-62)	111%
Beatrice Rd (4/2)				
Total Difference	-39		-29	

*Figures in brackets are the difference between the 2039 baseline (existing layout) and 2039 + Development (mitigation layout)

7.2.7.1 The junction is shown to operate with less queues and delays with the mitigation measure in place than the existing layout in the growthed 2039 baseline and as such considered to provide more than a nil detriment solution.

7.3 Highways Safety Mitigation Proposals

7.3.1.1 Within the accident record assessment set out in the TA, three junctions were noted as having highways safety considerations that needed to be addressed in the form of a mitigation scheme as follows;

- Spitfire Way/Alland Grange Lane;
- Spitfire Way/ B2050 Manston Road; and
- B5020 Manston Road/Manston Court Road.

7.3.1.2 Of these three junctions one of these have been improved as a result of the capacity assessment modelling and mitigation scheme development. Spitfire Way/B2050 Manston Road has been redesigned to accommodate the new RiverOak Manston to Haine link road and this TA sets this out as a roundabout and signalised junction arrangement. Both of these layouts are a vast step up in safety from the current priority junctions' arrangements. These junctions will also be provided with safe controlled pedestrian crossing points on the key links and improved pedestrian routes around the edges of the junctions. It is considered therefore that the highways safety issues raised in this report are addressed though these mitigation schemes.

7.3.1.3 As a result, only two further junction requires a scheme to alleviate the highways safety issues raised in the assessment earlier in this TA at the Spitfire Way/Allend Grange and Manston Road/Manston Court Road junction.

Spitfire Way/Alland Grange Road

7.3.1.4 The issue at this junction was noted to be a lack of visibility from the Allend Grange Road minor arm and as such an improvement scheme, as set out in **Figure 7.8** is proposed to provide for a clearer visibility splay from the junctions. This scheme is in conjunction with the proposals to widen Spitfire Way to a 7.3 carriageway and provide further signage warning users of Spitfire Way of the presence of this minor arm.

7.3.1.5 This junction is also considered an offsite junction and the works required will be secured outside of this DCO.

Manston Road/Manston Court Road

7.3.1.6 The issues at this junction were noted to be related to the turning movement into and out of the minor Manston Court Road arm with a fairly even split of accidents between right turning vehicles into the Manston Court Road and vehicles turning out of Manston Court Road.

7.3.1.7 Manston Road is moderately straight along this location and visibility appears to be good along the road. Visibility from Manston Court Road when trying to turn on Manston Road is less adequate, particularly from the right where it is obstructed by fencing around 20m from the junction.

7.3.1.8 A scheme has been developed therefore to mitigate the accident issues at this junction which could be made worse by the effects of development traffic. The proposals would be to provide a visibility improvement to the junction eliminating the issues for vehicle's turning out of the minor arm. Figure **7.9** sets out the proposals.

8. Highways England Network Impacts

8.1.1.1 In addition to the local impacts and mitigation required set out in this TA Addendum, it was agreed following a meeting with Highways England that assessment would be required to understand the potential impact of Manston Airport development traffic on the wider strategic Highways England network, which comprises the following:

- A2 from Dover to the M2 junction 7;
- M2 from the A2 at Junction 7 to the A2 at junction 1;
- A2 from the A282(M25) to junction 1 M2;
- M25; and
- M20.

8.1.1.2 The Highways England strategic network in the south east of England as well as the proposed Manston Airport site is set out in **Figure 8.1.**

8.1.1.3 As set out in the revised traffic generation and distribution methodology the strategic network will be potentially impacted by trips generated by airport users including;

- Staff trips;
- Air Passenger trips;
- Freight trips;
- NGA development trips;
- Fuel delivery trips; and
- HGV Servicing Trips.

8.1.1.4 This chapter of the report will set out the wider distribution of airport related traffic outside of the agreed local scope and set out anticipated traffic numbers that will affect the Highways England network with a particular focus on two key junctions the Duke of York and Brenley Corner.

1.2 Wider Manston Airport Trip Distribution

8.1.1.5 With the assessment of the traffic flows now being undertaken within the strategic model the assessment below that was included within the DCO TA needed to be updated with the traffic entering and existing the strategic model and entering the elements of the Highways England network. To inform this the former distribution of trips has been used across the network but the traffic flows have been updated to those generated by the strategic model based on the revised traffic generation and distribution methodology agreed with KCC.

8.1.1.6 It should also be noted that the assessment of the Highways England network south of the Proposed Development around Dover and Folkstone has been revised to take into account comments made by Highways England during consultation leading to a more robust assessment of the potential impacts at the Duke of York Roundabout.

8.1.1.7 The distribution for staff and passenger trips has been calculated from the distribution gravity model developed for the project. Further interrogation of this model above and beyond the local

impacts has helped to identify what trips would enter elements of the Highways England strategic road network.

8.1.1.8 For staff trips this has resulted in the distribution as set out in **Table 8.1.**

Table 8.1 Staff Trips Distribution

Area	%	Routes from Manston
Shepway	0.5%	A299 – A256 – **A20 – M20**
Ashford	0.1%	A299 – **M2** – A251
Swale	0.0%	A229 – **M2** – A251
Dover	23.6%	A229 – A256

8.1.1.9 For passenger trips this has resulted in the distribution as set out in **Table 8.2** which sets out the area trips are proposed to route to, the percentage of the total trips and the routes proposed including elements of the strategic Highways network in bold. All routes would start from the airport along Manston Road – Spitfire Way – Minster Road and onto the A299

Table 8.2 Passenger Trips Distribution

Area	%	Routes from Manston
London via A2	7.5%	A299 – **M2 – A2**
Shepway	3.6%	A299 – A256 – **A20 – M20**
Ashford	2.9%	A299 – **M2** – A251
Swale	7.6%	A229 – **M2** – A251
Dover	11.8%	A229 – A256
Maidstone	3.2%	A299 – **M2** – A249
Tunbridge	1.6%	A299 – **M2** – A249 – **M20 –** A228
Tonbridge	2.2%	A299 – **M2** – A249 – **M20** – A228
Gravesend	1.7%	A299 – **M2 – A2** – Valley Drive
Dartford	1.9%	A299 – **M2 – A2 – A282** – A255
Sevenoaks	1.9%	A299 – **M2** – A249 – **M20** – **M26 –** A20

8.1.1.10 For freight and servicing HGV trips, distribution assumptions have been applied based on the applied to likely routing of HGVs from centres where warehousing and other industries would have an operational interest in the Manston airport site which is in keeping with the traffic and transport methodology underpinning this section of the TA. **Table 8.3** and **Table 8.4** set out the freight/northern grass development and servicing percentage distributions.

Table 8.3 Freight/Northern Grass Area HGV Distribution

Area	%	Routes from Manston
East London (South of Thames)	60%	A299 – **M2 – A2**
North and East London (North of Thames)	17.5%	A299 – **M2 – A2 – A282 – M25 (N)**
West and South London	17.5%	A299 – **M2 – A2 - A282 – M25 (S)**
Dover and Folkestone port	2.0%	A299 – A256 – **A20 – M20**
Ashford freight distribution sites	2.0%	A299 – **M2** – A251

Table 8.4 Servicing HGVs Distribution

Area	%	Routes from Manston
East London (South of Thames)	50%	A299 – **M2 – A2**
North and East London (North of Thames)	25%	A299 – **M2 – A2 – A282 – M25 (N)**
West and South London	25%	A299 – **M2 – A2 - A282 – M25 (S)**

8.1.1.11 Fuel farm trip distribution has been derived from the location of local oil refineries and the likely route to the Manston site from these locations. Two oil refineries have been identified as being suitable with regards to location to supply the Manston site, these are the Coryton oil refinery located in Essex and Isle of Grain refinery located in Kent. An assumption has been made that there will be a 50% split of fuel farm deliveries between the two sites. **Table 8.5** sets out the wider fuel farm traffic distribution.

Table 8.5 Fuel Farm Distribution

Area	%	Routes from Manston
Isle of Grain	50%	A299 – **M2 – A289**
Coryton	50%	A299 – **M2 – A2 – A282** – A13

8.1.1.12 These percentages have been used as a basis for a calculation for the percentages for light vehicles and HGVs entering the two elements of the highways network which can be applied to the Proposed Development traffic flows being generated by the strategic model. This resulted in the following splits set out in **Tables 8.6** and **8.7**.

Table 8.6 A299 Entry to Highways England Network Distribution

Area	Light Vehicle Percentage	HGV Percentage
Ashford	9.6%	0.67%
Swale	26%	

Area	Light Vehicle Percentage	HGV Percentage
London - A2	24.1%	37.04%
Maidstone	10.3%	
Tunbridge	5.1%	
Tonbridge	7.1%	
Gravesend	5.5%	
Dartford	6.1%	
7 Oaks	6.1%	
M25 North		31.14%
M25 South		14.31%
Isle of Grain		16.84%
Total	**100%**	**100%**

Table 8.7 A299 Entry to Highways England Network Distribution

Area	Light Vehicle Percentage	HGV Percentage
Dover	89.5%	
Shepway	10.5%	
Dover Port		100%
Total	**100%**	**100%**

8.1.1.13 The percentages set out above have been applied to the figures entering the Highways England network from the strategic modelling.

8.2 Trip Generation

8.2.1.1 The trip generation distributed across the Highways England network has this time been defined by the flows entering and existing the strategic road network and the zones that this traffic is routeing to and from.

8.2.1.2 This has been split to two elements as follows;

- Trips entering the Highways England Network at the M2/A2/A299 Junction (Brenley Corner); and
- Trips entering the Highways England Network at the A256.

8.2.1.3 For the A299 this process was simple in that everything existing the strategic model at the A299 also reaches the A299/M2/A2 junction. The strategic model set out that the following traffic would enter and exit the He network at this point and set out in **Table 8.8**.

Table 8.8 Strategic Model flows to Highways England Network – A299

Arrivals/Departures	AM Peak		PM Peak	
	Total Vehicles	HGVs	Total Vehicles	HGVs
Arrivals	46	13	46	14
Departures	65	15	38	17

8.2.1.4 To understand the traffic entering at the A256 north of Dover this was more difficult as the traffic leaving the strategic model at the A256 at the A299/A256 junction near Cliffsend also includes traffic routing southbound for locations such as Deal and Sandwich.

8.2.1.5 To develop a robust flow for traffic entering the A2 from the A256 interrogation of the calculations which informed the matrix development of the strategic model were undertaken. The gravity model used to inform distribution calculations was used and the trips to the following locations were aggregated to understand the arrivals and departures;

- Buckland (Ward);
- Capel-le-Ferne (Ward);
- Castle (Ward);
- Maxton, Elms Vale and Priory (Ward);
- River (Ward);
- St Margaret's-at-Cliffe (Ward);
- St Radigunds (Ward);
- Tower Hamlets (Ward);
- Town and Pier (Ward);
- Whitfield (Ward); and
- Shepway (District).

8.2.1.6 This process resulted in the following trips entering and exiting the Highways England network at the A256/A2 junction as set out in **Table 8.9**.

Table 8.9 Strategic Model flows to Highways England Network – A256

Arrivals/Departures	AM Peak		PM Peak	
	Total Vehicles	HGVs	Total Vehicles	HGVs
Arrivals	45	1	21	1
Departures	12	1	37	1

1.2.1 **Figures 8.1** to **8.2** set out the AM and PM development traffic flows across this network model for the 2039 worst case development traffic based on the outputs of the TSTM.

8.2.1.7 Interrogation of the figures for the AM and PM peak set out that the impacts across the network within the peak hours are negligible.

8.2.1.8 At Brenley Corner it is not proposed any development traffic would leave the carriageway and enter the grade separated junction. Development traffic would continue under the junction on the main line and have little to no impact on the operation of the junction.

8.2.1.9 To the south at the junction at the Duke of York would only experience a minimal number of additional vehicles in the peak hour and it is not considered that there would be a material impact at this junction.

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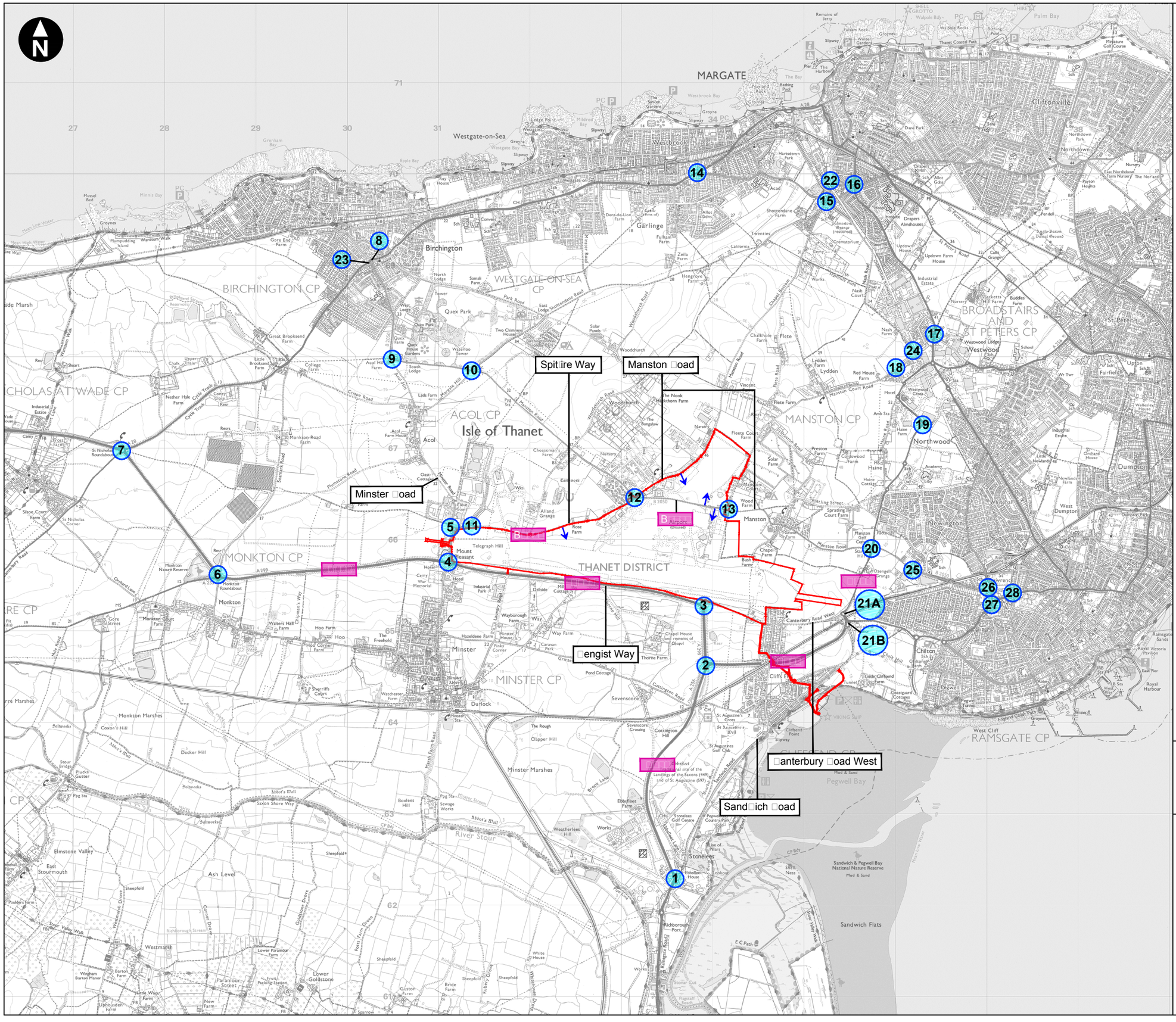

Key

Order Limits

1 Key junction

□ □□□□Sand□ich □oad
□ □□□□□□□□□ottingham □ink □oad
□ □□□□□anterbury □oad West
□ □□□□B□□□□ □Minster □oad□B□□□□ □□othill Street□
□ B□□□□Minster □oad
□ □□□□ □anterbury □oad□□□□Willetts □ill□Seamark □oad
□ □□□□□□□ □anterbury □oad□Potten Street □oad
□ □□□ □anterbury □oad□□he S□uare □he Station □oad□
□ B□□□□ □Park lane□□col □ill□B□□□□ □Manston □oad□
□□ B□□□□ □Manston □oad□Shottendane □oad□Margate □ill
□□ B□□□□ □Spit□ire Way□□olumbus □venue
□□ B□□□□ □Manston □oad□Shottendane □oad□B□□□□ □Spit□ire Way□
□□ B□□□□ □Manston □oad□Manston □ourt □oad
□□ □□□ □□anterbury □oad□B□□□□ □□eorge □ □venue□
□□ B□□□□ □artsdo□n □oad□B□□□□ □□ivoli □oad□B□□□□ □□ollege □oad□□□ash □oad□Empire □errace□Manston□oad □□o□ln □orner□
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□□ □□□□ □Margate road□□□□□ □□amsgate □oad□Star □ane□Poorhole □ane
□□ Star □ane □ink□Manston court □oad
□□ □□□□ □e□ □aine □oad□□e□ □ross □oad
□□ □□□□ □□aine □oad□B□□□□ □Manston □oad□
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□□B □□□□□anterbury □oad East□□□□□ □engist Way□Sand□ich □oad□□□□□ord o□the Manor □oundabout
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□□ B□□□□Park □ane□□□□ □□anterbury □oad□
□□ Star □ane□□ash □oad
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□□ B□□□□ □Manston □oad□B□□□□ □□e□ington □oad□
□□ B□□□□ □□e□ington □oad□□□□□ □igh Street□
□□ □□□□□ □igh Street□□□□□□ □Park □oad□Wil□red □oad□□range □oad

Access points

0 m 500 m

Scale 1:10,000 @ A3

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Figure 3.1
Junctions within the scope of assessment

March 2019

wood.

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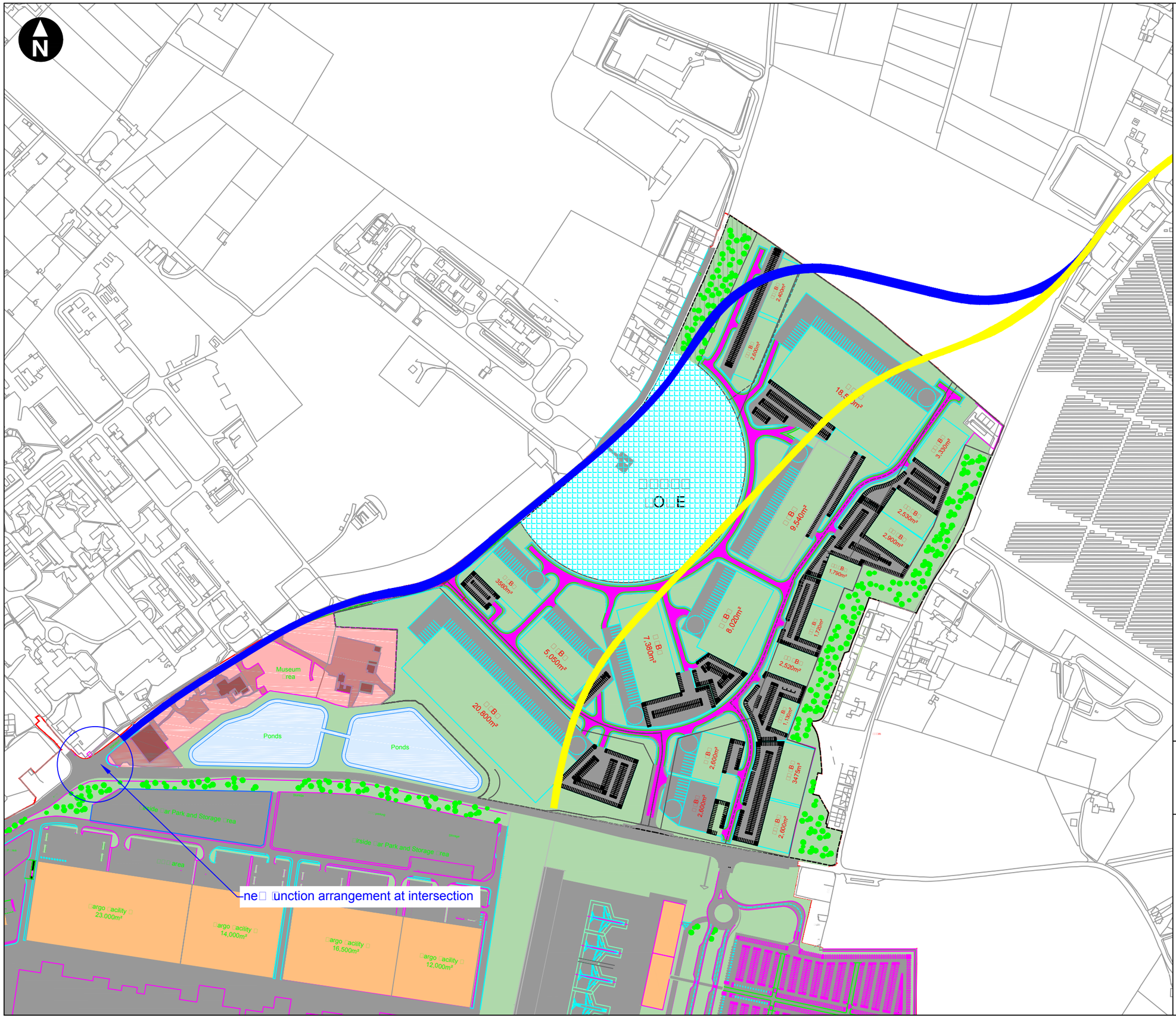

Key

- Order Limits
- Riveroak Scheme
- Kent County Council Local Plan 2031 scheme

0 m 300 m

Scale 1:5000 @ A3

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Figure 5.1
Manston to Haine link road - Riveroak scheme and local plan scheme

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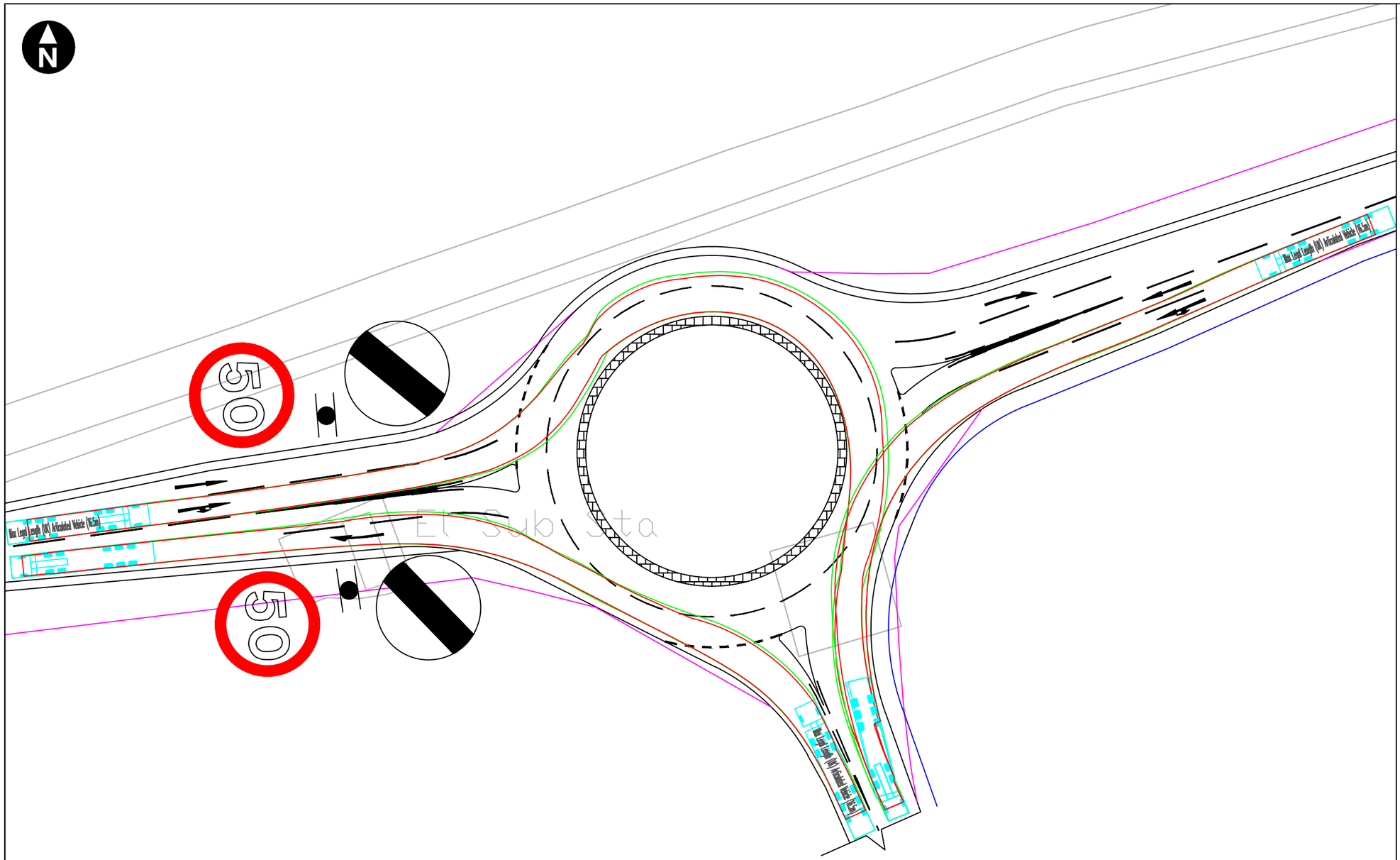

Key

- Existing based on Ordnance Survey Mapping
- Proposed Kerbline
- Proposed road marking
- Proposed location of speed limit signage
- Wheel outline
- Body outline

0 m 30 m

Scale 1:500 @ A3

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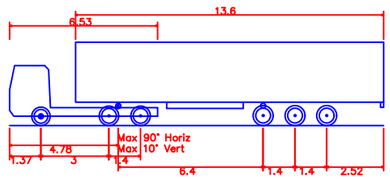

Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	6.530m

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Transport Assessment Addendum

Figure 6.1
Cargo Access - Swept Path Analysis

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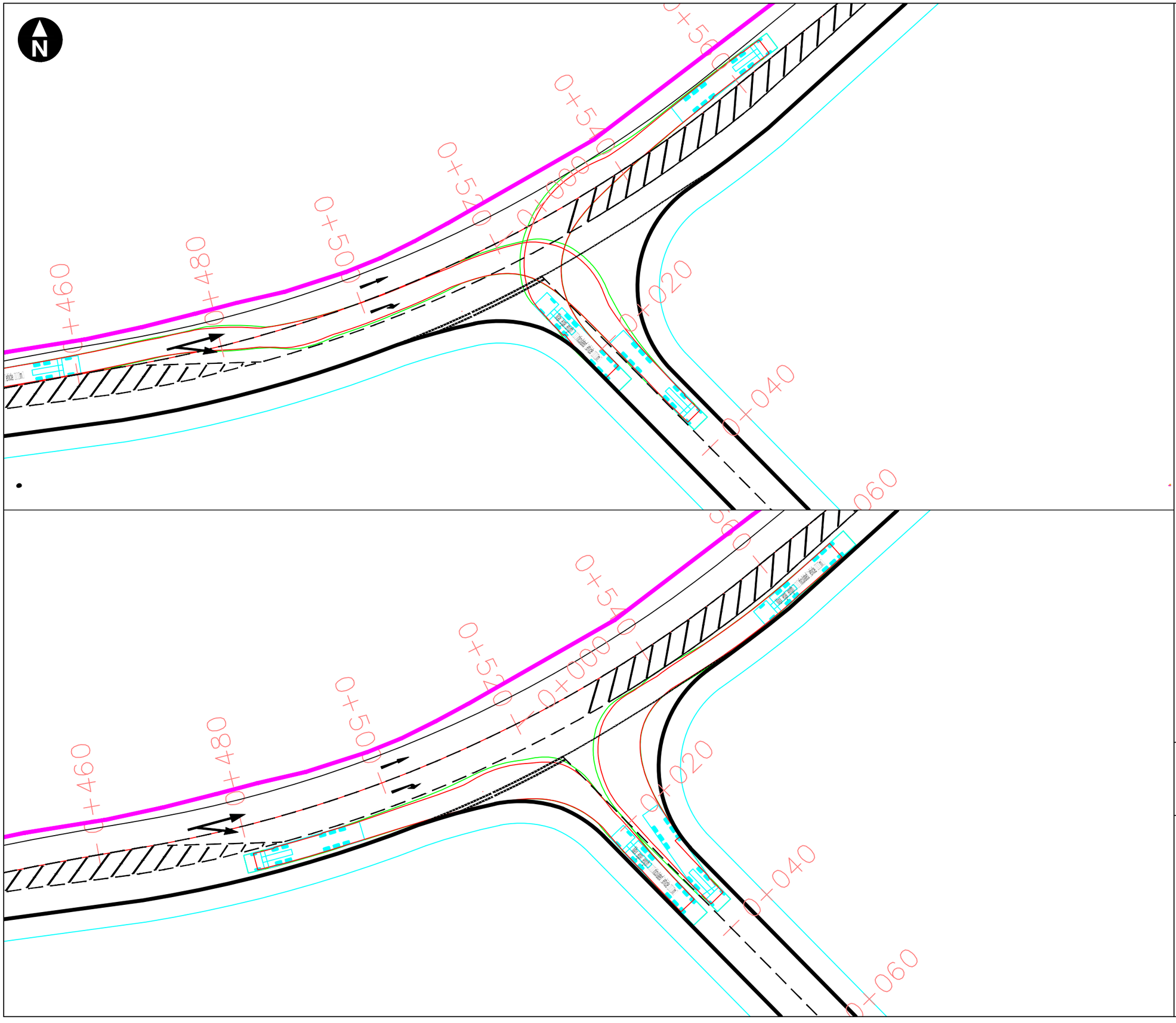

Key

- Existing based on Ordnance Survey mapping
- Proposed kerbline
- Proposed road marking
- Wheel outline
- Body outline

0 m 30 m

Scale 1:500 @ A3

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Figure 6.2
Northern Grass Area West Access - Swept Path Analysis

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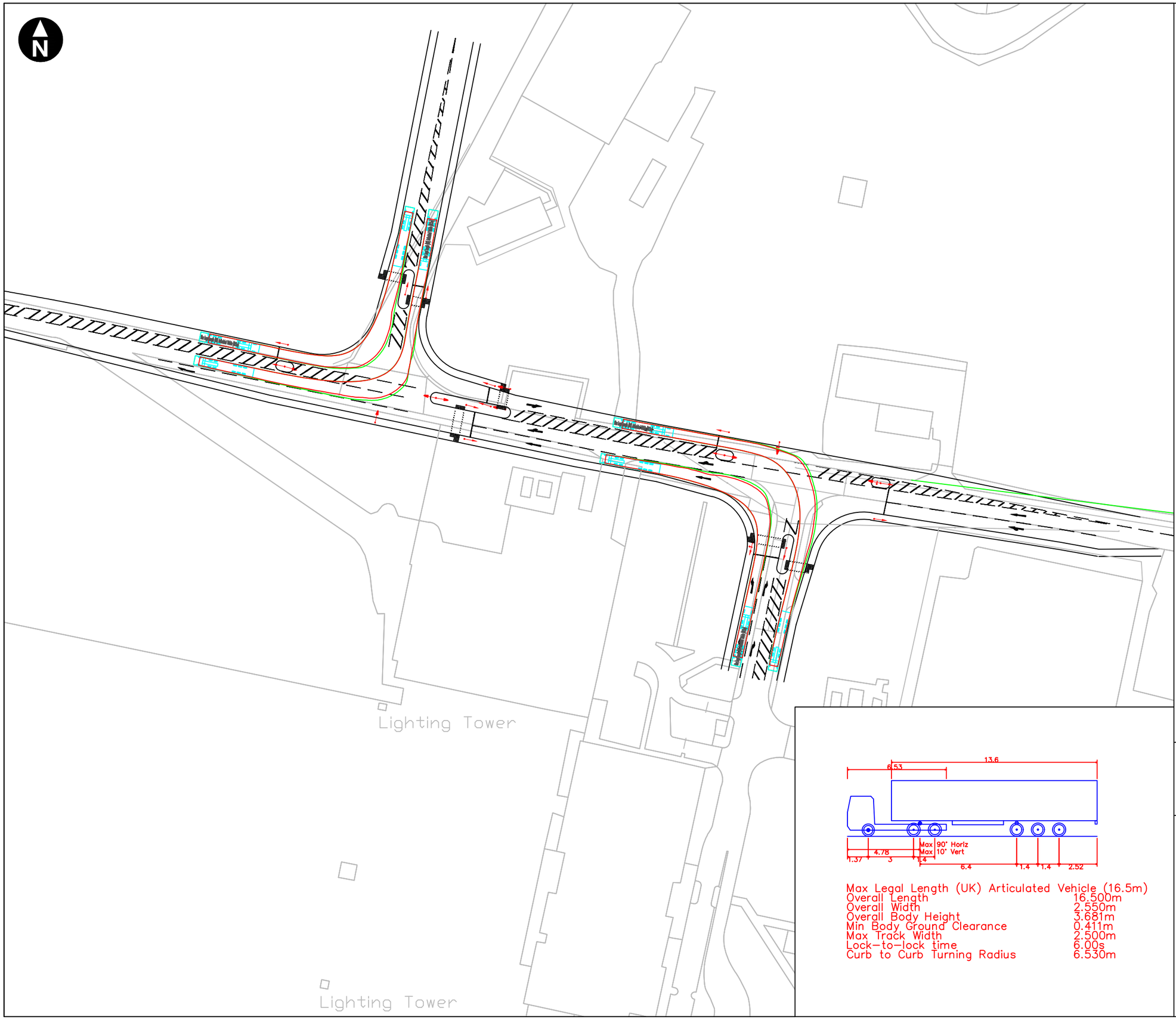

Key

- Proposed masterplan
- Existing based on Ordnance Survey mapping
- Proposed kerbline
- Proposed road marking
- Wheel outline
- Body outline

0 m 50 m

Scale 1:1000 @ A3

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Figure 6.3
Passenger access and Northern Grass Area (south) access - Swept Path Analysis

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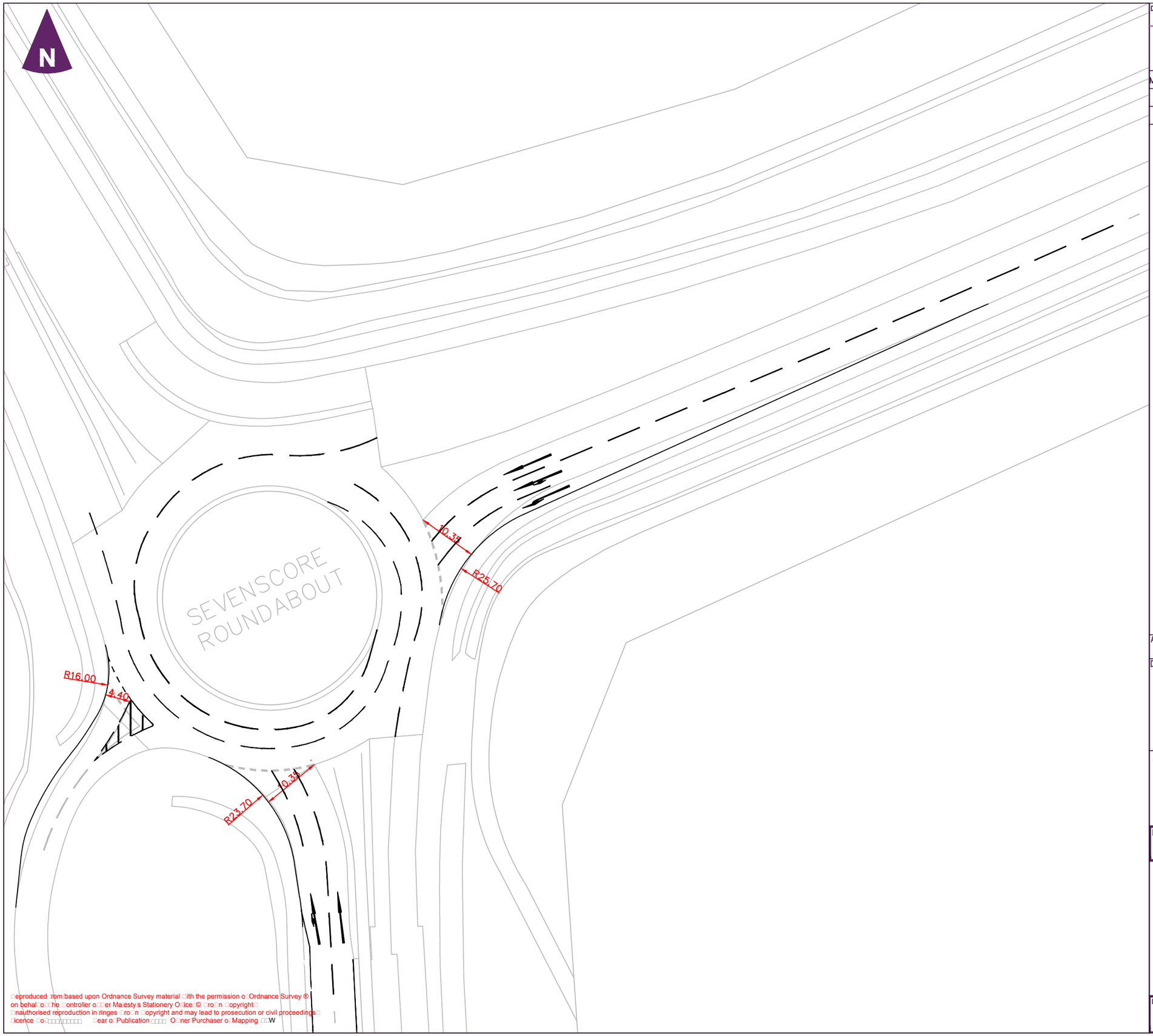

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02/02/2018	FIRST ISSUE	HUDAF	FOUDA

REVISIONS

Mark	Revision	Drawn	Date	Chkd
A	Eastern arm width adjusted to connect to Manston Road proposal	FOUDA	09/11/17	COUPB
B	UPDATE TO MITIGATION PROPOSAL	ARPUG	29/03/19	MORRC

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- Proposed kerbline
- Proposed road marking

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A3 SCALE
1:650

Drawing Title
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Figure 7.1 Jct 2 A56/A299
Mitigation proposal

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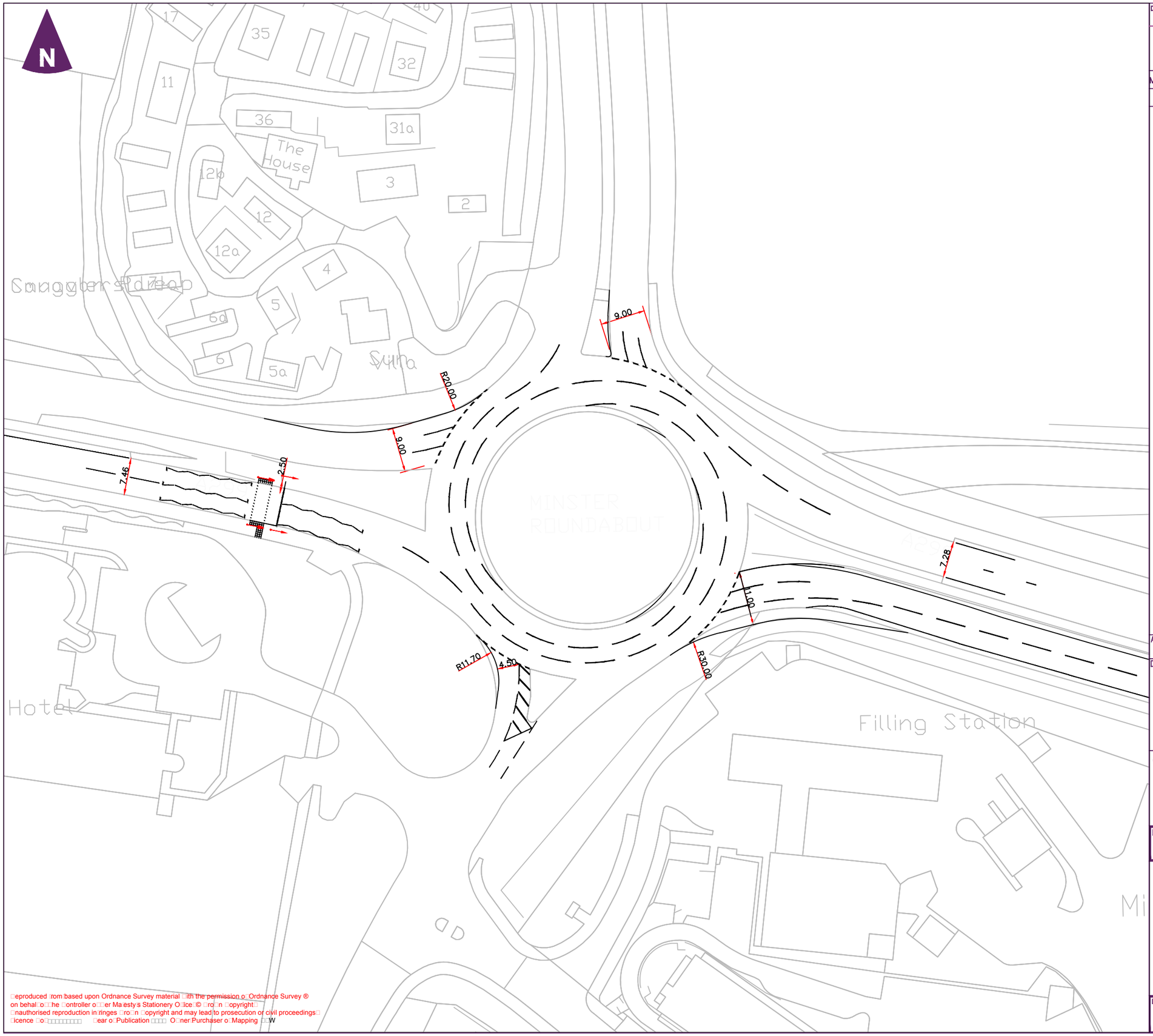

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A	UPDATE TO MITIGATION PROPOSAL	ARPUG	29/03/19	MORRC

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- Existing based on Ordnance Survey map
- Proposed kerbline
- Proposed road marking
- Proposed tactile paving surface
- Proposed traffic signal head

Notes

1. All dimensions are in metres unless otherwise noted.
2. This drawing is not to be used for construction.
3. The proposed roads are designed in accordance with Design Manual for Roads and Bridges (DMRB) and Traffic Signs Regulations and General Directions (TSRGD)

A3 SCALE
1:750

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Figure 7.2 Jct4 A256/B2190
Mitigation proposal

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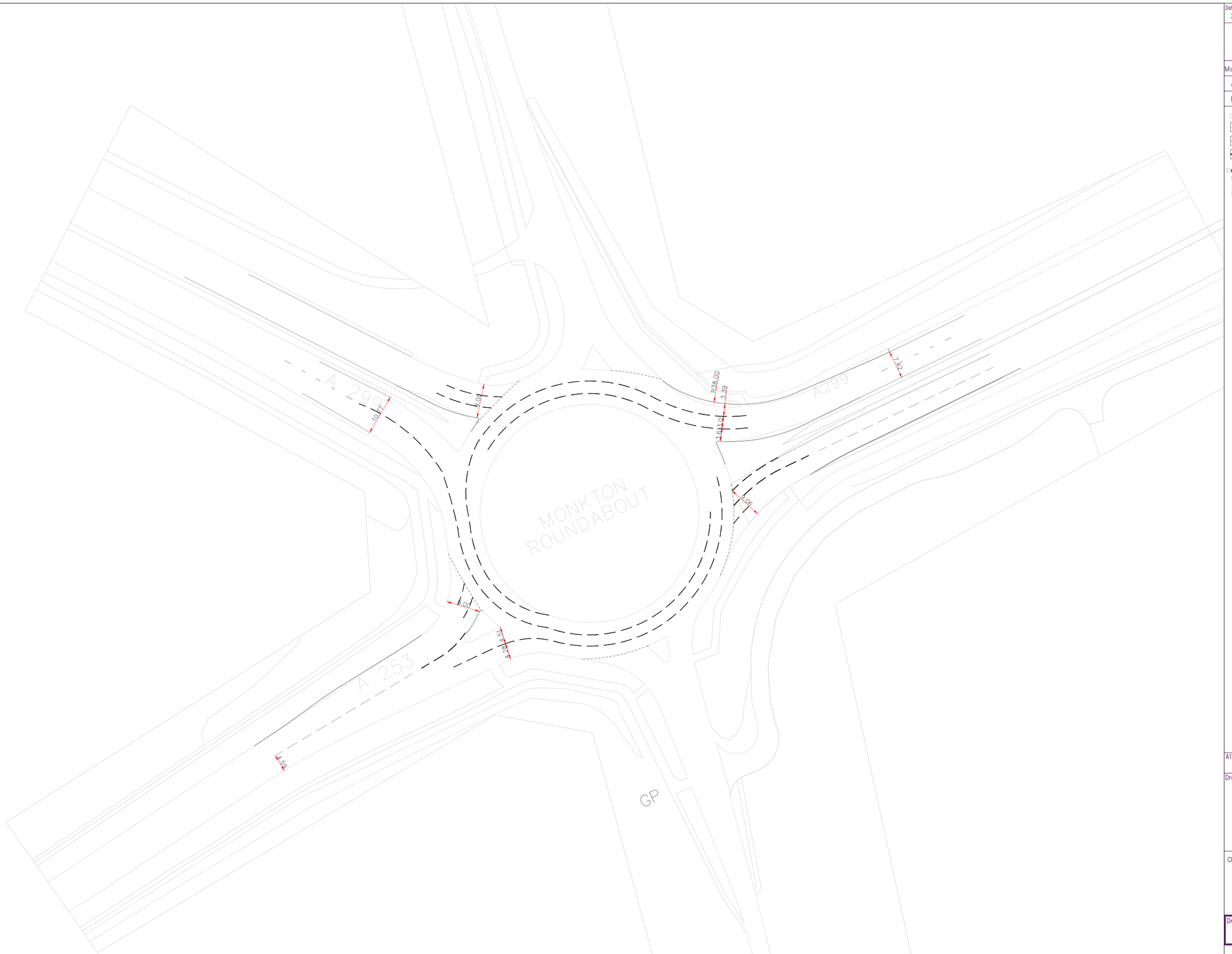

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B	UPDATE TO MITIGATION PROPOSAL	ARPUG	29/03/19	MORRC

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- Proposed road marking

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AT SCALE
1:500

Drawing Title
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Figure 7.3 Jct 6 A253/A299
Mitigation proposal

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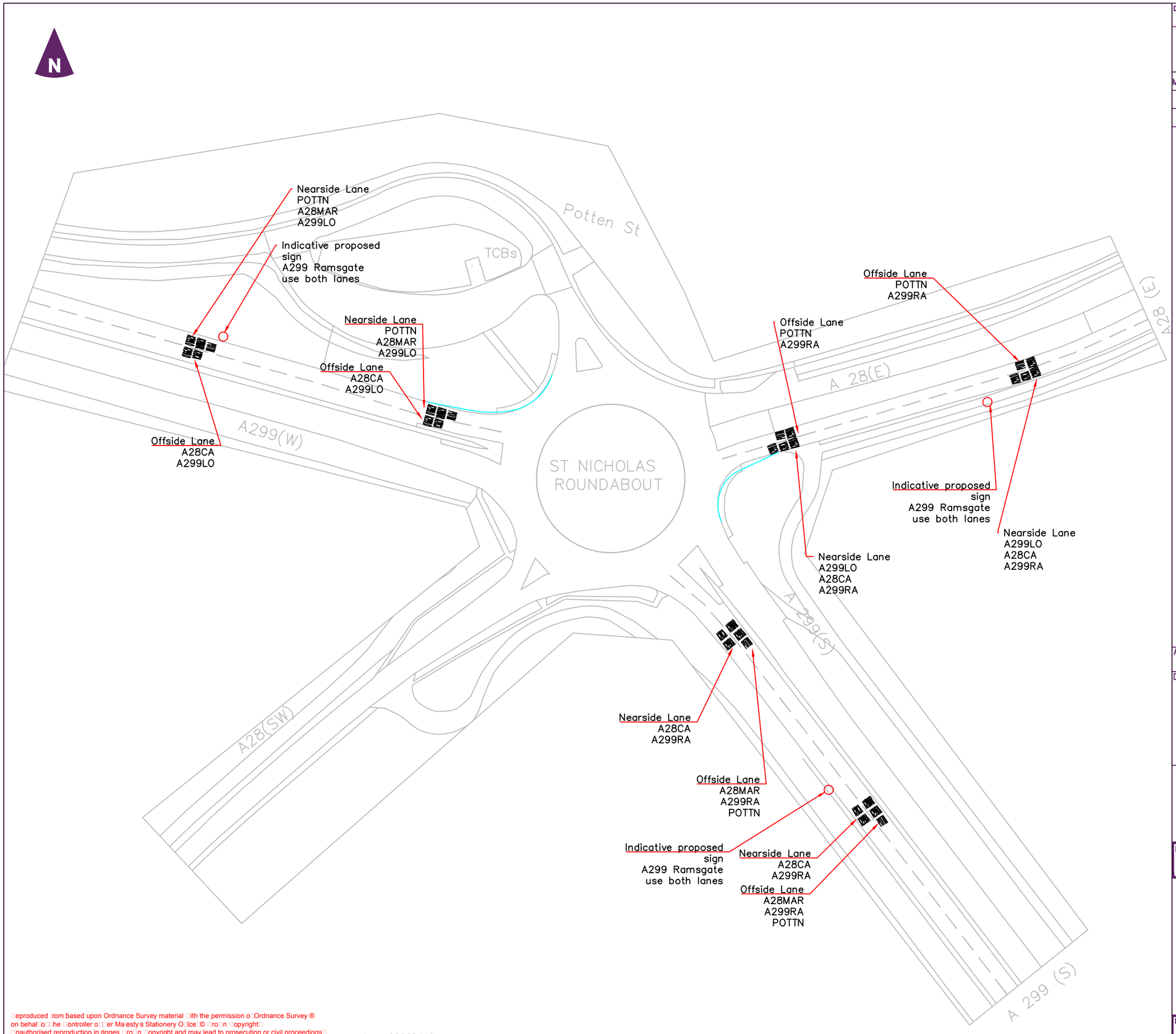

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A	Eastern arm width adjusted to connect to Manston Road proposal	FOUDA	09/11/17	COUPB
B	UPDATE TO MITIGATION PROPOSAL	ARPUG	29/03/19	MORRC

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- Existing based on Ordnance Survey map
- POTTN — Proposed road markings
- □ndicative proposed sign

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□□ □dditional tra□ic signs □ill be provided in the next stage o□the design to rein□orce the in□ormation sho□n on the carriage□ay□

A3 SCALE
1:1250

Drawing Title
Manston Airport DCO EIA

Figure 7.4 Jct 7 A299/A28 Mitigation proposal

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CV34 6TT

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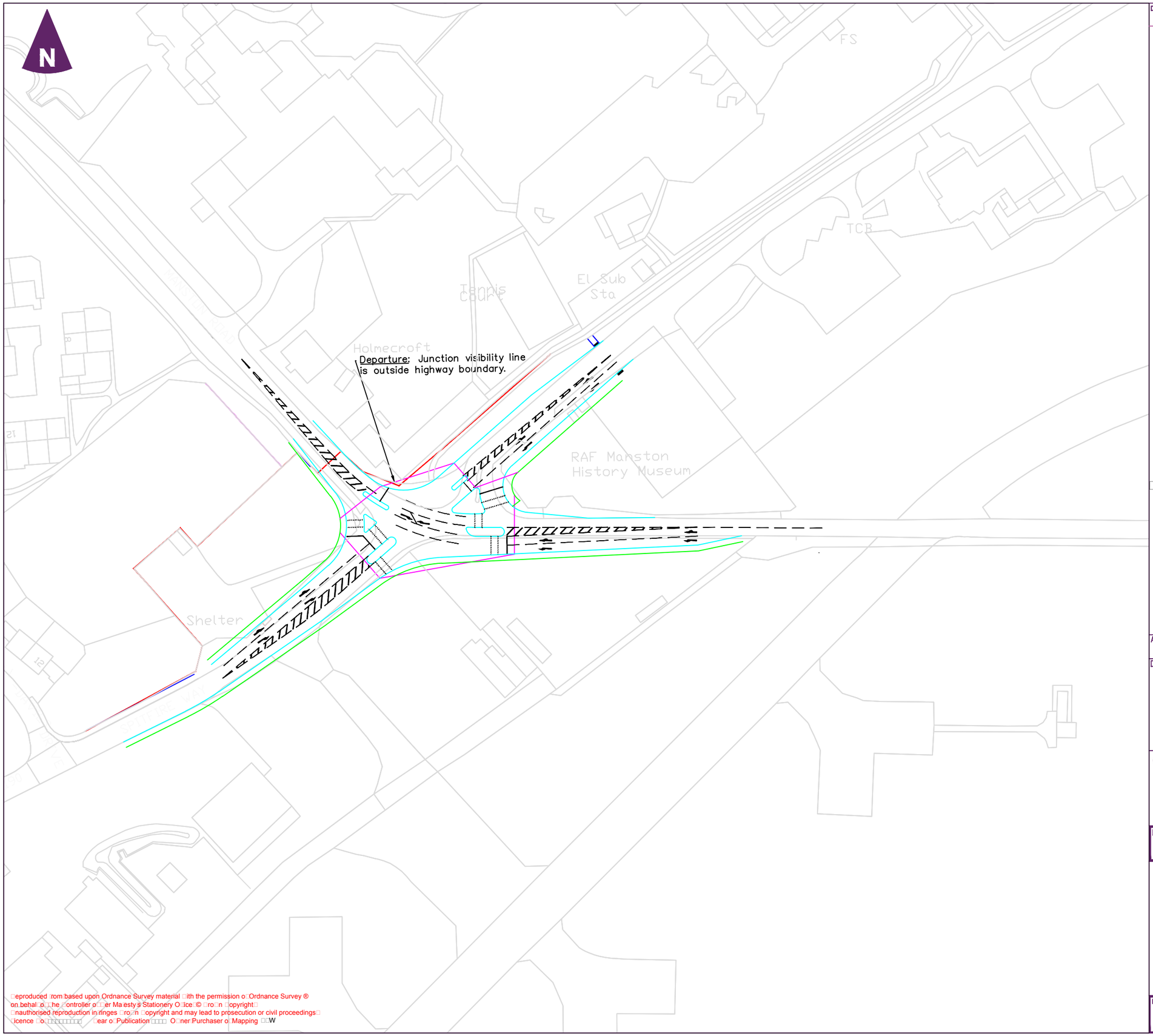
38199– Lon367	B



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- Existing based on Ordnance Survey map
- Proposed kerbline
- Proposed □oot□ay
- Proposed road marking
- □ntervisibility □one
- □ssumed high□ay boundary
- □evelopment boundary

□otes

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□□ □his dra□ing is not to be used □or construction□
□□ □he proposed roads are designed in accordance □ith □esign Manual □or □oads and Bridges □□M□B□ and □ra□ic Signs □egulations and □eneral □irections □□S□□□□□

A3 SCALE
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Drawing Title
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Figure 7.5 Jct 12 Manston Road/Spitfire Way Mitigation proposal

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WARWICKSHIRE CV32 6JX
01926 439000

amec foster wheeler

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user name: guy, adam

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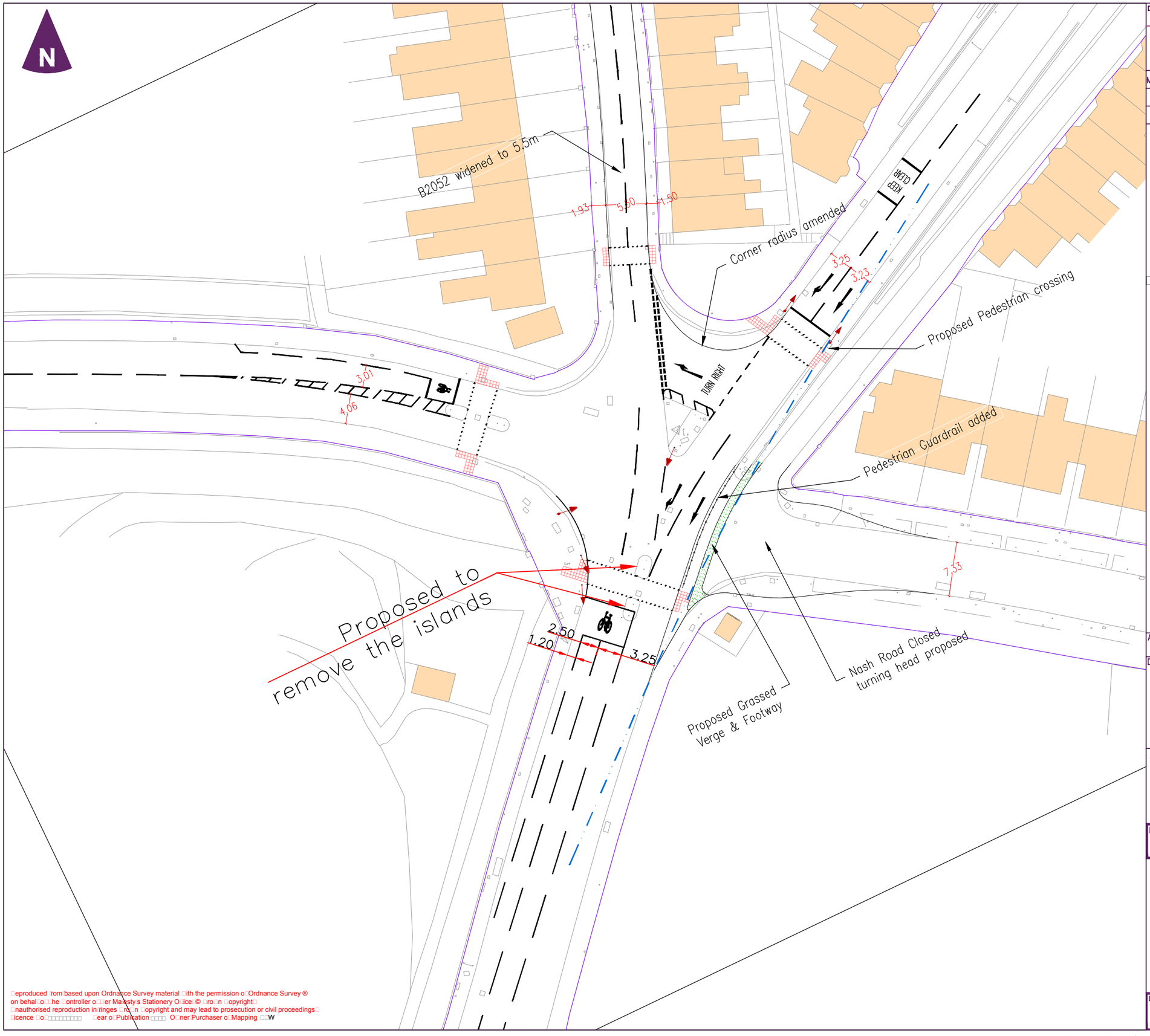

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REVISIONS

Mark	Revision	Drawn	Date	Chkd
A	Eastern arm width adjusted to connect to Manston Road proposal	FOUDA	09/11/17	COUPB
B	Update to mitigation proposal	ARPUG	29/03/19	MORRC

□ey

- Existing based on Ordnance Survey map
- Proposed kerbline
- Proposed road marking
- Proposed secondary signal head □ith right turn indicative arro□

□otes

□□ □ll dimensions are in metres unless other□ise noted□
□□ □his dra□ing is not to be used □or construction□
□□ □he proposed roads are designed in accordance □ith □esign Manual □or □oads and Bridges □□M□B□□ Manual □or Streets and □ra□ic Signs □egulations and □eneral □irections □□S□□□□□

A3 SCALE
1:500

Drawing Title
Manston Airport DCO
Transport Assessment Addendum
Figure 7.6 Jct 15 B2052 Nash Rd/ Shottendane Rd Mitigation proposal

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Leamington Spa
Nicholl's House,
Home Close,
Warwickshire,
CV34 6TT
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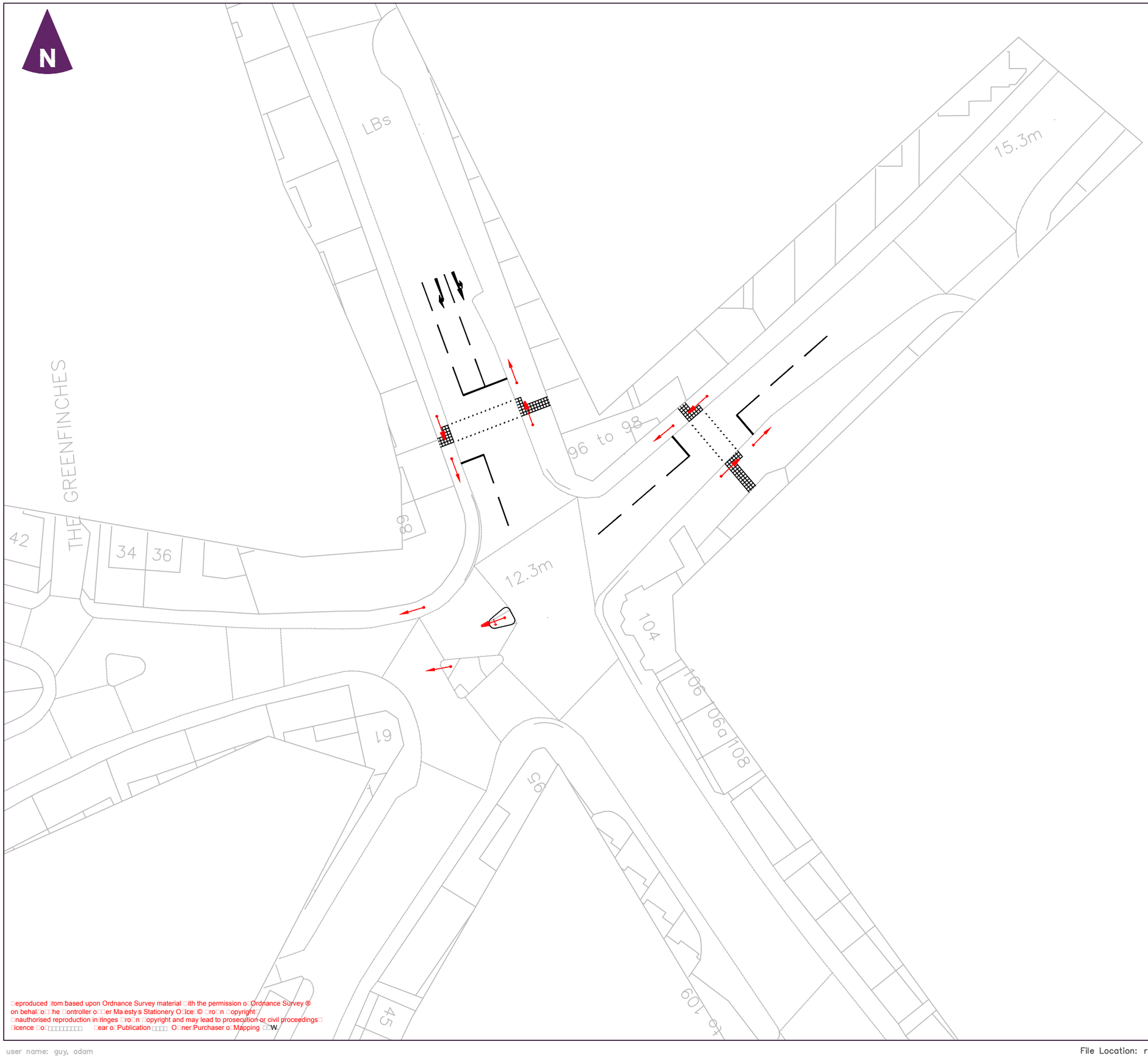

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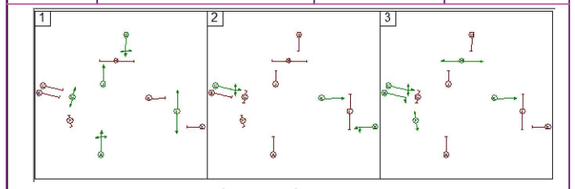

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- Proposed kerbline
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Drawing Title
Manston Airport DCO
Transport Assessment Addendum
Figure 7.7 Jct 16 A254/B2052
Mitigation proposal

Client
RSP

Drawing Status
Preliminary Design

LEAMINGTON SPA
GABLES HOUSE, KENILWORTH ROAD, LEAMINGTON SPA,
WARWICKSHIRE CV32 6JX
01926 439000

amec foster wheeler

Drawing Number
38199– Lon311

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user name: guy, adam

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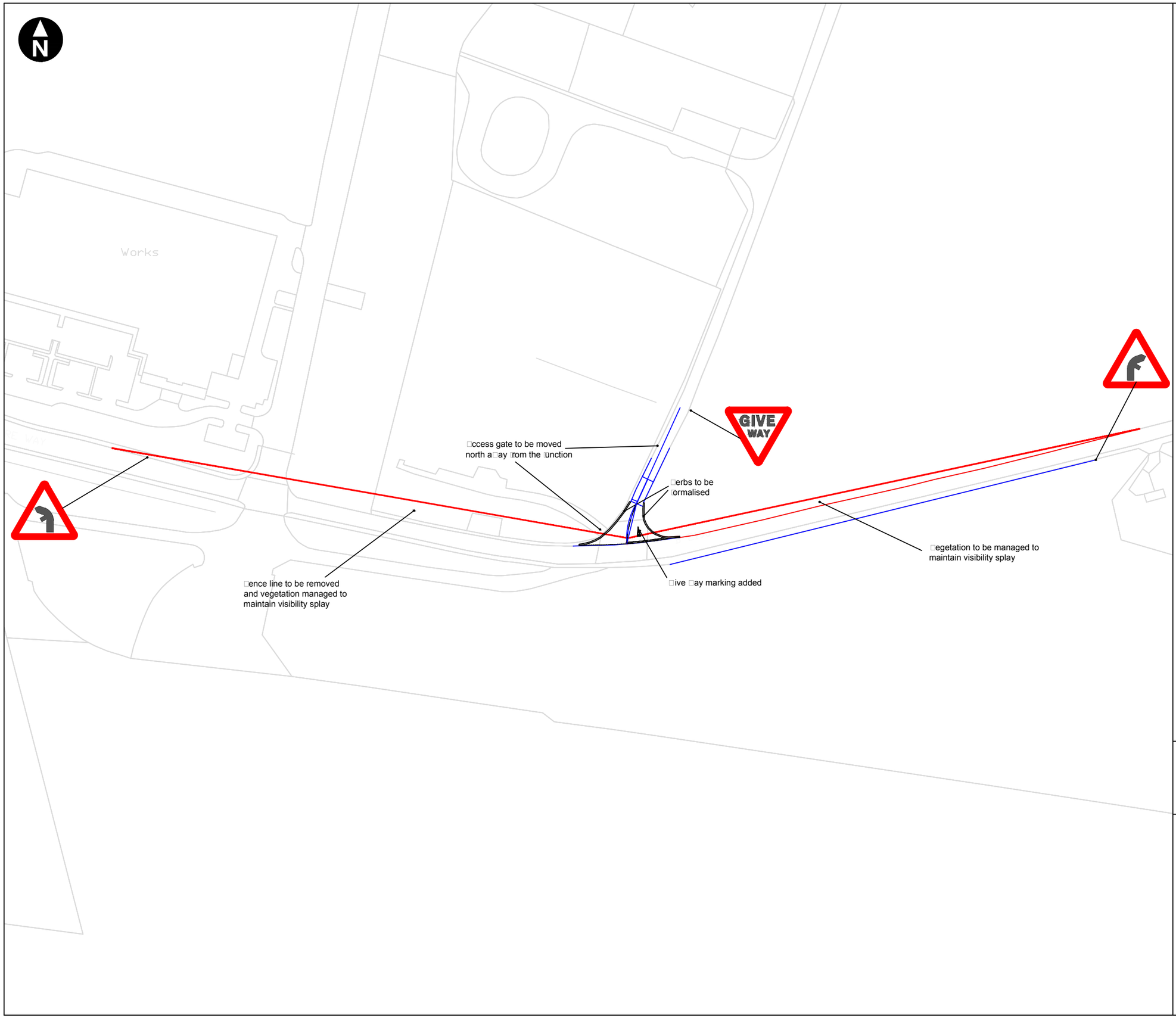

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Visibility splay 2.4m x 215m

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Scale 1:1500 @ A3

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Figure 7.8
Alland Grange Road/Spitfire Way mitigation scheme

March 2019

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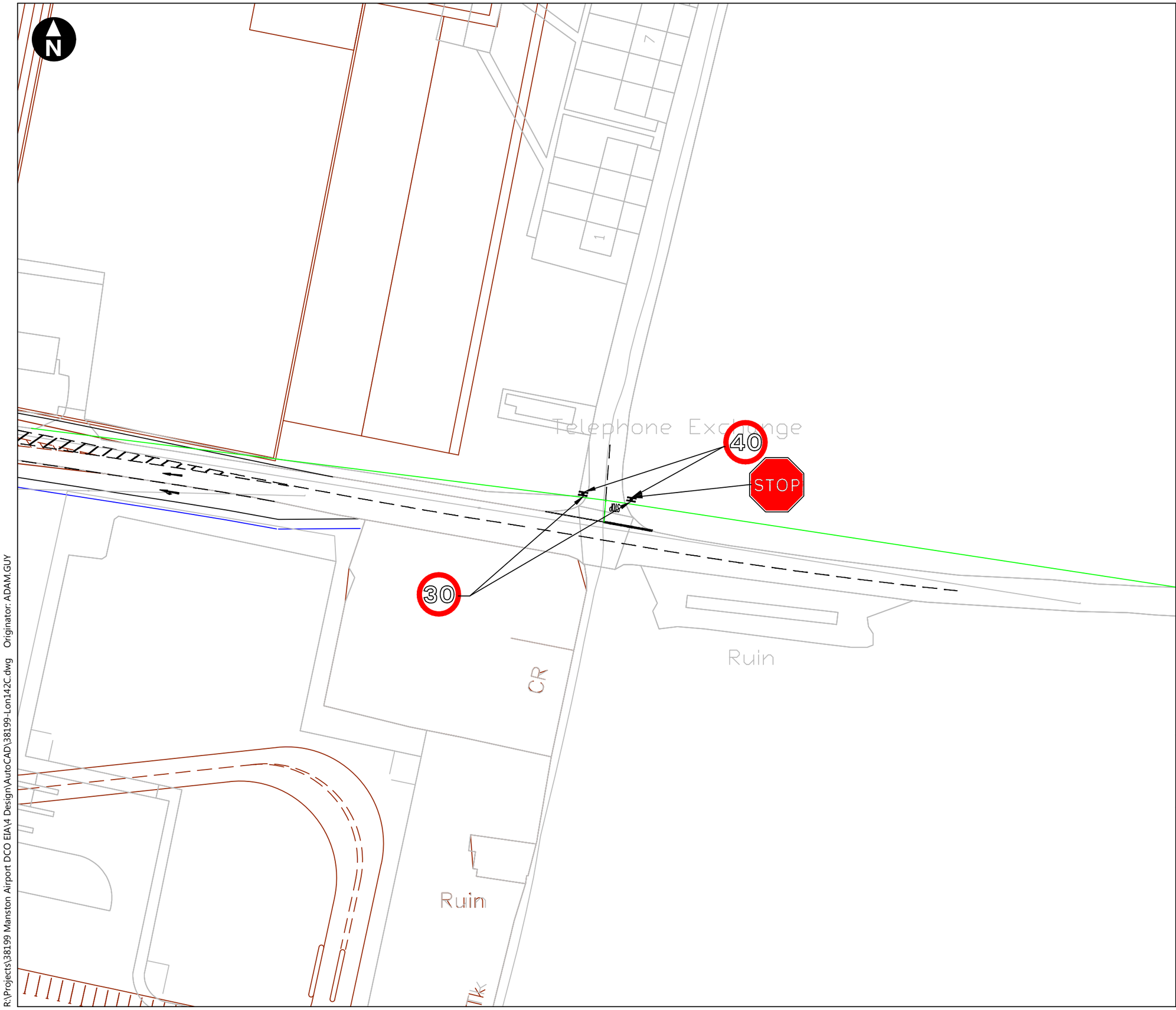

Key

- Existing based on OS Mapping
- Existing road markings
- Proposed Visibility Splay 4.5m x 120m

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Figure 7.9
Manston Road/Manston Court Road Mitigation Scheme

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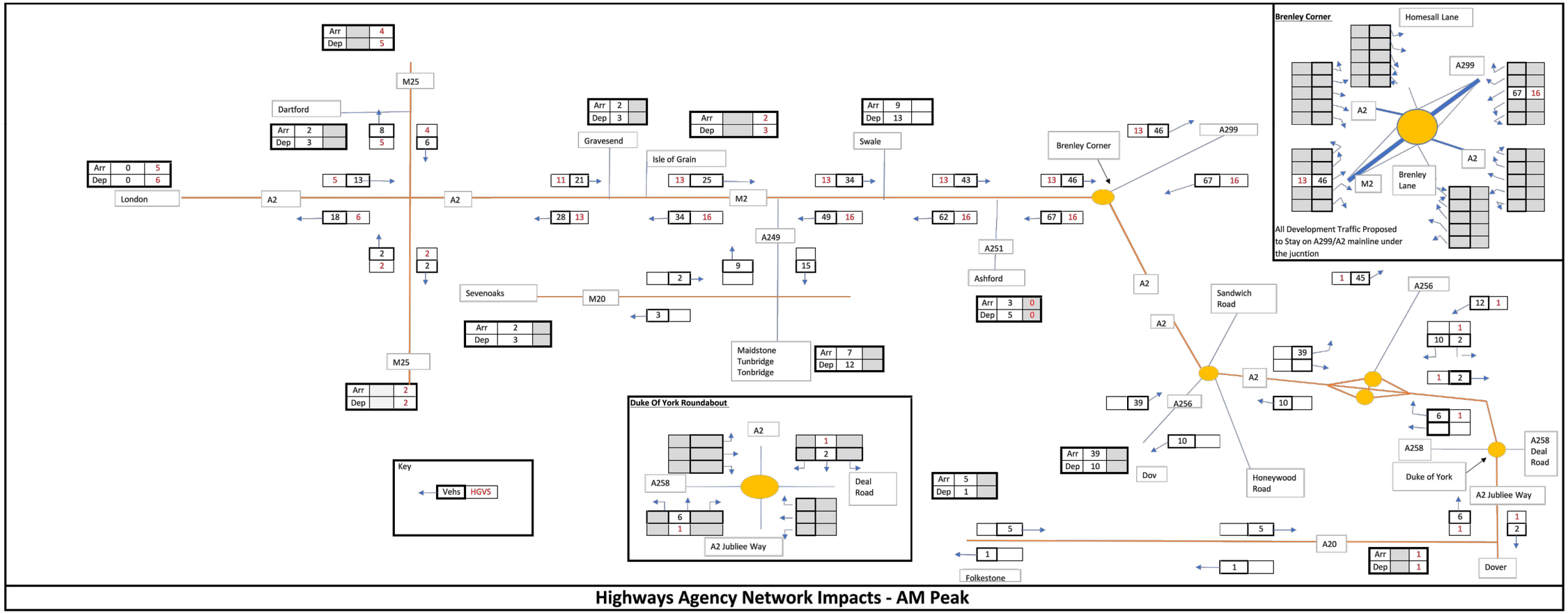

Highways Agency Network Impacts - AM Peak

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Manston Airport DCO
Transport Assessment Addendum

Figure 8.1
Highways England network traffic impacts - AM peak

March 2019

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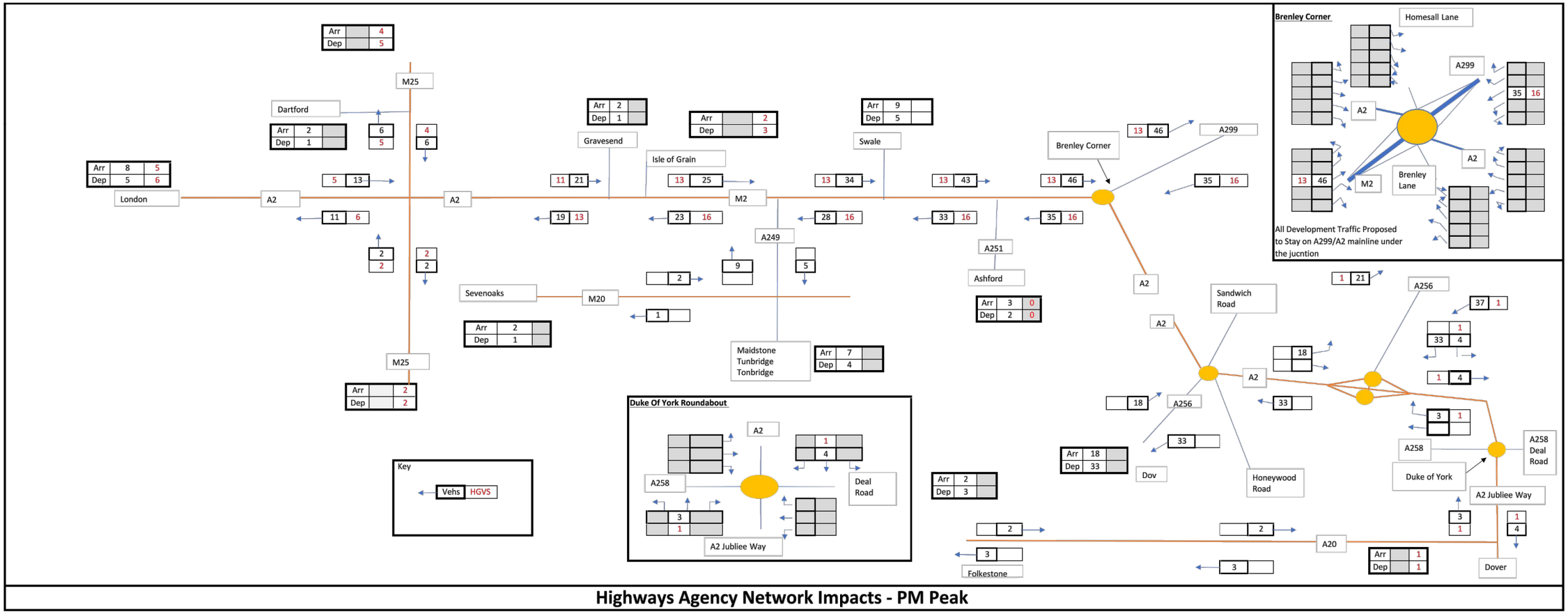

Highways Agency Network Impacts - PM Peak

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Client

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Manston Airport DCO
Transport Assessment Addendum

Figure 8.2
Highways England network traffic impacts - PM peak

March 2019

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Appendix A
KCC Meeting Minutes

Minutes

Date: 11/10/2018

Meeting at: KCC Ashford Highways Depot, Henwood Industrial Estate. Javelin Way. Ashford. TN24 8AD

Subject / purpose:

Attendees:

James Wraight (KCC)
Sally Benge (KCC)
Paul Lulham (DHA Transport)
Glyn Price (Wood)
Bev Coupe (Wood)
Liz Elphick (Amey)
Geoff Dewick (Amey)

Apologies:

Rachel Hicks (Wood)

Minutes:		**Action by:**
1	Meeting commenced with introductions and then JW gave background to all on recent meetings and the position with Woods request to use the strategic Model and the outstanding issues with link through the Northern Grass Area.	
2	**Northern Grass Area Link Road/Manston to Haine Link**	
	BC set out detailed narrative as to the reasons why the link through Northern Grass area would preferred not to be implemented is being prepared by the client and will be provided to KCC in due course along with a constraints plan.	Wood
	In addition to this it was agreed that an alternative alignment would be investigated following the proxy route of Manston Road then routing east across fields to the north of the Northern Grass Area.	
	KCC would send the design plan of the route that was proposed across the Northern Grass Area (Post Meeting Note – This has been received in PDF and Cad version has been requested)	KCC
	KCC will provide a cost for designing an alternative alignment	KCC
	Wood will also undertake consultation with the client as to understanding costs for Wood to prepare an alternative alignment design.	Wood
	Discussion was undertaken on the form of junctions on the proposed new alignment. KCC would like to see a roundabout at the Manston Road/Spitfire Way junction. The junction has been modelled in the strategic model as a roundabout also.	
	BC set out constraints at that junction relative to the clients' design solutions. Final design solution in the new alignment at this junction will be based on new traffic flows	

from the model. It was also agreed the revised link road alignment needs to consider the proposed model traffic flows.

There was discussion on how the roundabout and link road would be funded. BC said that this process would need to be understood and JW said that this could be considered as part of the balance of improvements that might be needed further afield from the Airport. Further discussion on this will be undertaken as the project progresses. KCC/Wood

Discussion on how the road would be delivered (and later other off-site junction/link improvements) was discussed and it was agreed that this would likely be secured through separate planning applications as required or under the powers of a Section 278 where improvements are within existing highways land.

3 **Thanet Strategic Transport Model**

JW set out the ongoing use of the strategic model and timeframes for undertaking work. At the moment AMEY are progressing completing the local growth business case which is two weeks away from being completed.

Following this a separate developer has also agreed to undertake scenario testing in the strategic model also.

It was agreed that Wood would prepare a Task order to be sent by JW, to assist with getting the proposed scenario testing Wood need to undertake into the queue. This will then define the cost to undertake the work and likely timeframes once Amey have had chance to consider. Wood/KCC

To inform the modelling KCC and Wood need to agree the remaining issues on the traffic generation and distribution. Wood will provide part one of the responses to KCC for comment and approval and the second and final part to follow ASAP. Wood

It was agreed that following receipt of the traffic flow outputs that Wood would re assess junctions and then look at link and junction mitigation schemes. It was considered by all that these schemes would not require a second series of model runs.

Wood are looking to proceed with a "back up plan" scenario run in the model which is to understands the airport impacts in the future year with all local plan growth and interventions other than the Manston to Hain Link across the northern grass area. JW gave a health warning that if this was the scenario taken forward to enquiry, this would not be something that would be included as common ground.

Discussion on the outputs from the model took place. GP enquired what form this would be. Amey informed that this would be network plots of the junctions and links that formed the scope of assessment (TBC by KCC) and would be for total vehicles. Discussion took place as to how these flows would be converted into light vehicles and HGVs for the purposes of assessment. KCC stated that this had been done for the local plan process work and a factor was used. GP requested this factor and its narrative be included in the outputs that are requested of Amey and would be included in the work brief. AMEY

Wood agreed to provide a fixed day that the data was needed by in the work brief. It was agreed informally around the table that working to a data of the end of November

would be last point that Wood could turn further assessment work around from. Amey to consider if outputs of the scenario testing could be delivered sooner.	
It was agreed that Wood would use the model base flows for the future year. The existing junction models provided to KCC have been reviewed and it was agreed these could be used without any further alterations. A formal response on this will be provided in due course	KCC

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Appendix B (part 1)
KCC Comments on Manston Airport TA

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Technical note:
Kent County Council Comments on Manston Airport TA.

This Technical note (TN) has been prepared to evaluate the comments received from Kent County Council (KCC) in July in response to the Manston Airport TA, and to hence begin outlining how they can be approached or more detailed justification as to why the figures have been calculated. This is the first note to be issues with comments that have been addressed to enable KCC to make a start reviewing the additional justification provided by Wood. Further iterations of this note will be issued including with further details on the technical work underpinning the traffic generation and distribution.

Table 1 – Traffic Generation and Distribution - KCC Comments – Wood Response

	KCC Comment	Wood Response
	Traffic/Trip generation	
	The trip generation methodology presented in the TA is heavily based on assumptions that are not adequately justified or referenced to appropriate 'real world' examples in a number of cases (notably HGV movement profiles and load factors, and airport staff shift patterns and staffing requirements). This limits the ability of the Highway Authority to comment on their validity with a sufficient degree of confidence	The following series of responses will provide the additional narrative or justification, based where possible on real world examples, to the methodology proposed within the Wood Transport Assessment traffic generation methodology. These responses will also as necessary detail the change in pure vehicles should an alternative strategy or approach be suggested by KCC. It is hoped that this narrative will give KCC the confidence that is required to agree with the traffic and transport generation figures for Manston Airport, though it is considered this can still be part of a short iterative process through the early weeks of October.
1.	It is forecast that a total of 340,758 tonnes of freight per annum will be reached in Year 20 (Table 6.3). If this is deemed to be the peak handling capacity of the facility, then an appropriate cap should be	TBC

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	attached to any grant of planning consent to ensure that it is not exceeded.	
2.	The adjustment to the 'Total HGVs per annum' figures in Table 6.4 to allow for efficient working should be related to evidence from comparable facilities elsewhere within the UK.	The figure of 30% for efficient working has been assumed and is a very robust assessment. For comparison a look at the Domestic Road Freight Statistics from the DfT indicates that for ALL HGV traffic on UK Roads in 2004 only 27% would run empty, and in 2014 that percentage had increased marginally to 29% and has not varied much in the preceding years. As such this indicates that around 70% of vehicles are loaded from origin to destination while 30% are empty from origin to destination. The Wood TA could have sought to apply discounts for efficient working by discounting HGVs from the figures presented in the TA. Therefore, for a robust assessment a percentage of only 30% of vehicles loaded from origin to destination was used.
3.	It is not considered realistic that HGV trips to the cargo facility would arrive and depart in an even profile throughout a typical 24-hour period. It is considered likely that there would be peaks and troughs associated with flight arrivals and departures and/or specific market demands. Moreover, the Planning Authority may place restrictions on night flights and potentially also HGV movements. Appropriate sensitivity testing should be undertaken to allow for these scenarios.	In the absence of any information about scheduling of ATMS (which without specific contracts is not really possible), then evenly spreading movements across the day was a reasonable assumption. There is not expected to be a time critical component to the traffic as with either bellyhold (which is based on passenger scheduling) or express freight – late evening and early morning (unless such a carrier chooses to relocate from Stanstead because of night noise restrictions) and hence it is difficult to ascribe flight times to freight operators who will be driven by other considerations. To come up with an artificial schedule based on assumed geographical distribution of ATMS and therefore departure windows based on sector times would be possible but spurious. In the absence of any detailed scheduling info we could offer to provide a sensitivity test based on the airport schedule of flights that have been developed as part of the traffic generation methodology. The impacts however of changing the profile to peak the HGVs over the day time period would result in very little change in the HGV numbers from the cargo facility. If all HGVs deliveries to the site were paused 8pm to 4am (which is not at all likely) then with an

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even distribution through the day the peak hour HGV trips would change as follows in Year 20;

- 24 hours Even Profile HGV Flows – AM Peak 5 Arrivals and Departures – PM Peak 5 Arrivals and Departures;
- No Night period HGV Flow – AM Peak 7 Arrivals and Departures – PM Peak 7 Arrivals and Departures

It must also be noted of these total HGV numbers, 50% of these are proposed to go directly to the Northern Grass area and not affect the wider network.
As such with the low change in HGV flow using a differing profile, which cannot be defined at this stage in any event it is hope that KCC will be able to agree that the profile used reasonable and that do not need to be amended in the traffic generation calculations set out in the TA.

Finally, by way of a real world example. The freight hub being constructed at East Midlands Airport by UPS has provided a detailed narrative of the commercial vehicles and provide an indication of the types of delivery schedules you may expect from a site such as is proposed at Manston. Although it's not proposed that vehicle movements during the day would be as low as shown in the figure below, it does provide credence that freight operators focus delivery schedule peaks over the night time hours and by and large avoid the peak hours. As such the even spreading of the HGV rather than a peaking approach that has been applied in the Manton Airport DCO could be considered a robust form of assessment.

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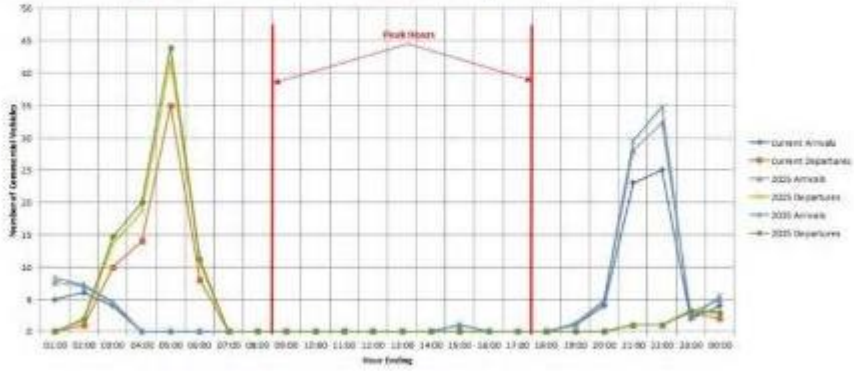
7.1.2 UPS Commercial Vehicles

UPS has also supplied AECOM with commercial vehicle trip data obtained at the existing EMA UPS premises. As with the personnel data, UPS has also provided forecast commercial vehicle trips by time of arrival and departure (**Appendix C**). **Figure 7.2** summarises the current and forecast 2021 and 2035 commercial vehicles trips at the existing (Current) and proposed Air Gateway (2021/2035), compared to the identified AM and PM peak hours.

Figure 7.2 Existing and Forecast Commercial Vehicle Trips



AECOM
22/78

4.	It is pleasing to see that the 'Airport Passenger Flights per Day, per Carrier' figures in Table 6.6 is now informed by data from comparable UK airports. Whilst these figures are difficult to contest in the absence of other data sources (e.g. TRICS), it is nevertheless necessary to consider the scope for larger planes to operate from Manston, as these would inevitably generate significantly greater levels of passenger activity. As such, further justification for the assumptions made will be necessary, unless the applicant is willing to accept a restriction on the type and frequency of passenger planes that would operate from the airport.	TBC

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5.	It is not considered realistic that 80% of departing passengers would arrive at the airport three hours before flight departure. It is envisaged that passenger flights would be short-haul in nature and since the car park is located close to the terminal, and the terminal facilities will be relatively limited in comparison to other UK airports, it is more likely that the majority of passengers would arrive 1-2 hours before their departure time. Indeed, with the increasing uptake of online check-in options and the tendency for short-haul passengers not to place their luggage in the aircraft hold, it is likely that passenger arrival times of less than one-hour prior to departure will be relatively commonplace. Again, evidence from similar airports such as Southend would be valuable in this respect.	TBC
6.	It is not clear why the passenger mode share for "shared taxi" is anticipated to treble during the daytime (from 2% to 6%) and more than quadruple during the night time (from 2.8% to 11%) over a 20-year period – thereby surpassing the "taxi" mode share – as no significant changes to the relative attractiveness of this mode are proposed.	TBC
7.	As outlined within KCC 's previous response, there is limited information provided as to how the fuel tanker trip generation has been calculated. Further justification will be required in order for there to be sufficient confidence in these figures.	The fuel tanker trips have been calculated from a series of complex calculations on the needs for fuel based on the anticipated numbers of flights arriving and departing the site for freight and passengers. A breakdown of these calculations for the year 20 of the proposed programme (worst case) is set out below detailing how the figures of 21 arrivals and 21 departures of fuel tanker have been derived in the TA. Year 20 • Prediction for freight flights a fuel burn of 257,722 (Klitres) per year; • Prediction for passenger flights a fuel burn of 27,898 (Klitres) per year; • Total fuel burn (or fuel requirements) of 285,620 (Klitres) per year;

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	• Fuel tankers assumed to be able to carry 38,000 litres of fuel; • As such 285,620 (Klitres) of fuel requires 7,516 fuel tankers per year; and • This is calculated as 21 tankers of fuel per day (rounded up) with deliveries across the 365 days of the year. • Fuel deliveries are, as set out in the TA, anticipated to arrive in a uniform pattern across the 24 hours of the day as the facility cannot accommodate multiple vehicles per hour. Tankers take some time to discharge the contents of the tanker and as such a schedule with the facility operating cross 24 hours is required. The same calculations have been undertaken based on fuel requirements for years 2-20. In summary this results in peak hour impacts of 1 arrival and 1 departures in the AM and PM peak hours and as such the sensitivity of the fuel tanker deliveries, which access directly onto the A299 via Canterbury Road West is not considered materially important in the overall traffic generation calculations of the proposed airport.
8. With respect to the trip generation methodology for the employment uses in the Northern Grass area and for the museum, the TRICS-based approach adopted in the TA is considered appropriate, albeit it is surprising that the trip generation of the existing museum has not been used as a direct reference.	It is pleasing to see that the trip generation methodology using trips is considered appropriate. In terms of the museums, no traffic counts have been undertaken into and out of the museum. It is felt that this would not be appropriate as the scale of the current museums and that which is proposed will be different. As such the approach to use larger museums from the TRICs database was felt the more robust approach. The traffic generated by the museum however is a very small part of overall traffic generation mix of the proposed development. In the AM Peak it is proposed the site would generate 2 arrivals and 1 departure and in the PM Peak 2 arrivals and 7 departures.

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	It is hoped therefore that KCC will understand the justification set out above and agree that the traffic generation calculations for this element of the methodology can remain as set out in the DCO Submission Transport Statement.
9. It is noted that the office/administration staff are now assumed to follow a more traditional 9-5 working pattern, which is an improvement on previous assumptions. However, the majority of the operational staff shift patterns appear to avoid the AM and PM peak hours on the local highway network, which is considered overly optimistic and could potentially underestimate their impact. It is recommended that a sensitivity test is applied, whereby at least one-third of the operational staff generate peak hour trips.	It has been identified that first flights departing smaller airports typically depart between 6.30-7.00am. Staff will be on site at 5.00am to open up and start processing passengers from 5.30am. If an aircraft is based at the airport the final return flight will typically be 10-11.00pm with the terminal being clear of passengers at approximately 11pm. Typically the final passenger processed for departure will be at approximately 8-9pm having arrived at the airport from 7pm onwards. Airports work on a two shift pattern per day and a three shift rotation to cover 7 days a week with typically 40-48 hrs per shift depending on arrival patterns. Above is the case at Newquay and will be so at other similar small airports. The actual patterns for different types of staff (ATC vs security vs ramp vs check-in) will be different but that is too much detail to offer at this stage to define, however the estimates on shift patterns presented in the TA figures provided a robust picture of what may be implemented which corresponds with real world examples.
Traffic/Trip distribution	
10. It is stated in Paragraph 6.5.4 of the TA that the scope of the assessed highway network has been agreed with KCC; however, this is not the case. Whilst the area within which material local impacts are likely to be experienced will likely be contained within the model study area, trip origins and destinations will likely be spread over a much wider area.	The scope of assessment for revised assessment work within the strategic model is being scoped with KCC and the following junctions have now been established as a starting point following and email with James Wraight on 28th of September 2018. • Junction 1: A256 / Sandwich Rd (Four arm standard roundabout); • Junction 2: A299 / A256 / Cottington Link Rd (Four arm standard roundabout); • Junction 4: A299 / B2190 (Four arm standard roundabout); • Junction 6: A299 / Seamark Rd / A253 / Willetts Hill (Five arm standard roundabout); • Junction 7: A299 / A28 (Five arm standard roundabout);

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- Junction 8: A28 / Park Ln / Station Rd (Three arm mini roundabout with left in / left out simple priority);
- Junction 10: Shottendane Rd / Manston Rd / Margate Hill (Four arm staggered);
- Junction 12: Manston Road / B2050 / Spitfire Way (Four arm staggered priority);
- Junction 13: Manston Court Road / B2050 (Three arm priority);
- Junction 15: Manston Rd / Hartsdown Rd / Tivoli Rd / College Rd / Nash Rd (Five arm signalised);
- Junction 16: Ramsgate Rd / College Rd / A254 / Beatrice Rd (Five arm signalised);
- Junction 17: Ramsgate Road / Poorhole Lane / Margate Road / Star Lane (Four arm standard roundabout);
- Junction 18: Star Ln / Manston Court Rd (Left in / left out simple priority);
- Junction 20a: A256 (N) / A256 (S) / Manston Road East (Three arm priority);
- Junction 20b: A256 / Manston Road West (Three arm standard roundabout);
- Junction 21a: Canterbury Road / Haine Road (Three arm standard roundabout);
- Junction 21b: A299 / A256 / Sandwich Rd / Canterbury Rd E (Four arm signalised);
- Junction 22: Airport Access (Left in / left out priority);
- Junction 24: Star Lane Link / Nash Road (Four arm standard roundabout);
- Junction 25: Tesco Access (Three arm standard roundabout);
- Junction 26: Newington Rd / Manston Rd (Three arm mini roundabout);
- Junction 27: Newington Rd / High Street (Three arm mini roundabout); and
- Junction 28: Wilfred Rd / A255 / Grange Rd (Four arm signalised).

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	These junctions form "reasonable coverage" and it's been agreed that this will be developed as part of an iterative process. It is hoped that this discussion will be wrapped up at the meeting with KCC on the 11th of October.
11. There is a lack of robust justification for certain aspects of the trip distribution methodology presented. Examples include the assumed origins and destinations of passenger and freight trips within broad geographical areas, which are simply attributed to the "wider project team". With respect to the latter trip category, it is unclear why international air freight would be directed to/from the international ports of Dover, Folkestone (Channel Tunnel) and Ramsgate. It is also disputed that there are notable freight distribution sites in the Ashford area – there are in fact greater concentrations of these sites in the Sittingbourne, Maidstone and Dartford areas of Kent.	TBC
12. The gravity model approach to distributing passenger trips is considered appropriate in principle, albeit if first-hand information from the most recent period of passenger operations at Manston is available, this would be preferred.	It is pleasing to see KCC agreeing that the gravity model approach for distributing passengers is appropriate. The details on the most recent passenger operations at Manston are not available to us to use.
13. Whilst the gravity model approach to distributing employee trips to/from the Northern Grass area is acceptable, this should be cross-referenced with 2011 Census Journey to work data for the local Middle-level Super Output Areas for validation purposes.	The detailed gravity models for this element of the site have already been based on the Mid-Level Super output areas for the 2011 census (Journey to work data) that KCC have suggested in this comment. The only exceptions to this are for locations outside Thanet where it was appropriate to gather data from a larger source such as district level.
14. It is not considered appropriate to distribute the Northern Grass area HGV trips on the same basis as the freight trips, as the nature of these businesses may be significantly different. It is considered that their catchment area is likely to be more localised.	TBC

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Issued by

Glyn Price

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[redacted]

Approved by

Bev Coupe

.....

[redacted]

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Appendix B (part 2)
Wood Response to KCC Comments on Manston Airport TA

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Technical note:

Wood Response to Kent County Council Comments on Manston Airport TA. Version 3

This Technical note (TN) has been prepared to evaluate the comments received from Kent County Council (KCC) in July in response to the Manston Airport TA, and to hence begin outlining how they can be approached or more detailed justification as to why the figures have been calculated.

This is the third iteration of note addressing the outstanding issues raised by KCC related to points 6, 11, 13 and 14.

The remaining comments were provided with detailed justifications or where necessary changes that need to be applied to the Manston Airport DCO traffic generation methodology (related to passenger arrival times to the airport). These comments have been accepted and, on an email, received on the 26th of October 2018 from Paul Lulham it was staged that KCC are *"Generally happy with the justification provided and/or consider that any further revisions would not materially affect the outcome of the further round of modelling"*. As such no further discussion on these points is required at this stage.

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Table 1 – Traffic Generation and Distribution - KCC Comments – Wood Response

	KCC Comment	Wood Response	KCC/DHA Transport Response	Wood Response
	Traffic/Trip generation The trip generation methodology presented in the TA is heavily based on assumptions that are not adequately justified or referenced to appropriate 'real world' examples in a number of cases (notably HGV movement profiles and load factors, and airport staff shift patterns and staffing requirements). This limits the ability of the Highway Authority to comment on their validity with a sufficient degree of confidence	The following series of responses will provide the additional narrative or justification, based where possible on real world examples, to the methodology proposed within the Wood Transport Assessment traffic generation methodology. These responses will also as necessary detail the change in pure vehicles should an alternative strategy or approach be suggested by KCC. It is hoped that this narrative will give KCC the confidence that is required to agree with the traffic and transport generation figures for Manston Airport, though it is considered this can still be part of a short iterative process through the early weeks of October.		
1.	It is forecast that a total of 340,758 tonnes of freight per annum will be	Aspects such as this are being dealt with by RiverOak's solicitor's BDB.	**Comments Accepted**	N/A

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	reached in Year 20 (Table 6.3). If this is deemed to be the peak handling capacity of the facility, then an appropriate cap should be attached to any grant of planning consent to ensure that it is not exceeded.			
2.	The adjustment to the 'Total HGVs per annum' figures in Table 6.4 to allow for efficient working should be related to evidence from comparable facilities elsewhere within the UK.	The figure of 30% for efficient working has been assumed and is a very robust assessment. For comparison a look at the Domestic Road Freight Statistics from the DfT indicates that for ALL HGV traffic on UK Roads in 2004 only 27% would run empty, and in 2014 that percentage had increased marginally to 29% and has not varied much in the preceding years. As such this indicates that around 70% of vehicles are loaded from origin to destination while 30% are empty from origin to destination. The Wood TA could have sought to apply discounts for efficient working by discounting HGVs from the figures presented in the TA. Therefore, for a robust assessment a percentage of only 30% of vehicles loaded from origin to destination was used.	**Comments Accepted**	N/A
3.	It is not considered realistic that HGV trips to the cargo facility would arrive and depart in an even profile throughout a typical	In the absence of any information about scheduling of ATMS (which without specific contracts is not really possible), then evenly spreading movements across the day was a reasonable assumption. There is not expected to be a time critical component to the traffic as with either bellyhold (which is based on passenger scheduling) or express freight – late evening and early morning (unless such a carrier chooses to relocate from Stanstead because of night noise restrictions) and hence it is difficult to ascribe flight times to freight operators who will be driven by other considerations.	**Comments Accepted**	N/A

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24-hour period. It is considered likely that there would be peaks and troughs associated with flight arrivals and departures and/or specific market demands. Moreover, the Planning Authority may place restrictions on night flights and potentially also HGV movements. Appropriate sensitivity testing should be undertaken to allow for these scenarios.	To come up with an artificial schedule based on assumed geographical distribution of ATMS and therefore departure windows based on sector times would be possible but spurious. In the absence of any detailed scheduling info we could offer to provide a sensitivity test based on the airport schedule of flights that have been developed as part of the traffic generation methodology. The impacts however of changing the profile to peak the HGVs over the day time period would result in very little change in the HGV numbers from the cargo facility. If all HGVs deliveries to the site were paused 8pm to 4am (which is not at all likely) then with an even distribution through the day the peak hour HGV trips would change as follows in Year 20; • 24 hours Even Profile HGV Flows – AM Peak 5 Arrivals and Departures – PM Peak 5 Arrivals and Departures; • No Night period HGV Flow – AM Peak 7 Arrivals and Departures – PM Peak 7 Arrivals and Departures It must also be noted of these total HGV numbers, 50% of these are proposed to go directly to the Northern Grass area and not affect the wider network. As such with the low change in HGV flow using a differing profile, which cannot be defined at this stage in any event it is hope that KCC will be able to agree that the profile used reasonable and that do not need to be amended in the traffic generation calculations set out in the TA. Finally, by way of a real world example. The freight hub being constructed at East Midlands Airport by UPS has provided a detailed narrative of the commercial vehicles and provide an indication of the types of delivery schedules you may expect from a site such as is proposed at Manston. Although it's not proposed that vehicle movements during the day would be as low as shown in the figure below, it does provide credence that freight operators focus delivery schedule peaks over the night time hours and by and large avoid the peak hours. As such the even spreading of the HGV rather than a peaking approach that has been applied in the Manton Airport DCO could be considered a robust form of assessment.

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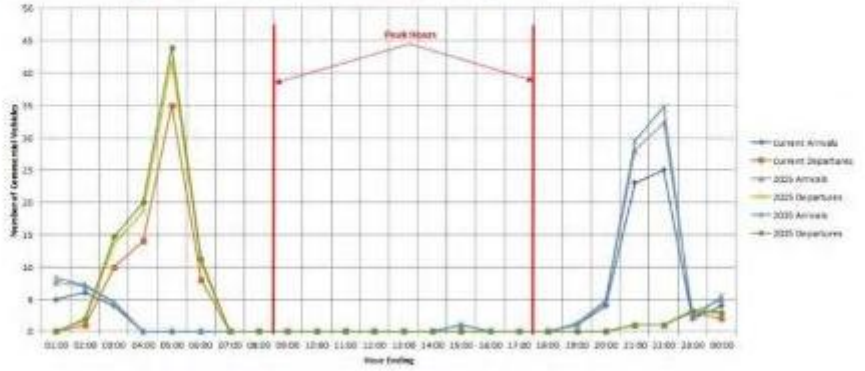
7.1.2 UPS Commercial Vehicles

UPS has also supplied AECOM with commercial vehicle trip data obtained at the existing EMA UPS premises. As with the personnel data, UPS has also provided forecast commercial vehicle trips by time of arrival and departure (**Appendix C**). **Figure 7.2** summarises the current and forecast 2021 and 2035 commercial vehicles trips at the existing (Current) and proposed Air Gateway (2021/2035), compared to the identified AM and PM peak hours.

Figure 7.2 Existing and Forecast Commercial Vehicle Trips



AECOM
22/78

4.	It is pleasing to see that the 'Airport Passenger Flights per Day, per Carrier' figures in Table 6.6 is now informed by data from comparable UK airports. Whilst these figures are difficult to contest in the absence of other	Aspects such as this are being dealt with by RiverOak's solicitor's BDB.	**Comments Accepted**

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	data sources (e.g. TRICS), it is nevertheless necessary to consider the scope for larger planes to operate from Manston, as these would inevitably generate significantly greater levels of passenger activity. As such, further justification for the assumptions made will be necessary, unless the applicant is willing to accept a restriction on the type and frequency of passenger planes that would operate from the airport.			
5.	It is not considered realistic that 80% of departing passengers would arrive at the airport three hours before flight departure. It is envisaged that	The arrival times set out in the Transport Assessment are intended to read as 2 – 3 hours and 1 – 2 hours before flights and have been based on a review of nationwide airport recommendations on arrival times before flight departures. Most airports, including smaller airports such as Southend, advise that passengers arrive at least two hours before flights to allow plenty of extra time to check-in and pass through security. Passengers are generally advised to arrive on the 'airside' at least 30 minutes before flight departure time as boarding closes at least 20 minutes before departure for most flights/airports; some have longer times. Less than 1 hour was not identified due to the time required to	**Comments Accepted**	N/A

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passenger flights would be short-haul in nature and since the car park is located close to the terminal, and the terminal facilities will be relatively limited in comparison to other UK airports, it is more likely that the majority of passengers would arrive 1-2 hours before their departure time. Indeed, with the increasing uptake of online check-in options and the tendency for short-haul passengers not to place their luggage in the aircraft hold, it is likely that passenger arrival times of less than one-hour prior to departure will be relatively commonplace. Again, evidence from similar airports arrive at the airport, park and walk to the terminal building, check-in (if appropriate) and get through security, etc.

The airport will carry predominantly short haul, but will also have the potential for long haul flights (as per its previous operations).

There is a difficulty in obtaining information on passenger arrival times at other comparable airports to support the assumptions made within the Transport Assessment. Further consideration of passenger arrival times has been made and in response to the comments, a robust approach has been taken which assumes a greater proportion of passengers arriving nearer the flight time as follows:

- 30% of passengers arrive 2 – 3 hours before the flight;
- 70% of passengers arrive 1 - 2 hours before the flight

This will result in no change to the AM peak period and an additional 102 vehicles in the PM peak period by Year 20.

DEPATURES ACROSS DAY

Time	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
00:00 - 01:00																		
01:00 - 02:00																		
02:00 - 03:00																		
03:00 - 04:00	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
04:00 - 05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	85	85	85
05:00 - 06:00	68	68	68	68	68	68	68	68	68	68	68	68	68	170	153	153	153	153
06:00 - 07:00	85	85	85	85	85	85	85	85	85	85	85	85	85	43	43	43	43	43
07:00 - 08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 - 09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00 - 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 - 11:00	0	0	0	-05	-05	-05	-03	-03	-05	-05	-05	-03	-05	-05	-03	-05	-05	-05
11:00 - 12:00	0	0	0	05	05	05	05	03	05	0	0	0	0	0	0	0	0	0
12:00 - 13:00	-05	-05	-05	-17	-17	-17	-17	-17	-15	0	0	0	0	0	0	0	-17	-17
13:00 - 14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	34
14:00 - 15:00	65	66	65	66	66	66	66	65	66	66	66	66	66	66	65	66	16	15
15:00 - 16:00	-35	-35	-35	-51	-51	-51	-51	-51	-5	-51	-51	-51	-51	-5	-51	-51	-51	-136
16:00 - 17:00	-68	-68	-68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
17:00 - 18:00	68	68	68	34	34	34	34	34	34	34	34	34	34	34	34	34	34	102
18:00 - 19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00 - 20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00 - 21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00 - 22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00 - 23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00 - 00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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	such as Southend would be valuable in this respect.			
6.	It is not clear why the passenger mode share for "shared taxi" is anticipated to treble during the daytime (from 2% to 6%) and more than quadruple during the night time (from 2.8% to 11%) over a 20-year period – thereby surpassing the "taxi" mode share – as no significant changes to the relative attractiveness of this mode are proposed.	Shared taxis can also be described as demand responsive transport, commercial shared taxis, or commercially operated airport shuttle services, and are common in countries such as the USA, Canada, Australia and New Zealand, as well as many countries in the developing world. A shared taxi offers the convenience of a taxi, i.e. a door-to-door journey, although will take longer due to multiple passenger drop-offs/pick ups, and a significantly lower price. This is a growing sustainable transport opportunity in the UK and it is envisioned that it will continue to grow as Manston Airport is built out and is something that would be promoted as part of Travel Plan and Surface Access initiatives. Commercial services which currently exist in the UK include: • UberPool which turns a standard Uber into a miniature bus service by matching riders travelling in the same direction. Passengers request the cars as they usually would but can have their fares reduced by being connected with other people, who share the journey and help subsidise the trip. This is currently operating in Zones 1 and 2 as well as Heathrow Airport. • ArrivaClick which has recently started in Liverpool and Sittingbourne. Passengers who use the on-demand ArrivaClick service determines the route by entering their chosen pick-up point and destination. The technology matches people travelling in the same direction to the right vehicle. The app allows people to track their chosen vehicle, tell them the name of the driver and reserve a seat. With no fixed routes, journeys are determined by where passengers want to go within an area running from the city centre to Liverpool John Lennon Airport. Arriva has reported said that when the same technology was piloted in Kent, more than half its passengers had switched from private cars with 43% using it for their daily commute.[1]. As is common at a number of airports, hotels in the vicinity offer car parking and a shuttle service to the airport. The assumption regarding a higher percentage of shared	**Response on 26th October 2018** I am not persuaded by the justification provided here. The commercial shared taxi / airport shuttle services cited are unlikely to be as viable in relation to Manston, in view of its relatively peripheral location, its relatively local catchment area (which limits the potential for hotel stays pre- or post-flight) and the fact that products such as	**Response on 30th October 2018** This response appears to be rather shortsighted, focussing on the 'now' rather than considering the transport situation over the next 20 years, which requires a more visionary stance. KCC has identified the need for new roads to accommodate growth in the residential and working populations. This needs to be complemented by

[1] https://www.bbc.co.uk/news/uk-england-merseyside-44614616

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taxi during the night time is because it is more likely that those passengers catching early morning flights will book a hotel and use a private shuttle service to the airport. It is anticipated that this situation would increasingly occur as passenger numbers increase over the 20-year period.

The impact of these percentages that have been proposed are set out below with the maximum numbers of shared taxi trips split out for the year 20 scenario. As can be seen the increase from 6% to 11% for the night team peak only effects a few of the slight arrivals and departures and these increases fall outside of the peak hours.

For the remainder of the day the figures of vehicle generation for arrivals and departures seem a reasonable number. It should be noted however these figures would change of the arrival and departure profile of passenger's changes as set out in point five above.

Time	Departure (Flights) – Arrival to the Airport (Vehicle)		Arrival (Flights) – Departure from the Airport (Vehicle)	
	Mode Share %	Trips	Mode Share %	Trips
00:00 - 01:00				
01:00 - 02:00				
02:00 - 03:00				
03:00 - 04:00	11%	5		
04:00 - 05:00	11%	24		
05:00 - 06:00	6%	15	6%	0
06:00 - 07:00	6%	2	6%	0
07:00 - 08:00	6%	0	6%	0
08:00 - 09:00	6%	0	6%	10
09:00 - 10:00	6%	0	6%	10
10:00 - 11:00	6%	3	6%	0
11:00 - 12:00	6%	10	6%	10
12:00 - 13:00	6%	13	6%	3
13:00 - 14:00	6%	17	6%	10
14:00 - 15:00	6%	8	6%	10
15:00 - 16:00	6%	8	6%	10

Uber are not currently available in East Kent. They are generally most effective in high-density metropolitan areas where the scope for lift-sharing is that much greater. I would therefore expect this mode to capture a very small percentage of passenger movements, with the rest likely to use conventional taxi services or be given lifts by friends or relatives.

encouraging and adopting new approaches to travel and transport in the district. The Airport Travel Plan would need to include targets and initiatives to develop shared taxi, and this would help support the growth of this type of scheme for the district.

As identified in our response, the shared taxi scheme ArrivaClick has been introduced this year in Sittingbourne in Kent, a town of comparable population to Margate, and smaller than the combined population of

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16:00 - 17:00	6%	17	6%	10
17:00 - 18:00	6%	7	6%	0
18:00 - 19:00	6%	0	6%	3
19:00 - 20:00	6%	0	6%	10
20:00 - 21:00	6%	0	6%	10
21:00 - 22:00	6%	0	6%	10
22:00 - 23:00			11%	18
23:00 - 00:00				

Note the above flows are revised based on the new passenger arrivals times to the airport as set out in point 5 of this TN.

Margate, Ramsgate and Broadstairs. This is not a high densely populated metropolitan area, and whilst it is too early to evaluate the success of the scheme, Arriva must have considered that there was potential for the service in order to introduce within this market town.

Whilst the airport has a peripheral location, there will be demand for hotel provision from a proportion of the 20% that are travelling from West Kent, London and further afield.

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	In conclusion, neither Wood nor RiverOak can provide empirical evidence of shared taxi as a mode as this is a new initiative to the UK. If there is the view from KCC that shared taxi is unlikely to be a viable mode of travel, then we would need to discuss this with KCC in terms of revised figures. It is noted however, that in terms of traffic flows, the numbers are low and reducing the proportion of shared taxi would have an insignificant effect on overall traffic generation, particularly in the peak hours (the AM is 0), as set out in the table

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				within our original response.
7.	As outlined within KCC 's previous response, there is limited information provided as to how the fuel tanker trip generation has been calculated. Further justification will be required in order for there to be sufficient confidence in these figures.	The fuel tanker trips have been calculated from a series of complex calculations on the needs for fuel based on the anticipated numbers of flights arriving and departing the site for freight and passengers. A breakdown of these calculations for the year 20 of the proposed programme (worst case) is set out below detailing how the figures of 21 arrivals and 21 departures of fuel tanker have been derived in the TA. *Year 20* • Prediction for freight flights a fuel burn of 257,722 (Klitres) per year; • Prediction for passenger flights a fuel burn of 27,898 (Klitres) per year; • Total fuel burn (or fuel requirements) of 285,620 (Klitres) per year; • Fuel tankers assumed to be able to carry 38,000 litres of fuel; • As such 285,620 (Klitres) of fuel requires 7,516 fuel tankers per year; and • This is calculated as 21 tankers of fuel per day (rounded up) with deliveries across the 365 days of the year. • Fuel deliveries are, as set out in the TA, anticipated to arrive in a uniform pattern across the 24 hours of the day as the facility cannot accommodate multiple vehicles per hour. Tankers take some time to discharge the contents of the tanker and as such a schedule with the facility operating cross 24 hours is required. The same calculations have been undertaken based on fuel requirements for years 2-20. In summary this results in peak hour impacts of 1 arrival and 1 departures in the AM and PM peak hours and as such the sensitivity of the fuel tanker deliveries, which access directly onto the A299 via Canterbury Road West is not considered materially important in the overall traffic generation calculations of the proposed airport.	**Comments Accepted**	N/A
8.	With respect to the trip generation methodology for the	It is pleasing to see that the trip generation methodology using trips is considered appropriate. In terms of the museums, no traffic counts have been undertaken into and out of the	**Comments Accepted**	N/A

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	employment uses in the Northern Grass area and for the museum, the TRICS-based approach adopted in the TA is considered appropriate, albeit it is surprising that the trip generation of the existing museum has not been used as a direct reference.	museum. It is felt that this would not be appropriate as the scale of the current museums and that which is proposed will be different. As such the approach to use larger museums from the TRICs database was felt the more robust approach. The traffic generated by the museum however is a very small part of overall traffic generation mix of the proposed development. In the AM Peak it is proposed the site would generate 2 arrivals and 1 departure and in the PM Peak 2 arrivals and 7 departures. It is hoped therefore that KCC will understand the justification set out above and agree that the traffic generation calculations for this element of the methodology can remain as set out in the DCO Submission Transport Statement.		
9.	It is noted that the office/administration staff are now assumed to follow a more traditional 9-5 working pattern, which is an improvement on previous assumptions. However, the majority of the operational staff shift patterns appear to avoid the AM and PM peak hours on the local highway network, which is considered overly	It has been identified that first flights departing smaller airports typically depart between 6.30-7.00am. Staff will be on site at 5.00am to open up and start processing passengers from 5.30am. If an aircraft is based at the airport the final return flight will typically be 10-11.00pm with the terminal being clear of passengers at approximately 11pm. Typically the final passenger processed for departure will be at approximately 8-9pm having arrived at the airport from 7pm onwards. Airports work on a two shift pattern per day and a three shift rotation to cover 7 days a week with typically 40-48 hrs per shift depending on arrival patterns. Above is the case at Newquay and will be so at other similar small airports. The actual patterns for different types of staff (ATC vs security vs ramp vs check-in) will be different but that is too much detail to offer at this stage to define, however the estimates on shift patterns presented in the TA figures provided a robust picture of what may be implemented which corresponds with real world examples.	**Comments Accepted**	N/A

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	optimistic and could potentially underestimate their impact. It is recommended that a sensitivity test is applied, whereby at least one-third of the operational staff generate peak hour trips.			
	Traffic/Trip distribution			
10.	It is stated in Paragraph 6.5.4 of the TA that the scope of the assessed highway network has been agreed with KCC; however, this is not the case. Whilst the area within which material local impacts are likely to be experienced will likely be contained within the model study area, trip origins and	The scope of assessment for revised assessment work within the strategic model is being scoped with KCC and the following junctions have now been established as a starting point following and email with James Wraight on 28th of September 2018. • Junction 1: A256 / Sandwich Rd (Four arm standard roundabout); • Junction 2: A299 / A256 / Cottington Link Rd (Four arm standard roundabout); • Junction 4: A299 / B2190 (Four arm standard roundabout); • Junction 6: A299 / Seamark Rd / A253 / Willetts Hill (Five arm standard roundabout); • Junction 7: A299 / A28 (Five arm standard roundabout); • Junction 8: A28 / Park Ln / Station Rd (Three arm mini roundabout with left in / left out simple priority); • Junction 10: Shottendane Rd / Manston Rd / Margate Hill (Four arm staggered); • Junction 12: Manston Road / B2050 / Spitfire Way (Four arm staggered priority); • Junction 13: Manston Court Road / B2050 (Three arm priority);	**Comments Accepted**	N/A

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	destinations will likely be spread over a much wider area.	• Junction 15: Manston Rd / Hartsdown Rd / Tivoli Rd / College Rd / Nash Rd (Five arm • signalised); • Junction 16: Ramsgate Rd / College Rd / A254 / Beatrice Rd (Five arm signalised); • Junction 17: Ramsgate Road / Poorhole Lane / Margate Road / Star Lane (Four arm standard roundabout); • Junction 18: Star Ln / Manston Court Rd (Left in / left out simple priority); • Junction 20a: A256 (N) / A256 (S) / Manston Road East (Three arm priority); • Junction 20b: A256 / Manston Road West (Three arm standard roundabout); • Junction 21a: Canterbury Road / Haine Road (Three arm standard roundabout); • Junction 21b: A299 / A256 / Sandwich Rd / Canterbury Rd E (Four arm signalised); • Junction 22: Airport Access (Left in / left out priority); • Junction 24: Star Lane Link / Nash Road (Four arm standard roundabout); • Junction 25: Tesco Access (Three arm standard roundabout); • Junction 26: Newington Rd / Manston Rd (Three arm mini roundabout); • Junction 27: Newington Rd / High Street (Three arm mini roundabout); and • Junction 28: Wilfred Rd / A255 / Grange Rd (Four arm signalised). These junctions form "reasonable coverage" and it's been agreed that this will be developed as part of an iterative process. It is hoped that this discussion will be wrapped up at the meeting with KCC on the 11th of October.		
11.	There is a lack of robust justification for certain aspects of the trip	The passenger distribution assumptions have been based on EU actual ticketing data and on 2011 CAA data. In summary the data shows substantive market penetration in east Kent, modest from Mid Kent – Medway towns, Maidstone etc. and depending on rail access some minor	**Response on 26th October 2018**	Appendices sent 29th October 2018 and comment on

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distribution methodology presented. Examples include the assumed origins and destinations of passenger and freight trips within broad geographical areas, which are simply attributed to the "wider project team". With respect to the latter trip category, it is unclear why international air freight would be directed to/from the international ports of Dover, Folkestone (Channel Tunnel) and Ramsgate. It is also disputed that there are notable freight distribution sites in the Ashford area – there are in fact greater concentrations of these sites in the Sittingbourne, Maidstone and	penetration into the south east London market. There is little penetration above the River Thames because of the time and cost of travel to the Manston site and the presence of Stansted and Southend Airports. The Lower Thames Crossing could change this dynamic in the floating catchment but not the core catchment. Any location in Kent which is within one hour's drive of London Gatwick will see most traffic gravitating there, only a small amount will be generated by Manston on routes London Gatwick does not serve (e.g. Manchester, Liverpool, and Newcastle) or where it offers cheaper more convenient access to short haul leisure flights. The catchment boundary falls close to Maidstone, although concerns about journey time reliability on the M25 might extend this closer to Sevenoaks because the journey time to Manston would be much more certain. Appendix 1 shows the market analysis of the South East area and the demand profile Manston Airport could generate. Which was presented to the Airport Commission Davies Commission in 2014 by Manston Airport. A similar exercise has been undertaken for freight trips from the airport (drawings to support this are currently being prepared). However, the key points of this are that the distribution catchment for freight trips covers all the M25 and 30-60 minutes out from the M25 the Southern and western aerial routes (as well as the inner elements of the M25). Analysis has been undertaken GIS software to understand the potential distribution of freight trips by analysing trucking times from the Manston Airport site. Two trucking times for a freight vehicle have been assessed, 135 minutes (including a 15 minute delay for heavy traffic) from Manston Airport and 150 minutes (including a 10 minute delay for rush hour traffic) from Manston airport. GIS software provided an output of the distance on a map of the UK of the distance a HGV freight vehicle could achieve in the two trucking times used in the analysis. The results showed that the areas that can be reached in the 135 minute trucking time include all areas of Kent, areas along the M25 corridor to the M3 at Woking and to the M1 at St Albans, along the M23/A23 corridor to Haywards heath in Sussex and to the north along the M11 corridor to Bishops Stortford. The 150 minute trucking time would serve all areas in the 135 minute trucking time with the addition of all junctions of the M25, The M1 corridor to Luton, the A1(M) to	This response assumes knowledge about the dynamics of market penetration and freight journey times that require further explanation. Moreover, the Appendices referred to were not attached to your email. **Response on 30th October 2018** I am content with the passenger trip distribution, which is usefully informed by actual ticketing data from EU Jet's operations at Manston. With regard to the freight trip distribution,	these provided on 30th October. **Response on 30th October 2018** It is pleasing that the provision of the appendices has addressed the issues remaining with passenger distribution which as partiocually resolved the issues in point 11. All that remains is

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	Dartford areas of Kent.	Stevenage, M11 to Stevenage, M23/A23 corridor to Brighton and the M3 to Farnborough. The areas located within the trucking time zones have reasonable journey times to Manston Airport. Air cargo trips generated in this area could serve the freight terminal at Manston Airport. Appendix 2 sets out the plans of the GIS assessment set out above. As with the freight capacity information is also from data submitted to the Davies Commission.	could you please explain the significance of the 135 minute and 150 minute trucking times?	to provide more detailed of the trucking times and this will be provided separately once the member of the project team has provided a more detailed narrative to Wood to send onto KCC.
12.	The gravity model approach to distributing passenger trips is considered appropriate in principle, albeit if first-hand information from the most recent period of passenger operations at Manston is available, this would be preferred.	It is pleasing to see KCC agreeing that the gravity model approach for distributing passengers is appropriate. The details on the most recent passenger operations at Manston are not available to us to use.	**Comments Accepted**	N/A
13.	Whilst the gravity model approach to distributing	The detailed gravity models for this element of the site have already been based on the Mid-Level Super output areas for the 2011 census (Journey to work data) that KCC have	**Response on 26th October 2018**	**Response on 30th October 2018**

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employee trips to/from the Northern Grass area is acceptable, this should be cross-referenced with 2011 Census Journey to work data for the local Middle-level Super Output Areas for validation purposes.	suggested in this comment. The only exceptions to this are for locations outside Thanet where it was appropriate to gather data from a larger source such as district level.	This is noted and generally accepted; however as we discussed at our recent meeting, it needs to be cross-referenced against the Economic Assessment (or similar) accompanying the DCO application to ensure consistency.	Section 5.3 of *The Economic and Social Impacts of Airport Operations Volume 4 of Manston Airport; National and Regional Aviation Asset*, by Azimuth Associated, dated July 2018 (part of the DCO submission) includes job forecasts by location, however, does not provide any level of detail that could be used for the TA. The approach undertaken for the purpose of the transport assessment, and reported in the TA was to develop a gravity model which resulted in the following distributions:) Thanet 76.16%

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				) Remaining East Kent – 23.65%) West Kent – 0.2%
14.	It is not considered appropriate to distribute the Northern Grass area HGV trips on the same basis as the freight trips, as the nature of these businesses may be significantly different. It is considered that their catchment area is likely to be more localised.	The businesses on the Northern Grass Area will be complementary to the airport: 75% of the building areas will be warehouses which will support the proposed cargo facility, likely to comprise large scale and nationally focused businesses that will be looking to serve the South East. A relevant example is East Midlands Airport, the UK's second busiest cargo airport, handling more than 320,000 tonnes p.a. and is the UK hub for DHL and UPS, and support operations for TNT and Royal Mail. UPS has a current hub of 86,000sqft adjacent to the airport and intends to expand this to a 28.5 acre plot costing £114 million. This type of facility serves a wider area than just the local area - data in the Transport Assessment for the UPS planning application indicates that only 1-2% of the total HGVs generated by the site would have origins/destinations within an area local to the East Midlands Airport. This is reflective of the figure of 95% presented within the Manston Airport DCO Transport Assessment. It is clear that these large freight facilities constructed next to airports be that UPS, DHL, Amazon etc are regionally focused and for Manston London and the surrounding areas focused. There will be a smaller office element, but this does not generate significant HGvs and as such it not considered as important as the detailed set out above. This would be more locally focused as reflected in light vehicle trip distribution matrix.	**Response on 26th October 2018** I am not persuaded by this response, as again the geography of East Kent is not at all comparable to that of the East Midlands, which enjoys far superior connectivity to a catchment area encompassing many of England's largest towns and cities. It seems to me inevitable therefore that the nature of the businesses that will locate in the Northern Grass Area will be	**Response on 30th October 2018** This response seems to be based on opinion and ignores the fact that the Manston Airport proposal has been accepted as a Nationally Significant Infrastructure Project on the basis that there is a need for additional air freight capacity in the south east. The location of a distribution company such as UPS or DHL is linked to the opportunity that the cargo airport provides, and the

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		materially different to DHL, UPS etc. in many cases.	road connectivity is less relevant. There is ample evidence of other cargo airports which have colocations of distribution companies.

Issued by

Glyn Price

[redacted]

Approved by

Bev Coupe

[redacted]

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Appendix 1

Market Analysis to 2030

From the demand profiling work we undertook for our Interim Measures submission, we are confident that there are a number of niche's in the South East passenger market that Manston could help to address, not only in the medium term, but depending on future capacity development scenarios elsewhere, also in the period between 2025-50, which we are taking to correspond with the longer term.

Catchment Area

Using the most recent CAA survey data we have access to (from 2011 and 2012), we have been able to build up a picture of the nature and geographical distribution of existing demand within Manston's current core and extended catchment areas. These are illustrated in Figure 1, whose authenticity is verified by empirical evidence gathered during EU Jets operation from Manston in 2005, illustrated in Figure 2.

Figure 1: Manston Airports Catchment Area

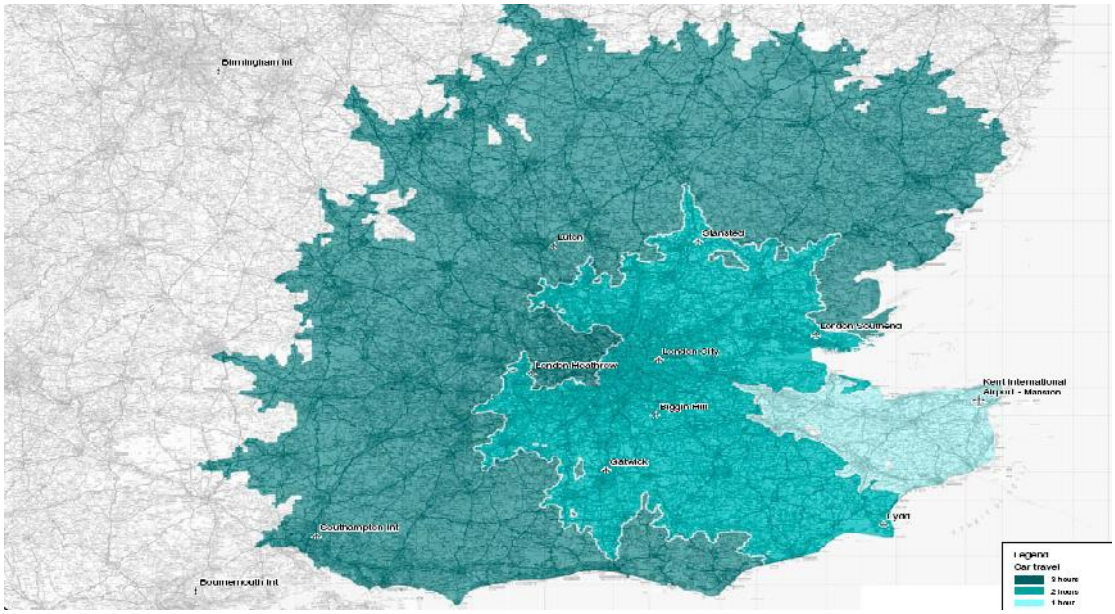
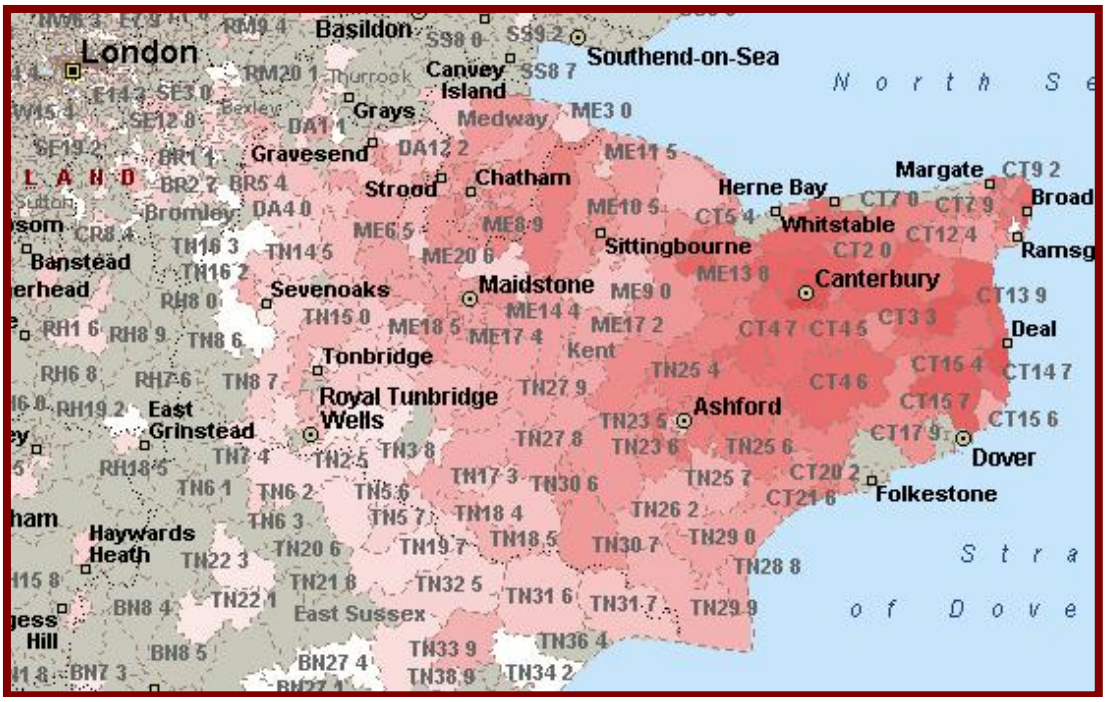


Figure 2: Distribution of EU Jet Passengers Using Manston in 2005



As can be seen, while the Airport's core catchment is focused in Kent within an area bounded by the M25 and M20, its wider (or contested catchment) expands beyond both into East Sussex and the outer London suburbs East and South East of the capital.

Based on this analysis, we sought to identify how many air travellers who use other airports in the London area, have their origins or destinations within Manston's catchment area. We looked at this first based on existing surface access infrastructure and associated travel times, and then extrapolated this based on assumptions about those links to be improved or extended. This then provided a useful platform for the second part of the analysis, which examined the picture painted by DfT's 2011 and 2013 forecasts, in terms of the potential scale and nature of the capacity shortfall facing the South East moving forwards, and the contribution Manston can potentially make to meeting some of that shortfall by targeting certain key markets. This in turn, then acts as a forerunner to a brief description of how Manston could be developed to meet this demand before setting out a series of generic and airport specific policy propositions that we consider necessary to facilitate Manston taking on this role.

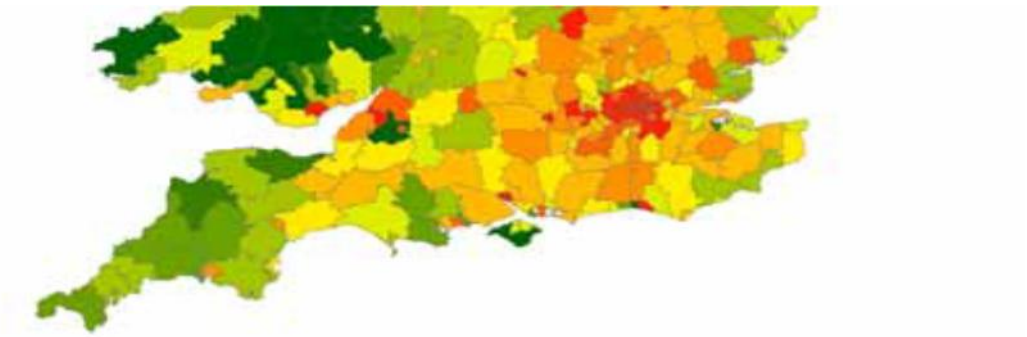
It is worth pointing out at this juncture, that this approach has been driven by the absence of any DfT Forecasting model runs that have included Manston. We know that there are spare slots within the model to add airports, and we hope that the Commission will at the very least request DfT produce model outputs for Manston under a Constrained (or Max Use) scenario and one with one additional runway added either at Heathrow or Stansted by 2030 but with the surface access enhancements we outline later incorporated.

Demand Assessment

Figure 3 below, provides an overview of current demand density in the southernmost part of the UK. As can be seen, the level of demand for air travel emanating from Kent is comparable

with other parts of the Home Counties around London, save for those immediately adjacent to Heathrow and Gatwick.

Figure 3: Density of Demand in the Southern Half of England and Wales



Source: CAA Data

Our analysis of O&D survey data collected from the other London airports, indicates that Manston's core and floating catchment areas currently generate demand of between 3.5-4.0m passengers per annum, depending on where the exact boundaries of the Airport's catchment is drawn (see Table 1).

Table 1: Leakage from Manston's Catchment

MSE	Leakage		
Outer catchment	Business	Leisure	Total
Dartford District	39,433	231,649	271,082
Gravesham District	31,236	158,594	189,829
Hastings District	26,554	135,992	162,546
Maidstone District	52,142	300,236	352,378
Medway	68,439	388,215	456,654
Rother District	15,862	109,763	125,626
Sevenoaks District	41,058	295,695	336,753
Tonbridge and Malling District	27,932	198,425	226,357
Tunbridge Wells District	79,579	254,615	334,194
Grand Total	382,235	2,073,183	2,455,418
MSE	Leakage		
Inner catchment	Business	Leisure	Total
Ashford District	33,918	193,472	227,390
Canterbury District	46,218	294,806	341,024
Dover District	20,628	164,176	184,805
Shepway District	19,251	125,768	145,018
Swale District	37,863	148,213	186,076
Thanet District	50,628	181,701	232,329
Grand Total	208,504	1,108,138	1,316,642

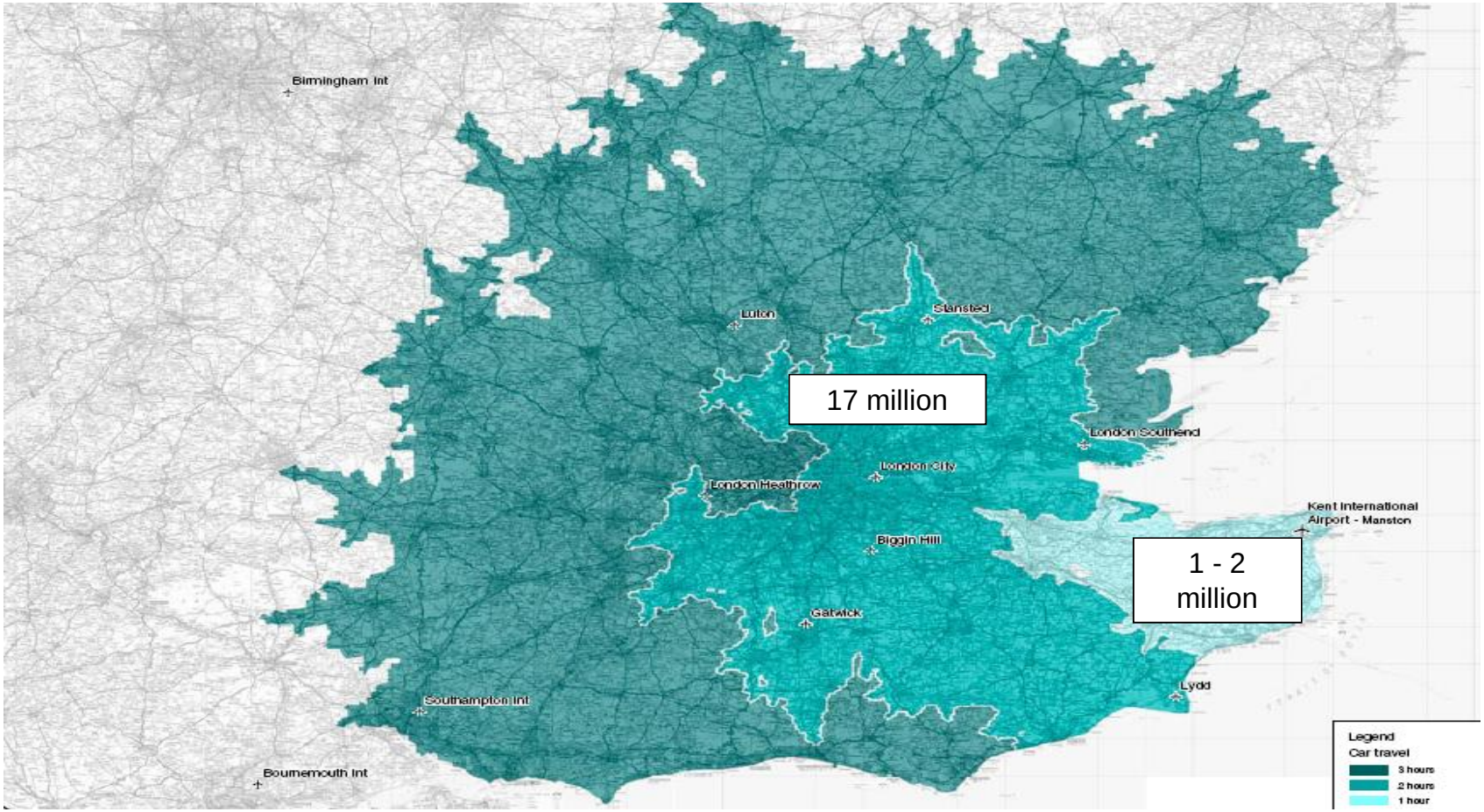
MSE	Leakage		
Total catchment	Business	Leisure	Total
Total	590,740	3,181,321	3,772,060

However, from that same analysis and the fact that between 50-100,000 passengers are expected to use Manston this year, we know that most of this traffic is 'leaking' to other South East airports. The data suggests by far the largest percentage of this leaking traffic (around 85%) uses Gatwick and that much of it is leisure orientated (i.e. it is predominantly point-to-point and therefore not dependent on access to a hub airport such as Heathrow to be viable).

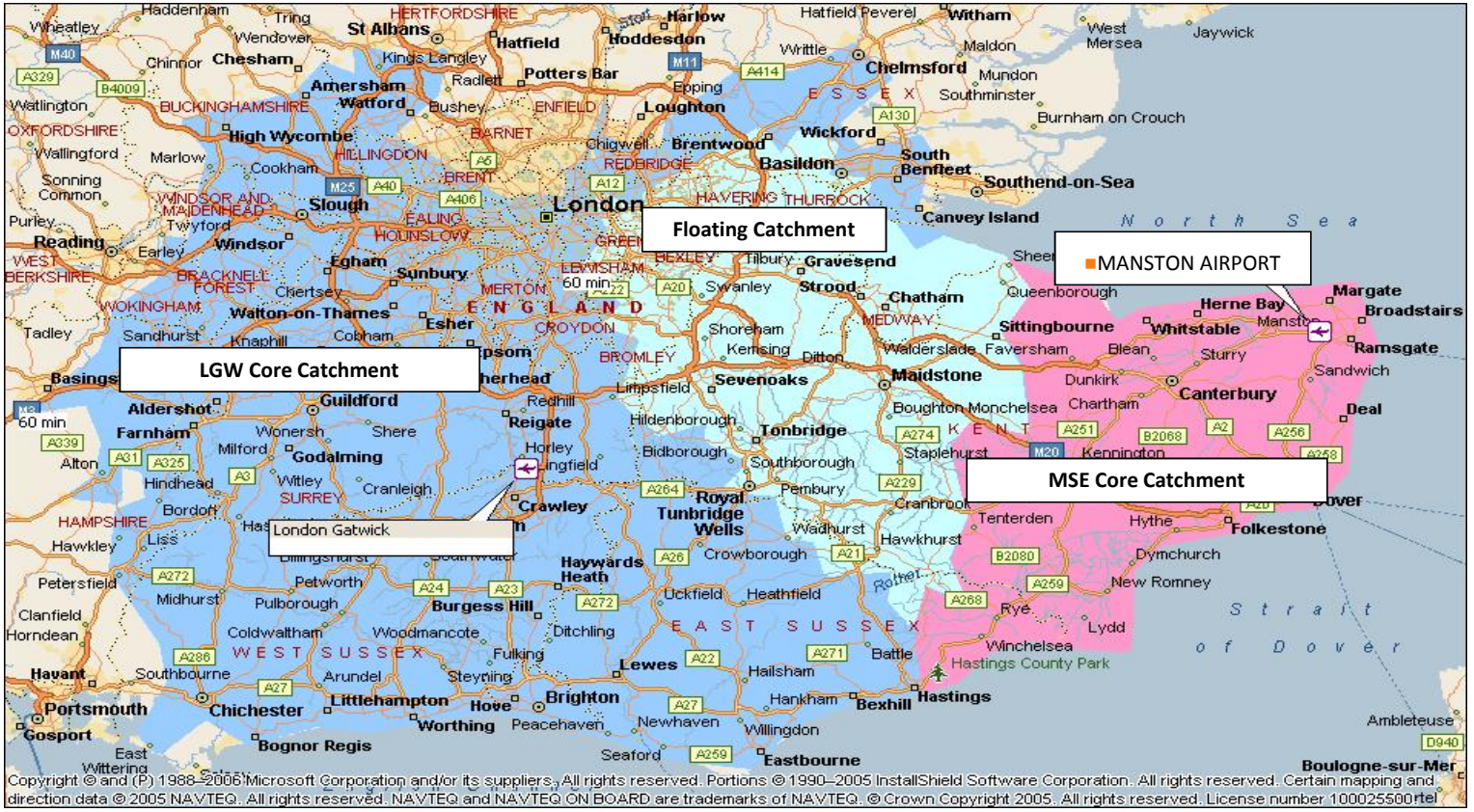
This is important, because in a Maximum Use scenario such as that the South East is likely to face until at least 2025, which is likely to be characterised by an increasing shortfall in capacity relative to demand, it is the premium hub airports such as Heathrow and Gatwick where capacity will be most constrained (see Appendix A). This also means that it is these airports where the price of access is likely to rise substantially, displacing thinner route domestic and short haul regional and low cost traffic serving routes with a high VFR/leisure content – a process that can be seen in action with Flybe's sale of its Gatwick slots, but also in Appendix B. It is exactly this traffic, where the journey's are point-to-point, frequency is less significant, airport charges need to be low, but speed and convenience of using an airport high that will have the greatest potential to move to alternative lower cost airports such as Manston.

PAX CATCHMENT INFO

Catchment Area

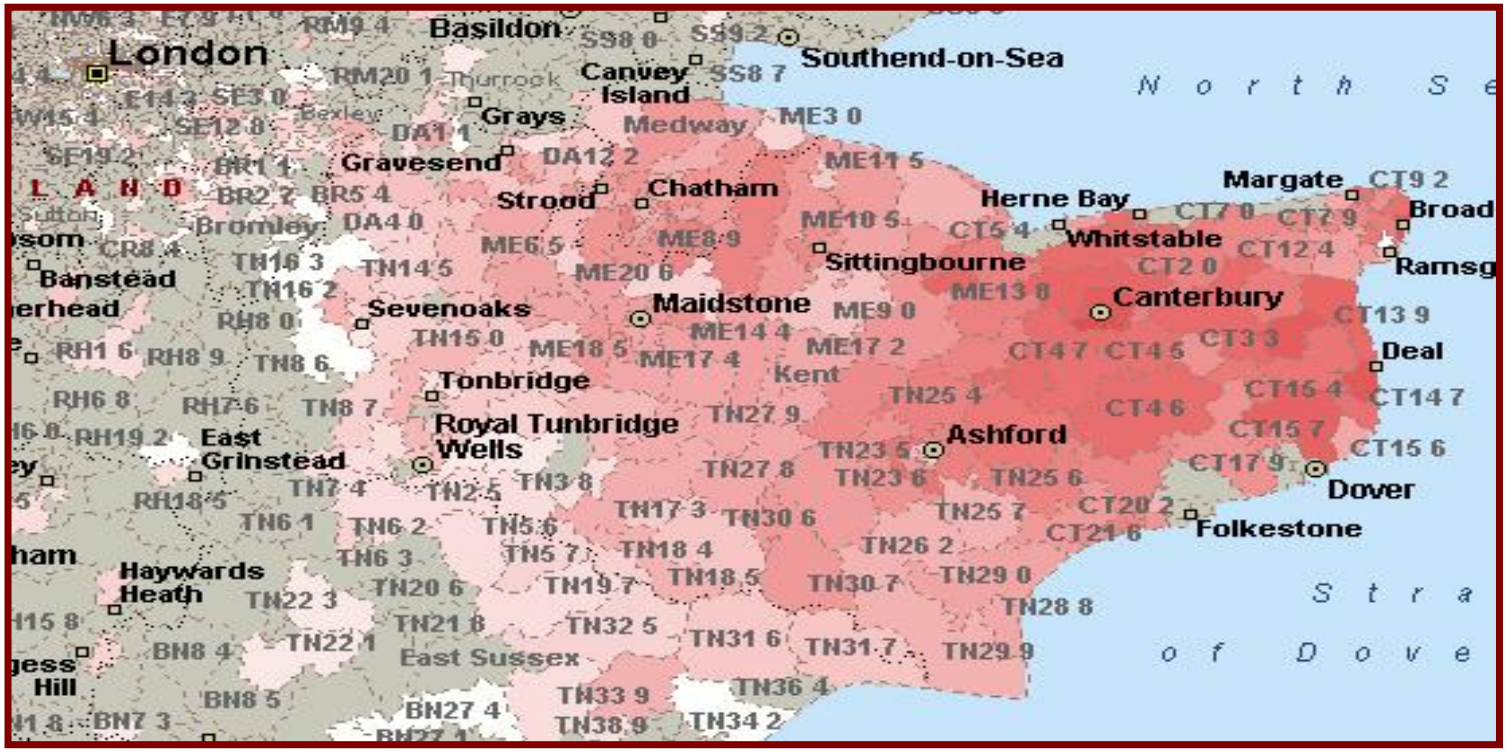


Current Market



EUJet Actuals Data 2005

- EUJet services confirmed the market response to services offered at MSE



Catchment Analysis

- Catchment Area:
  - ‘Core’ catchment: area where passengers are more closely located to Manston than all other competing airports
  - ‘Floating’ catchment: area where drive times to/from Manston are similar to competing airports
  - Level of market penetration is likely to be substantially lower in the floating catchment
- Catchment Population:
  - ‘Core’ is made up of 726,600 people and includes 6 districts within Kent
  - ‘Floating’ is made up of 889,800 people and covers 7 districts within Kent and East Sussex
  - Total in 2007 was 1,616,400 people
- Total Passengers
  - C 4mppa, with most using LHR and LGW

Core Catchement	Population
Ashford	112,500
Canterbury	148,000
Dover	106,600
Shepway	100,100
Swale	130,200
Thanet	129,200
Total Core Catchmen	726,600

Floating Catchment	Population
Gravesham	97,700
Hastings	86,200
Maidstone	144,200
Medway	252,200
Rother	88,200
Tonbridge and Mallin	115,700
Tunbridge Wells	105,600
Total Floationg Catch	889,800
Total Combined	1,616,400

Data from UK National Statistics
Key Population and Vital Statistics - 2007

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Appendix 2

15 min per hour penalty to demonstrate very heavy traffic:

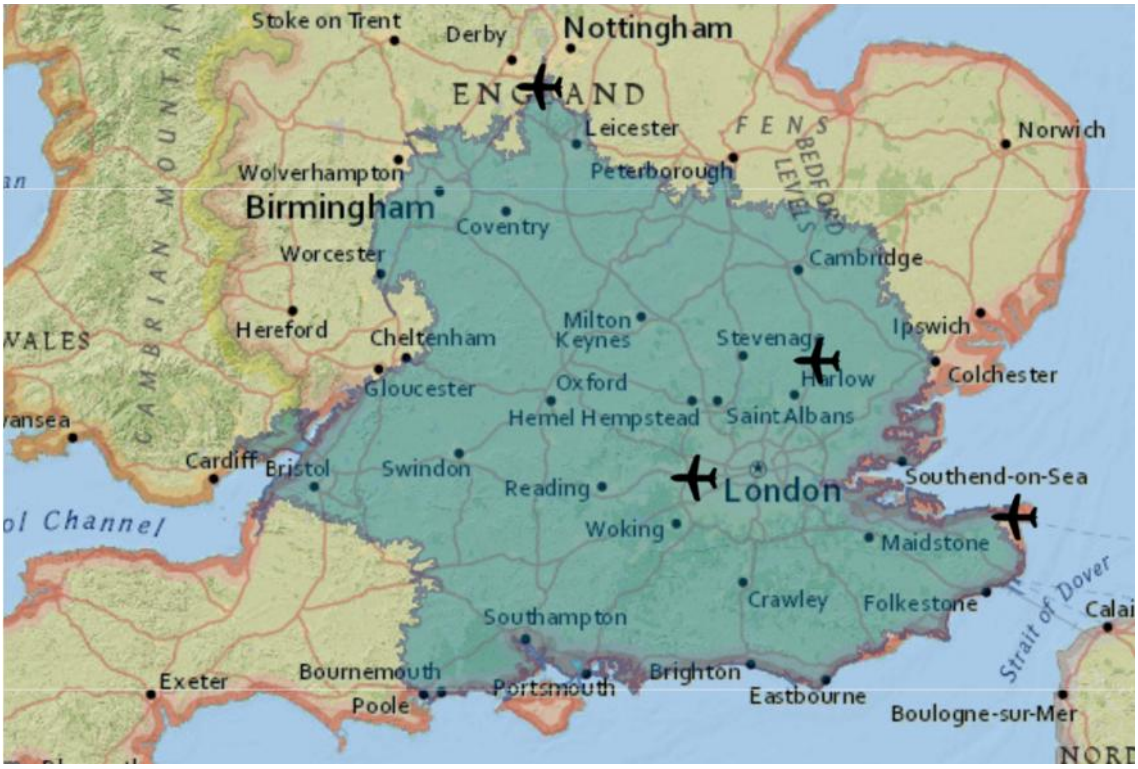
Manston airport (135mins):

East Midlands (135mins):

Manston airport vs East Midlands (135mins):

CLEVELAND HILLS
Britain
YORKSHIRE DALES
PENNINES
York
Kingston upon Hull
Preston
Leeds
Manchester
Sheffield
Lincoln
Stoke on Trent
Derby
Nottingham
ENGLAND
Leicester
FENS
BEDFORD LEVELS
Norwich
Wolverhampton
Peterborough
Birmingham
Coventry
Worcester
Cambridge
Hereford
Cheltenham
Milton Keynes
Stevenage
Ipswich
Harlow
Colchester
Gloucester
Oxford
Hemel Hempstead
Saint Albans
Bristol
Swindon
Reading
London
Southend-on-Sea
Woking
Maidstone
Crawley
Folkestone
Calais
Strait of Dover
Southampton
Bournemouth
Brighton
Portsmouth
Eastbourne
Poole
Boulogne-sur-Mer

Heathrow airport (135mins):



Stansted airport (135mins):

Manston and Heathrow (135mins):

Manston vs Stansted (135mins):

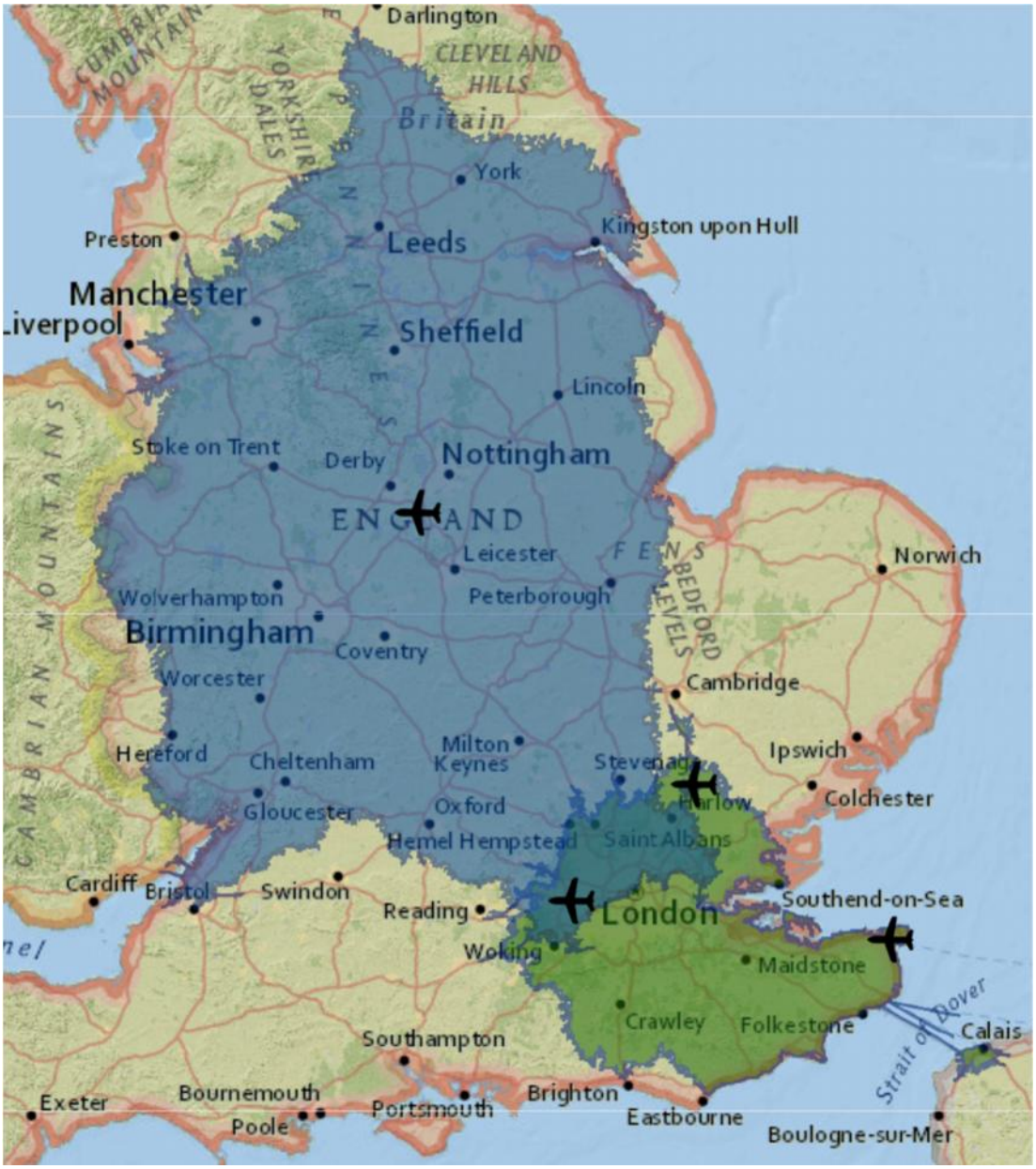
All 4 combined (135mins):

10min per hour penalty to demonstrate rush hour:

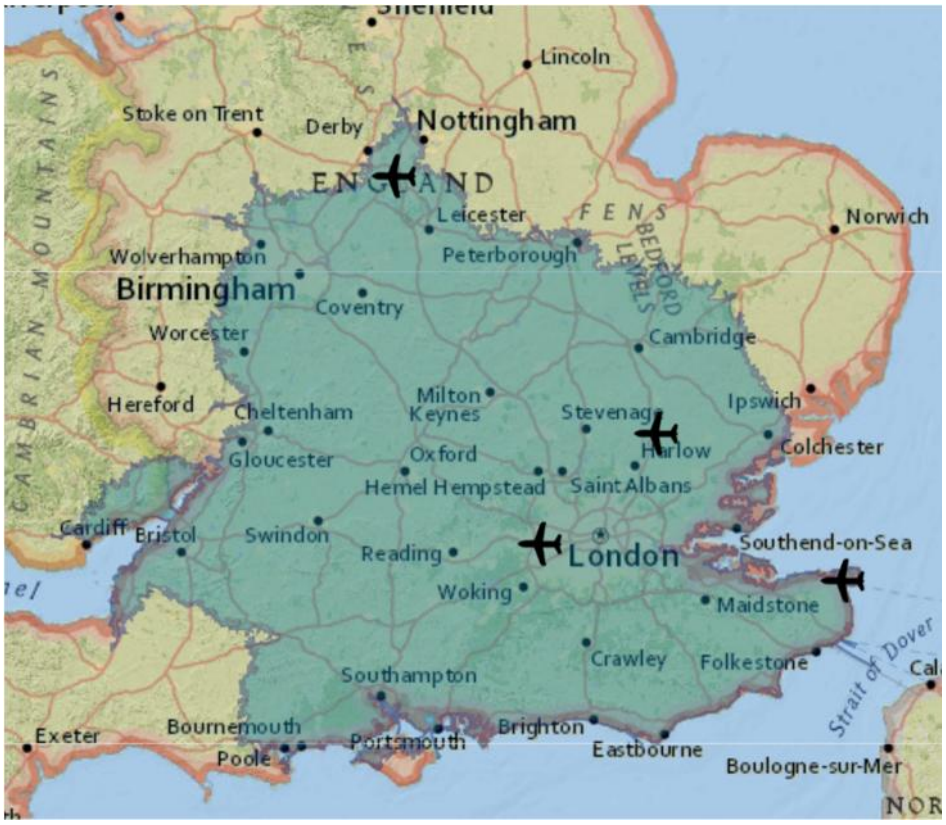
Manston Airport (150mins):

East Midlands (150mins):

Manston airport vs East Midlands (150mins):



Heathrow airport (150mins):

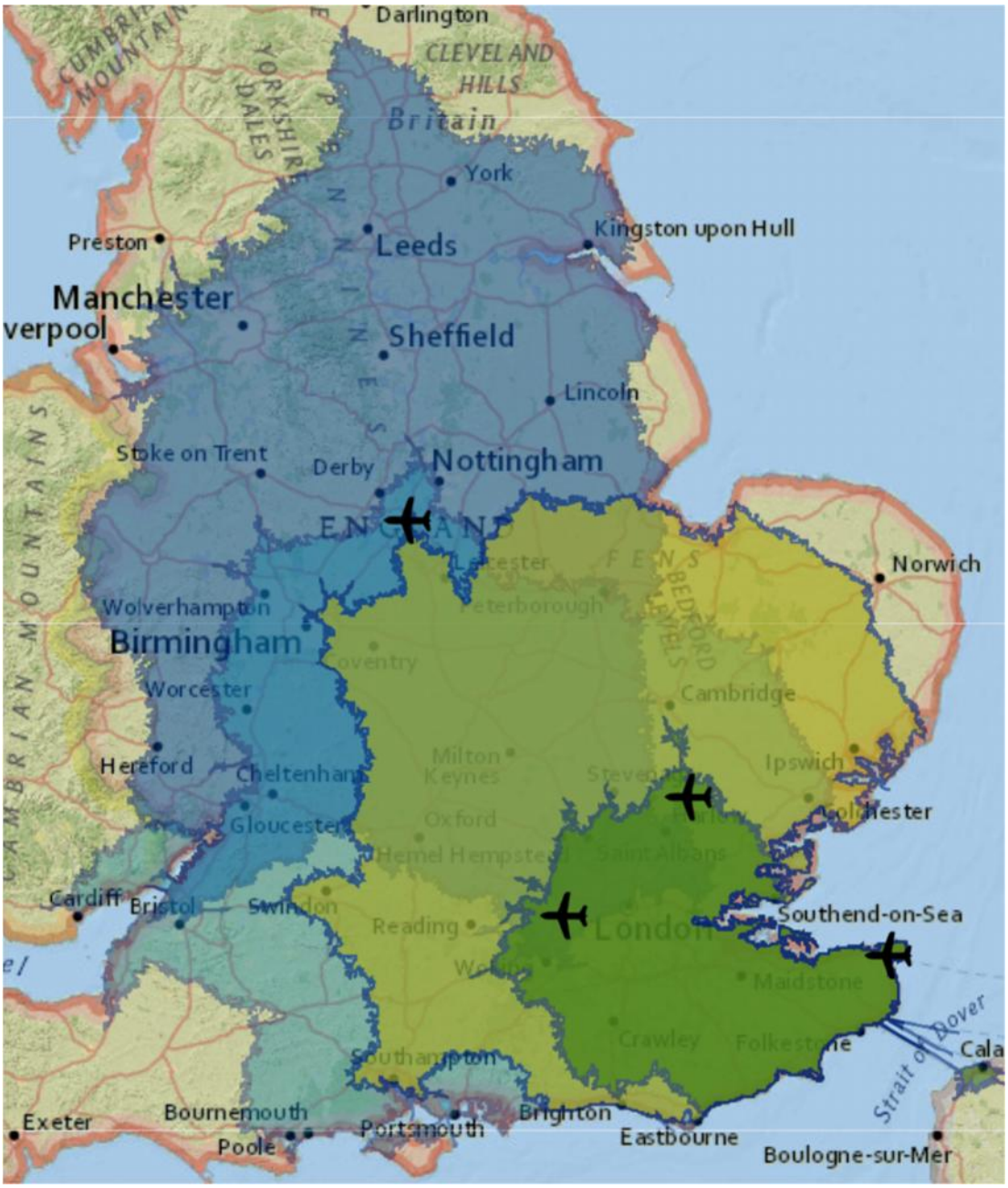


Stansted airport (150mins):

Manston airport vs Heathrow (150mins):

Manston vs Stansted airport (150mins):

All 4 combined (150mins):



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Appendix C
Traffic Generation Tables

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Appendix C:
Traffic Generation Tables

Table 1.1 Anticipated Departures

Total flights split by time of day	Arrivals																			
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
06:00 - 07:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
07:00 - 08:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00
08:00 - 09:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
09:00 - 10:00																				
10:00 - 11:00																				
11:00 - 12:00																				
12:00 - 13:00																				
13:00 - 14:00						1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14:00 - 15:00												1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
15:00 - 16:00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
16:00 - 17:00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
17:00 - 18:00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18:00 - 19:00				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
19:00 - 20:00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20:00 - 21:00																				
21:00 - 22:00																				
22:00 - 23:00																				

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Table 1.2 Anticipated Arrivals

Total flights split by time of day	Departures																		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
06:00 - 07:00																				
07:00 - 08:00																				
08:00 - 09:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
09:00 - 10:00						1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10:00 - 11:00																				
11:00 - 12:00																	1.00	1.00	1.00	1.00
12:00 - 13:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13:00 - 14:00														1.00	1.00	1.00	1.00	1.00	1.00	1.00
14:00 - 15:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
15:00 - 16:00																				1.00
16:00 - 17:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
17:00 - 18:00																				
18:00 - 19:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
19:00 - 20:00						1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20:00 - 21:00														1.00	1.00	1.00	1.00	1.00	1.00	1.00
21:00 - 22:00									1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22:00 - 23:00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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Table 1.3 Passenger Numbers Per Departures

Total flights split by time of day	Departures																		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
06:00 - 07:00			170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
07:00 - 08:00			170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	340.20	340.20	340.20	340.20	340.20
08:00 - 09:00			52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00
09:00 - 10:00																				
10:00 - 11:00																				
11:00 - 12:00																				
12:00 - 13:00																				
13:00 - 14:00						170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
14:00 - 15:00												170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
15:00 - 16:00			170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	340.20	340.20
16:00 - 17:00			170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
17:00 - 18:00			52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00
18:00 - 19:00						170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	340.20
19:00 - 20:00			170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
20:00 - 21:00																				
21:00 - 22:00																				
22:00 - 23:00																				

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Table 1.4 Passenger Numbers Per Arrivals

Total flights split by time of day	Arrivals																		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
06:00 - 07:00																				
07:00 - 08:00																				
08:00 - 09:00				170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
09:00 - 10:00							170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
10:00 - 11:00																				
11:00 - 12:00																		170.10	170.10	170.10
12:00 - 13:00				52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00
13:00 - 14:00															170.10	170.10	170.10	170.10	170.10	170.10
14:00 - 15:00				170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
15:00 - 16:00																				
16:00 - 17:00				170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
17:00 - 18:00																				
18:00 - 19:00				52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00
19:00 - 20:00							170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
20:00 - 21:00															170.10	170.10	170.10	170.10	170.10	170.10
21:00 - 22:00										170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10
22:00 - 23:00				170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10	170.10

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Table 1.5 Passenger Movements for Flight Departures (Requiring Arrivals to the Airport Site)

Time	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
03:00 - 04:00			51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
04:00 - 05:00			170	170	170	170	170	170	170	170	170	170	170	170	170	221	221	221	221	221
05:00 - 06:00			135	135	135	135	135	135	135	135	135	135	135	135	135	254	254	254	254	254
06:00 - 07:00			36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
07:00 - 08:00			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 - 09:00			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00 - 10:00			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 - 11:00			0	0	0	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
11:00 - 12:00			0	0	0	119	119	119	119	119	119	170	170	170	170	170	170	170	170	170
12:00 - 13:00			51	51	51	51	51	51	51	51	51	170	170	170	170	170	170	170	221	221
13:00 - 14:00			170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	289	289
14:00 - 15:00			135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135
15:00 - 16:00			36	36	36	87	87	87	87	87	87	87	87	87	87	87	87	87	87	138
16:00 - 17:00			51	51	51	170	170	170	170	170	170	170	170	170	170	170	170	170	170	289
17:00 - 18:00			119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119

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Table 1.6 Passenger Movements for Flight Arrivals (Requiring departure from the Airport Site)

Time	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
09:00 - 10:00			170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
10:00 - 11:00			0	0	0	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
11:00 - 12:00			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 - 13:00			0	0	0	0	0	0	0	0	0	0	0	0	0	0	170	170	170	170
13:00 - 14:00			52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
14:00 - 15:00			0	0	0	0	0	0	0	0	0	0	0	170	170	170	170	170	170	170
15:00 - 16:00			170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
16:00 - 17:00			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	170
17:00 - 18:00			170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
18:00 - 19:00			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00 - 20:00			52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
20:00 - 21:00			0	0	0	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
21:00 - 22:00			0	0	0	0	0	0	0	0	0	0	0	170	170	170	170	170	170	170
22:00 - 23:00			0	0	0	0	0	0	170	170	170	170	170	170	170	170	170	170	170	170
23:00 - 00:00			170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170

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Table 1.7 Total Light Vehicle Traffic – Passenger Terminal

LGVs	Year 1			Year 2			Year 3			Year 4			Year 5			Year 6			Year 7			Year 8			Year 9			Year 10		
Time	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total
Total	0	0	0	0	0	0	1158	1118	2276	1158	1118	2276	1158	1118	2276	1600	1559	3159	1600	1559	3159	1600	1559	3159	1690	1690	3380	1690	1690	3380
00:00 - 01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 - 02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 - 03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 - 04:00	0	0	0	0	0	0	41	28	69	41	28	69	41	28	69	41	28	69	41	28	69	41	28	69	41	28	69	41	28	69
04:00 - 05:00	0	0	0	0	0	0	135	94	230	135	94	230	135	94	230	135	94	230	135	94	230	135	94	230	135	94	230	135	94	230
05:00 - 06:00	0	0	0	0	0	0	103	71	175	103	71	175	103	71	175	103	71	175	103	71	175	103	71	175	103	71	175	103	71	175
06:00 - 07:00	0	0	0	0	0	0	28	19	47	28	19	47	28	19	47	28	19	47	28	19	47	28	19	47	28	19	47	28	19	47
07:00 - 08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 - 09:00	0	0	0	0	0	0	90	131	221	90	131	221	90	131	221	90	131	221	90	131	221	90	131	221	90	131	221	90	131	221
09:00 - 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	131	221	90	131	221	90	131	221	90	131	221	90	131	221
10:00 - 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	27	66	39	27	66	39	27	66	39	27	66	39	27	66
11:00 - 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	63	154	91	63	154	91	63	154	91	63	154	91	63	154
12:00 - 13:00	0	0	0	0	0	0	67	67	134	67	67	134	67	67	134	67	67	134	67	67	134	67	67	134	67	67	134	67	67	134
13:00 - 14:00	0	0	0	0	0	0	131	90	221	131	90	221	131	90	221	131	90	221	131	90	221	131	90	221	131	90	221	131	90	221
14:00 - 15:00	0	0	0	0	0	0	193	202	395	193	202	395	193	202	395	193	202	395	193	202	395	193	202	395	193	202	395	193	202	395
15:00 - 16:00	0	0	0	0	0	0	28	19	47	28	19	47	28	19	47	67	46	113	67	46	113	67	46	113	67	46	113	67	46	113
16:00 - 17:00	0	0	0	0	0	0	129	158	287	129	158	287	129	158	287	221	221	441	221	221	441	221	221	441	221	221	441	221	221	441
17:00 - 18:00	0	0	0	0	0	0	91	63	154	91	63	154	91	63	154	91	63	154	91	63	154	91	63	154	91	63	154	91	63	154
18:00 - 19:00	0	0	0	0	0	0	28	40	67	28	40	67	28	40	67	28	40	67	28	40	67	28	40	67	28	40	67	28	40	67
19:00 - 20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	131	221	90	131	221	90	131	221	90	131	221	90	131	221
20:00 - 21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00 - 22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	131	221	90	131	221

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22:00 - 23:00	0	0	0	0	0	0	94	135	230	94	135	230	94	135	230	94	135	230	94	135	230	94	135	230	94	135	230	94	135	230
23:00 - 00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LGVs	Year 11			Year 12			Year 13			Year 14			Year 15			Year 16			Year 17			Year 18			Year 19			Year 20		
Time	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total
Total	1579	1578	3157	1699	1661	3360	1699	1661	3360	1865	1900	3765	1865	1900	3765	1989	1987	3977	2073	2107	4180	2073	2107	4180	2192	2190	4382	2216	2212	4428
00:00 - 01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 - 02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 - 03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 - 04:00	41	29	70	41	29	70	41	29	70	41	29	70	41	29	70	41	29	70	41	29	70	41	29	70	41	29	70	41	30	71
04:00 - 05:00	137	97	234	137	97	234	137	97	234	137	97	234	137	97	234	178	126	304	178	126	304	178	126	304	178	126	304	180	129	309
05:00 - 06:00	95	66	160	95	66	160	95	66	160	95	66	160	95	66	160	178	124	302	178	124	302	178	124	302	178	124	302	162	113	276
06:00 - 07:00	26	18	43	26	18	43	26	18	43	26	18	43	26	18	43	26	18	43	26	18	43	26	18	43	26	18	43	23	16	40
07:00 - 08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 - 09:00	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	76	109	185
09:00 - 10:00	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	76	109	185
10:00 - 11:00	36	25	61	36	25	61	36	25	61	36	25	61	36	25	61	36	25	61	36	25	61	36	25	61	36	25	61	33	23	55
11:00 - 12:00	84	58	142	120	83	203	120	83	203	120	83	203	120	83	203	120	83	203	203	203	405	203	203	405	203	203	405	185	185	369
12:00 - 13:00	61	61	123	145	120	265	145	120	265	145	120	265	145	120	265	145	120	265	145	120	265	145	120	265	181	145	325	165	132	297
13:00 - 14:00	120	83	203	120	83	203	120	83	203	203	203	405	203	203	405	203	203	405	203	203	405	203	203	405	286	261	547	261	238	499
14:00 - 15:00	178	185	363	178	185	363	178	185	363	178	185	363	178	185	363	178	185	363	178	185	363	178	185	363	178	185	363	162	169	331
15:00 - 16:00	61	43	104	61	43	104	61	43	104	61	43	104	61	43	104	61	43	104	61	43	104	61	43	104	61	43	104	165	171	335
16:00 - 17:00	203	203	405	203	203	405	203	203	405	203	203	405	203	203	405	203	203	405	203	203	405	203	203	405	203	203	405	261	238	499
17:00 - 18:00	84	58	142	84	58	142	84	58	142	84	58	142	84	58	142	84	58	142	84	58	142	84	58	142	84	58	142	76	53	129
18:00 - 19:00	25	37	62	25	37	62	25	37	62	25	37	62	25	37	62	25	37	62	25	37	62	25	37	62	25	37	62	23	33	56
19:00 - 20:00	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	76	109	185

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20:00 - 21:00	0	0	0	0	0	0	0	0	0	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	76	109	185
21:00 - 22:00	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	83	120	203	76	109	185
22:00 - 23:00	97	137	234	97	137	234	97	137	234	97	137	234	97	137	234	97	137	234	97	137	234	97	137	234	97	137	234	100	138	238
23:00 - 00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Appendix D
Traffic Generation Tables – Total Manston Airport Traffic

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Appendix D:
Traffic Generation Tables – Total Manston Airport Traffic.

Table 1.1 Total Trip Generation for all Airport Staff

	Year 1			Year 2			Year 3			Year 4			Year 5			Year 6			Year 7			Year 8			Year 9			Year 10		
Time	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total
Total	186	188	373	705	702	1383	2461	2409	4846	2839	2783	5594	2872	2816	5660	3622	3565	7151	3685	3621	7270	3728	3662	7354	3799	3774	7537	3882	3857	7703
00:00 - 01:00	1	3	4	3	11	14	3	39	42	5	42	46	6	42	48	6	54	60	6	55	61	6	55	61	6	56	62	6	56	63
01:00 - 02:00	1	1	2	3	3	6	3	3	7	4	5	8	5	6	10	5	6	11	5	6	11	5	6	11	5	6	11	5	6	12
02:00 - 03:00	1	1	2	3	3	6	3	3	7	6	4	9	6	5	10	6	5	11	6	5	11	6	5	11	6	5	11	6	5	12
03:00 - 04:00	1	1	2	2	3	5	43	32	75	44	33	77	45	33	78	45	33	79	46	33	79	46	33	79	47	34	81	46	35	80
04:00 - 05:00	20	1	21	32	2	34	195	96	291	197	98	295	199	99	298	212	99	311	212	99	311	212	99	311	212	100	313	212	99	312
05:00 - 06:00	9	1	10	63	3	66	214	79	293	248	79	327	250	81	331	278	81	359	282	82	364	286	81	367	282	82	364	290	82	371
06:00 - 07:00	1	10	11	3	70	74	35	144	179	36	183	219	37	185	221	37	216	252	37	220	257	37	225	262	37	221	258	37	230	267
07:00 - 08:00	1	1	2	34	13	44	76	27	101	106	36	140	109	36	143	134	44	173	138	45	179	142	46	184	141	45	183	149	48	193
08:00 - 09:00	14	1	15	115	13	126	291	162	451	355	173	526	359	174	530	407	184	587	418	186	600	424	187	607	420	188	604	435	189	619
09:00 - 10:00	3	2	5	34	18	50	77	35	110	109	46	152	111	48	156	223	188	407	230	190	416	233	192	420	231	191	418	238	193	428
10:00 - 11:00	16	6	22	36	18	52	80	33	111	94	44	136	95	45	138	155	79	232	157	80	236	159	81	238	158	81	237	161	83	242
11:00 - 12:00	17	5	22	34	21	52	56	41	95	70	57	125	71	58	127	175	131	304	178	134	310	179	136	313	179	135	312	183	139	320
12:00 - 13:00	15	14	29	34	40	72	122	160	281	139	179	316	140	181	319	152	208	357	155	211	364	157	213	368	156	212	366	159	217	374
13:00 - 14:00	24	14	38	104	34	135	314	149	461	373	167	539	378	169	545	422	182	602	433	185	616	440	187	625	435	186	618	448	191	637
14:00 - 15:00	24	25	50	49	100	147	290	375	663	306	429	733	307	433	738	330	474	802	332	482	812	334	488	820	333	483	814	337	497	831
15:00 - 16:00	10	36	46	25	62	85	76	111	185	89	131	218	90	134	222	139	176	313	143	180	321	144	182	324	144	181	323	147	186	330
16:00 - 17:00	9	18	27	27	57	82	178	267	443	194	304	496	195	308	501	298	400	694	301	405	702	302	411	709	302	408	707	307	417	720
17:00 - 18:00	3	21	24	16	112	126	122	249	369	132	307	435	133	309	438	140	351	487	141	358	496	142	364	502	142	361	499	144	373	513

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18:00 - 19:00	1	4	5	8	33	39	44	125	167	49	146	193	50	148	195	53	174	223	54	177	227	55	179	229	55	177	228	55	181	233
19:00 - 20:00	1	1	2	3	2	5	7	6	14	9	9	17	9	9	17	99	139	238	99	139	239	99	140	239	99	140	239	99	140	239
20:00 - 21:00	1	1	2	3	3	6	7	7	15	9	9	17	9	9	17	9	9	18	9	9	18	10	9	19	10	9	19	10	9	20
21:00 - 22:00	10	1	11	70	3	74	125	7	132	164	9	173	166	9	175	196	9	205	201	9	210	206	10	216	292	141	433	302	141	443
22:00 - 23:00	1	9	10	2	63	65	97	243	340	99	280	378	99	282	381	99	308	407	99	313	412	99	317	416	100	314	414	100	322	422
23:00 - 00:00	1	10	12	2	13	16	2	15	17	4	16	19	4	16	20	4	16	20	4	16	20	4	17	21	5	17	23	5	18	23

	Year 11			**Year 12**			**Year 13**			**Year 14**			**Year 15**			**Year 16**			**Year 17**			**Year 18**			**Year 19**			**Year 20**		
Time	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total
Total	3860	3834	7658	4081	4015	8061	4169	4102	8235	4437	4444	8845	4550	4551	9065	4782	4749	9494	4973	4970	9903	5089	5084	10133	5327	5288	10571	5490	5445	10903
00:00 - 01:00	6	58	65	8	60	67	8	61	69	8	65	73	8	67	75	8	69	77	8	71	79	8	73	81	8	74	83	10	78	87
01:00 - 02:00	5	6	12	6	8	13	6	8	13	7	8	15	7	8	15	7	8	15	8	8	16	8	8	17	8	8	17	9	10	18
02:00 - 03:00	6	5	12	7	6	12	7	6	12	7	7	14	8	7	15	8	7	15	8	8	16	8	8	17	8	8	17	10	9	18
03:00 - 04:00	47	35	83	48	36	83	48	36	83	48	36	84	48	37	85	48	37	85	49	37	86	50	37	88	50	37	88	51	39	90
04:00 - 05:00	216	103	319	218	103	321	220	104	323	222	104	326	224	104	328	267	133	400	269	134	403	271	135	406	274	135	409	278	139	417
05:00 - 06:00	289	76	365	297	77	374	305	77	382	311	78	389	321	78	399	412	136	548	421	136	557	429	136	565	438	137	576	432	129	561
06:00 - 07:00	35	237	272	36	247	283	36	256	292	36	264	300	38	276	313	38	284	321	38	293	331	39	302	341	39	312	351	37	320	357
07:00 - 08:00	156	50	202	164	53	213	171	55	222	180	57	233	188	60	245	197	63	256	207	65	268	217	70	282	227	72	295	237	74	307
08:00 - 09:00	441	181	618	458	184	638	472	187	655	488	190	673	505	192	694	527	196	719	543	199	736	562	202	759	580	208	782	595	199	789
09:00 - 10:00	238	186	419	246	190	431	253	192	441	261	196	453	272	199	465	281	203	479	291	207	492	301	210	506	309	215	518	313	206	514

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10:00 - 11:00	161	84	243	165	86	249	170	88	255	174	91	263	181	94	273	185	99	281	190	101	289	195	104	296	200	107	305	203	110	312
11:00 - 12:00	178	137	313	219	165	382	223	169	390	227	172	396	231	177	407	235	181	414	322	306	626	328	310	636	332	315	644	323	304	626
12:00 - 13:00	158	217	373	247	281	525	250	287	535	254	295	547	259	302	559	263	308	569	267	315	580	274	323	595	316	357	670	306	354	659
13:00 - 14:00	451	189	637	466	193	657	479	197	674	578	321	897	594	326	918	611	331	941	627	336	961	644	342	985	750	410	1158	742	392	1133
14:00 - 15:00	326	492	816	331	505	834	335	518	851	342	529	869	347	545	890	353	559	910	358	572	929	365	587	950	371	603	972	366	605	970
15:00 - 16:00	145	188	331	148	193	339	152	199	349	156	204	358	160	209	367	164	216	379	169	222	388	174	229	401	177	235	410	288	374	661
16:00 - 17:00	292	407	695	295	418	709	299	427	723	304	437	737	309	448	752	313	461	769	317	471	785	322	483	801	328	496	819	394	547	937
17:00 - 18:00	139	380	515	142	394	533	144	405	546	146	421	563	149	435	579	152	453	601	156	466	617	159	483	636	162	499	655	158	515	669
18:00 - 19:00	55	184	236	56	191	244	57	197	250	59	204	259	60	211	267	62	218	275	63	225	283	64	232	292	66	239	301	65	243	304
19:00 - 20:00	93	129	222	93	129	222	93	129	222	94	130	224	94	131	225	94	131	225	95	131	226	96	131	227	96	132	229	90	121	211
20:00 - 21:00	10	9	20	11	10	20	11	10	20	95	130	225	95	131	226	95	131	226	96	132	228	96	133	229	96	133	230	90	122	212
21:00 - 22:00	303	130	433	313	130	444	322	130	452	330	131	461	341	132	472	349	132	481	357	133	490	366	133	499	376	133	509	379	122	501
22:00 - 23:00	103	332	435	103	340	444	104	348	451	105	356	461	105	365	470	105	375	479	105	383	488	106	392	498	106	402	508	109	412	521
23:00 - 00:00	5	18	23	6	18	23	6	18	24	7	19	26	7	19	26	7	19	26	7	19	27	7	21	28	7	21	28	9	21	29

Appendix E (part 1)
Market Analysis to 2030

From the demand profiling work we undertook for our Interim Measures submission, we are confident that there are a number of niche's in the South East passenger market that Manston could help to address, not only in the medium term, but depending on future capacity development scenarios elsewhere, also in the period between 2025-50, which we are taking to correspond with the longer term.

Catchment Area

Using the most recent CAA survey data we have access to (from 2011 and 2012), we have been able to build up a picture of the nature and geographical distribution of existing demand within Manston's current core and extended catchment areas. These are illustrated in **Figure 1**, whose authenticity is verified by empirical evidence gathered during EU Jets operation from Manston in 2005, illustrated in **Figure 2**.

Figure 1: Manston Airports Catchment Area

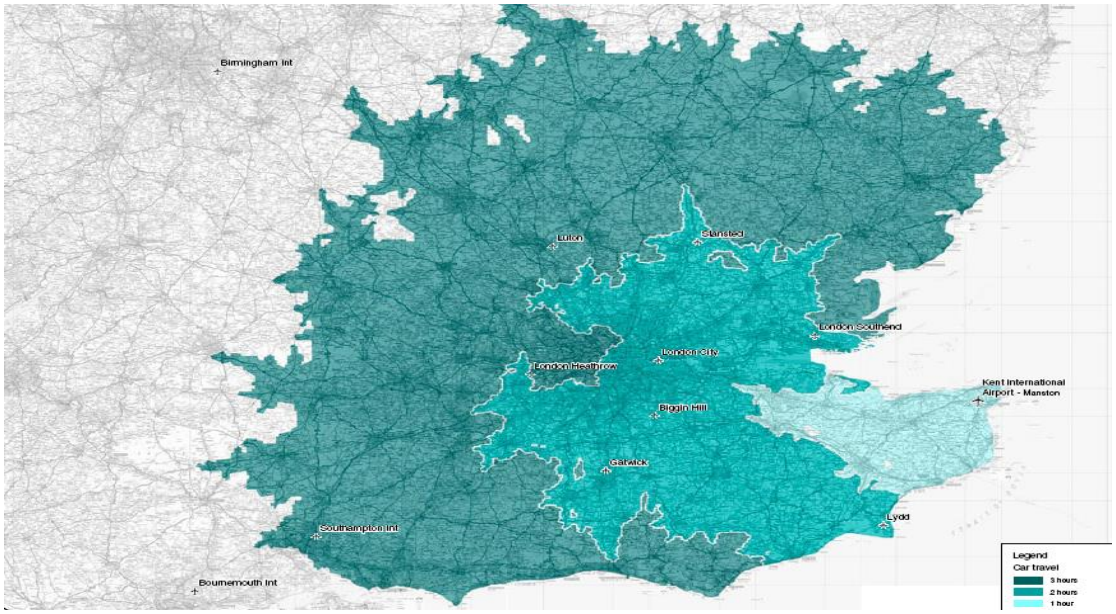
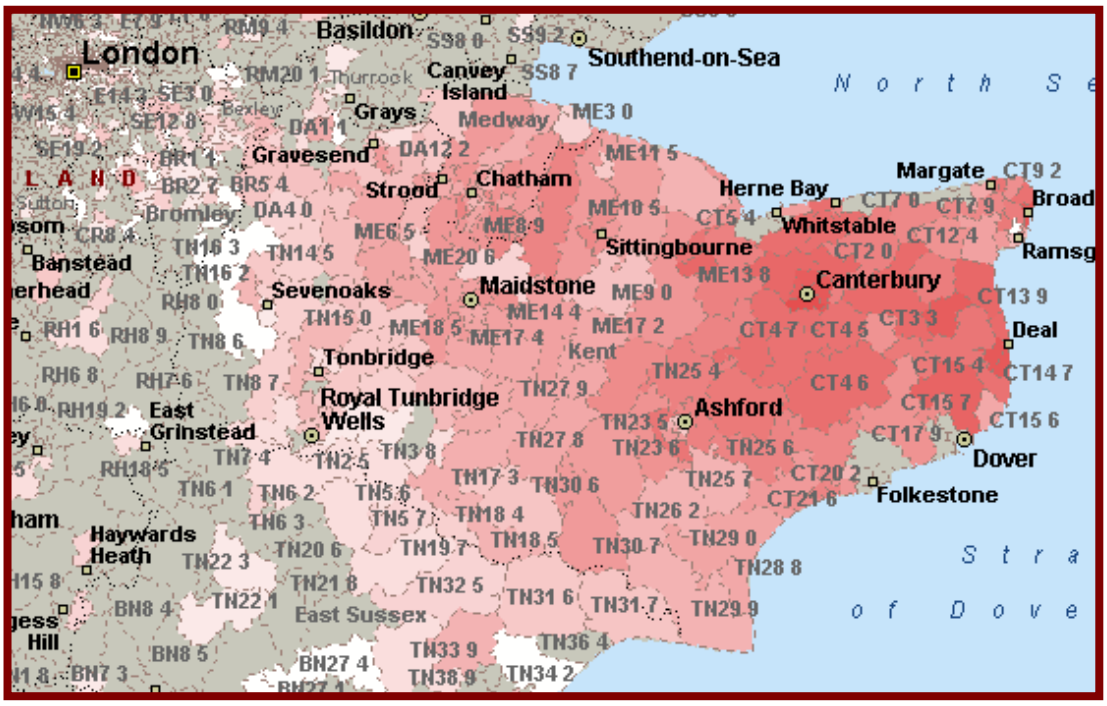


Figure 2: Distribution of EU Jet Passengers Using Manston in 2005



As can be seen, while the Airport's core catchment is focused in Kent within an area bounded by the M25 and M20, its wider (or contested catchment) expands beyond both into East Sussex and the outer London suburbs East and South East of the capital.

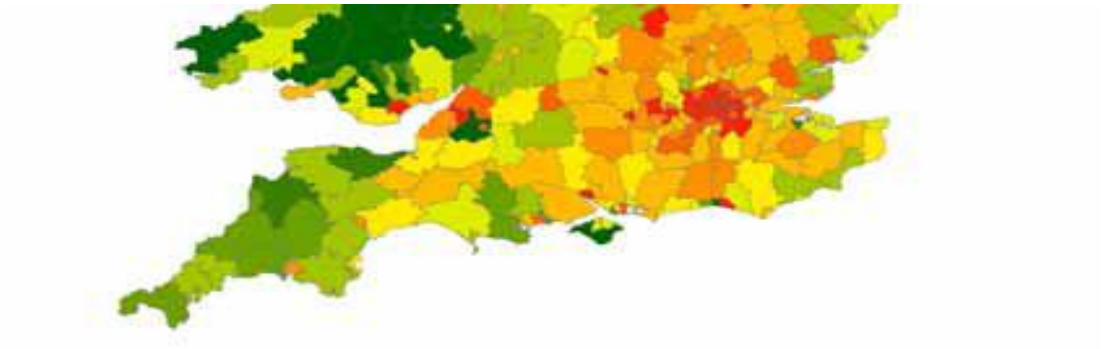
Based on this analysis, we sought to identify how many air travellers who use other airports in the London area, have their origins or destinations within Manston's catchment area. We looked at this first based on existing surface access infrastructure and associated travel times, and then extrapolated this based on assumptions about those links to be improved or extended. This then provided a useful platform for the second part of the analysis, which examined the picture painted by DfT's 2011 and 2013 forecasts, in terms of the potential scale and nature of the capacity shortfall facing the South East moving forwards, and the contribution Manston can potentially make to meeting some of that shortfall by targeting certain key markets. This in turn, then acts as a forerunner to a brief description of how Manston could be developed to meet this demand before setting out a series of generic and airport specific policy propositions that we consider necessary to facilitate Manston taking on this role.

It is worth pointing out at this juncture, that this approach has been driven by the absence of any DfT Forecasting model runs that have included Manston. We know that there are spare slots within the model to add airports, and we hope that the Commission will at the very least request DfT produce model outputs for Manston under a Constrained (or Max Use) scenario and one with one additional runway added either at Heathrow or Stansted by 2030 but with the surface access enhancements we outline later incorporated.

Demand Assessment

Figure 3 below, provides an overview of current demand density in the southernmost part of the UK. As can be seen, the level of demand for air travel emanating from Kent is comparable with other parts of the Home Counties around London, save for those immediately adjacent to Heathrow and Gatwick.

Figure 3: Density of Demand in the Southern Half of England and Wales



Source: CAA Data

Our analysis of O&D survey data collected from the other London airports, indicates that Manston's core and floating catchment areas currently generate demand of between 3.5-4.0m passengers per annum, depending on where the exact boundaries of the Airport's catchment is drawn (see **Table 1**).

Table 1: Leakage from Manston's Catchment

MSE	Leakage		
Outer catchment	**Business**	**Leisure**	**Total**
Dartford District	39,433	231,649	271,082
Gravesham District	31,236	158,594	189,829
Hastings District	26,554	135,992	162,546
Maidstone District	52,142	300,236	352,378
Medway	68,439	388,215	456,654
Rother District	15,862	109,763	125,626
Sevenoaks District	41,058	295,695	336,753
Tonbridge and Malling District	27,932	198,425	226,357
Tunbridge Wells District	79,579	254,615	334,194
Grand Total	**382,235**	**2,073,183**	**2,455,418**
MSE	**Leakage**		
Inner catchment	**Business**	**Leisure**	**Total**
Ashford District	33,918	193,472	227,390
Canterbury District	46,218	294,806	341,024
Dover District	20,628	164,176	184,805

Shepway District	19,251	125,768	145,018
Swale District	37,863	148,213	186,076
Thanet District	50,628	181,701	232,329
Grand Total	**208,504**	**1,108,138**	**1,316,642**

MSE	**Leakage**		
Total catchment	**Business**	**Leisure**	**Total**
Total	**590,740**	**3,181,321**	**3,772,060**

However, from that same analysis and the fact that between 50-100,000 passengers are expected to use Manston this year, we know that most of this traffic is 'leaking' to other South East airports. The data suggests by far the largest percentage of this leaking traffic (around 85%) uses Gatwick and that much of it is leisure orientated (i.e. it is predominantly point-to-point and therefore not dependent on access to a hub airport such as Heathrow to be viable).

This is important, because in a Maximum Use scenario such as that the South East is likely to face until at least 2025, which is likely to be characterised by an increasing shortfall in capacity relative to demand, it is the premium hub airports such as Heathrow and Gatwick where capacity will be most constrained (see Appendix A). This also means that it is these airports where the price of access is likely to rise substantially, displacing thinner route domestic and short haul regional and low cost traffic serving routes with a high VFR/leisure content – a process that can be seen in action with Flybe's sale of its Gatwick slots, but also in Appendix B. It is exactly this traffic, where the journey's are point-to-point, frequency is less significant, airport charges need to be low, but speed and convenience of using an airport high that will have the greatest potential to move to alternative lower cost airports such as Manston.

Appendix E (part 2)
Catchment Drawings

Figure 1: Catchment Area

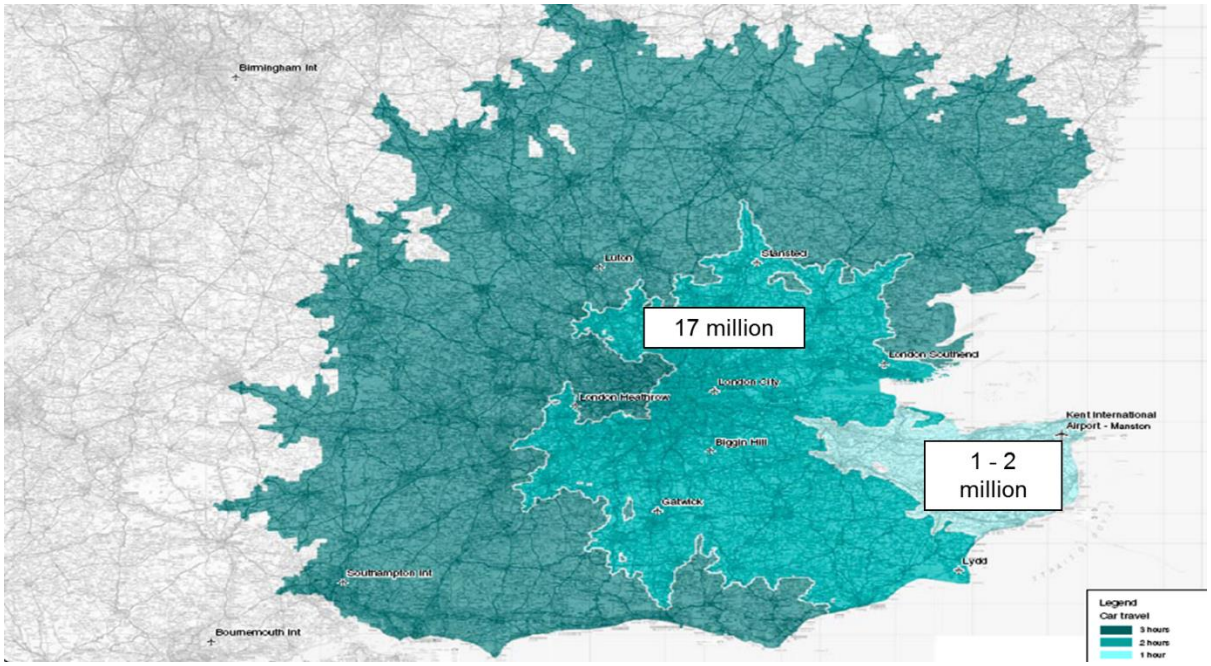


Figure 2: Current Market

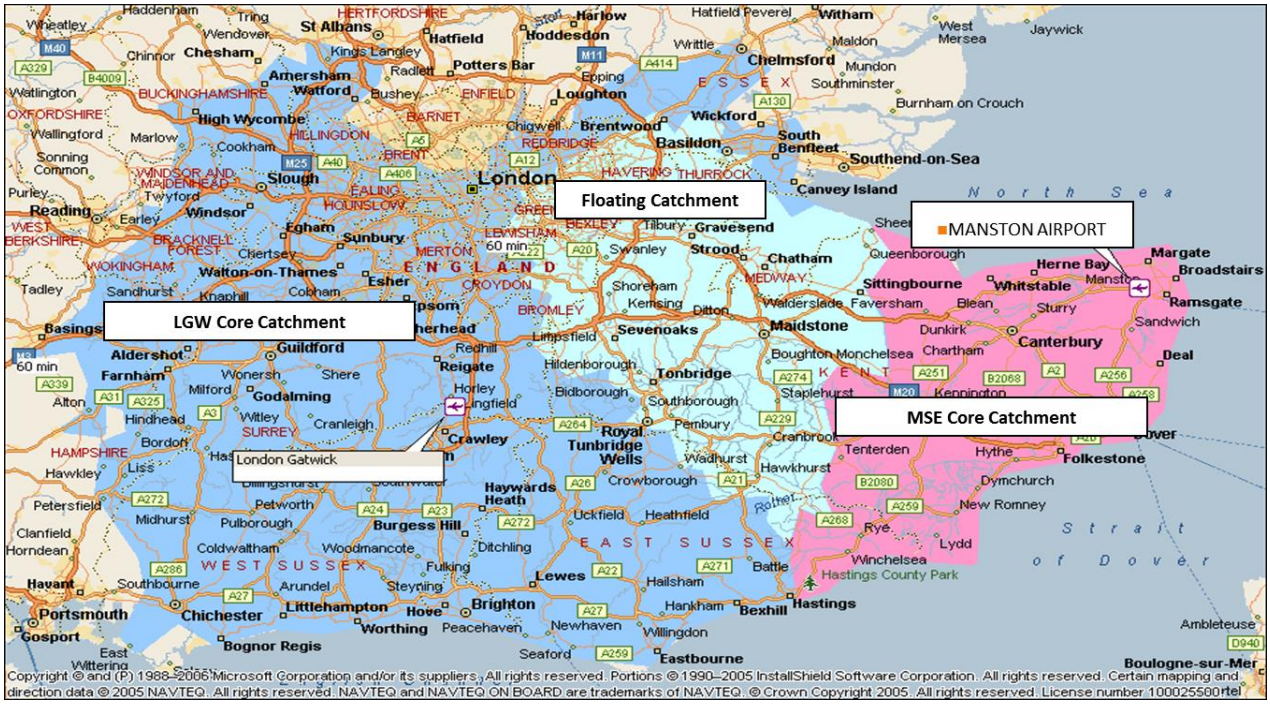
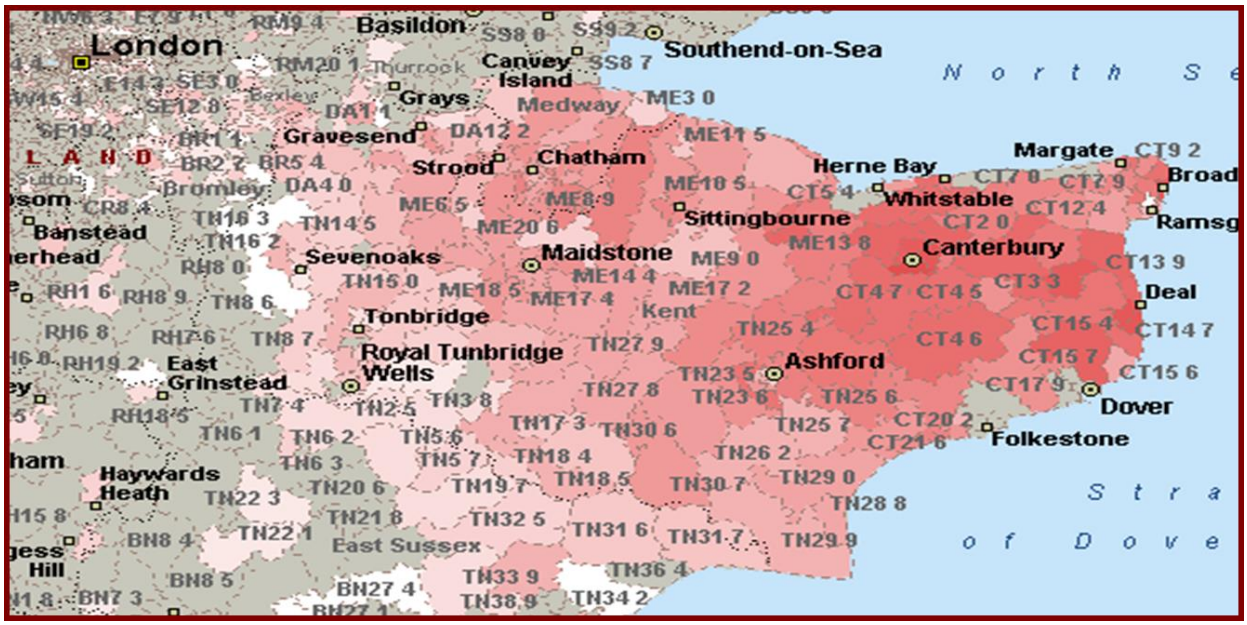


Figure 3: EUJet Actuals Data 2005



EUJet services confirmed the market response to services offered at MSE.

Catchment Analysis

Catchment Area:

- 'Core' catchment: area where passengers are more closely located to Manston than all other competing airports;
- 'Floating' catchment: area where drive times to/from Manston are similar to competing airports; and
- Level of market penetration is likely to be substantially lower in the floating catchment.

Catchment Population[1]:

- 'Core' is made up of 726,600 people and includes 6 districts within Kent;
- 'Floating' is made up of 889,800 people and covers 7 districts within Kent and East Sussex; and
- Total in 2007 was 1,616,400 people.

Total Passengers:

- C 4mppa, with most using LHR and LGW.

[1] UK National Statistics (2007) Key Population and Vital Statistics.

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Appendix F (part 1)
Matrixes

| AM PEAK | | |

| AM PEAK | | |

| AM PEAK | | |

| AM PEAK | | |

| PM Peak | | |

Client

RSP

Manston Airport DCO
Transport Assessment Addendum
Appendix F

Figure 1.6
Passenger terminal

March 2019

wood.

H:\Projects\40820 Manston Airport Subfile\Transport Assessment Addendum\40820-Lon72.indd Originator: vicki smith

PM Peak

| TOTAL VEH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94-104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
|---|---|---

| AM PEAK | | |

Client

RSP

Manston Airport DCO
Transport Assessment Addendum
Appendix F

Figure 1.9
Cargo facility

March 2019

wood.

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| AM PEAK | | |

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Appendix F (part 2)
Matrixes

| PM Peak | | |

| AM PEAK | | |

| PM Peak | | |

| PM Peak | | |

AM PEAK

HGVS

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94-104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
|---|---|---

PM Peak

HGVS

Client

RSP

Manston Airport DCO
Transport Assessment Addendum
Appendix F

Figure 1.16
Fuel farm

March 2019

wood.

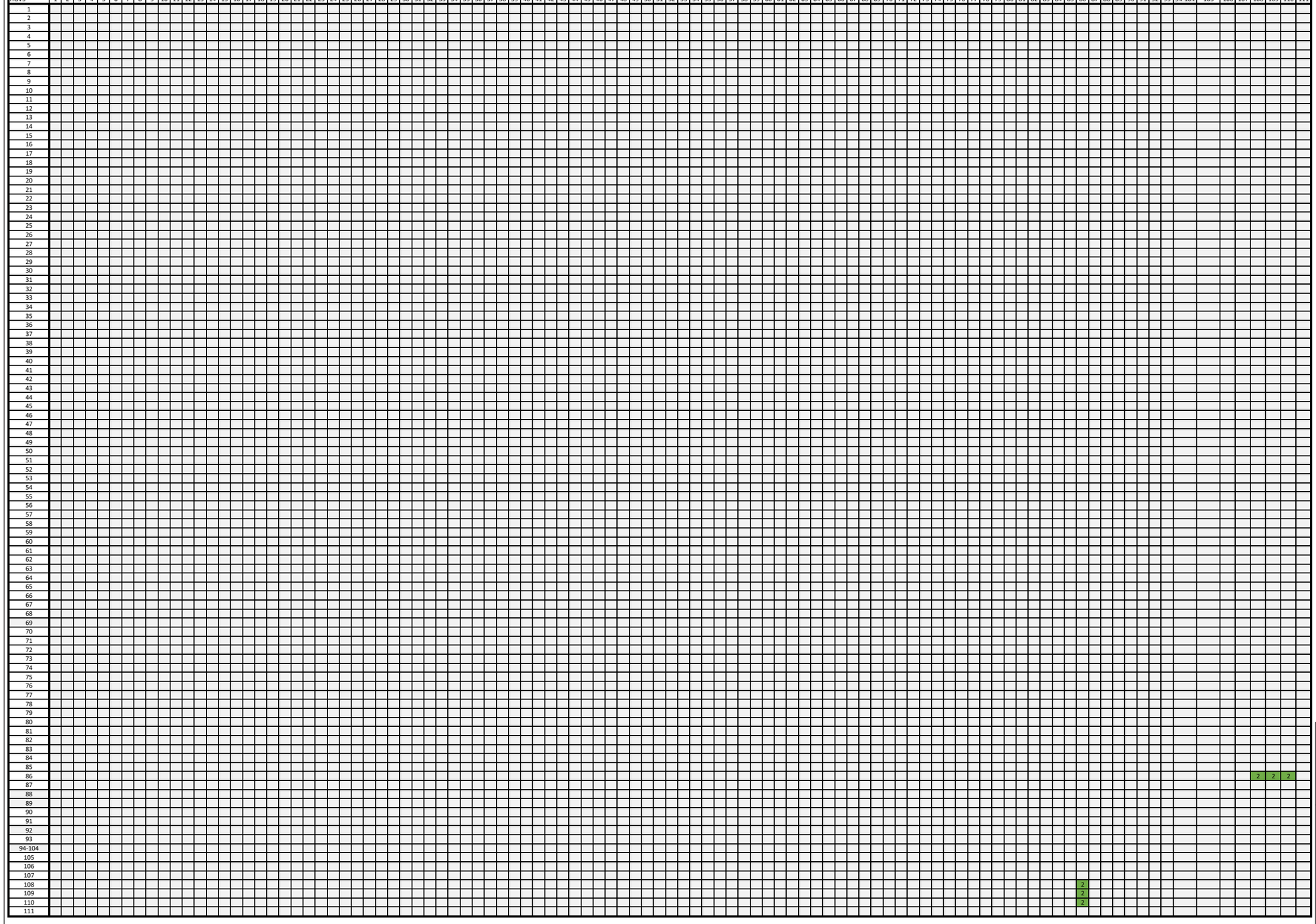
H:\Projects\40820 Manston Airport Subfile\Transport Assessment Addendum\40820-Lon82.indd Originator: vicki smith

| AM PEAK | | |

| PM Peak | | |

AM PEAK

HGVS



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Client

RSP

Manston Airport DCO
Transport Assessment Addendum
Appendix F

Figure 1.20
Servicing

March 2019

wood.

PM Peak

| HGVS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94-104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
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Appendix F (part 3)
Matrixes

| AM PEAK | | |

| AM PEAK | | |

| AM PEAK | | |

| PM Peak | | |

| PM Peak | | |

PM Peak

| TOTAL VEH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94-104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
|---|---|---

| AM PEAK | | |

| AM PEAK | | |

| AM PEAK | | |

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Appendix F (part 4)
Matrixes

| PM Peak | | |

PM Peak

HGVS

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94-104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
|---|---|---

PM Peak

| TOTAL VEH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94-104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
|---|---|---

| AM PEAK | | |

| AM PEAK | | |

| AM PEAK | | |

| PM Peak | | |

| PM Peak | | |

PM Peak

| TOTAL VEH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94-104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
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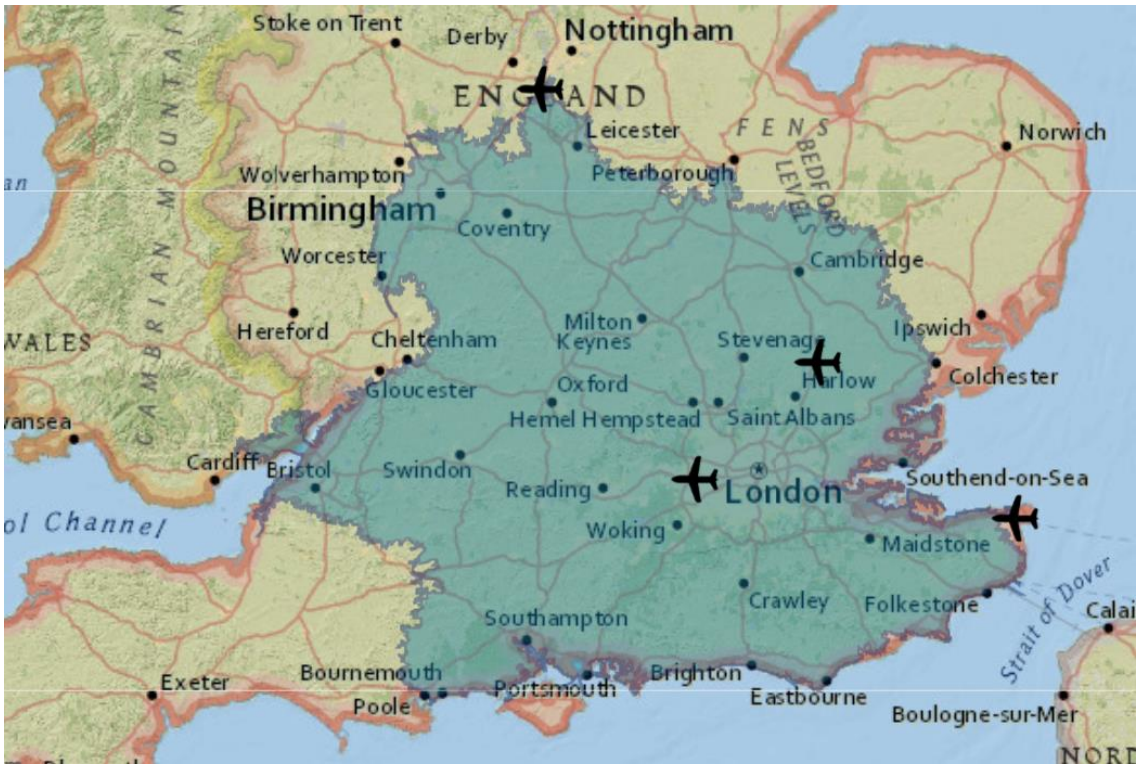
Appendix G (part 1)
15 min per hour penalty to demonstrate very heavy traffic

Manston airport (135mins):

East Midlands (135mins):

Manston airport vs East Midlands (135mins):

Heathrow airport (135mins):



Stansted airport (135mins):

Manston and Heathrow (135mins):

Manston vs Stansted (135mins):

All 4 combined (135mins):

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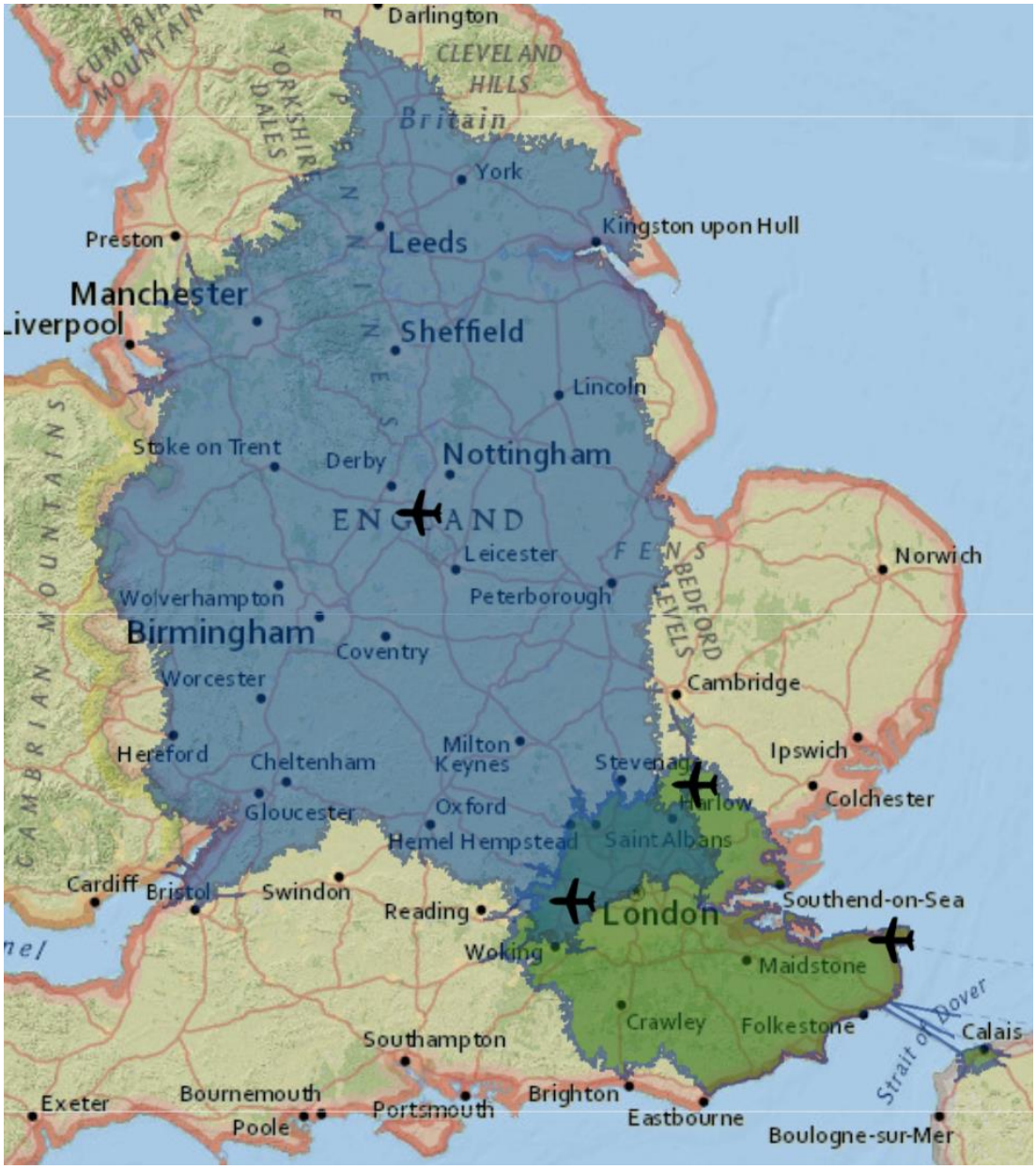
Appendix G (part 2)
10 min per hour penalty to demonstrate rush hour

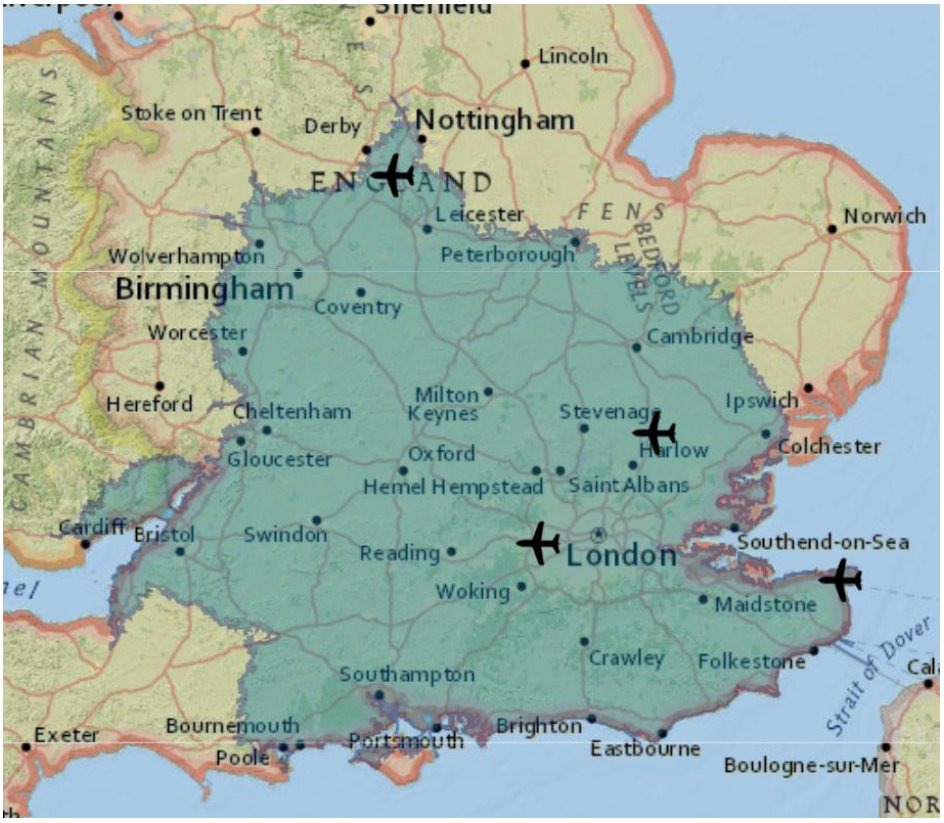
Manston Airport (150mins):

East Midlands (150mins):

Manston airport vs East Midlands (150mins):



Heathrow airport (150mins):

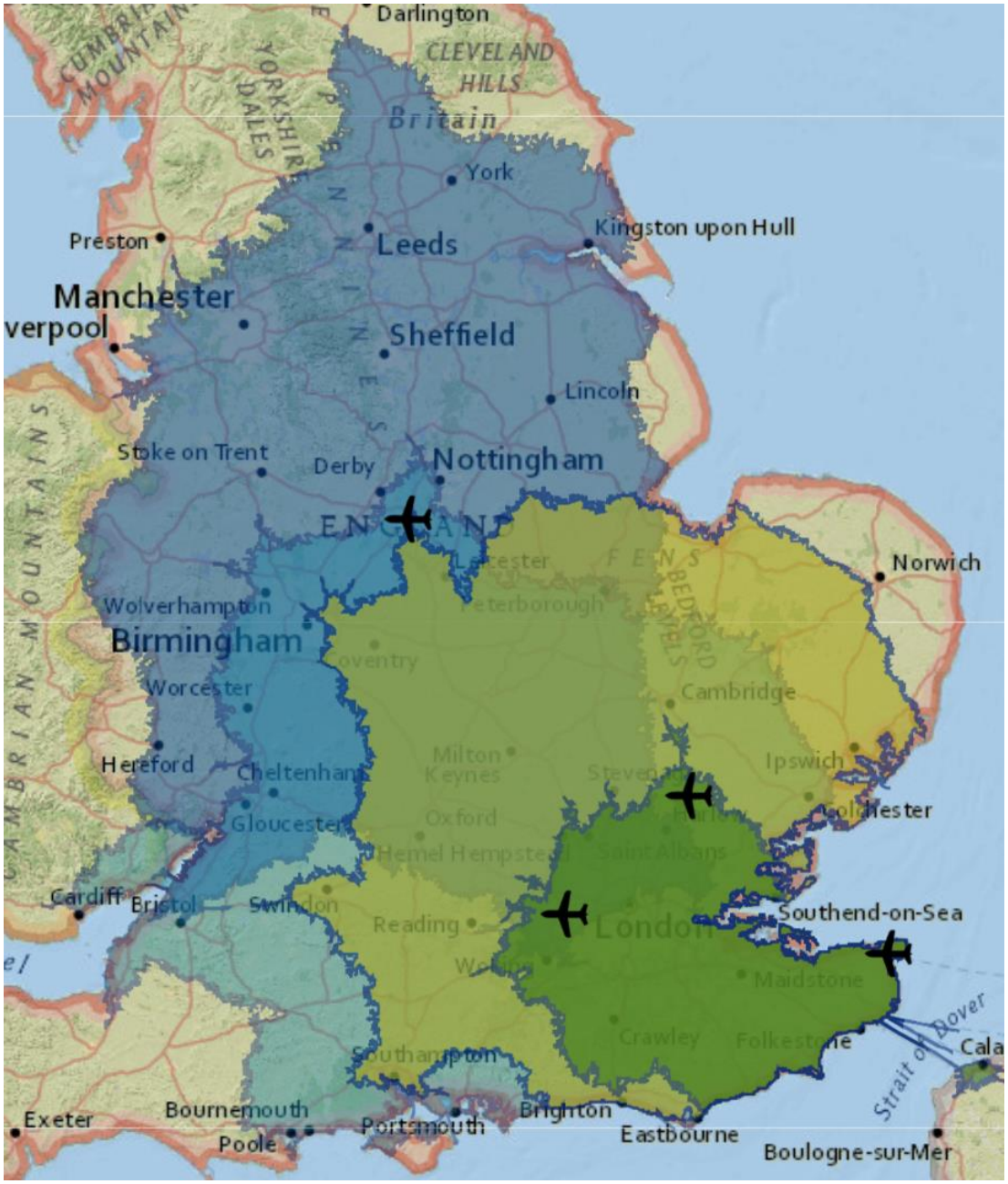


Stansted airport (150mins):

Manston airport vs Heathrow (150mins):

Manston vs Stansted airport (150mins):

All 4 combined (150mins):



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Appendix H
Proposed Link Road Indicative Corridor and Spitfire Way / Manston Road Signalised Junction Design

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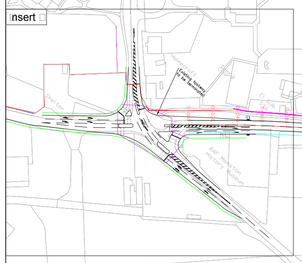

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Appendix I (part 1)
2039 Base and 2039 Base + Development Junction Model Outputs

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 2_A256_A299_R1_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 2_A299_A256\Strategic Model Scenario
Report generation date: 18/03/2019 12:23:14

»Lane simulation - 2039+Dev(link+sig) , AM
»Lane simulation - 2039+Dev(link+sig), PM

Summary of junction performance

	AM						PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	Lane simulation [Lane Simulation] - 2039+Dev(link+sig)											
1 - A299 Hengist Way E	130.2	4.37		F	2.69	% [ ]	5.2	0.21		B	1.96	% [ ]
2 - A256	13.5	0.52		D			114.4	3.66		F		
3 - Cottington Link Road	40.3	18.27		F			1.8	4.49		F		
4 - A299 Hengist Way N	3.0	0.22		B			1.0	0.15		A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

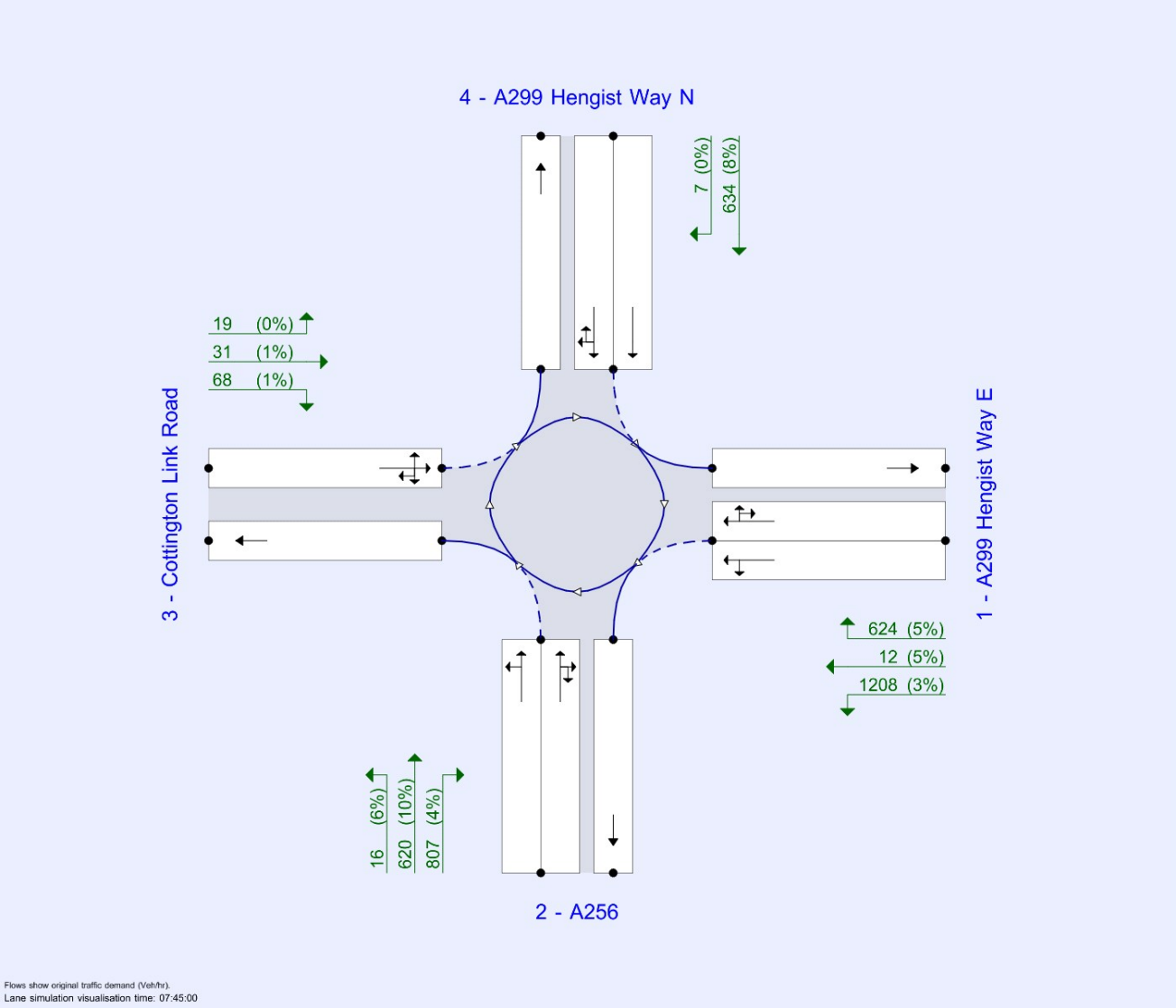
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			1444267564	140	37.09

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(link+sig)	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039+Dev(link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane simulation	✓	✓	100.000	100.000

Lane simulation - 2039+Dev(link+sig) , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	1 - A299 Hengist Way E - Lane Simulation	Arm 1: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	2.69	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A299 Hengist Way E	
2	A256	
3	Cottington Link Road	
4	A299 Hengist Way N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 Hengist Way E	7.29	10.47	9.3	42.0	60.0	14.5	
2 - A256	7.66	10.10	14.8	25.1	60.0	56.0	
3 - Cottington Link Road	2.80	4.40	6.9	22.3	60.0	21.0	
4 - A299 Hengist Way N	7.37	10.01	4.5	23.2	60.0	22.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	0.783	2881
2 - A256	0.688	2580
3 - Cottington Link Road	0.474	1168
4 - A299 Hengist Way N	0.722	2599

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
3 - Cottington Link Road	Percentage		85.00
4 - A299 Hengist Way N	Percentage		60.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A299 Hengist Way E	Evenly split	10.00
2 - A256	Evenly split	10.00
3 - Cottington Link Road	Evenly split	10.00
4 - A299 Hengist Way N	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A299 Hengist Way E	Entry	1	1	2, 3		Infinity		0	99999	
			2	1, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
2 - A256	Entry	1	1	3, 4		Infinity		0	99999	
			2	1, 2, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
4 - A299 Hengist Way N	Entry	1	2	2		Infinity		0	99999	
			3	2, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	Entry	1	1	0.391	1440
			2	0.391	1440
2 - A256	Entry	1	1	0.344	1290
			2	0.344	1290
3 - Cottington Link Road	Entry	1	1	0.474	1168
4 - A299 Hengist Way N	Entry	1	2	0.361	1300
			3	0.361	1300

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm			
			A299 Hengist Way E	A256	Cottington Link Road	A299 Hengist Way N
1 - A299 Hengist Way E	1	1		✓	✓	
		2	✓		✓	✓
2 - A256	1	1			✓	✓
		2	✓	✓		✓
3 - Cottington Link Road	1	1	✓	✓	✓	✓
4 - A299 Hengist Way N	1	2		✓		
		3		✓	✓	✓

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(link+sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 Hengist Way E		ONE HOUR	✓	1844	100.000
2 - A256		ONE HOUR	✓	1443	100.000
3 - Cottington Link Road		ONE HOUR	✓	118	100.000
4 - A299 Hengist Way N		ONE HOUR	✓	641	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	1208	12	624
	2 - A256	807	0	16	620
	3 - Cottington Link Road	31	68	0	19
	4 - A299 Hengist Way N	0	634	7	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	3	5	5
	2 - A256	4	0	6	10
	3 - Cottington Link Road	1	1	0	0
	4 - A299 Hengist Way N	0	8	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 Hengist Way E	4.37	130.2	F	1691	2537
2 - A256	0.52	13.5	D	1327	1991
3 - Cottington Link Road	18.27	40.3	F	108	162
4 - A299 Hengist Way N	0.22	3.0	B	587	881

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1383	346	522	1381	1426	634	0.0	4.0	0.166	A
2 - A256	1096	274	480	1099	1153	1423	0.0	2.1	0.123	A
3 - Cottington Link Road	84	21	1553	83	87	27	0.0	0.4	0.245	B
4 - A299 Hengist Way N	478	119	681	476	521	955	0.0	1.1	0.133	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1644	411	639	1633	1685	756	4.0	14.3	0.420	D
2 - A256	1290	323	576	1293	1379	1697	2.1	3.8	0.174	B
3 - Cottington Link Road	107	27	1836	108	104	34	0.4	1.6	0.788	E
4 - A299 Hengist Way N	576	144	819	576	622	1124	1.1	1.5	0.156	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	2035	509	726	1801	1875	894	14.3	71.2	1.550	F
2 - A256	1583	396	712	1578	1658	1815	3.8	12.4	0.398	C
3 - Cottington Link Road	134	34	2252	47	60	38	1.6	19.5	12.484	F
4 - A299 Hengist Way N	700	175	920	700	752	1379	1.5	2.4	0.214	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	2040	510	745	1780	1864	907	71.2	131.3	3.618	F
2 - A256	1617	404	704	1614	1693	1820	12.4	13.7	0.515	D
3 - Cottington Link Road	128	32	2281	43	44	37	19.5	40.4	18.273	F
4 - A299 Hengist Way N	718	180	931	721	763	1393	2.4	2.9	0.225	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1665	416	684	1709	1774	772	131.3	119.5	4.365	F
2 - A256	1296	324	586	1294	1423	1807	13.7	4.2	0.239	B
3 - Cottington Link Road	106	26	1848	190	151	32	40.4	29.6	11.257	F
4 - A299 Hengist Way N	575	144	880	576	628	1158	2.9	1.7	0.175	B

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1385	346	559	1632	1686	632	119.5	61.5	2.850	F
2 - A256	1083	271	487	1084	1165	1704	4.2	2.0	0.126	A
3 - Cottington Link Road	87	22	1546	137	202	25	29.6	2.0	2.742	F
4 - A299 Hengist Way N	475	119	712	479	522	972	1.7	0.8	0.141	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	911	1183	0.770	906	926	0.0	3.5	0.206	B
			2	1, 3, 4	472	1163	0.406	475	500	0.0	0.6	0.090	A
	Exit	1	1		634			634	648	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	356	1019	0.349	355	387	0.0	0.6	0.082	A
			2	1, 2, 4	740	1065	0.694	744	766	0.0	1.5	0.142	A
	Exit	1	1		1423			1423	1490	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	84	326	0.258	83	87	0.0	0.4	0.245	B
	Exit	1	1		27			27	28	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	238	583	0.407	236	258	0.0	0.6	0.136	A
			3	2, 3, 4	240	580	0.413	240	263	0.0	0.5	0.130	A
	Exit	1	1		955			955	1020	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1073	1140	0.942	1065	1083	3.5	13.1	0.582	D
			2	1, 3, 4	571	1118	0.511	569	602	0.6	1.2	0.113	A
	Exit	1	1		756			756	779	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	451	982	0.459	454	500	0.6	0.7	0.104	A
			2	1, 2, 4	839	1036	0.810	839	879	1.5	3.1	0.212	B
	Exit	1	1		1697			1697	1758	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	107	207	0.517	108	104	0.4	1.6	0.788	E
	Exit	1	1		34			34	34	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	288	551	0.521	288	310	0.6	0.7	0.155	A
			3	2, 3, 4	289	553	0.523	287	312	0.5	0.8	0.157	A
	Exit	1	1		1124			1124	1218	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1329	1102	1.204	1098	1139	13.1	69.1	2.285	F
			2	1, 3, 4	706	1077	0.656	704	736	1.2	2.1	0.161	A
	Exit	1	1		894			894	912	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	635	941	0.675	634	680	0.7	2.1	0.177	B
			2	1, 2, 4	948	989	0.960	944	978	3.1	10.3	0.542	D
	Exit	1	1		1815			1815	1918	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	134	44	3.076	47	60	1.6	19.5	12.484	F
	Exit	1	1		38			38	38	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	348	534	0.653	350	375	0.7	1.1	0.211	B
			3	2, 3, 4	352	529	0.664	350	377	0.8	1.3	0.216	B
	Exit	1	1		1379			1379	1478	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1346	1095	1.227	1083	1130	69.1	129.5	5.413	F
			2	1, 3, 4	694	1072	0.647	697	734	2.1	1.8	0.162	A
	Exit	1	1		907			907	940	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	648	944	0.686	651	702	2.1	1.8	0.202	B
			2	1, 2, 4	969	992	0.976	963	991	10.3	11.9	0.724	E
	Exit	1	1		1820			1820	1910	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	128	35	3.664	43	44	19.5	40.4	18.273	F
	Exit	1	1		37			37	39	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	360	532	0.677	362	382	1.1	1.4	0.222	B
			3	2, 3, 4	359	531	0.675	359	381	1.3	1.5	0.228	B
	Exit	1	1		1393			1393	1475	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1088	1121	0.972	1128	1164	129.5	118.6	6.623	F
			2	1, 3, 4	577	1097	0.526	580	610	1.8	0.9	0.118	A
	Exit	1	1		772			772	827	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	457	976	0.468	458	525	1.8	0.9	0.116	A
			2	1, 2, 4	838	1031	0.814	836	898	11.9	3.4	0.310	C
	Exit	1	1		1807			1807	1872	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	106	200	0.530	190	151	40.4	29.6	11.257	F
	Exit	1	1		32			32	34	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	284	537	0.530	285	311	1.4	0.8	0.177	B
			3	2, 3, 4	291	540	0.539	291	317	1.5	0.8	0.173	B
	Exit	1	1		1158			1158	1244	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	903	1171	0.770	1149	1176	118.6	60.8	4.624	F
			2	1, 3, 4	482	1146	0.421	483	510	0.9	0.7	0.096	A
	Exit	1	1		632			632	688	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	354	1017	0.347	355	388	0.9	0.4	0.083	A
			2	1, 2, 4	729	1059	0.688	729	776	3.4	1.6	0.147	A
	Exit	1	1		1704			1704	1810	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	87	328	0.265	137	202	29.6	2.0	2.742	F
	Exit	1	1		25			25	27	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	235	573	0.409	237	259	0.8	0.4	0.141	A
			3	2, 3, 4	240	577	0.417	241	262	0.8	0.4	0.141	A
	Exit	1	1		972			972	1050	0.0	0.0	0.000	A

Lane simulation - 2039+Dev(link+sig), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	2 - A256 - Lane Simulation	Arm 2: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	1.96	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 Hengist Way E		ONE HOUR	✓	1423	100.000
2 - A256		ONE HOUR	✓	1840	100.000
3 - Cottington Link Road		ONE HOUR	✓	18	100.000
4 - A299 Hengist Way N		ONE HOUR	✓	372	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	932	12	479
	2 - A256	1162	0	31	647
	3 - Cottington Link Road	5	8	0	5
	4 - A299 Hengist Way N	0	363	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	1	2	3
	2 - A256	2	0	0	2
	3 - Cottington Link Road	3	0	0	0
	4 - A299 Hengist Way N	0	5	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 Hengist Way E	0.21	5.2	B	1306	1960
2 - A256	3.66	114.4	F	1686	2529
3 - Cottington Link Road	4.49	1.8	F	17	26
4 - A299 Hengist Way N	0.15	1.0	A	344	516

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1072	268	293	1068	1077	883	0.0	1.8	0.090	A
2 - A256	1405	351	370	1405	1405	991	0.0	4.7	0.183	B
3 - Cottington Link Road	16	4	1737	15	16	38	0.0	0.1	0.211	B
4 - A299 Hengist Way N	286	72	890	286	297	862	0.0	0.6	0.122	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1290	322	349	1284	1292	1026	1.8	2.6	0.112	A
2 - A256	1651	413	442	1628	1639	1191	4.7	12.6	0.379	C
3 - Cottington Link Road	17	4	2022	16	17	48	0.1	0.2	0.526	D
4 - A299 Hengist Way N	345	86	1032	342	354	1006	0.6	1.0	0.132	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1558	390	419	1563	1575	1075	2.6	4.9	0.184	B
2 - A256	2017	504	562	1816	1842	1419	12.6	64.3	1.401	F
3 - Cottington Link Road	20	5	2318	14	14	61	0.2	1.3	3.762	F
4 - A299 Hengist Way N	414	104	1081	413	432	1251	1.0	1.0	0.151	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1584	396	414	1585	1604	1071	4.9	5.2	0.210	B
2 - A256	2023	506	552	1822	1858	1447	64.3	114.4	3.154	F
3 - Cottington Link Road	21	5	2314	16	17	60	1.3	1.8	4.487	F
4 - A299 Hengist Way N	406	101	1078	407	431	1252	1.0	0.9	0.150	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1260	315	346	1262	1313	1103	5.2	2.2	0.114	A
2 - A256	1632	408	447	1702	1750	1161	114.4	96.8	3.655	F
3 - Cottington Link Road	16	4	2102	19	24	47	1.8	0.3	1.444	F
4 - A299 Hengist Way N	335	84	1113	336	350	1008	0.9	0.8	0.139	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1075	269	283	1076	1095	1098	2.2	1.6	0.088	A
2 - A256	1390	348	374	1595	1648	985	96.8	40.8	2.176	F
3 - Cottington Link Road	14	4	1929	14	16	39	0.3	0.1	0.454	D
4 - A299 Hengist Way N	278	69	1104	278	297	839	0.8	0.6	0.133	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	712	1308	0.544	708	707	0.0	1.5	0.103	A
			2	1, 3, 4	361	1278	0.282	361	370	0.0	0.3	0.065	A
	Exit	1	1		883			883	888	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	445	1137	0.391	446	440	0.0	0.6	0.081	A
			2	1, 2, 4	960	1135	0.845	959	965	0.0	4.1	0.230	B
	Exit	1	1		991			991	1003	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	16	276	0.056	15	16	0.0	0.1	0.211	B
	Exit	1	1		38			38	39	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	141	557	0.253	141	147	0.0	0.3	0.120	A
			3	2, 3, 4	146	555	0.263	145	150	0.0	0.3	0.125	A
	Exit	1	1		862			862	867	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	860	1283	0.670	855	848	1.5	2.0	0.132	A
			2	1, 3, 4	430	1264	0.340	430	444	0.3	0.6	0.072	A
	Exit	1	1		1026			1026	1029	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	576	1115	0.516	573	572	0.6	1.2	0.105	A
			2	1, 2, 4	1075	1111	0.968	1055	1067	4.1	11.4	0.523	D
	Exit	1	1		1191			1191	1198	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	17	158	0.109	16	17	0.1	0.2	0.526	D
	Exit	1	1		48			48	48	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	169	522	0.324	168	173	0.3	0.5	0.130	A
			3	2, 3, 4	176	527	0.333	174	181	0.3	0.5	0.134	A
	Exit	1	1		1006			1006	1028	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1009	1255	0.804	1014	1015	2.0	4.1	0.235	B
			2	1, 3, 4	549	1227	0.447	549	560	0.6	0.9	0.089	A
	Exit	1	1		1075			1075	1097	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	744	1071	0.695	744	743	1.2	2.1	0.171	B
			2	1, 2, 4	1273	1069	1.192	1072	1100	11.4	62.2	2.104	F
	Exit	1	1		1419			1419	1440	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	20	48	0.418	14	14	0.2	1.3	3.762	F
	Exit	1	1		61			61	57	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	203	515	0.394	203	213	0.5	0.5	0.152	A
			3	2, 3, 4	211	513	0.411	210	219	0.5	0.5	0.149	A
	Exit	1	1		1251			1251	1269	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1044	1262	0.827	1045	1048	4.1	4.4	0.273	C
			2	1, 3, 4	540	1235	0.437	540	555	0.9	0.8	0.090	A
	Exit	1	1		1071			1071	1099	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	753	1072	0.701	755	763	2.1	2.4	0.199	B
			2	1, 2, 4	1271	1073	1.184	1066	1095	62.2	112.0	4.892	F
	Exit	1	1		1447			1447	1473	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	21	50	0.411	16	17	1.3	1.8	4.487	F
	Exit	1	1		60			60	61	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	200	516	0.387	201	213	0.5	0.4	0.150	A
			3	2, 3, 4	206	517	0.398	206	217	0.5	0.5	0.150	A
	Exit	1	1		1252			1252	1277	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	826	1284	0.643	826	860	4.4	1.7	0.135	A
			2	1, 3, 4	434	1270	0.342	436	452	0.8	0.5	0.072	A
	Exit	1	1		1103			1103	1131	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	598	1113	0.538	603	625	2.4	0.9	0.125	A
			2	1, 2, 4	1034	1110	0.932	1099	1125	112.0	96.0	5.721	F
	Exit	1	1		1161			1161	1210	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	16	127	0.129	19	24	1.8	0.3	1.444	F
	Exit	1	1		47			47	46	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	166	514	0.323	167	171	0.4	0.3	0.138	A
			3	2, 3, 4	169	510	0.332	169	180	0.5	0.4	0.140	A
	Exit	1	1		1008			1008	1050	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	713	1310	0.544	713	718	1.7	1.3	0.100	A
			2	1, 3, 4	362	1296	0.279	363	377	0.5	0.3	0.065	A
	Exit	1	1		1098			1098	1135	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	483	1139	0.424	485	510	0.9	0.7	0.097	A
			2	1, 2, 4	908	1133	0.801	1110	1138	96.0	40.1	3.494	F
	Exit	1	1		985			985	1010	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	14	197	0.072	14	16	0.3	0.1	0.454	D
	Exit	1	1		39			39	39	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	136	513	0.265	136	144	0.3	0.3	0.135	A
			3	2, 3, 4	142	512	0.277	141	153	0.4	0.3	0.132	A
	Exit	1	1		839			839	871	0.0	0.0	0.000	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 3_Canterbury Rd (W)_A299.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 3_Canterbury Road West_A299
Report generation date: 18/03/2019 14:35:45

»2039+Dev (link+sig), AM
»2039+Dev (link+sig), PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev (link+sig)									
Arm 1	0.1	0.12	0.12	A	0.05	0.0	0.09	0.03	A	0.04
Arm 2	1.0	0.05	0.51	A		1.0	0.05	0.49	A	
Arm 3	1.0	0.05	0.51	A		0.9	0.04	0.47	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	14/12/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev (link+sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Canterbury Rd (W)	
2	A299 (S)	
3	A299 (W)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.00	5.10	5.7	25.0	60.0	23.0	
2	7.30	9.50	4.9	26.0	60.0	15.0	
3	7.30	9.00	15.2	26.0	60.0	25.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.487	1242
2	0.737	2643
3	0.732	2665

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	62	100.000
2		ONE HOUR	✓	1119	100.000
3		ONE HOUR	✓	1135	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	8	54
	2	6	0	1113
	3	34	1101	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	3
	2	0	0	7
	3	2	8	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.12	0.12	0.1	A	57	85
2	0.51	0.05	1.0	A	1027	1540
3	0.51	0.05	1.0	A	1041	1562

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	47	12	827	787	0.059	46	30	0.0	0.1	0.081	A
2	842	211	40	2442	0.345	840	833	0.0	0.5	0.037	A
3	854	214	5	2469	0.346	852	876	0.0	0.5	0.037	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	56	14	989	704	0.079	56	36	0.1	0.1	0.093	A
2	1006	251	48	2436	0.413	1005	996	0.5	0.7	0.042	A
3	1020	255	5	2468	0.413	1020	1048	0.5	0.7	0.041	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	68	17	1211	590	0.116	68	44	0.1	0.1	0.115	A
2	1232	308	59	2429	0.507	1231	1220	0.7	1.0	0.050	A
3	1250	312	7	2468	0.506	1248	1283	0.7	1.0	0.049	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	68	17	1212	589	0.116	68	44	0.1	0.1	0.115	A
2	1232	308	59	2429	0.507	1232	1221	1.0	1.0	0.050	A
3	1250	312	7	2468	0.506	1250	1285	1.0	1.0	0.049	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	56	14	991	703	0.079	56	36	0.1	0.1	0.093	A
2	1006	251	49	2436	0.413	1007	998	1.0	0.7	0.042	A
3	1020	255	5	2468	0.413	1022	1051	1.0	0.7	0.042	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	47	12	830	785	0.059	47	30	0.1	0.1	0.081	A
2	842	211	41	2442	0.345	843	836	0.7	0.5	0.038	A
3	854	214	5	2469	0.346	855	879	0.7	0.5	0.037	A

2039+Dev (link+sig), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	17	100.000
2		ONE HOUR	✓	1135	100.000
3		ONE HOUR	✓	1106	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	0	17
	2	0	0	1135
	3	35	1071	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	3
	3	1	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.03	0.09	0.0	A	16	23
2	0.49	0.05	1.0	A	1041	1562
3	0.47	0.04	0.9	A	1015	1522

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	13	3	805	843	0.015	13	26	0.0	0.0	0.072	A
2	854	214	13	2557	0.334	852	805	0.0	0.5	0.035	A
3	833	208	0	2614	0.319	831	865	0.0	0.5	0.034	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	15	4	962	764	0.020	15	31	0.0	0.0	0.080	A
2	1020	255	15	2555	0.399	1020	962	0.5	0.7	0.039	A
3	994	249	0	2614	0.380	994	1035	0.5	0.6	0.037	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	19	5	1178	657	0.028	19	39	0.0	0.0	0.094	A
2	1250	312	19	2553	0.490	1248	1178	0.7	1.0	0.046	A
3	1218	304	0	2614	0.466	1217	1267	0.6	0.9	0.043	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	19	5	1179	657	0.029	19	39	0.0	0.0	0.094	A
2	1250	312	19	2553	0.490	1250	1179	1.0	1.0	0.046	A
3	1218	304	0	2614	0.466	1218	1268	0.9	0.9	0.043	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	15	4	964	764	0.020	15	31	0.0	0.0	0.080	A
2	1020	255	15	2555	0.399	1021	964	1.0	0.7	0.039	A
3	994	249	0	2614	0.380	995	1037	0.9	0.6	0.037	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	13	3	807	841	0.015	13	26	0.0	0.0	0.072	A
2	854	214	13	2557	0.334	855	807	0.7	0.5	0.035	A
3	833	208	0	2614	0.319	833	868	0.6	0.5	0.034	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 4_A256_B2190_R1_AM_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 4_A299_B2190\Strategic Modelling scenarios
Report generation date: 18/03/2019 12:48:13

«2039+Dev(Link+Sig), AM
- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

	AM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	2039+Dev(Link+Sig)					
1 - Hengist way E	50.6	1.94	1.05	F	3.57	-22 % [2 - Tothill Street]
2 - Tothill Street	101.6	16.54	1.49	F		
3 - A299 W	7.9	0.38	0.90	C		
4 - B2190 N	87.5	3.91	1.14	F		

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

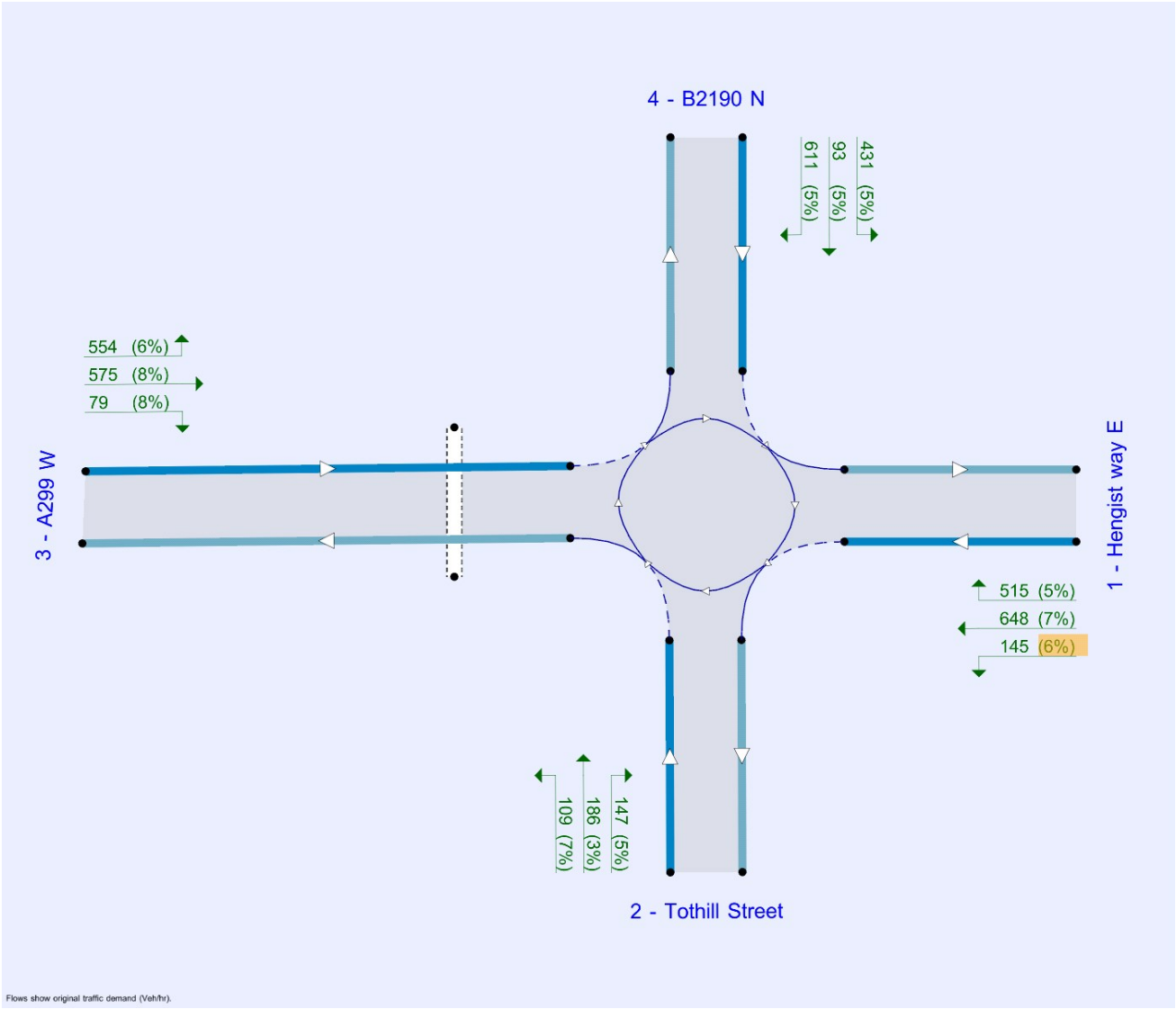
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev(Link+Sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.57	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-22	2 - Tothill Street

Arms

Arms

Arm	Name	Description
1	Hengist way E	
2	Tothill Street	
3	A299 W	
4	B2190 N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Hengist way E	7.50	8.80	15.6	39.0	65.0	14.5	
2 - Tothill Street	3.20	4.01	2.3	22.0	65.0	31.5	
3 - A299 W	7.47	7.47	0.0	34.0	65.0	28.0	
4 - B2190 N	7.33	7.33	0.0	20.0	65.0	23.0	

Pelican/Puffin Crossings

Arm	Space between crossing and junc. entry (Signalised) (PCU)	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)
3 - A299 W	7.00	3.00	2.90	1.00	6.00	6.00	7.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Hengist way E	0.728	2784
2 - Tothill Street	0.428	1084
3 - A299 W	0.639	2325
4 - B2190 N	0.631	2275

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Hengist way E	Percentage		66.00
2 - Tothill Street	Percentage		126.00
3 - A299 W	Percentage		88.00
4 - B2190 N	Percentage		67.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Hengist way E		ONE HOUR	✓	1308	100.000
2 - Tothill Street		ONE HOUR	✓	442	100.000
3 - A299 W		ONE HOUR	✓	1208	100.000
4 - B2190 N		ONE HOUR	✓	1135	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - Hengist way E		
2 - Tothill Street		
3 - A299 W	[ONEHOUR]	60.00
4 - B2190 N		

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	145	648	515
	2 - Tothill Street	147	0	109	186
	3 - A299 W	575	79	0	554
	4 - B2190 N	431	93	611	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	6	7	5
	2 - Tothill Street	5	0	7	3
	3 - A299 W	8	8	0	6
	4 - B2190 N	5	5	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Hengist way E	1.05	1.94	50.6	F	1200	1800
2 - Tothill Street	1.49	16.54	101.6	F	406	608
3 - A299 W	0.90	0.38	7.9	C	1108	1663
4 - B2190 N	1.14	3.91	87.5	F	1041	1562

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	985	246	583		1454	0.677	977	860	0.0	2.0	0.124	A
2 - Tothill Street	333	83	1323		584	0.570	328	237	0.0	1.3	0.230	B
3 - A299 W	909	227	631	45.17	1465	0.621	903	1019	0.0	1.6	0.106	A
4 - B2190 N	854	214	598		1193	0.716	845	937	0.0	2.4	0.168	B

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1176	294	693		1401	0.839	1165	1022	2.0	4.7	0.243	B
2 - Tothill Street	397	99	1576		446	0.891	381	282	1.3	5.4	0.779	E
3 - A299 W	1086	271	746	53.94	1450	0.749	1081	1211	1.6	2.9	0.160	A
4 - B2190 N	1020	255	712		1144	0.892	1003	1115	2.4	6.7	0.387	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1440	360	758		1370	1.051	1338	1148	4.7	30.2	0.973	F
2 - Tothill Street	487	122	1774		338	1.438	336	323	5.4	43.2	4.757	F
3 - A299 W	1330	333	780	66.06	1482	0.898	1312	1329	2.9	7.3	0.325	C
4 - B2190 N	1250	312	822		1096	1.141	1084	1270	6.7	48.0	1.714	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1440	360	764		1367	1.053	1359	1155	30.2	50.6	1.939	F
2 - Tothill Street	487	122	1796		326	1.492	326	327	43.2	83.3	11.952	F
3 - A299 W	1330	333	781	66.06	1481	0.898	1328	1341	7.3	7.9	0.376	C
4 - B2190 N	1250	312	827		1094	1.143	1092	1281	48.0	87.5	3.836	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1176	294	775		1362	0.863	1338	1065	50.6	10.1	1.469	F
2 - Tothill Street	397	99	1799		324	1.225	324	313	83.3	101.6	16.544	F
3 - A299 W	1086	271	771	53.94	1486	0.731	1106	1353	7.9	2.8	0.166	A
4 - B2190 N	1020	255	707		1146	0.891	1133	1171	87.5	59.4	3.906	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	985	246	729		1384	0.711	1015	1009	10.1	2.6	0.175	B
2 - Tothill Street	333	83	1483		497	0.669	492	261	101.6	61.7	9.996	F
3 - A299 W	909	227	770	45.17	1447	0.629	914	1205	2.8	1.7	0.114	A
4 - B2190 N	854	214	658		1167	0.732	1080	1026	59.4	3.1	1.372	F

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 4_A256_B2190_R1_PM_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 4_A299_B2190\Strategic Modelling scenarios
Report generation date: 18/03/2019 14:20:16

«2039+Dev(Link+Sig), PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	2039+Dev(Link+Sig)					
1 - Hengist way E	31.3	1.44	1.02	F	1.74	-12 % [3 - A299 W]
2 - Tothill Street	10.7	1.79	0.98	F		
3 - A299 W	92.3	2.69	1.10	F		
4 - B2190 N	4.5	0.29	0.83	C		

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

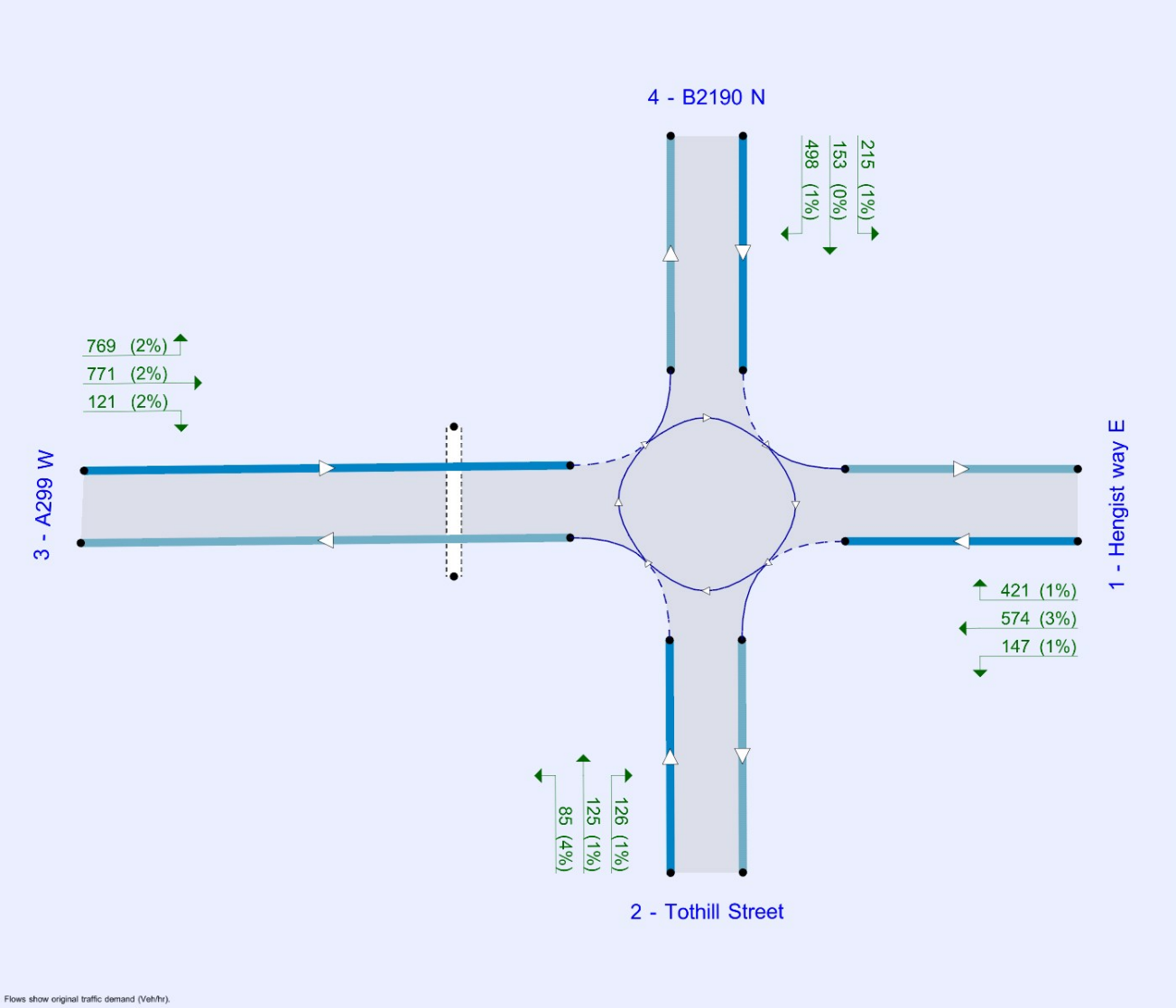
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev(Link+Sig), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	1.74	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-12	3 - A299 W

Arms

Arms

Arm	Name	Description
1	Hengist way E	
2	Tothill Street	
3	A299 W	
4	B2190 N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Hengist way E	7.50	8.80	15.6	39.0	65.0	14.5	
2 - Tothill Street	3.20	4.01	2.3	22.0	65.0	31.5	
3 - A299 W	7.47	7.47	0.0	34.0	65.0	28.0	
4 - B2190 N	7.33	7.33	0.0	20.0	65.0	23.0	

Pelican/Puffin Crossings

Arm	Space between crossing and junc. entry (Signalised) (PCU)	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)
3 - A299 W	7.00	3.00	2.90	1.00	6.00	6.00	7.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Hengist way E	0.728	2784
2 - Tothill Street	0.428	1084
3 - A299 W	0.639	2325
4 - B2190 N	0.631	2275

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Hengist way E	Percentage		58.00
2 - Tothill Street	Percentage		100.00
3 - A299 W	Percentage		91.00
4 - B2190 N	Percentage		72.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Hengist way E		ONE HOUR	✓	1142	100.000
2 - Tothill Street		ONE HOUR	✓	336	100.000
3 - A299 W		ONE HOUR	✓	1661	100.000
4 - B2190 N		ONE HOUR	✓	866	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - Hengist way E		
2 - Tothill Street		
3 - A299 W	[ONEHOUR]	60.00
4 - B2190 N		

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	147	574	421
	2 - Tothill Street	126	0	85	125
	3 - A299 W	771	121	0	769
	4 - B2190 N	215	153	498	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	1	3	1
	2 - Tothill Street	1	0	4	1
	3 - A299 W	2	2	0	2
	4 - B2190 N	1	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Hengist way E	1.02	1.44	31.3	F	1048	1572
2 - Tothill Street	0.98	1.79	10.7	F	308	462
3 - A299 W	1.10	2.69	92.3	F	1524	2286
4 - B2190 N	0.83	0.29	4.5	C	795	1192

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	860	215	577		1342	0.641	853	830	0.0	1.7	0.121	A
2 - Tothill Street	253	63	1116		588	0.430	250	315	0.0	0.7	0.176	B
3 - A299 W	1250	313	501	45.17	1691	0.740	1240	864	0.0	2.7	0.130	A
4 - B2190 N	652	163	759		1276	0.511	648	981	0.0	1.0	0.095	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1027	257	691		1294	0.793	1019	992	1.7	3.6	0.212	B
2 - Tothill Street	302	76	1334		494	0.611	299	376	0.7	1.5	0.303	C
3 - A299 W	1493	373	599	53.94	1729	0.864	1481	1034	2.7	5.7	0.232	B
4 - B2190 N	779	195	908		1208	0.644	776	1173	1.0	1.8	0.138	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1257	314	830		1236	1.017	1190	1131	3.6	20.6	0.803	E
2 - Tothill Street	370	92	1579		389	0.950	347	440	1.5	7.3	1.082	F
3 - A299 W	1829	457	698	66.06	1672	1.094	1651	1228	5.7	50.1	1.174	F
4 - B2190 N	953	238	1017		1158	0.823	944	1332	1.8	4.2	0.268	C

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1257	314	837		1233	1.019	1214	1140	20.6	31.3	1.443	F
2 - Tothill Street	370	92	1606		378	0.979	356	446	7.3	10.7	1.794	F
3 - A299 W	1829	457	714	66.06	1663	1.100	1660	1248	50.1	92.3	2.686	F
4 - B2190 N	953	238	1025		1154	0.826	953	1349	4.2	4.5	0.294	C

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1027	257	714		1285	0.799	1134	1097	31.3	4.4	0.593	E
2 - Tothill Street	302	76	1441		448	0.674	336	407	10.7	2.3	0.657	E
3 - A299 W	1493	373	669	53.94	1688	0.884	1670	1108	92.3	48.0	2.547	F
4 - B2190 N	779	195	1023		1155	0.674	788	1316	4.5	2.1	0.167	B

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	860	215	597		1333	0.645	870	925	4.4	1.9	0.132	A
2 - Tothill Street	253	63	1135		579	0.437	259	332	2.3	0.8	0.191	B
3 - A299 W	1250	313	514	45.17	1778	0.703	1433	880	48.0	2.5	0.293	C
4 - B2190 N	652	163	866		1227	0.531	656	1080	2.1	1.2	0.106	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 5_R1_base+validated.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 5_B2190_Minster Rd
Report generation date: 18/03/2019 15:57:34

»2039+Dev+Link(Sigs), AM
»2039+Dev+Link(Sigs), PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	2039+Dev+Link(Sigs)							
1 - B2190 E	1.2	0.06	0.54	0.08	0.7	0.04	0.42	0.08
2 - B2190 S	2.1	0.09	0.68		2.3	0.10	0.70	
3 - Minster Road	0.3	0.12	0.25		0.1	0.10	0.10	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

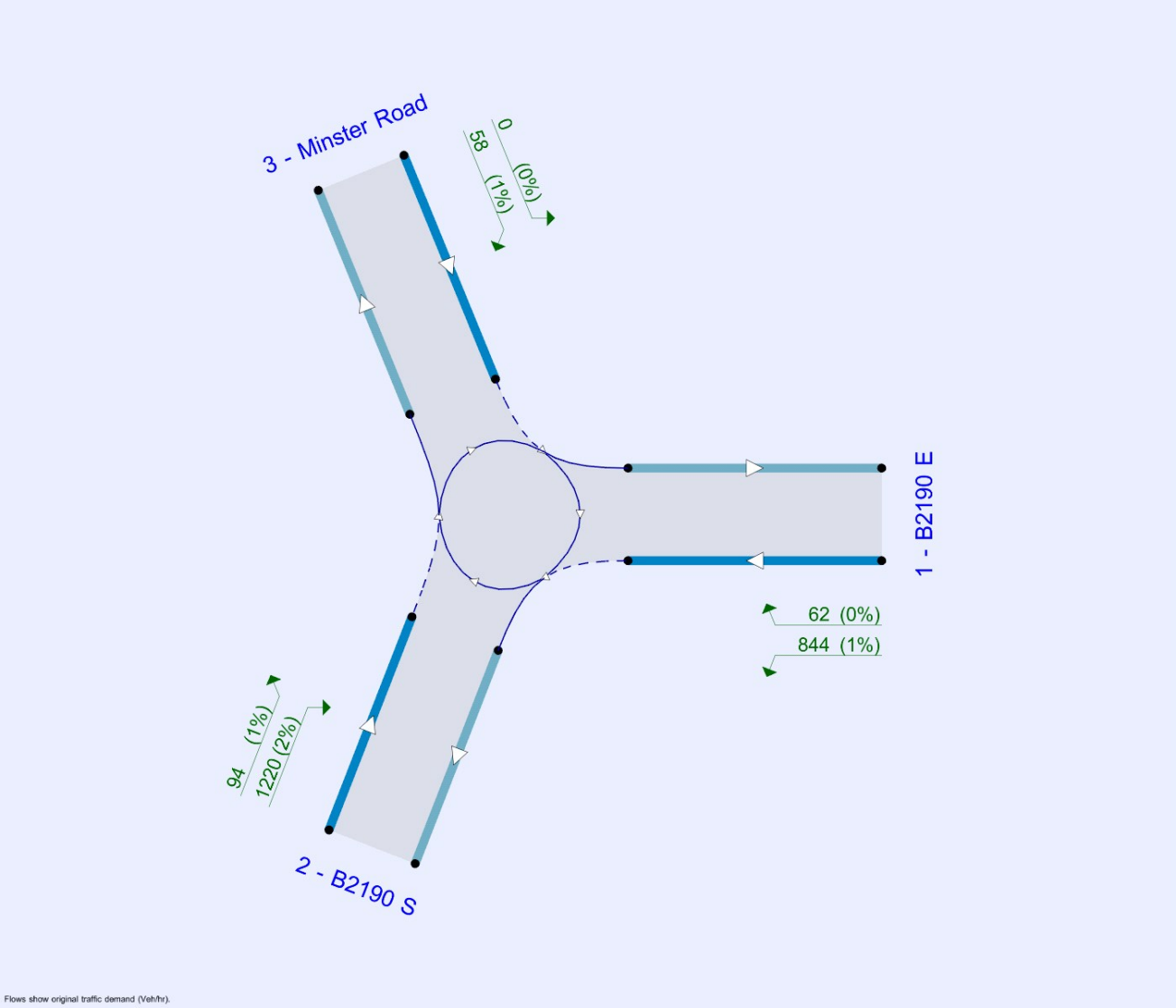
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
		0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2039+Dev+Link(Sigs)	AM	ONE HOUR	07:30	09:00	15
D10	2039+Dev+Link(Sigs)	PM	ONE HOUR	16:30	18:00	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2039+Dev+Link(Sigs), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	B2190 E	
2	B2190 S	
3	Minster Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - B2190 E	7.49	7.49	0.0	25.0	47.0	8.5	
2 - B2190 S	7.00	7.00	0.0	26.0	47.0	29.0	
3 - Minster Road	2.44	6.54	16.9	17.0	47.0	25.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - B2190 E	0.792	2461
2 - B2190 S	0.712	2152
3 - Minster Road	0.574	1448

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2039+Dev+Link(Sigs)	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B2190 E		✓	1094	100.000
2 - B2190 S		✓	1247	100.000
3 - Minster Road		✓	148	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - B2190 E	2 - B2190 S	3 - Minster Road
From	1 - B2190 E	0	1051	43
	2 - B2190 S	1169	0	78
	3 - Minster Road	66	82	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - B2190 E	2 - B2190 S	3 - Minster Road
From	1 - B2190 E	0	7	7
	2 - B2190 S	5	0	3
	3 - Minster Road	0	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
1 - B2190 E	0.54	0.06	1.2	A
2 - B2190 S	0.68	0.09	2.1	A
3 - Minster Road	0.25	0.12	0.3	A

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	824	61	2254	0.365	821	0.6	0.042	A
2 - B2190 S	939	32	2029	0.463	935	0.9	0.055	A
3 - Minster Road	111	877	909	0.123	111	0.1	0.075	A

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	983	74	2244	0.438	983	0.8	0.048	A
2 - B2190 S	1121	39	2024	0.554	1120	1.2	0.066	A
3 - Minster Road	133	1050	806	0.165	133	0.2	0.089	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	1205	90	2232	0.540	1203	1.2	0.058	A
2 - B2190 S	1373	47	2018	0.680	1370	2.1	0.092	A
3 - Minster Road	163	1284	667	0.244	162	0.3	0.119	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	1205	90	2232	0.540	1204	1.2	0.058	A
2 - B2190 S	1373	47	2018	0.680	1373	2.1	0.093	A
3 - Minster Road	163	1287	665	0.245	163	0.3	0.120	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	983	74	2244	0.438	985	0.8	0.048	A
2 - B2190 S	1121	39	2024	0.554	1124	1.3	0.067	A
3 - Minster Road	133	1054	804	0.166	134	0.2	0.090	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	824	62	2253	0.366	824	0.6	0.042	A
2 - B2190 S	939	32	2029	0.463	940	0.9	0.055	A
3 - Minster Road	111	882	907	0.123	112	0.1	0.075	A

2039+Dev+Link(Sigs), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D10	2039+Dev+Link(Sigs)	PM	ONE HOUR	16:30	18:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B2190 E		✓	906	100.000
2 - B2190 S		✓	1314	100.000
3 - Minster Road		✓	58	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - B2190 E	2 - B2190 S	3 - Minster Road
From	1 - B2190 E	0	844	62
	2 - B2190 S	1220	0	94
	3 - Minster Road	0	58	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - B2190 E	2 - B2190 S	3 - Minster Road
From	1 - B2190 E	0	1	0
	2 - B2190 S	2	0	1
	3 - Minster Road	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
1 - B2190 E	0.42	0.04	0.7	A
2 - B2190 S	0.70	0.10	2.3	A
3 - Minster Road	0.10	0.10	0.1	A

Main Results for each time segment

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	682	43	2404	0.284	681	0.4	0.035	A
2 - B2190 S	989	47	2079	0.476	986	0.9	0.055	A
3 - Minster Road	44	915	903	0.048	43	0.1	0.070	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	814	52	2397	0.340	814	0.5	0.038	A
2 - B2190 S	1181	56	2073	0.570	1180	1.3	0.067	A
3 - Minster Road	52	1095	799	0.065	52	0.1	0.080	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	998	64	2388	0.418	997	0.7	0.043	A
2 - B2190 S	1447	68	2064	0.701	1443	2.3	0.096	A
3 - Minster Road	64	1340	657	0.097	64	0.1	0.101	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	998	64	2388	0.418	998	0.7	0.043	A
2 - B2190 S	1447	68	2064	0.701	1447	2.3	0.097	A
3 - Minster Road	64	1343	655	0.098	64	0.1	0.102	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	814	52	2397	0.340	815	0.5	0.038	A
2 - B2190 S	1181	56	2073	0.570	1185	1.3	0.068	A
3 - Minster Road	52	1100	796	0.066	52	0.1	0.081	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	682	44	2404	0.284	683	0.4	0.035	A
2 - B2190 S	989	47	2079	0.476	991	0.9	0.055	A
3 - Minster Road	44	920	900	0.049	44	0.1	0.070	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 6_A253_Willetts Hill_R1_AM_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 6_A299_A253\Strategic Model Scenario
Report generation date: 18/03/2019 15:18:20

«2039+Dev+(Link+Sig), AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	2039+Dev+(Link+Sig)					
1 - A299 E	6.3	0.26	0.87	C	0.67	-17 % [3 - A253 Canterbury Road (W)]
2 - Willetts Hill S	0.2	0.07	0.14	A		
3 - A253 Canterbury Road (W)	9.1	1.72	0.95	F		
4 - A299 (N)	18.3	0.98	0.98	F		
5 - Seamark Road	0.0	0.09	0.04	A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

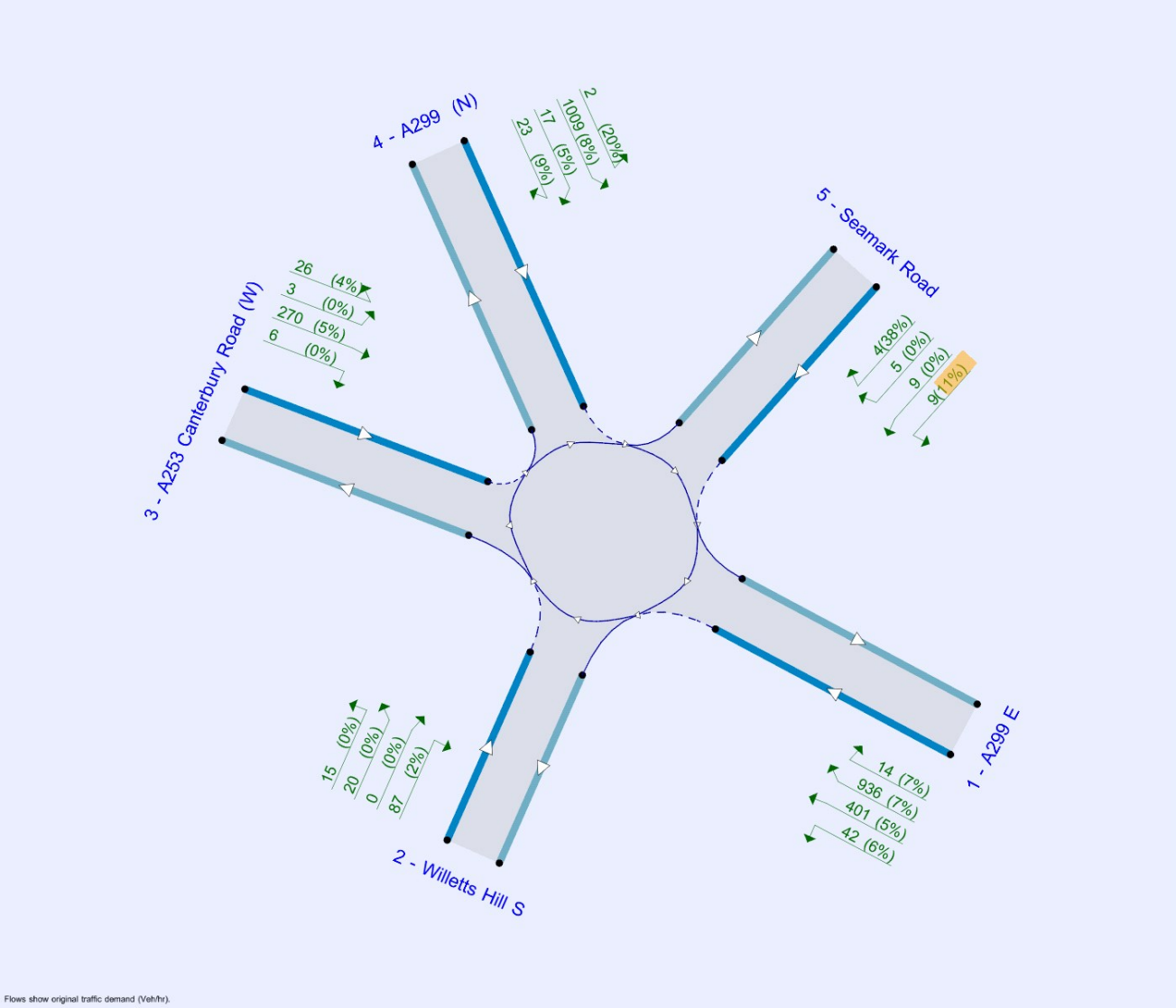
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev+(Link+Sig), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	3 - A253 Canterbury Road (W) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	0.67	E

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-17	3 - A253 Canterbury Road (W)

Arms

Arms

Arm	Name	Description
1	A299 E	
2	Willetts Hill S	
3	A253 Canterbury Road (W)	
4	A299 (N)	
5	Seamark Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 E	7.10	7.41	13.0	43.9	75.0	18.5	
2 - Willetts Hill S	2.49	8.24	27.5	19.7	76.0	30.0	
3 - A253 Canterbury Road (W)	4.70	8.79	31.2	16.8	76.0	35.0	
4 - A299 (N)	7.36	7.36	0.0	17.6	76.8	44.5	
5 - Seamark Road	3.16	7.58	11.2	29.1	75.0	31.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 E	0.606	2387
2 - Willetts Hill S	0.497	1797
3 - A253 Canterbury Road (W)	0.557	2236
4 - A299 (N)	0.528	2103
5 - Seamark Road	0.468	1565

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A299 E	Percentage		80.00
2 - Willetts Hill S	Percentage		100.00
3 - A253 Canterbury Road (W)	Percentage		24.00
4 - A299 (N)	Percentage		68.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev+(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 E		ONE HOUR	✓	1393	100.000
2 - Willetts Hill S		ONE HOUR	✓	122	100.000
3 - A253 Canterbury Road (W)		ONE HOUR	✓	305	100.000
4 - A299 (N)		ONE HOUR	✓	1051	100.000
5 - Seamark Road		ONE HOUR	✓	27	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	42	401	936	14
	2 - Willetts Hill S	87	0	15	20	0
	3 - A253 Canterbury Road (W)	270	6	0	26	3
	4 - A299 (N)	1009	17	23	0	2
	5 - Seamark Road	9	9	5	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	6	5	7	7
	2 - Willetts Hill S	2	0	0	0	0
	3 - A253 Canterbury Road (W)	5	0	0	4	0
	4 - A299 (N)	8	5	9	0	20
	5 - Seamark Road	11	0	0	38	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 E	0.87	0.26	6.3	C	1278	1917
2 - Willetts Hill S	0.14	0.07	0.2	A	112	168
3 - A253 Canterbury Road (W)	0.95	1.72	9.1	F	280	420
4 - A299 (N)	0.98	0.98	18.3	F	964	1447
5 - Seamark Road	0.04	0.09	0.0	A	25	37

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1049	262	48	1772	0.592	1043	1024	0.0	1.4	0.082	A
2 - Willetts Hill S	92	23	1035	1231	0.075	92	55	0.0	0.1	0.053	A
3 - A253 Canterbury Road (W)	230	57	795	404	0.568	225	332	0.0	1.3	0.326	C
4 - A299 (N)	791	198	281	1227	0.645	784	738	0.0	1.8	0.134	A
5 - Seamark Road	20	5	1051	950	0.021	20	14	0.0	0.0	0.065	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1252	313	57	1767	0.709	1249	1226	1.4	2.4	0.115	A
2 - Willetts Hill S	110	27	1239	1124	0.098	110	66	0.1	0.1	0.059	A
3 - A253 Canterbury Road (W)	274	69	951	383	0.717	270	398	1.3	2.3	0.514	D
4 - A299 (N)	945	236	338	1207	0.783	938	883	1.8	3.4	0.218	B
5 - Seamark Road	24	6	1259	855	0.028	24	17	0.0	0.0	0.072	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1534	383	68	1762	0.871	1519	1457	2.4	6.0	0.234	B
2 - Willetts Hill S	134	34	1508	984	0.137	134	80	0.1	0.2	0.071	A
3 - A253 Canterbury Road (W)	336	84	1158	355	0.947	317	484	2.3	7.0	1.209	F
4 - A299 (N)	1157	289	401	1185	0.976	1116	1074	3.4	13.8	0.639	E
5 - Seamark Road	30	7	1496	746	0.040	30	21	0.0	0.0	0.084	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1534	383	70	1761	0.871	1532	1489	6.0	6.3	0.258	C
2 - Willetts Hill S	134	34	1521	977	0.137	134	81	0.2	0.2	0.071	A
3 - A253 Canterbury Road (W)	336	84	1167	353	0.951	328	488	7.0	9.1	1.722	F
4 - A299 (N)	1157	289	411	1182	0.979	1139	1084	13.8	18.3	0.981	F
5 - Seamark Road	30	7	1529	731	0.041	30	21	0.0	0.0	0.086	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1252	313	60	1766	0.709	1268	1313	6.3	2.5	0.124	A
2 - Willetts Hill S	110	27	1259	1114	0.098	110	68	0.2	0.1	0.060	A
3 - A253 Canterbury Road (W)	274	69	964	381	0.720	299	405	9.1	2.9	0.860	F
4 - A299 (N)	945	236	364	1198	0.789	1002	899	18.3	4.0	0.377	C
5 - Seamark Road	24	6	1349	814	0.030	24	18	0.0	0.0	0.076	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1049	262	49	1771	0.592	1053	1049	2.5	1.5	0.084	A
2 - Willetts Hill S	92	23	1045	1226	0.075	92	56	0.1	0.1	0.053	A
3 - A253 Canterbury Road (W)	230	57	802	403	0.570	236	336	2.9	1.4	0.370	C
4 - A299 (N)	791	198	292	1223	0.647	800	746	4.0	1.9	0.145	A
5 - Seamark Road	20	5	1077	938	0.022	20	14	0.0	0.0	0.065	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 6_A253_Willetts Hill_R1_PM_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 6_A299_A253\Strategic Model Scenario
Report generation date: 18/03/2019 15:33:09

«2039+Dev(Link+Sigs), PM
- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

	PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	2039+Dev(Link+Sigs)					
1 - A299 E	5.0	0.20	0.84	B	1.24	-19 % [3 - A253 Canterbury Road (W)]
2 - Willetts Hill S	0.1	0.06	0.08	A		
3 - A253 Canterbury Road (W)	40.3	3.69	1.12	F		
4 - A299 (N)	31.3	1.40	1.02	F		
5 - Seamark Road	0.0	0.10	0.05	A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

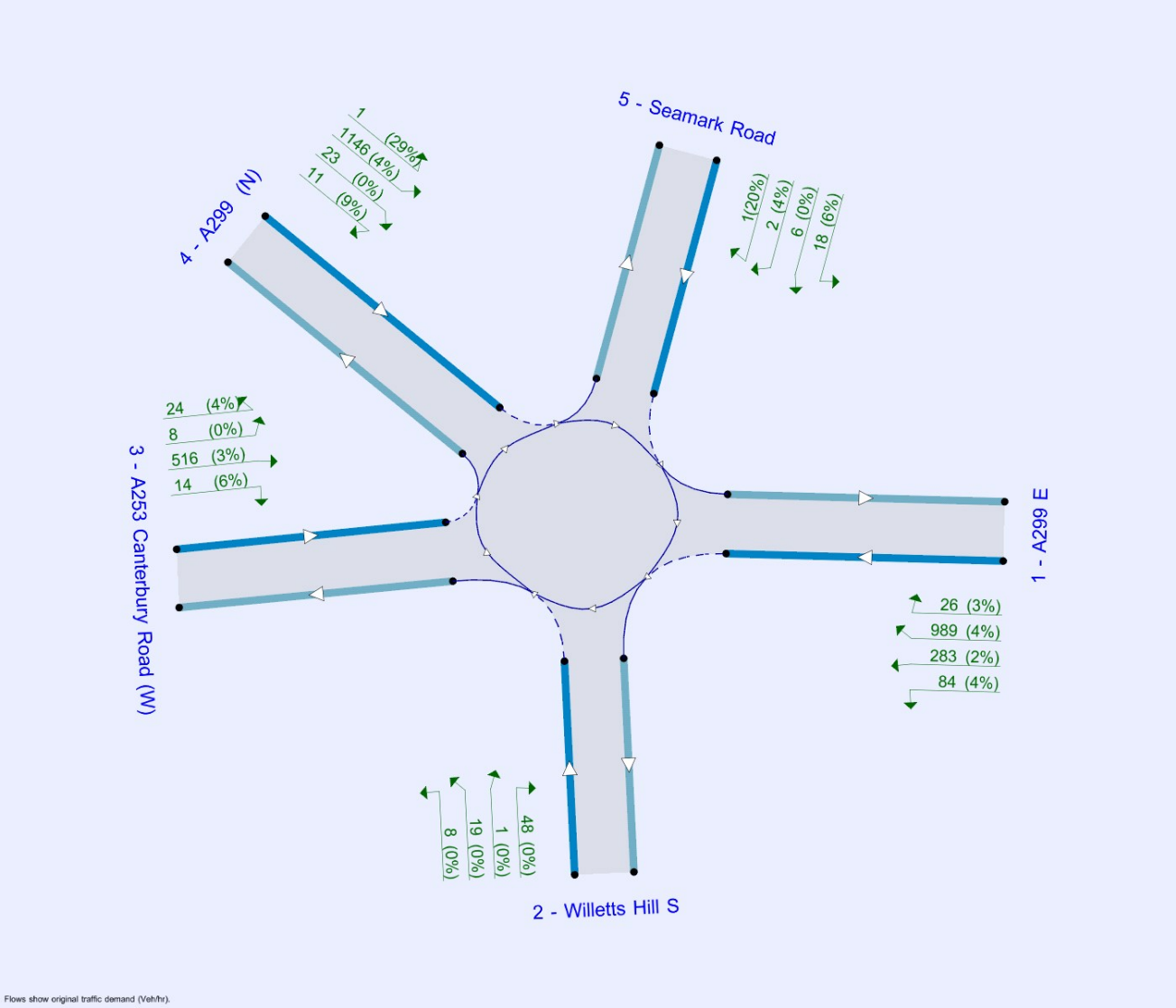
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev(Link+Sigs), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	3 - A253 Canterbury Road (W) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	1.24	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-19	3 - A253 Canterbury Road (W)

Arms

Arms

Arm	Name	Description
1	A299 E	
2	Willetts Hill S	
3	A253 Canterbury Road (W)	
4	A299 (N)	
5	Seamark Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 E	7.10	7.41	13.0	43.9	75.0	18.5	
2 - Willetts Hill S	2.49	8.24	27.5	19.7	76.0	30.0	
3 - A253 Canterbury Road (W)	4.70	8.79	31.2	16.8	76.0	35.0	
4 - A299 (N)	7.36	7.36	0.0	17.6	76.8	44.5	
5 - Seamark Road	3.16	7.58	11.2	29.1	75.0	31.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 E	0.606	2387
2 - Willetts Hill S	0.497	1797
3 - A253 Canterbury Road (W)	0.557	2236
4 - A299 (N)	0.528	2103
5 - Seamark Road	0.468	1565

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A299 E	Percentage		80.00
2 - Willetts Hill S	Percentage		100.00
3 - A253 Canterbury Road (W)	Percentage		37.00
4 - A299 (N)	Percentage		75.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(Link+Sigs)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 E		ONE HOUR	✓	1382	100.000
2 - Willetts Hill S		ONE HOUR	✓	76	100.000
3 - A253 Canterbury Road (W)		ONE HOUR	✓	562	100.000
4 - A299 (N)		ONE HOUR	✓	1181	100.000
5 - Seamark Road		ONE HOUR	✓	27	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	84	283	989	26
	2 - Willetts Hill S	48	0	8	19	1
	3 - A253 Canterbury Road (W)	516	14	0	24	8
	4 - A299 (N)	1146	23	11	0	1
	5 - Seamark Road	18	6	2	1	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	4	2	4	3
	2 - Willetts Hill S	0	0	0	0	0
	3 - A253 Canterbury Road (W)	3	6	0	4	0
	4 - A299 (N)	4	0	9	0	29
	5 - Seamark Road	6	0	4	20	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 E	0.84	0.20	5.0	B	1268	1902
2 - Willetts Hill S	0.08	0.06	0.1	A	70	105
3 - A253 Canterbury Road (W)	1.12	3.69	40.3	F	516	774
4 - A299 (N)	1.02	1.40	31.3	F	1084	1626
5 - Seamark Road	0.05	0.10	0.0	A	25	37

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1040	260	42	1823	0.571	1035	1286	0.0	1.3	0.076	A
2 - Willetts Hill S	57	14	983	1290	0.044	57	95	0.0	0.0	0.049	A
3 - A253 Canterbury Road (W)	423	106	812	634	0.667	415	228	0.0	1.9	0.266	C
4 - A299 (N)	889	222	454	1339	0.664	881	774	0.0	1.9	0.129	A
5 - Seamark Road	20	5	1309	886	0.023	20	27	0.0	0.0	0.069	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1242	311	51	1819	0.683	1239	1536	1.3	2.1	0.103	A
2 - Willetts Hill S	68	17	1176	1191	0.057	68	114	0.0	0.1	0.053	A
3 - A253 Canterbury Road (W)	505	126	972	601	0.841	495	273	1.9	4.4	0.525	D
4 - A299 (N)	1062	265	542	1305	0.814	1053	926	1.9	4.0	0.231	B
5 - Seamark Road	24	6	1563	768	0.032	24	32	0.0	0.0	0.081	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1522	380	59	1816	0.838	1511	1768	2.1	4.8	0.190	B
2 - Willetts Hill S	84	21	1434	1058	0.079	84	136	0.1	0.1	0.062	A
3 - A253 Canterbury Road (W)	619	155	1185	556	1.112	542	332	4.4	23.5	1.856	F
4 - A299 (N)	1300	325	601	1281	1.015	1234	1126	4.0	20.7	0.791	E
5 - Seamark Road	30	7	1797	660	0.045	30	38	0.0	0.0	0.095	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1522	380	60	1815	0.838	1521	1800	4.8	5.0	0.203	B
2 - Willetts Hill S	84	21	1443	1053	0.079	84	137	0.1	0.1	0.062	A
3 - A253 Canterbury Road (W)	619	155	1193	555	1.115	551	334	23.5	40.3	3.685	F
4 - A299 (N)	1300	325	610	1278	1.018	1258	1134	20.7	31.3	1.401	F
5 - Seamark Road	30	7	1830	645	0.046	30	39	0.0	0.0	0.098	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1242	311	56	1817	0.684	1253	1724	5.0	2.2	0.109	A
2 - Willetts Hill S	68	17	1191	1183	0.058	68	119	0.1	0.1	0.054	A
3 - A253 Canterbury Road (W)	505	126	983	598	0.844	584	277	40.3	20.6	3.200	F
4 - A299 (N)	1062	265	627	1271	0.835	1163	940	31.3	5.9	0.755	E
5 - Seamark Road	24	6	1756	679	0.036	24	34	0.0	0.0	0.092	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1040	260	45	1822	0.571	1044	1383	2.2	1.3	0.077	A
2 - Willetts Hill S	57	14	991	1286	0.044	57	98	0.1	0.0	0.049	A
3 - A253 Canterbury Road (W)	423	106	819	633	0.669	497	230	20.6	2.2	0.656	E
4 - A299 (N)	889	222	532	1308	0.680	904	783	5.9	2.2	0.154	A
5 - Seamark Road	20	5	1408	840	0.024	20	28	0.0	0.0	0.073	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 7_A299_A28_R1_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 7_A299_A28\Strategic Model Scenarios
Report generation date: 18/03/2019 16:32:34

»Lane Simulation - 2039+Dev(Link+Sig), AM
»Lane Simulation - 2039+Dev(Link+Sig), PM

Summary of junction performance

	AM						PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	Lane Simulation [Lane Simulation] - 2039+Dev(Link+Sig)											
1 - A28 (E)	109.3	4.01		F	2.80	% [ ]	4.6	0.27		C	2.12	% [ ]
2 - A299 (S)	15.3	0.79		E			7.8	0.42		D		
3 - Canterbury Road (A28 SW)	80.2	13.61		F			100.8	14.08		F		
4 - A299 (W)	8.1	0.26		C			39.6	0.97		F		
5 - Potten Street Road	0.0	0.00		A			0.0	0.00		A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

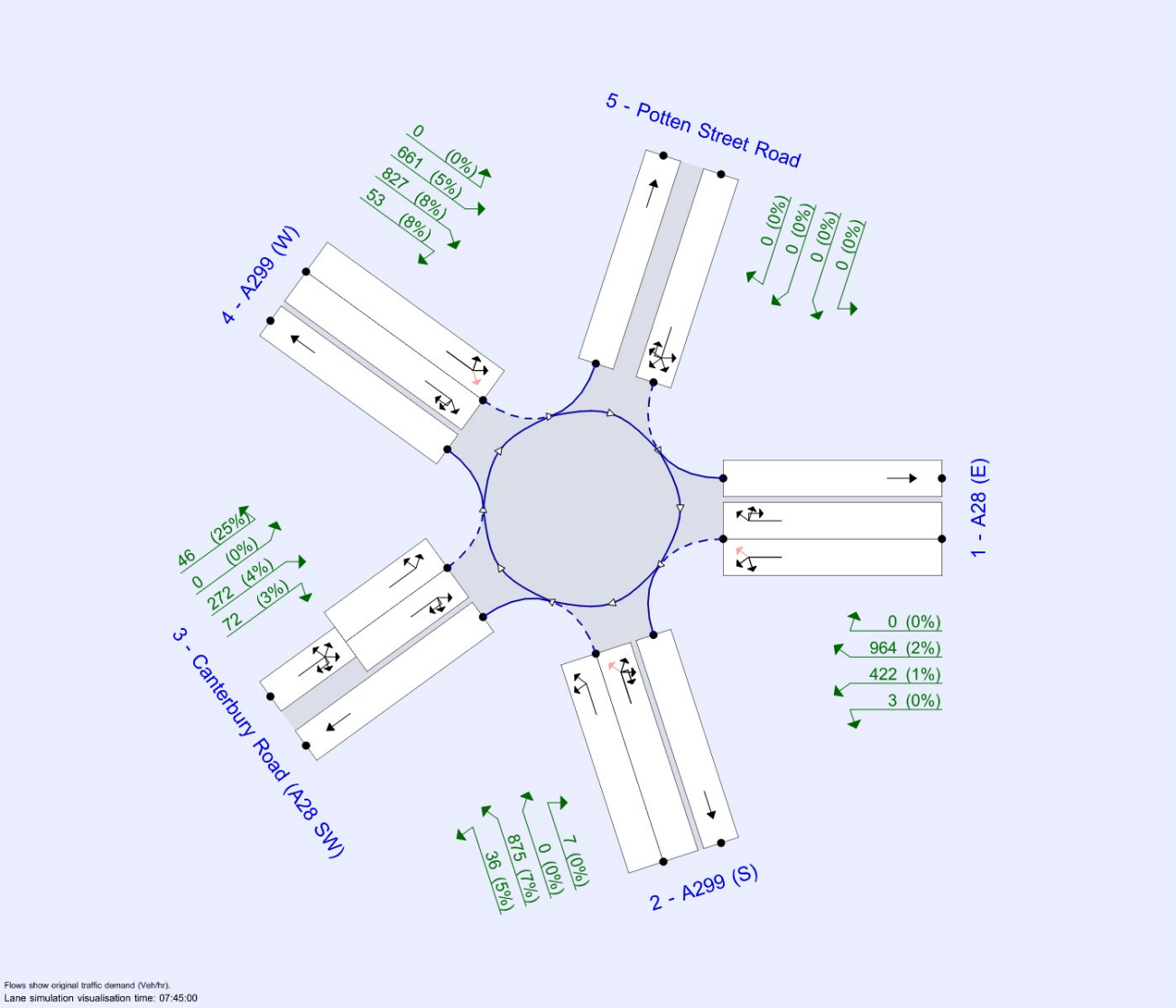
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	5	3	1	60	✓			5	145	82.78

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane Simulation	✓	✓	100.000	100.000

Lane Simulation - 2039+Dev(Link+Sig), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane Simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	1 - A28 (E) - Lane Simulation	Arm 1: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Last Run	Lane Simulation	3 - Canterbury Road (A28 SW) - Lane Simulation	Arm 3: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	2.80	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A28 (E)	
2	A299 (S)	
3	Canterbury Road (A28 SW)	
4	A299 (W)	
5	Potten Street Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A28 (E)	6.35	7.84	1.9	12.5	72.0	42.5	
2 - A299 (S)	7.69	8.17	1.5	20.6	75.0	20.5	
3 - Canterbury Road (A28 SW)	3.46	6.95	19.1	12.7	74.0	39.5	
4 - A299 (W)	8.16	9.75	2.2	24.2	75.2	46.0	
5 - Potten Street Road	3.09	7.25	15.8	46.0	73.6	23.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	0.512	1903
2 - A299 (S)	0.613	2484
3 - Canterbury Road (A28 SW)	0.462	1611
4 - A299 (W)	0.595	2495
5 - Potten Street Road	0.504	1705

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
3 - Canterbury Road (A28 SW)	Percentage		80.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A28 (E)	Evenly split	50.00
2 - A299 (S)	Evenly split	30.00
3 - Canterbury Road (A28 SW)	Evenly split	20.00
4 - A299 (W)	Evenly split	10.00
5 - Potten Street Road	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A28 (E)	Entry	1	1	2, 3, (4)		Infinity		0	99999	
			2	1, 4, 5		Infinity		0	99999	
	Exit	1	1			Infinity				
2 - A299 (S)	Entry	1	1	3, 4		Infinity		0	99999	
			2	1, 2, (4), 5		Infinity		0	99999	
	Exit	1	1			Infinity				
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	✓	3.00		0	99999	
			2	1, 2, 3	✓	3.00		0	99999	
		2	1	(1, 2, 3, 4, 5)		Infinity				
	Exit	1	1			Infinity				
4 - A299 (W)	Entry	1	1	1, (2), 5		Infinity		0	99999	
			2	2, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5		Infinity		0	99999	
	Exit	1	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	Entry	1	1	0.256	951
			2	0.256	951
2 - A299 (S)	Entry	1	1	0.306	1242
			2	0.306	1242
3 - Canterbury Road (A28 SW)	Entry	1	1	0.231	805
			2	0.231	805
4 - A299 (W)	Entry	1	1	0.297	1247
			2	0.297	1247
5 - Potten Street Road	Entry	1	1	0.504	1705

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm				
			A28 (E)	A299 (S)	Canterbury Road (A28 SW)	A299 (W)	Potten Street Road
1 - A28 (E)	1	1		✓	✓		
		2	✓			✓	✓
2 - A299 (S)	1	1			✓	✓	
		2	✓	✓			✓
3 - Canterbury Road (A28 SW)	1	1				✓	✓
		2	✓	✓	✓		
	2	1	✓	✓	✓	✓	✓
4 - A299 (W)	1	1	✓				✓
		2		✓	✓	✓	
5 - Potten Street Road	1	1	✓	✓	✓	✓	✓

Summary of Entry Lane allowed secondary movements

Arm	Lane Level	Lane	Destination arm				
			A28 (E)	A299 (S)	Canterbury Road (A28 SW)	A299 (W)	Potten Street Road
1 - A28 (E)	1	1				✓	
		2					
2 - A299 (S)	1	1					
		2				✓	
3 - Canterbury Road (A28 SW)	1	1					
		2					
	2	1					
4 - A299 (W)	1	1		✓			
		2					
5 - Potten Street Road	1	1					

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	1389	100.000
2 - A299 (S)		ONE HOUR	✓	918	100.000
3 - Canterbury Road (A28 SW)		ONE HOUR	✓	390	100.000
4 - A299 (W)		ONE HOUR	✓	1541	100.000
5 - Potten Street Road		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A28 (E)	2 - A299 (S)	3 - Canterbury Road (A28 SW)	4 - A299 (W)	5 - Potten Street Road
From	1 - A28 (E)	0	3	422	964	0
	2 - A299 (S)	7	0	36	875	0
	3 - Canterbury Road (A28 SW)	272	72	0	46	0
	4 - A299 (W)	661	827	53	0	0
	5 - Potten Street Road	0	0	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A28 (E)	2 - A299 (S)	3 - Canterbury Road (A28 SW)	4 - A299 (W)	5 - Potten Street Road
From	1 - A28 (E)	0	0	1	2	0
	2 - A299 (S)	0	0	5	7	0
	3 - Canterbury Road (A28 SW)	4	3	0	25	0
	4 - A299 (W)	5	8	8	0	0
	5 - Potten Street Road	0	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	4.01	109.3	F	1274	1910
2 - A299 (S)	0.79	15.3	E	847	1271
3 - Canterbury Road (A28 SW)	13.61	80.2	F	357	535
4 - A299 (W)	0.26	8.1	C	1413	2119
5 - Potten Street Road	0.00	0.0	A	0	0

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1041	260	704	1041	1048	712	0.0	3.6	0.201	B
2 - A299 (S)	687	172	1080	689	735	665	0.0	1.6	0.147	A
3 - Canterbury Road (A28 SW)	288	72	1392	283	303	378	0.0	2.9	0.487	D
4 - A299 (W)	1153	288	259	1156	1238	1415	0.0	2.0	0.117	A
5 - Potten Street Road	0	0	1416	0	0	0	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1248	312	846	1239	1246	823	3.6	8.9	0.375	C
2 - A299 (S)	832	208	1280	831	874	805	1.6	3.6	0.243	B
3 - Canterbury Road (A28 SW)	349	87	1662	319	338	449	2.9	10.0	1.238	F
4 - A299 (W)	1387	347	289	1380	1471	1692	2.0	4.2	0.150	A
5 - Potten Street Road	0	0	1668	0	0	0	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1513	378	1026	1316	1344	958	8.9	60.3	1.643	F
2 - A299 (S)	1018	254	1370	999	1051	971	3.6	11.8	0.551	D
3 - Canterbury Road (A28 SW)	430	108	1877	299	327	492	10.0	41.5	5.187	F
4 - A299 (W)	1701	425	274	1710	1792	1903	4.2	6.6	0.255	C
5 - Potten Street Road	0	0	1984	0	0	0	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1529	382	1016	1328	1359	942	60.3	109.5	3.866	F
2 - A299 (S)	1021	255	1384	997	1064	960	11.8	15.3	0.792	E
3 - Canterbury Road (A28 SW)	425	106	1875	303	323	506	41.5	73.6	11.509	F
4 - A299 (W)	1699	425	274	1684	1806	1903	6.6	8.1	0.260	C
5 - Potten Street Road	0	0	1958	0	0	0	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1266	316	844	1407	1414	837	109.5	75.0	4.014	F
2 - A299 (S)	830	207	1452	839	928	798	15.3	5.0	0.508	D
3 - Canterbury Road (A28 SW)	344	86	1789	335	342	502	73.6	80.0	13.614	F
4 - A299 (W)	1375	344	298	1383	1491	1826	8.1	3.2	0.160	A
5 - Potten Street Road	0	0	1680	0	0	0	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1049	262	726	1193	1314	764	75.0	12.3	1.569	F
2 - A299 (S)	699	175	1230	703	752	689	5.0	2.1	0.227	B
3 - Canterbury Road (A28 SW)	301	75	1495	375	383	438	80.0	64.5	10.034	F
4 - A299 (W)	1161	290	336	1155	1243	1535	3.2	2.7	0.120	A
5 - Potten Street Road	0	0	1491	0	0	0	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	508	746	0.680	507	510	0.0	1.7	0.194	B
			2	1, 4, 5	534	744	0.718	534	538	0.0	1.9	0.207	B
	Exit	1	1		712			712	740	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	529	848	0.623	530	570	0.0	1.4	0.167	A
			2	1, 2, (4), 5	158	852	0.185	159	165	0.0	0.1	0.080	A
	Exit	1	1		665			665	723	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	30	300	0.100	30	41	0.0	0.2	0.229	B
			2	1, 2, 3	254	363	0.702	253	262	0.0	1.5	0.329	C
		2	1	(1, 2, 3, 4, 5)	288			285	310	0.0	1.3	0.166	A
	Exit	1	1		378			378	390	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	540	1107	0.488	541	565	0.0	0.8	0.103	A
			2	2, 3, 4	613	1082	0.566	615	673	0.0	1.2	0.129	A
	Exit	1	1		1415			1415	1471	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	947	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	621	708	0.876	614	615	1.7	4.2	0.361	C
			2	1, 4, 5	628	702	0.893	625	631	1.9	4.7	0.390	C
	Exit	1	1		823			823	861	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	624	786	0.794	623	657	1.4	3.3	0.290	C
			2	1, 2, (4), 5	208	783	0.265	209	216	0.1	0.3	0.098	A
	Exit	1	1		805			805	862	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	37	262	0.141	37	48	0.2	0.2	0.259	C
			2	1, 2, 3	283	312	0.907	282	291	1.5	2.5	0.453	D
		2	1	(1, 2, 3, 4, 5)	349			320	343	1.3	7.3	0.799	E
	Exit	1	1		449			449	456	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	639	1104	0.578	635	672	0.8	1.5	0.124	A
			2	2, 3, 4	749	1071	0.699	745	799	1.2	2.7	0.172	B
	Exit	1	1		1692			1692	1751	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	813	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	748	660	1.134	649	665	4.2	29.8	1.635	F
			2	1, 4, 5	765	657	1.166	667	679	4.7	30.5	1.651	F
	Exit	1	1		958			958	991	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	732	764	0.959	712	753	3.3	11.2	0.713	E
			2	1, 2, (4), 5	286	763	0.374	288	298	0.3	0.5	0.126	A
	Exit	1	1		971			971	1030	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	34	224	0.150	34	46	0.2	0.2	0.315	C
			2	1, 2, 3	266	273	0.970	265	281	2.5	3.0	0.620	E
		2	1	(1, 2, 3, 4, 5)	430			300	328	7.3	38.4	4.593	F
	Exit	1	1		492			492	510	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	799	1105	0.723	801	824	1.5	2.0	0.177	B
			2	2, 3, 4	902	1080	0.836	909	968	2.7	4.6	0.323	C
	Exit	1	1		1903			1903	1983	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	644	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	757	662	1.144	657	674	29.8	54.5	3.857	F
			2	1, 4, 5	772	656	1.173	672	686	30.5	55.0	3.874	F
	Exit	1	1		942			942	999	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	738	760	0.973	713	761	11.2	14.6	1.048	F
			2	1, 2, (4), 5	283	754	0.375	283	302	0.5	0.7	0.135	A
	Exit	1	1		960			960	1035	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	37	220	0.167	37	44	0.2	0.2	0.348	C
			2	1, 2, 3	265	272	0.980	266	279	3.0	2.8	0.642	E
		2	1	(1, 2, 3, 4, 5)	425			302	324	38.4	70.6	10.920	F
	Exit	1	1		506			506	511	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	794	1103	0.719	787	834	2.0	2.8	0.186	B
			2	2, 3, 4	905	1076	0.842	897	971	4.6	5.3	0.325	C
	Exit	1	1		1903			1903	2007	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	655	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	636	708	0.897	706	709	54.5	37.2	3.982	F
			2	1, 4, 5	630	704	0.893	701	705	55.0	37.8	4.045	F
	Exit	1	1		837			837	864	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	609	739	0.824	618	691	14.6	4.6	0.652	E
			2	1, 2, (4), 5	221	736	0.299	221	236	0.7	0.4	0.110	A
	Exit	1	1		798			798	879	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	43	238	0.182	43	48	0.2	0.3	0.331	C
			2	1, 2, 3	291	289	1.009	291	294	2.8	2.9	0.609	E
		2	1	(1, 2, 3, 4, 5)	344			335	342	70.6	76.8	13.140	F
	Exit	1	1		502			502	512	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	643	1102	0.584	645	675	2.8	1.2	0.126	A
			2	2, 3, 4	731	1066	0.686	738	816	5.3	2.0	0.189	B
	Exit	1	1		1826			1826	1920	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	805	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	524	740	0.706	595	649	37.2	6.0	1.566	F
			2	1, 4, 5	525	734	0.714	598	665	37.8	6.2	1.573	F
	Exit	1	1		764			764	790	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	534	801	0.667	538	577	4.6	1.8	0.266	C
			2	1, 2, (4), 5	164	805	0.204	165	175	0.4	0.2	0.100	A
	Exit	1	1		689			689	745	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	43	292	0.149	45	56	0.3	0.1	0.289	C
			2	1, 2, 3	330	343	0.963	330	328	2.9	2.9	0.538	D
		2	1	(1, 2, 3, 4, 5)	301			373	383	76.8	61.5	9.636	F
	Exit	1	1		438			438	469	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	532	1084	0.491	532	563	1.2	1.0	0.106	A
			2	2, 3, 4	628	1053	0.597	623	680	2.0	1.7	0.131	A
	Exit	1	1		1535			1535	1689	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	906	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

Lane Simulation - 2039+Dev(Link+Sig), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane Simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	3 - Canterbury Road (A28 SW) - Lane Simulation	Arm 3: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	2.12	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	844	100.000
2 - A299 (S)		ONE HOUR	✓	996	100.000
3 - Canterbury Road (A28 SW)		ONE HOUR	✓	466	100.000
4 - A299 (W)		ONE HOUR	✓	2013	100.000
5 - Potten Street Road		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A28 (E)	2 - A299 (S)	3 - Canterbury Road (A28 SW)	4 - A299 (W)	5 - Potten Street Road
From	1 - A28 (E)	0	2	212	630	0
	2 - A299 (S)	6	0	67	923	0
	3 - Canterbury Road (A28 SW)	368	53	0	45	0
	4 - A299 (W)	972	968	73	0	0
	5 - Potten Street Road	0	0	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A28 (E)	2 - A299 (S)	3 - Canterbury Road (A28 SW)	4 - A299 (W)	5 - Potten Street Road
From	1 - A28 (E)	0	7	2	2	0
	2 - A299 (S)	10	0	0	3	0
	3 - Canterbury Road (A28 SW)	1	8	0	8	0
	4 - A299 (W)	1	2	20	0	0
	5 - Potten Street Road	0	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	0.27	4.6	C	772	1157
2 - A299 (S)	0.42	7.8	D	913	1369
3 - Canterbury Road (A28 SW)	14.08	100.8	F	429	643
4 - A299 (W)	0.97	39.6	F	1853	2780
5 - Potten Street Road	0.00	0.0	A	0	0

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	634	158	835	632	644	1002	0.0	1.3	0.130	A
2 - A299 (S)	753	188	685	752	765	781	0.0	1.7	0.118	A
3 - Canterbury Road (A28 SW)	348	87	1174	347	346	263	0.0	3.7	0.546	D
4 - A299 (W)	1513	378	319	1518	1542	1202	0.0	4.0	0.156	A
5 - Potten Street Road	0	0	1837	0	0	0	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	752	188	987	751	775	1192	1.3	2.0	0.162	A
2 - A299 (S)	884	221	817	888	921	921	1.7	2.3	0.167	B
3 - Canterbury Road (A28 SW)	419	105	1391	396	389	314	3.7	12.8	1.480	F
4 - A299 (W)	1823	456	362	1817	1832	1425	4.0	8.0	0.243	B
5 - Potten Street Road	0	0	2179	0	0	0	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	925	231	1165	926	936	1337	2.0	4.0	0.248	B
2 - A299 (S)	1096	274	1001	1081	1103	1090	2.3	7.5	0.335	C
3 - Canterbury Road (A28 SW)	526	132	1697	346	366	385	12.8	53.6	5.709	F
4 - A299 (W)	2232	558	321	2181	2172	1721	8.0	31.4	0.666	E
5 - Potten Street Road	0	0	2502	0	0	0	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	922	230	1155	920	943	1337	4.0	4.6	0.272	C
2 - A299 (S)	1096	274	1000	1096	1129	1074	7.5	7.7	0.418	D
3 - Canterbury Road (A28 SW)	510	127	1708	351	355	388	53.6	94.7	12.362	F
4 - A299 (W)	2227	557	326	2167	2230	1733	31.4	39.6	0.969	F
5 - Potten Street Road	0	0	2493	0	0	0	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	754	189	1002	758	787	1208	4.6	2.1	0.188	B
2 - A299 (S)	905	226	821	902	940	939	7.7	2.6	0.220	B
3 - Canterbury Road (A28 SW)	416	104	1409	412	406	313	94.7	100.8	14.079	F
4 - A299 (W)	1807	452	379	1832	1973	1442	39.6	10.5	0.559	D
5 - Potten Street Road	0	0	2211	0	0	0	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	642	160	833	641	659	1099	2.1	1.4	0.134	A
2 - A299 (S)	741	185	691	740	771	783	2.6	1.5	0.121	A
3 - Canterbury Road (A28 SW)	350	88	1170	454	455	261	100.8	77.1	9.883	F
4 - A299 (W)	1519	380	414	1518	1573	1210	10.5	4.5	0.184	B
5 - Potten Street Road	0	0	1932	0	0	0	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	291	716	0.406	291	297	0.0	0.5	0.120	A
			2	1, 4, 5	343	716	0.479	341	347	0.0	0.8	0.138	A
	Exit	1	1		1002			1002	1004	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	593	999	0.593	593	602	0.0	1.5	0.131	A
			2	1, 2, (4), 5	160	991	0.161	160	163	0.0	0.2	0.071	A
	Exit	1	1		781			781	789	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	33	400	0.083	33	36	0.0	0.1	0.170	B
			2	1, 2, 3	315	413	0.763	314	310	0.0	1.9	0.328	C
		2	1	(1, 2, 3, 4, 5)	348			348	354	0.0	1.7	0.231	B
	Exit	1	1		263			263	279	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	761	1139	0.668	763	768	0.0	2.1	0.154	A
			2	2, 3, 4	752	1111	0.677	755	774	0.0	1.9	0.158	A
	Exit	1	1		1202			1202	1225	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	758	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	348	677	0.513	348	358	0.5	0.8	0.147	A
			2	1, 4, 5	405	676	0.599	403	417	0.8	1.2	0.174	B
	Exit	1	1		1192			1192	1182	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	682	958	0.712	686	710	1.5	2.1	0.194	B
			2	1, 2, (4), 5	202	954	0.212	202	212	0.2	0.2	0.077	A
	Exit	1	1		921			921	931	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	39	350	0.112	40	40	0.1	0.1	0.203	B
			2	1, 2, 3	356	375	0.951	356	350	1.9	2.6	0.431	D
		2	1	(1, 2, 3, 4, 5)	419			396	392	1.7	10.0	1.066	F
	Exit	1	1		314			314	330	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	920	1125	0.818	920	917	2.1	3.7	0.233	B
			2	2, 3, 4	903	1101	0.820	897	916	1.9	4.2	0.253	C
	Exit	1	1		1425			1425	1475	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	583	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	441	631	0.700	440	444	0.8	1.7	0.226	B
			2	1, 4, 5	484	629	0.770	486	492	1.2	2.3	0.269	C
	Exit	1	1		1337			1337	1328	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	815	900	0.906	798	816	2.1	7.2	0.418	D
			2	1, 2, (4), 5	282	901	0.313	283	287	0.2	0.3	0.092	A
	Exit	1	1		1090			1090	1092	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	32	303	0.105	31	38	0.1	0.1	0.218	B
			2	1, 2, 3	314	316	0.995	315	328	2.6	2.9	0.537	D
		2	1	(1, 2, 3, 4, 5)	526			346	368	10.0	50.5	5.188	F
	Exit	1	1		385			385	399	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	1123	1138	0.987	1109	1089	3.7	15.6	0.668	E
			2	2, 3, 4	1109	1116	0.994	1073	1083	4.2	15.9	0.664	E
	Exit	1	1		1721			1721	1758	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	418	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	434	633	0.686	431	445	1.7	2.1	0.252	C
			2	1, 4, 5	488	634	0.771	488	499	2.3	2.5	0.290	C
	Exit	1	1		1337			1337	1348	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	807	901	0.897	807	833	7.2	7.2	0.532	D
			2	1, 2, (4), 5	289	897	0.321	289	296	0.3	0.5	0.096	A
	Exit	1	1		1074			1074	1114	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	33	296	0.111	33	36	0.1	0.1	0.243	B
			2	1, 2, 3	318	315	1.011	318	318	2.9	3.0	0.565	D
		2	1	(1, 2, 3, 4, 5)	510			351	355	50.5	91.6	11.882	F
	Exit	1	1		388			388	409	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	1126	1137	0.990	1099	1117	15.6	19.9	0.970	F
			2	2, 3, 4	1101	1111	0.991	1068	1113	15.9	19.7	0.967	F
	Exit	1	1		1733			1733	1786	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	421	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	349	673	0.518	350	365	2.1	0.9	0.172	B
			2	1, 4, 5	405	673	0.602	407	422	2.5	1.2	0.201	B
	Exit	1	1		1208			1208	1264	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	695	955	0.728	692	720	7.2	2.4	0.264	C
			2	1, 2, (4), 5	210	948	0.221	210	220	0.5	0.3	0.079	A
	Exit	1	1		939			939	998	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	39	348	0.112	39	41	0.1	0.2	0.217	B
			2	1, 2, 3	373	370	1.008	373	365	3.0	3.0	0.489	D
		2	1	(1, 2, 3, 4, 5)	416			411	407	91.6	97.7	13.690	F
	Exit	1	1		313			313	344	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	916	1122	0.816	922	986	19.9	5.2	0.551	D
			2	2, 3, 4	891	1094	0.814	910	986	19.7	5.2	0.566	D
	Exit	1	1		1442			1442	1500	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	566	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	296	717	0.413	295	302	0.9	0.6	0.125	A
			2	1, 4, 5	346	717	0.482	346	357	1.2	0.8	0.142	A
	Exit	1	1		1099			1099	1111	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	584	993	0.587	583	608	2.4	1.3	0.134	A
			2	1, 2, (4), 5	158	993	0.159	157	163	0.3	0.2	0.070	A
	Exit	1	1		783			783	808	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	44	387	0.114	45	48	0.2	0.1	0.201	B
			2	1, 2, 3	409	415	0.986	410	407	3.0	2.9	0.435	D
		2	1	(1, 2, 3, 4, 5)	350			453	455	97.7	74.1	9.602	F
	Exit	1	1		261			261	279	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	777	1110	0.700	776	789	5.2	2.3	0.182	B
			2	2, 3, 4	742	1085	0.684	742	784	5.2	2.2	0.186	B
	Exit	1	1		1210			1210	1260	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	710	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 8a_A28_Station Rd_R3_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 8 A28_Station Rd\Strategic Modelling Scenario
Report generation date: 18/03/2019 16:45:10

»ARCADY and PICADY module - 2039+Dev(Link+Sig), AM
»ARCADY and PICADY module - 2039+Dev(Link+Sig), PM
»(LS) ARCADY and PICADY module - 2039+Dev(Link+Sig), AM
»(LS) ARCADY and PICADY module - 2039+Dev(Link+Sig), PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	ARCADY and PICADY module - 2039+Dev(Link+Sig)									
1 - A28 (E)	13.2	1.00	0.96	F	2.92	2.6	0.22	0.72	B	0.99
2 - A28 (S)	6.2	0.43	0.87	D		7.0	0.48	0.89	D	
3 - Station Rd	87.1	8.72	1.29	F		28.5	2.68	1.06	F	
	(LS) ARCADY and PICADY module [Lane Simulation] - 2039+Dev(Link+Sig)									
1 - A28 (E)	193.8	17.56		F	19.80	20.1	1.51		F	12.28
2 - A28 (S)	190.8	15.92		F		203.2	16.44		F	
3 - Station Rd	291.0	27.85		F		151.2	18.80		F	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay.

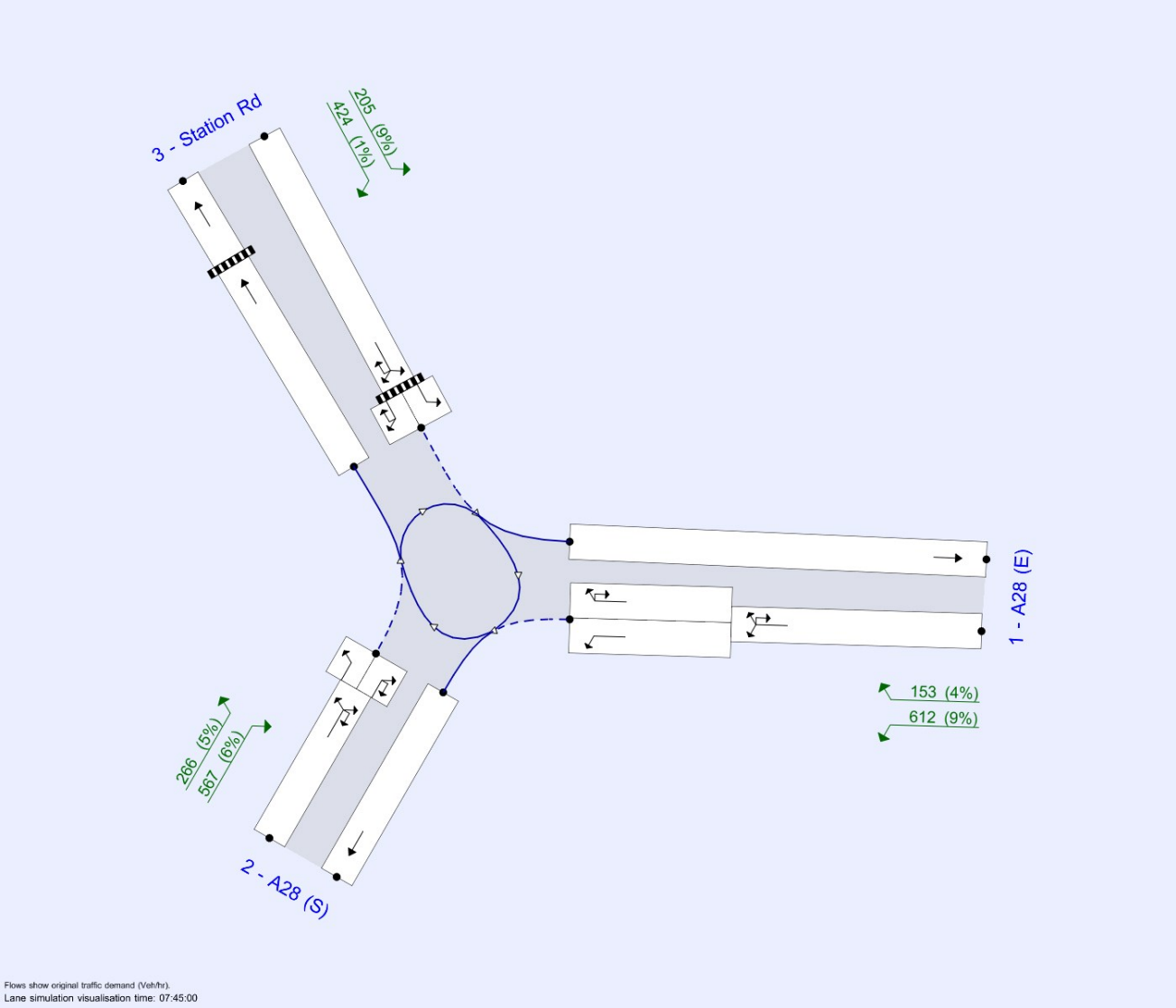
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	02/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\fuad.huda
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			0	0	0.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

ARCADY and PICADY module - 2039+Dev (Link+Sig), AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	ARCADY and PICADY module	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	2.92	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	A28 (E)	
2	A28 (S)	
3	Station Rd	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - A28 (E)	3.08	3.08	6.11	45.0	14.56	8.18	0.0	
2 - A28 (S)	3.82	3.82	7.20	17.2	13.47	7.36	0.0	
3 - Station Rd	3.65	3.65	9.21	16.2	16.43	15.73	0.0	

Zebra Crossings

Arm	Space between crossing and junction entry (Zebra) (PCU)	Vehicles queueing on exit (Zebra) (PCU)	Central Refuge	Crossing data type	Crossing length (m)	Crossing time (s)
3 - Station Rd	7.00	6.00		Distance	9.50	6.79

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	0.689	1283
2 - A28 (S)	0.701	1232
3 - Station Rd	0.751	1423

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A28 (E)	Percentage		92.00
2 - A28 (S)	Percentage		100.00
3 - Station Rd	Percentage		60.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	765	100.000
2 - A28 (S)		ONE HOUR	✓	833	100.000
3 - Station Rd		ONE HOUR	✓	629	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - A28 (E)		
2 - A28 (S)		
3 - Station Rd	[ONEHOUR]	10.00

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	612	153
	2 - A28 (S)	567	0	266
	3 - Station Rd	205	424	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	9	4
	2 - A28 (S)	6	0	5
	3 - Station Rd	9	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	0.96	1.00	13.2	F	702	1053
2 - A28 (S)	0.87	0.43	6.2	D	764	1147
3 - Station Rd	1.29	8.72	87.1	F	577	866

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	576	144	312		908	0.634	569	574	0.0	1.7	0.174	B
2 - A28 (S)	627	157	114		1088	0.577	622	767	0.0	1.3	0.127	A
3 - Station Rd	474	118	423	7.53	629	0.753	462	312	0.0	2.8	0.341	C

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	688	172	364		877	0.784	681	683	1.7	3.3	0.296	C
2 - A28 (S)	749	187	136		1072	0.698	745	909	1.3	2.2	0.181	B
3 - Station Rd	565	141	507	8.99	590	0.958	540	374	2.8	9.1	0.910	F

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	842	211	362		879	0.959	813	790	3.3	10.6	0.709	E
2 - A28 (S)	917	229	163		1054	0.870	903	1012	2.2	5.7	0.368	C
3 - Station Rd	693	173	615	11.01	540	1.281	537	451	9.1	48.0	3.480	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	842	211	361		879	0.958	832	798	10.6	13.2	0.996	F
2 - A28 (S)	917	229	166		1051	0.872	915	1027	5.7	6.2	0.426	D
3 - Station Rd	693	173	623	11.01	537	1.290	536	459	48.0	87.1	7.558	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	688	172	389		862	0.798	723	708	13.2	4.4	0.505	D
2 - A28 (S)	749	187	145		1067	0.702	764	968	6.2	2.5	0.207	B
3 - Station Rd	565	141	520	8.99	584	0.968	578	388	87.1	84.0	8.720	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	576	144	417		846	0.681	585	631	4.4	2.2	0.237	B
2 - A28 (S)	627	157	117		1086	0.578	631	885	2.5	1.4	0.133	A
3 - Station Rd	474	118	430	7.53	626	0.757	618	319	84.0	47.8	6.440	F

ARCADY and PICADY module - 2039+Dev (Link+Sig), PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	ARCADY and PICADY module	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	0.99	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	A28 (E)	
2	A28 (S)	
3	Station Rd	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - A28 (E)	3.08	3.08	6.11	45.0	14.56	8.18	0.0	
2 - A28 (S)	3.82	3.82	7.20	17.2	13.47	7.36	0.0	
3 - Station Rd	3.65	3.65	9.21	16.2	16.43	15.73	0.0	

Zebra Crossings

Arm	Space between crossing and junction entry (Zebra) (PCU)	Vehicles queueing on exit (Zebra) (PCU)	Central Refuge	Crossing data type	Crossing length (m)	Crossing time (s)
3 - Station Rd	7.00	6.00		Distance	9.50	6.79

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	0.689	1283
2 - A28 (S)	0.701	1232
3 - Station Rd	0.751	1423

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A28 (E)	Percentage		92.00
2 - A28 (S)	Percentage		100.00
3 - Station Rd	Percentage		60.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	659	100.000
2 - A28 (S)		ONE HOUR	✓	846	100.000
3 - Station Rd		ONE HOUR	✓	554	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - A28 (E)		
2 - A28 (S)		
3 - Station Rd	[ONEHOUR]	10.00

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	450	209
	2 - A28 (S)	528	0	318
	3 - Station Rd	319	235	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	3	2
	2 - A28 (S)	1	0	3
	3 - Station Rd	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	0.72	0.22	2.6	B	605	907
2 - A28 (S)	0.89	0.48	7.0	D	776	1164
3 - Station Rd	1.06	2.68	28.5	F	508	763

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	496	124	174		1042	0.476	493	630	0.0	0.9	0.108	A
2 - A28 (S)	637	159	156		1102	0.578	632	510	0.0	1.3	0.126	A
3 - Station Rd	417	104	394	7.53	655	0.636	410	394	0.0	1.7	0.239	B

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	592	148	208		1021	0.580	591	755	0.9	1.4	0.139	A
2 - A28 (S)	761	190	187		1080	0.704	757	611	1.3	2.3	0.184	B
3 - Station Rd	498	125	472	8.99	621	0.802	491	472	1.7	3.6	0.436	D

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	726	181	235		1005	0.722	721	890	1.4	2.5	0.208	B
2 - A28 (S)	931	233	229		1051	0.887	915	728	2.3	6.3	0.402	C
3 - Station Rd	610	152	571	11.01	577	1.057	554	573	3.6	17.5	1.443	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	726	181	240		1001	0.724	725	906	2.5	2.6	0.217	B
2 - A28 (S)	931	233	230		1050	0.887	929	735	6.3	7.0	0.476	D
3 - Station Rd	610	152	580	11.01	573	1.064	566	579	17.5	28.5	2.681	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	592	148	249		996	0.595	597	824	2.6	1.5	0.152	A
2 - A28 (S)	761	190	189		1078	0.705	778	657	7.0	2.5	0.211	B
3 - Station Rd	498	125	486	8.99	615	0.810	588	482	28.5	6.0	1.848	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	496	124	184		1036	0.479	498	650	1.5	0.9	0.112	A
2 - A28 (S)	637	159	158		1100	0.579	641	524	2.5	1.4	0.132	A
3 - Station Rd	417	104	400	7.53	653	0.639	434	399	6.0	1.9	0.293	C

(LS) ARCADY and PICADY module - 2039+Dev (Link+Sig), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - (LS) ARCADY and PICADY module [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	1 - A28 (E) - Lane Simulation	Arm 1: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Last Run	Lane Simulation	2 - A28 (S) - Lane Simulation	Arm 2: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Last Run	Lane Simulation	3 - Station Rd - Lane Simulation	Arm 3: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Crossings	3 - Station Rd - Pedestrian crossing	Lane Simulation: Pedestrian crossing properties specify gap between crossing and junction entry as 7, but actual storage on lanes is 2.

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	(LS) ARCADY and PICADY module	✓	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	19.80	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	A28 (E)	
2	A28 (S)	
3	Station Rd	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - A28 (E)	3.08	3.08	6.11	45.0	14.56	8.18	0.0	
2 - A28 (S)	3.82	3.82	7.20	17.2	13.47	7.36	0.0	
3 - Station Rd	3.65	3.65	9.21	16.2	16.43	15.73	0.0	

Zebra Crossings

Arm	Space between crossing and junction entry (Zebra) (PCU)	Vehicles queueing on exit (Zebra) (PCU)	Central Refuge	Crossing data type	Crossing length (m)	Crossing time (s)
3 - Station Rd	7.00	6.00		Distance	9.50	6.79

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	0.689	1283
2 - A28 (S)	0.701	1232
3 - Station Rd	0.751	1423

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A28 (E)	Percentage		92.00
2 - A28 (S)	Percentage		100.00
3 - Station Rd	Percentage		60.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A28 (E)	Evenly split	10.00
2 - A28 (S)	Evenly split	10.00
3 - Station Rd	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A28 (E)	Entry	1	1	2	✓	4.00		0	99999	
			2	1, 3	✓	4.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1			Infinity				
2 - A28 (S)	Entry	1	1	3	✓	1.00		0	99999	
			2	1, 2	✓	1.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1			Infinity				
3 - Station Rd	Entry	1	1	1	✓	1.00		0	99999	
			2	2, 3	✓	1.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1		✓	6.00				
		2	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	Entry	1	1	0.344	642
			2	0.344	642
2 - A28 (S)	Entry	1	1	0.350	616
			2	0.350	616
3 - Station Rd	Entry	1	1	0.376	711
			2	0.376	711

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm		
			A28 (E)	A28 (S)	Station Rd
1 - A28 (E)	1	1		✓	
		2	✓		✓
	2	1	✓	✓	✓
2 - A28 (S)	1	1			✓
		2	✓	✓	
	2	1	✓	✓	✓
3 - Station Rd	1	1	✓		
		2		✓	✓
	2	1	✓	✓	✓

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	765	100.000
2 - A28 (S)		ONE HOUR	✓	833	100.000
3 - Station Rd		ONE HOUR	✓	629	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - A28 (E)		
2 - A28 (S)		
3 - Station Rd	[ONEHOUR]	10.00

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	612	153
	2 - A28 (S)	567	0	266
	3 - Station Rd	205	424	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	9	4
	2 - A28 (S)	6	0	5
	3 - Station Rd	9	1	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	17.56	193.8	F	699	1049
2 - A28 (S)	15.92	190.8	F	767	1150
3 - Station Rd	27.85	291.0	F	579	868

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	580	145	268		532	564	533	0.0	14.1	1.027	F
2 - A28 (S)	617	154	113		599	615	689	0.0	11.0	0.801	E
3 - Station Rd	476	119	407	7.53	395	398	305	0.0	22.9	2.082	F

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	693	173	260		596	620	580	14.1	42.6	3.113	F
2 - A28 (S)	753	188	121		663	686	731	11.0	36.5	2.333	F
3 - Station Rd	561	140	453	8.99	384	405	332	22.9	66.5	7.025	F

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	827	207	253		571	637	572	42.6	103.1	7.585	F
2 - A28 (S)	922	230	114		651	690	714	36.5	102.4	6.508	F
3 - Station Rd	702	176	445	11.01	383	399	319	66.5	143.5	16.620	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	835	209	243		571	629	581	103.1	167.1	14.075	F
2 - A28 (S)	927	232	112		678	697	713	102.4	167.8	12.426	F
3 - Station Rd	696	174	455	11.01	379	395	335	143.5	220.8	27.797	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	690	172	259		578	632	576	167.1	192.7	17.561	F
2 - A28 (S)	745	186	116		658	694	722	167.8	190.8	15.925	F
3 - Station Rd	562	140	447	8.99	389	399	327	220.8	266.3	27.854	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	577	144	252		573	622	569	192.7	194.1	13.434	F
2 - A28 (S)	629	157	115		662	692	715	190.8	182.2	13.107	F
3 - Station Rd	480	120	450	7.53	375	395	327	266.3	291.2	14.995	F

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	421		462	0.912	419	450	0.0	3.0	0.396	C
			2	1, 3	112		484	0.230	113	114	0.0	0.3	0.176	B
		2	1	(1, 2, 3)	580				533	579	0.0	10.8	0.671	E
	Exit	1	1		533				533	559	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	191		546	0.350	192	193	0.0	0.3	0.108	A
			2	1, 2	407		542	0.751	407	422	0.0	0.7	0.112	A
		2	1	(1, 2, 3)	617				599	620	0.0	9.9	0.690	E
	Exit	1	1		689				689	712	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	125		303	0.412	126	137	0.0	0.4	0.192	B
			2	2, 3	270		325	0.831	270	261	0.0	0.9	0.181	B
		2	1	(1, 2, 3)	476	7.53			396	404	0.0	21.6	1.896	F
	Exit	1	1		305	7.53			305	307	0.0	0.0	0.001	A
		2	1		305				305	307	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	476		465	1.024	475	502	3.0	3.6	0.461	D
			2	1, 3	122		491	0.249	121	119	0.3	0.5	0.180	B
		2	1	(1, 2, 3)	693				598	624	10.8	38.4	2.709	F
	Exit	1	1		580				580	607	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	211		545	0.387	211	218	0.3	0.4	0.109	A
			2	1, 2	452		542	0.833	453	467	0.7	0.7	0.110	A
		2	1	(1, 2, 3)	753				663	686	9.9	35.4	2.223	F
	Exit	1	1		731				731	767	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	127		296	0.432	127	140	0.4	0.4	0.203	B
			2	2, 3	257		315	0.814	257	265	0.9	0.8	0.186	B
		2	1	(1, 2, 3)	561	8.99			384	405	21.6	65.3	6.833	F
	Exit	1	1		332	8.99			332	337	0.0	0.0	0.001	A
		2	1		332				332	337	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	458		468	0.979	458	514	3.6	3.7	0.462	D
			2	1, 3	113		485	0.234	114	123	0.5	0.4	0.193	B
		2	1	(1, 2, 3)	827				571	636	38.4	99.0	7.174	F
	Exit	1	1		572				572	611	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	206		546	0.377	206	219	0.4	0.4	0.109	A
			2	1, 2	445		541	0.822	445	471	0.7	0.8	0.112	A
		2	1	(1, 2, 3)	922				651	690	35.4	101.2	6.397	F
	Exit	1	1		714				714	774	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	126		291	0.429	126	139	0.4	0.4	0.204	B
			2	2, 3	257		318	0.808	256	260	0.8	0.9	0.190	B
		2	1	(1, 2, 3)	702	11.01			383	399	65.3	142.3	16.423	F
	Exit	1	1		320	11.01			319	341	0.0	0.0	0.001	A
		2	1		319				319	341	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	460		466	0.986	459	507	3.7	3.7	0.469	D
			2	1, 3	112		492	0.228	112	122	0.4	0.4	0.194	B
		2	1	(1, 2, 3)	835				572	629	99.0	163.0	13.662	F
	Exit	1	1		581				581	611	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	225		546	0.412	223	223	0.4	0.5	0.109	A
			2	1, 2	454		547	0.830	455	474	0.8	0.7	0.111	A
		2	1	(1, 2, 3)	927				679	697	101.2	166.6	12.317	F
	Exit	1	1		713				713	765	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	125		295	0.425	125	136	0.4	0.4	0.204	B
			2	2, 3	255		316	0.806	254	259	0.9	0.9	0.192	B
		2	1	(1, 2, 3)	696	11.01			379	395	142.3	219.5	27.642	F
	Exit	1	1		335	11.01			335	345	0.0	0.0	0.001	A
		2	1		335				335	345	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	464		462	0.999	462	508	3.7	3.7	0.470	D
			2	1, 3	116		482	0.239	116	124	0.4	0.4	0.186	B
		2	1	(1, 2, 3)	690				579	632	163.0	188.6	17.223	F
	Exit	1	1		576				576	609	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	211		548	0.386	211	222	0.5	0.4	0.110	A
			2	1, 2	447		541	0.827	447	472	0.7	0.9	0.110	A
		2	1	(1, 2, 3)	745				658	694	166.6	189.6	15.831	F
	Exit	1	1		722				722	770	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	129		291	0.444	129	137	0.4	0.5	0.208	B
			2	2, 3	260		316	0.823	260	262	0.9	0.8	0.189	B
		2	1	(1, 2, 3)	562	8.99			390	399	219.5	265.0	27.784	F
	Exit	1	1		327	8.99			327	346	0.0	0.0	0.001	A
		2	1		327				327	346	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	460		467	0.983	458	502	3.7	3.8	0.471	D
			2	1, 3	114		494	0.231	115	119	0.4	0.3	0.185	B
		2	1	(1, 2, 3)	577				574	621	188.6	190.0	13.314	F
	Exit	1	1		569				569	606	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	212		549	0.386	212	220	0.4	0.4	0.110	A
			2	1, 2	451		544	0.828	450	473	0.9	0.8	0.110	A
		2	1	(1, 2, 3)	629				663	692	189.6	181.0	13.054	F
	Exit	1	1		715				715	764	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	118		293	0.402	118	133	0.5	0.4	0.203	B
			2	2, 3	258		316	0.815	257	262	0.8	0.9	0.191	B
		2	1	(1, 2, 3)	480	7.53			375	395	265.0	289.9	14.995	F
	Exit	1	1		327	7.53			327	339	0.0	0.0	0.001	A
		2	1		327				327	339	0.0	0.0	0.000	A

(LS) ARCADY and PICADY module - 2039+Dev (Link+Sig), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - (LS) ARCADY and PICADY module [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	2 - A28 (S) - Lane Simulation	Arm 2: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Last Run	Lane Simulation	3 - Station Rd - Lane Simulation	Arm 3: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Crossings	3 - Station Rd - Pedestrian crossing	Lane Simulation: Pedestrian crossing properties specify gap between crossing and junction entry as 7, but actual storage on lanes is 2.

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	(LS) ARCADY and PICADY module	✓	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	12.28	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	A28 (E)	
2	A28 (S)	
3	Station Rd	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - A28 (E)	3.08	3.08	6.11	45.0	14.56	8.18	0.0	
2 - A28 (S)	3.82	3.82	7.20	17.2	13.47	7.36	0.0	
3 - Station Rd	3.65	3.65	9.21	16.2	16.43	15.73	0.0	

Zebra Crossings

Arm	Space between crossing and junction entry (Zebra) (PCU)	Vehicles queueing on exit (Zebra) (PCU)	Central Refuge	Crossing data type	Crossing length (m)	Crossing time (s)
3 - Station Rd	7.00	6.00		Distance	9.50	6.79

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	0.689	1283
2 - A28 (S)	0.701	1232
3 - Station Rd	0.751	1423

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A28 (E)	Percentage		92.00
2 - A28 (S)	Percentage		100.00
3 - Station Rd	Percentage		60.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A28 (E)	Evenly split	10.00
2 - A28 (S)	Evenly split	10.00
3 - Station Rd	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A28 (E)	Entry	1	1	2	✓	4.00		0	99999	
			2	1, 3	✓	4.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1			Infinity				
2 - A28 (S)	Entry	1	1	3	✓	1.00		0	99999	
			2	1, 2	✓	1.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1			Infinity				
3 - Station Rd	Entry	1	1	1	✓	1.00		0	99999	
			2	2, 3	✓	1.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1		✓	6.00				
		2	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	Entry	1	1	0.344	642
			2	0.344	642
2 - A28 (S)	Entry	1	1	0.350	616
			2	0.350	616
3 - Station Rd	Entry	1	1	0.376	711
			2	0.376	711

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm		
			A28 (E)	A28 (S)	Station Rd
1 - A28 (E)	1	1		✓	
		2	✓		✓
	2	1	✓	✓	✓
2 - A28 (S)	1	1			✓
		2	✓	✓	
	2	1	✓	✓	✓
3 - Station Rd	1	1	✓		
		2		✓	✓
	2	1	✓	✓	✓

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	659	100.000
2 - A28 (S)		ONE HOUR	✓	846	100.000
3 - Station Rd		ONE HOUR	✓	554	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - A28 (E)		
2 - A28 (S)		
3 - Station Rd	[ONEHOUR]	10.00

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	450	209
	2 - A28 (S)	528	0	318
	3 - Station Rd	319	235	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	3	2
	2 - A28 (S)	1	0	3
	3 - Station Rd	5	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	1.51	20.1	F	603	905
2 - A28 (S)	16.44	203.2	F	776	1164
3 - Station Rd	18.80	151.2	F	504	756

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	493	123	163		493	496	611	0.0	2.5	0.277	C
2 - A28 (S)	644	161	158		630	609	502	0.0	11.0	0.844	F
3 - Station Rd	411	103	391	7.53	387	381	397	0.0	11.2	1.188	F

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	580	145	171		574	599	647	2.5	5.2	0.473	D
2 - A28 (S)	769	192	176		656	665	569	11.0	38.8	2.365	F
3 - Station Rd	487	122	410	8.99	409	418	421	11.2	32.4	3.355	F

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	731	183	178		715	714	639	5.2	14.3	0.964	F
2 - A28 (S)	928	232	227		652	664	652	38.8	106.0	6.820	F
3 - Station Rd	611	153	409	11.01	395	418	471	32.4	80.4	8.290	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	730	183	168		715	724	644	14.3	20.1	1.510	F
2 - A28 (S)	932	233	224		663	659	666	106.0	176.5	13.123	F
3 - Station Rd	606	152	411	11.01	409	431	477	80.4	128.9	15.223	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	583	146	183		603	658	653	20.1	7.4	1.034	F
2 - A28 (S)	762	190	192		662	668	589	176.5	203.3	16.440	F
3 - Station Rd	499	125	418	8.99	413	427	436	128.9	149.7	18.802	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	501	125	164		501	535	666	7.4	2.7	0.386	C
2 - A28 (S)	620	155	159		674	692	509	203.3	191.3	12.993	F
3 - Station Rd	414	104	432	7.53	400	420	401	149.7	151.1	13.629	F

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	335		523	0.640	335	337	0.0	1.4	0.249	B
			2	1, 3	157		530	0.295	158	159	0.0	0.4	0.169	B
		2	1	(1, 2, 3)	493				492	504	0.0	0.7	0.053	A
	Exit	1	1		611				611	600	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	239		545	0.439	239	231	0.0	0.4	0.111	A
			2	1, 2	390		554	0.704	391	378	0.0	0.7	0.110	A
		2	1	(1, 2, 3)	644				630	613	0.0	9.9	0.733	E
	Exit	1	1		502				502	497	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	223		319	0.697	221	222	0.0	0.8	0.186	B
			2	2, 3	167		338	0.494	167	159	0.0	0.5	0.177	B
		2	1	(1, 2, 3)	411	7.53			390	387	0.0	9.9	1.007	F
	Exit	1	1		397	7.53			397	389	0.0	0.0	0.000	A
		2	1		397				397	389	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	396		518	0.765	398	413	1.4	2.0	0.318	C
			2	1, 3	175		528	0.331	176	186	0.4	0.5	0.172	B
		2	1	(1, 2, 3)	580				571	601	0.7	2.6	0.200	B
	Exit	1	1		647				647	657	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	246		540	0.456	246	252	0.4	0.4	0.112	A
			2	1, 2	409		547	0.748	410	412	0.7	0.7	0.112	A
		2	1	(1, 2, 3)	769				655	665	9.9	37.6	2.253	F
	Exit	1	1		569				569	586	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	237		315	0.752	238	245	0.8	0.7	0.190	B
			2	2, 3	173		333	0.519	171	173	0.5	0.6	0.179	B
		2	1	(1, 2, 3)	487	8.99			410	418	9.9	31.0	3.170	F
	Exit	1	1		421	8.99			421	439	0.0	0.0	0.001	A
		2	1		421				421	439	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	488		518	0.943	488	487	2.0	3.1	0.373	C
			2	1, 3	229		522	0.439	227	226	0.5	0.9	0.227	B
		2	1	(1, 2, 3)	731				717	720	2.6	10.3	0.635	E
	Exit	1	1		639				639	659	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	243		521	0.467	244	251	0.4	0.4	0.115	A
			2	1, 2	409		530	0.771	409	413	0.7	0.7	0.113	A
		2	1	(1, 2, 3)	928				651	664	37.6	104.8	6.705	F
	Exit	1	1		652				652	659	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	229		317	0.723	230	246	0.7	0.7	0.188	B
			2	2, 3	164		334	0.493	165	172	0.6	0.5	0.184	B
		2	1	(1, 2, 3)	611	11.01			394	417	31.0	79.2	8.106	F
	Exit	1	1		471	11.01			471	478	0.0	0.0	0.001	A
		2	1		471				471	478	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	489		521	0.940	491	498	3.1	3.2	0.406	C
			2	1, 3	227		526	0.430	224	225	0.9	1.1	0.207	B
		2	1	(1, 2, 3)	730				716	725	10.3	15.8	1.167	F
	Exit	1	1		644				644	661	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	252		521	0.482	252	250	0.4	0.5	0.116	A
			2	1, 2	411		531	0.773	411	408	0.7	0.8	0.114	A
		2	1	(1, 2, 3)	932				663	659	104.8	175.2	13.010	F
	Exit	1	1		666				666	677	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	233		316	0.737	234	253	0.7	0.7	0.186	B
			2	2, 3	174		333	0.523	175	178	0.5	0.5	0.179	B
		2	1	(1, 2, 3)	606	11.01			408	432	79.2	127.6	15.039	F
	Exit	1	1		477	11.01			477	476	0.0	0.0	0.001	A
		2	1		477				477	476	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	407		516	0.790	411	449	3.2	2.3	0.363	C
			2	1, 3	190		520	0.366	192	209	1.1	0.7	0.210	B
		2	1	(1, 2, 3)	583				597	652	15.8	4.5	0.724	E
	Exit	1	1		653				653	669	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	245		530	0.463	244	250	0.5	0.6	0.115	A
			2	1, 2	417		542	0.770	418	418	0.8	0.7	0.111	A
		2	1	(1, 2, 3)	762				662	668	175.2	202.0	16.348	F
	Exit	1	1		589				589	625	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	235		316	0.744	235	251	0.7	0.8	0.186	B
			2	2, 3	177		332	0.533	178	176	0.5	0.5	0.180	B
		2	1	(1, 2, 3)	499	8.99			412	427	127.6	148.5	18.656	F
	Exit	1	1		436	8.99			436	458	0.0	0.0	0.001	A
		2	1		436				436	458	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	342		524	0.651	342	368	2.3	1.5	0.282	C
			2	1, 3	159		527	0.302	159	168	0.7	0.5	0.169	B
		2	1	(1, 2, 3)	501				501	531	4.5	0.7	0.144	A
	Exit	1	1		666				666	683	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	240		544	0.442	242	258	0.6	0.4	0.109	A
			2	1, 2	433		555	0.781	432	434	0.7	0.8	0.107	A
		2	1	(1, 2, 3)	620				673	691	202.0	190.2	12.958	F
	Exit	1	1		509				509	538	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	233		316	0.740	233	249	0.8	0.7	0.192	B
			2	2, 3	167		329	0.509	167	171	0.5	0.5	0.174	B
		2	1	(1, 2, 3)	414	7.53			400	420	148.5	149.8	13.568	F
	Exit	1	1		401	7.53			401	425	0.0	0.0	0.001	A
		2	1		401				401	425	0.0	0.0	0.000	A

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

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Filename: Jct 8b_A28_Park Ln_R3_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 8 A28_Station Rd\Strategic Modelling Scenario
Report generation date: 18/03/2019 17:00:33

»Lane simulation - 2039+Dev(Link+Sigs), AM
»Lane simulation - 2039+Dev(Link+Sigs), PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	Lane simulation [Lane Simulation] - 2039+Dev(Link+Sigs)									
A - A28 (N)	0.0	0.00		A	0.23	0.0	0.00		A	0.05
B - Park Lane	8.9	2.36		F		1.7	0.60		E	
C - A28 (S)	0.0	0.00		A		0.0	0.00		A	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	02/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\fuad.huda
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			1104241500	357	26.77

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sigs)	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039+Dev(Link+Sigs)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane simulation	✓	✓	100.000	100.000

Lane simulation - 2039+Dev(Link+Sigs), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
2	untitled	T-Junction	Two-way		0.23	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	A28 (N)		Major
B	Park Lane		Minor
C	A28 (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - A28 (S)	9.15			28.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Park Lane	One lane	2.89	26	21

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
2	B-A	491	0.077	0.195	0.123	0.279
2	B-C	630	0.083	0.211	-	-
2	C-B	590	0.197	0.197	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
A - A28 (N)	Entry	1	1	B, C		Infinity		0	99999	
	Exit	1	1			Infinity				
B - Park Lane	Entry	1	1	A, C		Infinity		0	99999	
	Exit	1	1			Infinity				
C - A28 (S)	Entry	1	1	A, B		Infinity		0	99999	
	Exit	1	1			Infinity				

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm		
			A28 (N)	Park Lane	A28 (S)
A - A28 (N)	1	1		✓	✓
B - Park Lane	1	1	✓		✓
C - A28 (S)	1	1	✓	✓	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sigs)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - A28 (N)		ONE HOUR	✓	979	100.000
B - Park Lane		ONE HOUR	✓	185	100.000
C - A28 (S)		ONE HOUR	✓	717	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - A28 (N)	B - Park Lane	C - A28 (S)
From	A - A28 (N)	0	0	979
	B - Park Lane	122	0	63
	C - A28 (S)	717	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A28 (N)	B - Park Lane	C - A28 (S)
From	A - A28 (N)	0	1	2
	B - Park Lane	2	0	1
	C - A28 (S)	1	3	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A28 (N)	0.00	0.0	A	899	1349
B - Park Lane	2.36	8.9	F	168	253
C - A28 (S)	0.00	0.0	A	660	990

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	735	184	735	750	634	0.0	0.0	0.000	A
B - Park Lane	141	35	140	139	0	0.0	0.8	0.357	C
C - A28 (S)	541	135	541	546	782	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	885	221	885	893	763	0.0	0.0	0.000	A
B - Park Lane	167	42	170	167	0	0.8	1.5	0.573	D
C - A28 (S)	650	163	650	650	943	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	1084	271	1084	1098	910	0.0	0.0	0.000	A
B - Park Lane	201	50	189	186	0	1.5	6.2	1.477	F
C - A28 (S)	785	196	785	793	1149	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	1070	268	1070	1092	916	0.0	0.0	0.000	A
B - Park Lane	201	50	188	197	0	6.2	8.9	2.356	F
C - A28 (S)	795	199	795	800	1137	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	879	220	879	900	763	0.0	0.0	0.000	A
B - Park Lane	162	41	178	197	0	8.9	2.2	1.323	F
C - A28 (S)	646	162	646	652	940	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	742	185	742	752	633	0.0	0.0	0.000	A
B - Park Lane	138	34	137	147	0	2.2	0.8	0.388	C
C - A28 (S)	543	136	543	549	789	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	735	735	750	0.0	0.0	0.000	A
	Exit	1	1		634	634	639	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	141	140	139	0.0	0.8	0.357	C
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	541	541	546	0.0	0.0	0.000	A
	Exit	1	1		782	782	796	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	885	885	893	0.0	0.0	0.000	A
	Exit	1	1		763	763	761	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	167	170	167	0.8	1.5	0.573	D
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	650	650	650	0.0	0.0	0.000	A
	Exit	1	1		943	943	949	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	1084	1084	1098	0.0	0.0	0.000	A
	Exit	1	1		910	910	916	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	201	189	186	1.5	6.2	1.477	F
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	785	785	793	0.0	0.0	0.000	A
	Exit	1	1		1149	1149	1161	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	1070	1070	1092	0.0	0.0	0.000	A
	Exit	1	1		916	916	930	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	201	188	197	6.2	8.9	2.356	F
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	795	795	800	0.0	0.0	0.000	A
	Exit	1	1		1137	1137	1159	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	879	879	900	0.0	0.0	0.000	A
	Exit	1	1		763	763	782	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	162	178	197	8.9	2.2	1.323	F
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	646	646	652	0.0	0.0	0.000	A
	Exit	1	1		940	940	967	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	742	742	752	0.0	0.0	0.000	A
	Exit	1	1		633	633	645	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	138	137	147	2.2	0.8	0.388	C
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	543	543	549	0.0	0.0	0.000	A
	Exit	1	1		789	789	803	0.0	0.0	0.000	A

Lane simulation - 2039+Dev(Link+Sigs), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
2	untitled	T-Junction	Two-way		0.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(Link+Sigs)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - A28 (N)		ONE HOUR	✓	725	100.000
B - Park Lane		ONE HOUR	✓	149	100.000
C - A28 (S)		ONE HOUR	✓	771	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - A28 (N)	B - Park Lane	C - A28 (S)
From	A - A28 (N)	0	0	725
	B - Park Lane	89	0	60
	C - A28 (S)	771	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A28 (N)	B - Park Lane	C - A28 (S)
From	A - A28 (N)	0	1	2
	B - Park Lane	3	0	1
	C - A28 (S)	1	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A28 (N)	0.00	0.0	A	667	1000
B - Park Lane	0.60	1.7	E	137	205
C - A28 (S)	0.00	0.0	A	709	1064

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	537	134	537	554	658	0.0	0.0	0.000	A
B - Park Lane	119	30	119	119	0	0.0	0.5	0.266	C
C - A28 (S)	584	146	584	586	581	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	648	162	648	659	780	0.0	0.0	0.000	A
B - Park Lane	139	35	139	135	0	0.5	0.7	0.328	C
C - A28 (S)	694	174	694	708	701	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	802	201	802	809	940	0.0	0.0	0.000	A
B - Park Lane	159	40	157	160	0	0.7	1.4	0.486	D
C - A28 (S)	844	211	844	854	863	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	810	202	810	823	934	0.0	0.0	0.000	A
B - Park Lane	161	40	159	167	0	1.4	1.7	0.602	E
C - A28 (S)	839	210	839	858	874	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	655	164	655	665	789	0.0	0.0	0.000	A
B - Park Lane	136	34	137	140	0	1.7	0.8	0.363	C
C - A28 (S)	706	177	706	706	710	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	550	138	550	562	651	0.0	0.0	0.000	A
B - Park Lane	107	27	108	115	0	0.8	0.5	0.260	C
C - A28 (S)	588	147	588	587	596	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	537	537	554	0.0	0.0	0.000	A
	Exit	1	1		658	658	658	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	119	119	119	0.0	0.5	0.266	C
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	584	584	586	0.0	0.0	0.000	A
	Exit	1	1		581	581	601	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	648	648	659	0.0	0.0	0.000	A
	Exit	1	1		780	780	790	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	139	139	135	0.5	0.7	0.328	C
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	694	694	708	0.0	0.0	0.000	A
	Exit	1	1		701	701	713	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	802	802	809	0.0	0.0	0.000	A
	Exit	1	1		940	940	949	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	159	157	160	0.7	1.4	0.486	D
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	844	844	854	0.0	0.0	0.000	A
	Exit	1	1		863	863	874	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	810	810	823	0.0	0.0	0.000	A
	Exit	1	1		934	934	958	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	161	159	167	1.4	1.7	0.602	E
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	839	839	858	0.0	0.0	0.000	A
	Exit	1	1		874	874	890	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	655	655	665	0.0	0.0	0.000	A
	Exit	1	1		789	789	792	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	136	137	140	1.7	0.8	0.363	C
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	706	706	706	0.0	0.0	0.000	A
	Exit	1	1		710	710	719	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	550	550	562	0.0	0.0	0.000	A
	Exit	1	1		651	651	656	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	107	108	115	0.8	0.5	0.260	C
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	588	588	587	0.0	0.0	0.000	A
	Exit	1	1		596	596	607	0.0	0.0	0.000	A

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Appendix I (part 2)
2039 Base and 2039 Base + Development Junction Model Outputs

Junctions 9

ARCADY 9 - Roundabout Module
PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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Filename: Jct 10_B2050_New_Rbt+T.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 10_B2050_Margate Hill\Strategic Model Scenario
Report generation date: 19/03/2019 09:50:20

»2039+Dev (link+sig), AM
»2039+Dev (link+sig), PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	[Lane Simulation] - 2039+Dev (link+sig)							
Junction 1 - Arm 1	2.1	0.11		0.09	0.7	0.05		0.07
Junction 1 - Arm 2	0.5	0.05			0.9	0.06		
Junction 1 - Arm 3	2.0	0.09			1.5	0.09		
Junction 2 - Arm A	0.0	0.00		0.04	0.0	0.00		0.15
Junction 2 - Arm B	0.9	0.31			3.2	0.59		
Junction 2 - Arm C	0.0	0.00			0.0	0.00		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay.

File summary

File Description

Title	
Location	
Site number	
Date	11/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			599281272	101	9.86

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	✓	100.000	100.000

2039+Dev (link+sig), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	Junction 1 - Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout			1, 2, 3	0.09	A
2	untitled	T-Junction	Two-way			0.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Name	Description	Arm type
1	1	Shottendane Rd		
	2	Columbus Ave		
	3	Manston Rd (W)		
2	A	Columbus Ave (north)		Major
	B	Manston Road		Minor
	C	Columbus Ave (south)		Major

Roundabout Geometry

Junction	Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	1	2.50	9.10	31.0	25.0	50.0	16.0	
	2	3.60	8.70	24.9	25.0	50.0	16.0	
	3	2.60	8.70	26.4	25.0	50.0	14.0	

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
2	C	7.25			72.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
2	B	One lane plus flare	10.00	9.90	5.90	3.70	2.50		1.00	65	41

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Junction	Arm	Final slope	Final intercept (PCU/hr)
1	1	0.694	2061
	2	0.709	2142
	3	0.679	1971

The slope and intercept shown above include any corrections and adjustments.

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
2	B-A	583	0.100	0.254	0.160	0.363
2	B-C	689	0.100	0.252	-	-
2	C-B	616	0.226	0.226	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Lane Simulation: Arm options

Junction	Arm	Lane capacity source	Traffic considering secondary lanes (%)
1	1	Evenly split	10.00
	2	Evenly split	10.00
	3	Evenly split	10.00
2	A		
	B		
	C		

Lanes

Junction	Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1	1	Entry	1	1	1, 2, 3		Infinity		0	99999	
		Exit	1	1			Infinity				
	2	Entry	1	1	1, 2, 3	✓	5.00		0	99999	
		Exit	1	1		✓	5.00				
	3	Entry	1	1	1, 2, 3		Infinity		0	99999	
		Exit	1	1			Infinity				
2	A	Entry	1	1	B, C	✓	5.00		0	99999	
		Exit	1	1		✓	5.00				
	B	Entry	1	1	C	✓	1.00		0	99999	
				2	A	✓	1.00		0	99999	
			2	1	(A, C)		Infinity				
		Exit	1	1			Infinity				
	C	Entry	1	1	A, B		Infinity		0	99999	
		Exit	1	1			Infinity				

Entry Lane slope and intercept

Junction	Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1	1	Entry	1	1	0.694	2061
	2	Entry	1	1	0.709	2142
	3	Entry	1	1	0.679	1971

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				1	2	3
1	1	1	1	✓	✓	✓
	2	1	1	✓	✓	✓
	3	1	1	✓	✓	✓

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				A	B	C
2	A	1	1		✓	✓
	B	1	1			✓
			2	✓		
		2	1	✓		✓
	C	1	1	✓	✓	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (Veh/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	2	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	2	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	1006	100.000
	2	✓				
	3		ONE HOUR	✓	1037	100.000
2	A	✓				
	B		ONE HOUR	✓	144	100.000
	C		ONE HOUR	✓	235	100.000

Origin-Destination Data

Demand (Veh/hr)

Junction 1

		To		
		1	2	3
From	1	0	417	589
	2	145	0	235
	3	585	452	0

Demand (Veh/hr)

Junction 2

		To		
		A	B	C
From	A	0	315	554
	B	144	0	0
	C	235	0	0

Vehicle Mix

Heavy Vehicle Percentages

Junction 1

		To		
		1	2	3
From	1	0	0	1
	2	0	0	1
	3	1	1	0

Heavy Vehicle Percentages

Junction 2

		To		
		A	B	C
From	A	0	1	0
	B	2	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1	0.11	2.1	A	913	1369
	2	0.05	0.5	A	350	525
	3	0.09	2.0	A	951	1426
2	A	0.00	0.0	A	790	1186
	B	0.31	0.9	C	131	197
	C	0.00	0.0	A	218	326

Main Results for each time segment

07:45 - 08:00

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	758	190	335	763	763	537	0.0	0.5	0.057	A
	2	298	75	446	298	295	652	0.0	0.2	0.040	A
	3	767	192	106	766	782	637	0.0	0.8	0.055	A
2	A	652	163		652	657	298	0.0	0.0	0.000	A
	B	114	28		116	115	236	0.0	0.3	0.210	B
	C	182	45		182	181	416	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	892	223	417	892	908	665	0.5	1.2	0.070	A
	2	340	85	523	341	340	786	0.2	0.3	0.041	A
	3	948	237	132	951	950	732	0.8	1.1	0.066	A
2	A	786	197		786	789	340	0.0	0.0	0.000	A
	B	134	34		133	129	291	0.3	0.5	0.234	B
	C	207	52		207	212	495	0.0	0.0	0.000	A

08:15 - 08:30

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	1102	275	485	1105	1117	790	1.2	1.8	0.105	A
	2	414	103	652	411	417	938	0.3	0.5	0.047	A
	3	1126	282	157	1118	1144	907	1.1	2.0	0.082	A
2	A	938	234		938	957	414	0.0	0.0	0.000	A
	B	157	39		158	162	342	0.5	0.9	0.306	C
	C	256	64		256	256	596	0.0	0.0	0.000	A

08:30 - 08:45

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	1105	276	492	1102	1103	804	1.8	2.1	0.099	A
	2	409	102	647	409	417	947	0.5	0.4	0.048	A
	3	1138	284	161	1135	1160	895	2.0	1.5	0.087	A
2	A	947	237		947	958	409	0.0	0.0	0.000	A
	B	148	37		150	158	335	0.9	0.6	0.310	C
	C	259	65		259	259	612	0.0	0.0	0.000	A

08:45 - 09:00

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	886	222	393	889	913	662	2.1	0.8	0.072	A
	2	344	86	513	345	349	770	0.4	0.2	0.043	A
	3	928	232	133	923	945	725	1.5	1.3	0.066	A
2	A	770	192		770	794	344	0.0	0.0	0.000	A
	B	125	31		128	134	276	0.6	0.4	0.242	B
	C	216	54		216	215	494	0.0	0.0	0.000	A

09:00 - 09:15

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	736	184	347	738	756	559	0.8	0.6	0.056	A
	2	294	74	434	295	292	650	0.2	0.1	0.039	A
	3	798	199	109	797	793	619	1.3	0.8	0.057	A
2	A	651	163		651	656	294	0.0	0.0	0.000	A
	B	110	27		109	112	230	0.4	0.3	0.197	B
	C	186	46		186	181	420	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	758	1812	0.418	763	763	0.0	0.5	0.057	A
		Exit	1	1		537			537	549	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	298	1810	0.165	298	295	0.0	0.2	0.040	A
		Exit	1	1		652			652	658	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	767	1874	0.409	766	782	0.0	0.8	0.055	A
		Exit	1	1		637			637	633	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	652			652	657	0.0	0.0	0.000	A
		Exit	1	1		298			298	296	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	115			116	115	0.0	0.2	0.151	A
			2	1	(A, C)	114			115	116	0.0	0.0	0.059	A
		Exit	1	1		236			236	238	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	182			182	181	0.0	0.0	0.000	A
		Exit	1	1		416			416	419	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	892	1757	0.508	892	908	0.5	1.2	0.070	A
		Exit	1	1		665			665	665	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	340	1760	0.193	341	340	0.2	0.3	0.041	A
		Exit	1	1		786			786	791	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	948	1858	0.510	951	950	0.8	1.1	0.066	A
		Exit	1	1		732			732	741	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	786			786	789	0.0	0.0	0.000	A
		Exit	1	1		340			340	340	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	134			133	129	0.2	0.4	0.153	A
			2	1	(A, C)	134			134	129	0.0	0.1	0.081	A
		Exit	1	1		291			291	289	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	207			207	212	0.0	0.0	0.000	A
		Exit	1	1		495			495	500	0.0	0.0	0.000	A

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	1102	1711	0.644	1105	1117	1.2	1.8	0.105	A
		Exit	1	1		790			790	800	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	414	1665	0.249	411	417	0.3	0.5	0.047	A
		Exit	1	1		938			938	959	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	1126	1845	0.611	1118	1144	1.1	2.0	0.082	A
		Exit	1	1		907			907	920	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	938			938	957	0.0	0.0	0.000	A
		Exit	1	1		414			414	418	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	159			158	162	0.4	0.5	0.173	B
			2	1	(A, C)	157			159	162	0.1	0.3	0.133	A
		Exit	1	1		342			342	346	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	256			256	256	0.0	0.0	0.000	A
		Exit	1	1		596			596	611	0.0	0.0	0.000	A

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	1105	1711	0.646	1102	1103	1.8	2.1	0.099	A
		Exit	1	1		804			804	813	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	409	1673	0.245	409	417	0.5	0.4	0.048	A
		Exit	1	1		947			947	959	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	1138	1846	0.616	1135	1160	2.0	1.5	0.087	A
		Exit	1	1		895			895	907	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	947			947	958	0.0	0.0	0.000	A
		Exit	1	1		409			409	417	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	149			150	158	0.5	0.4	0.175	B
			2	1	(A, C)	148			149	158	0.3	0.2	0.135	A
		Exit	1	1		335			335	345	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	259			259	259	0.0	0.0	0.000	A
		Exit	1	1		612			612	613	0.0	0.0	0.000	A

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	886	1775	0.499	889	913	2.1	0.8	0.072	A
		Exit	1	1		662			662	664	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	344	1761	0.195	345	349	0.4	0.2	0.043	A
		Exit	1	1		770			770	796	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	928	1863	0.498	923	945	1.5	1.3	0.066	A
		Exit	1	1		725			725	747	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	770			770	794	0.0	0.0	0.000	A
		Exit	1	1		344			344	348	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	125			128	134	0.4	0.2	0.158	A
			2	1	(A, C)	125			125	133	0.2	0.1	0.085	A
		Exit	1	1		276			276	294	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	216			216	215	0.0	0.0	0.000	A
		Exit	1	1		494			494	500	0.0	0.0	0.000	A

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	736	1806	0.407	738	756	0.8	0.6	0.056	A
		Exit	1	1		559			559	554	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	294	1825	0.161	295	292	0.2	0.1	0.039	A
		Exit	1	1		650			650	658	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	798	1876	0.425	797	793	1.3	0.8	0.057	A
		Exit	1	1		619			619	629	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	651			651	656	0.0	0.0	0.000	A
		Exit	1	1		294			294	293	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	109			109	112	0.2	0.3	0.147	A
			2	1	(A, C)	110			109	112	0.1	0.1	0.051	A
		Exit	1	1		230			230	237	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	186			186	181	0.0	0.0	0.000	A
		Exit	1	1		420			420	418	0.0	0.0	0.000	A

2039+Dev (link+sig), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	Junction 1 - Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout			1, 2, 3	0.07	A
2	untitled	T-Junction	Two-way			0.15	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (Veh/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	2	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	2	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	599	100.000
	2	✓				
	3		ONE HOUR	✓	925	100.000
2	A	✓				
	B		ONE HOUR	✓	283	100.000
	C		ONE HOUR	✓	472	100.000

Origin-Destination Data

Junction 1

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	157	442
	2	374	0	381
	3	706	219	0

Junction 2

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	158	218
	B	283	0	0
	C	472	0	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	2
	2	0	0	1
	3	0	1	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	0
	B	1	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1	0.05	0.7	A	551	826
	2	0.06	0.9	A	696	1044
	3	0.09	1.5	A	846	1269
2	A	0.00	0.0	A	343	515
	B	0.59	3.2	E	261	391
	C	0.00	0.0	A	435	653

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	448	112	164	449	453	817	0.0	0.4	0.040	A
	2	570	143	331	571	573	281	0.0	0.3	0.045	A
	3	704	176	275	705	702	627	0.0	0.6	0.057	A
2	A	281	70		281	284	570	0.0	0.0	0.000	A
	B	209	52		211	212	118	0.0	0.8	0.249	B
	C	359	90		359	361	164	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	544	136	189	545	545	966	0.4	0.3	0.045	A
	2	694	173	407	694	687	328	0.3	0.6	0.052	A
	3	803	201	353	802	817	748	0.6	0.9	0.065	A
2	A	328	82		328	327	694	0.0	0.0	0.000	A
	B	257	64		258	259	139	0.8	1.3	0.297	C
	C	436	109		436	429	189	0.0	0.0	0.000	A

17:15 - 17:30

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	655	164	244	655	662	1198	0.3	0.5	0.049	A
	2	826	206	484	822	823	415	0.6	0.9	0.060	A
	3	1029	257	410	1032	1022	897	0.9	1.4	0.086	A
2	A	415	104		415	413	826	0.0	0.0	0.000	A
	B	317	79		311	309	171	1.3	3.2	0.519	D
	C	515	129		515	514	244	0.0	0.0	0.000	A

17:30 - 17:45

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	668	167	244	666	675	1179	0.5	0.7	0.050	A
	2	829	207	491	830	838	419	0.9	0.7	0.063	A
	3	1019	255	408	1015	1019	914	1.4	1.5	0.089	A
2	A	419	105		419	418	829	0.0	0.0	0.000	A
	B	312	78		314	316	178	3.2	2.8	0.592	E
	C	515	129		515	521	241	0.0	0.0	0.000	A

17:45 - 18:00

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	537	134	195	537	550	964	0.7	0.4	0.045	A
	2	688	172	400	688	693	332	0.7	0.5	0.052	A
	3	820	205	341	818	831	747	1.5	0.8	0.066	A
2	A	332	83		332	346	688	0.0	0.0	0.000	A
	B	255	64		258	260	139	2.8	1.4	0.347	C
	C	430	107		430	431	193	0.0	0.0	0.000	A

18:00 - 18:15

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	452	113	169	452	460	818	0.4	0.2	0.042	A
	2	570	143	337	571	580	284	0.5	0.3	0.046	A
	3	703	176	281	706	708	627	0.8	0.6	0.057	A
2	A	284	71		284	287	570	0.0	0.0	0.000	A
	B	215	54		213	220	122	1.4	0.9	0.253	C
	C	357	89		357	358	162	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	448	1909	0.235	449	453	0.0	0.4	0.040	A
		Exit	1	1		817			817	815	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	570	1894	0.301	571	573	0.0	0.3	0.045	A
		Exit	1	1		281			281	285	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	704	1779	0.396	705	702	0.0	0.6	0.057	A
		Exit	1	1		627			627	628	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	281			281	284	0.0	0.0	0.000	A
		Exit	1	1		571			570	573	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	210			211	212	0.0	0.4	0.131	A
			2	1	(A, C)	209			210	214	0.0	0.3	0.118	A
		Exit	1	1		118			118	118	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	359			359	361	0.0	0.0	0.000	A
		Exit	1	1		164			164	166	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	544	1902	0.286	545	545	0.4	0.3	0.045	A
		Exit	1	1		966			966	966	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	694	1841	0.377	694	687	0.3	0.6	0.052	A
		Exit	1	1		328			328	327	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	803	1729	0.464	802	817	0.6	0.9	0.065	A
		Exit	1	1		748			748	756	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	328			328	327	0.0	0.0	0.000	A
		Exit	1	1		694			694	688	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	259			258	259	0.4	0.6	0.131	A
			2	1	(A, C)	257			259	260	0.3	0.7	0.166	A
		Exit	1	1		139			139	140	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	436			436	429	0.0	0.0	0.000	A
		Exit	1	1		189			189	187	0.0	0.0	0.000	A

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	655	1862	0.352	655	662	0.3	0.5	0.049	A
		Exit	1	1		1198			1198	1189	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	826	1786	0.462	822	823	0.6	0.9	0.060	A
		Exit	1	1		415			415	413	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	1029	1690	0.609	1032	1022	0.9	1.4	0.086	A
		Exit	1	1		897			897	904	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	415			415	413	0.0	0.0	0.000	A
		Exit	1	1		826			826	823	0.0	0.0	0.001	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	312			311	309	0.6	0.8	0.142	A
			2	1	(A, C)	317			312	310	0.7	2.4	0.376	C
		Exit	1	1		171			171	173	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	515			515	514	0.0	0.0	0.000	A
		Exit	1	1		244			244	240	0.0	0.0	0.000	A

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	668	1864	0.358	666	675	0.5	0.7	0.050	A
		Exit	1	1		1179			1179	1187	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	829	1779	0.466	830	838	0.9	0.7	0.063	A
		Exit	1	1		419			419	418	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	1019	1690	0.603	1015	1019	1.4	1.5	0.089	A
		Exit	1	1		914			914	928	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	419			419	418	0.0	0.0	0.000	A
		Exit	1	1		829			829	837	0.0	0.0	0.002	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	314			314	316	0.8	0.7	0.143	A
			2	1	(A, C)	312			314	315	2.4	2.1	0.449	D
		Exit	1	1		178			178	178	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	515			515	521	0.0	0.0	0.000	A
		Exit	1	1		241			241	240	0.0	0.0	0.000	A

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	537	1898	0.283	537	550	0.7	0.4	0.045	A
		Exit	1	1		964			964	973	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	688	1843	0.373	688	693	0.7	0.5	0.052	A
		Exit	1	1		332			332	346	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	820	1735	0.473	818	831	1.5	0.8	0.066	A
		Exit	1	1		747			747	755	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	332			332	346	0.0	0.0	0.000	A
		Exit	1	1		688			688	691	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	257			258	260	0.7	0.5	0.136	A
			2	1	(A, C)	255			257	259	2.1	0.9	0.211	B
		Exit	1	1		139			139	147	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	430			430	431	0.0	0.0	0.000	A
		Exit	1	1		193			193	200	0.0	0.0	0.000	A

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	452	1913	0.236	452	460	0.4	0.2	0.042	A
		Exit	1	1		818			818	822	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	570	1889	0.302	571	580	0.5	0.3	0.046	A
		Exit	1	1		284			284	287	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	703	1777	0.396	706	708	0.8	0.6	0.057	A
		Exit	1	1		627			627	639	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	284			284	287	0.0	0.0	0.000	A
		Exit	1	1		570			570	578	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	214			213	220	0.5	0.5	0.127	A
			2	1	(A, C)	215			214	220	0.9	0.4	0.126	A
		Exit	1	1		122			122	124	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	357			357	358	0.0	0.0	0.000	A
		Exit	1	1		162			162	163	0.0	0.0	0.000	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

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Filename: Jct 11_Columbus Ave_Spitfire Way.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 11_Columbus Avenue_Spitfire Way
Report generation date: 19/03/2019 10:00:58

»2039+Dev (link+sig), AM
»2039+Dev (link+sig) , PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev (link+sig)									
Arm 1	0.8	0.09	0.45	A	0.09	0.3	0.05	0.24	A	0.06
Arm 2	1.5	0.12	0.59	A		0.8	0.07	0.43	A	
Arm 3	1.7	0.07	0.63	A		1.4	0.06	0.59	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	13/12/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev (link+sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.09	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Columbus Ave	
2	Spitfire Way	
3	B2190 (W)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.30	8.00	1.0	31.0	39.0	17.0	
2	3.30	6.30	30.0	22.0	39.0	17.0	
3	7.50	7.50	0.0	26.0	39.0	15.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.807	2420
2	0.674	1772
3	0.807	2416

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	468	100.000
2		ONE HOUR	✓	691	100.000
3		ONE HOUR	✓	1294	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	25	443
	2	39	0	652
	3	321	973	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	25	31
	2	3	0	5
	3	6	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.45	0.09	0.8	A	429	644
2	0.59	0.12	1.5	A	634	951
3	0.63	0.07	1.7	A	1187	1781

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	352	88	730	1378	0.256	351	270	0.0	0.3	0.058	A
2	520	130	332	1410	0.369	518	749	0.0	0.6	0.067	A
3	974	244	29	2273	0.429	971	821	0.0	0.7	0.046	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	421	105	874	1285	0.327	420	323	0.3	0.5	0.069	A
2	621	155	398	1355	0.458	620	896	0.6	0.8	0.082	A
3	1163	291	35	2268	0.513	1162	983	0.7	1.0	0.054	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	515	129	1069	1158	0.445	514	396	0.5	0.8	0.093	A
2	761	190	487	1280	0.594	758	1097	0.8	1.4	0.114	A
3	1425	356	43	2262	0.630	1422	1202	1.0	1.7	0.071	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	515	129	1071	1157	0.445	515	396	0.8	0.8	0.094	A
2	761	190	488	1279	0.595	761	1099	1.4	1.5	0.116	A
3	1425	356	43	2262	0.630	1425	1206	1.7	1.7	0.072	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	421	105	877	1283	0.328	422	324	0.8	0.5	0.070	A
2	621	155	399	1354	0.459	624	899	1.5	0.9	0.082	A
3	1163	291	35	2268	0.513	1166	988	1.7	1.1	0.055	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	352	88	733	1376	0.256	353	271	0.5	0.3	0.059	A
2	520	130	334	1409	0.369	521	752	0.9	0.6	0.068	A
3	974	244	29	2273	0.429	975	826	1.1	0.8	0.046	A

2039+Dev (link+sig) , PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.06	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	357	100.000
2		ONE HOUR	✓	606	100.000
3		ONE HOUR	✓	1260	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	51	306
	2	6	0	600
	3	405	855	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	1
	2	13	0	0
	3	7	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.24	0.05	0.3	A	328	491
2	0.43	0.07	0.8	A	556	834
3	0.59	0.06	1.4	A	1156	1734

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	269	67	642	1880	0.143	268	309	0.0	0.2	0.037	A
2	456	114	230	1614	0.283	455	680	0.0	0.4	0.052	A
3	949	237	5	2344	0.405	946	680	0.0	0.7	0.043	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	321	80	768	1778	0.180	321	369	0.2	0.2	0.041	A
2	545	136	275	1583	0.344	544	814	0.4	0.5	0.058	A
3	1133	283	5	2343	0.483	1132	814	0.7	0.9	0.049	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	393	98	940	1639	0.240	393	452	0.2	0.3	0.048	A
2	667	167	337	1541	0.433	666	996	0.5	0.8	0.069	A
3	1387	347	7	2342	0.592	1385	996	0.9	1.4	0.063	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	393	98	941	1638	0.240	393	453	0.3	0.3	0.048	A
2	667	167	337	1541	0.433	667	998	0.8	0.8	0.069	A
3	1387	347	7	2342	0.592	1387	998	1.4	1.4	0.063	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	321	80	770	1777	0.181	321	370	0.3	0.2	0.041	A
2	545	136	275	1583	0.344	546	816	0.8	0.5	0.058	A
3	1133	283	5	2343	0.483	1135	816	1.4	0.9	0.050	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	269	67	644	1878	0.143	269	310	0.2	0.2	0.037	A
2	456	114	231	1613	0.283	457	683	0.5	0.4	0.052	A
3	949	237	5	2344	0.405	950	683	0.9	0.7	0.043	A

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

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Filename: Jct 13_R1 Strategic model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 13_B2050_Manston Ct Rd\Strategic Model Scenario
Report generation date: 19/03/2019 10:12:31

»2039+Dev(Link+Sig), AM
»2039+Dev(Link+Sig), PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev(Link+Sig)									
Stream B-AC	0.3	0.19	0.24	B	0.03	0.2	0.18	0.19	B	0.03
Stream C-AB	0.3	0.09	0.16	A		0.3	0.09	0.16	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

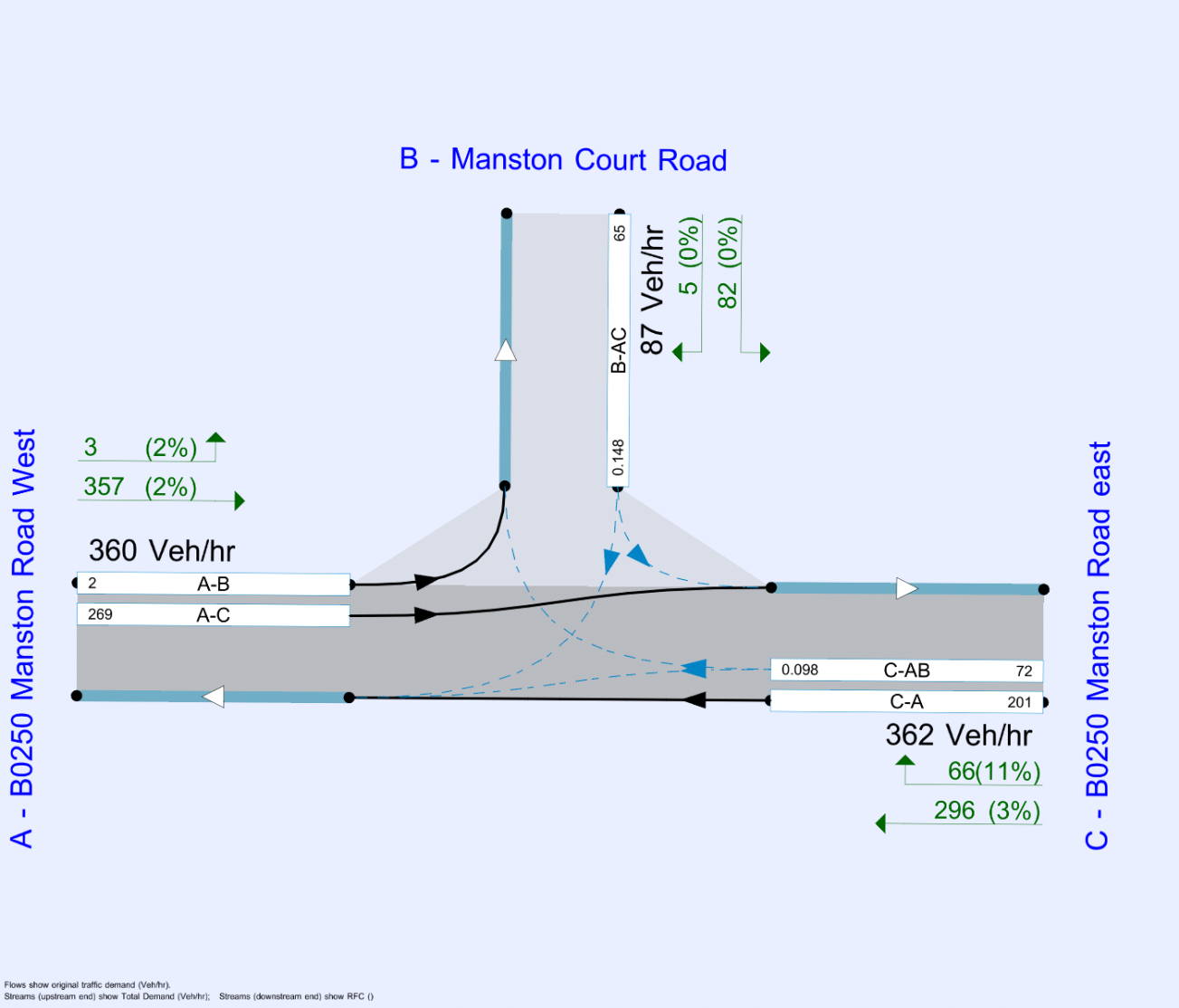
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev(Link+Sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
13	untitled	T-Junction	Two-way		0.03	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	B0250 Manston Road West		Major
B	Manston Court Road		Minor
C	B0250 Manston Road east		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - B0250 Manston Road east	6.75			250.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Manston Court Road	One lane	3.88	21	16

Slope / Intercept / Capacity

Stream Intercept Adjustments

Stream intercept adjustment	Use adjustment	Reason	Direct intercept adjustment (PCU/hr)
B-AC	✓		-160

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
13	B-A	536	0.094	0.239	0.150	0.341
13	B-C	690	0.102	0.259	-	-
13	C-B	719	0.269	0.269	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - B0250 Manston Road West		ONE HOUR	✓	360	100.000
B - Manston Court Road		ONE HOUR	✓	87	100.000
C - B0250 Manston Road east		ONE HOUR	✓	362	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - B0250 Manston Road West	B - Manston Court Road	C - B0250 Manston Road east
From	A - B0250 Manston Road West	0	3	357
	B - Manston Court Road	5	0	82
	C - B0250 Manston Road east	296	66	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - B0250 Manston Road West	B - Manston Court Road	C - B0250 Manston Road east
From	A - B0250 Manston Road West	0	2	2
	B - Manston Court Road	0	0	0
	C - B0250 Manston Road east	3	11	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.24	0.19	0.3	B	80	120
C-AB	0.16	0.09	0.3	A	97	145
C-A					235	353
A-B					3	4
A-C					328	491

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	65	16	442	0.148	65	0.0	0.2	0.159	A
C-AB	72	18	729	0.098	71	0.0	0.2	0.091	A
C-A	201	50			201				
A-B	2	0.56			2				
A-C	269	67			269				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	78	20	427	0.183	78	0.2	0.2	0.172	B
C-AB	92	23	747	0.124	92	0.2	0.2	0.092	A
C-A	233	58			233				
A-B	3	0.67			3				
A-C	321	80			321				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	96	24	406	0.236	95	0.2	0.3	0.193	B
C-AB	126	32	773	0.163	126	0.2	0.3	0.093	A
C-A	273	68			273				
A-B	3	0.83			3				
A-C	393	98			393				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	96	24	406	0.236	96	0.3	0.3	0.193	B
C-AB	126	32	773	0.163	126	0.3	0.3	0.093	A
C-A	272	68			272				
A-B	3	0.83			3				
A-C	393	98			393				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	78	20	427	0.183	79	0.3	0.2	0.172	B
C-AB	93	23	748	0.124	93	0.3	0.2	0.092	A
C-A	233	58			233				
A-B	3	0.67			3				
A-C	321	80			321				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	65	16	442	0.148	66	0.2	0.2	0.160	A
C-AB	72	18	730	0.098	72	0.2	0.2	0.091	A
C-A	201	50			201				
A-B	2	0.56			2				
A-C	269	67			269				

2039+Dev(Link+Sig), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
13	untitled	T-Junction	Two-way		0.03	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - B0250 Manston Road West		ONE HOUR	✓	405	100.000
B - Manston Court Road		ONE HOUR	✓	71	100.000
C - B0250 Manston Road east		ONE HOUR	✓	363	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - B0250 Manston Road West	B - Manston Court Road	C - B0250 Manston Road east
From	A - B0250 Manston Road West	0	7	398
	B - Manston Court Road	0	0	71
	C - B0250 Manston Road east	290	73	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - B0250 Manston Road West	B - Manston Court Road	C - B0250 Manston Road east
From	A - B0250 Manston Road West	0	0	2
	B - Manston Court Road	0	0	0
	C - B0250 Manston Road east	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.19	0.18	0.2	B	65	98
C-AB	0.16	0.09	0.3	A	103	154
C-A					230	346
A-B					6	10
A-C					365	548

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	53	13	450	0.119	53	0.0	0.1	0.151	A
C-AB	76	19	776	0.099	76	0.0	0.2	0.086	A
C-A	197	49			197				
A-B	5	1			5				
A-C	300	75			300				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	64	16	435	0.147	64	0.1	0.2	0.161	A
C-AB	98	25	789	0.125	98	0.2	0.2	0.087	A
C-A	228	57			228				
A-B	6	2			6				
A-C	358	89			358				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	78	20	414	0.189	78	0.2	0.2	0.179	B
C-AB	133	33	809	0.165	133	0.2	0.3	0.089	A
C-A	266	67			266				
A-B	8	2			8				
A-C	438	110			438				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	78	20	414	0.189	78	0.2	0.2	0.179	B
C-AB	133	33	809	0.165	133	0.3	0.3	0.089	A
C-A	266	67			266				
A-B	8	2			8				
A-C	438	110			438				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	64	16	435	0.147	64	0.2	0.2	0.162	A
C-AB	98	25	789	0.125	99	0.3	0.2	0.087	A
C-A	228	57			228				
A-B	6	2			6				
A-C	358	89			358				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	53	13	450	0.119	54	0.2	0.1	0.151	A
C-AB	77	19	776	0.099	77	0.2	0.2	0.086	A
C-A	197	49			197				
A-B	5	1			5				
A-C	300	75			300				

LinSig V1 style report

User and Project Details

Project:	**Manston Airport DCO EIA**
Title:	**Junction 15**
Location:	
File name:	Junction 15_Validated.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX
Notes:	

Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7

Phase Intergreens Matrix

		Starting Phase		
		A	B	C
Terminating Phase	A		5	-
	B	10		10
	C	-	10	

Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		10	10
	2	10		0
	3	10	2	

Phases in Stage

Stage No.	Phases in Stage
1	B
2	A C
3	C

Give-Way Lane Input Data

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
2/2 (College Road)	5/1 (Right)	1439	0	1/1	1.09	All	2.00	2.00	0.50	2	2.00
				1/2	1.09	All					
3/1 (Hartsdown Road Entry)	6/1 (Right)	1439	0	2/1	1.09	To 6/1 (Ahead)	2.00	2.00	0.50	2	2.00
7/1 (College Road to Tivoli Road)	4/2 (Right)	1439	0	1/1	1.09	To 4/1 (Ahead)	-	-	-	-	-
				1/2	1.09	To 4/2 (Ahead)					
				3/1	1.09	To 4/1 (Left)					

Lane Input Data

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Manston Road south (Entry))	U	A	2	3	60.0	Geom	-	2.41	0.00	Y	Arm 4 Ahead	Inf
											Arm 5 Left	19.00
1/2 (Manston Road south (Entry))	U	A	2	3	12.0	Geom	-	2.58	0.00	Y	Arm 4 Ahead	Inf
2/1 (College Road)	U	C	2	3	60.0	Geom	-	3.23	0.00	Y	Arm 6 Ahead	Inf
2/2 (College Road)	O	C	2	3	6.0	Geom	-	3.25	0.00	Y	Arm 5 Right	16.00
											Arm 7 Right	15.00
3/1 (Hartsdown Road Entry)	O	B	2	3	60.0	Geom	-	3.01	0.00	Y	Arm 4 Left	Inf
											Arm 6 Right	8.00
4/1 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/2 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Hartsdown Road Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Manston Road south (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (College Road to Tivoli Road)	O		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Right	15.00

Lane Saturation Flows

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039+Dev (link+sig) - AM Peak', Plan 1: 'Base')

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	2.41	0.00	Y	Arm 4 Ahead	Inf	55.5 %	1793	1793
				Arm 5 Left	19.00	44.5 %		
1/2 (Manston Road south (Entry))	2.58	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1873	1873
2/1 (College Road)	3.23	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1938	1938
2/2 (College Road)	3.25	0.00	Y	Arm 5 Right	16.00	98.7 %	1774	1774
				Arm 7 Right	15.00	1.3 %		
3/1 (Hartsdown Road Entry)	3.01	0.00	Y	Arm 4 Left	Inf	48.7 %	1748	1748
				Arm 6 Right	8.00	51.3 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039+Dev (link+sig) - PM Peak', Plan 1: 'Base')

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	2.41	0.00	Y	Arm 4 Ahead	Inf	46.1 %	1780	1780
				Arm 5 Left	19.00	53.9 %		
1/2 (Manston Road south (Entry))	2.58	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1873	1873
2/1 (College Road)	3.23	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1938	1938
2/2 (College Road)	3.25	0.00	Y	Arm 5 Right	16.00	97.8 %	1773	1773
				Arm 7 Right	15.00	2.2 %		
3/1 (Hartsdown Road Entry)	3.01	0.00	Y	Arm 4 Left	Inf	67.3 %	1805	1805
				Arm 6 Right	8.00	32.7 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039+Dev (link+sig) - AM Peak'	08:00	09:00	01:00	
2: '2039+Dev (link+sig) - PM Peak'	17:00	18:00	01:00	

Traffic Flows, Desired

FG1: '2039+Dev (link+sig) - AM Peak'

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	229	802	1031
	B	545	0	517	1062
	C	244	234	3	481
	Tot.	789	463	1322	2574

FG2: '2039+Dev (link+sig) - PM Peak'
Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	292	791	1083
	B	252	0	518	770
	C	230	222	5	457
	Tot.	482	514	1314	2310

Stage Timings

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039+Dev (link+sig) - AM Peak', Plan 1: 'Base')

Stage	**1**	**2**	**3**
Duration	52	25	12
Change Point	0	62	97

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	-	-	**N/A**	-	-		-	-	-	-	-	-	**124.9%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**124.9%**
1/1+1/2	Manston Road south (Entry) Ahead Left	U	N/A	N/A	A		1	25	-	1031	1793:1873	413+414	124.7 : 124.7%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	C		1	37	-	481	1938:1774	203+197	120.2 : 120.2%
3/1	Hartsdown Road Entry Left Right	O	N/A	N/A	B		1	52	-	1062	1748	850	124.9%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	803	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	519	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	463	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	789	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	3	1764	645	0.4%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**585**	**49**	**45.3**	**256.2**	**0.5**	**302.0**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**585**	**49**	**45.3**	**256.2**	**0.5**	**302.0**	**-**	**-**	**-**	**-**
1/1+1/2	1031	827	-	-	-	19.3	104.4	-	123.7	432.0	28.2	104.4	132.6
2/1+2/2	481	400	0	162	32	7.2	43.3	0.5	50.9	380.9	12.6	43.3	55.9
3/1	1062	850	0	420	16	18.9	108.5	0.0	127.3	431.7	38.6	108.5	147.1
4/1	643	643	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	416	416	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	378	378	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	639	639	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	2	2	0	2	0	0.0	0.0	-	0.0	10.9	0.0	0.0	0.0

C1 - 08-0695

PRC for Signalled Lanes (%): -38.8
PRC Over All Lanes (%): -38.8

Total Delay for Signalled Lanes (pcuHr): 301.95
Total Delay Over All Lanes(pcuHr): 301.96

Cycle Time (s): 109

Stage Timings

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039+Dev (link+sig) - PM Peak', Plan 1: 'Base')

Stage	1	2	3
Duration	36	27	11
Change Point	6	52	89

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	-	-	**N/A**	-	-		-	-	-	-	-	-	**108.7%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**108.7%**
1/1+1/2	Manston Road south (Entry) Ahead Left	U	N/A	N/A	A		1	27	-	1083	1780:1873	498+498	108.7 : 108.7%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	C		1	38	-	457	1938:1773	213+210	107.9 : 107.9%
3/1	Hartsdown Road Entry Left Right	O	N/A	N/A	B		1	36	-	770	1805	710	108.4%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	768	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	546	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	514	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	482	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	5	1764	489	0.9%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**393**	**49**	**24.9**	**106.2**	**0.6**	**131.7**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**393**	**49**	**24.9**	**106.2**	**0.6**	**131.7**	**-**	**-**	**-**	**-**
1/1+1/2	1083	996	-	-	-	12.2	49.0	-	61.2	203.6	19.8	49.0	68.9
2/1+2/2	457	440	0	169	37	4.0	22.0	0.6	26.6	209.4	6.4	22.0	28.3
3/1	770	710	0	220	13	8.6	35.2	0.0	43.8	204.9	21.7	35.2	56.9
4/1	708	708	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	502	502	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	474	474	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	463	463	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	5	5	0	5	0	0.0	0.0	-	0.0	13.3	0.0	0.0	0.0

C1 - 08-0695

PRC for Signalled Lanes (%): -20.8
PRC Over All Lanes (%): -20.8

Total Delay for Signalled Lanes (pcuHr): 131.66
Total Delay Over All Lanes(pcuHr): 131.67

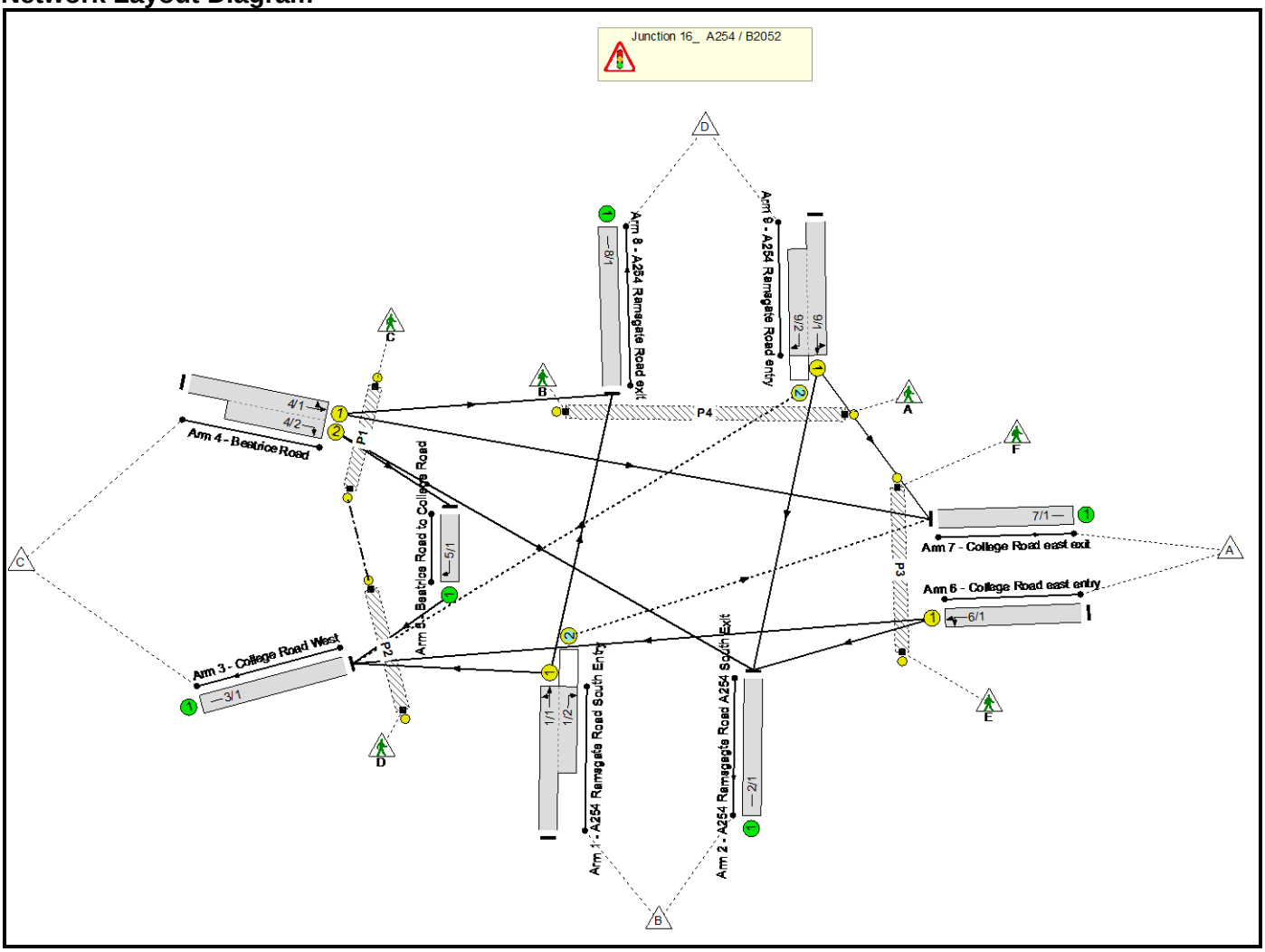
Cycle Time (s): 94

Full Input Data And Results

User and Project Details

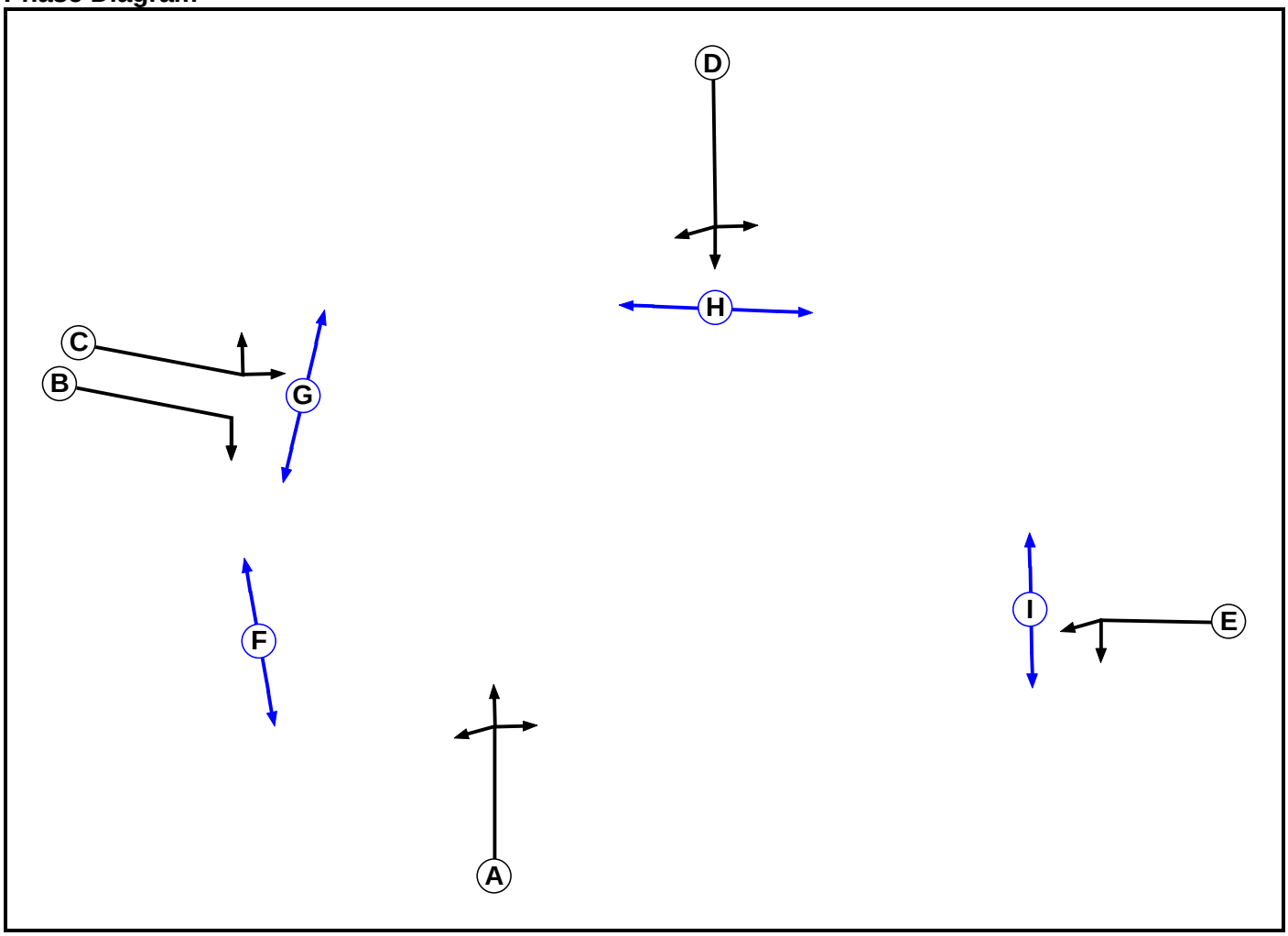
Project:	**Manston Airport DCO EIA**
Title:	**Junction 16**
Location:	
File name:	Junction 16_Validated_Strategic Model.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX
Notes:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Pedestrian		6	6
G	Pedestrian		6	6
H	Pedestrian		7	7
I	Pedestrian		6	6

Full Input Data And Results

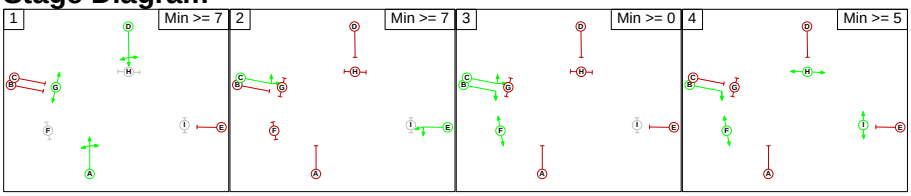
Phase Intergreens Matrix

Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H	I
A		-	5	-	5	-	-	-	-
B	11		-	11	-	-	11	-	-
C	-	-		-	-	-	-	8	-
D	-	-	5		5	-	-	-	-
E	-	8	-	-		8	-	-	-
F	-	-	-	-	-		-	-	-
G	-	-	5	-	5	-		-	-
H	-	-	-	-	-	-	-		-
I	-	-	-	-	-	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A D G
2	C E
3	B C F
4	B F H I

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

From Stage \ To Stage	1	2	3	4
1		5	5	2
2	2		8	8
3	11	2		8
4	11	2	2	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Junction 16_ A254 / B2052											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
1/2 (A254 Ramsgate Road South Entry)	7/1 (Right)	1439	0	9/1	1.09	All	3.00	-	0.50	3	3.00
9/2 (A254 Ramsgate Road entry)	3/1 (Right)	1439	0	1/1	1.09	All	2.00	-	0.50	2	2.00

Full Input Data And Results

Lane Input Data

Junction: Junction 16_ A254 / B2052

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (A254 Ramsgate Road South Entry)	U	A	2	3	60.0	Geom	-	2.50	0.00	Y	Arm 3 Left	8.00
											Arm 8 Ahead	Inf
1/2 (A254 Ramsgate Road South Entry)	O	A	2	3	7.0	Geom	-	2.50	0.00	Y	Arm 7 Right	10.00
2/1 (A254 Ramsgagte Road A254 South Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1 (College Road West)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (Beatrice Road)	U	C	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 7 Ahead	Inf
											Arm 8 Left	15.00
4/2 (Beatrice Road)	U	B	2	3	8.0	Geom	-	3.00	0.00	Y	Arm 2 Right	15.00
											Arm 5 Right	8.00
5/1 (Beatrice Road to College Road)	U		2	3	60.0	Geom	-	5.00	0.00	Y	Arm 3 Right	Inf
6/1 (College Road east entry)	U	E	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 2 Left	Inf
											Arm 3 Ahead	Inf
7/1 (College Road east exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1 (A254 Ramsgate Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
9/1 (A254 Ramsgate Road entry)	U	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 2 Ahead	Inf
											Arm 7 Left	8.00
9/2 (A254 Ramsgate Road entry)	O	D	2	3	9.0	Geom	-	3.00	0.00	Y	Arm 3 Right	15.00

Full Input Data And Results

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039+Dev+(Link+Sig) - AM Peak'	07:45	08:45	01:00	
2: '2039+Dev(Link+Sig) - PM Peak'	16:45	17:45	01:00	

Scenario 1: '2039+Dev(Link+Sig) - AM Peak' (FG1: '2039+Dev+(Link+Sig) - AM Peak', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	366	342	0	708
	B	206	0	42	356	604
	C	644	78	58	10	790
	D	9	618	108	0	735
	Tot.	859	1062	550	366	2837

Traffic Lane Flows

Lane	Scenario 1: 2039+Dev(Link+Sig) - AM Peak
Junction: Junction 16_ A254 / B2052	
1/1 (with short)	604(In) 398(Out)
1/2 (short)	206
2/1	1062
3/1	550
4/1 (with short)	790(In) 654(Out)
4/2 (short)	136
5/1	58
6/1	708
7/1	859
8/1	366
9/1 (with short)	735(In) 627(Out)
9/2 (short)	108

Full Input Data And Results

Lane Saturation Flows

Junction: Junction 16_ A254 / B2052								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A254 Ramsgate Road South Entry)	2.50	0.00	Y	Arm 3 Left	8.00	10.6 %	1829	1829
				Arm 8 Ahead	Inf	89.4 %		
1/2 (A254 Ramsgate Road South Entry)	2.50	0.00	Y	Arm 7 Right	10.00	100.0 %	1622	1622
2/1 (A254 Ramsgagte Road A254 South Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
3/1 (College Road West Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Beatrice Road)	3.00	0.00	Y	Arm 7 Ahead	Inf	98.5 %	1912	1912
				Arm 8 Left	15.00	1.5 %		
4/2 (Beatrice Road)	3.00	0.00	Y	Arm 2 Right	15.00	57.4 %	1684	1684
				Arm 5 Right	8.00	42.6 %		
5/1 (Beatrice Road to College Road)	5.00	0.00	Y	Arm 3 Right	Inf	100.0 %	2115	2115
6/1 (College Road east entry)	3.65	0.00	Y	Arm 2 Left	Inf	51.7 %	1980	1980
				Arm 3 Ahead	Inf	48.3 %		
7/1 (College Road east exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A254 Ramsgate Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/1 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 2 Ahead	Inf	98.6 %	1910	1910
				Arm 7 Left	8.00	1.4 %		
9/2 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 3 Right	15.00	100.0 %	1741	1741

Scenario 2: '2039+Dev(Link+Sig)- PM Peak' (FG2: '2039+Dev(Link+Sig) - PM Peak', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	239	308	0	547
	B	281	0	56	435	772
	C	647	101	64	14	826
	D	15	596	98	0	709
	Tot.	943	936	526	449	2854

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2039+Dev(Link+Sig)- PM Peak
Junction: Junction 16_ A254 / B2052	
1/1 (with short)	772(In) 491(Out)
1/2 (short)	281
2/1	936
3/1	526
4/1 (with short)	826(In) 661(Out)
4/2 (short)	165
5/1	64
6/1	547
7/1	943
8/1	449
9/1 (with short)	709(In) 611(Out)
9/2 (short)	98

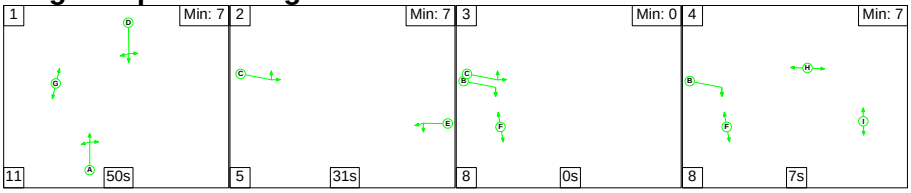
Full Input Data And Results

Lane Saturation Flows

Junction: Junction 16_ A254 / B2052								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A254 Ramsgate Road South Entry)	2.50	0.00	Y	Arm 3 Left	8.00	11.4 %	1826	1826
				Arm 8 Ahead	Inf	88.6 %		
1/2 (A254 Ramsgate Road South Entry)	2.50	0.00	Y	Arm 7 Right	10.00	100.0 %	1622	1622
2/1 (A254 Ramsgagte Road A254 South Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
3/1 (College Road West Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Beatrice Road)	3.00	0.00	Y	Arm 7 Ahead	Inf	97.9 %	1911	1911
				Arm 8 Left	15.00	2.1 %		
4/2 (Beatrice Road)	3.00	0.00	Y	Arm 2 Right	15.00	61.2 %	1689	1689
				Arm 5 Right	8.00	38.8 %		
5/1 (Beatrice Road to College Road)	5.00	0.00	Y	Arm 3 Right	Inf	100.0 %	2115	2115
6/1 (College Road east entry)	3.65	0.00	Y	Arm 2 Left	Inf	43.7 %	1980	1980
				Arm 3 Ahead	Inf	56.3 %		
7/1 (College Road east exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A254 Ramsgate Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/1 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 2 Ahead	Inf	97.5 %	1906	1906
				Arm 7 Left	8.00	2.5 %		
9/2 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 3 Right	15.00	100.0 %	1741	1741

Scenario 1: '2039+Dev(Link+Sig) - AM Peak' (FG1: '2039+Dev+(Link+Sig) - AM Peak', Plan 1: 'Base')

Stage Sequence Diagram

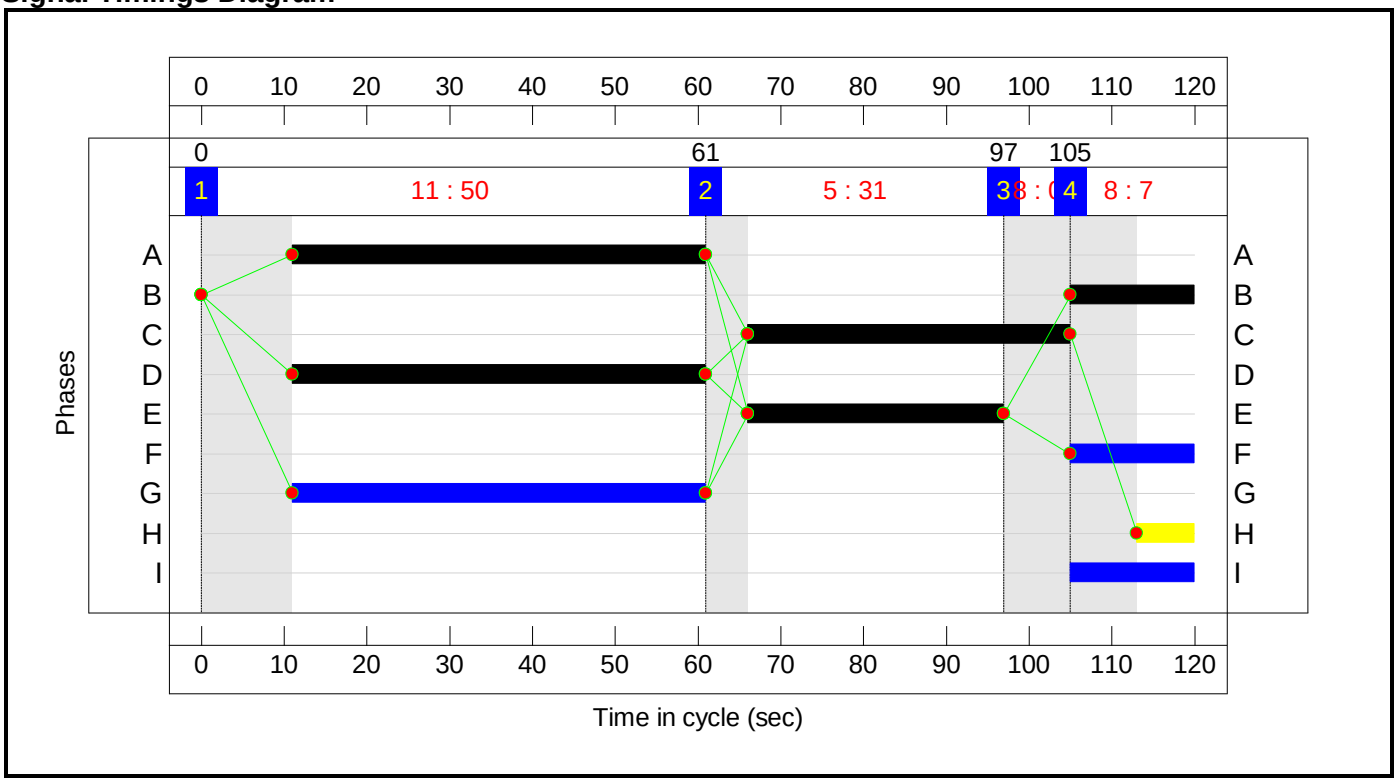


Stage Timings

Stage	1	2	3	4
Duration	50	31	0	7
Change Point	0	61	97	105

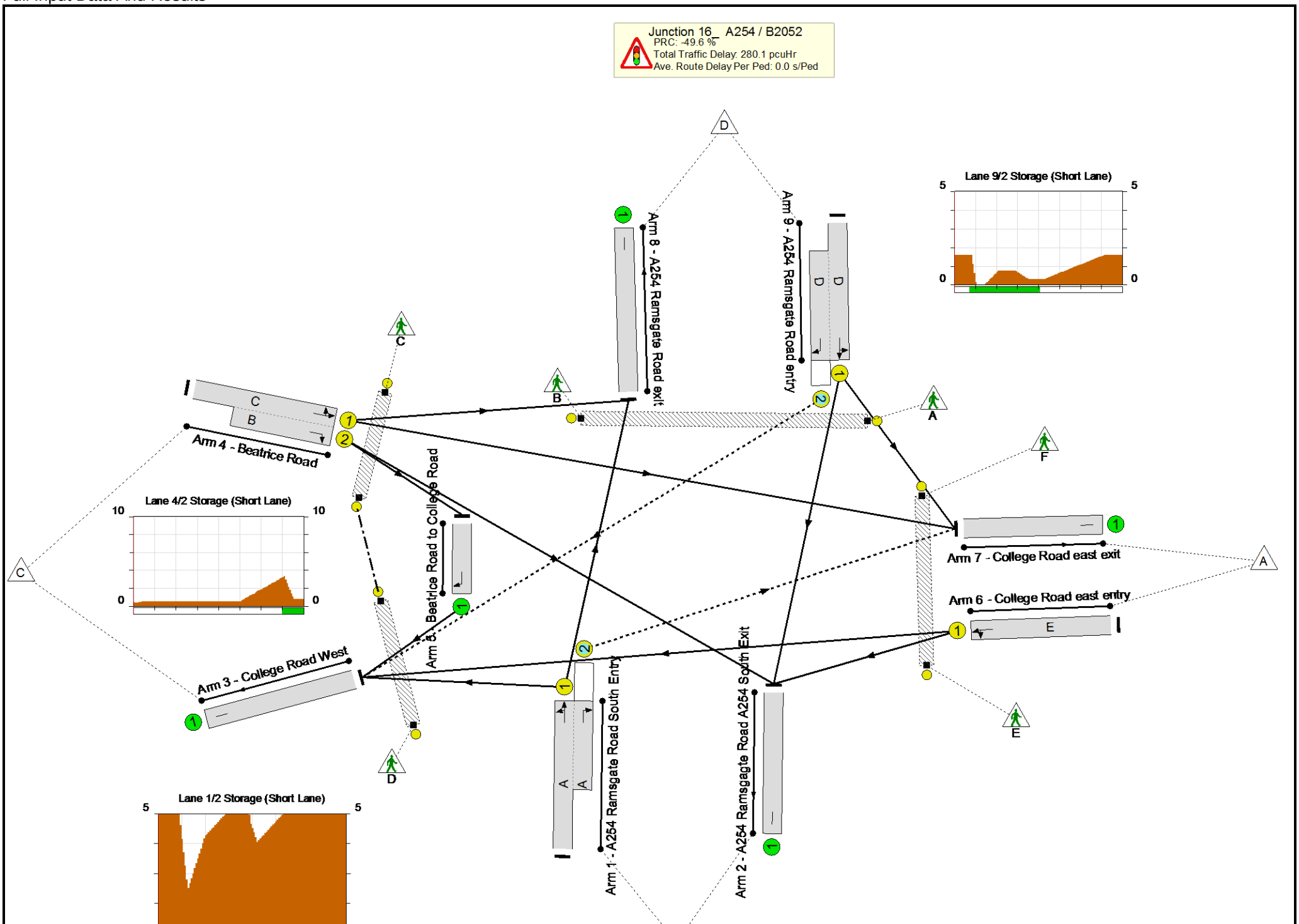
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Junction 16_ A254 / B2052
PRC: -49.6 %
Total Traffic Delay: 280.1 pcuHr
Ave. Route Delay Per Ped: 0.0 s/Ped
Arm 8 - A254 Ramsgate Road exit
Arm 9 - A254 Ramsgate Road entry
Lane 9/2 Storage (Short Lane)
Arm 4 - Beatrice Road
Lane 4/2 Storage (Short Lane)
Arm 5 - Beatrice Road to College Road
Arm 7 - College Road east exit
Arm 6 - College Road east entry
Arm 3 - College Road West
Arm 1 - A254 Ramsgate Road South Entry
Arm 2 - A254 Ramsgate Road A254 South Exit
Lane 1/2 Storage (Short Lane)

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 16	-	-	**N/A**	-	-		-	-	-	-	-	-	**134.7%**
Junction 16_ A254 / B2052	-	-	**N/A**	-	-		-	-	-	-	-	-	**134.7%**
1/1+1/2	A254 Ramsgate Road South Entry Left Right Ahead	U+O	N/A	N/A	A		1	50	-	604	1829:1622	296+153	134.7 : 134.7%
2/1	A254 Ramsgagte Road A254 South Exit	U	N/A	N/A	-		-	-	-	1062	Inf	Inf	0.0%
3/1	College Road West	U	N/A	N/A	-		-	-	-	550	Inf	Inf	0.0%
4/1+4/2	Beatrice Road Right Right2 Ahead Left	U	N/A	N/A	C B		1	39:15	-	790	1912:1684	562+117	116.3 : 116.3%
5/1	Beatrice Road to College Road Right	U	N/A	N/A	-		-	-	-	58	2115	2115	2.4%
6/1	College Road east entry Left Ahead	U	N/A	N/A	E		1	31	-	708	1980	528	134.1%
7/1	College Road east exit	U	N/A	N/A	-		-	-	-	859	Inf	Inf	0.0%
8/1	A254 Ramsgate Road exit	U	N/A	N/A	-		-	-	-	366	Inf	Inf	0.0%
9/1+9/2	A254 Ramsgate Road entry Ahead Right Left	U+O	N/A	N/A	D		1	50	-	735	1910:1741	725+125	86.5 : 86.5%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	50	-	0	-	30000	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	F		1	15	-	0	-	9000	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	I		1	15	-	0	-	9000	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	H		1	7	-	0	-	4200	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 16	**-**	**-**	**184**	**0**	**77**	**45.2**	**233.4**	**1.5**	**280.1**	**-**	**-**	**-**	**-**
Junction 16_ A254 / B2052	**-**	**-**	**184**	**0**	**77**	**45.2**	**233.4**	**1.5**	**280.1**	**-**	**-**	**-**	**-**
1/1+1/2	604	551	76	0	77	7.6	79.7	1.2	88.4	527.1	12.0	79.7	91.6
2/1	958	958	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	455	455	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1+4/2	790	679	-	-	-	12.9	58.8	-	71.7	326.6	31.0	58.8	89.8
5/1	50	50	-	-	-	0.0	0.0	-	0.0	0.9	0.0	0.0	0.0
6/1	708	528	-	-	-	18.5	91.9	-	110.5	561.7	31.7	91.9	123.6
7/1	716	716	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	365	365	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1+9/2	735	735	108	0	0	6.1	3.0	0.3	9.5	46.4	20.3	3.0	23.3
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P3	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P4	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0

C1 - 08-0694

PRC for Signalled Lanes (%): -49.6
PRC Over All Lanes (%): -49.6

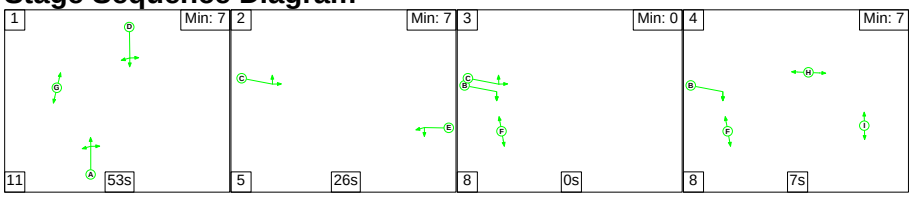
Total Delay for Signalled Lanes (pcuHr): 280.05
Total Delay Over All Lanes(pcuHr): 280.06

Cycle Time (s): 120

Full Input Data And Results

Scenario 2: '2039+Dev(Link+Sig)- PM Peak' (FG2: '2039+Dev(Link+Sig) - PM Peak', Plan 1: 'Base')

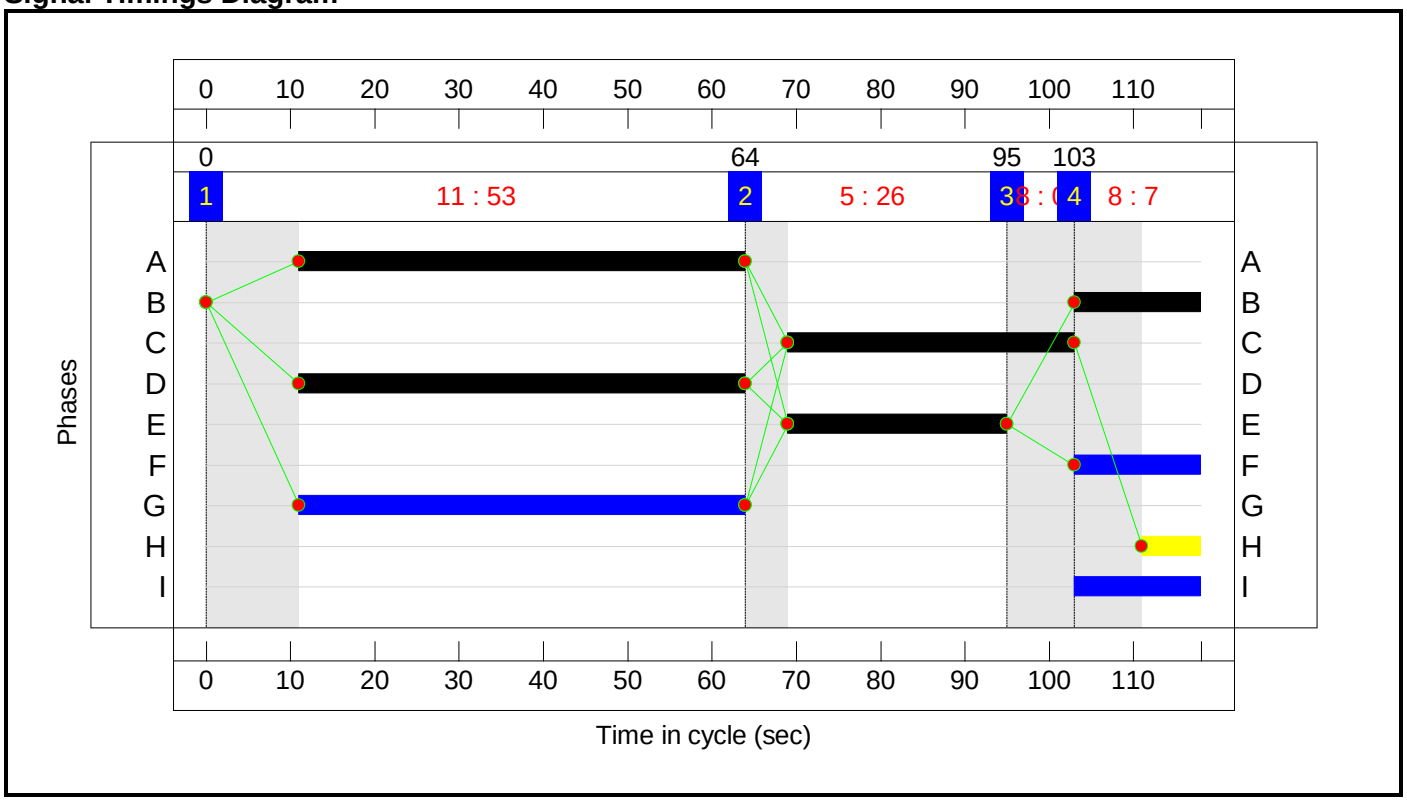
Stage Sequence Diagram



Stage Timings

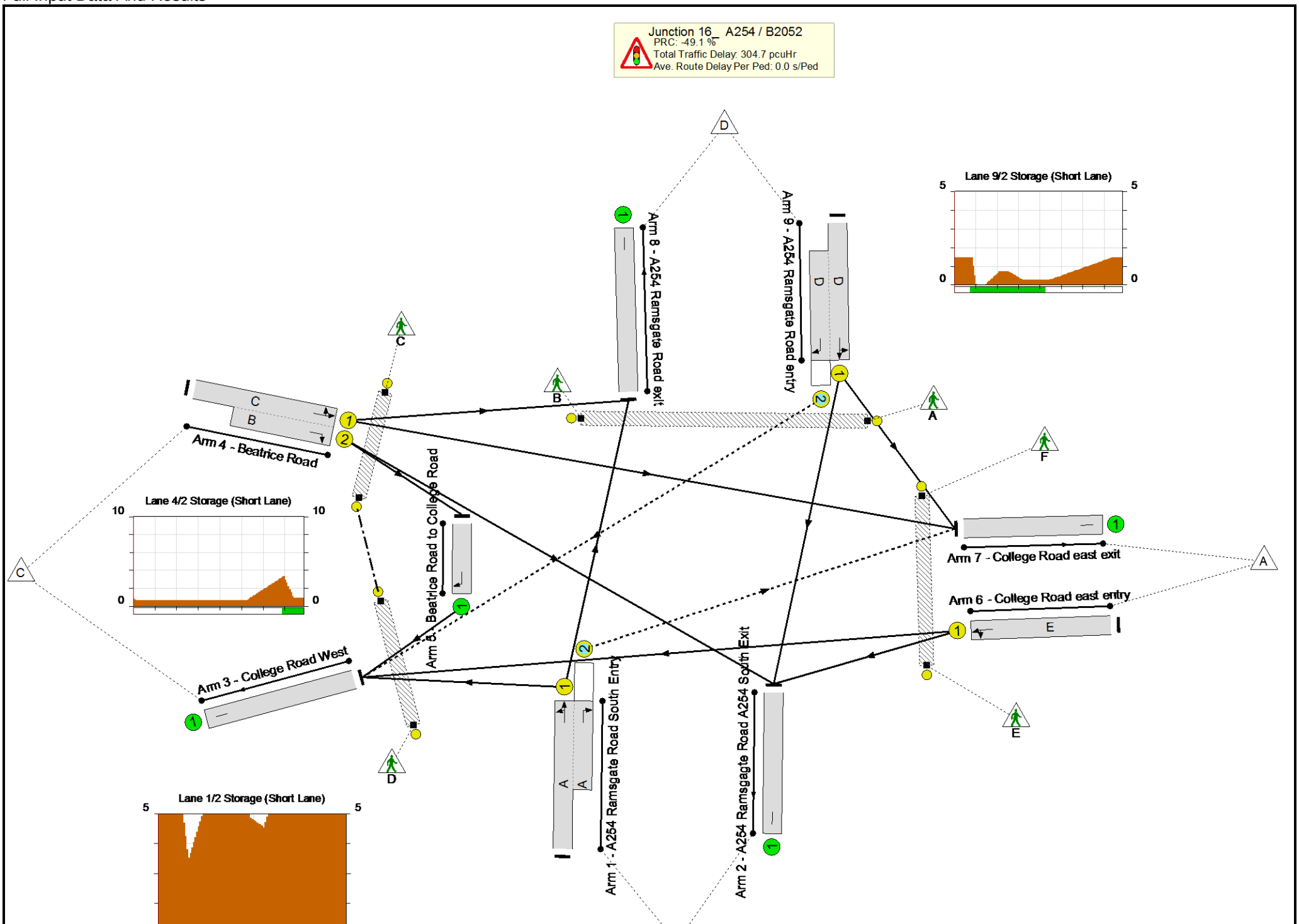
Stage	1	2	3	4
Duration	53	26	0	7
Change Point	0	64	95	103

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Junction 16_ A254 / B2052
PRC: -49.1 %
Total Traffic Delay: 304.7 pcuHr
Ave. Route Delay Per Ped: 0.0 s/Ped
Arm 8 - A254 Ramsgate Road exit
Arm 9 - A254 Ramsgate Road entry
Lane 9/2 Storage (Short Lane)
Arm 4 - Beatrice Road
Lane 4/2 Storage (Short Lane)
Arm 5 - Beatrice Road to College Road
Arm 7 - College Road east exit
Arm 6 - College Road east entry
Arm 3 - College Road West
Arm 1 - A254 Ramsgate Road South Entry
Arm 2 - A254 Ramsgate Road A254 South Exit
Lane 1/2 Storage (Short Lane)

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 16	-	-	**N/A**	-	-		-	-	-	-	-	-	**134.2%**
Junction 16_ A254 / B2052	-	-	**N/A**	-	-		-	-	-	-	-	-	**134.2%**
1/1+1/2	A254 Ramsgate Road South Entry Left Right Ahead	U+O	N/A	N/A	A		1	53	-	772	1826:1622	366+209	134.2 : 134.2%
2/1	A254 Ramsgagte Road A254 South Exit	U	N/A	N/A	-		-	-	-	936	Inf	Inf	0.0%
3/1	College Road West	U	N/A	N/A	-		-	-	-	526	Inf	Inf	0.0%
4/1+4/2	Beatrice Road Right Right2 Ahead Left	U	N/A	N/A	C B		1	34:15	-	826	1911:1689	497+124	133.1 : 133.1%
5/1	Beatrice Road to College Road Right	U	N/A	N/A	-		-	-	-	64	2115	2115	2.3%
6/1	College Road east entry Left Ahead	U	N/A	N/A	E		1	26	-	547	1980	453	120.7%
7/1	College Road east exit	U	N/A	N/A	-		-	-	-	943	Inf	Inf	0.0%
8/1	A254 Ramsgate Road exit	U	N/A	N/A	-		-	-	-	449	Inf	Inf	0.0%
9/1+9/2	A254 Ramsgate Road entry Ahead Right Left	U+O	N/A	N/A	D		1	53	-	709	1906:1741	783+126	78.0 : 78.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	53	-	0	-	32339	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	F		1	15	-	0	-	9153	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	I		1	15	-	0	-	9153	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	H		1	7	-	0	-	4271	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 16	**-**	**-**	**229**	**0**	**78**	**46.7**	**256.4**	**1.6**	**304.7**	**-**	**-**	**-**	**-**
Junction 16_ A254 / B2052	**-**	**-**	**229**	**0**	**78**	**46.7**	**256.4**	**1.6**	**304.7**	**-**	**-**	**-**	**-**
1/1+1/2	772	619	131	0	78	11.3	100.2	1.2	112.7	525.6	22.8	100.2	123.0
2/1	870	870	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	448	448	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1+4/2	826	621	-	-	-	19.5	104.7	-	124.2	541.2	36.9	104.7	141.6
5/1	48	48	-	-	-	0.0	0.0	-	0.0	0.9	0.0	0.0	0.0
6/1	547	453	-	-	-	10.9	49.7	-	60.6	399.1	21.0	49.7	70.8
7/1	711	711	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	373	373	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1+9/2	709	709	98	0	0	5.0	1.7	0.4	7.2	36.4	17.7	1.7	19.4
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P3	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P4	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0

C1 - 08-0694

PRC for Signalled Lanes (%): -49.1
PRC Over All Lanes (%): -49.1

Total Delay for Signalled Lanes (pcuHr): 304.72
Total Delay Over All Lanes(pcuHr): 304.73

Cycle Time (s): 118

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 20a and b_Manston Rd_A256.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 20a_A256_Manston Rd E
Report generation date: 19/03/2019 11:50:05

»2039+Dev(Link+Sig), AM
»2039+Dev(Link+Sig), PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev(Link+Sig)									
Arm 1	1.1	0.06	0.52	A	0.17	1.2	0.06	0.54	A	0.20
Arm 2	1.5	0.14	0.60	A		1.2	0.11	0.54	A	
Arm 3	0.2	0.06	0.17	A		0.1	0.07	0.12	A	
Arm 4	5.7	0.31	0.86	C		7.8	0.37	0.90	C	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	14/12/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev(Link+Sig)	AM	Dedicated left turn from Manston Road (W)	ONE HOUR	07:45	09:15	15	✓
D2	2039+Dev(Link+Sig)	PM	Dedicated left turn from Manston Road (W)	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev(Link+Sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.17	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 (N)	
2	Manston Road (E)	
3	A256 (S)	
4	Manston Road (W)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.30	8.30	5.9	30.0	60.0	18.0	
2	3.70	7.10	12.8	20.0	60.0	20.0	
3	3.70	7.10	12.7	20.0	60.0	13.0	
4	3.70	7.10	7.9	50.0	60.0	17.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.719	2548
2	0.572	1736
3	0.586	1775
4	0.571	1670

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev(Link+Sig)	AM	Dedicated left turn from Manston Road (W)	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	964	100.000
2		ONE HOUR	✓	599	100.000
3		ONE HOUR	✓	196	100.000
4		ONE HOUR	✓	1042	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	34	784	146
	2	255	0	41	303
	3	78	105	0	13
	4	671	364	7	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	4	6	6
	2	2	0	5	1
	3	3	5	0	8
	4	5	2	7	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.52	0.06	1.1	A	885	1327
2	0.60	0.14	1.5	A	550	824
3	0.17	0.06	0.2	A	180	270
4	0.86	0.31	5.7	C	956	1434

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	726	181	356	2157	0.337	724	752	0.0	0.5	0.042	A
2	451	113	703	1287	0.350	449	377	0.0	0.5	0.071	A
3	148	37	528	1397	0.106	147	625	0.0	0.1	0.048	A
4	784	196	328	1421	0.552	780	346	0.0	1.2	0.093	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	867	217	427	2108	0.411	866	900	0.5	0.7	0.048	A
2	538	135	842	1205	0.447	537	451	0.5	0.8	0.090	A
3	176	44	632	1337	0.132	176	747	0.1	0.2	0.052	A
4	937	234	393	1384	0.677	933	415	1.2	2.0	0.132	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1061	265	519	2043	0.519	1060	1095	0.7	1.1	0.061	A
2	660	165	1030	1093	0.604	657	549	0.8	1.5	0.137	A
3	216	54	772	1256	0.172	216	915	0.2	0.2	0.058	A
4	1147	287	481	1335	0.860	1134	507	2.0	5.4	0.282	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1061	265	524	2040	0.520	1061	1105	1.1	1.1	0.061	A
2	660	165	1032	1092	0.604	659	553	1.5	1.5	0.139	A
3	216	54	775	1255	0.172	216	916	0.2	0.2	0.058	A
4	1147	287	482	1334	0.860	1146	509	5.4	5.7	0.314	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	867	217	433	2103	0.412	868	913	1.1	0.7	0.049	A
2	538	135	844	1204	0.447	541	457	1.5	0.8	0.091	A
3	176	44	636	1335	0.132	176	749	0.2	0.2	0.052	A
4	937	234	395	1383	0.677	951	417	5.7	2.2	0.143	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	726	181	360	2154	0.337	727	759	0.7	0.5	0.042	A
2	451	113	706	1286	0.351	452	380	0.8	0.5	0.072	A
3	148	37	531	1395	0.106	148	627	0.2	0.1	0.048	A
4	784	196	330	1420	0.553	788	349	2.2	1.3	0.096	A

2039+Dev(Link+Sig), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.20	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039+Dev(Link+Sig)	PM	Dedicated left turn from Manston Road (W)	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1044	100.000
2		ONE HOUR	✓	578	100.000
3		ONE HOUR	✓	98	100.000
4		ONE HOUR	✓	1221	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	176	61	807
	2	159	0	79	340
	3	34	53	0	11
	4	767	446	8	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	2	1
	2	0	0	0	0
	3	1	1	0	0
	4	1	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.54	0.06	1.2	A	958	1437
2	0.54	0.11	1.2	A	530	796
3	0.12	0.07	0.1	A	90	135
4	0.90	0.37	7.8	C	1120	1681

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	786	196	379	2252	0.349	784	719	0.0	0.5	0.041	A
2	435	109	658	1356	0.321	433	506	0.0	0.5	0.065	A
3	74	18	980	1187	0.062	74	111	0.0	0.1	0.054	A
4	919	230	184	1549	0.593	913	869	0.0	1.4	0.094	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	939	235	454	2198	0.427	938	860	0.5	0.7	0.048	A
2	520	130	787	1281	0.406	519	605	0.5	0.7	0.079	A
3	88	22	1173	1074	0.082	88	133	0.1	0.1	0.061	A
4	1098	274	221	1528	0.718	1094	1040	1.4	2.5	0.137	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1149	287	551	2129	0.540	1148	1045	0.7	1.2	0.061	A
2	636	159	963	1179	0.540	634	736	0.7	1.2	0.110	A
3	108	27	1435	921	0.117	108	162	0.1	0.1	0.074	A
4	1344	336	270	1500	0.896	1326	1273	2.5	7.2	0.314	C

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1149	287	557	2124	0.541	1149	1055	1.2	1.2	0.062	A
2	636	159	964	1178	0.540	636	742	1.2	1.2	0.111	A
3	108	27	1438	920	0.117	108	163	0.1	0.1	0.074	A
4	1344	336	271	1500	0.896	1342	1275	7.2	7.8	0.367	C

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	939	235	464	2192	0.428	940	877	1.2	0.8	0.048	A
2	520	130	789	1280	0.406	522	615	1.2	0.7	0.079	A
3	88	22	1177	1072	0.082	88	134	0.1	0.1	0.061	A
4	1098	274	222	1528	0.718	1118	1043	7.8	2.6	0.153	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	786	196	383	2249	0.349	787	726	0.8	0.5	0.041	A
2	435	109	660	1354	0.321	436	510	0.7	0.5	0.065	A
3	74	18	985	1184	0.062	74	112	0.1	0.1	0.054	A
4	919	230	186	1548	0.594	924	873	2.6	1.5	0.097	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 21A_4arms.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 21a_Canterbury Rd_A256
Report generation date: 22/01/2019 10:01:18

»2039+Dev (link+sig) , AM
»2039+Dev (link+sig), PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev (link+sig)									
Arm 1	0.1	0.06	0.11	A	0.79	0.1	0.06	0.05	A	0.86
Arm 2	29.2	1.28	1.01	F		23.6	1.06	0.99	F	
Arm 3	0.0	0.05	0.03	A		0.0	0.05	0.03	A	
Arm 4	5.8	0.32	0.86	C		14.6	0.71	0.96	E	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	10/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev (link+sig) , AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.79	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 Haine Rd	
2	A256 (south)	
3	Canterbury Rd W	
4	New Arm (north)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.40	7.10	48.7	17.0	55.0	20.0	
2	3.90	4.70	2.0	26.0	55.0	14.0	
3	7.10	7.10	0.0	15.0	55.0	18.0	
4	3.40	7.10	6.6	17.0	55.0	28.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.643	1982
2	0.544	1374
3	0.683	2206
4	0.535	1429

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	113	100.000
2		ONE HOUR	✓	1223	100.000
3		ONE HOUR	✓	39	100.000
4		ONE HOUR	✓	1036	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	113	0	0
	2	51	0	61	1111
	3	2	11	0	26
	4	0	1036	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	5	0	0
	2	3	0	3	3
	3	0	5	0	0
	4	0	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.11	0.06	0.1	A	104	156
2	1.01	1.28	29.2	F	1122	1683
3	0.03	0.05	0.0	A	36	54
4	0.86	0.32	5.8	C	951	1426

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	85	21	783	1385	0.061	85	40	0.0	0.1	0.046	A
2	921	230	0	1334	0.690	912	868	0.0	2.2	0.139	A
3	29	7	867	1574	0.019	29	45	0.0	0.0	0.039	A
4	780	195	48	1336	0.584	774	848	0.0	1.4	0.106	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	102	25	938	1285	0.079	102	47	0.1	0.1	0.051	A
2	1099	275	0	1334	0.824	1091	1039	2.2	4.3	0.238	B
3	35	9	1036	1456	0.024	35	54	0.0	0.0	0.042	A
4	931	233	57	1331	0.700	928	1014	1.4	2.3	0.148	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	124	31	1140	1155	0.108	124	56	0.1	0.1	0.058	A
2	1347	337	0	1334	1.009	1283	1264	4.3	20.1	0.756	E
3	43	11	1219	1329	0.032	43	64	0.0	0.0	0.047	A
4	1141	285	68	1325	0.861	1128	1194	2.3	5.4	0.287	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	124	31	1151	1148	0.108	124	57	0.1	0.1	0.059	A
2	1347	337	0	1334	1.009	1310	1276	20.1	29.2	1.284	F
3	43	11	1245	1311	0.033	43	65	0.0	0.0	0.047	A
4	1141	285	69	1325	0.861	1139	1219	5.4	5.8	0.318	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	102	25	955	1274	0.080	102	52	0.1	0.1	0.051	A
2	1099	275	0	1334	0.824	1195	1056	29.2	5.3	0.602	E
3	35	9	1136	1387	0.025	35	60	0.0	0.0	0.044	A
4	931	233	62	1329	0.701	945	1109	5.8	2.4	0.161	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	85	21	792	1379	0.062	85	40	0.1	0.1	0.046	A
2	921	230	0	1334	0.690	933	877	5.3	2.3	0.154	A
3	29	7	886	1560	0.019	29	47	0.0	0.0	0.039	A
4	780	195	49	1335	0.584	784	867	2.4	1.4	0.110	A

2039+Dev (link+sig), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.86	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	51	100.000
2		ONE HOUR	✓	1227	100.000
3		ONE HOUR	✓	33	100.000
4		ONE HOUR	✓	1190	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	51	0	0
	2	67	0	16	1144
	3	3	9	0	21
	4	0	1190	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	1	0	0
	2	1	0	1	1
	3	0	1	0	0
	4	0	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.05	0.06	0.1	A	47	70
2	0.99	1.06	23.6	F	1126	1689
3	0.03	0.05	0.0	A	30	45
4	0.96	0.71	14.6	E	1092	1638

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	38	10	895	1387	0.028	38	52	0.0	0.0	0.044	A
2	924	231	0	1360	0.679	916	934	0.0	2.1	0.133	A
3	25	6	904	1578	0.016	25	12	0.0	0.0	0.039	A
4	896	224	59	1383	0.648	889	869	0.0	1.8	0.120	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	46	11	1072	1274	0.036	46	63	0.0	0.0	0.049	A
2	1103	276	0	1360	0.811	1095	1118	2.1	4.0	0.220	B
3	30	7	1081	1456	0.020	30	14	0.0	0.0	0.042	A
4	1070	267	71	1377	0.777	1064	1040	1.8	3.3	0.188	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	56	14	1285	1137	0.049	56	74	0.0	0.1	0.056	A
2	1351	338	0	1360	0.993	1298	1341	4.0	17.2	0.665	E
3	36	9	1281	1318	0.028	36	17	0.0	0.0	0.047	A
4	1310	328	84	1370	0.956	1275	1233	3.3	12.0	0.508	D

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	56	14	1310	1121	0.050	56	76	0.1	0.1	0.056	A
2	1351	338	0	1360	0.993	1326	1366	17.2	23.6	1.063	F
3	36	9	1308	1299	0.028	36	17	0.0	0.0	0.047	A
4	1310	328	86	1369	0.957	1300	1259	12.0	14.6	0.710	E

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	46	11	1121	1242	0.037	46	67	0.1	0.0	0.050	A
2	1103	276	0	1360	0.811	1179	1167	23.6	4.7	0.432	D
3	30	7	1163	1399	0.021	30	15	0.0	0.0	0.044	A
4	1070	267	75	1375	0.778	1113	1118	14.6	3.7	0.263	C

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	38	10	910	1378	0.028	38	53	0.0	0.0	0.045	A
2	924	231	0	1360	0.679	934	948	4.7	2.2	0.144	A
3	25	6	922	1566	0.016	25	12	0.0	0.0	0.039	A
4	896	224	60	1383	0.648	903	887	3.7	1.9	0.127	A

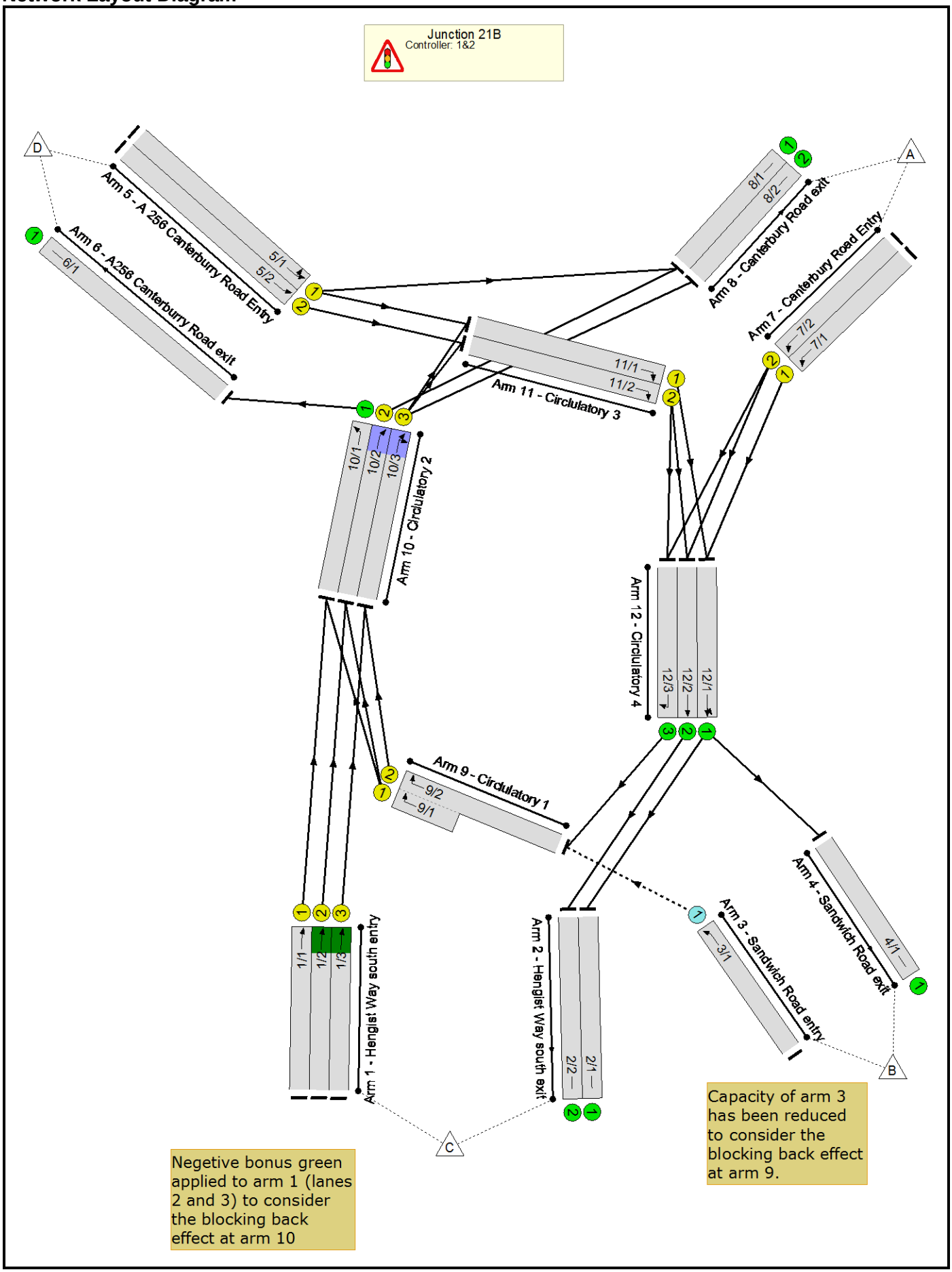
Full Input Data And Results

User and Project Details

Project:	**Manston Airport DCO EIA**
Title:	**Junction 21b**
Location:	
File name:	Junction 21b_Validated_Strategic Model.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX
Notes:	

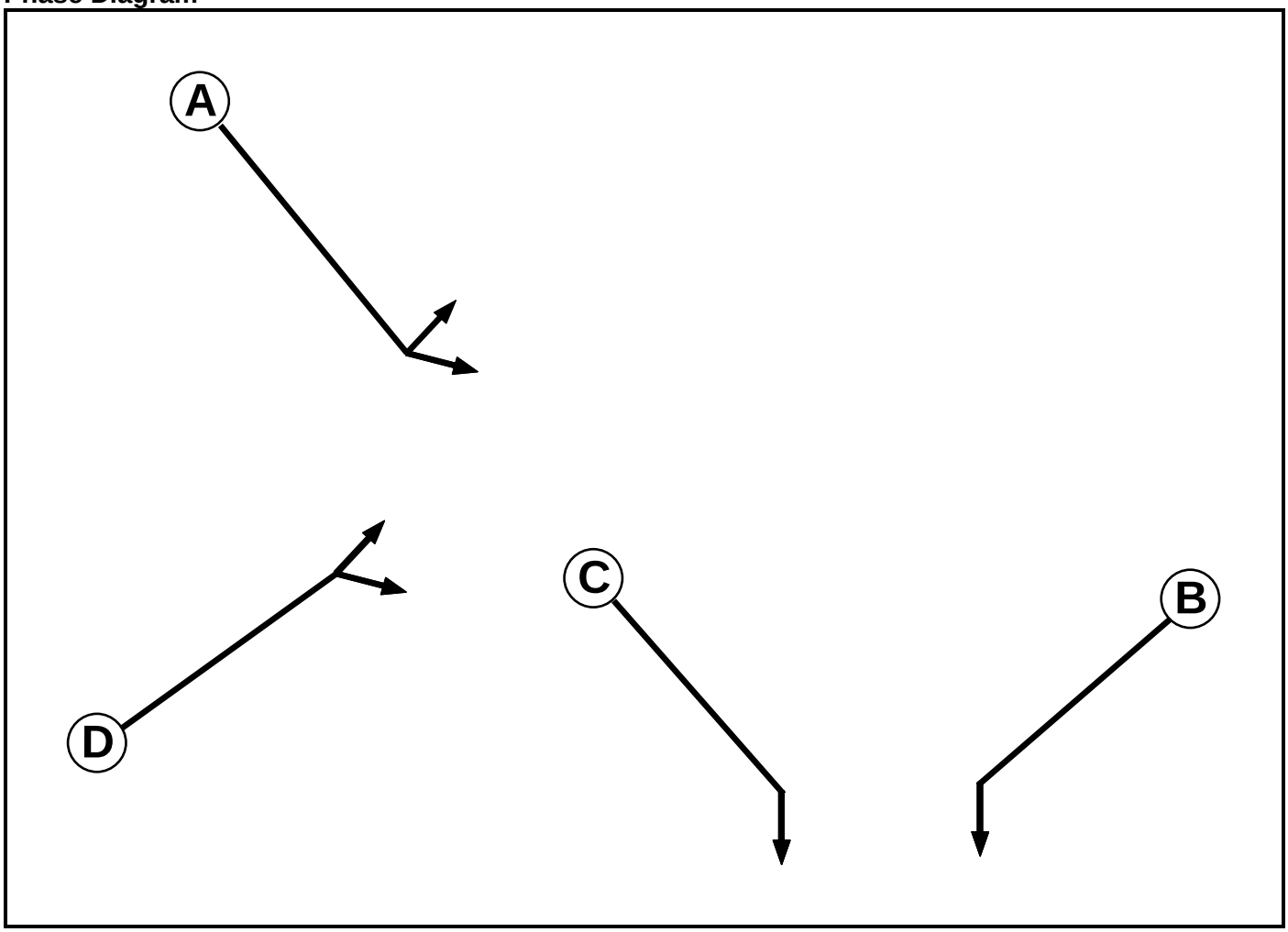
Full Input Data And Results

Network Layout Diagram



C1 - 08-1078

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7

Full Input Data And Results

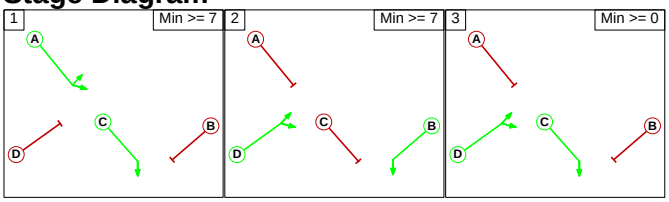
Phase Intergreens Matrix

Terminating Phase	Starting Phase				
		A	B	C	D
A			5	-	5
B	5			5	-
C	-	5			-
D	5	-	-		

Phases in Stage

Stage No.	Phases in Stage
1	A C
2	B D
3	C D

Stage Diagram



Phase Delays

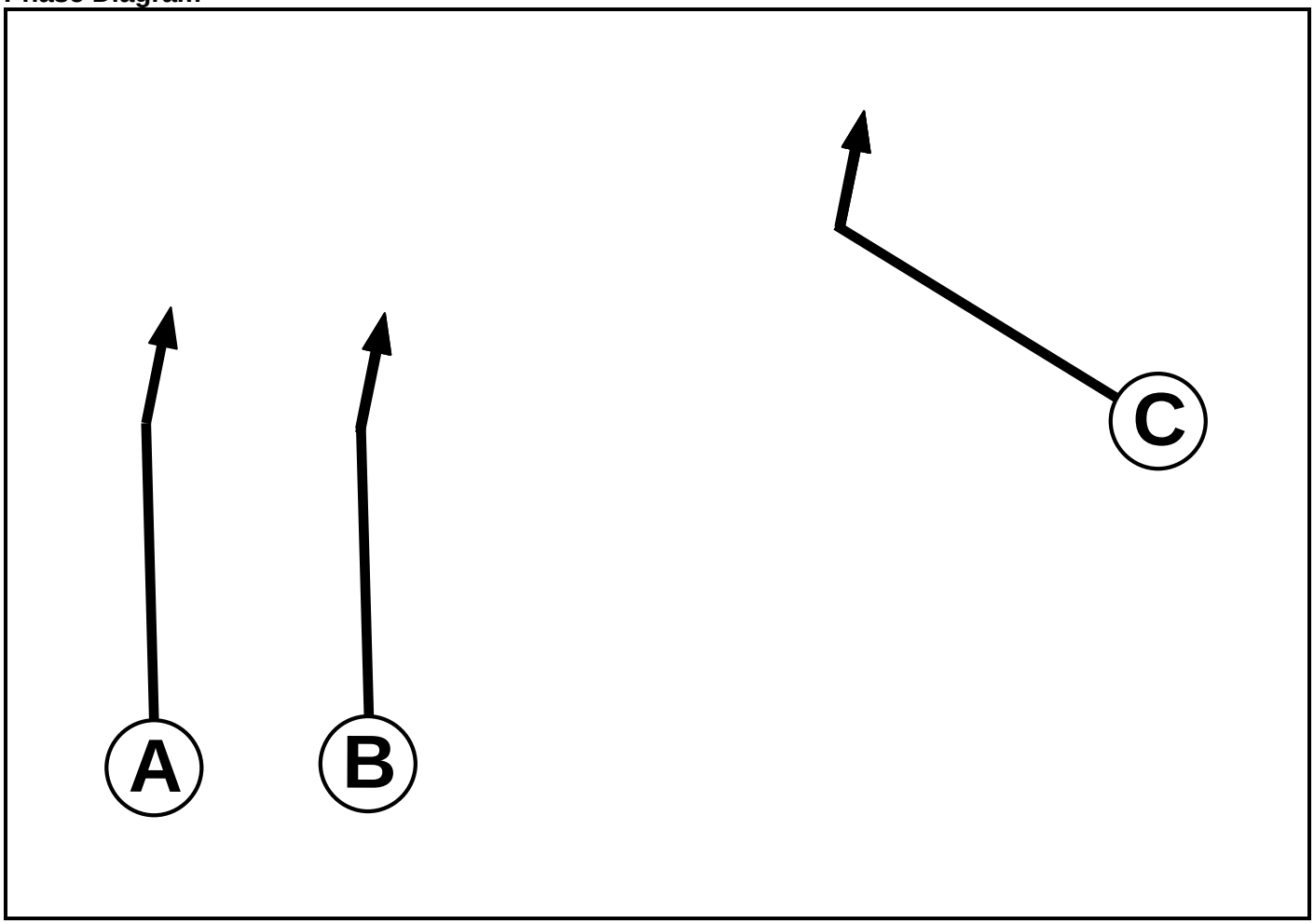
Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	C	Losing	6	6

Prohibited Stage Change

From Stage	To Stage			
		1	2	3
1			11	5
2	5			5
3	5	5		

C2 - 08-1079

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7

Phase Intergreens Matrix

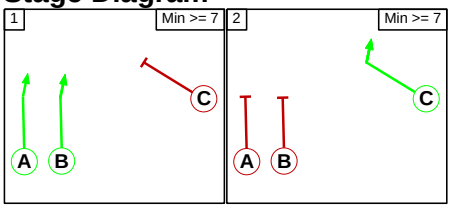
		Starting Phase		
		A	B	C
Terminating Phase	A		-	5
	B	-		5
	C	5	5	

Phases in Stage

Stage No.	Phases in Stage
1	A B
2	C

Full Input Data And Results

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

	To Stage		
		1	2
From Stage	1		5
	2	5	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Junction 21B											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
3/1 (Sandwich Road entry)	9/2 (Ahead)	390	0	12/2	0.12	All	-	-	-	-	-
				12/1	0.12	To 2/1 (Ahead)					
				12/3	0.12	All					

Full Input Data And Results

Lane Input Data

Junction: Junction 21B												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Hengist Way south entry)	U	A	2	3	60.0	Geom	-	3.70	0.00	Y	Arm 10 Ahead	Inf
1/2 (Hengist Way south entry)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 10 Ahead	Inf
1/3 (Hengist Way south entry)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 10 Ahead	Inf
2/1 (Hengist Way south exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
2/2 (Hengist Way south exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1 (Sandwich Road entry)	O		2	3	60.0	Geom	-	3.50	0.00	Y	Arm 9 Ahead	50.00
4/1 (Sandwich Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (A 256 Canterburry Road Entry)	U	A	2	3	14.0	Geom	-	4.00	0.00	Y	Arm 8 Left	153.00
											Arm 11 Ahead	30.00
5/2 (A 256 Canterburry Road Entry)	U	A	2	3	14.0	Geom	-	4.00	0.00	Y	Arm 11 Ahead	30.00
6/1 (A256 Canterburry Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (Canterbury Road Entry)	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 12 Left	20.00
7/2 (Canterbury Road Entry)	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 12 Left	20.00
8/1 (Canterbury Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
8/2 (Canterbury Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
9/1 (Circulatory 1)	U	C	2	3	5.0	Geom	-	3.40	0.00	Y	Arm 10 Right	17.00
9/2 (Circulatory 1)	U	C	2	3	60.0	Geom	-	3.40	0.00	Y	Arm 10 Right	14.00
10/1 (Circulatory 2)	U		2	3	60.0	Inf	-	-	-	-	-	-

10/2 (Circlulatory 2)	U	D	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Ahead	50.00
10/3 (Circlulatory 2)	U	D	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Ahead	50.00
											Arm 11 Right	12.00
11/1 (Circlulatory 3)	U	C	2	3	60.0	Geom	-	4.25	0.00	Y	Arm 12 Right	Inf
11/2 (Circlulatory 3)	U	C	2	3	60.0	Geom	-	4.25	0.00	Y	Arm 12 Right	Inf
12/1 (Circlulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-
12/2 (Circlulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-
12/3 (Circlulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039+Dev(Link+Sig) - AM Peak'	07:45	08:45	01:00	
2: '2039+Dev(Link+Sig) - PM Peak'	16:45	17:45	01:00	

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039+Dev(Link+Sig) - AM Peak', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	18	1090	457	1565
	B	61	0	15	67	143
	C	732	4	0	631	1367
	D	384	16	753	0	1153
	Tot.	1177	38	1858	1155	4228

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2039 Baseline Traffic - AM Peak
Junction: Junction 21B	
1/1	631
1/2	344
1/3	392
2/1	956
2/2	902
3/1	143
4/1	38
5/1	591
5/2	562
6/1	1155
7/1	783
7/2	782
8/1	778
8/2	399
9/1 (short)	574
9/2 (with short)	600(In) 26(Out)
10/1	1155
10/2	394
10/3	418
11/1	211
11/2	577
12/1	994
12/2	902
12/3	457

Full Input Data And Results

Lane Saturation Flows

Junction: Junction 21B								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Hengist Way south entry)	3.70	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1985	1985
1/2 (Hengist Way south entry)	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
1/3 (Hengist Way south entry)	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
2/1 (Hengist Way south exit Lane 1)	Infinite Saturation Flow						Inf	Inf
2/2 (Hengist Way south exit Lane 2)	Infinite Saturation Flow						Inf	Inf
3/1 (Sandwich Road entry)	3.50	0.00	Y	Arm 9 Ahead	50.00	100.0 %	1908	1908
4/1 (Sandwich Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (A 256 Canterburry Road Entry)	4.00	0.00	Y	Arm 8 Left Arm 11 Ahead	153.00 30.00	65.0 % 35.0 %	1968	1968
5/2 (A 256 Canterburry Road Entry)	4.00	0.00	Y	Arm 11 Ahead	30.00	100.0 %	1919	1919
6/1 (A256 Canterburry Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Canterbury Road Entry)	3.50	0.00	Y	Arm 12 Left	20.00	100.0 %	1828	1828
7/2 (Canterbury Road Entry)	3.50	0.00	Y	Arm 12 Left	20.00	100.0 %	1828	1828
8/1 (Canterbury Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/2 (Canterbury Road exit Lane 2)	Infinite Saturation Flow						Inf	Inf
9/1 (Circlulatory 1)	3.40	0.00	Y	Arm 10 Right	17.00	100.0 %	1796	1796
9/2 (Circlulatory 1)	3.40	0.00	Y	Arm 10 Right	14.00	100.0 %	1766	1766
10/1 (Circlulatory 2 Lane 1)	Infinite Saturation Flow						Inf	Inf
10/2 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Ahead	50.00	100.0 %	1922	1922
10/3 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Ahead Arm 11 Right	50.00 12.00	95.5 % 4.5 %	1914	1914
11/1 (Circlulatory 3)	4.25	0.00	Y	Arm 12 Right	Inf	100.0 %	2040	2040
11/2 (Circlulatory 3)	4.25	0.00	Y	Arm 12 Right	Inf	100.0 %	2040	2040
12/1 (Circlulatory 4 Lane 1)	Infinite Saturation Flow						Inf	Inf

12/2 (Circlulatory 4 Lane 2)	Infinite Saturation Flow	Inf	Inf
12/3 (Circlulatory 4 Lane 3)	Infinite Saturation Flow	Inf	Inf

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039+Dev(Link+Sig) - PM Peak', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	16	737	285	1038
	B	85	0	4	87	176
	C	1049	8	0	832	1889
	D	337	35	759	0	1131
	Tot.	1471	59	1500	1204	4234

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2039 Baseline Traffic - PM Peak
Junction: Junction 21B	
1/1	832
1/2	544
1/3	513
2/1	718
2/2	782
3/1	176
4/1	59
5/1	587
5/2	544
6/1	1204
7/1	519
7/2	519
8/1	915
8/2	556
9/1 (short)	406
9/2 (with short)	461(In) 55(Out)
10/1	1204
10/2	578
10/3	568
11/1	258
11/2	548
12/1	777
12/2	782
12/3	285

Full Input Data And Results

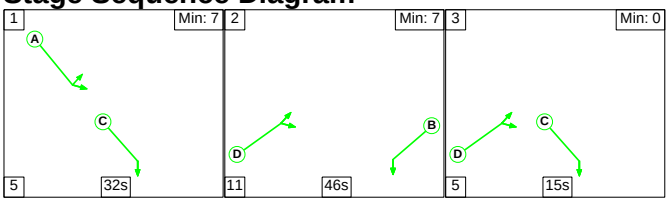
Lane Saturation Flows

Junction: Junction 21B								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Hengist Way south entry)	3.70	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1985	1985
1/2 (Hengist Way south entry)	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
1/3 (Hengist Way south entry)	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
2/1 (Hengist Way south exit Lane 1)	Infinite Saturation Flow						Inf	Inf
2/2 (Hengist Way south exit Lane 2)	Infinite Saturation Flow						Inf	Inf
3/1 (Sandwich Road entry)	3.50	0.00	Y	Arm 9 Ahead	50.00	100.0 %	1908	1908
4/1 (Sandwich Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (A 256 Canterburry Road Entry)	4.00	0.00	Y	Arm 8 Left Arm 11 Ahead	153.00 30.00	57.4 % 42.6 %	1962	1962
5/2 (A 256 Canterburry Road Entry)	4.00	0.00	Y	Arm 11 Ahead	30.00	100.0 %	1919	1919
6/1 (A256 Canterburry Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Canterbury Road Entry)	3.50	0.00	Y	Arm 12 Left	20.00	100.0 %	1828	1828
7/2 (Canterbury Road Entry)	3.50	0.00	Y	Arm 12 Left	20.00	100.0 %	1828	1828
8/1 (Canterbury Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/2 (Canterbury Road exit Lane 2)	Infinite Saturation Flow						Inf	Inf
9/1 (Circlulatory 1)	3.40	0.00	Y	Arm 10 Right	17.00	100.0 %	1796	1796
9/2 (Circlulatory 1)	3.40	0.00	Y	Arm 10 Right	14.00	100.0 %	1766	1766
10/1 (Circlulatory 2 Lane 1)	Infinite Saturation Flow						Inf	Inf
10/2 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Ahead	50.00	100.0 %	1922	1922
10/3 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Ahead Arm 11 Right	50.00 12.00	97.9 % 2.1 %	1919	1919
11/1 (Circlulatory 3)	4.25	0.00	Y	Arm 12 Right	Inf	100.0 %	2040	2040
11/2 (Circlulatory 3)	4.25	0.00	Y	Arm 12 Right	Inf	100.0 %	2040	2040
12/1 (Circlulatory 4 Lane 1)	Infinite Saturation Flow						Inf	Inf

12/2 (Circulatory 4 Lane 2)	Infinite Saturation Flow	Inf	Inf
12/3 (Circulatory 4 Lane 3)	Infinite Saturation Flow	Inf	Inf

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039+Dev(Link+Sig) - AM Peak', Plan 1: 'Base')
C1 - 08-1078

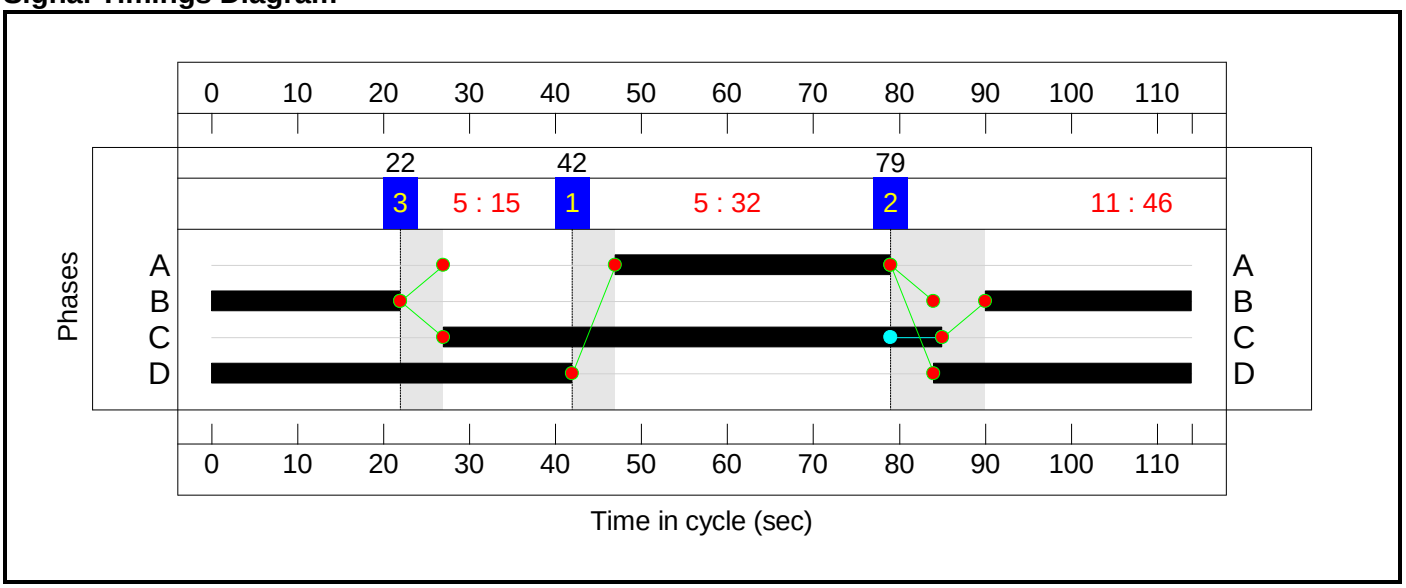
Stage Sequence Diagram



Stage Timings

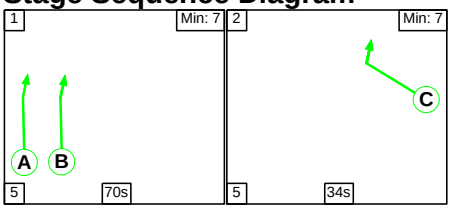
Stage	1	2	3
Duration	32	46	15
Change Point	42	79	22

Signal Timings Diagram



C2 - 08-1079

Stage Sequence Diagram

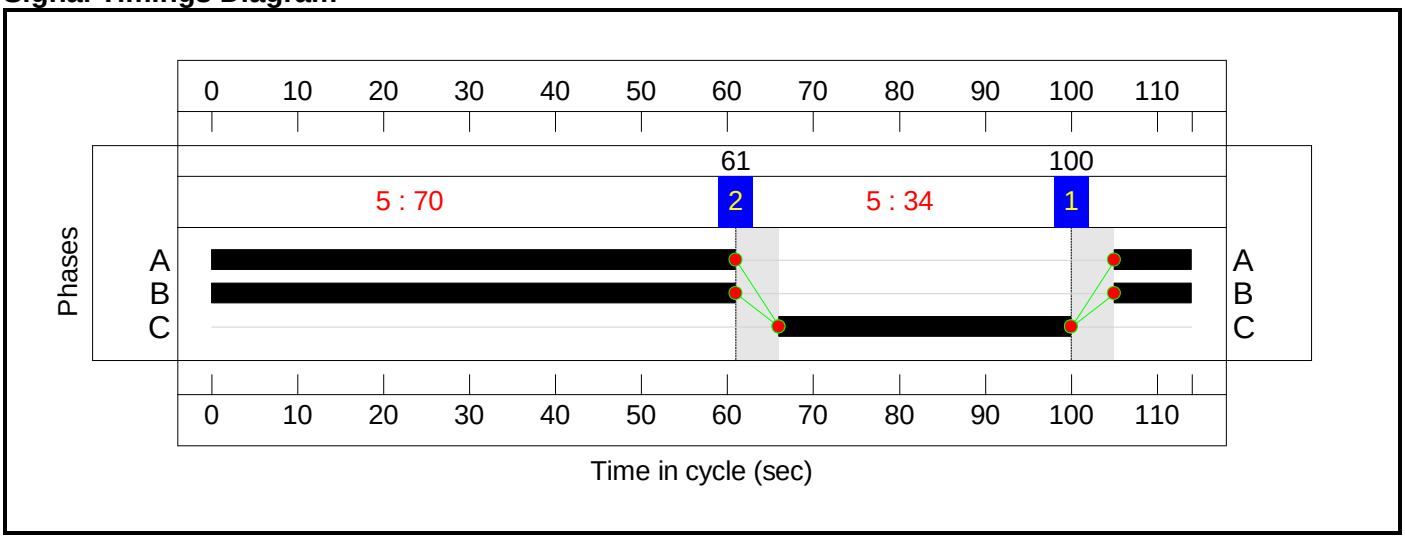


Stage Timings

Stage	1	2
Duration	70	34
Change Point	100	61

Full Input Data And Results

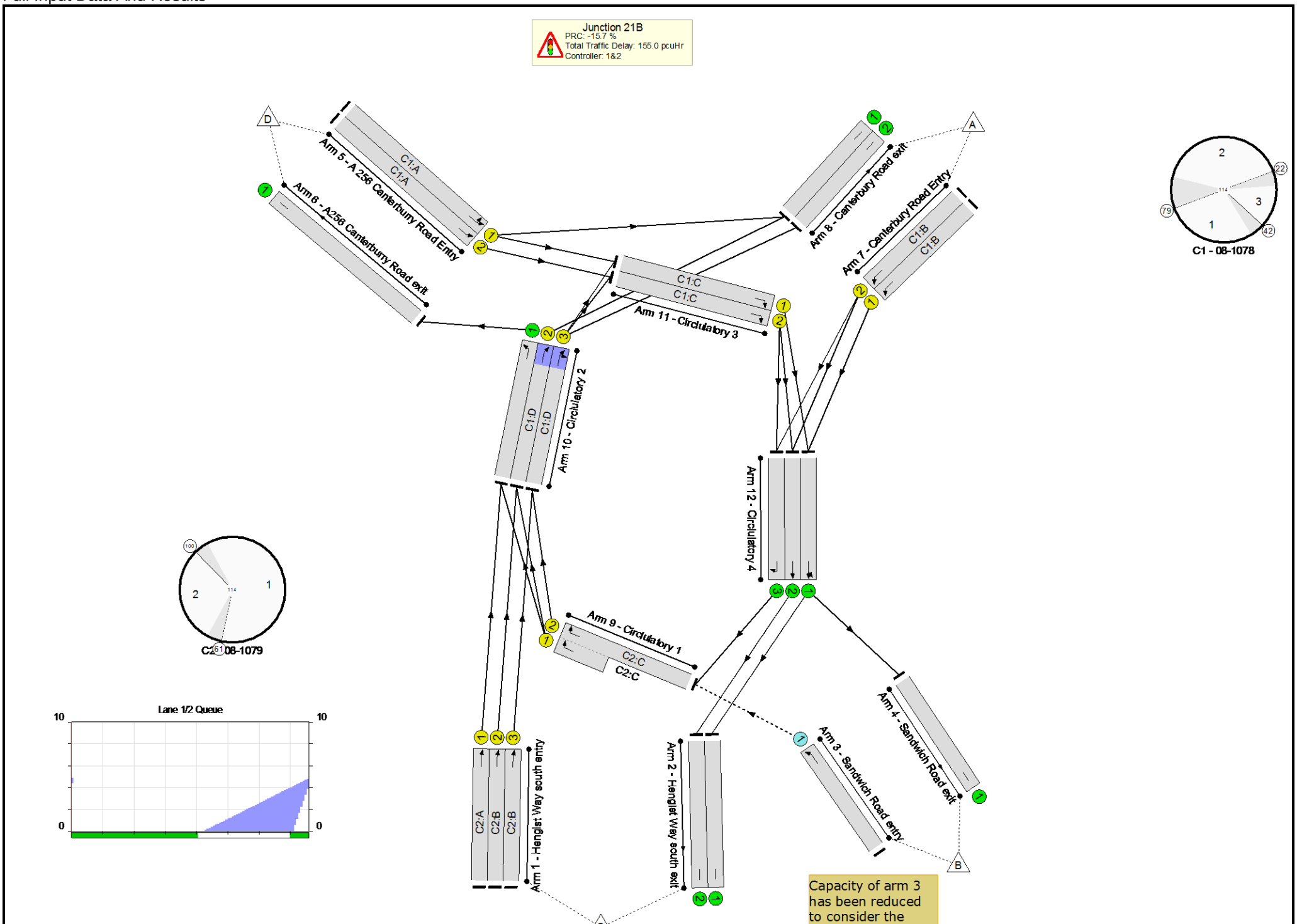
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Full Input Data And Results

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 21b	-	-	**N/A**	-	-		-	-	-	-	-	-	**104.2%**
Junction 21B	-	-	**N/A**	-	-		-	-	-	-	-	-	**104.2%**
1/1	Hengist Way south entry Ahead	U	N/A	N/A	C2:A		1	70	-	631	1985	1236	51.0%
1/2	Hengist Way south entry Ahead	U	N/A	N/A	C2:B		1	70	-	344	1980	1233	27.9%
1/3	Hengist Way south entry Ahead	U	N/A	N/A	C2:B		1	70	-	392	1980	1233	31.8%
2/1	Hengist Way south exit	U	N/A	N/A	-		-	-	-	956	Inf	Inf	0.0%
2/2	Hengist Way south exit	U	N/A	N/A	-		-	-	-	902	Inf	Inf	0.0%
3/1	Sandwich Road entry Ahead	O	N/A	N/A	-		-	-	-	143	1908	137	104.2%
4/1	Sandwich Road exit	U	N/A	N/A	-		-	-	-	38	Inf	Inf	0.0%
5/1	A 256 Canterburry Road Entry Left Ahead	U	N/A	N/A	C1:A		1	32	-	591	1968	570	103.7%
5/2	A 256 Canterburry Road Entry Ahead	U	N/A	N/A	C1:A		1	32	-	562	1919	556	101.2%
6/1	A256 Canterburry Road exit	U	N/A	N/A	-		-	-	-	1155	Inf	Inf	0.0%
7/1	Canterbury Road Entry Left	U	N/A	N/A	C1:B		1	46	-	783	1828	754	103.9%
7/2	Canterbury Road Entry Left	U	N/A	N/A	C1:B		1	46	-	782	1828	754	103.8%
8/1	Canterbury Road exit	U	N/A	N/A	-		-	-	-	778	Inf	Inf	0.0%

Full Input Data And Results

8/2	Canterbury Road exit	U	N/A	N/A	-		-	-	-	399	Inf	Inf	0.0%
9/2+9/1	Circulatory 1 Right	U	N/A	N/A	C2:C		1	34	-	600	1766:1796	24+534	103.1 : 103.4%
10/1	Circulatory 2 Left	U	N/A	N/A	-		-	-	-	1155	Inf	Inf	0.0%
10/2	Circulatory 2 Ahead	U	N/A	N/A	C1:D		1	72	-	394	1922	1231	31.2%
10/3	Circulatory 2 Ahead Right	U	N/A	N/A	C1:D		1	72	-	418	1914	1226	33.7%
11/1	Circulatory 3 Right	U	N/A	N/A	C1:C		1	58	-	211	2040	1056	19.3%
11/2	Circulatory 3 Right	U	N/A	N/A	C1:C		1	58	-	577	2040	1056	53.7%
12/1	Circulatory 4 Ahead Ahead2	U	N/A	N/A	-		-	-	-	994	Inf	Inf	0.0%
12/2	Circulatory 4 Ahead	U	N/A	N/A	-		-	-	-	902	Inf	Inf	0.0%
12/3	Circulatory 4 Right	U	N/A	N/A	-		-	-	-	457	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 21b	**-**	**-**	**137**	**0**	**0**	**49.5**	**105.5**	**0.0**	**155.0**	**-**	**-**	**-**	**-**
Junction 21B	**-**	**-**	**137**	**0**	**0**	**49.5**	**105.5**	**0.0**	**155.0**	**-**	**-**	**-**	**-**
1/1	631	631	-	-	-	2.1	0.5	-	2.6	14.9	11.0	0.5	11.6
1/2	344	344	-	-	-	0.9	0.2	-	1.1	11.8	5.0	0.2	5.2
1/3	392	392	-	-	-	1.1	0.2	-	1.3	12.3	5.8	0.2	6.0
2/1	920	920	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	881	881	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	143	137	137	0	0	1.0	7.6	-	8.6	215.9	11.2	7.6	18.8
4/1	37	37	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	591	570	-	-	-	7.6	18.6	-	26.2	159.7	19.4	18.6	38.0
5/2	562	556	-	-	-	6.6	13.6	-	20.2	129.4	18.0	13.6	31.6
6/1	1124	1124	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	783	754	-	-	-	9.1	23.1	-	32.3	148.4	25.7	23.1	48.9
7/2	782	754	-	-	-	9.1	22.8	-	31.8	146.5	25.7	22.8	48.4
8/1	754	754	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	397	397	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2+9/1	578	553	-	-	-	10.4	17.7	-	28.1	175.4	20.5	17.7	38.2
10/1	1124	1124	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/2	384	384	-	-	-	0.6	0.2	-	0.9	8.2	2.4	0.2	2.7
10/3	413	413	-	-	-	0.7	0.3	-	1.0	8.6	2.7	0.3	3.0
11/1	204	204	-	-	-	0.0	0.1	-	0.1	2.6	0.1	0.1	0.2
11/2	567	567	-	-	-	0.1	0.6	-	0.7	4.5	0.4	0.6	1.0
12/1	957	957	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	881	881	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/3	440	440	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

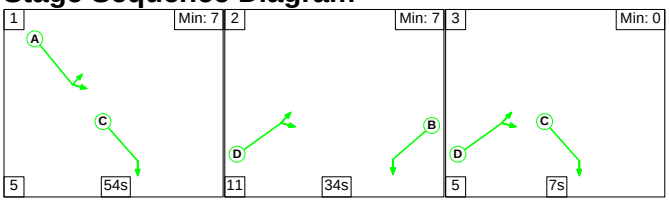
C1 - 08-1078	PRC for Signalled Lanes (%):	-15.4	Total Delay for Signalled Lanes (pcuHr):	113.24	Cycle Time (s):	114
C2 - 08-1079	PRC for Signalled Lanes (%):	-14.9	Total Delay for Signalled Lanes (pcuHr):	33.21	Cycle Time (s):	114
	PRC Over All Lanes (%):	-15.7	Total Delay Over All Lanes(pcuHr):	155.02		

Full Input Data And Results

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039+Dev(Link+Sig) - PM Peak', Plan 1: 'Base')

C1 - 08-1078

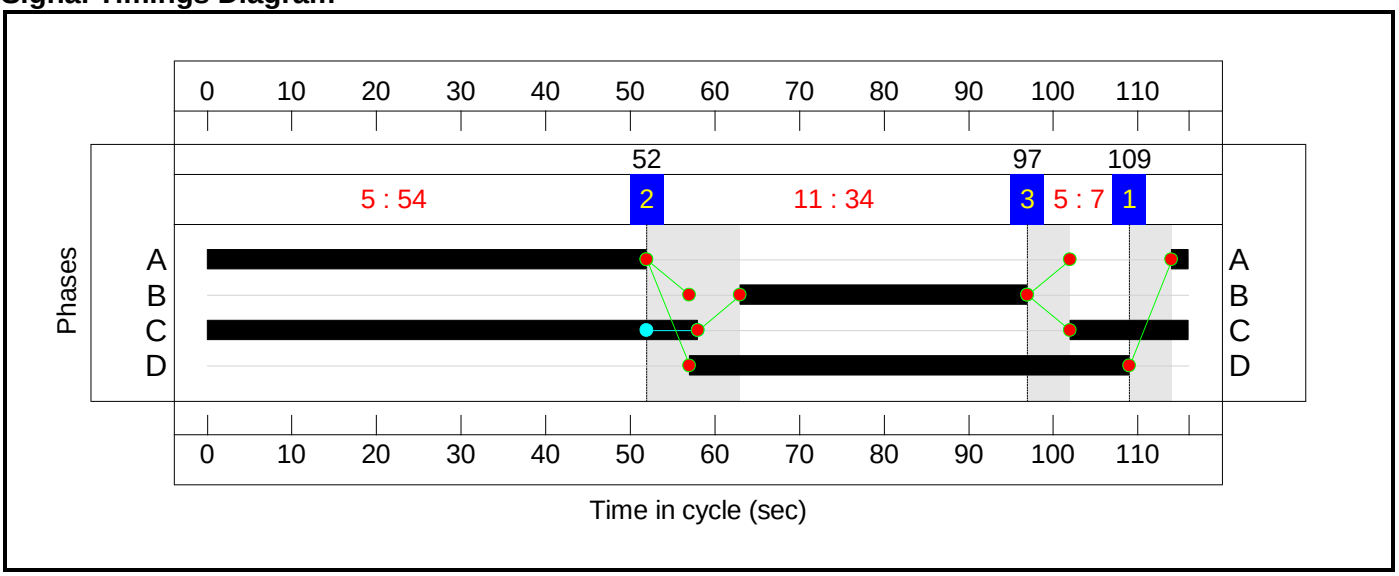
Stage Sequence Diagram



Stage Timings

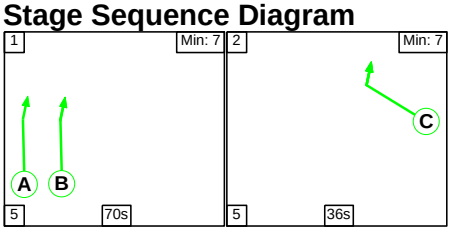
Stage	1	2	3
Duration	54	34	7
Change Point	109	52	97

Signal Timings Diagram



C2 - 08-1079

Stage Sequence Diagram

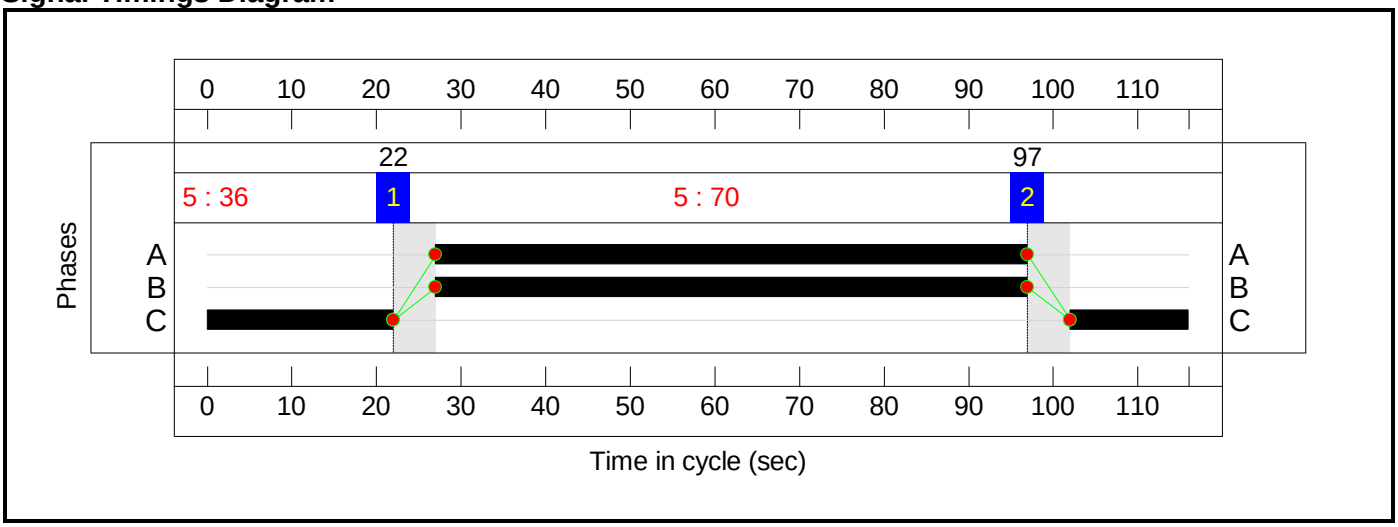


Stage Timings

Stage	1	2
Duration	70	36
Change Point	22	97

Full Input Data And Results

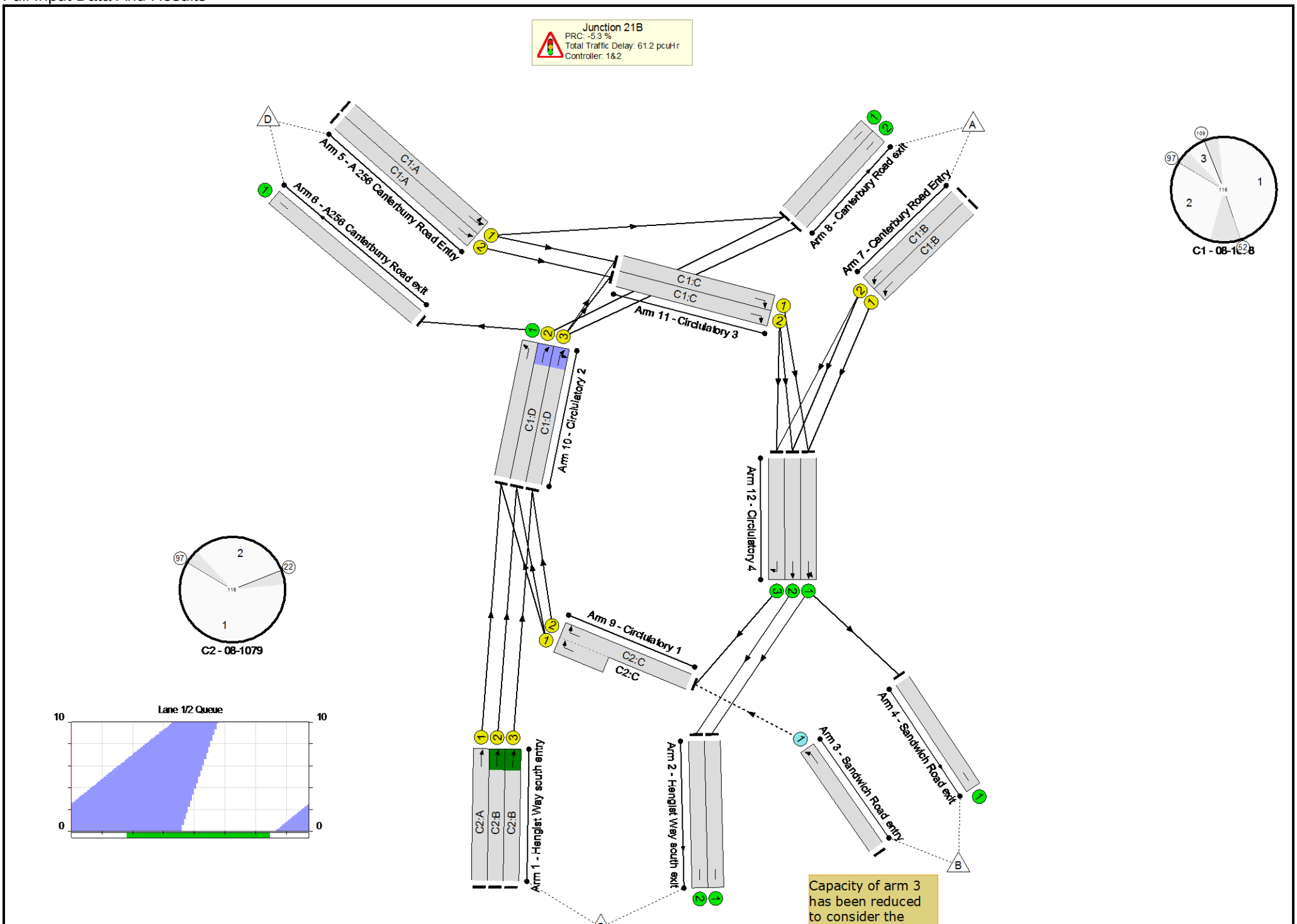
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Full Input Data And Results

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 21b	-	-	**N/A**	-	-		-	-	-	-	-	-	**94.8%**
Junction 21B	-	-	**N/A**	-	-		-	-	-	-	-	-	**94.8%**
1/1	Hengist Way south entry Ahead	U	N/A	N/A	C2:A		1	70	-	832	1985	1215	68.5%
1/2	Hengist Way south entry Ahead	U	N/A	N/A	C2:B		1	70	-	544	1980	785	69.3%
1/3	Hengist Way south entry Ahead	U	N/A	N/A	C2:B		1	70	-	513	1980	785	65.3%
2/1	Hengist Way south exit	U	N/A	N/A	-		-	-	-	718	Inf	Inf	0.0%
2/2	Hengist Way south exit	U	N/A	N/A	-		-	-	-	782	Inf	Inf	0.0%
3/1	Sandwich Road entry Ahead	O	N/A	N/A	-		-	-	-	176	1908	186	94.8%
4/1	Sandwich Road exit	U	N/A	N/A	-		-	-	-	59	Inf	Inf	0.0%
5/1	A 256 Canterburry Road Entry Left Ahead	U	N/A	N/A	C1:A		1	54	-	587	1962	930	63.1%
5/2	A 256 Canterburry Road Entry Ahead	U	N/A	N/A	C1:A		1	54	-	544	1919	910	59.8%
6/1	A256 Canterburry Road exit	U	N/A	N/A	-		-	-	-	1204	Inf	Inf	0.0%
7/1	Canterbury Road Entry Left	U	N/A	N/A	C1:B		1	34	-	519	1828	552	94.1%
7/2	Canterbury Road Entry Left	U	N/A	N/A	C1:B		1	34	-	519	1828	552	94.1%
8/1	Canterbury Road exit	U	N/A	N/A	-		-	-	-	915	Inf	Inf	0.0%
8/2	Canterbury Road exit	U	N/A	N/A	-		-	-	-	556	Inf	Inf	0.0%

Full Input Data And Results

9/2+9/1	Circulatory 1 Right	U	N/A	N/A	C2:C		1	36	-	461	1766:1796	71+523	77.7 : 77.7%
10/1	Circulatory 2 Left	U	N/A	N/A	-		-	-	-	1204	Inf	Inf	0.0%
10/2	Circulatory 2 Ahead	U	N/A	N/A	C1:D		1	52	-	578	1922	878	65.8%
10/3	Circulatory 2 Ahead Right	U	N/A	N/A	C1:D		1	52	-	568	1919	877	64.8%
11/1	Circulatory 3 Right	U	N/A	N/A	C1:C		1	72	-	258	2040	1284	20.1%
11/2	Circulatory 3 Right	U	N/A	N/A	C1:C		1	72	-	548	2040	1284	42.7%
12/1	Circulatory 4 Ahead Ahead2	U	N/A	N/A	-		-	-	-	777	Inf	Inf	0.0%
12/2	Circulatory 4 Ahead	U	N/A	N/A	-		-	-	-	782	Inf	Inf	0.0%
12/3	Circulatory 4 Right	U	N/A	N/A	-		-	-	-	285	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 21b	**-**	**-**	**176**	**0**	**0**	**36.0**	**25.2**	**0.0**	**61.2**	**-**	**-**	**-**	**-**
Junction 21B	**-**	**-**	**176**	**0**	**0**	**36.0**	**25.2**	**0.0**	**61.2**	**-**	**-**	**-**	**-**
1/1	832	832	-	-	-	3.5	1.1	-	4.6	19.7	17.8	1.1	18.9
1/2	544	544	-	-	-	4.4	1.1	-	5.5	36.5	14.5	1.1	15.6
1/3	513	513	-	-	-	4.1	0.9	-	5.0	35.1	13.4	0.9	14.3
2/1	718	718	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	782	782	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	176	176	176	0	0	0.7	4.6	-	5.4	109.5	5.3	4.6	10.0
4/1	59	59	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	587	587	-	-	-	3.7	0.9	-	4.6	28.1	14.2	0.9	15.0
5/2	544	544	-	-	-	3.4	0.7	-	4.1	27.3	12.8	0.7	13.6
6/1	1204	1204	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	519	519	-	-	-	5.7	5.9	-	11.6	80.1	16.3	5.9	22.2
7/2	519	519	-	-	-	5.7	5.9	-	11.6	80.1	16.3	5.9	22.2
8/1	915	915	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	556	556	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2+9/1	461	461	-	-	-	3.8	1.7	-	5.5	42.7	13.6	1.7	15.3
10/1	1204	1204	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/2	578	578	-	-	-	0.5	1.0	-	1.4	8.9	15.5	1.0	16.5
10/3	568	568	-	-	-	0.6	0.9	-	1.5	9.4	14.6	0.9	15.5
11/1	258	258	-	-	-	0.1	0.1	-	0.2	2.5	0.3	0.1	0.4
11/2	548	548	-	-	-	0.0	0.4	-	0.4	2.6	0.1	0.4	0.4
12/1	777	777	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	782	782	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/3	285	285	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

C1 - 08-1078	PRC for Signalled Lanes (%):	-4.6	Total Delay for Signalled Lanes (pcuHr):	35.30	Cycle Time (s):	116
C2 - 08-1079	PRC for Signalled Lanes (%):	15.8	Total Delay for Signalled Lanes (pcuHr):	20.54	Cycle Time (s):	116
	PRC Over All Lanes (%):	-5.3	Total Delay Over All Lanes(pcuHr):	61.19		

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 26_R1_AM validated_Strateic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 26_Manston Rd_B2014\Strategic Model Scenario
Report generation date: 19/03/2019 12:39:25

«2039+Dev(Link+Sig), AM
- »Junction Network
- »Arms
- »Traffic Demand
- »Origin-Destination Data
- »Vehicle Mix
- »Results

Summary of junction performance

	AM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev(Link+Sig)				
1 - Newington Road north	4.1	0.50	0.82	D	5.91
2 - Newington Road south	5.3	0.40	0.85	C	
3 - Manston Road	151.3	15.94	1.46	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

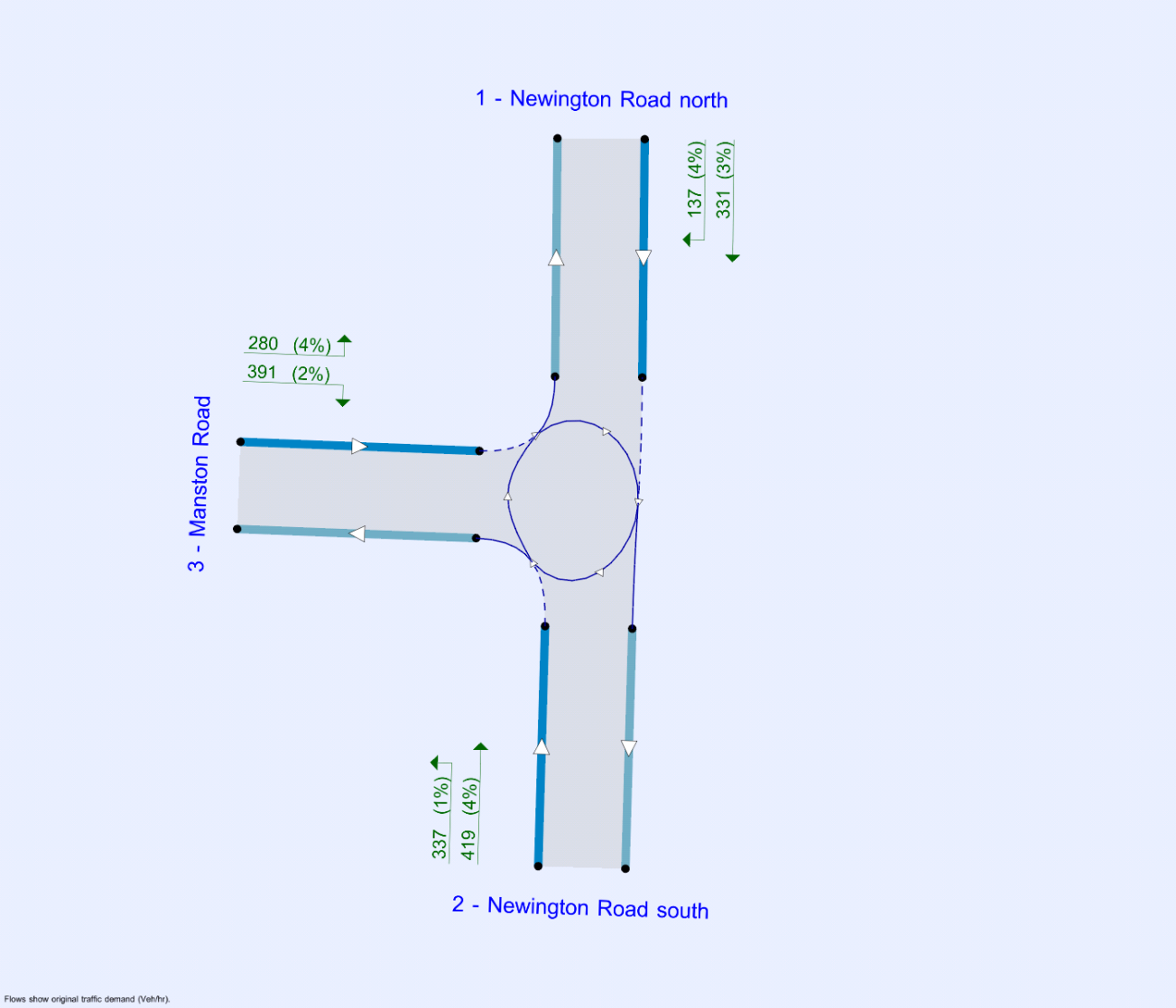
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	05/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev(Link+Sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1		Mini-roundabout		1, 2, 3	5.91	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Newington Road north	
2	Newington Road south	
3	Manston Road	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Newington Road north	4.15	4.15	4.15	0.0	19.30	19.30	0.0	
2 - Newington Road south	3.96	3.24	6.13	14.7	15.49	12.00	0.0	
3 - Manston Road	2.79	2.47	5.40	4.7	14.19	9.14	0.0	✓

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Newington Road north	0.848	1264
2 - Newington Road south	0.672	1114
3 - Manston Road	0.498	762

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Newington Road north	Percentage		65.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev(Link+Sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Newington Road north		ONE HOUR	✓	469	100.000
2 - Newington Road south		ONE HOUR	✓	759	100.000
3 - Manston Road		ONE HOUR	✓	671	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Newington Road north	2 - Newington Road south	3 - Manston Road
From	1 - Newington Road north	1	331	137
	2 - Newington Road south	419	3	337
	3 - Manston Road	280	391	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Newington Road north	2 - Newington Road south	3 - Manston Road
From	1 - Newington Road north	0	3	4
	2 - Newington Road south	4	0	1
	3 - Manston Road	4	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	0.82	0.50	4.1	D	430	646
2 - Newington Road south	0.85	0.40	5.3	C	696	1045
3 - Manston Road	1.46	15.94	151.3	F	616	924

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	353	88	285	640	0.551	348	516	0.0	1.2	0.202	B
2 - Newington Road south	571	143	102	1015	0.563	566	531	0.0	1.3	0.132	A
3 - Manston Road	505	126	316	582	0.867	485	353	0.0	5.0	0.540	D

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	422	105	315	624	0.676	418	599	1.2	2.0	0.287	C
2 - Newington Road south	682	171	123	1001	0.681	679	610	1.3	2.1	0.184	B
3 - Manston Road	603	151	378	551	1.095	536	424	5.0	21.8	1.833	F

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	516	129	300	632	0.817	509	669	2.0	3.9	0.459	D
2 - Newington Road south	836	209	150	983	0.850	824	659	2.1	4.9	0.354	C
3 - Manston Road	739	185	459	510	1.448	509	515	21.8	79.2	6.200	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	516	129	299	633	0.816	515	673	3.9	4.1	0.501	D
2 - Newington Road south	836	209	152	982	0.851	834	663	4.9	5.3	0.397	C
3 - Manston Road	739	185	465	507	1.456	507	521	79.2	137.1	12.535	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	422	105	321	621	0.679	429	612	4.1	2.2	0.324	C
2 - Newington Road south	682	171	126	999	0.683	694	624	5.3	2.2	0.204	B
3 - Manston Road	603	151	387	546	1.104	546	434	137.1	151.3	15.936	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	353	88	338	611	0.577	356	559	2.2	1.4	0.238	B
2 - Newington Road south	571	143	105	1014	0.564	575	590	2.2	1.3	0.138	A
3 - Manston Road	505	126	321	580	0.871	576	359	151.3	133.6	14.848	F

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 26_R1_PM_validated_Strategic Model.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 26_Manston Rd_B2014\Strategic Model Scenario
Report generation date: 19/03/2019 12:46:26

«2039+Dev(Link+Sig), PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev(Link+Sig)				
1 - Newington Road north	125.3	19.87	1.42	F	9.74
2 - Newington Road south	1.8	0.17	0.64	B	
3 - Manston Road	106.5	10.23	1.30	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

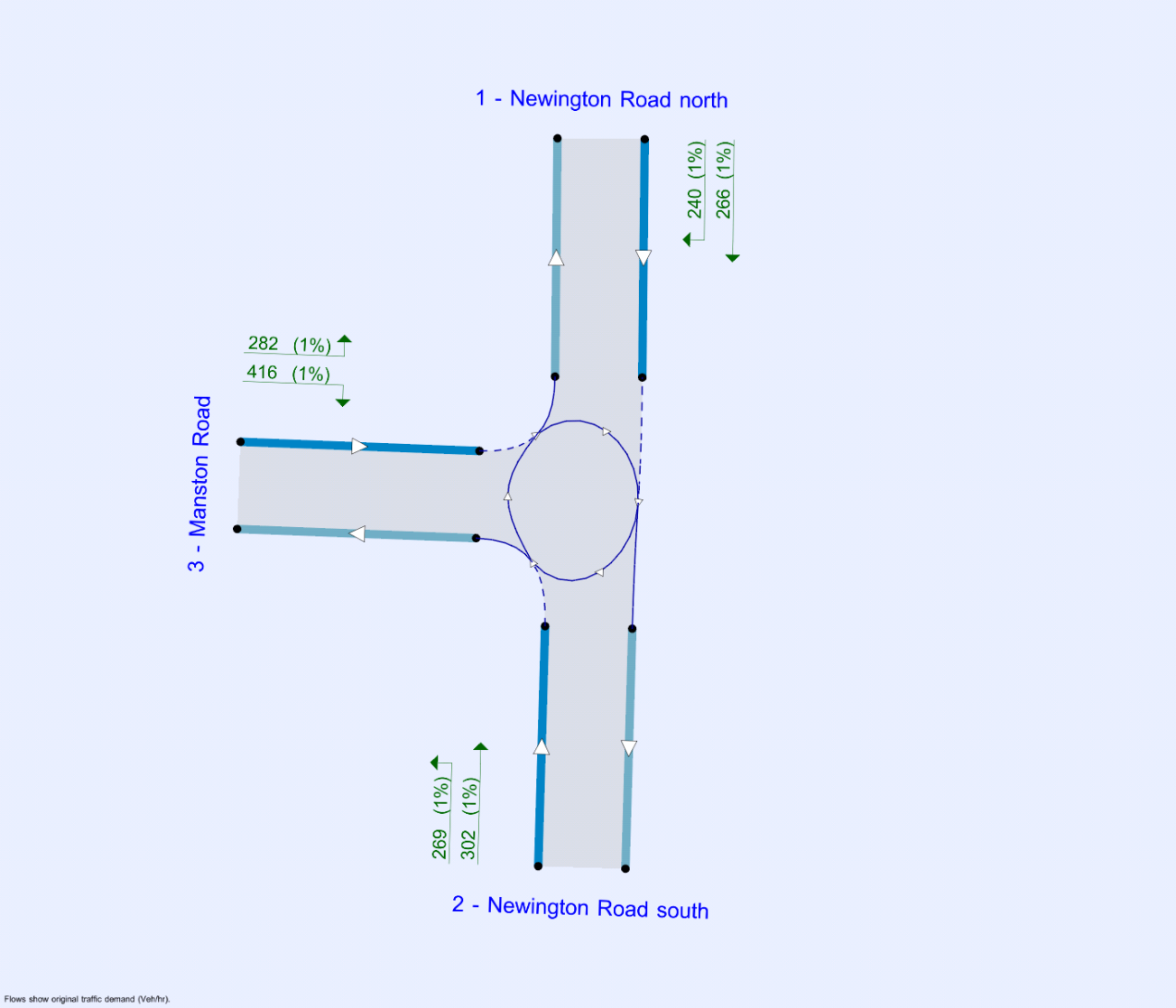
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	05/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev(Link+Sig), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1		Mini-roundabout		1, 2, 3	9.74	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Newington Road north	
2	Newington Road south	
3	Manston Road	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Newington Road north	4.15	4.15	4.15	0.0	19.30	19.30	0.0	
2 - Newington Road south	3.96	3.24	6.13	14.7	15.49	12.00	0.0	
3 - Manston Road	2.79	2.47	5.40	4.7	14.19	9.14	0.0	✓

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Newington Road north	0.848	1264
2 - Newington Road south	0.672	1114
3 - Manston Road	0.498	762

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Newington Road north	Percentage		41.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev(Link+Sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Newington Road north		ONE HOUR	✓	506	100.000
2 - Newington Road south		ONE HOUR	✓	571	100.000
3 - Manston Road		ONE HOUR	✓	698	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Newington Road north	2 - Newington Road south	3 - Manston Road
From	1 - Newington Road north	0	266	240
	2 - Newington Road south	302	0	269
	3 - Manston Road	282	416	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Newington Road north	2 - Newington Road south	3 - Manston Road
From	1 - Newington Road north	0	1	1
	2 - Newington Road south	1	0	1
	3 - Manston Road	1	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	1.42	19.87	125.3	F	464	696
2 - Newington Road south	0.64	0.17	1.8	B	524	786
3 - Manston Road	1.30	10.23	106.5	F	640	961

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	381	95	304	407	0.935	354	432	0.0	6.7	0.895	F
2 - Newington Road south	430	107	168	990	0.434	427	490	0.0	0.8	0.106	A
3 - Manston Road	525	131	226	642	0.818	510	369	0.0	3.9	0.416	C

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	455	114	350	391	1.163	384	508	6.7	24.4	2.805	F
2 - Newington Road south	513	128	182	981	0.524	512	552	0.8	1.1	0.128	A
3 - Manston Road	627	157	271	620	1.012	588	423	3.9	13.8	1.182	F

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	557	139	350	391	1.424	391	569	24.4	66.0	7.227	F
2 - Newington Road south	629	157	185	978	0.643	626	556	1.1	1.7	0.169	B
3 - Manston Road	769	192	331	590	1.303	588	480	13.8	59.0	3.970	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	557	139	351	391	1.425	391	570	66.0	107.5	13.647	F
2 - Newington Road south	629	157	185	978	0.643	629	556	1.7	1.8	0.171	B
3 - Manston Road	769	192	332	589	1.304	589	482	59.0	103.9	8.343	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	455	114	368	385	1.181	385	522	107.5	125.0	18.360	F
2 - Newington Road south	513	128	183	980	0.524	516	570	1.8	1.1	0.130	A
3 - Manston Road	627	157	273	619	1.014	617	426	103.9	106.5	10.226	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	381	95	379	381	0.999	380	485	125.0	125.3	19.868	F
2 - Newington Road south	430	107	180	982	0.438	431	578	1.1	0.8	0.109	A
3 - Manston Road	525	131	228	641	0.820	635	383	106.5	79.1	8.791	F

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Appendix I (part 3)
2039 Base and 2039 Base + Development Junction Model Outputs

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.2.5947
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Filename: Jct 27_R1_AM_validated_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18 \2039+(Dev+Signals) models\Validated\Jct 27_B2014_A255\Strategic Model Scenario
Report generation date: 10/01/2019 15:31:54

«2039+Dev (link+sig), AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev (link+sig)				
1 - Newington Road north	52.4	3.78	1.13	F	3.34
2 - High Street east	71.9	3.96	1.12	F	
3 - High Street south	20.4	1.82	1.02	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

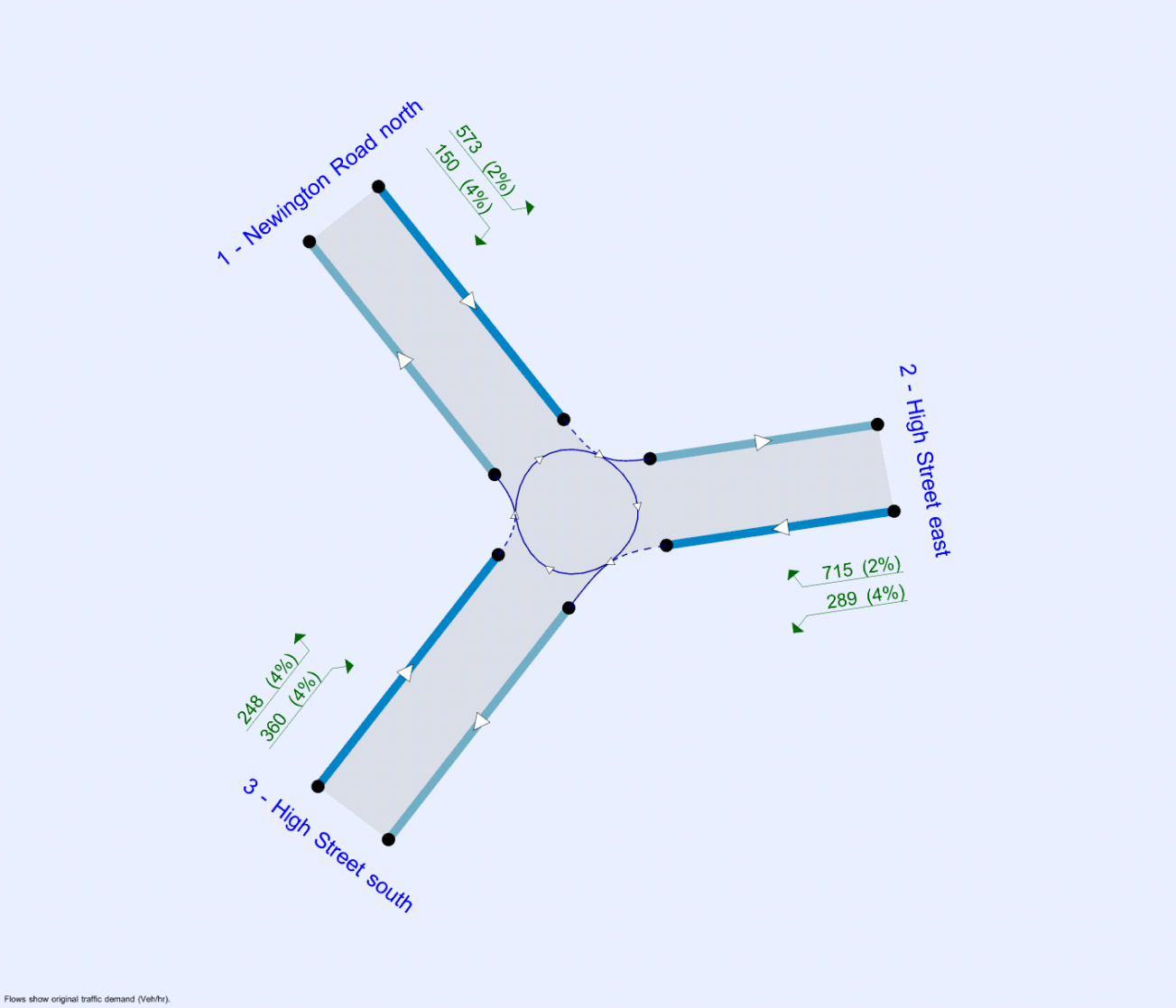
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	05/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev (link+sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout	1, 2, 3	3.34	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Newington Road north	
2	High Street east	
3	High Street south	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Newington Road north	3.96	3.71	4.87	1.4	13.95	8.20	0.0	
2 - High Street east	3.64	3.20	4.13	19.6	20.00	17.75	0.0	✓
3 - High Street south	3.58	3.28	5.97	10.0	14.07	9.72	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Newington Road north	0.630	785
2 - High Street east	0.616	1102
3 - High Street south	0.657	1081

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Newington Road north	Percentage		135.00
3 - High Street south	Percentage		112.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Newington Road north		ONE HOUR	✓	723	100.000
2 - High Street east		ONE HOUR	✓	1004	100.000
3 - High Street south		ONE HOUR	✓	608	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Newington Road north	2 - High Street east	3 - High Street south
From	1 - Newington Road north	0	573	150
	2 - High Street east	715	0	289
	3 - High Street south	248	360	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Newington Road north	2 - High Street east	3 - High Street south
From	1 - Newington Road north	0	2	4
	2 - High Street east	2	0	4
	3 - High Street south	4	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	1.13	3.78	52.4	F	663	995
2 - High Street east	1.12	3.96	71.9	F	921	1382
3 - High Street south	1.02	1.82	20.4	F	558	837

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	544	136	268	803	0.678	536	715	0.0	2.0	0.219	B
2 - High Street east	756	189	111	1005	0.752	744	693	0.0	2.9	0.222	B
3 - High Street south	458	114	530	781	0.586	452	326	0.0	1.4	0.180	B

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	650	162	320	758	0.857	638	850	2.0	5.0	0.459	D
2 - High Street east	903	226	132	992	0.910	884	825	2.9	7.5	0.488	D
3 - High Street south	547	137	630	709	0.771	540	387	1.4	3.1	0.341	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	796	199	371	714	1.116	699	948	5.0	29.1	1.735	F
2 - High Street east	1105	276	145	984	1.124	972	926	7.5	40.8	1.710	F
3 - High Street south	669	167	692	664	1.008	627	425	3.1	13.6	1.066	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	796	199	380	706	1.128	703	961	29.1	52.4	3.679	F
2 - High Street east	1105	276	146	983	1.124	981	938	40.8	71.9	3.609	F
3 - High Street south	669	167	699	659	1.015	642	428	13.6	20.4	1.820	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	650	162	358	725	0.897	711	937	52.4	37.1	3.781	F
2 - High Street east	903	226	148	982	0.919	969	922	71.9	55.3	3.957	F
3 - High Street south	547	137	690	666	0.821	605	426	20.4	5.7	1.166	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	544	136	279	793	0.686	683	875	37.1	2.4	1.064	F
2 - High Street east	756	189	142	986	0.767	959	821	55.3	4.6	1.914	F
3 - High Street south	458	114	683	671	0.682	471	418	5.7	2.3	0.319	C

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.2.5947
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Filename: Jct 27_R1_PM validated_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18 \2039+(Dev+Signals) models\Validated\Jct 27_B2014_A255\Strategic Model Scenario
Report generation date: 10/01/2019 15:37:08

«2039+Dev (link+sig), PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev (link+sig)				
1 - Newington Road north	20.0	1.63	1.01	F	1.43
2 - High Street east	33.0	1.82	1.03	F	
3 - High Street south	7.9	0.69	0.91	E	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

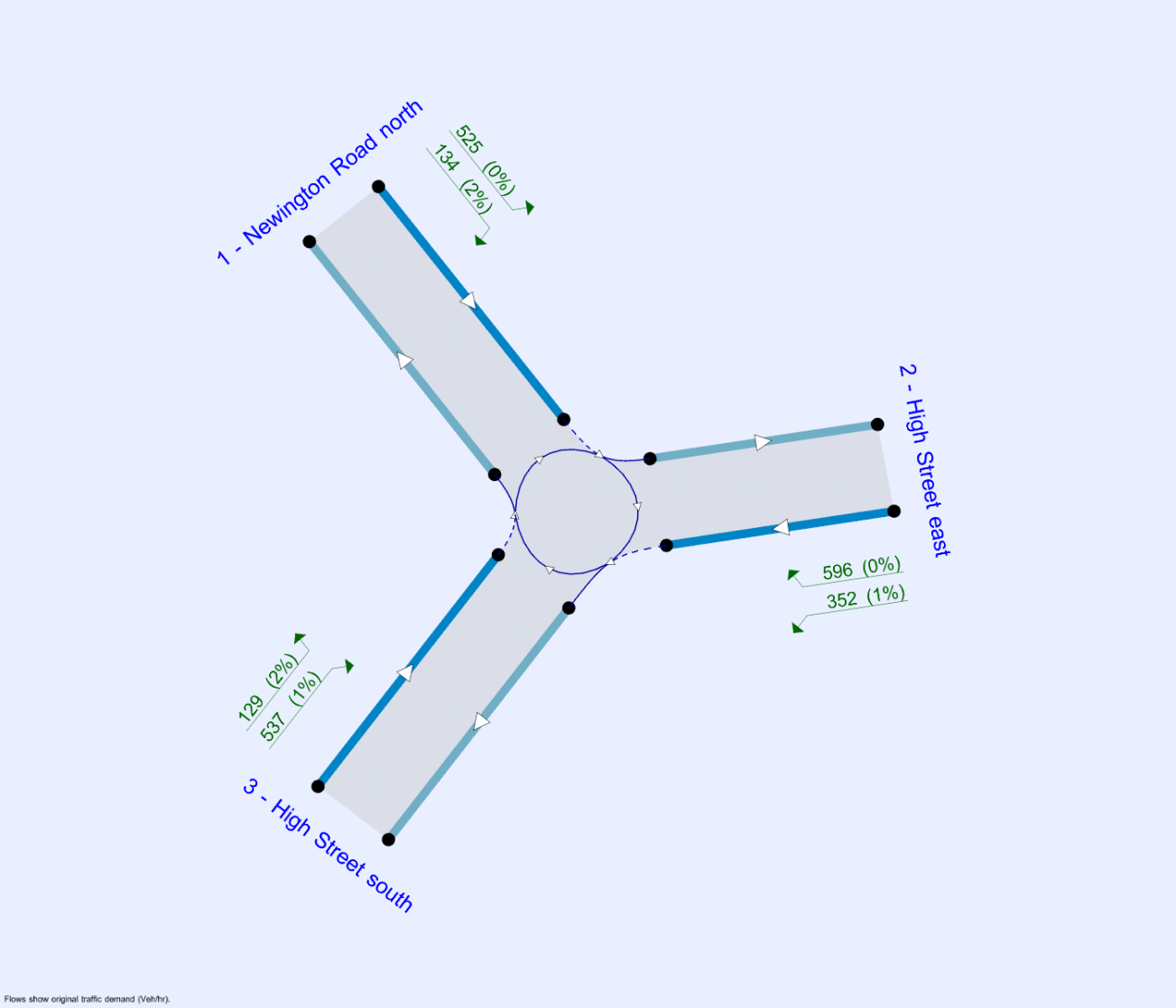
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	05/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev (link+sig), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout	1, 2, 3	1.43	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Newington Road north	
2	High Street east	
3	High Street south	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Newington Road north	3.96	3.71	4.87	1.4	13.95	8.20	0.0	
2 - High Street east	3.64	3.20	4.13	19.6	20.00	17.75	0.0	✓
3 - High Street south	3.58	3.28	5.97	10.0	14.07	9.72	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Newington Road north	0.630	785
2 - High Street east	0.616	1102
3 - High Street south	0.657	1081

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Newington Road north	Percentage		175.00
3 - High Street south	Percentage		122.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Newington Road north		ONE HOUR	✓	659	100.000
2 - High Street east		ONE HOUR	✓	948	100.000
3 - High Street south		ONE HOUR	✓	666	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Newington Road north	2 - High Street east	3 - High Street south
From	1 - Newington Road north	0	525	134
	2 - High Street east	596	0	352
	3 - High Street south	129	537	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Newington Road north	2 - High Street east	3 - High Street south
From	1 - Newington Road north	0	0	2
	2 - High Street east	0	0	1
	3 - High Street south	2	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	1.01	1.63	20.0	F	605	907
2 - High Street east	1.03	1.82	33.0	F	870	1305
3 - High Street south	0.91	0.69	7.9	E	611	917

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	496	124	401	923	0.537	492	540	0.0	1.1	0.138	A
2 - High Street east	714	178	100	1036	0.689	705	792	0.0	2.1	0.177	B
3 - High Street south	501	125	443	952	0.527	497	362	0.0	1.1	0.131	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	592	148	480	835	0.709	588	645	1.1	2.3	0.238	B
2 - High Street east	852	213	120	1023	0.833	843	948	2.1	4.4	0.317	C
3 - High Street south	599	150	530	883	0.678	595	433	1.1	2.0	0.206	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	726	181	577	728	0.997	683	753	2.3	13.0	0.920	F
2 - High Street east	1044	261	139	1011	1.032	977	1121	4.4	21.2	1.007	F
3 - High Street south	733	183	614	816	0.898	715	502	2.0	6.6	0.520	D

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	726	181	587	717	1.013	697	767	13.0	20.0	1.630	F
2 - High Street east	1044	261	142	1009	1.034	996	1143	21.2	33.0	1.817	F
3 - High Street south	733	183	626	806	0.909	728	512	6.6	7.9	0.690	E

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	592	148	499	814	0.728	661	722	20.0	2.9	0.537	D
2 - High Street east	852	213	134	1014	0.840	957	1026	33.0	6.7	1.188	F
3 - High Street south	599	150	602	826	0.725	619	490	7.9	2.8	0.315	C

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	496	124	410	913	0.543	503	558	2.9	1.2	0.148	A
2 - High Street east	714	178	102	1034	0.690	731	810	6.7	2.3	0.209	B
3 - High Street south	501	125	460	939	0.534	508	374	2.8	1.2	0.141	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 29_New Haine Rd_Haine Rd_A256.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 29_New Haine Rd_Haine Rd_A256
Report generation date: 19/03/2019 14:21:37

»2039+Dev (link+sig), AM
»2039+Dev (link+sig), PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039+Dev (link+sig)									
Arm 1	1.3	0.07	0.56	A	0.15	1.3	0.06	0.57	A	0.26
Arm 2	3.1	0.24	0.76	B		10.2	0.69	0.93	E	
Arm 3	0.1	0.07	0.11	A		0.2	0.09	0.19	A	
Arm 4	3.2	0.17	0.77	B		1.9	0.13	0.66	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	13/12/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039+Dev (link+sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.15	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 (N)	
2	New Haine Road	
3	Haine Road	
4	New Arm	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.30	8.00	16.6	34.4	50.0	17.5	
2	3.90	8.30	4.4	11.0	50.0	36.0	
3	3.10	7.00	20.8	41.8	50.0	17.0	
4	3.50	7.20	24.6	36.0	50.0	17.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.788	2552
2	0.536	1408
3	0.647	1796
4	0.672	1936

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039+Dev (link+sig)	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1079	100.000
2		ONE HOUR	✓	725	100.000
3		ONE HOUR	✓	91	100.000
4		ONE HOUR	✓	1034	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	568	68	443
	2	491	0	4	230
	3	73	6	0	12
	4	602	396	36	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	5	5	0
	2	5	0	20	0
	3	0	0	0	0
	4	0	2	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.56	0.07	1.3	A	990	1485
2	0.76	0.24	3.1	B	665	998
3	0.11	0.07	0.1	A	84	125
4	0.77	0.17	3.2	B	949	1423

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	812	203	328	2223	0.365	810	873	0.0	0.6	0.042	A
2	546	136	411	1146	0.476	542	728	0.0	0.9	0.099	A
3	69	17	872	1220	0.056	68	81	0.0	0.1	0.052	A
4	778	195	426	1624	0.479	775	514	0.0	0.9	0.070	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	970	243	393	2173	0.446	969	1046	0.6	0.8	0.050	A
2	652	163	491	1104	0.590	650	871	0.9	1.4	0.131	A
3	82	20	1044	1107	0.074	82	97	0.1	0.1	0.059	A
4	930	232	511	1566	0.594	927	615	0.9	1.4	0.094	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1188	297	479	2105	0.564	1186	1275	0.8	1.3	0.065	A
2	798	200	601	1047	0.762	792	1064	1.4	3.0	0.229	B
3	100	25	1274	954	0.105	100	119	0.1	0.1	0.070	A
4	1138	285	623	1488	0.765	1132	751	1.4	3.1	0.166	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1188	297	482	2103	0.565	1188	1283	1.3	1.3	0.066	A
2	798	200	602	1047	0.763	798	1068	3.0	3.1	0.240	B
3	100	25	1281	950	0.105	100	119	0.1	0.1	0.071	A
4	1138	285	627	1485	0.767	1138	754	3.1	3.2	0.173	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	970	243	397	2170	0.447	972	1057	1.3	0.8	0.050	A
2	652	163	493	1104	0.591	658	876	3.1	1.5	0.137	A
3	82	20	1054	1100	0.074	82	97	0.1	0.1	0.059	A
4	930	232	517	1561	0.595	936	619	3.2	1.5	0.097	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	812	203	331	2221	0.366	813	881	0.8	0.6	0.043	A
2	546	136	412	1146	0.476	548	732	1.5	0.9	0.101	A
3	69	17	879	1216	0.056	69	81	0.1	0.1	0.052	A
4	778	195	431	1621	0.480	781	517	1.5	0.9	0.072	A

2039+Dev (link+sig), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.26	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039+Dev (link+sig)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1216	100.000
2		ONE HOUR	✓	856	100.000
3		ONE HOUR	✓	136	100.000
4		ONE HOUR	✓	855	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	568	83	565
	2	599	0	0	257
	3	97	3	0	36
	4	646	200	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	2	0	0
	2	1	0	0	0
	3	0	2	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.57	0.06	1.3	A	1116	1674
2	0.93	0.69	10.2	E	785	1178
3	0.19	0.09	0.2	A	125	187
4	0.66	0.13	1.9	A	785	1177

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	915	229	159	2404	0.381	913	1004	0.0	0.6	0.040	A
2	644	161	493	1136	0.567	639	579	0.0	1.3	0.120	A
3	102	26	1064	1105	0.093	102	69	0.0	0.1	0.060	A
4	644	161	522	1582	0.407	641	643	0.0	0.7	0.064	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1093	273	190	2380	0.459	1092	1202	0.6	0.8	0.047	A
2	770	192	590	1084	0.710	765	692	1.3	2.3	0.186	B
3	122	31	1273	969	0.126	122	83	0.1	0.1	0.071	A
4	769	192	625	1512	0.508	767	770	0.7	1.0	0.080	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1339	335	233	2347	0.571	1337	1457	0.8	1.3	0.059	A
2	942	236	722	1014	0.930	917	847	2.3	8.7	0.522	D
3	150	37	1538	797	0.188	149	101	0.1	0.2	0.093	A
4	941	235	752	1426	0.660	938	936	1.0	1.9	0.122	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1339	335	233	2346	0.571	1339	1473	1.3	1.3	0.060	A
2	942	236	723	1013	0.930	937	849	8.7	10.2	0.692	E
3	150	37	1559	783	0.191	150	101	0.2	0.2	0.095	A
4	941	235	765	1417	0.664	941	943	1.9	1.9	0.126	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1093	273	191	2379	0.460	1095	1231	1.3	0.9	0.047	A
2	770	192	592	1083	0.710	800	695	10.2	2.6	0.232	B
3	122	31	1309	946	0.129	123	83	0.2	0.1	0.073	A
4	769	192	650	1495	0.514	772	781	1.9	1.1	0.083	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	915	229	160	2403	0.381	916	1015	0.9	0.6	0.040	A
2	644	161	495	1135	0.568	649	581	2.6	1.3	0.125	A
3	102	26	1075	1097	0.093	103	69	0.1	0.1	0.060	A
4	644	161	530	1577	0.408	645	648	1.1	0.7	0.065	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

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Filename: Proposed Acccess to Airport_R2.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Junction 1
Report generation date: 19/03/2019 14:39:56

»Arcady Module - 2039 + Dev(Link+Sigs), AM
»Arcady Module - 2039 + Dev(Link+Sigs), PM

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (PCU)	Delay (min)	RFC	LOS	Junction Delay (min)
	Arcady Module - 2039 + Dev(Link+Sigs)									
Arm 1	1.1	0.08	0.51	A	0.09	0.7	0.06	0.39	A	0.08
Arm 2	0.0	0.11	0.02	A		0.0	0.09	0.02	A	
Arm 3	1.8	0.10	0.64	A		1.5	0.09	0.60	A	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	30/05/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	PCU	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2039 + Dev(Link+Sigs)	AM	ONE HOUR	07:30	09:00	15	✓
D6	2039 + Dev(Link+Sigs)	PM	ONE HOUR	16:30	18:00	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Arcady Module	✓	100.000	100.000

Arcady Module - 2039 + Dev(Link+Sigs), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.09	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Spitfire Way (E)	
2	Airport Access	
3	Spitfire Way (W)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.60	7.00	35.0	25.0	45.0	54.0	
2	3.60	6.00	6.0	25.0	45.0	54.0	
3	3.60	7.00	28.3	25.0	45.0	54.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.614	1739
2	0.529	1306
3	0.606	1700

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2039 + Dev(Link+Sigs)	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	754	100.000
2		ONE HOUR	✓	13	100.000
3		ONE HOUR	✓	939	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	3	751
	2	4	0	9
	3	930	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	100	6
	2	75	0	33
	3	4	33	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.51	0.08	1.1	A	736	1104
2	0.02	0.11	0.0	A	17	26
3	0.64	0.10	1.8	A	899	1348

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	604	151	9	1733	0.348	602	730	0.0	0.6	0.056	A
2	14	4	597	990	0.014	14	13	0.0	0.0	0.090	A
3	737	184	5	1697	0.434	734	606	0.0	0.8	0.065	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	721	180	11	1732	0.416	720	875	0.6	0.8	0.063	A
2	17	4	715	928	0.018	17	16	0.0	0.0	0.096	A
3	880	220	6	1696	0.519	879	726	0.8	1.1	0.076	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	883	221	13	1731	0.510	882	1070	0.8	1.1	0.075	A
2	21	5	875	843	0.025	21	20	0.0	0.0	0.106	A
3	1078	270	8	1695	0.636	1075	888	1.1	1.8	0.100	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	883	221	13	1731	0.510	883	1073	1.1	1.1	0.075	A
2	21	5	876	842	0.025	21	20	0.0	0.0	0.107	A
3	1078	270	8	1695	0.636	1078	890	1.8	1.8	0.101	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	721	180	11	1732	0.416	722	878	1.1	0.8	0.063	A
2	17	4	717	927	0.018	17	16	0.0	0.0	0.096	A
3	880	220	6	1696	0.519	883	728	1.8	1.1	0.077	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	604	151	9	1733	0.348	605	735	0.8	0.6	0.057	A
2	14	4	600	989	0.014	14	14	0.0	0.0	0.090	A
3	737	184	5	1697	0.434	738	609	1.1	0.8	0.065	A

Arcady Module - 2039 + Dev(Link+Sigs), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2039 + Dev(Link+Sigs)	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	600	100.000
2		ONE HOUR	✓	13	100.000
3		ONE HOUR	✓	897	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	4	596
	2	4	0	9
	3	888	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	75	3
	2	75	0	33
	3	2	33	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.39	0.06	0.7	A	570	855
2	0.02	0.09	0.0	A	17	26
3	0.60	0.09	1.5	A	842	1263

Main Results for each time segment

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	467	117	9	1733	0.270	466	684	0.0	0.4	0.049	A
2	14	4	461	1062	0.013	14	14	0.0	0.0	0.084	A
3	691	173	5	1697	0.407	688	470	0.0	0.7	0.061	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	558	140	11	1732	0.322	558	820	0.4	0.5	0.053	A
2	17	4	551	1014	0.017	17	17	0.0	0.0	0.088	A
3	825	206	6	1696	0.486	824	562	0.7	1.0	0.070	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	684	171	13	1731	0.395	683	1003	0.5	0.7	0.059	A
2	21	5	675	949	0.022	21	21	0.0	0.0	0.094	A
3	1010	253	8	1695	0.596	1008	688	1.0	1.5	0.089	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	684	171	13	1731	0.395	684	1005	0.7	0.7	0.059	A
2	21	5	676	948	0.022	21	21	0.0	0.0	0.094	A
3	1010	253	8	1695	0.596	1010	689	1.5	1.5	0.090	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	558	140	11	1732	0.322	559	823	0.7	0.5	0.053	A
2	17	4	553	1014	0.017	17	17	0.0	0.0	0.088	A
3	825	206	6	1696	0.486	827	563	1.5	1.0	0.071	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (min)	Unsignalised level of service
1	467	117	9	1733	0.270	468	688	0.5	0.4	0.049	A
2	14	4	463	1061	0.013	14	14	0.0	0.0	0.084	A
3	691	173	5	1697	0.407	692	472	1.0	0.7	0.061	A

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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Filename: Junction 2 - R4.j9
Path: V:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Junction 2
Report generation date: 12/02/2019 15:28:33

»2039+Dev(Link+Sigs), AM
»2039+Dev(Link+Sigs), PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	2039+Dev(Link+Sigs)							
Stream B-C	0.1	0.13	0.06	0.02	0.2	0.18	0.17	0.04
Stream B-A	0.2	0.49	0.14		1.0	0.48	0.51	
Stream C-AB	0.5	0.20	0.33		0.0	0.12	0.03	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	12/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
		0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2039+Dev(Link+Sigs)	AM	ONE HOUR	07:30	09:00	15
D2	2039+Dev(Link+Sigs)	PM	ONE HOUR	16:30	18:00	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2039+Dev(Link+Sigs), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
1	untitled	T-Junction	Two-way		0.02	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Manston Road (NE)		Major
B	Proposed Access		Minor
C	Manston Road (SW)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00		✓	3.50	67.0	✓	5.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	8.00	4.00	3.50	3.50	3.50		1.00	110	85

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	564	0.098	0.248	0.156	0.355
1	B-C	737	0.108	0.273	-	-
1	C-B	699	0.259	0.259	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2039+Dev(Link+Sigs)	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	813	100.000
B		✓	46	100.000
C		✓	981	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	145	668
	B	18	0	28
	C	846	135	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	9
	B	0	0	0
	C	6	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
B-C	0.06	0.13	0.1	A
B-A	0.14	0.49	0.2	D
C-AB	0.33	0.20	0.5	B
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	21	568	0.037	21	0.0	0.110	A
B-A	14	275	0.049	13	0.1	0.229	B
C-AB	102	529	0.192	101	0.2	0.140	A
C-A	637			637			
A-B	109			109			
A-C	503			503			

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	25	533	0.047	25	0.0	0.118	A
B-A	16	219	0.074	16	0.1	0.295	C
C-AB	122	497	0.245	121	0.3	0.160	A
C-A	760			760			
A-B	130			130			
A-C	601			601			

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	31	481	0.064	31	0.1	0.133	A
B-A	20	142	0.140	20	0.2	0.489	D
C-AB	150	454	0.330	149	0.5	0.196	B
C-A	930			930			
A-B	160			160			
A-C	735			735			

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	31	481	0.064	31	0.1	0.133	A
B-A	20	142	0.140	20	0.2	0.491	D
C-AB	150	454	0.330	150	0.5	0.197	B
C-A	930			930			
A-B	160			160			
A-C	735			735			

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	25	533	0.047	25	0.0	0.118	A
B-A	16	220	0.074	16	0.1	0.295	C
C-AB	122	497	0.245	122	0.3	0.160	A
C-A	760			760			
A-B	130			130			
A-C	601			601			

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	21	568	0.037	21	0.0	0.110	A
B-A	14	276	0.049	14	0.1	0.229	B
C-AB	102	529	0.192	102	0.2	0.141	A
C-A	637			637			
A-B	109			109			
A-C	503			503			

2039+Dev(Link+Sigs), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
1	untitled	T-Junction	Two-way		0.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2039+Dev(Link+Sigs)	PM	ONE HOUR	16:30	18:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		✓	606	100.000
B		✓	176	100.000
C		✓	910	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	12	594
	B	116	0	60
	C	894	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	2	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
B-C	0.17	0.18	0.2	B
B-A	0.51	0.48	1.0	D
C-AB	0.03	0.12	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	45	524	0.086	45	0.1	0.125	A
B-A	87	366	0.239	86	0.3	0.214	B
C-AB	12	581	0.021	12	0.0	0.105	A
C-A	673			673			
A-B	9			9			
A-C	447			447			

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	54	482	0.112	54	0.1	0.140	A
B-A	104	318	0.327	104	0.5	0.278	C
C-AB	14	558	0.026	14	0.0	0.110	A
C-A	804			804			
A-B	11			11			
A-C	534			534			

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	66	395	0.167	66	0.2	0.182	B
B-A	128	253	0.506	126	1.0	0.466	D
C-AB	18	527	0.033	18	0.0	0.118	A
C-A	984			984			
A-B	13			13			
A-C	654			654			

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	66	392	0.169	66	0.2	0.184	B
B-A	128	252	0.506	128	1.0	0.480	D
C-AB	18	527	0.033	18	0.0	0.118	A
C-A	984			984			
A-B	13			13			
A-C	654			654			

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	54	479	0.113	54	0.1	0.141	A
B-A	104	318	0.328	106	0.5	0.285	C
C-AB	14	558	0.026	14	0.0	0.110	A
C-A	804			804			
A-B	11			11			
A-C	534			534			

17:45 - 18:00

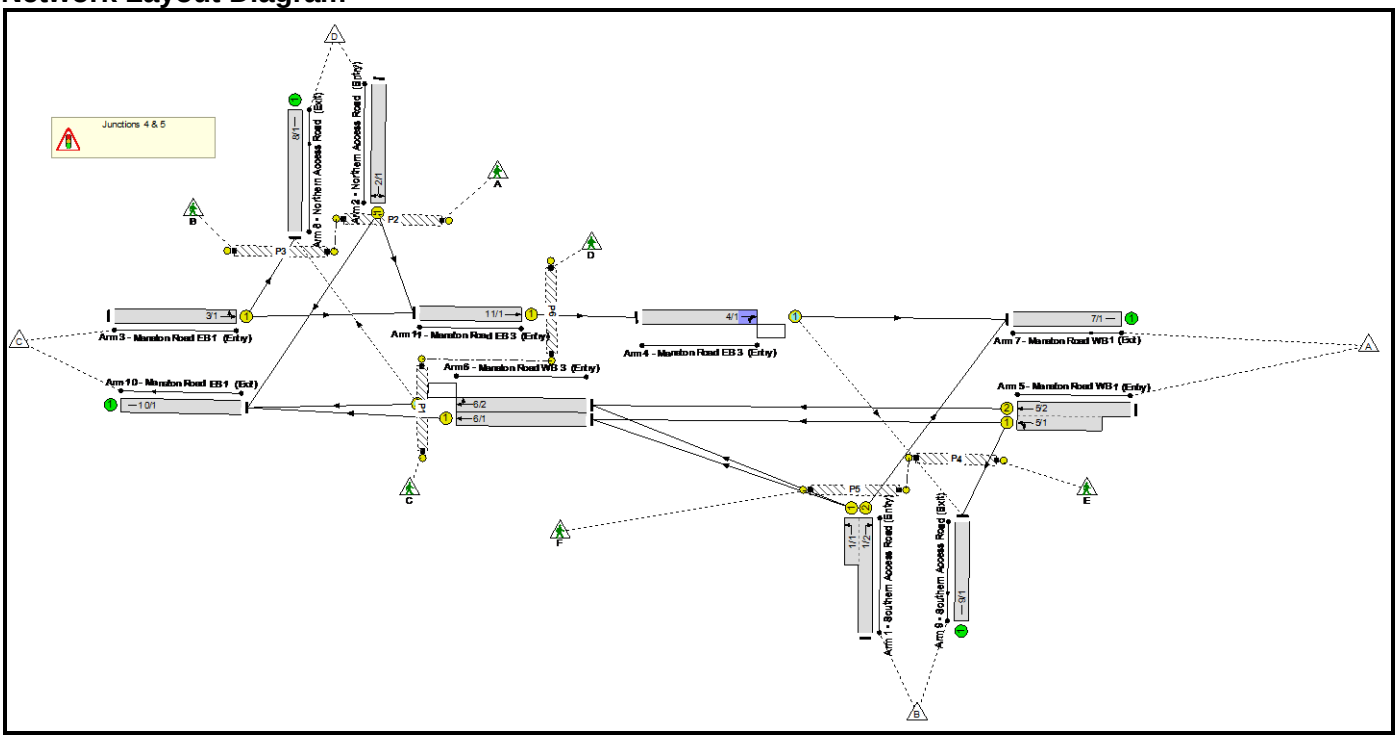
Stream	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-C	45	523	0.086	45	0.1	0.126	A
B-A	87	366	0.239	88	0.3	0.217	B
C-AB	12	581	0.021	12	0.0	0.105	A
C-A	673			673			
A-B	9			9			
A-C	447			447			

Full Input Data And Results

User and Project Details

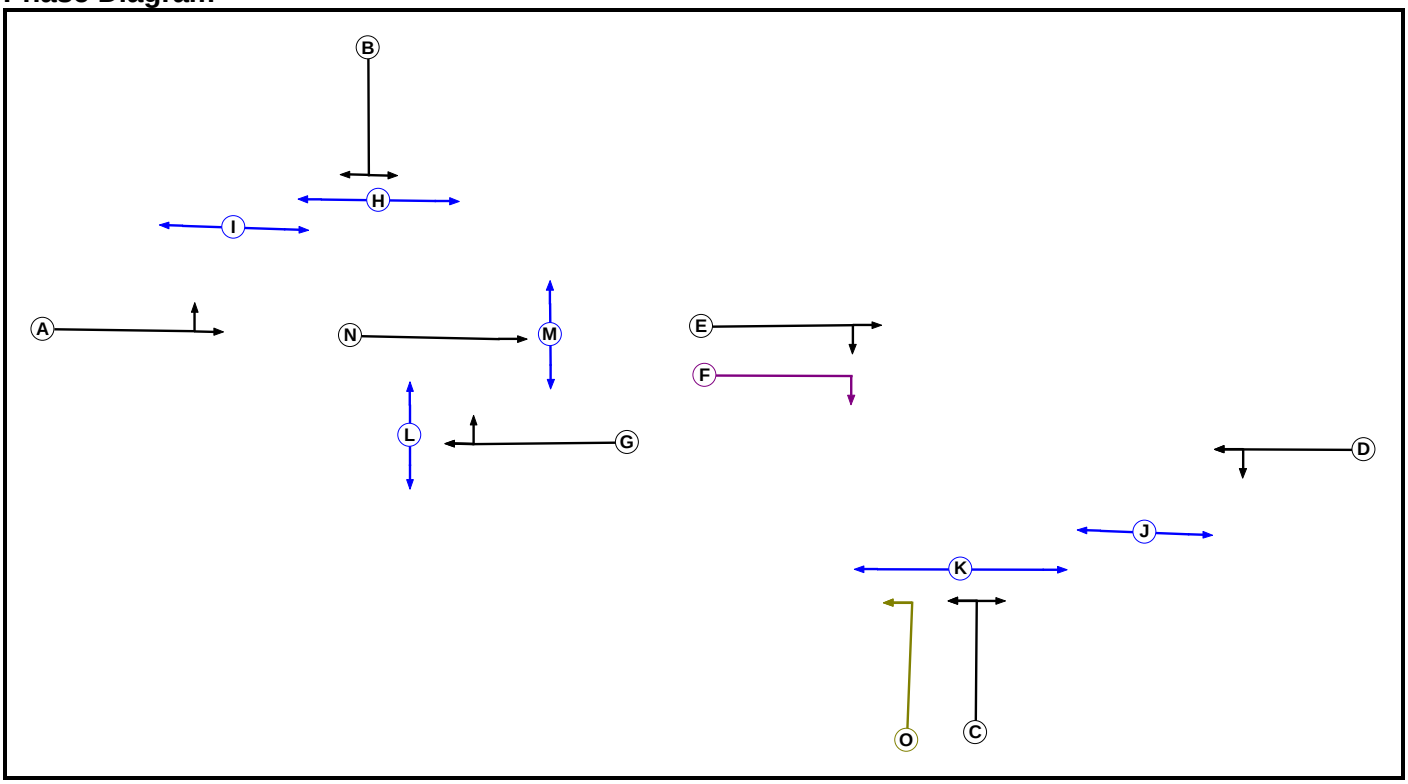
Project:	**Manston Airport DCO EIA**
Title:	**Junctions 3+4 Staggered**
Location:	
File name:	Signalised_R9.lsg3x
Author:	Fouda
Company:	AmecFW
Address:	
Notes:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	0
F	Ind. Arrow	E	4	0
G	Traffic		7	4
H	Pedestrian		6	6
I	Pedestrian		6	6
J	Pedestrian		6	0
K	Pedestrian		7	7
L	Pedestrian		7	7
M	Pedestrian		7	7
N	Traffic		7	1
O	Filter	C	4	0

Full Input Data And Results

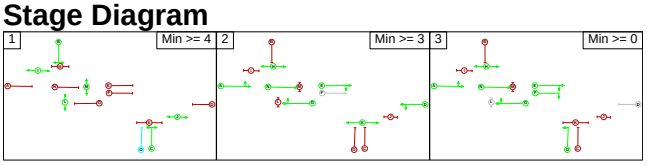
Phase Intergreens Matrix

Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A		5	-	-	-	-	-	-	9	-	-	-	-	-	-
B	5		-	-	-	-	6	5	-	-	-	-	-	-	-
C	-	-		5	7	7	-	-	-	-	5	-	-	-	-
D	-	-	5		-	-	-	-	-	8	-	-	-	-	-
E	-	-	7	-		-	-	-	-	-	-	-	-	-	-
F	-	-	7	-	-		-	-	-	10	-	-	-	-	-
G	-	7	-	-	-	-		-	11	-	-	-	-	-	-
H	-	5	-	-	-	-	-		-	-	-	-	-	-	-
I	-	-	-	-	-	-	6	-		-	-	-	-	-	-
J	-	-	-	6	6	6	-	-	-		-	-	-	-	-
K	-	-	8	-	-	-	-	-	-	-		-	-	-	8
L	-	-	-	-	-	-	-	-	-	-	-		-	-	-
M	-	-	-	-	-	-	-	-	-	-	-	-		8	-
N	-	-	-	-	-	-	-	-	-	-	-	-	5		-
O	-	-	-	-	-	-	-	-	-	-	5	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	B C I J L M
2	A D E G H K N
3	A E F G H N O

Stage Diagram



Full Input Data And Results

Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	A	Gaining absolute	16	16
1	2	J	Losing	6	6
1	2	L	Losing	12	12
1	2	M	Losing	3	3
1	2	N	Gaining absolute	11	11
1	3	J	Losing	9	9
2	1	E	Losing	10	10
2	1	G	Losing	10	10
2	1	H	Losing	9	9
2	1	K	Losing	10	10
2	1	N	Losing	6	6
3	1	E	Losing	10	10
3	1	G	Losing	3	3
3	1	N	Losing	6	6

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		16	15
	2	21		8
	3	20	X	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Junctions 4 && 5											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
4/1 (Manston Road EB 3 (Entry))	9/1 (Right)	1439	0	5/2	1.09	All	3.00	3.00	0.50	3	3.00
				5/1	1.09	All					
6/2 (Manston Road WB 3 (Entry))	8/1 (Right)	1439	0	3/1	1.09	All	3.00	3.00	0.50	3	3.00

Full Input Data And Results

Lane Input Data

Junction: Junctions 4 && 5

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (Southern Access Road (Entry))	U	C O	2	3	5.0	Geom	-	3.50	0.00	Y	Arm 6 Left	Inf
1/2 (Southern Access Road (Entry))	U	C	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 7 Right	Inf
2/1 (Northern Access Road (Entry))	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 10 Right	20.00
											Arm 11 Left	20.00
3/1 (Manston Road EB 1 (Entry))	U	A	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 8 Left	Inf
											Arm 11 Ahead	Inf
4/1 (Manston Road EB 3 (Entry))	O	E F	2	3	10.0	Geom	-	3.50	0.00	Y	Arm 7 Ahead	Inf
											Arm 9 Right	20.00
5/1 (Manston Road WB 1 (Entry))	U	D	2	3	9.0	Geom	-	3.25	0.00	Y	Arm 6 Ahead	Inf
											Arm 9 Left	15.00
5/2 (Manston Road WB 1 (Entry))	U	D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 6 Ahead	Inf
6/1 (Manston Road WB 3 (Entry))	U	G	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 10 Ahead	Inf
6/2 (Manston Road WB 3 (Entry))	O	G	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 8 Right	Inf
											Arm 10 Ahead	Inf
7/1 (Manston Road WB 1 (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1 (Northern Access Road (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
9/1 (Southern Access Road (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-

10/1 (Manston Road EB 1 (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
11/1 (Manston Road EB 3 (Entry))	U	N	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 4 Ahead	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039+Dev(Link+Sig) - AM Peak '	08:00	09:00	01:00	
2: '2039+Dev(Link+Sig)- PM Peak '	17:00	18:00	01:00	

Scenario 1: '2039+Dev(Link+Sig)- AM Peak ' (FG1: '2039+Dev(Link+Sig) - AM Peak ', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	62	138	108	308
	B	45	0	74	0	119
	C	253	85	0	8	346
	D	28	0	1	0	29
	Tot.	326	147	213	116	802

Traffic Lane Flows

Lane	Scenario 1: 2039+Dev(Link+Sig)-AM Peak
Junction: Junctions 4 && 5	
1/1 (short)	74
1/2 (with short)	119(In) 45(Out)
2/1	29
3/1	346
4/1	366
5/1 (short)	150
5/2 (with short)	308(In) 158(Out)
6/1	113
6/2	207
7/1	326
8/1	116
9/1	147
10/1	213
11/1	366

Full Input Data And Results

Lane Saturation Flows

Junction: Junctions 4 && 5								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Southern Access Road (Entry))	3.50	0.00	Y	Arm 6 Left	Inf	100.0 %	1965	1965
1/2 (Southern Access Road (Entry))	3.50	0.00	Y	Arm 7 Right	Inf	100.0 %	1965	1965
2/1 (Northern Access Road (Entry))	3.50	0.00	Y	Arm 10 Right	20.00	3.4 %	1828	1828
				Arm 11 Left	20.00	96.6 %		
3/1 (Manston Road EB 1 (Entry))	3.50	0.00	Y	Arm 8 Left	Inf	2.3 %	1965	1965
				Arm 11 Ahead	Inf	97.7 %		
4/1 (Manston Road EB 3 (Entry))	3.50	0.00	Y	Arm 7 Ahead	Inf	76.8 %	1931	1931
				Arm 9 Right	20.00	23.2 %		
5/1 (Manston Road WB 1 (Entry))	3.25	0.00	Y	Arm 6 Ahead	Inf	58.7 %	1863	1863
				Arm 9 Left	15.00	41.3 %		
5/2 (Manston Road WB 1 (Entry))	3.50	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1965	1965
6/1 (Manston Road WB 3 (Entry))	3.25	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1940	1940
6/2 (Manston Road WB 3 (Entry))	3.50	0.00	Y	Arm 8 Right	Inf	52.2 %	1965	1965
				Arm 10 Ahead	Inf	47.8 %		
7/1 (Manston Road WB 1 (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Northern Access Road (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
9/1 (Southern Access Road (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
10/1 (Manston Road EB 1 (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
11/1 (Manston Road EB 3 (Entry))	3.50	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1965	1965

Full Input Data And Results

Scenario 2: '2039+Dev(Link+Sig)- PM Peak ' (FG2: '2039+Dev(Link+Sig)- PM Peak ', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	42	220	34	296
	B	77	0	61	0	138
	C	142	48	0	0	190
	D	187	0	10	0	197
	Tot.	406	90	291	34	821

Traffic Lane Flows

Lane	Scenario 2: 2039+Dev(Link+Sig)- PM Peak
Junction: Junctions 4 && 5	
1/1 (short)	61
1/2 (with short)	138(In) 77(Out)
2/1	197
3/1	190
4/1	377
5/1 (short)	145
5/2 (with short)	296(In) 151(Out)
6/1	133
6/2	182
7/1	406
8/1	34
9/1	90
10/1	291
11/1	377

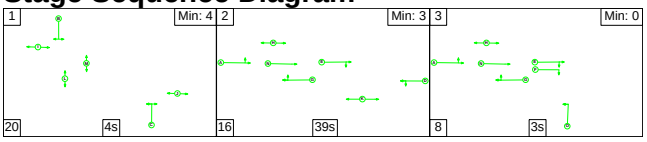
Full Input Data And Results

Lane Saturation Flows

Junction: Junctions 4 && 5								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Southern Access Road (Entry))	3.50	0.00	Y	Arm 6 Left	Inf	100.0 %	1965	1965
1/2 (Southern Access Road (Entry))	3.50	0.00	Y	Arm 7 Right	Inf	100.0 %	1965	1965
2/1 (Northern Access Road (Entry))	3.50	0.00	Y	Arm 10 Right	20.00	5.1 %	1828	1828
				Arm 11 Left	20.00	94.9 %		
3/1 (Manston Road EB 1 (Entry))	3.50	0.00	Y	Arm 8 Left	Inf	0.0 %	1965	1965
				Arm 11 Ahead	Inf	100.0 %		
4/1 (Manston Road EB 3 (Entry))	3.50	0.00	Y	Arm 7 Ahead	Inf	87.3 %	1946	1946
				Arm 9 Right	20.00	12.7 %		
5/1 (Manston Road WB 1 (Entry))	3.25	0.00	Y	Arm 6 Ahead	Inf	71.0 %	1885	1885
				Arm 9 Left	15.00	29.0 %		
5/2 (Manston Road WB 1 (Entry))	3.50	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1965	1965
6/1 (Manston Road WB 3 (Entry))	3.25	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1940	1940
6/2 (Manston Road WB 3 (Entry))	3.50	0.00	Y	Arm 8 Right	Inf	18.7 %	1965	1965
				Arm 10 Ahead	Inf	81.3 %		
7/1 (Manston Road WB 1 (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Northern Access Road (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
9/1 (Southern Access Road (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
10/1 (Manston Road EB 1 (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
11/1 (Manston Road EB 3 (Entry))	3.50	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1965	1965

Scenario 1: '2039+Dev(Link+Sig)- AM Peak ' (FG1: '2039+Dev(Link+Sig) - AM Peak ', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

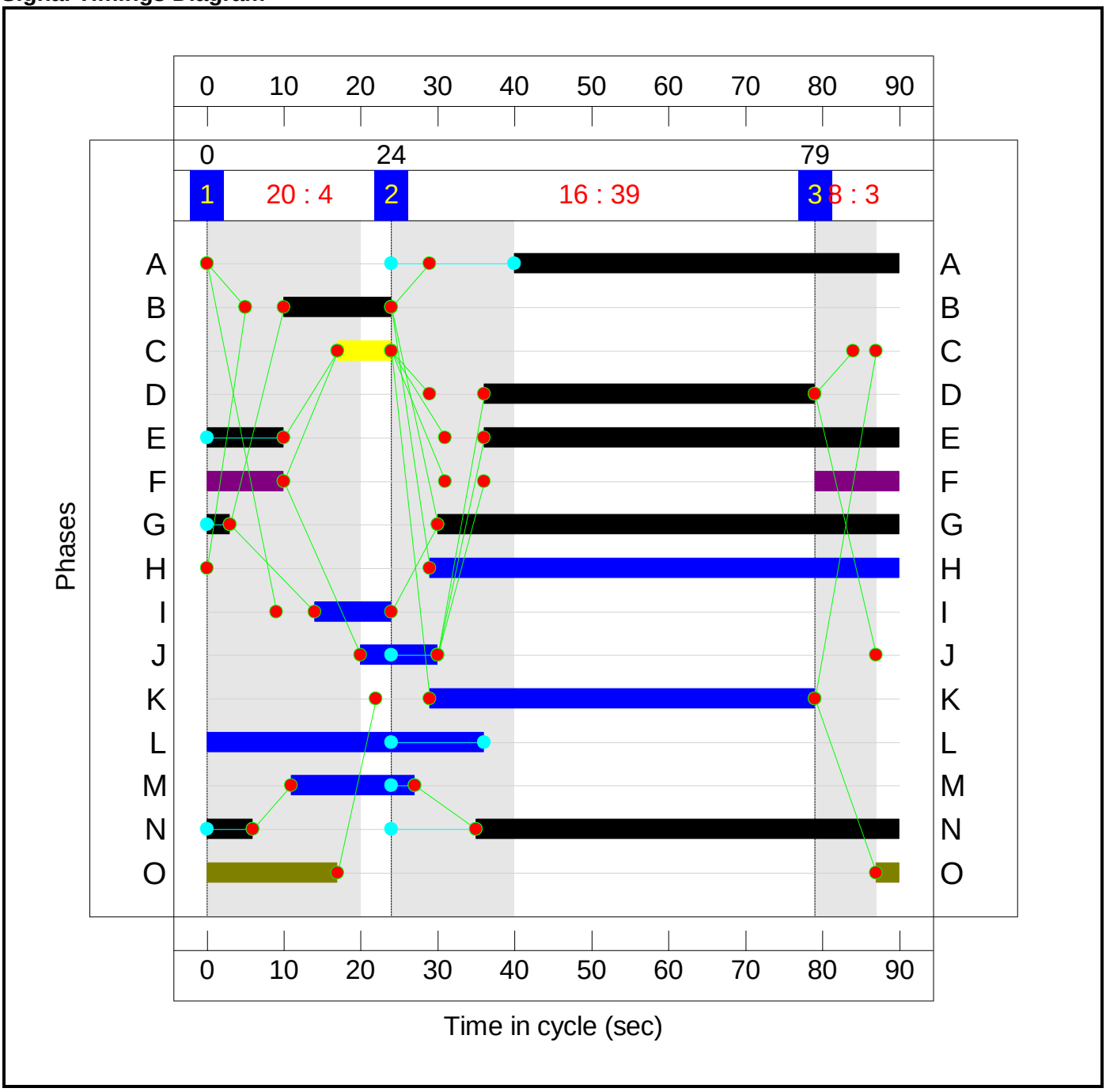


Full Input Data And Results

Stage Timings

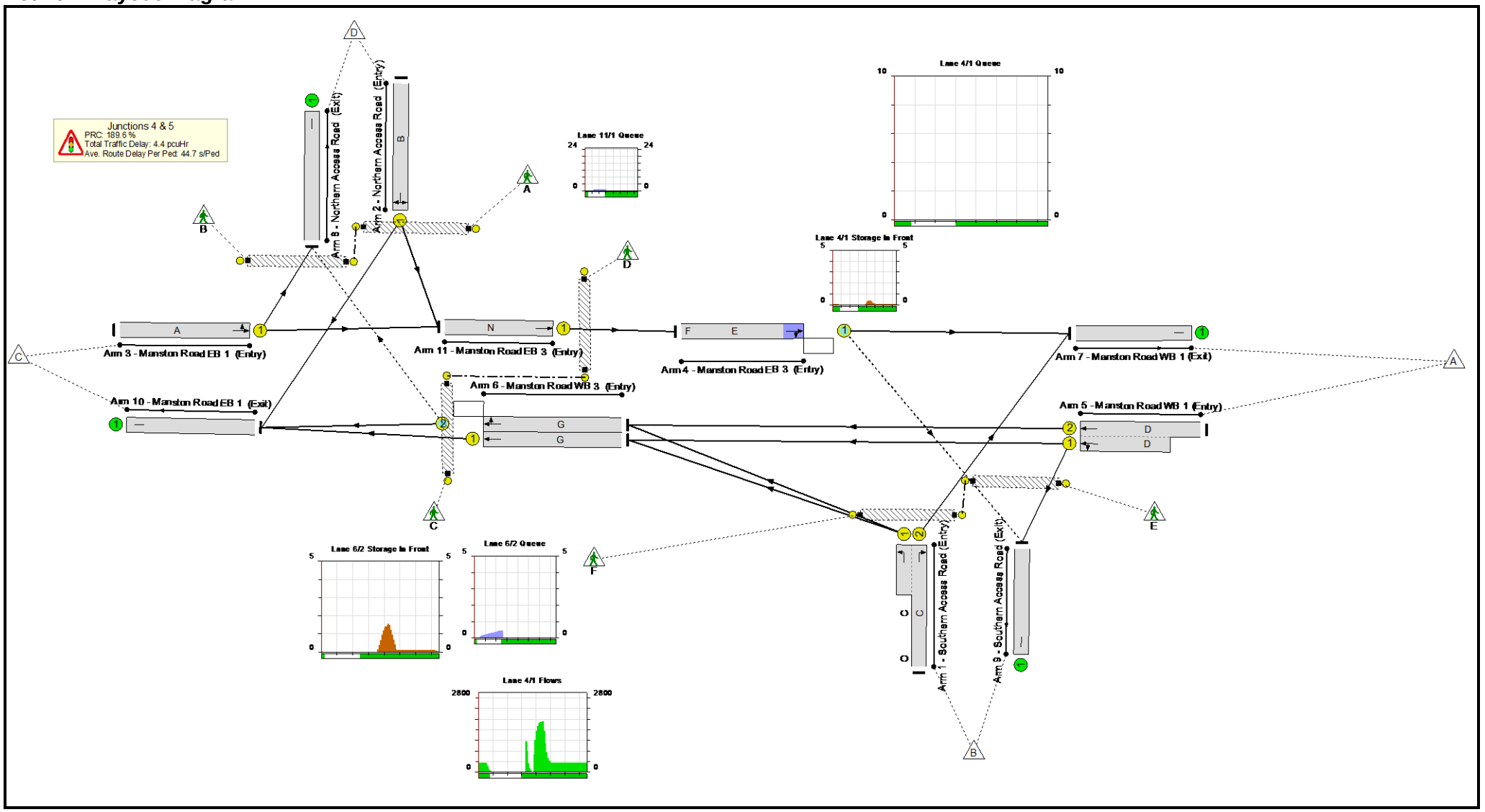
Stage	1	2	3
Duration	4	39	3
Change Point	0	24	79

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junctions 3+4 Staggered	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**31.1%**
Junctions 4 && 5	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**31.1%**
1/2+1/1	Southern Access Road (Entry) Left Right	U	N/A	N/A	C	O	1	7:27	20	119	1965:1965	175+287	25.8 : 25.8%
2/1	Northern Access Road (Entry) Right Left	U	N/A	N/A	B		1	14	-	29	1828	305	9.5%
3/1	Manston Road EB 1 (Entry) Left Ahead	U	N/A	N/A	A		1	50	-	346	1965	1113	31.1%
4/1	Manston Road EB 3 (Entry) Ahead Right	O	N/A	N/A	E	F	1	64	21	366	1931	1395	26.2%
5/2+5/1	Manston Road WB 1 (Entry) Ahead Left	U	N/A	N/A	D		1	43	-	308	1965:1863	665+632	23.7 : 23.7%
6/1	Manston Road WB 3 (Entry) Ahead	U	N/A	N/A	G		1	63	-	113	1940	1380	8.2%
6/2	Manston Road WB 3 (Entry) Right Ahead	O	N/A	N/A	G		1	63	-	207	1965	1278	16.2%
7/1	Manston Road WB 1 (Exit)	U	N/A	N/A	-		-	-	-	326	Inf	Inf	0.0%
8/1	Northern Access Road (Exit)	U	N/A	N/A	-		-	-	-	116	Inf	Inf	0.0%
9/1	Southern Access Road (Exit)	U	N/A	N/A	-		-	-	-	147	Inf	Inf	0.0%
10/1	Manston Road EB 1 (Exit)	U	N/A	N/A	-		-	-	-	213	Inf	Inf	0.0%
11/1	Manston Road EB 3 (Entry) Ahead	U	N/A	N/A	N		1	61	-	366	1965	1354	27.0%

Full Input Data And Results

Ped Link: P1	Unnamed Ped Link	-	N/A	-	L		1	36	-	2	-	28800	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	H		1	61	-	2	-	48800	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	I		1	10	-	2	-	8000	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	10	-	2	-	8000	0.0%
Ped Link: P5	Unnamed Ped Link	-	N/A	-	K		1	50	-	2	-	40000	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	M		1	16	-	2	-	12800	0.0%

Full Input Data And Results

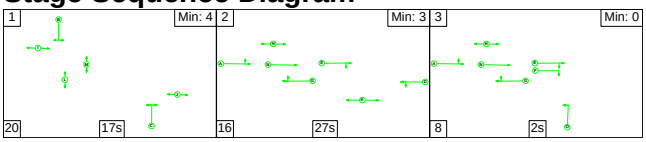
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junctions 3+4 Staggered	**-**	**-**	**176**	**16**	**0**	**3.6**	**0.8**	**0.1**	**4.4**	**-**	**-**	**-**	**-**
Junctions 4 && 5	**-**	**-**	**176**	**16**	**0**	**3.6**	**0.8**	**0.1**	**4.4**	**-**	**-**	**-**	**-**
1/2+1/1	119	119	-	-	-	0.9	0.2	-	1.1	33.5	1.3	0.2	1.5
2/1	29	29	-	-	-	0.3	0.1	-	0.3	38.3	0.6	0.1	0.7
3/1	346	346	-	-	-	1.0	0.2	-	1.2	12.6	4.5	0.2	4.7
4/1	366	366	69	16	0	0.0	0.2	0.0	0.2	1.8	0.0	0.2	0.2
5/2+5/1	308	308	-	-	-	1.1	0.2	-	1.2	14.6	2.2	0.2	2.4
6/1	113	113	-	-	-	0.0	0.0	-	0.0	1.4	0.2	0.0	0.2
6/2	207	207	108	0	0	0.1	0.0	0.1	0.2	3.1	0.4	0.0	0.4
7/1	326	326	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	116	116	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	147	147	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	213	213	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	366	366	-	-	-	0.2	0.0	-	0.2	1.6	0.7	0.0	0.7
Ped Link: P1	2	2	-	-	-	-	-	-	0.0	8.4	-	-	0.0
Ped Link: P2	2	2	-	-	-	-	-	-	0.0	6.2	-	-	0.0
Ped Link: P3	2	2	-	-	-	-	-	-	0.0	42.8	-	-	0.0
Ped Link: P4	2	2	-	-	-	-	-	-	0.0	48.2	-	-	0.0
Ped Link: P5	2	2	-	-	-	-	-	-	0.0	5.5	-	-	0.0
Ped Link: P6	2	2	-	-	-	-	-	-	0.0	22.9	-	-	0.0

C1 PRC for Signalled Lanes (%): 189.6 Total Delay for Signalled Lanes (pcuHr): 4.44 Cycle Time (s): 90
PRC Over All Lanes (%): 189.6 Total Delay Over All Lanes(pcuHr): 4.44

Full Input Data And Results

Scenario 2: '2039+Dev(Link+Sig)- PM Peak ' (FG2: '2039+Dev(Link+Sig)- PM Peak ', Plan 1: 'Network Control Plan 1')

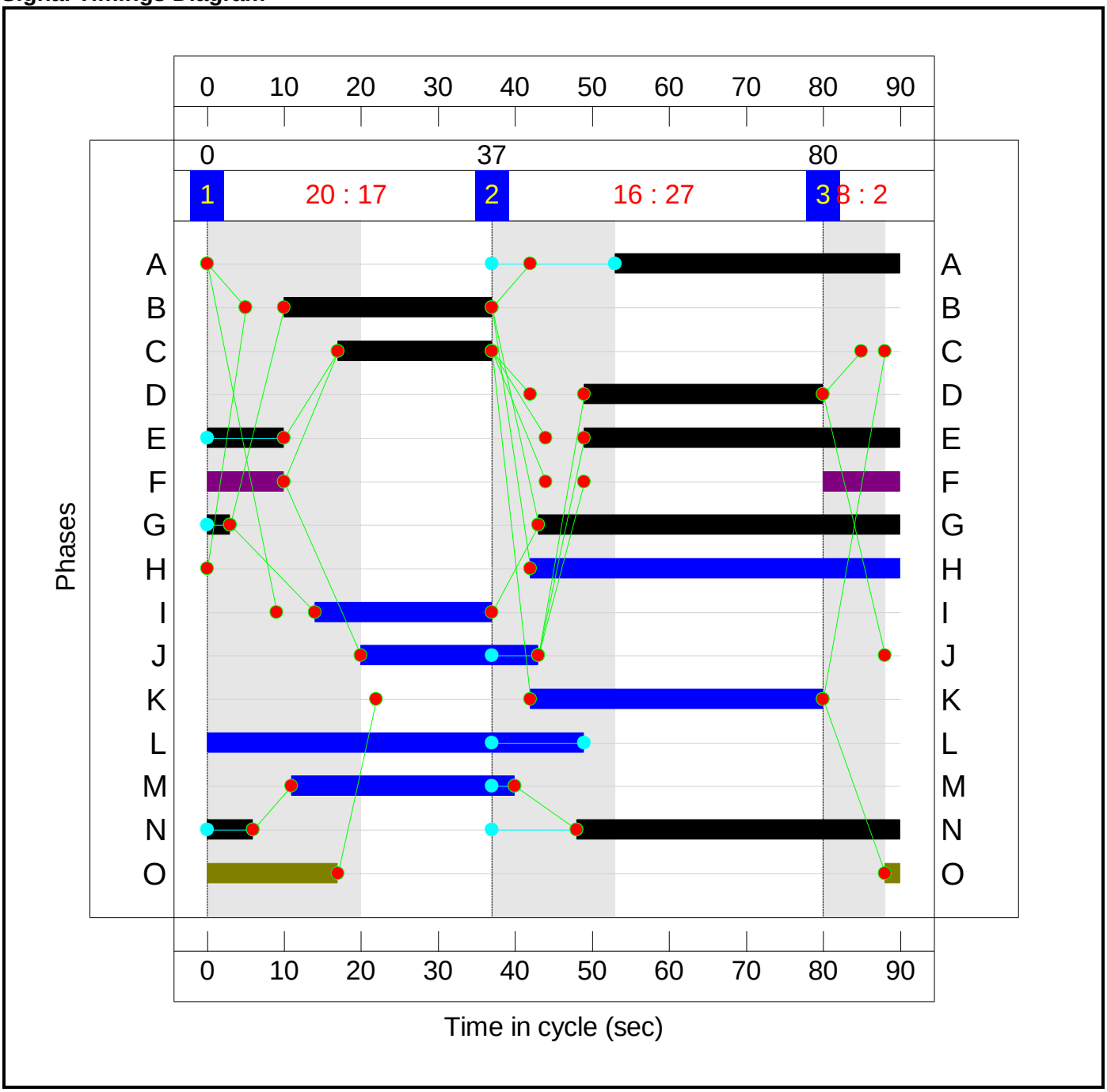
Stage Sequence Diagram



Stage Timings

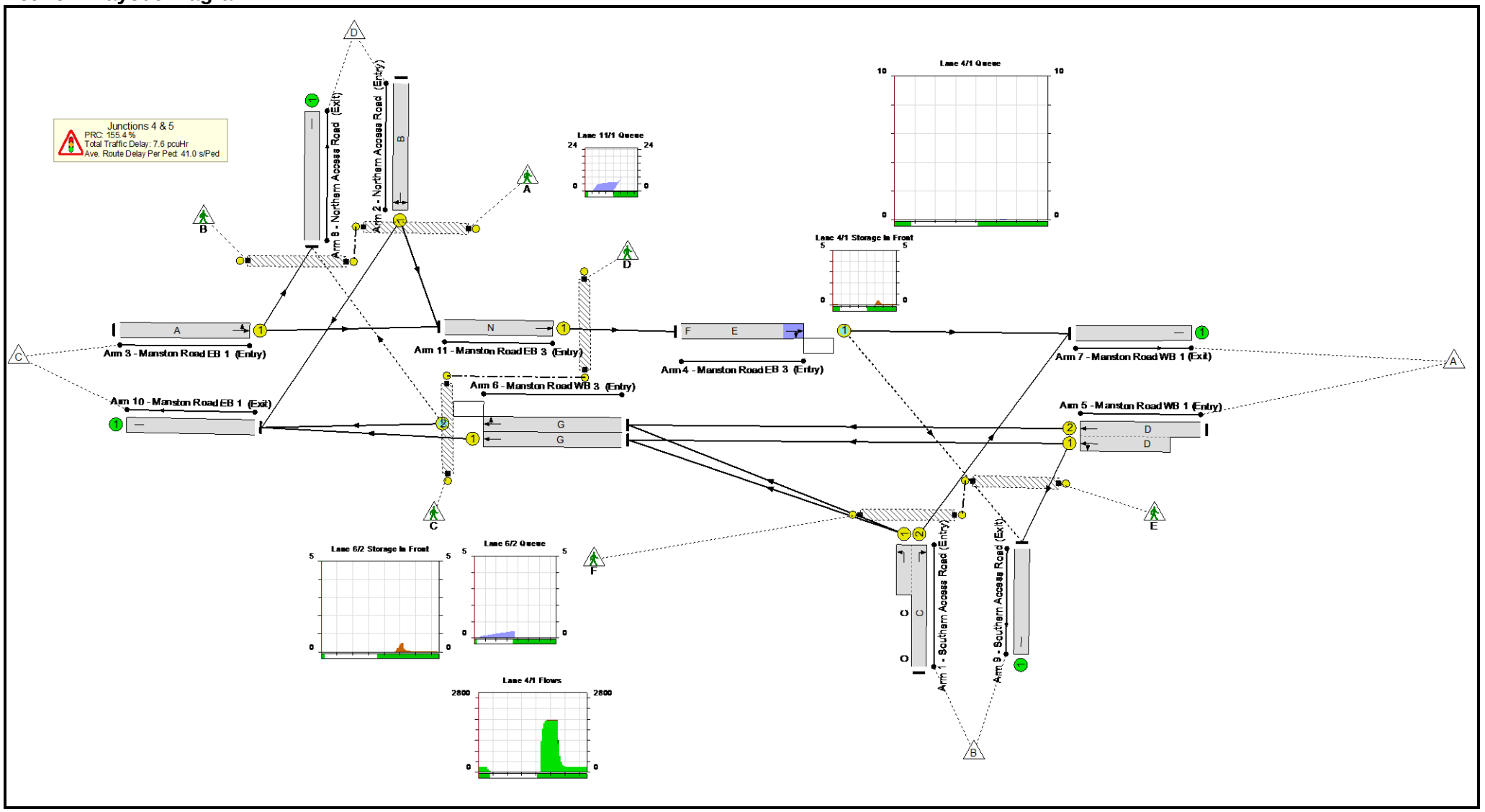
Stage	1	2	3
Duration	17	27	2
Change Point	0	37	80

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junctions 3+4 Staggered	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**35.2%**
Junctions 4 && 5	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**35.2%**
1/2+1/1	Southern Access Road (Entry) Left Right	U	N/A	N/A	C	O	1	20:39	19	138	1965:1965	346+274	22.2 : 22.2%
2/1	Northern Access Road (Entry) Right Left	U	N/A	N/A	B		1	27	-	197	1828	569	34.6%
3/1	Manston Road EB 1 (Entry) Left Ahead	U	N/A	N/A	A		1	37	-	190	1965	830	22.9%
4/1	Manston Road EB 3 (Entry) Ahead Right	O	N/A	N/A	E	F	1	51	20	377	1946	1124	33.5%
5/2+5/1	Manston Road WB 1 (Entry) Ahead Left	U	N/A	N/A	D		1	31	-	296	1965:1885	535+513	28.2 : 28.2%
6/1	Manston Road WB 3 (Entry) Ahead	U	N/A	N/A	G		1	50	-	133	1940	1099	12.1%
6/2	Manston Road WB 3 (Entry) Right Ahead	O	N/A	N/A	G		1	50	-	182	1965	1114	16.3%
7/1	Manston Road WB 1 (Exit)	U	N/A	N/A	-		-	-	-	406	Inf	Inf	0.0%
8/1	Northern Access Road (Exit)	U	N/A	N/A	-		-	-	-	34	Inf	Inf	0.0%
9/1	Southern Access Road (Exit)	U	N/A	N/A	-		-	-	-	90	Inf	Inf	0.0%
10/1	Manston Road EB 1 (Exit)	U	N/A	N/A	-		-	-	-	291	Inf	Inf	0.0%
11/1	Manston Road EB 3 (Entry) Ahead	U	N/A	N/A	N		1	48	-	377	1965	1070	35.2%

Full Input Data And Results

Ped Link: P1	Unnamed Ped Link	-	N/A	-	L		1	49	-	2	-	39200	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	H		1	48	-	2	-	38400	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	I		1	23	-	2	-	18400	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	23	-	2	-	18400	0.0%
Ped Link: P5	Unnamed Ped Link	-	N/A	-	K		1	38	-	2	-	30400	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	M		1	29	-	2	-	23200	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junctions 3+4 Staggered	**-**	**-**	**73**	**9**	**0**	**6.6**	**1.0**	**0.0**	**7.6**	**-**	**-**	**-**	**-**
Junctions 4 && 5	**-**	**-**	**73**	**9**	**0**	**6.6**	**1.0**	**0.0**	**7.6**	**-**	**-**	**-**	**-**
1/2+1/1	138	138	-	-	-	0.8	0.1	-	1.0	25.5	1.5	0.1	1.7
2/1	197	197	-	-	-	1.3	0.3	-	1.6	28.8	3.8	0.3	4.0
3/1	190	190	-	-	-	0.9	0.1	-	1.0	19.5	3.0	0.1	3.2
4/1	377	377	39	9	0	0.0	0.3	0.0	0.3	2.4	0.0	0.3	0.3
5/2+5/1	296	296	-	-	-	1.7	0.2	-	1.9	22.6	2.6	0.2	2.8
6/1	133	133	-	-	-	0.1	0.0	-	0.1	2.8	0.4	0.0	0.4
6/2	182	182	34	0	0	0.1	0.0	0.0	0.1	2.3	0.4	0.0	0.4
7/1	406	406	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	34	34	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1	90	90	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	291	291	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	377	377	-	-	-	1.7	0.0	-	1.7	16.5	7.6	0.0	7.6
Ped Link: P1	2	2	-	-	-	-	-	-	0.0	4.9	-	-	0.0
Ped Link: P2	2	2	-	-	-	-	-	-	0.0	14.2	-	-	0.0
Ped Link: P3	2	2	-	-	-	-	-	-	0.0	34.6	-	-	0.0
Ped Link: P4	2	2	-	-	-	-	-	-	0.0	38.9	-	-	0.0
Ped Link: P5	2	2	-	-	-	-	-	-	0.0	14.0	-	-	0.0
Ped Link: P6	2	2	-	-	-	-	-	-	0.0	16.4	-	-	0.0

C1 PRC for Signalled Lanes (%): 155.4 Total Delay for Signalled Lanes (pcuHr): 7.64 Cycle Time (s): 90
PRC Over All Lanes (%): 155.4 Total Delay Over All Lanes(pcuHr): 7.64

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Appendix I (part 4)
2039 Base and 2039 Base + Development Junction Model Outputs

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 2_A256_A299_R1_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 2_A299_A256\Strategic Model Scenario
Report generation date: 18/03/2019 11:59:23

»Lane simulation - 2039 Base Traffic Flow, AM
»Lane simulation - 2039 Base Traffic Flow, PM

Summary of junction performance

	AM						PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	Lane simulation [Lane Simulation] - 2039 Base Traffic Flow											
1 - A299 Hengist Way E	147.2	5.28		F	2.66	% [ ]	3.4	0.14		A	1.37	% [ ]
2 - A256	9.1	0.36		C			87.3	2.45		F		
3 - Cottington Link Road	3.3	2.33		F			2.2	3.83		F		
4 - A299 Hengist Way N	3.0	0.23		B			1.1	0.15		A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

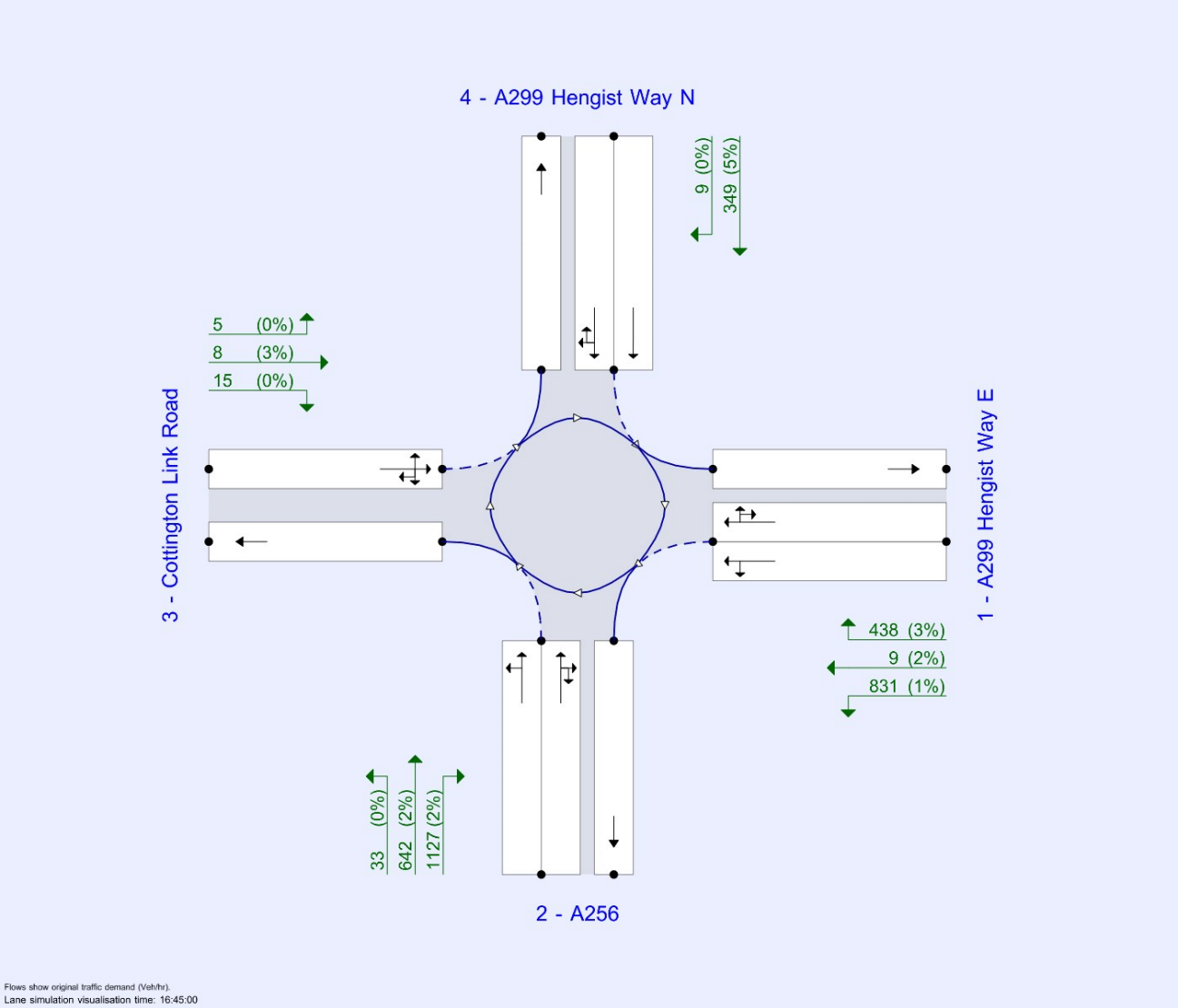
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			1564761303	404	102.98

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Base Traffic Flow	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039 Base Traffic Flow	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane simulation	✓	✓	100.000	100.000

Lane simulation - 2039 Base Traffic Flow, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	1 - A299 Hengist Way E - Lane Simulation	Arm 1: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	2.66	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A299 Hengist Way E	
2	A256	
3	Cottington Link Road	
4	A299 Hengist Way N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 Hengist Way E	7.29	10.47	9.3	42.0	60.0	14.5	
2 - A256	7.66	10.10	14.8	25.1	60.0	56.0	
3 - Cottington Link Road	2.80	4.40	6.9	22.3	60.0	21.0	
4 - A299 Hengist Way N	7.37	10.01	4.5	23.2	60.0	22.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	0.783	2881
2 - A256	0.688	2580
3 - Cottington Link Road	0.474	1168
4 - A299 Hengist Way N	0.722	2599

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
3 - Cottington Link Road	Percentage		85.00
4 - A299 Hengist Way N	Percentage		60.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A299 Hengist Way E	Evenly split	10.00
2 - A256	Evenly split	10.00
3 - Cottington Link Road	Evenly split	10.00
4 - A299 Hengist Way N	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A299 Hengist Way E	Entry	1	1	2, 3		Infinity		0	99999	
			2	1, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
2 - A256	Entry	1	1	3, 4		Infinity		0	99999	
			2	1, 2, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
4 - A299 Hengist Way N	Entry	1	2	2		Infinity		0	99999	
			3	2, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	Entry	1	1	0.391	1440
			2	0.391	1440
2 - A256	Entry	1	1	0.344	1290
			2	0.344	1290
3 - Cottington Link Road	Entry	1	1	0.474	1168
4 - A299 Hengist Way N	Entry	1	2	0.361	1300
			3	0.361	1300

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm			
			A299 Hengist Way E	A256	Cottington Link Road	A299 Hengist Way N
1 - A299 Hengist Way E	1	1		✓	✓	
		2	✓		✓	✓
2 - A256	1	1			✓	✓
		2	✓	✓		✓
3 - Cottington Link Road	1	1	✓	✓	✓	✓
4 - A299 Hengist Way N	1	2		✓		
		3		✓	✓	✓

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Base Traffic Flow	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 Hengist Way E		ONE HOUR	✓	1806	100.000
2 - A256		ONE HOUR	✓	1305	100.000
3 - Cottington Link Road		ONE HOUR	✓	76	100.000
4 - A299 Hengist Way N		ONE HOUR	✓	648	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	1234	13	559
	2 - A256	806	0	18	481
	3 - Cottington Link Road	15	42	0	19
	4 - A299 Hengist Way N	0	641	7	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	3	5	5
	2 - A256	4	0	6	10
	3 - Cottington Link Road	1	1	0	0
	4 - A299 Hengist Way N	0	8	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 Hengist Way E	5.28	147.2	F	1655	2482
2 - A256	0.36	9.1	C	1192	1788
3 - Cottington Link Road	2.33	3.3	F	69	104
4 - A299 Hengist Way N	0.23	3.0	B	592	888

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1351	338	517	1346	1387	621	0.0	4.2	0.177	B
2 - A256	982	245	429	983	1042	1434	0.0	2.0	0.115	A
3 - Cottington Link Road	56	14	1381	56	59	30	0.0	0.2	0.181	B
4 - A299 Hengist Way N	484	121	652	486	523	786	0.0	1.0	0.132	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1627	407	622	1605	1633	729	4.2	16.0	0.448	D
2 - A256	1167	292	525	1166	1238	1702	2.0	3.2	0.156	A
3 - Cottington Link Road	66	16	1658	67	67	33	0.2	0.3	0.289	C
4 - A299 Hengist Way N	586	147	765	586	624	960	1.0	1.6	0.155	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1986	496	748	1723	1791	896	16.0	80.1	1.795	F
2 - A256	1427	357	637	1427	1505	1834	3.2	8.4	0.319	C
3 - Cottington Link Road	84	21	2024	77	75	40	0.3	2.7	1.418	F
4 - A299 Hengist Way N	708	177	938	706	760	1163	1.6	2.8	0.220	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1997	499	751	1718	1782	891	80.1	148.1	4.299	F
2 - A256	1436	359	637	1422	1522	1833	8.4	9.2	0.365	C
3 - Cottington Link Road	82	20	2017	83	82	42	2.7	3.3	2.333	F
4 - A299 Hengist Way N	701	175	937	705	766	1163	2.8	2.6	0.231	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1623	406	618	1658	1709	731	148.1	142.6	5.283	F
2 - A256	1165	291	516	1165	1271	1759	9.2	3.2	0.195	B
3 - Cottington Link Road	69	17	1648	70	82	33	3.3	0.3	0.675	E
4 - A299 Hengist Way N	578	144	769	579	634	949	2.6	1.5	0.173	B

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1352	338	526	1595	1658	622	142.6	82.1	3.535	F
2 - A256	978	244	437	983	1047	1684	3.2	1.6	0.121	A
3 - Cottington Link Road	56	14	1390	57	58	29	0.3	0.1	0.202	B
4 - A299 Hengist Way N	495	124	654	495	531	794	1.5	1.1	0.134	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	929	1187	0.783	925	942	0.0	3.6	0.220	B
			2	1, 3, 4	422	1167	0.361	421	444	0.0	0.6	0.082	A
	Exit	1	1		621			621	641	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	278	1033	0.269	278	307	0.0	0.4	0.073	A
			2	1, 2, 4	704	1081	0.651	704	735	0.0	1.6	0.132	A
	Exit	1	1		1434			1434	1490	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	56	400	0.141	56	59	0.0	0.2	0.181	B
	Exit	1	1		30			30	31	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	240	585	0.410	241	260	0.0	0.5	0.133	A
			3	2, 3, 4	244	588	0.415	246	264	0.0	0.5	0.131	A
	Exit	1	1		786			786	849	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1108	1143	0.968	1088	1098	3.6	15.1	0.610	E
			2	1, 3, 4	519	1125	0.461	517	535	0.6	0.9	0.097	A
	Exit	1	1		729			729	761	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	358	1004	0.357	358	391	0.4	0.5	0.085	A
			2	1, 2, 4	809	1051	0.769	808	848	1.6	2.7	0.186	B
	Exit	1	1		1702			1702	1751	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	66	284	0.232	67	67	0.2	0.3	0.289	C
	Exit	1	1		33			33	35	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	296	563	0.526	295	312	0.5	0.8	0.154	A
			3	2, 3, 4	291	564	0.514	290	312	0.5	0.8	0.156	A
	Exit	1	1		960			960	1015	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1359	1092	1.242	1094	1134	15.1	78.8	2.563	F
			2	1, 3, 4	627	1073	0.584	630	657	0.9	1.4	0.137	A
	Exit	1	1		896			896	918	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	493	966	0.510	493	534	0.5	1.0	0.120	A
			2	1, 2, 4	934	1014	0.920	934	970	2.7	7.4	0.422	D
	Exit	1	1		1834			1834	1929	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	84	129	0.656	77	75	0.3	2.7	1.418	F
	Exit	1	1		40			40	43	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	352	526	0.669	351	378	0.8	1.4	0.220	B
			3	2, 3, 4	356	528	0.675	355	382	0.8	1.4	0.219	B
	Exit	1	1		1163			1163	1242	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1368	1091	1.253	1089	1121	78.8	146.7	6.222	F
			2	1, 3, 4	629	1071	0.587	629	660	1.4	1.4	0.140	A
	Exit	1	1		891			891	938	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	492	963	0.511	492	542	1.0	1.1	0.126	A
			2	1, 2, 4	944	1017	0.928	930	980	7.4	8.1	0.490	D
	Exit	1	1		1833			1833	1924	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	82	131	0.624	83	82	2.7	3.3	2.333	F
	Exit	1	1		42			42	45	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	350	526	0.666	352	383	1.4	1.3	0.229	B
			3	2, 3, 4	351	527	0.666	352	383	1.4	1.3	0.232	B
	Exit	1	1		1163			1163	1244	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	1114	1146	0.972	1147	1165	146.7	141.8	7.683	F
			2	1, 3, 4	510	1122	0.454	511	544	1.4	0.8	0.103	A
	Exit	1	1		731			731	791	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	357	1002	0.356	357	404	1.1	0.5	0.092	A
			2	1, 2, 4	808	1053	0.768	808	867	8.1	2.6	0.242	B
	Exit	1	1		1759			1759	1838	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	69	286	0.242	70	82	3.3	0.3	0.675	E
	Exit	1	1		33			33	36	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	289	562	0.514	290	317	1.3	0.7	0.172	B
			3	2, 3, 4	289	562	0.514	290	317	1.3	0.8	0.173	B
	Exit	1	1		949			949	1031	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	920	1184	0.777	1164	1205	141.8	81.5	5.638	F
			2	1, 3, 4	432	1164	0.371	432	453	0.8	0.6	0.081	A
	Exit	1	1		622			622	648	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	276	1030	0.268	277	307	0.5	0.3	0.074	A
			2	1, 2, 4	702	1081	0.649	706	739	2.6	1.3	0.140	A
	Exit	1	1		1684			1684	1763	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	56	397	0.142	57	58	0.3	0.1	0.202	B
	Exit	1	1		29			29	30	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	247	588	0.420	247	264	0.7	0.6	0.133	A
			3	2, 3, 4	248	586	0.424	248	267	0.8	0.5	0.135	A
	Exit	1	1		794			794	854	0.0	0.0	0.000	A

Lane simulation - 2039 Base Traffic Flow, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	2 - A256 - Lane Simulation	Arm 2: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	1.37	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039 Base Traffic Flow	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 Hengist Way E		ONE HOUR	✓	1278	100.000
2 - A256		ONE HOUR	✓	1802	100.000
3 - Cottington Link Road		ONE HOUR	✓	28	100.000
4 - A299 Hengist Way N		ONE HOUR	✓	358	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	831	9	438
	2 - A256	1127	0	33	642
	3 - Cottington Link Road	8	15	0	5
	4 - A299 Hengist Way N	0	349	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	1	2	3
	2 - A256	2	0	0	2
	3 - Cottington Link Road	3	0	0	0
	4 - A299 Hengist Way N	1	5	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 Hengist Way E	0.14	3.4	A	1172	1758
2 - A256	2.45	87.3	F	1652	2478
3 - Cottington Link Road	3.83	2.2	F	26	38
4 - A299 Hengist Way N	0.15	1.1	A	328	493

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	970	243	277	969	974	862	0.0	1.3	0.080	A
2 - A256	1366	341	344	1379	1375	902	0.0	3.2	0.168	B
3 - Cottington Link Road	20	5	1685	20	22	38	0.0	0.1	0.215	B
4 - A299 Hengist Way N	267	67	873	266	279	832	0.0	0.5	0.116	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1157	289	341	1152	1162	1014	1.3	1.7	0.091	A
2 - A256	1610	403	407	1610	1631	1086	3.2	9.3	0.298	C
3 - Cottington Link Road	24	6	1972	25	24	46	0.1	0.2	0.454	D
4 - A299 Hengist Way N	328	82	1027	327	339	970	0.5	0.6	0.128	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1402	350	417	1397	1414	1099	1.7	3.4	0.138	A
2 - A256	1996	499	499	1842	1859	1315	9.3	50.6	1.078	F
3 - Cottington Link Road	34	8	2282	27	24	58	0.2	1.9	3.069	F
4 - A299 Hengist Way N	404	101	1114	402	414	1196	0.6	1.1	0.146	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1395	349	405	1397	1425	1104	3.4	3.2	0.140	A
2 - A256	1970	492	496	1837	1870	1307	50.6	87.4	2.417	F
3 - Cottington Link Road	29	7	2279	27	29	54	1.9	2.2	3.831	F
4 - A299 Hengist Way N	389	97	1118	392	417	1188	1.1	0.8	0.148	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1154	288	331	1153	1180	1114	3.2	2.0	0.099	A
2 - A256	1615	404	414	1716	1763	1071	87.4	59.1	2.451	F
3 - Cottington Link Road	24	6	2083	27	34	47	2.2	0.4	1.418	F
4 - A299 Hengist Way N	316	79	1128	317	335	982	0.8	0.8	0.139	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	958	239	278	958	980	975	2.0	1.3	0.080	A
2 - A256	1358	339	340	1483	1568	896	59.1	12.9	1.073	F
3 - Cottington Link Road	21	5	1785	21	23	38	0.4	0.1	0.400	C
4 - A299 Hengist Way N	267	67	985	268	285	821	0.8	0.5	0.129	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	635	1313	0.483	635	633	0.0	0.8	0.089	A
			2	1, 3, 4	335	1291	0.260	334	341	0.0	0.4	0.064	A
	Exit	1	1		862			862	863	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	434	1147	0.379	436	430	0.0	0.4	0.078	A
			2	1, 2, 4	931	1146	0.813	943	945	0.0	2.8	0.208	B
	Exit	1	1		902			902	915	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	20	294	0.069	20	22	0.0	0.1	0.215	B
	Exit	1	1		38			38	38	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	130	559	0.233	130	137	0.0	0.3	0.116	A
			3	2, 3, 4	137	560	0.245	136	142	0.0	0.3	0.116	A
	Exit	1	1		832			832	834	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	759	1289	0.589	756	755	0.8	1.3	0.103	A
			2	1, 3, 4	397	1268	0.313	397	407	0.4	0.4	0.069	A
	Exit	1	1		1014			1014	1018	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	551	1125	0.490	549	562	0.4	1.2	0.101	A
			2	1, 2, 4	1060	1125	0.943	1061	1070	2.8	8.2	0.399	C
	Exit	1	1		1086			1086	1095	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	24	180	0.133	25	24	0.1	0.2	0.454	D
	Exit	1	1		46			46	46	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	161	525	0.306	161	169	0.3	0.3	0.125	A
			3	2, 3, 4	167	529	0.315	166	170	0.3	0.3	0.130	A
	Exit	1	1		970			970	997	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	912	1258	0.725	910	915	1.3	2.6	0.169	B
			2	1, 3, 4	489	1236	0.396	487	498	0.4	0.8	0.080	A
	Exit	1	1		1099			1099	1102	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	752	1093	0.687	750	752	1.2	2.2	0.168	B
			2	1, 2, 4	1244	1089	1.140	1092	1106	8.2	48.3	1.621	F
	Exit	1	1		1315			1315	1329	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	34	60	0.556	27	24	0.2	1.9	3.069	F
	Exit	1	1		58			58	57	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	202	508	0.398	201	204	0.3	0.5	0.145	A
			3	2, 3, 4	201	510	0.395	200	210	0.3	0.6	0.147	A
	Exit	1	1		1196			1196	1221	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	910	1262	0.721	913	924	2.6	2.6	0.172	B
			2	1, 3, 4	485	1241	0.391	484	501	0.8	0.6	0.080	A
	Exit	1	1		1104			1104	1121	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	738	1093	0.676	740	757	2.2	1.9	0.166	A
			2	1, 2, 4	1231	1093	1.126	1097	1113	48.3	85.5	3.762	F
	Exit	1	1		1307			1307	1343	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	29	59	0.504	27	29	1.9	2.2	3.831	F
	Exit	1	1		54			54	55	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	195	508	0.384	197	207	0.5	0.4	0.147	A
			3	2, 3, 4	195	508	0.382	195	210	0.6	0.5	0.148	A
	Exit	1	1		1188			1188	1221	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	751	1291	0.581	751	764	2.6	1.5	0.115	A
			2	1, 3, 4	403	1264	0.318	403	415	0.6	0.5	0.069	A
	Exit	1	1		1114			1114	1149	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	604	1121	0.539	605	621	1.9	1.2	0.123	A
			2	1, 2, 4	1010	1120	0.902	1111	1142	85.5	57.9	3.850	F
	Exit	1	1		1071			1071	1107	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	24	133	0.185	27	34	2.2	0.4	1.418	F
	Exit	1	1		47			47	47	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	155	508	0.305	155	165	0.4	0.4	0.138	A
			3	2, 3, 4	161	505	0.320	162	170	0.5	0.4	0.141	A
	Exit	1	1		982			982	1009	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2, 3	625	1313	0.476	627	636	1.5	0.9	0.090	A
			2	1, 3, 4	332	1291	0.257	331	343	0.5	0.4	0.062	A
	Exit	1	1		975			975	1056	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	467	1148	0.406	467	488	1.2	0.7	0.090	A
			2	1, 2, 4	891	1145	0.778	1015	1080	57.9	12.2	1.623	F
	Exit	1	1		896			896	925	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 2, 3, 4	21	257	0.082	21	23	0.4	0.1	0.400	C
	Exit	1	1		38			38	39	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	2	131	535	0.245	132	140	0.4	0.3	0.129	A
			3	2, 3, 4	136	533	0.255	136	145	0.4	0.3	0.129	A
	Exit	1	1		821			821	836	0.0	0.0	0.000	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 3_Canterbury Rd (W)_A299.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 3_Canterbury Road West_A299
Report generation date: 18/03/2019 12:27:04

»2039 Base , AM
»2039 Base, PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Base									
Arm 1	0.1	0.11	0.07	A	0.05	0.0	0.09	0.03	A	0.04
Arm 2	1.0	0.05	0.49	A		0.9	0.04	0.47	A	
Arm 3	1.0	0.05	0.50	A		0.7	0.04	0.42	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	14/12/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Base , AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Canterbury Rd (W)	
2	A299 (S)	
3	A299 (W)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.00	5.10	5.7	25.0	60.0	23.0	
2	7.30	9.50	4.9	26.0	60.0	15.0	
3	7.30	9.00	15.2	26.0	60.0	25.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.487	1242
2	0.737	2643
3	0.732	2665

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	40	100.000
2		ONE HOUR	✓	1091	100.000
3		ONE HOUR	✓	1125	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	4	36
	2	13	0	1078
	3	32	1093	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	3
	2	0	0	7
	3	2	8	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.07	0.11	0.1	A	37	55
2	0.49	0.05	1.0	A	1001	1502
3	0.50	0.05	1.0	A	1032	1548

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	30	8	821	789	0.038	30	34	0.0	0.0	0.079	A
2	821	205	27	2453	0.335	819	824	0.0	0.5	0.037	A
3	847	212	10	2465	0.344	845	837	0.0	0.5	0.037	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	36	9	982	707	0.051	36	40	0.0	0.1	0.089	A
2	981	245	32	2449	0.400	980	986	0.5	0.7	0.041	A
3	1011	253	12	2464	0.410	1011	1001	0.5	0.7	0.041	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	44	11	1202	594	0.074	44	49	0.1	0.1	0.109	A
2	1201	300	40	2444	0.492	1200	1207	0.7	1.0	0.048	A
3	1239	310	14	2462	0.503	1237	1225	0.7	1.0	0.049	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	44	11	1203	593	0.074	44	50	0.1	0.1	0.109	A
2	1201	300	40	2444	0.492	1201	1208	1.0	1.0	0.048	A
3	1239	310	14	2462	0.503	1239	1227	1.0	1.0	0.049	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	36	9	984	706	0.051	36	41	0.1	0.1	0.090	A
2	981	245	32	2449	0.401	982	987	1.0	0.7	0.041	A
3	1011	253	12	2464	0.410	1013	1003	1.0	0.7	0.041	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	30	8	824	788	0.038	30	34	0.1	0.0	0.079	A
2	821	205	27	2453	0.335	822	827	0.7	0.5	0.037	A
3	847	212	10	2465	0.344	848	839	0.7	0.5	0.037	A

2039 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	19	100.000
2		ONE HOUR	✓	1086	100.000
3		ONE HOUR	✓	1003	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	0	19
	2	0	0	1086
	3	34	969	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	0
	2	0	0	3
	3	1	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.03	0.09	0.0	A	17	26
2	0.47	0.04	0.9	A	997	1495
3	0.42	0.04	0.7	A	920	1381

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	14	4	728	881	0.016	14	26	0.0	0.0	0.069	A
2	818	204	14	2556	0.320	816	728	0.0	0.5	0.034	A
3	755	189	0	2614	0.289	753	830	0.0	0.4	0.032	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	17	4	871	810	0.021	17	31	0.0	0.0	0.076	A
2	976	244	17	2554	0.382	976	871	0.5	0.6	0.038	A
3	902	225	0	2614	0.345	901	993	0.4	0.5	0.035	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	21	5	1066	713	0.029	21	37	0.0	0.0	0.087	A
2	1196	299	21	2551	0.469	1195	1066	0.6	0.9	0.044	A
3	1104	276	0	2614	0.422	1104	1216	0.5	0.7	0.040	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	21	5	1067	712	0.029	21	37	0.0	0.0	0.087	A
2	1196	299	21	2551	0.469	1196	1067	0.9	0.9	0.044	A
3	1104	276	0	2614	0.422	1104	1217	0.7	0.7	0.040	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	17	4	872	809	0.021	17	31	0.0	0.0	0.076	A
2	976	244	17	2554	0.382	977	872	0.9	0.6	0.038	A
3	902	225	0	2614	0.345	902	994	0.7	0.5	0.035	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	14	4	730	880	0.016	14	26	0.0	0.0	0.069	A
2	818	204	14	2556	0.320	818	730	0.6	0.5	0.035	A
3	755	189	0	2614	0.289	756	833	0.5	0.4	0.032	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 4_A256_B2190_R1_AM_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 4_A299_B2190\Strategic Modelling scenarios
Report generation date: 18/03/2019 13:26:34

«2039 Baseline Traffic, AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	2039 Baseline Traffic					
1 - Hengist way E	8.1	0.42	0.90	D	1.80	-18 % [2 - Tothill Street]
2 - Tothill Street	66.3	7.35	1.32	F		
3 - A299 W	4.9	0.24	0.84	B		
4 - B2190 N	53.9	2.54	1.08	F		

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

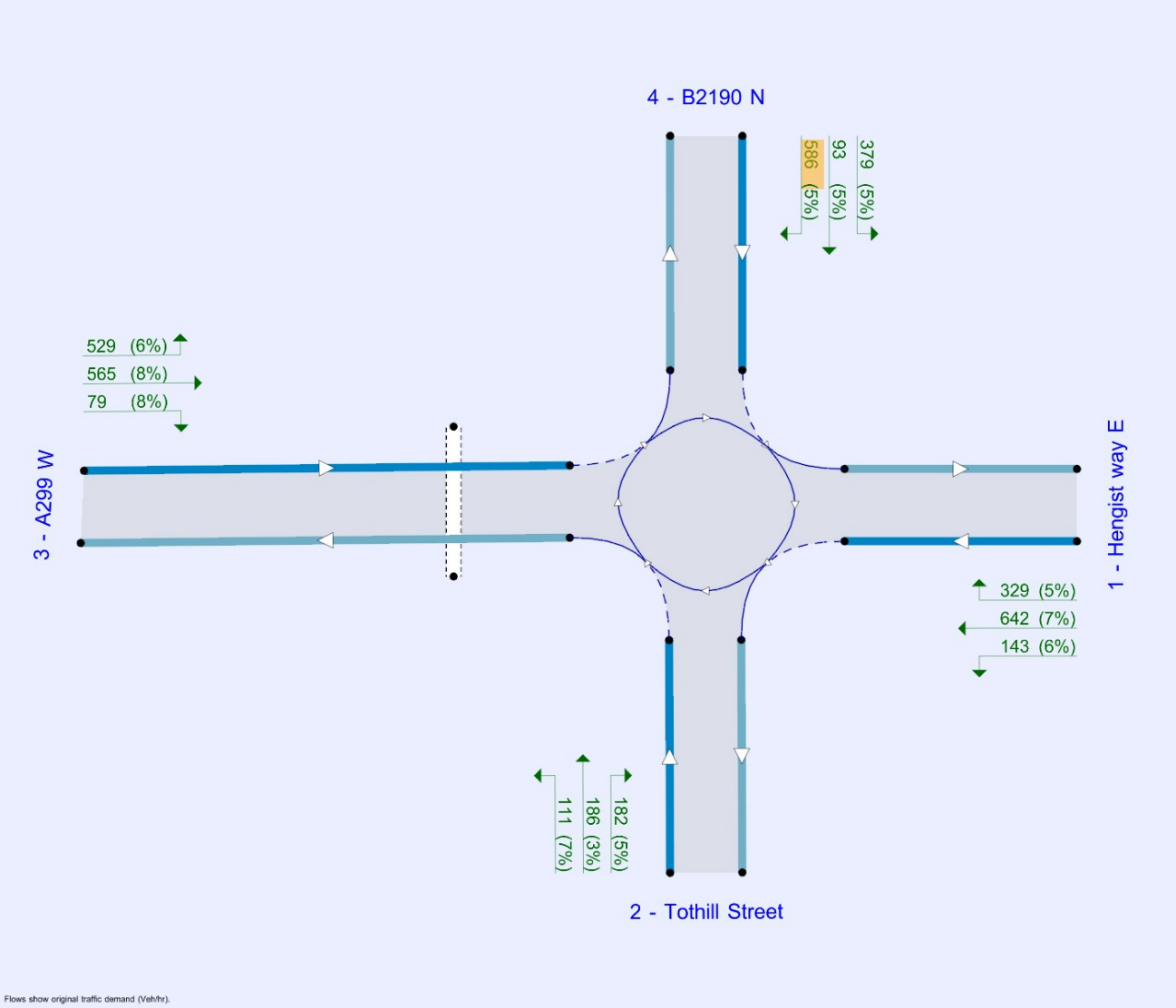
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	1.80	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-18	2 - Tothill Street

Arms

Arms

Arm	Name	Description
1	Hengist way E	
2	Tothill Street	
3	A299 W	
4	B2190 N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Hengist way E	7.50	8.80	15.6	39.0	65.0	14.5	
2 - Tothill Street	3.20	4.01	2.3	22.0	65.0	31.5	
3 - A299 W	7.47	7.47	0.0	34.0	65.0	28.0	
4 - B2190 N	7.33	7.33	0.0	20.0	65.0	23.0	

Pelican/Puffin Crossings

Arm	Space between crossing and junc. entry (Signalised) (PCU)	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)
3 - A299 W	7.00	3.00	2.90	1.00	6.00	6.00	7.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Hengist way E	0.728	2784
2 - Tothill Street	0.428	1084
3 - A299 W	0.639	2325
4 - B2190 N	0.631	2275

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Hengist way E	Percentage		66.00
2 - Tothill Street	Percentage		126.00
3 - A299 W	Percentage		88.00
4 - B2190 N	Percentage		67.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Hengist way E		ONE HOUR	✓	1114	100.000
2 - Tothill Street		ONE HOUR	✓	479	100.000
3 - A299 W		ONE HOUR	✓	1173	100.000
4 - B2190 N		ONE HOUR	✓	1058	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - Hengist way E		
2 - Tothill Street		
3 - A299 W	[ONEHOUR]	60.00
4 - B2190 N		

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	143	642	329
	2 - Tothill Street	182	0	111	186
	3 - A299 W	565	79	0	529
	4 - B2190 N	379	93	586	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	6	7	5
	2 - Tothill Street	5	0	7	3
	3 - A299 W	8	8	0	6
	4 - B2190 N	5	5	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Hengist way E	0.90	0.42	8.1	D	1022	1533
2 - Tothill Street	1.32	7.35	66.3	F	440	659
3 - A299 W	0.84	0.24	4.9	B	1076	1615
4 - B2190 N	1.08	2.54	53.9	F	971	1456

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	839	210	565		1460	0.575	833	840	0.0	1.3	0.095	A
2 - Tothill Street	361	90	1163		670	0.538	356	235	0.0	1.1	0.188	B
3 - A299 W	883	221	520	45.17	1518	0.582	878	1000	0.0	1.4	0.093	A
4 - B2190 N	797	199	617		1185	0.672	789	780	0.0	2.0	0.149	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1001	250	674		1408	0.711	997	1003	1.3	2.4	0.145	A
2 - Tothill Street	431	108	1390		547	0.788	422	281	1.1	3.2	0.454	D
3 - A299 W	1055	264	619	53.94	1497	0.704	1051	1193	1.4	2.3	0.133	A
4 - B2190 N	951	238	737		1133	0.839	940	932	2.0	4.7	0.296	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1227	307	765		1364	0.899	1207	1150	2.4	7.2	0.345	C
2 - Tothill Street	527	132	1638		411	1.283	405	334	3.2	34.0	3.117	F
3 - A299 W	1291	323	667	66.06	1540	0.839	1282	1376	2.3	4.8	0.224	B
4 - B2190 N	1165	291	857		1081	1.078	1058	1092	4.7	31.3	1.235	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1227	307	777		1359	0.902	1223	1158	7.2	8.1	0.420	D
2 - Tothill Street	527	132	1661		399	1.323	398	338	34.0	66.3	7.351	F
3 - A299 W	1291	323	667	66.06	1544	0.837	1291	1392	4.8	4.9	0.236	B
4 - B2190 N	1165	291	860		1080	1.079	1075	1098	31.3	53.9	2.540	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1001	250	778		1359	0.737	1022	1089	8.1	2.9	0.188	B
2 - Tothill Street	431	108	1500		487	0.884	480	300	66.3	54.0	7.134	F
3 - A299 W	1055	264	670	53.94	1542	0.684	1065	1310	4.9	2.2	0.129	A
4 - B2190 N	951	238	767		1120	0.849	1100	969	53.9	16.7	2.006	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	839	210	608		1440	0.583	845	950	2.9	1.4	0.102	A
2 - Tothill Street	361	90	1209		645	0.559	571	243	54.0	1.4	2.134	F
3 - A299 W	883	221	688	45.17	1474	0.599	886	1092	2.2	1.5	0.102	A
4 - B2190 N	797	199	703		1149	0.693	854	871	16.7	2.4	0.242	B

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 4_A256_B2190_R1_PM_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 4_A299_B2190\Strategic Modelling scenarios
Report generation date: 18/03/2019 13:30:46

«2039 Baseline Traffic, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	2039 Baseline Traffic					
1 - Hengist way E	15.7	0.82	0.96	E	1.11	-8 % [3 - A299 W]
2 - Tothill Street	4.8	0.88	0.85	F		
3 - A299 W	58.9	1.79	1.05	F		
4 - B2190 N	2.6	0.19	0.73	B		

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

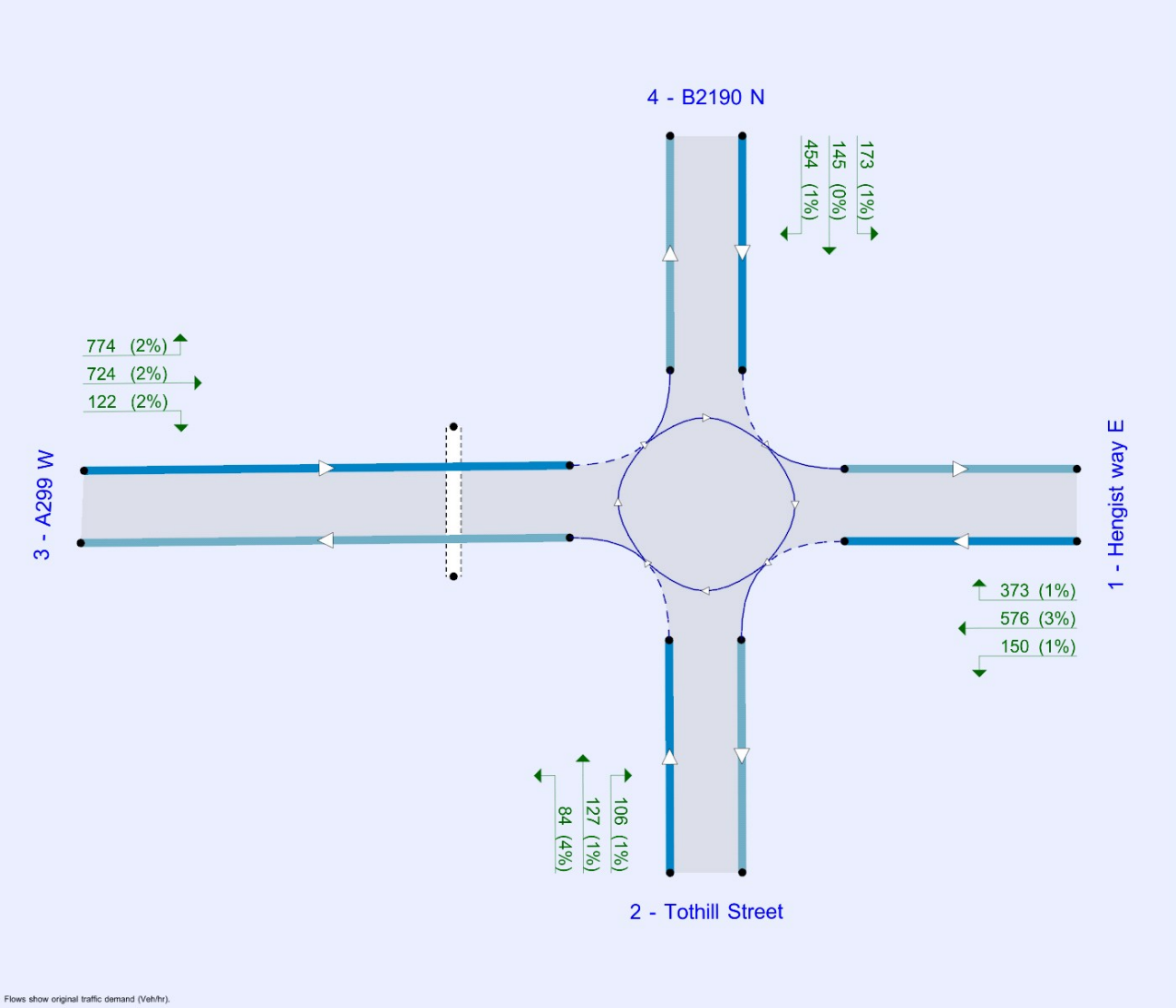
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	1.11	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-8	3 - A299 W

Arms

Arms

Arm	Name	Description
1	Hengist way E	
2	Tothill Street	
3	A299 W	
4	B2190 N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Hengist way E	7.50	8.80	15.6	39.0	65.0	14.5	
2 - Tothill Street	3.20	4.01	2.3	22.0	65.0	31.5	
3 - A299 W	7.47	7.47	0.0	34.0	65.0	28.0	
4 - B2190 N	7.33	7.33	0.0	20.0	65.0	23.0	

Pelican/Puffin Crossings

Arm	Space between crossing and junc. entry (Signalised) (PCU)	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)
3 - A299 W	7.00	3.00	2.90	1.00	6.00	6.00	7.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Hengist way E	0.728	2784
2 - Tothill Street	0.428	1084
3 - A299 W	0.639	2325
4 - B2190 N	0.631	2275

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Hengist way E	Percentage		58.00
2 - Tothill Street	Percentage		100.00
3 - A299 W	Percentage		91.00
4 - B2190 N	Percentage		72.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Hengist way E		ONE HOUR	✓	1099	100.000
2 - Tothill Street		ONE HOUR	✓	317	100.000
3 - A299 W		ONE HOUR	✓	1620	100.000
4 - B2190 N		ONE HOUR	✓	772	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - Hengist way E		
2 - Tothill Street		
3 - A299 W	[ONEHOUR]	60.00
4 - B2190 N		

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	150	576	373
	2 - Tothill Street	106	0	84	127
	3 - A299 W	724	122	0	774
	4 - B2190 N	173	145	454	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	1	3	1
	2 - Tothill Street	1	0	4	1
	3 - A299 W	2	2	0	2
	4 - B2190 N	1	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Hengist way E	0.96	0.82	15.7	E	1008	1513
2 - Tothill Street	0.85	0.88	4.8	F	291	436
3 - A299 W	1.05	1.79	58.9	F	1487	2230
4 - B2190 N	0.73	0.19	2.6	B	708	1063

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	827	207	540		1357	0.610	821	749	0.0	1.5	0.111	A
2 - Tothill Street	239	60	1049		616	0.388	236	312	0.0	0.6	0.157	A
3 - A299 W	1220	305	452	45.17	1711	0.713	1210	833	0.0	2.4	0.118	A
4 - B2190 N	581	145	711		1299	0.448	578	951	0.0	0.8	0.083	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	988	247	646		1312	0.753	982	897	1.5	2.9	0.179	B
2 - Tothill Street	285	71	1255		527	0.540	283	373	0.6	1.1	0.244	B
3 - A299 W	1456	364	541	53.94	1745	0.835	1447	997	2.4	4.7	0.196	B
4 - B2190 N	694	174	850		1235	0.562	692	1138	0.8	1.3	0.110	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1210	303	781		1256	0.963	1172	1047	2.9	12.4	0.556	D
2 - Tothill Street	349	87	1509		419	0.834	338	444	1.1	3.9	0.668	E
3 - A299 W	1784	446	646	66.06	1702	1.048	1666	1201	4.7	34.2	0.867	F
4 - B2190 N	850	212	983		1174	0.724	845	1329	1.3	2.5	0.180	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1210	303	786		1254	0.965	1197	1059	12.4	15.7	0.816	E
2 - Tothill Street	349	87	1533		408	0.855	346	450	3.9	4.8	0.884	F
3 - A299 W	1784	446	660	66.06	1694	1.053	1685	1219	34.2	58.9	1.789	F
4 - B2190 N	850	212	995		1168	0.728	850	1350	2.5	2.6	0.188	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	988	247	668		1303	0.758	1037	1002	15.7	3.3	0.263	C
2 - Tothill Street	285	71	1307		505	0.564	299	398	4.8	1.3	0.308	C
3 - A299 W	1456	364	572	53.94	1745	0.835	1667	1034	58.9	6.2	1.063	F
4 - B2190 N	694	174	971		1179	0.588	699	1268	2.6	1.5	0.126	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	827	207	546		1354	0.611	834	764	3.3	1.6	0.117	A
2 - Tothill Street	239	60	1064		609	0.392	241	317	1.3	0.7	0.164	A
3 - A299 W	1220	305	461	45.17	1809	0.674	1236	844	6.2	2.1	0.108	A
4 - B2190 N	581	145	726		1292	0.450	584	970	1.5	0.8	0.085	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 5_R1_base+validated.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 5_B2190_Minster Rd
Report generation date: 19/03/2019 11:56:33

»2039 Base, AM
»2039 Base, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	2039 Base							
1 - B2190 E	1.0	0.05	0.51	0.07	0.6	0.04	0.38	0.07
2 - B2190 S	1.5	0.07	0.60		2.1	0.09	0.68	
3 - Minster Road	0.3	0.10	0.21		0.2	0.10	0.16	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

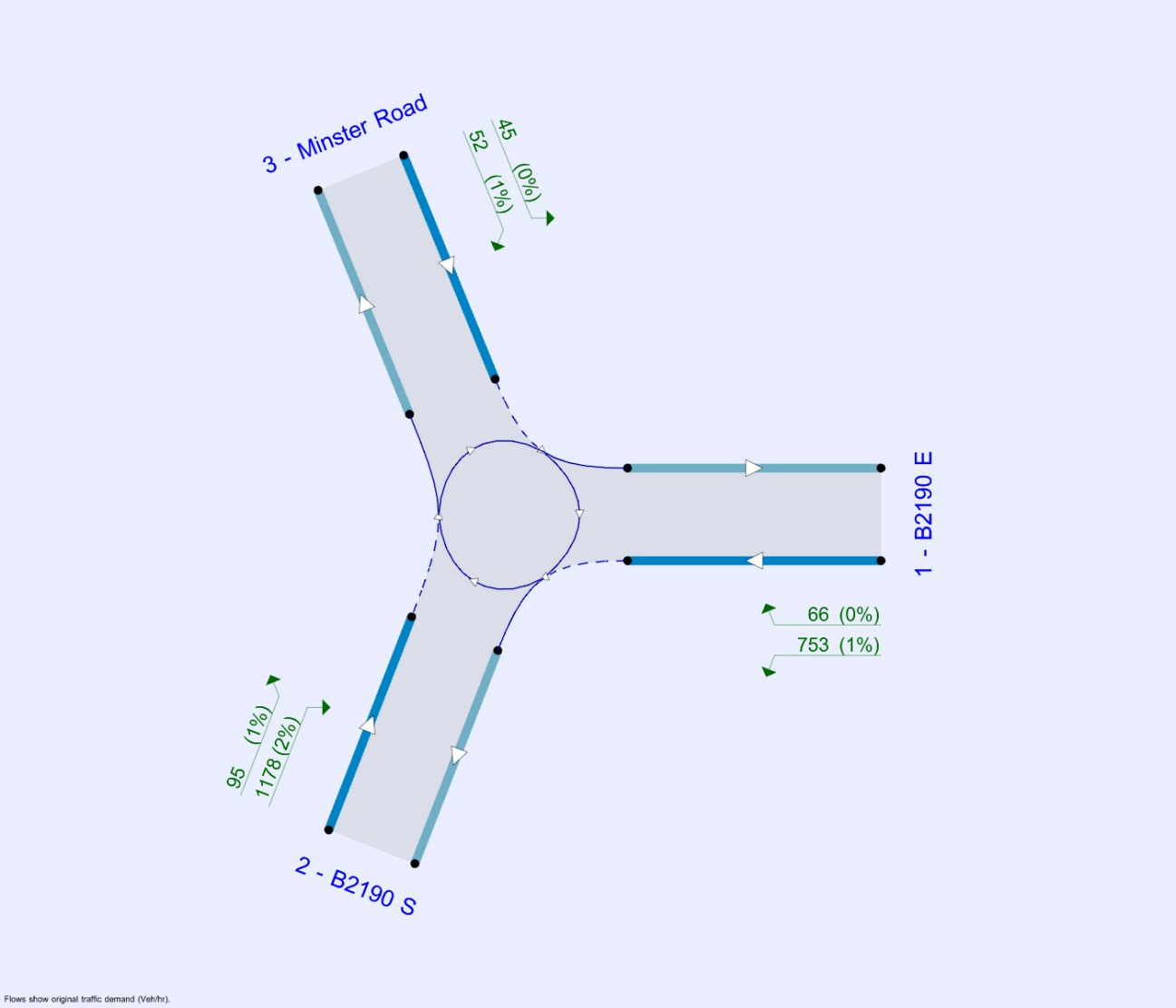
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
		0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2039 Base	AM	ONE HOUR	07:30	09:00	15
D10	2039 Base	PM	ONE HOUR	16:30	18:00	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2039 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.07	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	B2190 E	
2	B2190 S	
3	Minster Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - B2190 E	7.49	7.49	0.0	25.0	47.0	8.5	
2 - B2190 S	7.00	7.00	0.0	26.0	47.0	29.0	
3 - Minster Road	2.44	6.54	16.9	17.0	47.0	25.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - B2190 E	0.792	2461
2 - B2190 S	0.712	2152
3 - Minster Road	0.574	1448

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2039 Base	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B2190 E		✓	1030	100.000
2 - B2190 S		✓	1092	100.000
3 - Minster Road		✓	146	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - B2190 E	2 - B2190 S	3 - Minster Road
From	1 - B2190 E	0	982	48
	2 - B2190 S	1018	0	74
	3 - Minster Road	69	77	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - B2190 E	2 - B2190 S	3 - Minster Road
From	1 - B2190 E	0	7	7
	2 - B2190 S	5	0	3
	3 - Minster Road	0	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
1 - B2190 E	0.51	0.05	1.0	A
2 - B2190 S	0.60	0.07	1.5	A
3 - Minster Road	0.21	0.10	0.3	A

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	775	58	2256	0.344	773	0.5	0.040	A
2 - B2190 S	822	36	2026	0.406	819	0.7	0.050	A
3 - Minster Road	110	764	977	0.112	109	0.1	0.069	A

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	926	69	2248	0.412	925	0.7	0.045	A
2 - B2190 S	982	43	2021	0.486	981	0.9	0.058	A
3 - Minster Road	131	914	888	0.148	131	0.2	0.079	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	1134	85	2236	0.507	1133	1.0	0.054	A
2 - B2190 S	1202	53	2014	0.597	1200	1.5	0.074	A
3 - Minster Road	161	1119	765	0.210	160	0.3	0.099	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	1134	85	2236	0.507	1134	1.0	0.054	A
2 - B2190 S	1202	53	2014	0.597	1202	1.5	0.074	A
3 - Minster Road	161	1121	764	0.210	161	0.3	0.099	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	926	69	2248	0.412	927	0.7	0.045	A
2 - B2190 S	982	43	2021	0.486	984	1.0	0.058	A
3 - Minster Road	131	917	886	0.148	132	0.2	0.080	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	775	58	2256	0.344	776	0.5	0.041	A
2 - B2190 S	822	36	2026	0.406	823	0.7	0.050	A
3 - Minster Road	110	767	975	0.113	110	0.1	0.069	A

2039 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.07	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D10	2039 Base	PM	ONE HOUR	16:30	18:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - B2190 E		✓	819	100.000
2 - B2190 S		✓	1273	100.000
3 - Minster Road		✓	97	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - B2190 E	2 - B2190 S	3 - Minster Road
From	1 - B2190 E	0	753	66
	2 - B2190 S	1178	0	95
	3 - Minster Road	45	52	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - B2190 E	2 - B2190 S	3 - Minster Road
From	1 - B2190 E	0	1	0
	2 - B2190 S	2	0	1
	3 - Minster Road	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS
1 - B2190 E	0.38	0.04	0.6	A
2 - B2190 S	0.68	0.09	2.1	A
3 - Minster Road	0.16	0.10	0.2	A

Main Results for each time segment

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	617	39	2408	0.256	615	0.3	0.033	A
2 - B2190 S	958	50	2077	0.461	955	0.9	0.053	A
3 - Minster Road	73	884	926	0.079	73	0.1	0.070	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	736	47	2402	0.307	736	0.4	0.036	A
2 - B2190 S	1144	59	2070	0.553	1143	1.2	0.065	A
3 - Minster Road	87	1058	824	0.106	87	0.1	0.081	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	902	57	2393	0.377	901	0.6	0.040	A
2 - B2190 S	1402	73	2061	0.680	1398	2.1	0.090	A
3 - Minster Road	107	1294	687	0.156	107	0.2	0.103	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	902	57	2393	0.377	902	0.6	0.040	A
2 - B2190 S	1402	73	2061	0.680	1402	2.1	0.091	A
3 - Minster Road	107	1297	685	0.156	107	0.2	0.104	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	736	47	2401	0.307	737	0.4	0.036	A
2 - B2190 S	1144	59	2070	0.553	1148	1.2	0.065	A
3 - Minster Road	87	1062	822	0.106	87	0.1	0.082	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - B2190 E	617	39	2407	0.256	617	0.3	0.034	A
2 - B2190 S	958	50	2077	0.461	960	0.9	0.054	A
3 - Minster Road	73	888	923	0.079	73	0.1	0.071	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 6_A253_Willetts Hill_R1_AM_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 6_A299_A253\Strategic Model Scenario
Report generation date: 18/03/2019 13:42:00

«2039 Baseline Traffic, AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	2039 Baseline Traffic					
1 - A299 E	5.8	0.24	0.86	B	0.57	-19 % [3 - A253 Canterbury Road (W)]
2 - Willetts Hill S	0.1	0.07	0.13	A		
3 - A253 Canterbury Road (W)	11.8	2.11	0.99	F		
4 - A299 (N)	10.5	0.61	0.93	E		
5 - Seamark Road	0.0	0.08	0.04	A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

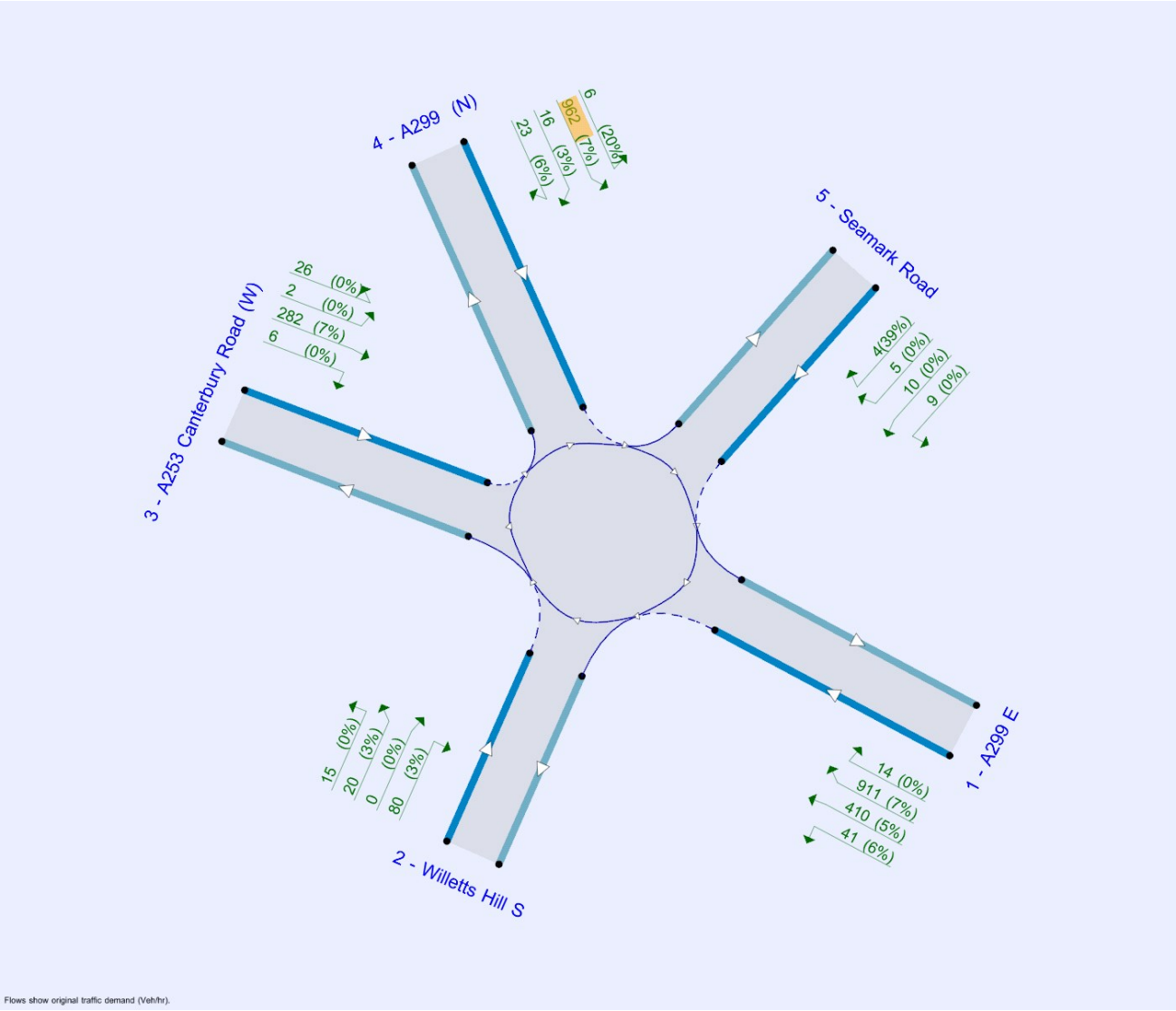
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	3 - A253 Canterbury Road (W) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	0.57	D

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-19	3 - A253 Canterbury Road (W)

Arms

Arms

Arm	Name	Description
1	A299 E	
2	Willetts Hill S	
3	A253 Canterbury Road (W)	
4	A299 (N)	
5	Seamark Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 E	7.10	7.41	13.0	43.9	75.0	18.5	
2 - Willetts Hill S	2.49	8.24	27.5	19.7	76.0	30.0	
3 - A253 Canterbury Road (W)	4.70	8.79	31.2	16.8	76.0	35.0	
4 - A299 (N)	7.36	7.36	0.0	17.6	76.8	44.5	
5 - Seamark Road	3.16	7.58	11.2	29.1	75.0	31.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 E	0.606	2387
2 - Willetts Hill S	0.497	1797
3 - A253 Canterbury Road (W)	0.557	2236
4 - A299 (N)	0.528	2103
5 - Seamark Road	0.468	1565

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A299 E	Percentage		80.00
2 - Willetts Hill S	Percentage		100.00
3 - A253 Canterbury Road (W)	Percentage		24.00
4 - A299 (N)	Percentage		68.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 E		ONE HOUR	✓	1376	100.000
2 - Willetts Hill S		ONE HOUR	✓	115	100.000
3 - A253 Canterbury Road (W)		ONE HOUR	✓	316	100.000
4 - A299 (N)		ONE HOUR	✓	1007	100.000
5 - Seamark Road		ONE HOUR	✓	28	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	41	410	911	14
	2 - Willetts Hill S	80	0	15	20	0
	3 - A253 Canterbury Road (W)	282	6	0	26	2
	4 - A299 (N)	962	16	23	0	6
	5 - Seamark Road	9	10	5	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	6	5	7	0
	2 - Willetts Hill S	3	0	0	3	0
	3 - A253 Canterbury Road (W)	7	0	0	0	0
	4 - A299 (N)	7	3	6	0	20
	5 - Seamark Road	0	0	0	39	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 E	0.86	0.24	5.8	B	1263	1894
2 - Willetts Hill S	0.13	0.07	0.1	A	106	158
3 - A253 Canterbury Road (W)	0.99	2.11	11.8	F	290	435
4 - A299 (N)	0.93	0.61	10.5	E	924	1386
5 - Seamark Road	0.04	0.08	0.0	A	26	39

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1036	259	48	1774	0.584	1030	992	0.0	1.4	0.080	A
2 - Willetts Hill S	87	22	1024	1223	0.071	86	55	0.0	0.1	0.053	A
3 - A253 Canterbury Road (W)	238	59	771	402	0.593	232	339	0.0	1.4	0.345	C
4 - A299 (N)	758	190	284	1236	0.613	752	719	0.0	1.6	0.122	A
5 - Seamark Road	21	5	1019	1000	0.021	21	16	0.0	0.0	0.061	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1237	309	57	1769	0.699	1233	1189	1.4	2.3	0.111	A
2 - Willetts Hill S	103	26	1225	1119	0.092	103	65	0.1	0.1	0.059	A
3 - A253 Canterbury Road (W)	284	71	923	381	0.745	279	406	1.4	2.6	0.563	D
4 - A299 (N)	905	226	341	1216	0.745	900	861	1.6	2.8	0.187	B
5 - Seamark Road	25	6	1221	905	0.028	25	20	0.0	0.0	0.068	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1515	379	69	1764	0.859	1502	1423	2.3	5.5	0.219	B
2 - Willetts Hill S	127	32	1492	982	0.129	126	79	0.1	0.1	0.070	A
3 - A253 Canterbury Road (W)	348	87	1124	354	0.983	324	494	2.6	8.6	1.391	F
4 - A299 (N)	1109	277	401	1195	0.928	1084	1047	2.8	9.0	0.464	D
5 - Seamark Road	31	8	1461	791	0.039	31	24	0.0	0.0	0.079	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1515	379	70	1763	0.859	1514	1450	5.5	5.8	0.238	B
2 - Willetts Hill S	127	32	1504	976	0.130	127	80	0.1	0.1	0.071	A
3 - A253 Canterbury Road (W)	348	87	1132	353	0.986	335	498	8.6	11.8	2.110	F
4 - A299 (N)	1109	277	411	1191	0.931	1103	1056	9.0	10.5	0.607	E
5 - Seamark Road	31	8	1490	778	0.040	31	24	0.0	0.0	0.080	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1237	309	59	1768	0.700	1251	1256	5.8	2.4	0.119	A
2 - Willetts Hill S	103	26	1243	1110	0.093	104	67	0.1	0.1	0.060	A
3 - A253 Canterbury Road (W)	284	71	934	380	0.749	317	412	11.8	3.5	1.156	F
4 - A299 (N)	905	226	376	1203	0.752	934	876	10.5	3.2	0.245	B
5 - Seamark Road	25	6	1290	872	0.029	25	20	0.0	0.0	0.071	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1036	259	49	1773	0.584	1040	1017	2.4	1.4	0.082	A
2 - Willetts Hill S	87	22	1033	1218	0.071	87	55	0.1	0.1	0.053	A
3 - A253 Canterbury Road (W)	238	59	777	401	0.594	246	342	3.5	1.5	0.405	C
4 - A299 (N)	758	190	296	1231	0.616	764	727	3.2	1.6	0.130	A
5 - Seamark Road	21	5	1044	988	0.021	21	17	0.0	0.0	0.062	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 6_A253_Willetts Hill_R1_PM_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 6_A299_A253\Strategic Model Scenario
Report generation date: 18/03/2019 13:49:02

«2039 Baseline Traffic, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	2039 Baseline Traffic					
1 - A299 E	3.9	0.16	0.80	A	0.94	-18 % [3 - A253 Canterbury Road (W)]
2 - Willetts Hill S	0.1	0.06	0.08	A		
3 - A253 Canterbury Road (W)	36.7	3.27	1.09	F		
4 - A299 (N)	15.0	0.76	0.96	E		
5 - Seamark Road	0.0	0.09	0.04	A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

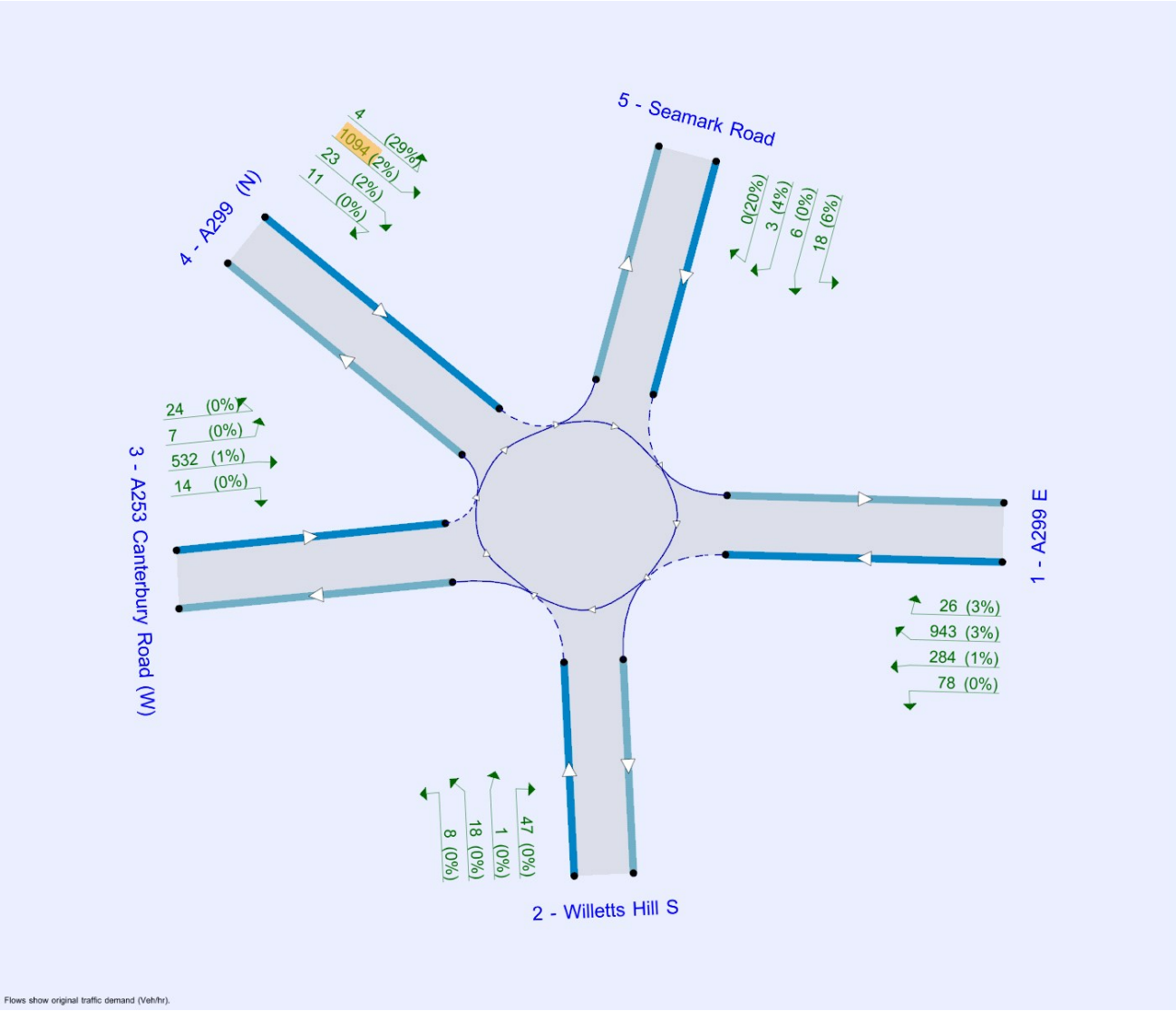
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	3 - A253 Canterbury Road (W) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	0.94	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-18	3 - A253 Canterbury Road (W)

Arms

Arms

Arm	Name	Description
1	A299 E	
2	Willetts Hill S	
3	A253 Canterbury Road (W)	
4	A299 (N)	
5	Seamark Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 E	7.10	7.41	13.0	43.9	75.0	18.5	
2 - Willetts Hill S	2.49	8.24	27.5	19.7	76.0	30.0	
3 - A253 Canterbury Road (W)	4.70	8.79	31.2	16.8	76.0	35.0	
4 - A299 (N)	7.36	7.36	0.0	17.6	76.8	44.5	
5 - Seamark Road	3.16	7.58	11.2	29.1	75.0	31.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 E	0.606	2387
2 - Willetts Hill S	0.497	1797
3 - A253 Canterbury Road (W)	0.557	2236
4 - A299 (N)	0.528	2103
5 - Seamark Road	0.468	1565

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A299 E	Percentage		80.00
2 - Willetts Hill S	Percentage		100.00
3 - A253 Canterbury Road (W)	Percentage		37.00
4 - A299 (N)	Percentage		75.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 E		ONE HOUR	✓	1331	100.000
2 - Willetts Hill S		ONE HOUR	✓	74	100.000
3 - A253 Canterbury Road (W)		ONE HOUR	✓	577	100.000
4 - A299 (N)		ONE HOUR	✓	1132	100.000
5 - Seamark Road		ONE HOUR	✓	27	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	78	284	943	26
	2 - Willetts Hill S	47	0	8	18	1
	3 - A253 Canterbury Road (W)	532	14	0	24	7
	4 - A299 (N)	1094	23	11	0	4
	5 - Seamark Road	18	6	3	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	50	0	1	3	3
	2 - Willetts Hill S	0	0	0	0	0
	3 - A253 Canterbury Road (W)	1	0	0	0	0
	4 - A299 (N)	2	2	0	0	29
	5 - Seamark Road	6	0	4	20	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 E	0.80	0.16	3.9	A	1221	1832
2 - Willetts Hill S	0.08	0.06	0.1	A	68	102
3 - A253 Canterbury Road (W)	1.09	3.27	36.7	F	529	794
4 - A299 (N)	0.96	0.76	15.0	E	1039	1558
5 - Seamark Road	0.04	0.09	0.0	A	25	37

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1002	251	43	1845	0.543	997	1260	0.0	1.2	0.070	A
2 - Willetts Hill S	56	14	949	1313	0.042	56	90	0.0	0.0	0.048	A
3 - A253 Canterbury Road (W)	434	109	776	657	0.662	427	229	0.0	1.9	0.254	C
4 - A299 (N)	852	213	465	1363	0.625	846	738	0.0	1.6	0.115	A
5 - Seamark Road	20	5	1282	914	0.022	20	28	0.0	0.0	0.067	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1197	299	51	1841	0.650	1194	1506	1.2	1.8	0.092	A
2 - Willetts Hill S	67	17	1137	1217	0.055	66	108	0.0	0.1	0.052	A
3 - A253 Canterbury Road (W)	519	130	929	625	0.831	510	274	1.9	4.1	0.486	D
4 - A299 (N)	1018	254	555	1328	0.766	1012	883	1.6	3.1	0.186	B
5 - Seamark Road	24	6	1533	800	0.030	24	34	0.0	0.0	0.077	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1465	366	60	1837	0.798	1458	1762	1.8	3.8	0.155	A
2 - Willetts Hill S	81	20	1387	1089	0.075	81	130	0.1	0.1	0.060	A
3 - A253 Canterbury Road (W)	635	159	1134	581	1.093	565	335	4.1	21.8	1.686	F
4 - A299 (N)	1246	312	622	1301	0.958	1211	1076	3.1	11.9	0.528	D
5 - Seamark Road	30	7	1793	682	0.044	30	41	0.0	0.0	0.092	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1465	366	61	1836	0.798	1465	1795	3.8	3.9	0.161	A
2 - Willetts Hill S	81	20	1395	1086	0.075	81	132	0.1	0.1	0.060	A
3 - A253 Canterbury Road (W)	635	159	1139	580	1.095	576	337	21.8	36.7	3.272	F
4 - A299 (N)	1246	312	633	1297	0.961	1234	1082	11.9	15.0	0.761	E
5 - Seamark Road	30	7	1826	666	0.045	30	41	0.0	0.0	0.094	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1197	299	55	1839	0.651	1204	1644	3.9	1.9	0.096	A
2 - Willetts Hill S	67	17	1147	1212	0.055	67	112	0.1	0.1	0.052	A
3 - A253 Canterbury Road (W)	519	130	936	623	0.833	606	277	36.7	14.8	2.646	F
4 - A299 (N)	1018	254	648	1291	0.788	1062	895	15.0	4.0	0.303	C
5 - Seamark Road	24	6	1674	736	0.033	24	36	0.0	0.0	0.084	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1002	251	44	1844	0.543	1005	1329	1.9	1.2	0.072	A
2 - Willetts Hill S	56	14	957	1309	0.043	56	93	0.1	0.0	0.048	A
3 - A253 Canterbury Road (W)	434	109	781	655	0.663	485	231	14.8	2.1	0.448	D
4 - A299 (N)	852	213	521	1341	0.635	861	746	4.0	1.8	0.127	A
5 - Seamark Road	20	5	1353	882	0.023	20	29	0.0	0.0	0.070	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 7_A299_A28_R1_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 7_A299_A28\Strategic Model Scenarios
Report generation date: 18/03/2019 14:22:33

»Lane Simulation - 2039 Baseline Traffic, AM
»Lane Simulation - 2039 Baseline Traffic, PM

Summary of junction performance

	AM						PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	Lane Simulation [Lane Simulation] - 2039 Baseline Traffic											
1 - A28 (E)	112.1	4.05		F	2.48	% [ ]	3.8	0.25		B	1.77	% [ ]
2 - A299 (S)	11.3	0.70		E			5.9	0.32		C		
3 - Canterbury Road (A28 SW)	57.7	10.17		F			80.6	11.65		F		
4 - A299 (W)	7.1	0.25		B			31.8	0.81		E		
5 - Potten Street Road	0.0	0.00		A			0.0	0.00		A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

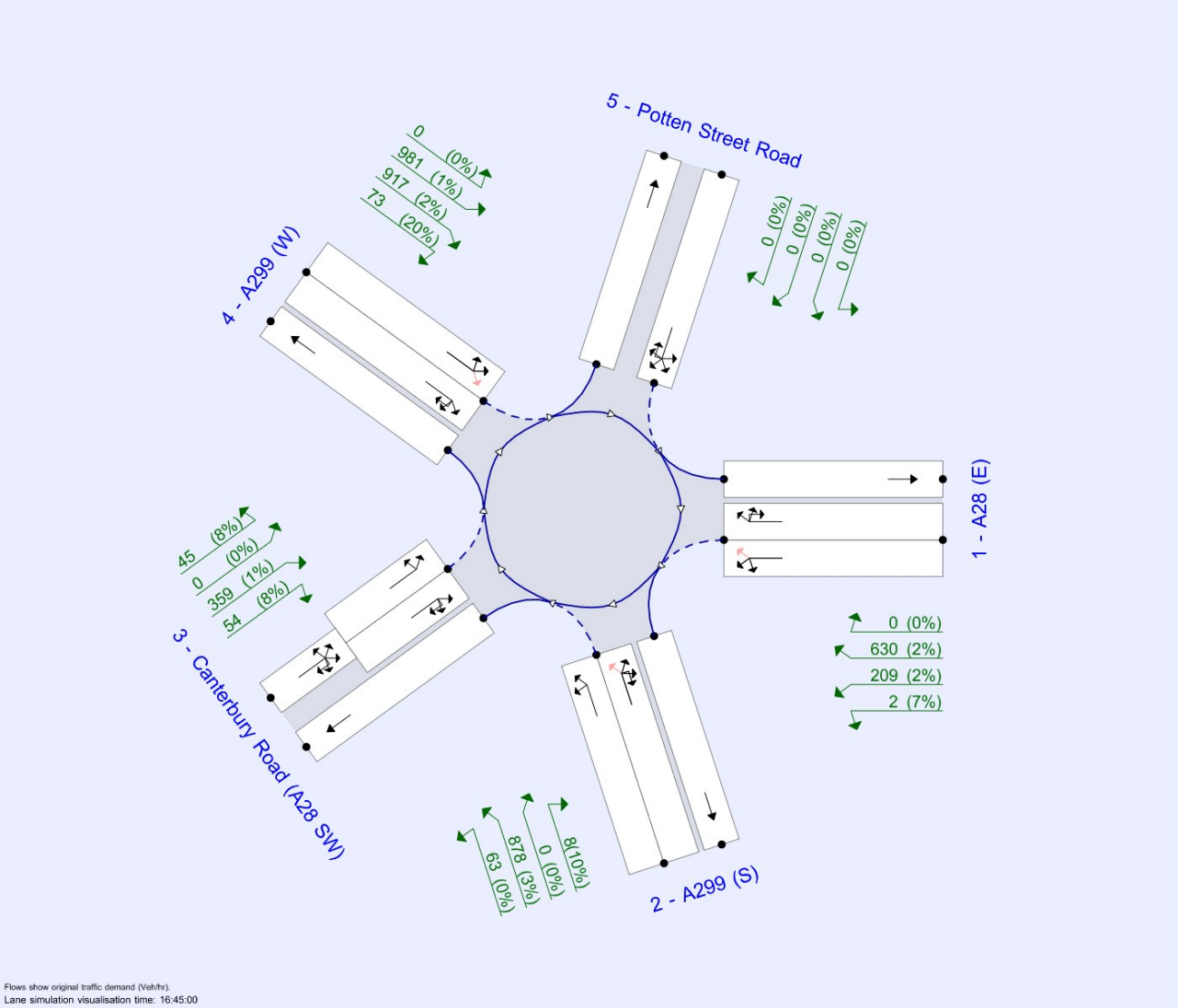
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	5	3	1	60	✓			5	229	125.35

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane Simulation	✓	✓	100.000	100.000

Lane Simulation - 2039 Baseline Traffic, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane Simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	1 - A28 (E) - Lane Simulation	Arm 1: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Last Run	Lane Simulation	3 - Canterbury Road (A28 SW) - Lane Simulation	Arm 3: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	2.48	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A28 (E)	
2	A299 (S)	
3	Canterbury Road (A28 SW)	
4	A299 (W)	
5	Potten Street Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A28 (E)	6.35	7.84	1.9	12.5	72.0	42.5	
2 - A299 (S)	7.69	8.17	1.5	20.6	75.0	20.5	
3 - Canterbury Road (A28 SW)	3.46	6.95	19.1	12.7	74.0	39.5	
4 - A299 (W)	8.16	9.75	2.2	24.2	75.2	46.0	
5 - Potten Street Road	3.09	7.25	15.8	46.0	73.6	23.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	0.512	1903
2 - A299 (S)	0.613	2484
3 - Canterbury Road (A28 SW)	0.462	1611
4 - A299 (W)	0.595	2495
5 - Potten Street Road	0.504	1705

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
3 - Canterbury Road (A28 SW)	Percentage		80.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A28 (E)	Evenly split	50.00
2 - A299 (S)	Evenly split	30.00
3 - Canterbury Road (A28 SW)	Evenly split	20.00
4 - A299 (W)	Evenly split	10.00
5 - Potten Street Road	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A28 (E)	Entry	1	1	2, 3, (4)		Infinity		0	99999	
			2	1, 4, 5		Infinity		0	99999	
	Exit	1	1			Infinity				
2 - A299 (S)	Entry	1	1	3, 4		Infinity		0	99999	
			2	1, 2, (4), 5		Infinity		0	99999	
	Exit	1	1			Infinity				
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	✓	3.00		0	99999	
			2	1, 2, 3	✓	3.00		0	99999	
		2	1	(1, 2, 3, 4, 5)		Infinity				
	Exit	1	1			Infinity				
4 - A299 (W)	Entry	1	1	1, (2), 5		Infinity		0	99999	
			2	2, 3, 4		Infinity		0	99999	
	Exit	1	1			Infinity				
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5		Infinity		0	99999	
	Exit	1	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	Entry	1	1	0.256	951
			2	0.256	951
2 - A299 (S)	Entry	1	1	0.306	1242
			2	0.306	1242
3 - Canterbury Road (A28 SW)	Entry	1	1	0.231	805
			2	0.231	805
4 - A299 (W)	Entry	1	1	0.297	1247
			2	0.297	1247
5 - Potten Street Road	Entry	1	1	0.504	1705

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm				
			A28 (E)	A299 (S)	Canterbury Road (A28 SW)	A299 (W)	Potten Street Road
1 - A28 (E)	1	1		✓	✓		
		2	✓			✓	✓
2 - A299 (S)	1	1			✓	✓	
		2	✓	✓			✓
3 - Canterbury Road (A28 SW)	1	1				✓	✓
		2	✓	✓	✓		
	2	1	✓	✓	✓	✓	✓
4 - A299 (W)	1	1	✓				✓
		2		✓	✓	✓	
5 - Potten Street Road	1	1	✓	✓	✓	✓	✓

Summary of Entry Lane allowed secondary movements

Arm	Lane Level	Lane	Destination arm				
			A28 (E)	A299 (S)	Canterbury Road (A28 SW)	A299 (W)	Potten Street Road
1 - A28 (E)	1	1				✓	
		2					
2 - A299 (S)	1	1					
		2				✓	
3 - Canterbury Road (A28 SW)	1	1					
		2					
	2	1					
4 - A299 (W)	1	1		✓			
		2					
5 - Potten Street Road	1	1					

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	1388	100.000
2 - A299 (S)		ONE HOUR	✓	895	100.000
3 - Canterbury Road (A28 SW)		ONE HOUR	✓	373	100.000
4 - A299 (W)		ONE HOUR	✓	1494	100.000
5 - Potten Street Road		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A28 (E)	2 - A299 (S)	3 - Canterbury Road (A28 SW)	4 - A299 (W)	5 - Potten Street Road
From	1 - A28 (E)	0	2	428	958	0
	2 - A299 (S)	5	0	37	853	0
	3 - Canterbury Road (A28 SW)	260	67	0	46	0
	4 - A299 (W)	646	795	53	0	0
	5 - Potten Street Road	0	0	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A28 (E)	2 - A299 (S)	3 - Canterbury Road (A28 SW)	4 - A299 (W)	5 - Potten Street Road
From	1 - A28 (E)	0	0	1	2	0
	2 - A299 (S)	0	0	5	7	0
	3 - Canterbury Road (A28 SW)	4	3	0	25	0
	4 - A299 (W)	5	8	8	0	0
	5 - Potten Street Road	0	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	4.05	112.1	F	1279	1919
2 - A299 (S)	0.70	11.3	E	820	1229
3 - Canterbury Road (A28 SW)	10.17	57.7	F	343	514
4 - A299 (W)	0.25	7.1	B	1373	2060
5 - Potten Street Road	0.00	0.0	A	0	0

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1041	260	688	1037	1045	690	0.0	3.9	0.197	B
2 - A299 (S)	674	168	1076	673	718	650	0.0	1.6	0.144	A
3 - Canterbury Road (A28 SW)	280	70	1356	281	291	393	0.0	2.2	0.453	D
4 - A299 (W)	1127	282	253	1125	1195	1383	0.0	2.2	0.111	A
5 - Potten Street Road	0	0	1378	0	0	0	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1252	313	821	1253	1259	813	3.9	8.6	0.388	C
2 - A299 (S)	814	203	1299	811	858	776	1.6	3.5	0.233	B
3 - Canterbury Road (A28 SW)	331	83	1641	316	329	469	2.2	7.6	1.081	F
4 - A299 (W)	1361	340	281	1353	1431	1676	2.2	3.6	0.147	A
5 - Potten Street Road	0	0	1634	0	0	0	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1553	388	982	1335	1354	931	8.6	60.7	1.592	F
2 - A299 (S)	980	245	1394	961	1015	923	3.5	10.6	0.523	D
3 - Canterbury Road (A28 SW)	412	103	1842	310	336	513	7.6	31.7	3.919	F
4 - A299 (W)	1646	411	275	1638	1740	1877	3.6	7.1	0.235	B
5 - Potten Street Road	0	0	1913	0	0	0	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1533	383	992	1324	1348	946	60.7	112.1	3.951	F
2 - A299 (S)	982	246	1379	983	1049	937	10.6	11.3	0.700	E
3 - Canterbury Road (A28 SW)	413	103	1862	322	334	499	31.7	55.6	8.507	F
4 - A299 (W)	1652	413	289	1649	1754	1896	7.1	6.7	0.247	B
5 - Potten Street Road	0	0	1938	0	0	0	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1248	312	825	1406	1420	811	112.1	75.3	4.053	F
2 - A299 (S)	802	200	1456	810	887	776	11.3	4.3	0.404	C
3 - Canterbury Road (A28 SW)	331	83	1748	341	349	518	55.6	57.3	10.167	F
4 - A299 (W)	1333	333	304	1332	1437	1784	6.7	3.3	0.155	A
5 - Potten Street Road	0	0	1637	0	0	0	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	1050	263	696	1208	1324	748	75.3	12.1	1.604	F
2 - A299 (S)	668	167	1246	670	727	657	4.3	2.0	0.207	B
3 - Canterbury Road (A28 SW)	287	72	1471	367	389	445	57.3	37.1	6.578	F
4 - A299 (W)	1122	281	326	1118	1201	1512	3.3	2.5	0.119	A
5 - Potten Street Road	0	0	1444	0	0	0	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	515	751	0.686	511	513	0.0	1.8	0.188	B
			2	1, 4, 5	526	748	0.704	526	533	0.0	2.0	0.205	B
	Exit	1	1		690			690	713	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	526	848	0.620	524	560	0.0	1.5	0.161	A
			2	1, 2, (4), 5	148	848	0.175	149	157	0.0	0.2	0.082	A
	Exit	1	1		650			650	696	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	31	311	0.100	31	40	0.0	0.1	0.227	B
			2	1, 2, 3	248	370	0.672	249	251	0.0	1.4	0.327	C
		2	1	(1, 2, 3, 4, 5)	280			279	298	0.0	0.8	0.136	A
	Exit	1	1		393			393	393	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	520	1113	0.467	520	547	0.0	0.8	0.096	A
			2	2, 3, 4	607	1083	0.560	604	648	0.0	1.4	0.124	A
	Exit	1	1		1383			1383	1447	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	968	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	617	717	0.861	615	622	1.8	4.3	0.375	C
			2	1, 4, 5	635	711	0.893	638	637	2.0	4.3	0.402	C
	Exit	1	1		813			813	840	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	609	781	0.779	607	647	1.5	3.1	0.276	C
			2	1, 2, (4), 5	205	785	0.261	205	211	0.2	0.4	0.098	A
	Exit	1	1		776			776	829	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	40	265	0.153	40	47	0.1	0.2	0.264	C
			2	1, 2, 3	277	316	0.876	277	282	1.4	2.4	0.455	D
		2	1	(1, 2, 3, 4, 5)	331			318	333	0.8	5.1	0.645	E
	Exit	1	1		469			469	472	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	630	1100	0.572	628	657	0.8	1.3	0.123	A
			2	2, 3, 4	731	1078	0.678	725	774	1.4	2.3	0.169	B
	Exit	1	1		1676			1676	1736	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	831	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	775	673	1.153	665	673	4.3	30.1	1.579	F
			2	1, 4, 5	778	668	1.165	670	681	4.3	30.6	1.605	F
	Exit	1	1		931			931	975	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	718	756	0.950	700	735	3.1	10.0	0.671	E
			2	1, 2, (4), 5	261	747	0.350	261	280	0.4	0.6	0.119	A
	Exit	1	1		923			923	993	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	41	232	0.179	41	51	0.2	0.2	0.336	C
			2	1, 2, 3	270	277	0.974	270	285	2.4	2.8	0.597	E
		2	1	(1, 2, 3, 4, 5)	412			311	338	5.1	28.6	3.347	F
	Exit	1	1		513			513	519	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	768	1104	0.695	767	803	1.3	2.2	0.169	B
			2	2, 3, 4	877	1078	0.814	871	936	2.3	4.8	0.292	C
	Exit	1	1		1877			1877	1958	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	680	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	764	668	1.141	660	673	30.1	55.9	3.927	F
			2	1, 4, 5	768	665	1.156	664	675	30.6	56.2	3.976	F
	Exit	1	1		946			946	976	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	713	760	0.938	715	760	10.0	10.7	0.919	F
			2	1, 2, (4), 5	270	759	0.355	268	289	0.6	0.6	0.124	A
	Exit	1	1		937			937	1011	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	41	231	0.177	40	46	0.2	0.2	0.323	C
			2	1, 2, 3	282	276	1.022	282	288	2.8	2.9	0.622	E
		2	1	(1, 2, 3, 4, 5)	413			323	334	28.6	52.5	7.929	F
	Exit	1	1		499			499	517	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	771	1102	0.699	771	803	2.2	2.3	0.173	B
			2	2, 3, 4	880	1072	0.822	878	952	4.8	4.5	0.311	C
	Exit	1	1		1896			1896	1981	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	668	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	625	714	0.874	703	710	55.9	37.4	4.021	F
			2	1, 4, 5	623	709	0.878	703	710	56.2	37.9	4.086	F
	Exit	1	1		811			811	845	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	599	736	0.813	607	666	10.7	4.0	0.504	D
			2	1, 2, (4), 5	203	730	0.279	203	221	0.6	0.4	0.113	A
	Exit	1	1		776			776	843	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	40	250	0.161	41	50	0.2	0.2	0.310	C
			2	1, 2, 3	300	296	1.014	300	299	2.9	2.9	0.598	E
		2	1	(1, 2, 3, 4, 5)	331			340	348	52.5	54.3	9.654	F
	Exit	1	1		518			518	522	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	622	1098	0.566	619	652	2.3	1.4	0.122	A
			2	2, 3, 4	711	1067	0.666	713	784	4.5	1.9	0.183	B
	Exit	1	1		1784			1784	1882	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	829	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	513	749	0.684	594	654	37.4	5.9	1.608	F
			2	1, 4, 5	538	746	0.720	614	670	37.9	6.2	1.600	F
	Exit	1	1		748			748	783	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	514	797	0.644	516	560	4.0	1.7	0.241	B
			2	1, 2, (4), 5	154	801	0.192	154	167	0.4	0.3	0.095	A
	Exit	1	1		657			657	712	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	44	285	0.154	45	57	0.2	0.2	0.298	C
			2	1, 2, 3	322	350	0.920	323	333	2.9	2.6	0.516	D
		2	1	(1, 2, 3, 4, 5)	287			366	388	54.3	34.3	6.147	F
	Exit	1	1		445			445	476	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	522	1092	0.479	521	550	1.4	1.0	0.103	A
			2	2, 3, 4	600	1060	0.567	596	651	1.9	1.5	0.134	A
	Exit	1	1		1512			1512	1670	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	933	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

Lane Simulation - 2039 Baseline Traffic, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane Simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	3 - Canterbury Road (A28 SW) - Lane Simulation	Arm 3: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	1.77	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	841	100.000
2 - A299 (S)		ONE HOUR	✓	949	100.000
3 - Canterbury Road (A28 SW)		ONE HOUR	✓	458	100.000
4 - A299 (W)		ONE HOUR	✓	1971	100.000
5 - Potten Street Road		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A28 (E)	2 - A299 (S)	3 - Canterbury Road (A28 SW)	4 - A299 (W)	5 - Potten Street Road
From	1 - A28 (E)	0	2	209	630	0
	2 - A299 (S)	8	0	63	878	0
	3 - Canterbury Road (A28 SW)	359	54	0	45	0
	4 - A299 (W)	981	917	73	0	0
	5 - Potten Street Road	0	0	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A28 (E)	2 - A299 (S)	3 - Canterbury Road (A28 SW)	4 - A299 (W)	5 - Potten Street Road
From	1 - A28 (E)	0	7	2	2	0
	2 - A299 (S)	10	0	0	3	0
	3 - Canterbury Road (A28 SW)	1	8	0	8	0
	4 - A299 (W)	1	2	20	0	0
	5 - Potten Street Road	0	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	0.25	3.8	B	776	1163
2 - A299 (S)	0.32	5.9	C	861	1292
3 - Canterbury Road (A28 SW)	11.65	80.6	F	419	628
4 - A299 (W)	0.81	31.8	E	1806	2709
5 - Potten Street Road	0.00	0.0	A	0	0

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	640	160	785	638	646	1003	0.0	1.5	0.126	A
2 - A299 (S)	705	176	690	705	727	734	0.0	1.3	0.109	A
3 - Canterbury Road (A28 SW)	345	86	1141	353	344	254	0.0	2.6	0.469	D
4 - A299 (W)	1465	366	323	1466	1501	1171	0.0	3.5	0.144	A
5 - Potten Street Road	0	0	1789	0	0	0	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	752	188	941	754	772	1198	1.5	2.0	0.154	A
2 - A299 (S)	831	208	820	830	865	875	1.3	2.3	0.151	A
3 - Canterbury Road (A28 SW)	422	106	1343	387	388	308	2.6	11.4	1.143	F
4 - A299 (W)	1778	445	354	1785	1792	1375	3.5	6.8	0.230	B
5 - Potten Street Road	0	0	2139	0	0	0	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	933	233	1120	927	938	1342	2.0	3.7	0.224	B
2 - A299 (S)	1039	260	1006	1027	1053	1041	2.3	5.9	0.261	C
3 - Canterbury Road (A28 SW)	493	123	1653	360	382	380	11.4	43.4	4.512	F
4 - A299 (W)	2149	537	331	2131	2129	1682	6.8	25.3	0.583	D
5 - Potten Street Road	0	0	2462	0	0	0	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	934	233	1119	935	953	1359	3.7	3.8	0.250	B
2 - A299 (S)	1025	256	1014	1026	1068	1040	5.9	5.6	0.321	C
3 - Canterbury Road (A28 SW)	509	127	1665	351	367	375	43.4	79.9	10.019	F
4 - A299 (W)	2175	544	328	2150	2184	1688	25.3	31.7	0.815	E
5 - Potten Street Road	0	0	2478	0	0	0	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	759	190	952	758	777	1243	3.8	2.1	0.178	B
2 - A299 (S)	856	214	824	860	895	886	5.6	1.8	0.182	B
3 - Canterbury Road (A28 SW)	401	100	1367	413	414	318	79.9	80.7	11.646	F
4 - A299 (W)	1783	446	384	1811	1920	1396	31.7	8.4	0.409	C
5 - Potten Street Road	0	0	2195	0	0	0	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	636	159	803	634	648	1110	2.1	1.5	0.128	A
2 - A299 (S)	710	178	688	712	725	749	1.8	1.5	0.115	A
3 - Canterbury Road (A28 SW)	344	86	1138	453	464	262	80.7	53.0	7.737	F
4 - A299 (W)	1492	373	416	1497	1538	1175	8.4	4.0	0.169	B
5 - Potten Street Road	0	0	1913	0	0	0	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	290	731	0.396	289	292	0.0	0.6	0.117	A
			2	1, 4, 5	350	729	0.480	349	355	0.0	0.9	0.134	A
	Exit	1	1		1003			1003	1008	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	556	998	0.558	556	572	0.0	1.2	0.121	A
			2	1, 2, (4), 5	149	999	0.149	149	155	0.0	0.1	0.066	A
	Exit	1	1		734			734	744	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	35	397	0.089	35	35	0.0	0.2	0.154	A
			2	1, 2, 3	316	419	0.755	318	309	0.0	1.6	0.305	C
		2	1	(1, 2, 3, 4, 5)	345			351	352	0.0	0.8	0.178	B
	Exit	1	1		254			254	267	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	756	1136	0.665	755	770	0.0	1.7	0.148	A
			2	2, 3, 4	709	1110	0.639	711	732	0.0	1.8	0.140	A
	Exit	1	1		1171			1171	1200	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	782	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	349	687	0.508	350	354	0.6	0.8	0.144	A
			2	1, 4, 5	403	687	0.586	404	417	0.9	1.2	0.163	A
	Exit	1	1		1198			1198	1182	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	644	956	0.673	644	670	1.2	2.0	0.174	B
			2	1, 2, (4), 5	187	949	0.197	186	195	0.1	0.3	0.072	A
	Exit	1	1		875			875	886	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	40	356	0.113	40	44	0.2	0.1	0.189	B
			2	1, 2, 3	349	382	0.914	347	344	1.6	2.7	0.409	C
		2	1	(1, 2, 3, 4, 5)	422			389	392	0.8	8.6	0.753	E
	Exit	1	1		308			308	325	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	924	1130	0.818	925	915	1.7	3.9	0.243	B
			2	2, 3, 4	854	1101	0.776	860	876	1.8	2.9	0.216	B
	Exit	1	1		1375			1375	1422	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	604	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	442	642	0.688	437	442	0.8	1.6	0.205	B
			2	1, 4, 5	492	642	0.766	490	497	1.2	2.1	0.240	B
	Exit	1	1		1342			1342	1346	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	776	899	0.864	763	783	2.0	5.5	0.319	C
			2	1, 2, (4), 5	263	897	0.293	264	270	0.3	0.4	0.089	A
	Exit	1	1		1041			1041	1045	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	37	308	0.120	38	40	0.1	0.1	0.258	C
			2	1, 2, 3	323	325	0.992	322	342	2.7	3.0	0.515	D
		2	1	(1, 2, 3, 4, 5)	493			360	382	8.6	40.4	4.011	F
	Exit	1	1		380			380	392	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	1105	1135	0.972	1088	1083	3.9	14.8	0.650	E
			2	2, 3, 4	1045	1109	0.941	1043	1047	2.9	10.5	0.511	D
	Exit	1	1		1682			1682	1719	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	437	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	442	644	0.687	443	453	1.6	1.6	0.227	B
			2	1, 4, 5	492	644	0.763	493	500	2.1	2.2	0.270	C
	Exit	1	1		1359			1359	1368	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	769	898	0.857	769	794	5.5	5.3	0.399	C
			2	1, 2, (4), 5	256	890	0.288	257	274	0.4	0.3	0.092	A
	Exit	1	1		1040			1040	1063	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	32	301	0.107	32	37	0.1	0.2	0.257	C
			2	1, 2, 3	320	323	0.991	319	330	3.0	3.0	0.545	D
		2	1	(1, 2, 3, 4, 5)	509			352	367	40.4	76.8	9.536	F
	Exit	1	1		375			375	400	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	1106	1134	0.974	1106	1110	14.8	18.1	0.947	F
			2	2, 3, 4	1070	1111	0.962	1044	1074	10.5	13.6	0.675	E
	Exit	1	1		1688			1688	1741	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	428	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	354	682	0.519	355	361	1.6	0.8	0.163	A
			2	1, 4, 5	405	685	0.591	403	416	2.2	1.3	0.191	B
	Exit	1	1		1243			1243	1276	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	661	956	0.691	665	690	5.3	1.7	0.214	B
			2	1, 2, (4), 5	195	949	0.206	195	205	0.3	0.2	0.075	A
	Exit	1	1		886			886	941	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	35	354	0.099	36	42	0.2	0.1	0.211	B
			2	1, 2, 3	377	377	0.999	377	372	3.0	2.9	0.481	D
		2	1	(1, 2, 3, 4, 5)	401			412	414	76.8	77.6	11.242	F
	Exit	1	1		318			318	336	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	929	1119	0.830	944	985	18.1	4.9	0.472	D
			2	2, 3, 4	854	1093	0.781	867	935	13.6	3.5	0.341	C
	Exit	1	1		1396			1396	1453	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	574	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2, 3, (4)	291	724	0.403	290	294	0.8	0.6	0.120	A
			2	1, 4, 5	345	726	0.476	344	353	1.3	0.8	0.134	A
	Exit	1	1		1110			1110	1128	0.0	0.0	0.000	A
2 - A299 (S)	Entry	1	1	3, 4	558	996	0.560	559	571	1.7	1.3	0.128	A
			2	1, 2, (4), 5	152	993	0.153	152	155	0.2	0.2	0.068	A
	Exit	1	1		749			749	769	0.0	0.0	0.000	A
3 - Canterbury Road (A28 SW)	Entry	1	1	4, 5	43	406	0.105	42	48	0.1	0.1	0.178	B
			2	1, 2, 3	410	420	0.977	411	416	2.9	2.8	0.424	D
		2	1	(1, 2, 3, 4, 5)	344			453	464	77.6	50.1	7.382	F
	Exit	1	1		262			262	270	0.0	0.0	0.000	A
4 - A299 (W)	Entry	1	1	1, (2), 5	775	1110	0.698	779	795	4.9	2.1	0.177	B
			2	2, 3, 4	716	1087	0.659	717	742	3.5	1.9	0.160	A
	Exit	1	1		1175			1175	1209	0.0	0.0	0.000	A
5 - Potten Street Road	Entry	1	1	1, 2, 3, 4, 5	0	721	0.000	0	0	0.0	0.0	0.000	A
	Exit	1	1		0			0	0	0.0	0.0	0.000	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 8a_A28_Station Rd_R3_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 8 A28_Station Rd\Strategic Modelling Scenario
Report generation date: 18/03/2019 14:31:41

«(LS) ARCADY and PICADY module - 2039 Baseline Traffic, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results
»Lane Results

Summary of junction performance

	AM						PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	ARCADY and PICADY module - 2039 Baseline Traffic											
1 - A28 (E)	13.1	0.98	0.96	F	2.80	-25 % [3 - Station Rd]	2.5	0.21	0.72	B	0.96	-15 % [3 - Station Rd]
2 - A28 (S)	5.8	0.40	0.86	C			6.9	0.47	0.89	D		
3 - Station Rd	84.0	8.34	1.28	F			26.9	2.57	1.06	F		
	(LS) ARCADY and PICADY module [Lane Simulation] - 2039 Baseline Traffic											
1 - A28 (E)	208.4	18.98		F	20.18	% [ ]	16.0	1.21		F	12.24	% [ ]
2 - A28 (S)	183.1	15.41		F			201.6	16.59		F		
3 - Station Rd	280.7	28.05		F			148.6	18.67		F		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

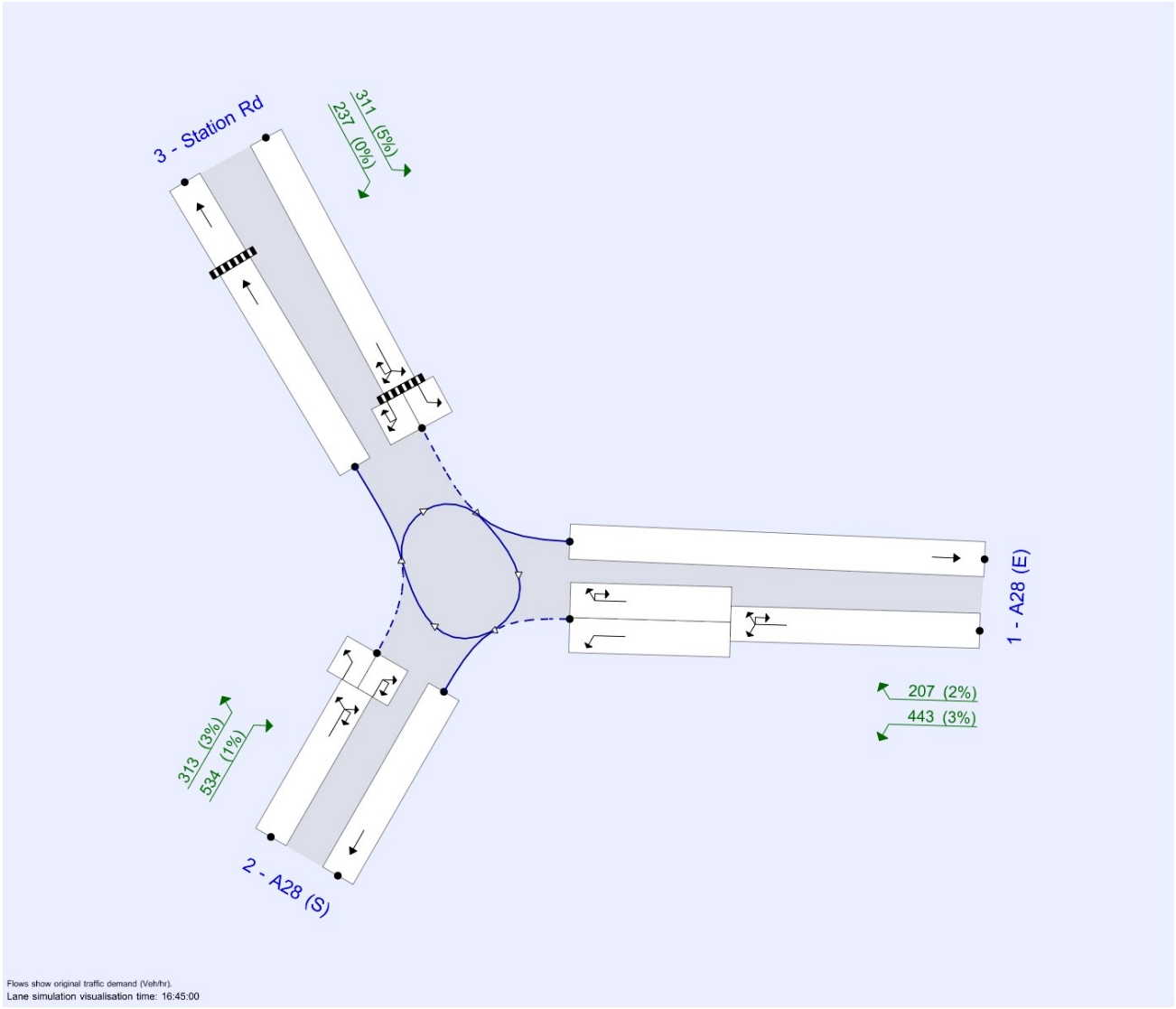
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	02/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\fuad.huda
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75			✓	RFC/DOS	0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			1579555071	189	23.49

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	(LS) ARCADY and PICADY module	✓	✓	100.000	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

(LS) ARCADY and PICADY module - 2039 Baseline Traffic, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - (LS) ARCADY and PICADY module [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	2 - A28 (S) - Lane Simulation	Arm 2: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Last Run	Lane Simulation	3 - Station Rd - Lane Simulation	Arm 3: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Crossings	3 - Station Rd - Pedestrian crossing	Lane Simulation: Pedestrian crossing properties specify gap between crossing and junction entry as 7, but actual storage on lanes is 2.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	12.24	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	A28 (E)	
2	A28 (S)	
3	Station Rd	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - A28 (E)	3.08	3.08	6.11	45.0	14.56	8.18	0.0	
2 - A28 (S)	3.82	3.82	7.20	17.2	13.47	7.36	0.0	
3 - Station Rd	3.65	3.65	9.21	16.2	16.43	15.73	0.0	

Zebra Crossings

Arm	Space between crossing and junction entry (Zebra) (PCU)	Vehicles queueing on exit (Zebra) (PCU)	Central Refuge	Crossing data type	Crossing length (m)	Crossing time (s)
3 - Station Rd	7.00	6.00		Distance	9.50	6.79

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	0.689	1283
2 - A28 (S)	0.701	1232
3 - Station Rd	0.751	1423

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A28 (E)	Percentage		92.00
2 - A28 (S)	Percentage		100.00
3 - Station Rd	Percentage		60.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A28 (E)	Evenly split	10.00
2 - A28 (S)	Evenly split	10.00
3 - Station Rd	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A28 (E)	Entry	1	1	2	✓	4.00		0	99999	
			2	1, 3	✓	4.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1			Infinity				
2 - A28 (S)	Entry	1	1	3	✓	1.00		0	99999	
			2	1, 2	✓	1.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1			Infinity				
3 - Station Rd	Entry	1	1	1	✓	1.00		0	99999	
			2	2, 3	✓	1.00		0	99999	
		2	1	(1, 2, 3)		Infinity				
	Exit	1	1		✓	6.00				
		2	1			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A28 (E)	Entry	1	1	0.344	642
			2	0.344	642
2 - A28 (S)	Entry	1	1	0.350	616
			2	0.350	616
3 - Station Rd	Entry	1	1	0.376	711
			2	0.376	711

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm		
			A28 (E)	A28 (S)	Station Rd
1 - A28 (E)	1	1		✓	
		2	✓		✓
	2	1	✓	✓	✓
2 - A28 (S)	1	1			✓
		2	✓	✓	
	2	1	✓	✓	✓
3 - Station Rd	1	1	✓		
		2		✓	✓
	2	1	✓	✓	✓

Traffic Demand

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A28 (E)		ONE HOUR	✓	650	100.000
2 - A28 (S)		ONE HOUR	✓	847	100.000
3 - Station Rd		ONE HOUR	✓	548	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - A28 (E)		
2 - A28 (S)		
3 - Station Rd	[ONEHOUR]	10.00

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	443	207
	2 - A28 (S)	534	0	313
	3 - Station Rd	311	237	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - A28 (E)	2 - A28 (S)	3 - Station Rd
From	1 - A28 (E)	0	3	2
	2 - A28 (S)	1	0	3
	3 - Station Rd	5	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A28 (E)	1.21	16.0	F	595	893
2 - A28 (S)	16.59	201.6	F	774	1161
3 - Station Rd	18.67	148.6	F	500	750

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	500	125	161		497	500	603	0.0	2.6	0.273	C
2 - A28 (S)	634	158	159		613	611	509	0.0	9.8	0.712	E
3 - Station Rd	410	102	383	7.53	390	384	389	0.0	9.9	1.118	F

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	581	145	170		588	598	653	2.6	4.1	0.449	D
2 - A28 (S)	762	190	184		671	673	576	9.8	34.8	2.117	F
3 - Station Rd	490	122	423	8.99	402	416	432	9.9	32.0	3.186	F

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	694	174	167		684	695	641	4.1	11.3	0.813	E
2 - A28 (S)	932	233	224		652	663	638	34.8	103.9	6.455	F
3 - Station Rd	599	150	410	11.01	409	421	466	32.0	79.9	8.375	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	713	178	167		700	715	645	11.3	16.1	1.213	F
2 - A28 (S)	927	232	219		655	660	660	103.9	175.1	12.975	F
3 - Station Rd	595	149	413	11.01	410	421	461	79.9	127.2	15.331	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	589	147	161		591	637	642	16.1	7.8	0.934	F
2 - A28 (S)	750	187	188		658	667	576	175.1	201.5	16.591	F
3 - Station Rd	498	125	414	8.99	402	420	432	127.2	148.7	18.669	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	495	124	166		495	527	646	7.8	2.6	0.371	C
2 - A28 (S)	640	160	158		667	678	513	201.5	193.5	13.483	F
3 - Station Rd	410	102	419	7.53	403	423	406	148.7	148.2	13.442	F

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	341		521	0.653	338	342	0.0	1.7	0.253	C
			2	1, 3	158		530	0.298	159	158	0.0	0.3	0.154	A
		2	1	(1, 2, 3)	500				498	508	0.0	0.6	0.050	A
	Exit	1	1		603				603	602	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	230		544	0.424	230	230	0.0	0.5	0.110	A
			2	1, 2	383		554	0.691	383	382	0.0	0.7	0.109	A
		2	1	(1, 2, 3)	634				613	616	0.0	8.6	0.602	E
	Exit	1	1		509				509	505	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	221		323	0.683	220	220	0.0	0.6	0.184	B
			2	2, 3	171		340	0.502	170	163	0.0	0.5	0.175	B
		2	1	(1, 2, 3)	410	7.53			391	388	0.0	8.7	0.938	F
	Exit	1	1		389	7.53			389	387	0.0	0.0	0.000	A
		2	1		389				389	387	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	403		520	0.774	404	410	1.7	2.0	0.317	C
			2	1, 3	185		525	0.352	184	187	0.3	0.7	0.181	B
		2	1	(1, 2, 3)	581				587	600	0.6	1.5	0.175	B
	Exit	1	1		653				653	659	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	247		534	0.463	248	255	0.5	0.4	0.111	A
			2	1, 2	423		545	0.776	423	418	0.7	0.8	0.108	A
		2	1	(1, 2, 3)	762				670	673	8.6	33.6	2.007	F
	Exit	1	1		576				576	585	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	230		314	0.732	230	241	0.6	0.7	0.189	B
			2	2, 3	173		331	0.522	172	175	0.5	0.5	0.179	B
		2	1	(1, 2, 3)	490	8.99			402	417	8.7	30.8	3.001	F
	Exit	1	1		432	8.99			432	442	0.0	0.0	0.001	A
		2	1		432				432	442	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	460		520	0.883	460	470	2.0	2.9	0.364	C
			2	1, 3	223		527	0.423	224	225	0.7	0.8	0.217	B
		2	1	(1, 2, 3)	694				683	699	1.5	7.6	0.495	D
	Exit	1	1		641				641	661	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	242		519	0.466	242	247	0.4	0.5	0.116	A
			2	1, 2	411		531	0.773	410	416	0.8	0.8	0.112	A
		2	1	(1, 2, 3)	932				653	663	33.6	102.6	6.341	F
	Exit	1	1		638				638	646	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	232		317	0.730	231	245	0.7	0.8	0.191	B
			2	2, 3	177		334	0.531	178	176	0.5	0.5	0.180	B
		2	1	(1, 2, 3)	599	11.01			409	421	30.8	78.6	8.188	F
	Exit	1	1		466	11.01			466	472	0.0	0.0	0.001	A
		2	1		466				466	472	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	483		522	0.925	481	488	2.9	3.2	0.389	C
			2	1, 3	221		528	0.417	219	227	0.8	1.0	0.217	B
		2	1	(1, 2, 3)	713				703	717	7.6	11.9	0.878	F
	Exit	1	1		645				645	658	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	242		521	0.464	242	244	0.5	0.5	0.115	A
			2	1, 2	413		533	0.775	413	415	0.8	0.8	0.114	A
		2	1	(1, 2, 3)	927				655	660	102.6	173.8	12.862	F
	Exit	1	1		660				660	665	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	231		318	0.727	231	243	0.8	0.7	0.191	B
			2	2, 3	179		333	0.538	179	178	0.5	0.6	0.182	B
		2	1	(1, 2, 3)	595	11.01			410	421	78.6	125.9	15.145	F
	Exit	1	1		461	11.01			461	472	0.0	0.0	0.001	A
		2	1		461				461	472	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	405		524	0.773	403	436	3.2	2.4	0.355	C
			2	1, 3	189		531	0.355	188	202	1.0	0.7	0.203	B
		2	1	(1, 2, 3)	589				594	633	11.9	4.7	0.630	E
	Exit	1	1		642				642	659	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	245		533	0.460	245	250	0.5	0.5	0.114	A
			2	1, 2	414		543	0.763	414	417	0.8	0.8	0.112	A
		2	1	(1, 2, 3)	750				659	667	173.8	200.2	16.495	F
	Exit	1	1		576				576	613	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	228		316	0.723	229	242	0.7	0.8	0.191	B
			2	2, 3	173		333	0.520	174	177	0.6	0.5	0.180	B
		2	1	(1, 2, 3)	498	8.99			401	419	125.9	147.5	18.521	F
	Exit	1	1		433	8.99			432	452	0.0	0.0	0.001	A
		2	1		432				432	452	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A28 (E)	Entry	1	1	2	337		522	0.645	337	359	2.4	1.5	0.279	C
			2	1, 3	158		526	0.301	158	167	0.7	0.4	0.174	B
		2	1	(1, 2, 3)	495				495	522	4.7	0.6	0.132	A
	Exit	1	1		646				646	669	0.0	0.0	0.000	A
2 - A28 (S)	Entry	1	1	3	247		543	0.456	247	255	0.5	0.4	0.111	A
			2	1, 2	420		553	0.759	419	423	0.8	0.8	0.111	A
		2	1	(1, 2, 3)	640				667	678	200.2	192.3	13.446	F
	Exit	1	1		513				513	537	0.0	0.0	0.000	A
3 - Station Rd	Entry	1	1	1	227		316	0.719	227	246	0.8	0.7	0.188	B
			2	2, 3	176		331	0.531	176	178	0.5	0.6	0.180	B
		2	1	(1, 2, 3)	410	7.53			403	424	147.5	147.0	13.406	F
	Exit	1	1		406	7.53			406	423	0.0	0.0	0.000	A
		2	1		406				406	423	0.0	0.0	0.000	A

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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Filename: Jct 8b_A28_Park Ln_R3_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 8 A28_Station Rd\Strategic Modelling Scenario
Report generation date: 18/03/2019 14:39:49

«Lane simulation - 2039 Baseline Traffic, AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results
»Lane Results

Summary of junction performance

	AM						PM					
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Network Residual Capacity
	Lane simulation [Lane Simulation] - 2039 Baseline Traffic											
A - A28 (N)	0.0	0.00		A	0.23	%	0.0	0.00		A	0.05	%
B - Park Lane	8.8	2.36		F		[ ]	1.8	0.51		D		[ ]
C - A28 (S)	0.0	0.00		A			0.0	0.00		A		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	02/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\fuad.huda
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	RFC/DOS	0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			2072100611	154	10.23

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane simulation	✓	✓	100.000	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓

Lane simulation - 2039 Baseline Traffic, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
2	untitled	T-Junction	Two-way		0.23	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	A28 (N)		Major
B	Park Lane		Minor
C	A28 (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - A28 (S)	9.15			28.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Park Lane	One lane	2.89	26	21

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
2	B-A	491	0.077	0.195	0.123	0.279
2	B-C	630	0.083	0.211	-	-
2	C-B	590	0.197	0.197	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
A - A28 (N)	Entry	1	1	B, C		Infinity		0	99999	
	Exit	1	1			Infinity				
B - Park Lane	Entry	1	1	A, C		Infinity		0	99999	
	Exit	1	1			Infinity				
C - A28 (S)	Entry	1	1	A, B		Infinity		0	99999	
	Exit	1	1			Infinity				

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm		
			A28 (N)	Park Lane	A28 (S)
A - A28 (N)	1	1		✓	✓
B - Park Lane	1	1	✓		✓
C - A28 (S)	1	1	✓	✓	

Traffic Demand

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - A28 (N)		ONE HOUR	✓	977	100.000
B - Park Lane		ONE HOUR	✓	185	100.000
C - A28 (S)		ONE HOUR	✓	714	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - A28 (N)	B - Park Lane	C - A28 (S)
From	A - A28 (N)	0	0	977
	B - Park Lane	117	0	68
	C - A28 (S)	714	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - A28 (N)	B - Park Lane	C - A28 (S)
From	A - A28 (N)	0	0	2
	B - Park Lane	2	0	1
	C - A28 (S)	1	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A28 (N)	0.00	0.0	A	899	1348
B - Park Lane	2.36	8.8	F	169	254
C - A28 (S)	0.00	0.0	A	653	979

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	735	184	735	755	623	0.0	0.0	0.000	A
B - Park Lane	141	35	139	139	0	0.0	1.0	0.363	C
C - A28 (S)	532	133	532	545	783	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	864	216	864	893	743	0.0	0.0	0.000	A
B - Park Lane	161	40	163	163	0	1.0	1.6	0.531	D
C - A28 (S)	641	160	641	647	925	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	1077	269	1077	1095	917	0.0	0.0	0.000	A
B - Park Lane	202	51	192	189	0	1.6	6.4	1.465	F
C - A28 (S)	796	199	796	797	1148	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	1090	272	1090	1102	909	0.0	0.0	0.000	A
B - Park Lane	210	52	196	199	0	6.4	8.8	2.359	F
C - A28 (S)	784	196	784	798	1161	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	889	222	889	898	743	0.0	0.0	0.000	A
B - Park Lane	166	41	178	195	0	8.8	2.5	1.411	F
C - A28 (S)	631	158	631	643	954	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	739	185	739	753	622	0.0	0.0	0.000	A
B - Park Lane	136	34	140	146	0	2.5	0.6	0.409	C
C - A28 (S)	534	133	534	545	790	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	735	735	755	0.0	0.0	0.000	A
	Exit	1	1		623	623	634	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	141	139	139	0.0	1.0	0.363	C
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	532	532	545	0.0	0.0	0.000	A
	Exit	1	1		783	783	805	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	864	864	893	0.0	0.0	0.000	A
	Exit	1	1		743	743	750	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	161	163	163	1.0	1.6	0.531	D
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	641	641	647	0.0	0.0	0.000	A
	Exit	1	1		925	925	953	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	1077	1077	1095	0.0	0.0	0.000	A
	Exit	1	1		917	917	917	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	202	192	189	1.6	6.4	1.465	F
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	796	796	797	0.0	0.0	0.000	A
	Exit	1	1		1148	1148	1164	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	1090	1090	1102	0.0	0.0	0.000	A
	Exit	1	1		909	909	923	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	210	196	199	6.4	8.8	2.359	F
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	784	784	798	0.0	0.0	0.000	A
	Exit	1	1		1161	1161	1175	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	889	889	898	0.0	0.0	0.000	A
	Exit	1	1		743	743	767	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	166	178	195	8.8	2.5	1.411	F
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	631	631	643	0.0	0.0	0.000	A
	Exit	1	1		954	954	970	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
A - A28 (N)	Entry	1	1	B, C	739	739	753	0.0	0.0	0.000	A
	Exit	1	1		622	622	638	0.0	0.0	0.000	A
B - Park Lane	Entry	1	1	A, C	136	140	146	2.5	0.6	0.409	C
	Exit	1	1		0	0	0	0.0	0.0	0.000	A
C - A28 (S)	Entry	1	1	A, B	534	534	545	0.0	0.0	0.000	A
	Exit	1	1		790	790	806	0.0	0.0	0.000	A

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Appendix I (part 5)
2039 Base and 2039 Base + Development Junction Model Outputs

Junctions 9

ARCADY 9 - Roundabout Module
PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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Filename: Jct 10_B2050_New_Rbt+T.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 10_B2050_Margate Hill\Strategic Model Scenario
Report generation date: 18/03/2019 16:30:45

»2039 Base, AM
»2039 Base , PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	[Lane Simulation] - 2039 Base							
Junction 1 - Arm 1	1.4	0.08		0.07	0.6	0.05		0.08
Junction 1 - Arm 2	0.4	0.05			1.0	0.06		
Junction 1 - Arm 3	1.4	0.08			1.7	0.10		
Junction 2 - Arm A	0.0	0.00		0.08	0.0	0.00		0.17
Junction 2 - Arm B	1.8	0.44			3.9	0.67		
Junction 2 - Arm C	0.0	0.00			0.0	0.00		

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay.

File summary

File Description

Title	
Location	
Site number	
Date	11/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			86101586	80	8.66

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	✓	100.000	100.000

2039 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	Junction 1 - Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout			1, 2, 3	0.07	A
2	untitled	T-Junction	Two-way			0.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Name	Description	Arm type
1	1	Shottendane Rd		
	2	Columbus Ave		
	3	Manston Rd (W)		
2	A	Columbus Ave (north)		Major
	B	Manston Road		Minor
	C	Columbus Ave (south)		Major

Roundabout Geometry

Junction	Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	1	2.50	9.10	31.0	25.0	50.0	16.0	
	2	3.60	8.70	24.9	25.0	50.0	16.0	
	3	2.60	8.70	26.4	25.0	50.0	14.0	

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
2	C	7.25			72.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
2	B	One lane plus flare	10.00	9.90	5.90	3.70	2.50		1.00	65	41

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Junction	Arm	Final slope	Final intercept (PCU/hr)
1	1	0.694	2061
	2	0.709	2142
	3	0.679	1971

The slope and intercept shown above include any corrections and adjustments.

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
2	B-A	583	0.100	0.254	0.160	0.363
2	B-C	689	0.100	0.252	-	-
2	C-B	616	0.226	0.226	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Lane Simulation: Arm options

Junction	Arm	Lane capacity source	Traffic considering secondary lanes (%)
1	1	Evenly split	10.00
	2	Evenly split	10.00
	3	Evenly split	10.00
2	A		
	B		
	C		

Lanes

Junction	Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1	1	Entry	1	1	1, 2, 3		Infinity		0	99999	
		Exit	1	1			Infinity				
	2	Entry	1	1	1, 2, 3	✓	5.00		0	99999	
		Exit	1	1		✓	5.00				
	3	Entry	1	1	1, 2, 3		Infinity		0	99999	
		Exit	1	1			Infinity				
2	A	Entry	1	1	B, C	✓	5.00		0	99999	
		Exit	1	1		✓	5.00				
	B	Entry	1	1	C	✓	1.00		0	99999	
				2	A	✓	1.00		0	99999	
			2	1	(A, C)		Infinity				
		Exit	1	1			Infinity				
	C	Entry	1	1	A, B		Infinity		0	99999	
		Exit	1	1			Infinity				

Entry Lane slope and intercept

Junction	Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1	1	Entry	1	1	0.694	2061
	2	Entry	1	1	0.709	2142
	3	Entry	1	1	0.679	1971

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				1	2	3
1	1	1	1	✓	✓	✓
	2	1	1	✓	✓	✓
	3	1	1	✓	✓	✓

Summary of Entry Lane allowed movements

Junction	Arm	Lane Level	Lane	Destination arm		
				A	B	C
2	A	1	1		✓	✓
	B	1	1			✓
			2	✓		
		2	1	✓		✓
	C	1	1	✓	✓	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (Veh/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	2	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	2	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	910	100.000
	2	✓				
	3		ONE HOUR	✓	940	100.000
2	A	✓				
	B		ONE HOUR	✓	209	100.000
	C		ONE HOUR	✓	231	100.000

Origin-Destination Data

Demand (Veh/hr)

Junction 1

		To		
		1	2	3
From	1	0	353	557
	2	201	0	239
	3	533	407	0

Demand (Veh/hr)

Junction 2

		To		
		A	B	C
From	A	0	298	462
	B	209	0	0
	C	231	0	0

Vehicle Mix

Heavy Vehicle Percentages

Junction 1

		To		
		1	2	3
From	1	0	1	1
	2	1	0	0
	3	1	0	0

Heavy Vehicle Percentages

Junction 2

		To		
		A	B	C
From	A	0	2	0
	B	2	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1	0.08	1.4	A	834	1252
	2	0.05	0.4	A	409	613
	3	0.08	1.4	A	859	1289
2	A	0.00	0.0	A	695	1042
	B	0.44	1.8	D	192	288
	C	0.00	0.0	A	216	324

Main Results for each time segment

07:45 - 08:00

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	672	168	309	672	685	566	0.0	0.7	0.054	A
	2	341	85	412	342	337	569	0.0	0.2	0.039	A
	3	717	179	157	718	716	597	0.0	0.6	0.052	A
2	A	569	142		569	573	341	0.0	0.0	0.000	A
	B	157	39		160	162	222	0.0	0.5	0.220	B
	C	181	45		181	178	346	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	822	206	365	820	827	648	0.7	1.1	0.060	A
	2	404	101	506	404	401	678	0.2	0.3	0.045	A
	3	826	206	184	829	842	726	0.6	0.7	0.061	A
2	A	678	170		678	688	404	0.0	0.0	0.000	A
	B	190	47		190	193	262	0.5	0.8	0.286	C
	C	214	54		214	210	416	0.0	0.0	0.000	A

08:15 - 08:30

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	1013	253	452	1010	1012	798	1.1	1.5	0.081	A
	2	489	122	613	488	481	849	0.3	0.4	0.050	A
	3	1028	257	216	1035	1044	885	0.7	1.0	0.079	A
2	A	849	212		849	843	489	0.0	0.0	0.000	A
	B	232	58		227	230	342	0.8	1.7	0.397	C
	C	261	65		261	253	507	0.0	0.0	0.000	A

08:30 - 08:45

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	999	250	456	997	1005	813	1.5	1.3	0.081	A
	2	491	123	617	491	483	836	0.4	0.3	0.050	A
	3	1047	262	222	1048	1034	886	1.0	1.4	0.077	A
2	A	836	209		836	839	491	0.0	0.0	0.000	A
	B	237	59		234	233	333	1.7	1.8	0.440	D
	C	257	64		257	252	503	0.0	0.0	0.000	A

08:45 - 09:00

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	814	203	365	812	825	652	1.3	0.9	0.063	A
	2	395	99	506	396	406	671	0.3	0.3	0.045	A
	3	839	210	178	839	844	725	1.4	1.0	0.062	A
2	A	671	168		671	685	395	0.0	0.0	0.000	A
	B	184	46		187	195	262	1.8	0.8	0.298	C
	C	208	52		208	213	410	0.0	0.0	0.000	A

09:00 - 09:15

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	687	172	295	690	696	554	0.9	0.5	0.054	A
	2	332	83	420	333	337	565	0.3	0.2	0.040	A
	3	699	175	149	700	707	604	1.0	0.8	0.053	A
2	A	565	141		565	570	332	0.0	0.0	0.000	A
	B	155	39		158	161	225	0.8	0.4	0.216	B
	C	174	44		174	177	340	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:45 - 08:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	672	1830	0.367	672	685	0.0	0.7	0.054	A
		Exit	1	1		566			566	563	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	341	1842	0.185	342	337	0.0	0.2	0.039	A
		Exit	1	1		569			569	572	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	717	1850	0.388	718	716	0.0	0.6	0.052	A
		Exit	1	1		597			597	602	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	569			569	573	0.0	0.0	0.000	A
		Exit	1	1		341			341	341	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	159			160	162	0.0	0.3	0.137	A
			2	1	(A, C)	157			159	164	0.0	0.1	0.082	A
		Exit	1	1		222			222	228	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	181			181	178	0.0	0.0	0.000	A
		Exit	1	1		346			346	345	0.0	0.0	0.000	A

08:00 - 08:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	822	1791	0.459	820	827	0.7	1.1	0.060	A
		Exit	1	1		648			648	661	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	404	1771	0.228	404	401	0.2	0.3	0.045	A
		Exit	1	1		678			678	686	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	826	1833	0.450	829	842	0.6	0.7	0.061	A
		Exit	1	1		726			726	723	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	678			678	688	0.0	0.0	0.000	A
		Exit	1	1		404			404	403	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	189			190	193	0.3	0.4	0.148	A
			2	1	(A, C)	190			189	194	0.1	0.5	0.138	A
		Exit	1	1		262			262	272	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	214			214	210	0.0	0.0	0.000	A
		Exit	1	1		416			416	416	0.0	0.0	0.000	A

08:15 - 08:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	1013	1729	0.586	1010	1012	1.1	1.5	0.081	A
		Exit	1	1		798			798	816	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	489	1694	0.289	488	481	0.3	0.4	0.050	A
		Exit	1	1		849			849	841	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	1028	1812	0.567	1035	1044	0.7	1.0	0.079	A
		Exit	1	1		885			885	878	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	849			849	843	0.0	0.0	0.000	A
		Exit	1	1		489			489	483	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	227			227	230	0.4	0.6	0.158	A
			2	1	(A, C)	232			227	231	0.5	1.1	0.238	B
		Exit	1	1		342			342	339	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	261			261	253	0.0	0.0	0.000	A
		Exit	1	1		507			507	504	0.0	0.0	0.000	A

08:30 - 08:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	999	1731	0.577	997	1005	1.5	1.3	0.081	A
		Exit	1	1		813			813	807	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	491	1693	0.290	491	483	0.4	0.3	0.050	A
		Exit	1	1		836			836	836	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	1047	1810	0.579	1048	1034	1.0	1.4	0.077	A
		Exit	1	1		886			886	878	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	836			836	839	0.0	0.0	0.000	A
		Exit	1	1		491			491	485	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	234			234	233	0.6	0.6	0.164	A
			2	1	(A, C)	237			234	233	1.1	1.2	0.277	C
		Exit	1	1		333			333	333	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	257			257	252	0.0	0.0	0.000	A
		Exit	1	1		503			503	507	0.0	0.0	0.000	A

08:45 - 09:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	814	1792	0.454	812	825	1.3	0.9	0.063	A
		Exit	1	1		652			652	663	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	395	1772	0.223	396	406	0.3	0.3	0.045	A
		Exit	1	1		671			671	684	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	839	1837	0.457	839	844	1.4	1.0	0.062	A
		Exit	1	1		725			725	729	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	671			671	685	0.0	0.0	0.000	A
		Exit	1	1		395			395	408	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	186			187	195	0.6	0.4	0.148	A
			2	1	(A, C)	184			186	194	1.2	0.4	0.150	A
		Exit	1	1		262			262	268	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	208			208	213	0.0	0.0	0.000	A
		Exit	1	1		410			410	418	0.0	0.0	0.000	A

09:00 - 09:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	687	1839	0.374	690	696	0.9	0.5	0.054	A
		Exit	1	1		554			554	558	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	332	1828	0.182	333	337	0.3	0.2	0.040	A
		Exit	1	1		565			565	569	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	699	1858	0.376	700	707	1.0	0.8	0.053	A
		Exit	1	1		604			604	613	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	565			565	570	0.0	0.0	0.000	A
		Exit	1	1		332			332	338	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	156			158	161	0.4	0.3	0.138	A
			2	1	(A, C)	155			156	161	0.4	0.1	0.077	A
		Exit	1	1		225			225	229	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	174			174	177	0.0	0.0	0.000	A
		Exit	1	1		340			340	341	0.0	0.0	0.000	A

2039 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	Junction 1 - Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout			1, 2, 3	0.08	A
2	untitled	T-Junction	Two-way			0.17	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Linked Arm Data

Junction	Arm	Feeding Junction	Feeding Arm	Link Type	Flow source	Uniform flow (Veh/hr)	Flow multiplier (%)	Internal storage space (PCU)
1	2	2	A	Simple (vertical queueing)	Normal	0	100.00	
2	A	1	2	Simple (vertical queueing)	Normal	0	100.00	

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1	1		ONE HOUR	✓	594	100.000
	2	✓				
	3		ONE HOUR	✓	933	100.000
2	A	✓				
	B		ONE HOUR	✓	302	100.000
	C		ONE HOUR	✓	492	100.000

Origin-Destination Data

Junction 1

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	156	438
	2	434	0	360
	3	695	238	0

Junction 2

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	205	187
	B	302	0	0
	C	492	0	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	2
	2	0	0	1
	3	0	2	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	2	0
	B	1	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Junction	Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	1	0.05	0.6	A	547	820
	2	0.06	1.0	A	727	1091
	3	0.10	1.7	A	859	1289
2	A	0.00	0.0	A	364	545
	B	0.67	3.9	E	276	415
	C	0.00	0.0	A	452	678

Main Results for each time segment

16:45 - 17:00

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	446	111	183	446	457	843	0.0	0.3	0.041	A
	2	593	148	329	593	597	299	0.0	0.4	0.046	A
	3	702	175	324	701	706	598	0.0	0.7	0.058	A
2	A	299	75		299	302	593	0.0	0.0	0.000	A
	B	225	56		224	226	160	0.0	1.0	0.251	C
	C	369	92		369	372	139	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	534	134	219	535	542	1018	0.3	0.4	0.045	A
	2	712	178	395	713	708	359	0.4	0.6	0.052	A
	3	843	211	393	844	844	715	0.7	0.9	0.070	A
2	A	359	90		359	357	712	0.0	0.0	0.000	A
	B	273	68		273	269	185	1.0	1.7	0.342	C
	C	439	110		439	439	174	0.0	0.0	0.000	A

17:15 - 17:30

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	660	165	263	661	666	1250	0.4	0.5	0.051	A
	2	879	220	490	878	875	434	0.6	1.0	0.063	A
	3	1032	258	480	1033	1034	888	0.9	1.6	0.099	A
2	A	434	109		434	437	879	0.0	0.0	0.000	A
	B	335	84		334	329	228	1.7	3.6	0.585	E
	C	545	136		545	547	206	0.0	0.0	0.000	A

17:30 - 17:45

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	658	164	260	659	661	1242	0.5	0.6	0.051	A
	2	872	218	480	872	873	439	1.0	0.9	0.065	A
	3	1029	257	471	1031	1033	882	1.6	1.7	0.100	A
2	A	439	110		439	440	872	0.0	0.0	0.000	A
	B	329	82		325	331	228	3.6	3.9	0.675	E
	C	547	137		547	540	210	0.0	0.0	0.000	A

17:45 - 18:00

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	539	135	214	539	548	1024	0.6	0.4	0.046	A
	2	706	177	398	708	732	355	0.9	0.6	0.054	A
	3	850	212	388	851	849	718	1.7	1.0	0.073	A
2	A	355	89		355	359	706	0.0	0.0	0.000	A
	B	270	67		269	285	184	3.9	1.6	0.411	C
	C	437	109		437	445	172	0.0	0.0	0.000	A

18:00 - 18:15

Junction	Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	442	111	179	443	458	850	0.4	0.3	0.041	A
	2	602	151	326	603	605	295	0.6	0.5	0.047	A
	3	699	175	329	700	712	600	1.0	0.6	0.058	A
2	A	295	74		295	303	602	0.0	0.0	0.000	A
	B	227	57		226	232	155	1.6	1.1	0.266	C
	C	377	94		377	372	140	0.0	0.0	0.000	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:45 - 17:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	446	1906	0.234	446	457	0.0	0.3	0.041	A
		Exit	1	1		843			843	847	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	593	1897	0.313	593	597	0.0	0.4	0.046	A
		Exit	1	1		299			299	302	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	702	1742	0.403	701	706	0.0	0.7	0.058	A
		Exit	1	1		598			598	611	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	299			299	302	0.0	0.0	0.000	A
		Exit	1	1		593			593	598	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	225			224	226	0.0	0.5	0.130	A
			2	1	(A, C)	225			225	228	0.0	0.5	0.122	A
		Exit	1	1		160			160	161	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	369			369	372	0.0	0.0	0.000	A
		Exit	1	1		139			139	141	0.0	0.0	0.000	A

17:00 - 17:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	534	1877	0.285	535	542	0.3	0.4	0.045	A
		Exit	1	1		1018			1018	1013	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	712	1847	0.385	713	708	0.4	0.6	0.052	A
		Exit	1	1		359			359	358	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	843	1697	0.497	844	844	0.7	0.9	0.070	A
		Exit	1	1		715			715	723	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	359			359	357	0.0	0.0	0.000	A
		Exit	1	1		712			712	708	0.0	0.0	0.001	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	273			273	269	0.5	0.6	0.133	A
			2	1	(A, C)	273			273	270	0.5	1.1	0.208	B
		Exit	1	1		185			185	188	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	439			439	439	0.0	0.0	0.000	A
		Exit	1	1		174			174	169	0.0	0.0	0.000	A

17:15 - 17:30

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	660	1844	0.358	661	666	0.4	0.5	0.051	A
		Exit	1	1		1250			1250	1245	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	879	1781	0.493	878	875	0.6	1.0	0.063	A
		Exit	1	1		434			434	439	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	1032	1636	0.631	1033	1034	0.9	1.6	0.099	A
		Exit	1	1		888			888	890	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	434			434	437	0.0	0.0	0.000	A
		Exit	1	1		879			879	876	0.0	0.1	0.002	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	334			334	329	0.6	0.8	0.142	A
			2	1	(A, C)	335			334	330	1.1	2.8	0.443	D
		Exit	1	1		228			228	231	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	545			545	547	0.0	0.0	0.000	A
		Exit	1	1		206			206	207	0.0	0.0	0.000	A

17:30 - 17:45

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	658	1847	0.356	659	661	0.5	0.6	0.051	A
		Exit	1	1		1242			1242	1237	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	872	1787	0.488	872	873	1.0	0.9	0.065	A
		Exit	1	1		439			439	440	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	1029	1643	0.626	1031	1033	1.6	1.7	0.100	A
		Exit	1	1		882			882	890	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	439			439	440	0.0	0.0	0.000	A
		Exit	1	1		872			872	871	0.1	0.0	0.002	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	326			325	331	0.8	0.8	0.143	A
			2	1	(A, C)	329			326	331	2.8	3.1	0.532	D
		Exit	1	1		228			228	234	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	547			547	540	0.0	0.0	0.000	A
		Exit	1	1		210			210	206	0.0	0.0	0.000	A

17:45 - 18:00

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	539	1880	0.287	539	548	0.6	0.4	0.046	A
		Exit	1	1		1024			1024	1031	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	706	1846	0.383	708	732	0.9	0.6	0.054	A
		Exit	1	1		355			355	360	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	850	1700	0.500	851	849	1.7	1.0	0.073	A
		Exit	1	1		718			718	738	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	355			355	359	0.0	0.0	0.000	A
		Exit	1	1		706			706	730	0.0	0.0	0.001	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	269			269	285	0.8	0.6	0.137	A
			2	1	(A, C)	270			269	284	3.1	1.0	0.274	C
		Exit	1	1		184			184	188	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	437			437	445	0.0	0.0	0.000	A
		Exit	1	1		172			172	171	0.0	0.0	0.000	A

18:00 - 18:15

Junction	Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1	Entry	1	1	1, 2, 3	442	1904	0.232	443	458	0.4	0.3	0.041	A
		Exit	1	1		850			850	856	0.0	0.0	0.000	A
	2	Entry	1	1	1, 2, 3	602	1898	0.317	603	605	0.6	0.5	0.047	A
		Exit	1	1		295			295	303	0.0	0.0	0.000	A
	3	Entry	1	1	1, 2, 3	699	1740	0.402	700	712	1.0	0.6	0.058	A
		Exit	1	1		600			600	615	0.0	0.0	0.000	A
2	A	Entry	1	1	B, C	295			295	303	0.0	0.0	0.000	A
		Exit	1	1		602			602	604	0.0	0.0	0.000	A
	B	Entry	1	1	C	0			0	0	0.0	0.0	0.000	A
				2	A	227			226	232	0.6	0.6	0.131	A
			2	1	(A, C)	227			227	232	1.0	0.6	0.136	A
		Exit	1	1		155			155	160	0.0	0.0	0.000	A
	C	Entry	1	1	A, B	377			377	372	0.0	0.0	0.000	A
		Exit	1	1		140			140	143	0.0	0.0	0.000	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 11_Columbus Ave_Spitfire Way.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 11_Columbus Avenue_Spitfire Way
Report generation date: 18/03/2019 16:39:43

»2039 Base, AM
»2039 Base , PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Base									
Arm 1	0.5	0.07	0.32	A	0.07	0.3	0.05	0.22	A	0.06
Arm 2	1.4	0.11	0.58	A		0.6	0.06	0.39	A	
Arm 3	1.1	0.06	0.52	A		1.4	0.06	0.58	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	13/12/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.07	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Columbus Ave	
2	Spitfire Way	
3	B2190 (W)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.30	8.00	1.0	31.0	39.0	17.0	
2	3.30	6.30	30.0	22.0	39.0	17.0	
3	7.50	7.50	0.0	26.0	39.0	15.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.807	2420
2	0.674	1772
3	0.807	2416

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	380	100.000
2		ONE HOUR	✓	720	100.000
3		ONE HOUR	✓	1060	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	19	361
	2	50	0	670
	3	312	748	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	25	31
	2	3	0	5
	3	6	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.32	0.07	0.5	A	349	523
2	0.58	0.11	1.4	A	661	991
3	0.52	0.06	1.1	A	973	1459

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	286	72	562	1487	0.192	285	272	0.0	0.2	0.050	A
2	542	136	271	1462	0.371	540	576	0.0	0.6	0.065	A
3	798	200	37	2265	0.352	796	773	0.0	0.5	0.041	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	342	85	672	1415	0.241	341	325	0.2	0.3	0.056	A
2	647	162	324	1417	0.457	646	689	0.6	0.8	0.078	A
3	953	238	45	2260	0.422	952	926	0.5	0.7	0.046	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	418	105	823	1318	0.318	418	398	0.3	0.5	0.067	A
2	793	198	397	1356	0.585	791	843	0.8	1.4	0.106	A
3	1167	292	55	2252	0.518	1166	1133	0.7	1.1	0.055	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	418	105	824	1317	0.318	418	399	0.5	0.5	0.067	A
2	793	198	397	1356	0.585	793	844	1.4	1.4	0.107	A
3	1167	292	55	2251	0.518	1167	1135	1.1	1.1	0.055	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	342	85	673	1415	0.242	342	326	0.5	0.3	0.056	A
2	647	162	325	1416	0.457	649	690	1.4	0.8	0.078	A
3	953	238	45	2259	0.422	954	929	1.1	0.7	0.046	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	286	72	564	1486	0.193	286	273	0.3	0.2	0.050	A
2	542	136	272	1461	0.371	543	578	0.8	0.6	0.065	A
3	798	200	38	2265	0.352	799	777	0.7	0.5	0.041	A

2039 Base , PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	0.06	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	342	100.000
2		ONE HOUR	✓	550	100.000
3		ONE HOUR	✓	1223	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	48	294
	2	6	0	544
	3	416	807	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	1
	2	13	0	0
	3	7	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.22	0.05	0.3	A	314	471
2	0.39	0.06	0.6	A	505	757
3	0.58	0.06	1.4	A	1122	1683

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	257	64	606	1909	0.135	257	317	0.0	0.2	0.036	A
2	414	104	221	1620	0.256	413	642	0.0	0.3	0.050	A
3	921	230	5	2341	0.393	918	629	0.0	0.6	0.042	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	307	77	725	1813	0.170	307	379	0.2	0.2	0.040	A
2	494	124	264	1590	0.311	494	768	0.3	0.4	0.055	A
3	1099	275	5	2340	0.470	1099	753	0.6	0.9	0.048	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	377	94	887	1682	0.224	376	464	0.2	0.3	0.046	A
2	606	151	323	1550	0.391	605	940	0.4	0.6	0.063	A
3	1347	337	7	2339	0.576	1345	922	0.9	1.3	0.060	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	377	94	889	1681	0.224	377	465	0.3	0.3	0.046	A
2	606	151	324	1550	0.391	606	941	0.6	0.6	0.064	A
3	1347	337	7	2339	0.576	1347	923	1.3	1.4	0.060	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	307	77	727	1812	0.170	308	380	0.3	0.2	0.040	A
2	494	124	265	1590	0.311	495	770	0.6	0.5	0.055	A
3	1099	275	5	2340	0.470	1101	754	1.4	0.9	0.048	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	257	64	608	1907	0.135	258	318	0.2	0.2	0.036	A
2	414	104	222	1619	0.256	415	644	0.5	0.3	0.050	A
3	921	230	5	2341	0.393	922	631	0.9	0.7	0.042	A

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896
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Filename: Jct 13_R1 Strategic model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 13_B2050_Manston Ct Rd\Strategic Model Scenario
Report generation date: 19/03/2019 12:15:56

»2039 Baseline Traffic, AM
»2039 Baseline Traffic, PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Baseline Traffic									
Stream B-AC	0.1	0.17	0.08	A	0.01	0.1	0.15	0.08	A	0.01
Stream C-AB	0.1	0.08	0.04	A		0.1	0.08	0.06	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

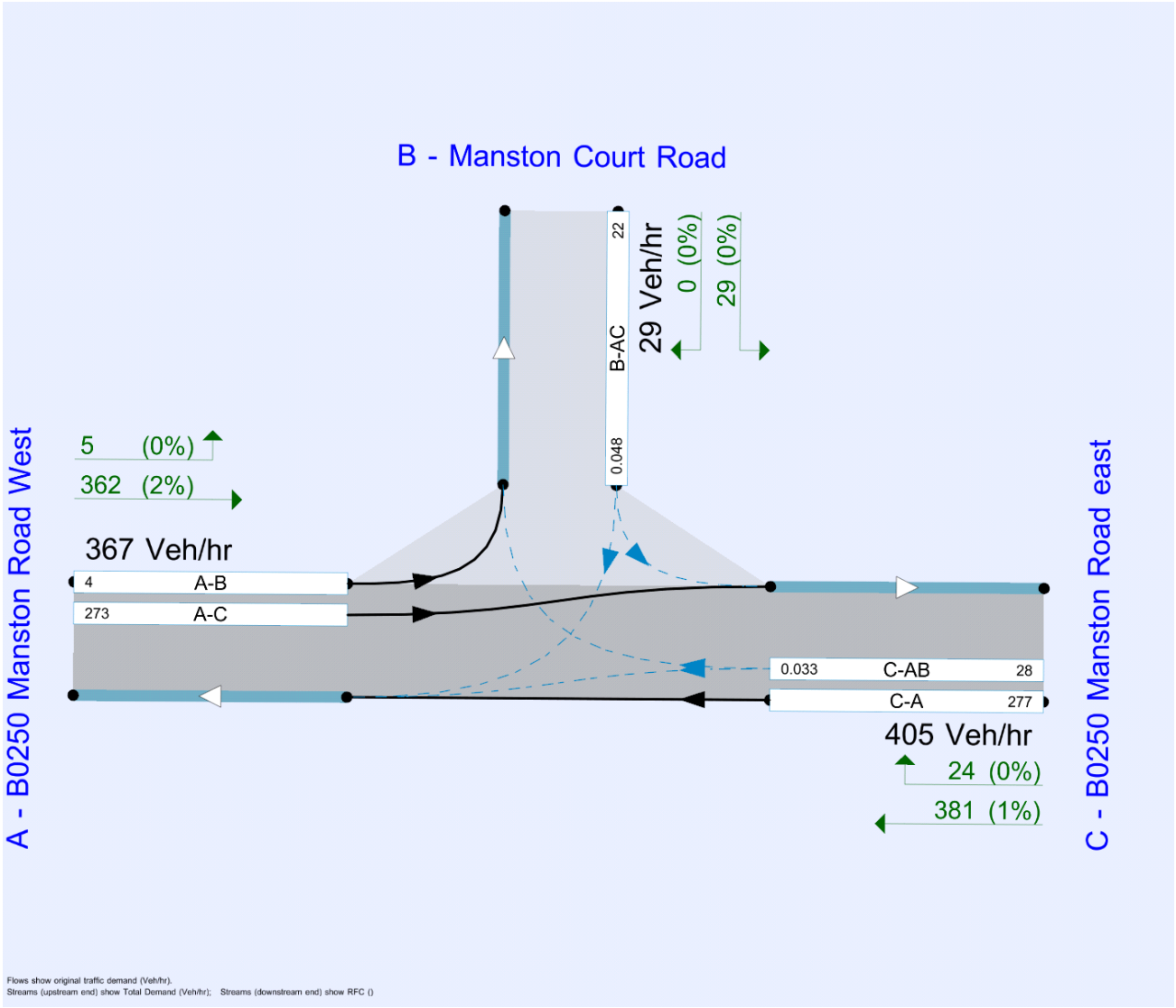
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
13	untitled	T-Junction	Two-way		0.01	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	B0250 Manston Road West		Major
B	Manston Court Road		Minor
C	B0250 Manston Road east		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - B0250 Manston Road east	6.75			250.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Manston Court Road	One lane	3.88	21	16

Slope / Intercept / Capacity

Stream Intercept Adjustments

Stream intercept adjustment	Use adjustment	Reason	Direct intercept adjustment (PCU/hr)
B-AC	✓		-160

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
13	B-A	536	0.094	0.239	0.150	0.341
13	B-C	690	0.102	0.259	-	-
13	C-B	719	0.269	0.269	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - B0250 Manston Road West		ONE HOUR	✓	485	100.000
B - Manston Court Road		ONE HOUR	✓	27	100.000
C - B0250 Manston Road east		ONE HOUR	✓	375	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - B0250 Manston Road West	B - Manston Court Road	C - B0250 Manston Road east
From	A - B0250 Manston Road West	0	13	472
	B - Manston Court Road	0	0	27
	C - B0250 Manston Road east	359	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - B0250 Manston Road West	B - Manston Court Road	C - B0250 Manston Road east
From	A - B0250 Manston Road West	0	2	3
	B - Manston Court Road	0	0	0
	C - B0250 Manston Road east	3	11	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.08	0.17	0.1	A	25	37
C-AB	0.04	0.08	0.1	A	26	40
C-A					318	477
A-B					12	18
A-C					433	650

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	20	5	434	0.047	20	0.0	0.0	0.145	A
C-AB	19	5	741	0.026	19	0.0	0.0	0.083	A
C-A	263	66			263				
A-B	10	2			10				
A-C	355	89			355				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	24	6	416	0.058	24	0.0	0.1	0.153	A
C-AB	25	6	762	0.033	25	0.0	0.0	0.082	A
C-A	312	78			312				
A-B	12	3			12				
A-C	424	106			424				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	30	7	390	0.076	30	0.1	0.1	0.166	A
C-AB	35	9	793	0.044	35	0.0	0.1	0.079	A
C-A	378	94			378				
A-B	14	4			14				
A-C	520	130			520				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	30	7	390	0.076	30	0.1	0.1	0.166	A
C-AB	35	9	793	0.044	35	0.1	0.1	0.079	A
C-A	378	94			378				
A-B	14	4			14				
A-C	520	130			520				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	24	6	416	0.058	24	0.1	0.1	0.153	A
C-AB	25	6	762	0.033	25	0.1	0.0	0.081	A
C-A	312	78			312				
A-B	12	3			12				
A-C	424	106			424				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	20	5	434	0.047	20	0.1	0.0	0.145	A
C-AB	19	5	741	0.026	19	0.0	0.0	0.083	A
C-A	263	66			263				
A-B	10	2			10				
A-C	355	89			355				

2039 Baseline Traffic, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (min)	Junction LOS
13	untitled	T-Junction	Two-way		0.01	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - B0250 Manston Road West		ONE HOUR	✓	367	100.000
B - Manston Court Road		ONE HOUR	✓	29	100.000
C - B0250 Manston Road east		ONE HOUR	✓	405	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - B0250 Manston Road West	B - Manston Court Road	C - B0250 Manston Road east
From	A - B0250 Manston Road West	0	5	362
	B - Manston Court Road	0	0	29
	C - B0250 Manston Road east	381	24	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - B0250 Manston Road West	B - Manston Court Road	C - B0250 Manston Road east
From	A - B0250 Manston Road West	0	0	2
	B - Manston Court Road	0	0	0
	C - B0250 Manston Road east	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.08	0.15	0.1	A	27	40
C-AB	0.06	0.08	0.1	A	38	57
C-A					334	500
A-B					5	7
A-C					332	498

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	22	5	458	0.048	22	0.0	0.0	0.138	A
C-AB	28	7	826	0.034	27	0.0	0.0	0.075	A
C-A	277	69			277				
A-B	4	0.94			4				
A-C	273	68			273				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	26	7	444	0.059	26	0.0	0.1	0.144	A
C-AB	36	9	850	0.043	36	0.0	0.1	0.074	A
C-A	328	82			328				
A-B	4	1			4				
A-C	325	81			325				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	32	8	424	0.075	32	0.1	0.1	0.153	A
C-AB	50	13	884	0.057	50	0.1	0.1	0.072	A
C-A	396	99			396				
A-B	6	1			6				
A-C	399	100			399				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	32	8	424	0.075	32	0.1	0.1	0.153	A
C-AB	50	13	884	0.057	50	0.1	0.1	0.072	A
C-A	395	99			395				
A-B	6	1			6				
A-C	399	100			399				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	26	7	444	0.059	26	0.1	0.1	0.144	A
C-AB	36	9	850	0.043	36	0.1	0.1	0.074	A
C-A	328	82			328				
A-B	4	1			4				
A-C	325	81			325				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
B-AC	22	5	458	0.048	22	0.1	0.1	0.138	A
C-AB	28	7	826	0.034	28	0.1	0.0	0.075	A
C-A	277	69			277				
A-B	4	0.94			4				
A-C	273	68			273				

LinSig V1 style report

User and Project Details

Project:	**Manston Airport DCO EIA**
Title:	**Junction 15**
Location:	
Additional detail:	
File name:	Junction 15_Validated.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX

Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7

Phase Intergreens Matrix

		Starting Phase		
		A	B	C
Terminating Phase	A		5	-
	B	10		10
	C	-	10	

Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		10	10
	2	10		0
	3	10	2	

Phases in Stage

Stage No.	Phases in Stage
1	B
2	A C
3	C

Give-Way Lane Input Data

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
2/2 (College Road)	5/1 (Right)	1439	0	1/1	1.09	All	2.00	2.00	0.50	2	2.00
				1/2	1.09	All					
3/1 (Hartsdown Road Entry)	6/1 (Right)	1439	0	2/1	1.09	To 6/1 (Ahead)	2.00	2.00	0.50	2	2.00
7/1 (College Road to Tivoli Road)	4/2 (Right)	1439	0	1/1	1.09	To 4/1 (Ahead)	-	-	-	-	-
				1/2	1.09	To 4/2 (Ahead)					
				3/1	1.09	To 4/1 (Left)					

Lane Input Data

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Manston Road south (Entry))	U	A	2	3	60.0	Geom	-	2.41	0.00	Y	Arm 4 Ahead	Inf
											Arm 5 Left	19.00
1/2 (Manston Road south (Entry))	U	A	2	3	12.0	Geom	-	2.58	0.00	Y	Arm 4 Ahead	Inf
2/1 (College Road)	U	C	2	3	60.0	Geom	-	3.23	0.00	Y	Arm 6 Ahead	Inf
2/2 (College Road)	O	C	2	3	6.0	Geom	-	3.25	0.00	Y	Arm 5 Right	16.00
											Arm 7 Right	15.00
3/1 (Hartsdown Road Entry)	O	B	2	3	60.0	Geom	-	3.01	0.00	Y	Arm 4 Left	Inf
											Arm 6 Right	8.00
4/1 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/2 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Hartsdown Road Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Manston Road south (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (College Road to Tivoli Road)	O		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Right	15.00

Lane Saturation Flows

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039 Baseline Traffic - AM Peak', Plan 1: 'Base')

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	2.41	0.00	Y	Arm 4 Ahead	Inf	57.2 %	1795	1795
				Arm 5 Left	19.00	42.8 %		
1/2 (Manston Road south (Entry))	2.58	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1873	1873
2/1 (College Road)	3.23	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1938	1938
2/2 (College Road)	3.25	0.00	Y	Arm 5 Right	16.00	98.6 %	1774	1774
				Arm 7 Right	15.00	1.4 %		
3/1 (Hartsdown Road Entry)	3.01	0.00	Y	Arm 4 Left	Inf	52.9 %	1760	1760
				Arm 6 Right	8.00	47.1 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039 Baseline Traffic - PM Peak', Plan 1: 'Base')

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	2.41	0.00	Y	Arm 4 Ahead	Inf	49.7 %	1785	1785
				Arm 5 Left	19.00	50.3 %		
1/2 (Manston Road south (Entry))	2.58	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1873	1873
2/1 (College Road)	3.23	0.00	Y	Arm 6 Ahead	Inf	100.0 %	1938	1938
2/2 (College Road)	3.25	0.00	Y	Arm 5 Right	16.00	95.0 %	1773	1773
				Arm 7 Right	15.00	5.0 %		
3/1 (Hartsdown Road Entry)	3.01	0.00	Y	Arm 4 Left	Inf	64.9 %	1798	1798
				Arm 6 Right	8.00	35.1 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 Baseline Traffic - AM Peak'	08:00	09:00	01:00	
2: '2039 Baseline Traffic - PM Peak'	17:00	18:00	01:00	

Traffic Flows, Desired

FG1: '2039 Baseline Traffic - AM Peak'

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	208	764	972
	B	514	0	577	1091
	C	224	209	3	436
	Tot.	738	417	1344	2499

FG2: '2039 Baseline Traffic - PM Peak'
Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	275	818	1093
	B	235	0	435	670
	C	250	228	12	490
	Tot.	485	503	1265	2253

Stage Timings

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039 Baseline Traffic - AM Peak', Plan 1: 'Base')

Stage	1	2	3
Duration	59	27	12
Change Point	0	69	106

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	-	-	**N/A**	-	-		-	-	-	-	-	-	**122.4%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**122.4%**
1/1+1/2	Manston Road south (Entry) Ahead Left	U	N/A	N/A	A		1	27	-	972	1795:1873	397+397	122.4 : 122.4%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	C		1	39	-	436	1938:1774	192+182	116.4 : 116.4%
3/1	Hartsdown Road Entry Left Right	O	N/A	N/A	B		1	59	-	1091	1760	895	121.9%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	855	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	489	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	417	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	738	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	3	1764	582	0.4%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**560**	**44**	**44.7**	**226.1**	**0.5**	**271.3**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**560**	**44**	**44.7**	**226.1**	**0.5**	**271.3**	**-**	**-**	**-**	**-**
1/1+1/2	972	794	-	-	-	18.9	91.5	-	110.4	408.9	28.3	91.5	119.8
2/1+2/2	436	387	0	150	30	6.3	33.9	0.5	40.7	336.1	8.8	33.9	42.7
3/1	1091	895	0	408	14	19.4	100.7	0.0	120.1	396.4	42.2	100.7	142.9
4/1	700	700	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	400	400	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	350	350	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	627	627	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	3	3	0	3	0	0.0	0.0	-	0.0	11.9	0.0	0.0	0.0

C1 - 08-0695

PRC for Signalled Lanes (%): -36.0
PRC Over All Lanes (%): -36.0

Total Delay for Signalled Lanes (pcuHr): 271.25
Total Delay Over All Lanes(pcuHr): 271.26

Cycle Time (s): 118

Stage Timings

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039 Baseline Traffic - PM Peak', Plan 1: 'Base')

Stage	1	2	3
Duration	41	42	15
Change Point	6	57	109

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	-	-	**N/A**	-	-		-	-	-	-	-	-	**106.5%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**106.5%**
1/1+1/2	Manston Road south (Entry) Ahead Left	U	N/A	N/A	A		1	42	-	1093	1785:1873	513+512	106.5 : 106.5%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	C		1	57	-	490	1938:1773	239+230	104.6 : 104.6%
3/1	Hartsdown Road Entry Left Right	O	N/A	N/A	B		1	41	-	670	1798	640	104.7%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	707	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	558	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	503	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	485	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	12	1764	462	2.5%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**415**	**39**	**26.4**	**80.5**	**0.7**	**107.7**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**415**	**39**	**26.4**	**80.5**	**0.7**	**107.7**	**-**	**-**	**-**	**-**
1/1+1/2	1093	1026	-	-	-	13.0	40.3	-	53.4	175.8	27.9	40.3	68.2
2/1+2/2	490	480	0	189	29	4.7	17.7	0.7	23.0	169.3	8.1	17.7	25.8
3/1	670	640	0	214	11	8.7	22.5	0.0	31.2	167.6	22.9	22.5	45.4
4/1	671	671	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	524	524	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	476	476	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	474	474	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	11	11	0	11	0	0.0	0.0	-	0.0	15.4	0.1	0.0	0.1

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PRC for Signalled Lanes (%): -18.4
PRC Over All Lanes (%): -18.4

Total Delay for Signalled Lanes (pcuHr): 107.60
Total Delay Over All Lanes(pcuHr): 107.65

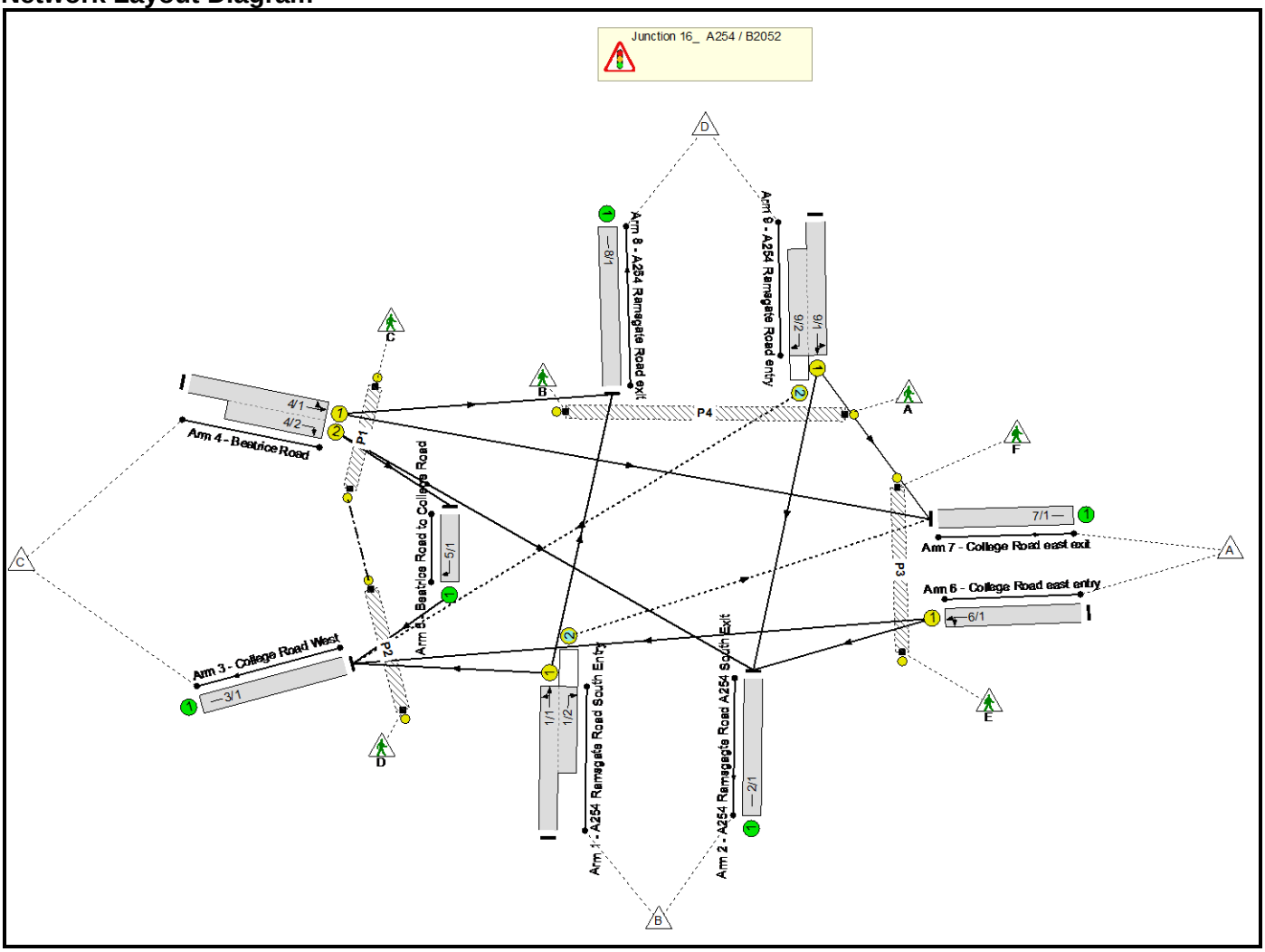
Cycle Time (s): 118

Full Input Data And Results

User and Project Details

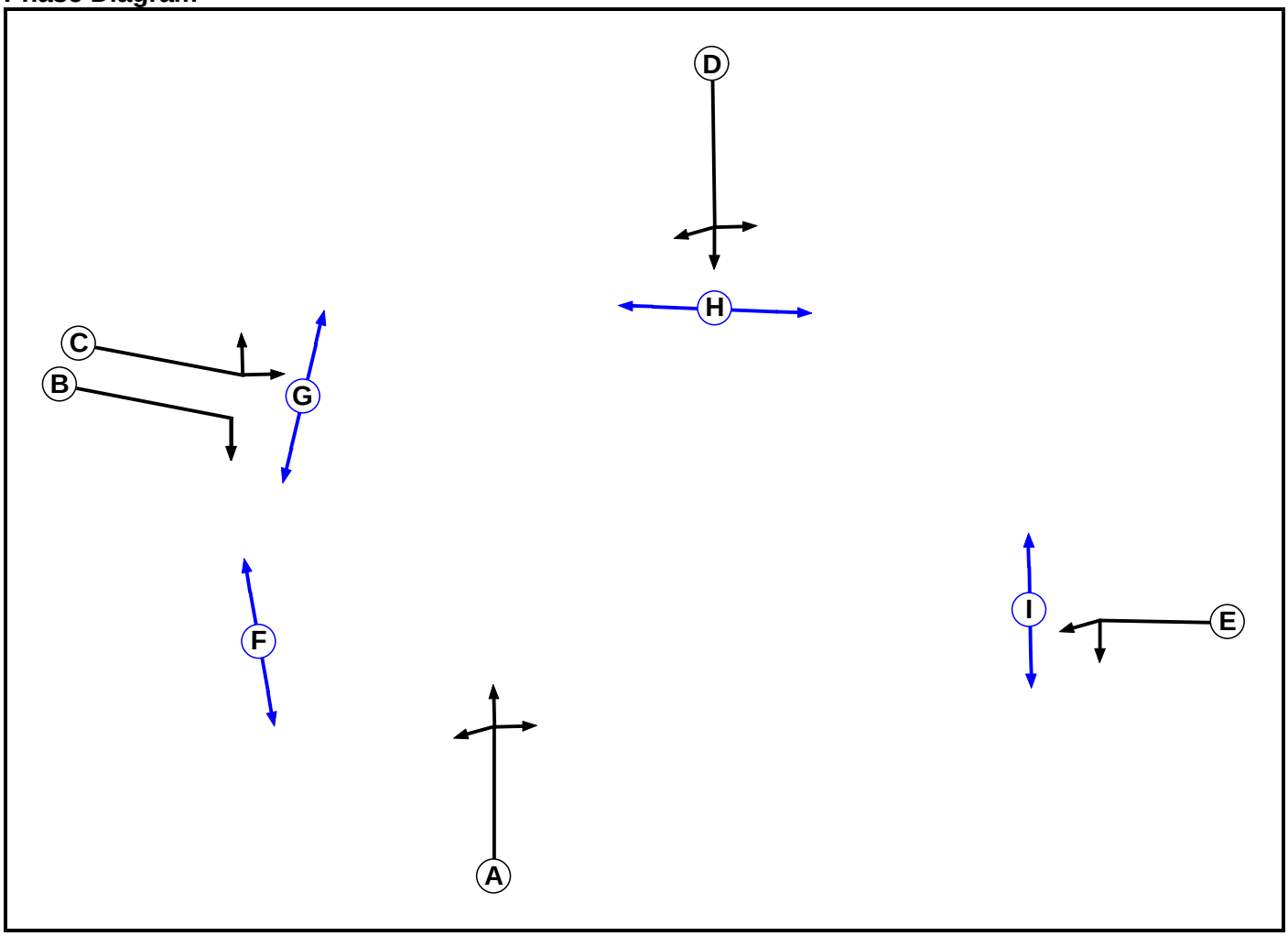
Project:	**Manston Airport DCO EIA**
Title:	**Junction 16**
Location:	
Additional detail:	
File name:	Junction 16_Validated_Strategic Model.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Pedestrian		6	6
G	Pedestrian		6	6
H	Pedestrian		7	7
I	Pedestrian		6	6

Full Input Data And Results

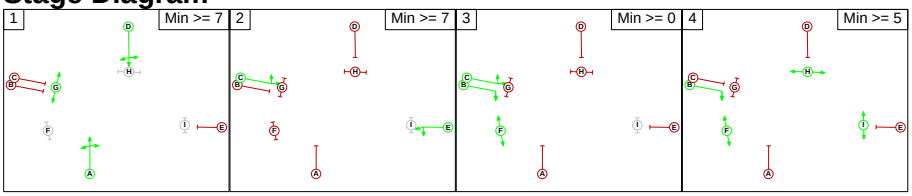
Phase Intergreens Matrix

Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H	I
A		-	5	-	5	-	-	-	-
B	11		-	11	-	-	11	-	-
C	-	-		-	-	-	-	8	-
D	-	-	5		5	-	-	-	-
E	-	8	-	-		8	-	-	-
F	-	-	-	-	-		-	-	-
G	-	-	5	-	5	-		-	-
H	-	-	-	-	-	-	-		-
I	-	-	-	-	-	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A D G
2	C E
3	B C F
4	B F H I

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

From Stage \ To Stage	1	2	3	4
1		5	5	2
2	2		8	8
3	11	2		8
4	11	2	2	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Junction 16_ A254 / B2052											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
1/2 (A254 Ramsgate Road South Entry)	7/1 (Right)	1439	0	9/1	1.09	All	3.00	-	0.50	3	3.00
9/2 (A254 Ramsgate Road entry)	3/1 (Right)	1439	0	1/1	1.09	All	2.00	-	0.50	2	2.00

Full Input Data And Results

Lane Input Data

Junction: Junction 16_ A254 / B2052

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (A254 Ramsgate Road South Entry)	U	A	2	3	60.0	Geom	-	2.50	0.00	Y	Arm 3 Left	8.00
											Arm 8 Ahead	Inf
1/2 (A254 Ramsgate Road South Entry)	O	A	2	3	7.0	Geom	-	2.50	0.00	Y	Arm 7 Right	10.00
2/1 (A254 Ramsgagte Road A254 South Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1 (College Road West)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (Beatrice Road)	U	C	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 7 Ahead	Inf
											Arm 8 Left	15.00
4/2 (Beatrice Road)	U	B	2	3	8.0	Geom	-	3.00	0.00	Y	Arm 2 Right	15.00
											Arm 5 Right	8.00
5/1 (Beatrice Road to College Road)	U		2	3	60.0	Geom	-	5.00	0.00	Y	Arm 3 Right	Inf
6/1 (College Road east entry)	U	E	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 2 Left	Inf
											Arm 3 Ahead	Inf
7/1 (College Road east exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1 (A254 Ramsgate Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
9/1 (A254 Ramsgate Road entry)	U	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 2 Ahead	Inf
											Arm 7 Left	8.00
9/2 (A254 Ramsgate Road entry)	O	D	2	3	9.0	Geom	-	3.00	0.00	Y	Arm 3 Right	15.00

Full Input Data And Results

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 Baseline Traffic - AM Peak'	07:45	08:45	01:00	
2: '2039 Baseline Traffic - PM Peak'	16:45	17:45	01:00	

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039 Baseline Traffic - AM Peak', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	275	316	0	591
	B	238	0	42	348	628
	C	651	83	58	9	801
	D	10	610	79	0	699
	Tot.	899	968	495	357	2719

Traffic Lane Flows

Lane	Scenario 1: 2039 Baseline Traffic - AM Peak
Junction: Junction 16_ A254 / B2052	
1/1 (with short)	628(In) 390(Out)
1/2 (short)	238
2/1	968
3/1	495
4/1 (with short)	801(In) 660(Out)
4/2 (short)	141
5/1	58
6/1	591
7/1	899
8/1	357
9/1 (with short)	699(In) 620(Out)
9/2 (short)	79

Full Input Data And Results

Lane Saturation Flows

Junction: Junction 16_ A254 / B2052								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A254 Ramsgate Road South Entry)	2.50	0.00	Y	Arm 3 Left	8.00	10.8 %	1828	1828
				Arm 8 Ahead	Inf	89.2 %		
1/2 (A254 Ramsgate Road South Entry)	2.50	0.00	Y	Arm 7 Right	10.00	100.0 %	1622	1622
2/1 (A254 Ramsgagte Road A254 South Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
3/1 (College Road West Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Beatrice Road)	3.00	0.00	Y	Arm 7 Ahead	Inf	98.6 %	1912	1912
				Arm 8 Left	15.00	1.4 %		
4/2 (Beatrice Road)	3.00	0.00	Y	Arm 2 Right	15.00	58.9 %	1686	1686
				Arm 5 Right	8.00	41.1 %		
5/1 (Beatrice Road to College Road)	5.00	0.00	Y	Arm 3 Right	Inf	100.0 %	2115	2115
6/1 (College Road east entry)	3.65	0.00	Y	Arm 2 Left	Inf	46.5 %	1980	1980
				Arm 3 Ahead	Inf	53.5 %		
7/1 (College Road east exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A254 Ramsgate Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/1 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 2 Ahead	Inf	98.4 %	1909	1909
				Arm 7 Left	8.00	1.6 %		
9/2 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 3 Right	15.00	100.0 %	1741	1741

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039 Baseline Traffic - PM Peak', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	242	329	0	571
	B	271	0	61	421	753
	C	636	97	64	13	810
	D	15	601	105	0	721
	Tot.	922	940	559	434	2855

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2039 Baseline Traffic - PM Peak
Junction: Junction 16_ A254 / B2052	
1/1 (with short)	753(In) 482(Out)
1/2 (short)	271
2/1	940
3/1	559
4/1 (with short)	810(In) 649(Out)
4/2 (short)	161
5/1	64
6/1	571
7/1	922
8/1	434
9/1 (with short)	721(In) 616(Out)
9/2 (short)	105

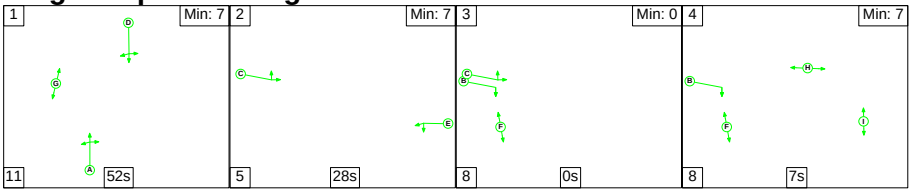
Full Input Data And Results

Lane Saturation Flows

Junction: Junction 16_ A254 / B2052								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A254 Ramsgate Road South Entry)	2.50	0.00	Y	Arm 3 Left	8.00	12.7 %	1822	1822
				Arm 8 Ahead	Inf	87.3 %		
1/2 (A254 Ramsgate Road South Entry)	2.50	0.00	Y	Arm 7 Right	10.00	100.0 %	1622	1622
2/1 (A254 Ramsgagte Road A254 South Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
3/1 (College Road West Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Beatrice Road)	3.00	0.00	Y	Arm 7 Ahead	Inf	98.0 %	1911	1911
				Arm 8 Left	15.00	2.0 %		
4/2 (Beatrice Road)	3.00	0.00	Y	Arm 2 Right	15.00	60.2 %	1688	1688
				Arm 5 Right	8.00	39.8 %		
5/1 (Beatrice Road to College Road)	5.00	0.00	Y	Arm 3 Right	Inf	100.0 %	2115	2115
6/1 (College Road east entry)	3.65	0.00	Y	Arm 2 Left	Inf	42.4 %	1980	1980
				Arm 3 Ahead	Inf	57.6 %		
7/1 (College Road east exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A254 Ramsgate Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
9/1 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 2 Ahead	Inf	97.6 %	1906	1906
				Arm 7 Left	8.00	2.4 %		
9/2 (A254 Ramsgate Road entry)	3.00	0.00	Y	Arm 3 Right	15.00	100.0 %	1741	1741

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039 Baseline Traffic - AM Peak', Plan 1: 'Base')

Stage Sequence Diagram

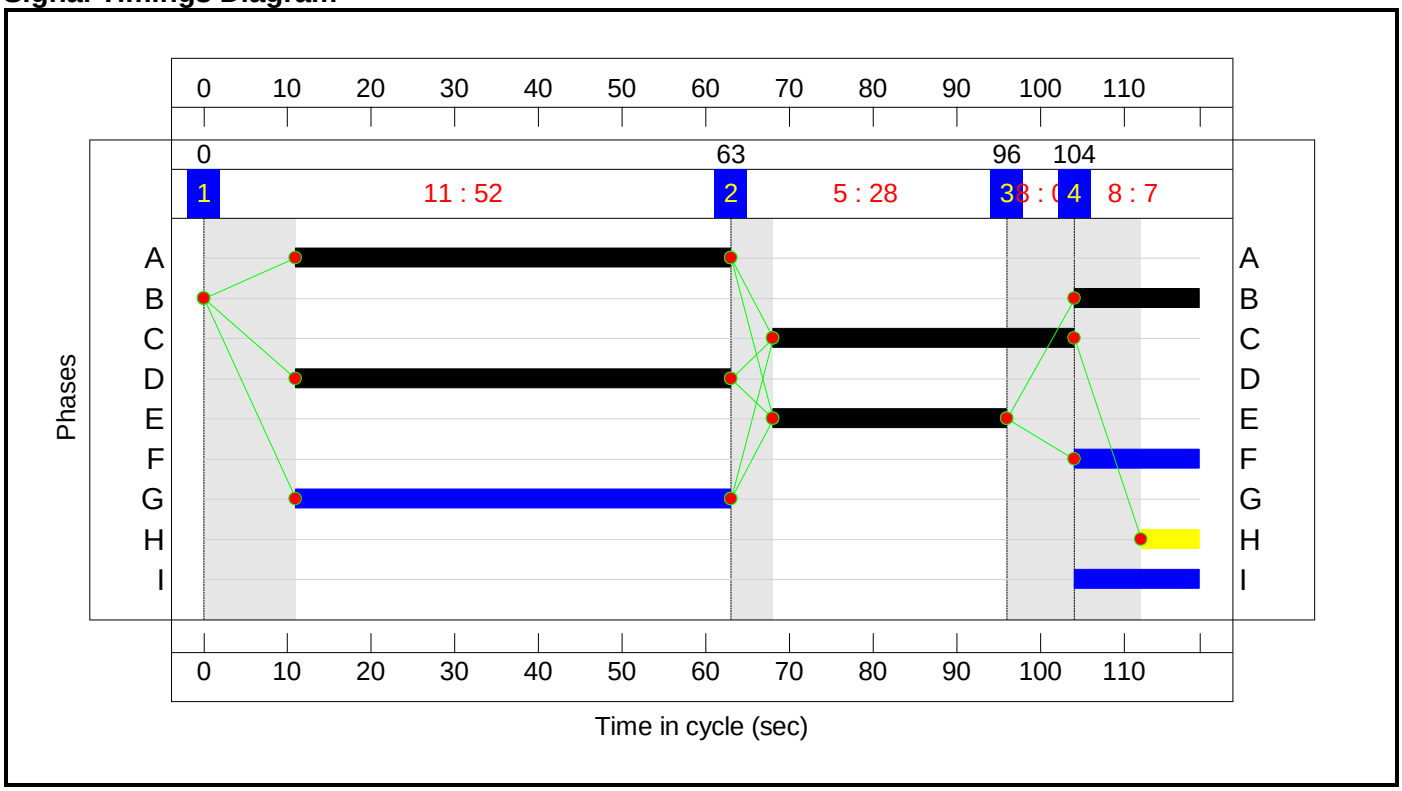


Stage Timings

Stage	1	2	3	4
Duration	52	28	0	7
Change Point	0	63	96	104

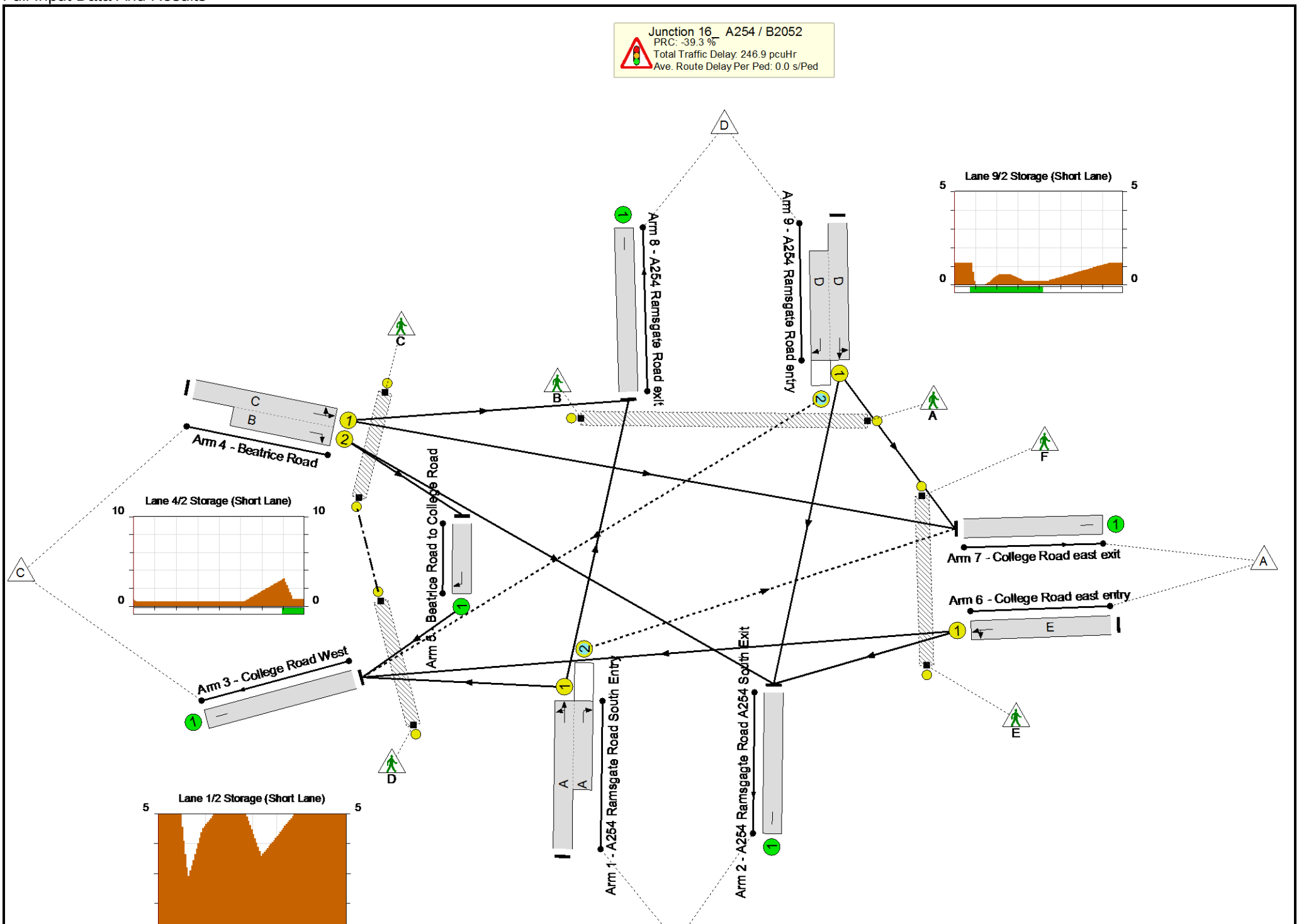
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Junction 16_ A254 / B2052
PRC: -39.3 %
Total Traffic Delay: 246.9 pcuHr
Ave. Route Delay Per Ped: 0.0 s/Ped
Lane 9/2 Storage (Short Lane)
Arm 8 - A254 Ramsgate Road exit
Arm 9 - A254 Ramsgate Road entry
Arm 4 - Beatrice Road
Lane 4/2 Storage (Short Lane)
Arm 5 - Beatrice Road to College Road
Arm 7 - College Road east exit
Arm 6 - College Road east entry
Arm 3 - College Road West
Arm 1 - A254 Ramsgate Road South Entry
Arm 2 - A254 Ramsgate Road A254 South Exit
Lane 1/2 Storage (Short Lane)

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 16	-	-	**N/A**	-	-		-	-	-	-	-	-	**125.3%**
Junction 16_ A254 / B2052	-	-	**N/A**	-	-		-	-	-	-	-	-	**125.3%**
1/1+1/2	A254 Ramsgate Road South Entry Left Right Ahead	U+O	N/A	N/A	A		1	52	-	628	1828:1622	316+193	123.5 : 123.5%
2/1	A254 Ramsgagte Road A254 South Exit	U	N/A	N/A	-		-	-	-	968	Inf	Inf	0.0%
3/1	College Road West	U	N/A	N/A	-		-	-	-	495	Inf	Inf	0.0%
4/1+4/2	Beatrice Road Right Right2 Ahead Left	U	N/A	N/A	C B		1	36:15	-	801	1912:1686	527+112	125.3 : 125.3%
5/1	Beatrice Road to College Road Right	U	N/A	N/A	-		-	-	-	58	2115	2115	2.2%
6/1	College Road east entry Left Ahead	U	N/A	N/A	E		1	28	-	591	1980	483	122.5%
7/1	College Road east exit	U	N/A	N/A	-		-	-	-	899	Inf	Inf	0.0%
8/1	A254 Ramsgate Road exit	U	N/A	N/A	-		-	-	-	357	Inf	Inf	0.0%
9/1+9/2	A254 Ramsgate Road entry Ahead Right Left	U+O	N/A	N/A	D		1	52	-	699	1909:1741	779+99	79.6 : 79.6%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	52	-	0	-	31462	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	F		1	15	-	0	-	9076	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	I		1	15	-	0	-	9076	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	H		1	7	-	0	-	4235	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 16	**-**	**-**	**194**	**0**	**78**	**41.1**	**204.4**	**1.4**	**246.9**	**-**	**-**	**-**	**-**
Junction 16_ A254 / B2052	**-**	**-**	**194**	**0**	**78**	**41.1**	**204.4**	**1.4**	**246.9**	**-**	**-**	**-**	**-**
1/1+1/2	628	583	115	0	78	7.2	62.3	1.2	70.6	405.0	11.1	62.3	73.3
2/1	901	901	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	425	425	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1+4/2	801	639	-	-	-	16.3	83.4	-	99.7	447.9	33.9	83.4	117.3
5/1	46	46	-	-	-	0.0	0.0	-	0.0	0.9	0.0	0.0	0.0
6/1	591	483	-	-	-	12.3	56.8	-	69.2	421.3	23.4	56.8	80.3
7/1	722	722	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	355	355	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1+9/2	699	699	79	0	0	5.3	1.9	0.2	7.4	38.1	18.5	1.9	20.4
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P3	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P4	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0

C1 - 08-0694

PRC for Signalled Lanes (%): -39.3
PRC Over All Lanes (%): -39.3

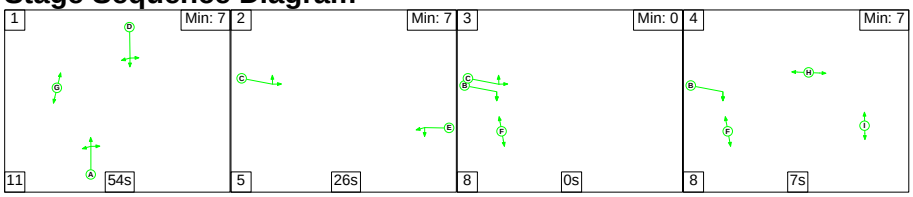
Total Delay for Signalled Lanes (pcuHr): 246.88
Total Delay Over All Lanes(pcuHr): 246.89

Cycle Time (s): 119

Full Input Data And Results

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039 Baseline Traffic - PM Peak', Plan 1: 'Base')

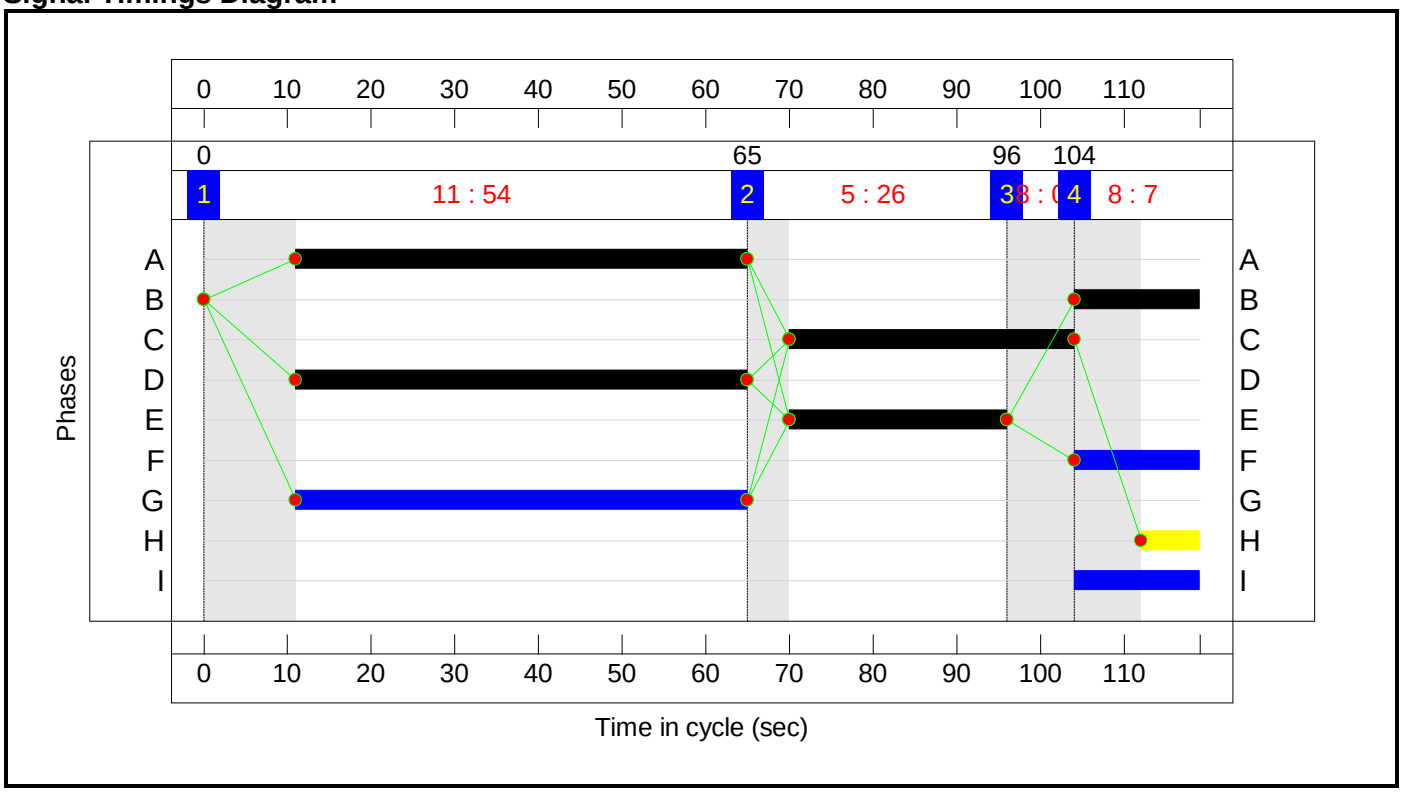
Stage Sequence Diagram



Stage Timings

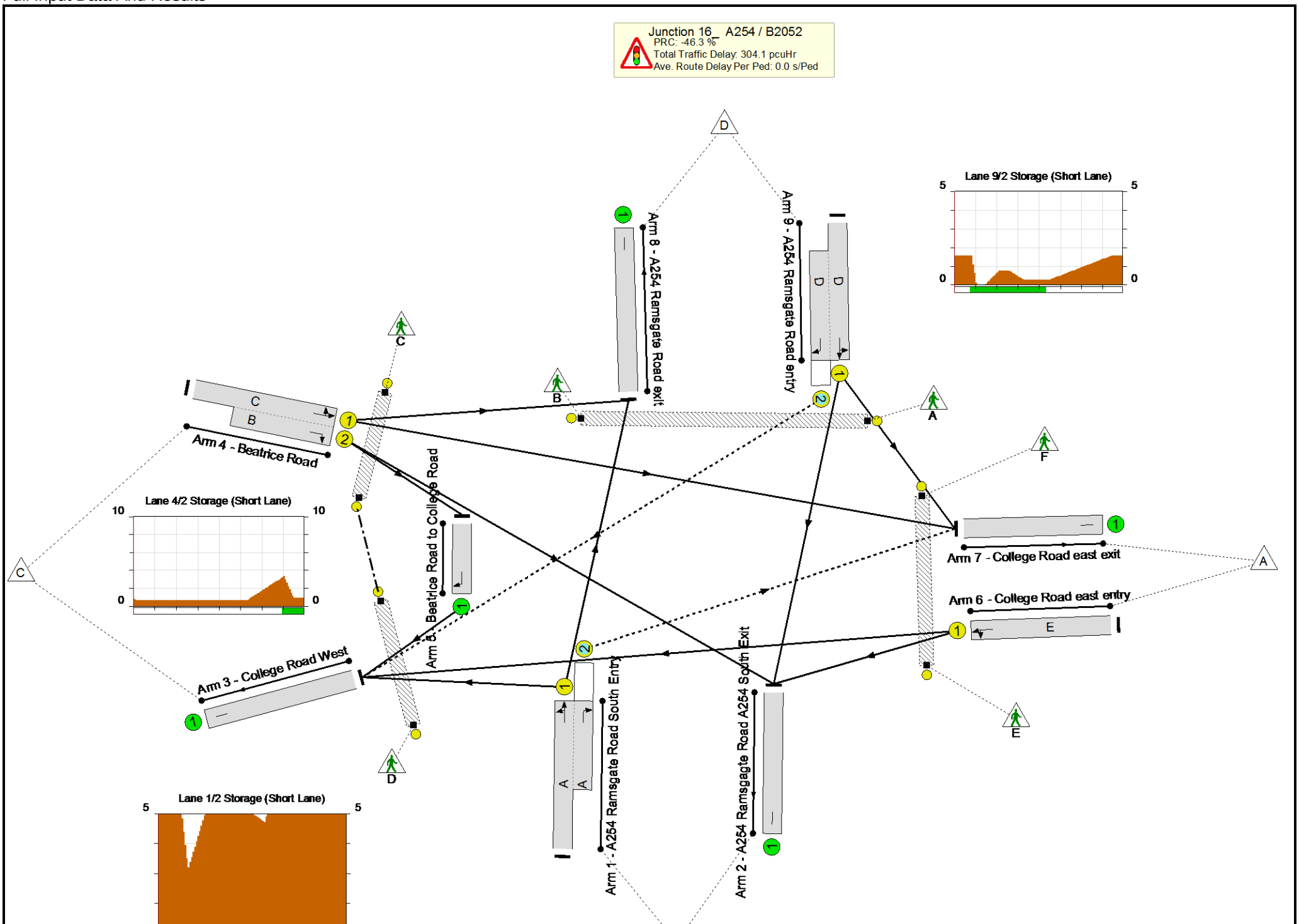
Stage	1	2	3	4
Duration	54	26	0	7
Change Point	0	65	96	104

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Junction 16_ A254 / B2052
PRC: -46.3 %
Total Traffic Delay: 304.1 pcuHr
Ave. Route Delay Per Ped: 0.0 s/Ped
Arm 8 - A254 Ramsgate Road exit
Arm 9 - A254 Ramsgate Road entry
Lane 9/2 Storage (Short Lane)
Arm 4 - Beatrice Road
Lane 4/2 Storage (Short Lane)
Arm 5 - Beatrice Road to College Road
Arm 7 - College Road east exit
Arm 6 - College Road east entry
Arm 3 - College Road West
Arm 1 - A254 Ramsgate Road South Entry
Arm 2 - A254 Ramsgate Road A254 South Exit
Lane 1/2 Storage (Short Lane)

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 16	-	-	**N/A**	-	-		-	-	-	-	-	-	**131.7%**
Junction 16_ A254 / B2052	-	-	**N/A**	-	-		-	-	-	-	-	-	**131.7%**
1/1+1/2	A254 Ramsgate Road South Entry Left Right Ahead	U+O	N/A	N/A	A		1	54	-	753	1822:1622	369+207	130.8 : 130.8%
2/1	A254 Ramsgagte Road A254 South Exit	U	N/A	N/A	-		-	-	-	940	Inf	Inf	0.0%
3/1	College Road West	U	N/A	N/A	-		-	-	-	559	Inf	Inf	0.0%
4/1+4/2	Beatrice Road Right Right2 Ahead Left	U	N/A	N/A	C B		1	34:15	-	810	1911:1688	493+122	131.7 : 131.7%
5/1	Beatrice Road to College Road Right	U	N/A	N/A	-		-	-	-	64	2115	2115	2.3%
6/1	College Road east entry Left Ahead	U	N/A	N/A	E		1	26	-	571	1980	449	127.1%
7/1	College Road east exit	U	N/A	N/A	-		-	-	-	922	Inf	Inf	0.0%
8/1	A254 Ramsgate Road exit	U	N/A	N/A	-		-	-	-	434	Inf	Inf	0.0%
9/1+9/2	A254 Ramsgate Road entry Ahead Right Left	U+O	N/A	N/A	D		1	54	-	721	1906:1741	785+134	78.5 : 78.5%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	G		1	54	-	0	-	32672	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	F		1	15	-	0	-	9076	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	I		1	15	-	0	-	9076	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	H		1	7	-	0	-	4235	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 16	**-**	**-**	**234**	**0**	**78**	**47.3**	**255.1**	**1.7**	**304.1**	**-**	**-**	**-**	**-**
Junction 16_ A254 / B2052	**-**	**-**	**234**	**0**	**78**	**47.3**	**255.1**	**1.7**	**304.1**	**-**	**-**	**-**	**-**
1/1+1/2	753	643	129	0	78	10.0	90.7	1.2	101.9	487.2	16.4	90.7	107.0
2/1	865	865	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	468	468	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/1+4/2	810	615	-	-	-	18.9	99.5	-	118.4	526.1	36.1	99.5	135.6
5/1	49	49	-	-	-	0.0	0.0	-	0.0	0.9	0.0	0.0	0.0
6/1	571	449	-	-	-	13.3	63.1	-	76.5	482.1	23.8	63.1	86.9
7/1	705	705	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	390	390	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/1+9/2	721	721	105	0	0	5.1	1.8	0.4	7.3	36.6	18.1	1.8	19.9
Ped Link: P1	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P2	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P3	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0
Ped Link: P4	0	0	-	-	-	-	-	-	0.0	0.0	-	-	0.0

C1 - 08-0694 PRC for Signalled Lanes (%): -46.3 Total Delay for Signalled Lanes (pcuHr): 304.09 Cycle Time (s): 119
PRC Over All Lanes (%): -46.3 Total Delay Over All Lanes(pcuHr): 304.10

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 20a and b_Manston Rd_A256.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 20a_A256_Manston Rd E
Report generation date: 19/03/2019 10:20:27

«2039 Base, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Base									
Arm 1	1.1	0.06	0.52	A	0.08	1.2	0.06	0.54	A	0.08
Arm 2	1.3	0.13	0.58	A		1.2	0.11	0.55	A	
Arm 3	0.2	0.06	0.18	A		0.1	0.07	0.12	A	
Arm 4	0.4	0.06	0.30	A		0.5	0.06	0.32	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	14/12/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039 Base	PM	Dedicated left turn from Manston Road (W)	ONE HOUR	16:45	18:15	15	✓

2039 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 (N)	
2	Manston Road (E)	
3	A256 (S)	
4	Manston Road (W)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.30	8.30	5.9	30.0	60.0	18.0	
2	3.70	7.10	12.8	20.0	60.0	20.0	
3	3.70	7.10	12.7	20.0	60.0	13.0	
4	3.70	7.10	7.9	50.0	60.0	17.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.719	2548
2	0.572	1736
3	0.586	1775
4	0.571	1670

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1044	100.000
2		ONE HOUR	✓	587	100.000
3		ONE HOUR	✓	97	100.000
4		ONE HOUR	✓	439	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	176	62	806
	2	149	0	80	358
	3	33	52	0	12
	4	0	427	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	2	1
	2	0	0	0	0
	3	1	1	0	0
	4	0	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.54	0.06	1.2	A	958	1437
2	0.55	0.11	1.2	A	539	808
3	0.12	0.07	0.1	A	89	134
4	0.32	0.06	0.5	A	403	604

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	786	196	368	2260	0.348	784	136	0.0	0.5	0.041	A
2	442	110	661	1354	0.326	440	492	0.0	0.5	0.066	A
3	73	18	985	1184	0.062	73	116	0.0	0.1	0.054	A
4	331	83	175	1554	0.213	329	883	0.0	0.3	0.049	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	939	235	441	2208	0.425	938	163	0.5	0.7	0.047	A
2	528	132	790	1279	0.413	527	588	0.5	0.7	0.080	A
3	87	22	1179	1071	0.081	87	138	0.1	0.1	0.061	A
4	395	99	210	1535	0.257	394	1056	0.3	0.3	0.053	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1149	287	540	2137	0.538	1148	200	0.7	1.2	0.061	A
2	646	162	967	1177	0.549	644	720	0.7	1.2	0.112	A
3	107	27	1443	917	0.116	107	169	0.1	0.1	0.074	A
4	483	121	257	1508	0.320	483	1292	0.3	0.5	0.058	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1149	287	541	2136	0.538	1149	200	1.2	1.2	0.061	A
2	646	162	969	1176	0.550	646	721	1.2	1.2	0.113	A
3	107	27	1446	915	0.117	107	170	0.1	0.1	0.074	A
4	483	121	258	1508	0.321	483	1295	0.5	0.5	0.059	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	939	235	442	2207	0.425	940	164	1.2	0.7	0.047	A
2	528	132	792	1278	0.413	530	590	1.2	0.7	0.080	A
3	87	22	1183	1068	0.082	87	139	0.1	0.1	0.061	A
4	395	99	211	1534	0.257	395	1060	0.5	0.3	0.053	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	786	196	370	2259	0.348	787	137	0.7	0.5	0.041	A
2	442	110	663	1353	0.327	443	494	0.7	0.5	0.066	A
3	73	18	990	1181	0.062	73	116	0.1	0.1	0.054	A
4	331	83	176	1554	0.213	331	887	0.3	0.3	0.049	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 21A_4arms.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 21a_Canterbury Rd_A256
Report generation date: 19/03/2019 12:26:33

«2039 Base , PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	Junction Delay (min)
	2039 Base							
Arm 1	0.1	0.06	0.10	0.53	0.0	0.05	0.05	0.51
Arm 2	15.7	0.78	0.96		14.4	0.71	0.96	
Arm 3	0.0	0.05	0.03		0.0	0.05	0.03	
Arm 4	5.6	0.31	0.86		6.4	0.34	0.87	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	10/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

2039 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.51	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 Haine Rd	
2	A256 (south)	
3	Canterbury Rd W	
4	New Arm (north)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.40	7.10	48.7	17.0	55.0	20.0	
2	3.90	4.70	2.0	26.0	55.0	14.0	
3	7.10	7.10	0.0	15.0	55.0	18.0	
4	3.40	7.10	6.6	17.0	55.0	28.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.643	1982
2	0.544	1374
3	0.683	2206
4	0.535	1429

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	51	100.000
2		ONE HOUR	✓	1181	100.000
3		ONE HOUR	✓	34	100.000
4		ONE HOUR	✓	1086	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	51	0	0
	2	64	0	19	1098
	3	3	13	0	18
	4	0	1086	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	1	0	0
	2	1	0	1	1
	3	0	1	0	0
	4	0	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.05	0.05	0.0	A	47	70
2	0.96	0.71	14.4	E	1084	1626
3	0.03	0.05	0.0	A	31	47
4	0.87	0.34	6.4	C	997	1495

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	38	10	822	1435	0.027	38	50	0.0	0.0	0.043	A
2	889	222	0	1360	0.654	882	860	0.0	1.8	0.124	A
3	26	6	868	1601	0.016	26	14	0.0	0.0	0.038	A
4	818	204	60	1383	0.591	812	833	0.0	1.4	0.104	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	46	11	984	1330	0.034	46	60	0.0	0.0	0.047	A
2	1062	265	0	1360	0.780	1056	1030	1.8	3.4	0.193	B
3	31	8	1039	1483	0.021	31	17	0.0	0.0	0.041	A
4	976	244	72	1377	0.709	973	998	1.4	2.4	0.147	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	56	14	1196	1194	0.047	56	72	0.0	0.0	0.053	A
2	1300	325	0	1360	0.956	1266	1252	3.4	11.9	0.510	D
3	37	9	1246	1341	0.028	37	20	0.0	0.0	0.046	A
4	1196	299	86	1369	0.874	1181	1197	2.4	6.0	0.299	C

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	56	14	1208	1186	0.047	56	73	0.0	0.0	0.053	A
2	1300	325	0	1360	0.956	1290	1265	11.9	14.4	0.706	E
3	37	9	1270	1325	0.028	37	21	0.0	0.0	0.047	A
4	1196	299	88	1368	0.874	1194	1219	6.0	6.4	0.337	C

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	46	11	1003	1318	0.035	46	63	0.0	0.0	0.047	A
2	1062	265	0	1360	0.780	1104	1049	14.4	3.8	0.268	C
3	31	8	1086	1450	0.021	31	18	0.0	0.0	0.042	A
4	976	244	74	1375	0.710	992	1043	6.4	2.5	0.162	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	38	10	832	1428	0.027	38	51	0.0	0.0	0.043	A
2	889	222	0	1360	0.654	897	870	3.8	1.9	0.131	A
3	26	6	882	1591	0.016	26	14	0.0	0.0	0.038	A
4	818	204	61	1382	0.591	822	847	2.5	1.5	0.108	A

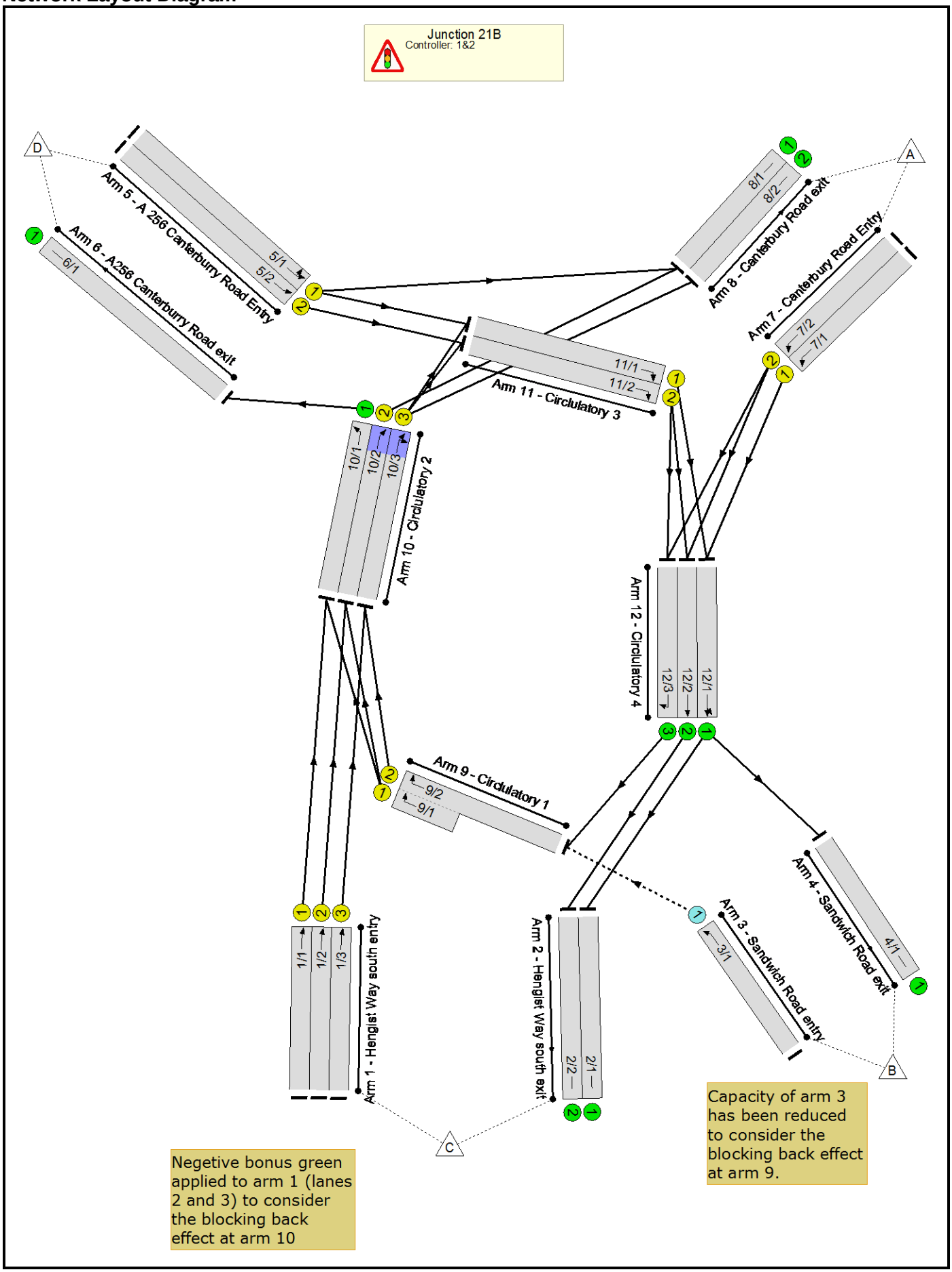
Full Input Data And Results

User and Project Details

Project:	**Manston Airport DCO EIA**
Title:	**Junction 21b**
Location:	
Additional detail:	
File name:	Junction 21b_Validated_Strategic Model.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX

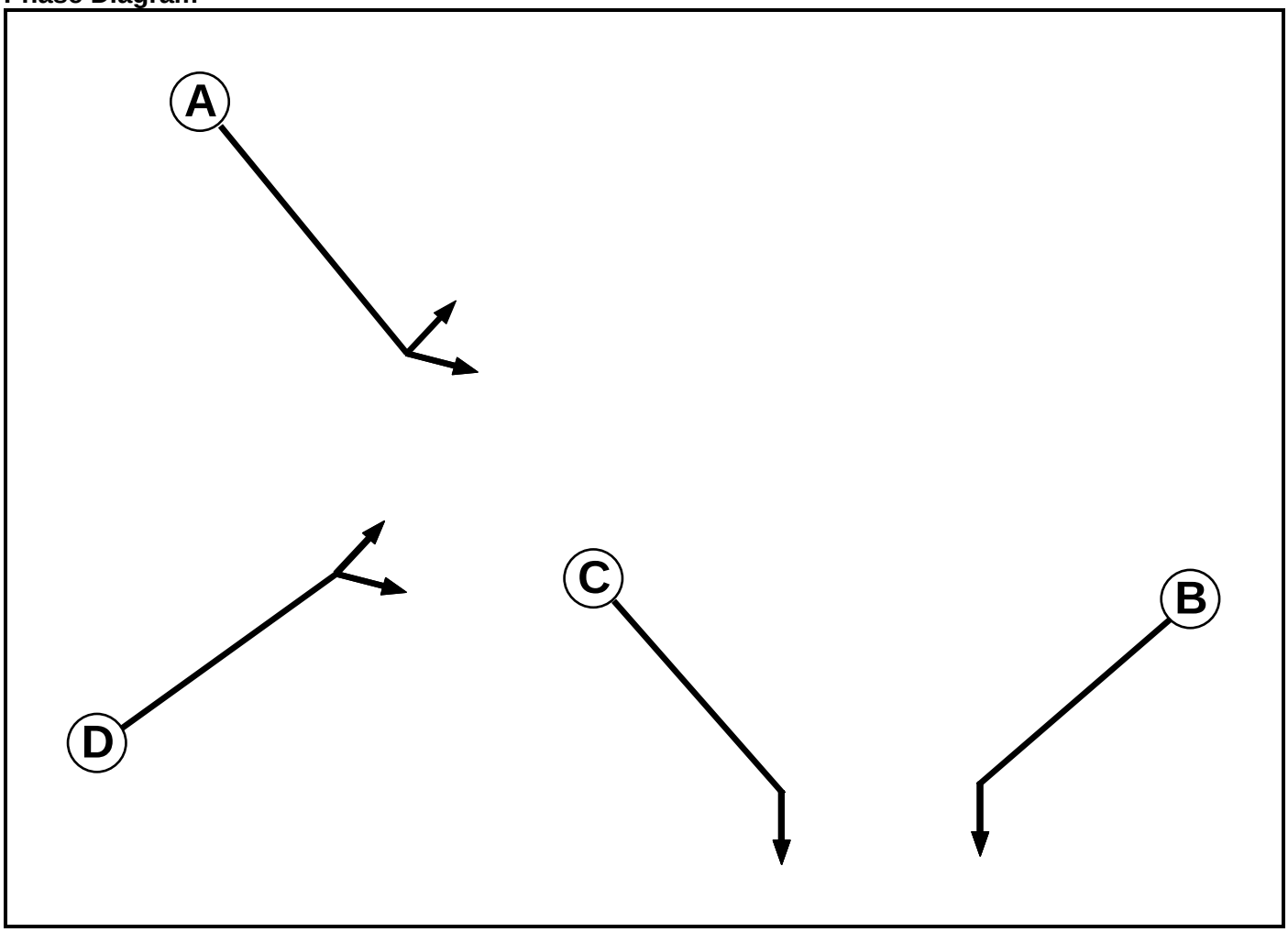
Full Input Data And Results

Network Layout Diagram



C1 - 08-1078

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7

Full Input Data And Results

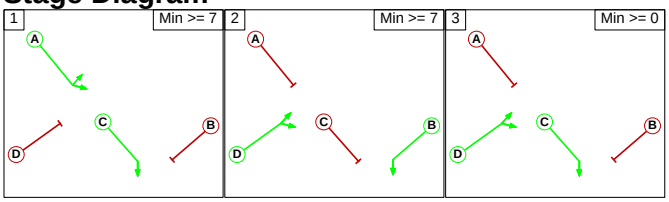
Phase Intergreens Matrix

Terminating Phase	Starting Phase				
		A	B	C	D
	A		5	-	5
	B	5		5	-
	C	-	5		-
	D	5	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A C
2	B D
3	C D

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	C	Losing	6	6

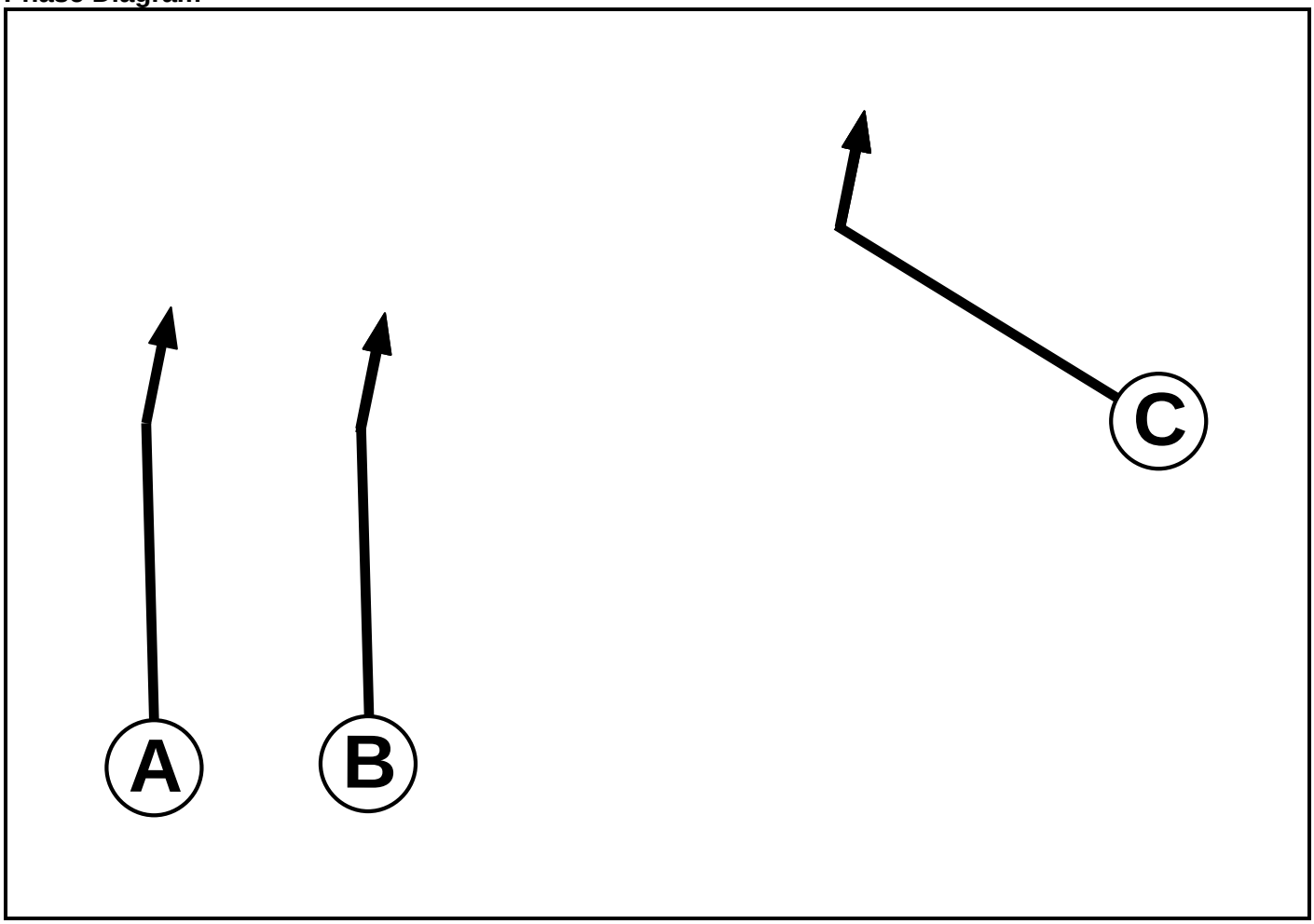
Prohibited Stage Change

From Stage	To Stage			
		1	2	3
	1		11	5
	2	5		5
	3	5	5	

Full Input Data And Results

C2 - 08-1079

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7

Phase Intergreens Matrix

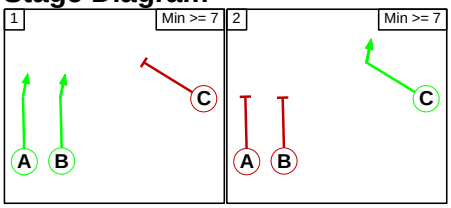
		Starting Phase		
		A	B	C
Terminating Phase	A		-	5
	B	-		5
	C	5	5	

Phases in Stage

Stage No.	Phases in Stage
1	A B
2	C

Full Input Data And Results

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

	To Stage		
		1	2
From Stage	1		5
	2	5	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Junction 21B											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
3/1 (Sandwich Road entry)	9/2 (Ahead)	390	0	12/2	0.12	All	-	-	-	-	-
				12/1	0.12	To 2/1 (Ahead)					
				12/3	0.12	All					

Full Input Data And Results

Lane Input Data

Junction: Junction 21B												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Hengist Way south entry)	U	A	2	3	60.0	Geom	-	3.70	0.00	Y	Arm 10 Ahead	Inf
1/2 (Hengist Way south entry)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 10 Ahead	Inf
1/3 (Hengist Way south entry)	U	B	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 10 Ahead	Inf
2/1 (Hengist Way south exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
2/2 (Hengist Way south exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1 (Sandwich Road entry)	O		2	3	60.0	Geom	-	3.50	0.00	Y	Arm 9 Ahead	50.00
4/1 (Sandwich Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (A 256 Canterburry Road Entry)	U	A	2	3	14.0	Geom	-	4.00	0.00	Y	Arm 8 Left	153.00
											Arm 11 Ahead	30.00
5/2 (A 256 Canterburry Road Entry)	U	A	2	3	14.0	Geom	-	4.00	0.00	Y	Arm 11 Ahead	30.00
6/1 (A256 Canterburry Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (Canterbury Road Entry)	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 12 Left	20.00
7/2 (Canterbury Road Entry)	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 12 Left	20.00
8/1 (Canterbury Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
8/2 (Canterbury Road exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
9/1 (Circulatory 1)	U	C	2	3	5.0	Geom	-	3.40	0.00	Y	Arm 10 Right	17.00
9/2 (Circulatory 1)	U	C	2	3	60.0	Geom	-	3.40	0.00	Y	Arm 10 Right	14.00
10/1 (Circulatory 2)	U		2	3	60.0	Inf	-	-	-	-	-	-

10/2 (Circlulatory 2)	U	D	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Ahead	50.00
10/3 (Circlulatory 2)	U	D	2	3	60.0	Geom	-	3.65	0.00	Y	Arm 8 Ahead	50.00
											Arm 11 Right	12.00
11/1 (Circlulatory 3)	U	C	2	3	60.0	Geom	-	4.25	0.00	Y	Arm 12 Right	Inf
11/2 (Circlulatory 3)	U	C	2	3	60.0	Geom	-	4.25	0.00	Y	Arm 12 Right	Inf
12/1 (Circlulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-
12/2 (Circlulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-
12/3 (Circlulatory 4)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 Baseline Traffic - AM Peak'	07:45	08:45	01:00	
2: '2039 Baseline Traffic - PM Peak'	16:45	17:45	01:00	

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039 Baseline Traffic - AM Peak', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	4	1072	433	1509
	B	61	0	14	66	141
	C	662	0	0	613	1275
	D	378	4	736	0	1118
	Tot.	1101	8	1822	1112	4043

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2039 Baseline Traffic - AM Peak
Junction: Junction 21B	
1/1	613
1/2	347
1/3	315
2/1	953
2/2	869
3/1	141
4/1	8
5/1	584
5/2	534
6/1	1112
7/1	755
7/2	754
8/1	743
8/2	358
9/1 (short)	517
9/2 (with short)	574(In) 57(Out)
10/1	1112
10/2	365
10/3	372
11/1	206
11/2	548
12/1	961
12/2	869
12/3	433

Full Input Data And Results

Lane Saturation Flows

Junction: Junction 21B								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Hengist Way south entry)	3.70	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1985	1985
1/2 (Hengist Way south entry)	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
1/3 (Hengist Way south entry)	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
2/1 (Hengist Way south exit Lane 1)	Infinite Saturation Flow						Inf	Inf
2/2 (Hengist Way south exit Lane 2)	Infinite Saturation Flow						Inf	Inf
3/1 (Sandwich Road entry)	3.50	0.00	Y	Arm 9 Ahead	50.00	100.0 %	1908	1908
4/1 (Sandwich Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (A 256 Canterburry Road Entry)	4.00	0.00	Y	Arm 8 Left Arm 11 Ahead	153.00 30.00	64.7 % 35.3 %	1968	1968
5/2 (A 256 Canterburry Road Entry)	4.00	0.00	Y	Arm 11 Ahead	30.00	100.0 %	1919	1919
6/1 (A256 Canterburry Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Canterbury Road Entry)	3.50	0.00	Y	Arm 12 Left	20.00	100.0 %	1828	1828
7/2 (Canterbury Road Entry)	3.50	0.00	Y	Arm 12 Left	20.00	100.0 %	1828	1828
8/1 (Canterbury Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/2 (Canterbury Road exit Lane 2)	Infinite Saturation Flow						Inf	Inf
9/1 (Circlulatory 1)	3.40	0.00	Y	Arm 10 Right	17.00	100.0 %	1796	1796
9/2 (Circlulatory 1)	3.40	0.00	Y	Arm 10 Right	14.00	100.0 %	1766	1766
10/1 (Circlulatory 2 Lane 1)	Infinite Saturation Flow						Inf	Inf
10/2 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Ahead	50.00	100.0 %	1922	1922
10/3 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Ahead Arm 11 Right	50.00 12.00	96.2 % 3.8 %	1916	1916
11/1 (Circlulatory 3)	4.25	0.00	Y	Arm 12 Right	Inf	100.0 %	2040	2040
11/2 (Circlulatory 3)	4.25	0.00	Y	Arm 12 Right	Inf	100.0 %	2040	2040
12/1 (Circlulatory 4 Lane 1)	Infinite Saturation Flow						Inf	Inf

12/2 (Circlulatory 4 Lane 2)	Infinite Saturation Flow	Inf	Inf
12/3 (Circlulatory 4 Lane 3)	Infinite Saturation Flow	Inf	Inf

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039 Baseline Traffic - PM Peak', Plan 1: 'Base')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	16	688	289	993
	B	85	0	4	87	176
	C	994	8	0	782	1784
	D	319	35	661	0	1015
	Tot.	1398	59	1353	1158	3968

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2039 Baseline Traffic - PM Peak
Junction: Junction 21B	
1/1	782
1/2	517
1/3	485
2/1	656
2/2	697
3/1	176
4/1	59
5/1	529
5/2	486
6/1	1158
7/1	497
7/2	496
8/1	848
8/2	550
9/1 (short)	388
9/2 (with short)	465(In) 77(Out)
10/1	1158
10/2	529
10/3	562
11/1	218
11/2	490
12/1	715
12/2	697
12/3	289

Full Input Data And Results

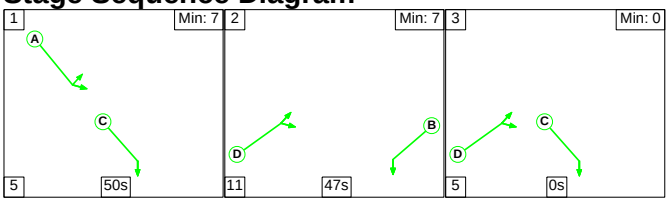
Lane Saturation Flows

Junction: Junction 21B								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Hengist Way south entry)	3.70	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1985	1985
1/2 (Hengist Way south entry)	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
1/3 (Hengist Way south entry)	3.65	0.00	Y	Arm 10 Ahead	Inf	100.0 %	1980	1980
2/1 (Hengist Way south exit Lane 1)	Infinite Saturation Flow						Inf	Inf
2/2 (Hengist Way south exit Lane 2)	Infinite Saturation Flow						Inf	Inf
3/1 (Sandwich Road entry)	3.50	0.00	Y	Arm 9 Ahead	50.00	100.0 %	1908	1908
4/1 (Sandwich Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (A 256 Canterburry Road Entry)	4.00	0.00	Y	Arm 8 Left	153.00	60.3 %	1964	1964
				Arm 11 Ahead	30.00	39.7 %		
5/2 (A 256 Canterburry Road Entry)	4.00	0.00	Y	Arm 11 Ahead	30.00	100.0 %	1919	1919
6/1 (A256 Canterburry Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Canterbury Road Entry)	3.50	0.00	Y	Arm 12 Left	20.00	100.0 %	1828	1828
7/2 (Canterbury Road Entry)	3.50	0.00	Y	Arm 12 Left	20.00	100.0 %	1828	1828
8/1 (Canterbury Road exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/2 (Canterbury Road exit Lane 2)	Infinite Saturation Flow						Inf	Inf
9/1 (Circlulatory 1)	3.40	0.00	Y	Arm 10 Right	17.00	100.0 %	1796	1796
9/2 (Circlulatory 1)	3.40	0.00	Y	Arm 10 Right	14.00	100.0 %	1766	1766
10/1 (Circlulatory 2 Lane 1)	Infinite Saturation Flow						Inf	Inf
10/2 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Ahead	50.00	100.0 %	1922	1922
10/3 (Circlulatory 2)	3.65	0.00	Y	Arm 8 Ahead	50.00	97.9 %	1919	1919
				Arm 11 Right	12.00	2.1 %		
11/1 (Circlulatory 3)	4.25	0.00	Y	Arm 12 Right	Inf	100.0 %	2040	2040
11/2 (Circlulatory 3)	4.25	0.00	Y	Arm 12 Right	Inf	100.0 %	2040	2040
12/1 (Circlulatory 4 Lane 1)	Infinite Saturation Flow						Inf	Inf

12/2 (Circulatory 4 Lane 2)	Infinite Saturation Flow	Inf	Inf
12/3 (Circulatory 4 Lane 3)	Infinite Saturation Flow	Inf	Inf

Scenario 1: '2039 Baseline Traffic - AM Peak' (FG1: '2039 Baseline Traffic - AM Peak', Plan 1: 'Base')
C1 - 08-1078

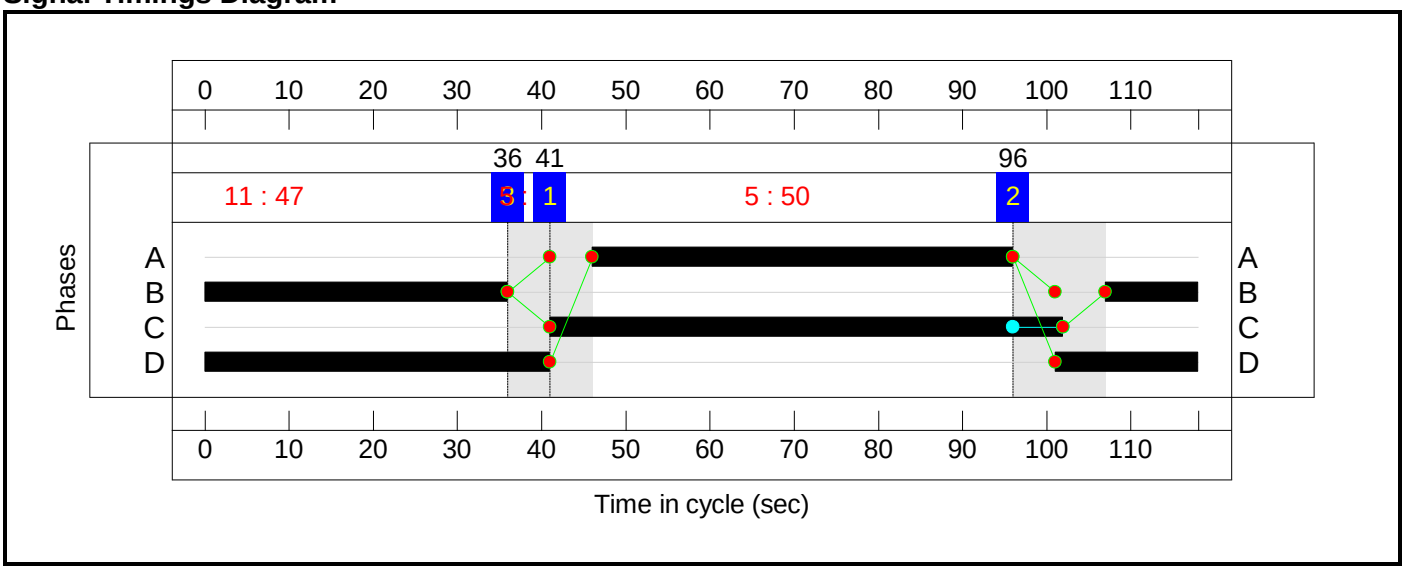
Stage Sequence Diagram



Stage Timings

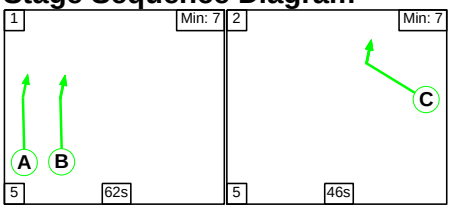
Stage	1	2	3
Duration	50	47	0
Change Point	41	96	36

Signal Timings Diagram



C2 - 08-1079

Stage Sequence Diagram

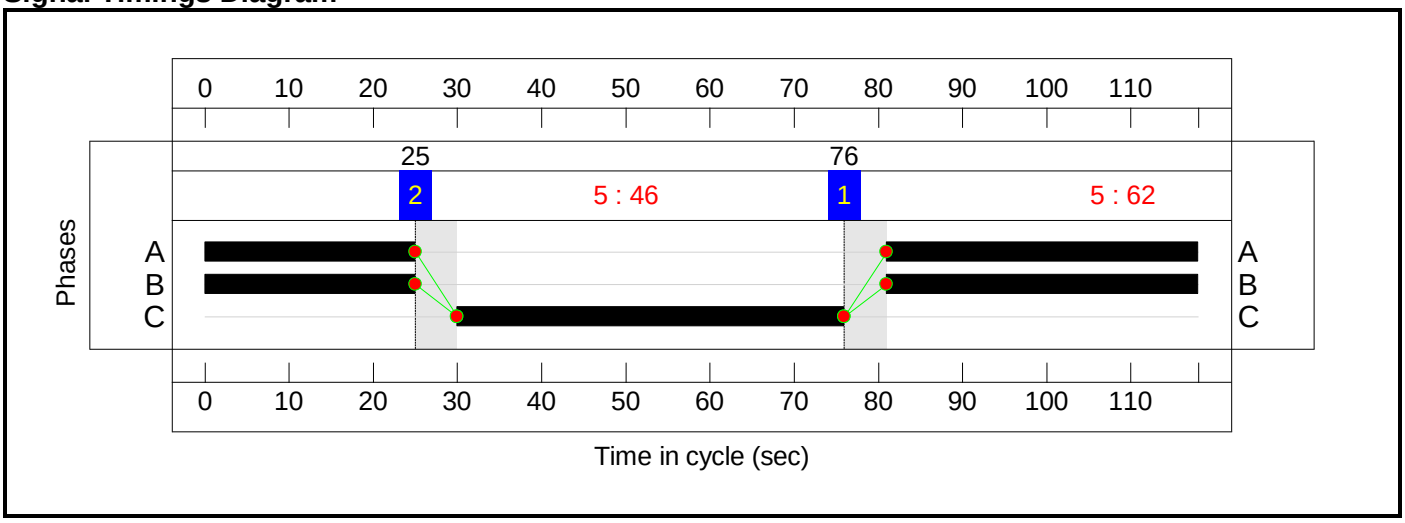


Stage Timings

Stage	1	2
Duration	62	46
Change Point	76	25

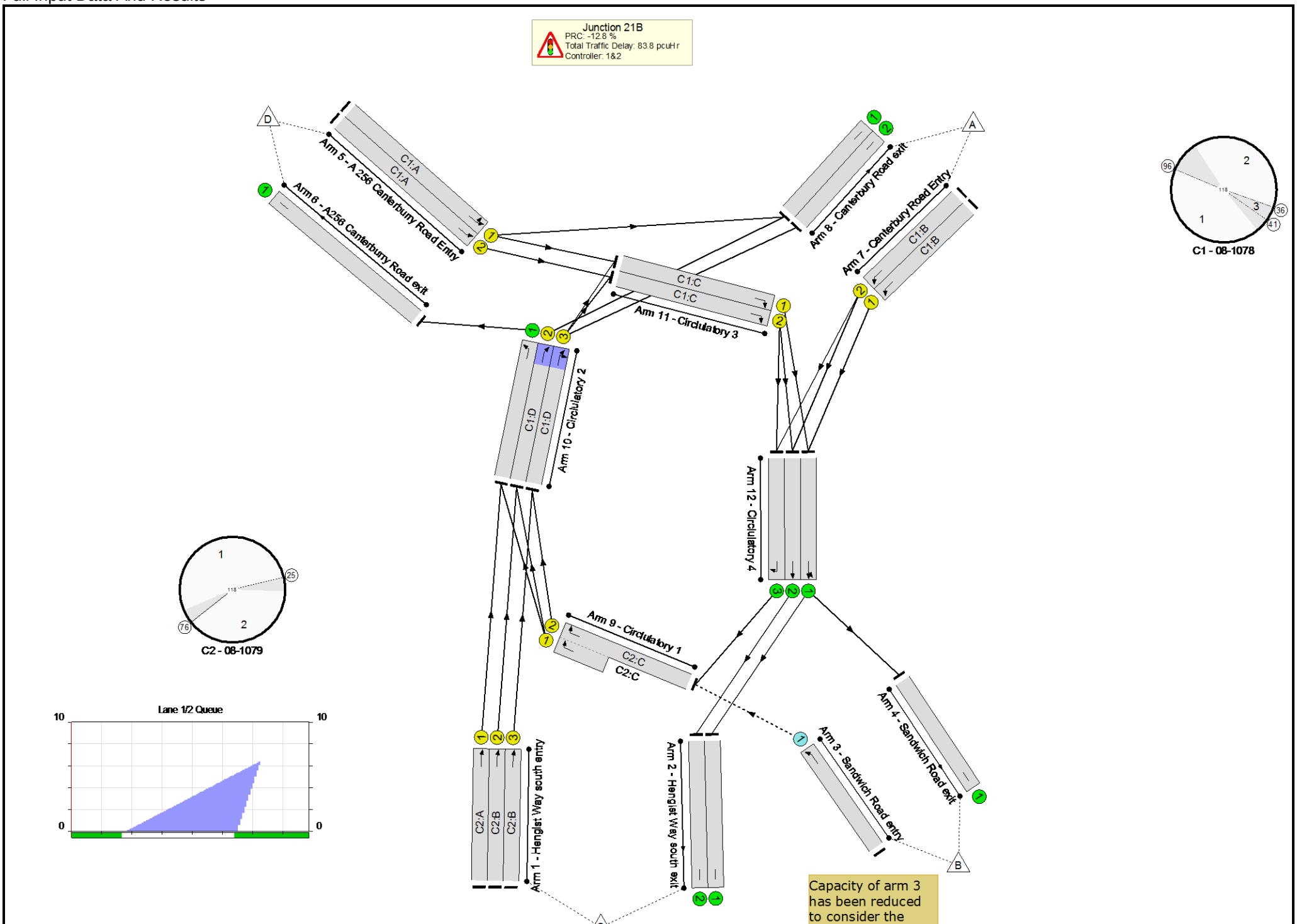
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Junction 21B
PRC: -12.8 %
Total Traffic Delay: 83.8 pcuHr
Controller: 1&2
Arm 5 - A256 Canterbury Road Entry
Arm 6 - A256 Canterbury Road exit
Arm 8 - Canterbury Road exit
Arm 7 - Canterbury Road Entry
Arm 11 - Circulatory 3
Arm 10 - Circulatory 2
Arm 12 - Circulatory 4
Arm 9 - Circulatory 1
Arm 1 - Hengist Way south entry
Arm 2 - Hengist Way south exit
Arm 3 - Sandwich Road entry
Arm 4 - Sandwich Road exit
C1 - 08-1078
C2 - 08-1079
Lane 1/2 Queue
Capacity of arm 3 has been reduced to consider the

Full Input Data And Results

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 21b	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.5%**
Junction 21B	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.5%**
1/1	Hengist Way south entry Ahead	U	N/A	N/A	C2:A		1	62	-	613	1985	1060	57.8%
1/2	Hengist Way south entry Ahead	U	N/A	N/A	C2:B		1	62	-	347	1980	1057	32.8%
1/3	Hengist Way south entry Ahead	U	N/A	N/A	C2:B		1	62	-	315	1980	1057	29.8%
2/1	Hengist Way south exit	U	N/A	N/A	-		-	-	-	953	Inf	Inf	0.0%
2/2	Hengist Way south exit	U	N/A	N/A	-		-	-	-	869	Inf	Inf	0.0%
3/1	Sandwich Road entry Ahead	O	N/A	N/A	-		-	-	-	141	1908	140	101.0%
4/1	Sandwich Road exit	U	N/A	N/A	-		-	-	-	8	Inf	Inf	0.0%
5/1	A 256 Canterburry Road Entry Left Ahead	U	N/A	N/A	C1:A		1	50	-	584	1968	851	68.7%
5/2	A 256 Canterburry Road Entry Ahead	U	N/A	N/A	C1:A		1	50	-	534	1919	829	64.4%
6/1	A256 Canterburry Road exit	U	N/A	N/A	-		-	-	-	1112	Inf	Inf	0.0%
7/1	Canterbury Road Entry Left	U	N/A	N/A	C1:B		1	47	-	755	1828	744	101.5%
7/2	Canterbury Road Entry Left	U	N/A	N/A	C1:B		1	47	-	754	1828	744	101.4%
8/1	Canterbury Road exit	U	N/A	N/A	-		-	-	-	743	Inf	Inf	0.0%

Full Input Data And Results

8/2	Canterbury Road exit	U	N/A	N/A	-		-	-	-	358	Inf	Inf	0.0%
9/2+9/1	Circulatory 1 Right	U	N/A	N/A	C2:C		1	46	-	574	1766:1796	73+659	77.7 : 77.4%
10/1	Circulatory 2 Left	U	N/A	N/A	-		-	-	-	1112	Inf	Inf	0.0%
10/2	Circulatory 2 Ahead	U	N/A	N/A	C1:D		1	58	-	365	1922	961	38.0%
10/3	Circulatory 2 Ahead Right	U	N/A	N/A	C1:D		1	58	-	372	1916	958	38.8%
11/1	Circulatory 3 Right	U	N/A	N/A	C1:C		1	61	-	206	2040	1072	19.2%
11/2	Circulatory 3 Right	U	N/A	N/A	C1:C		1	61	-	548	2040	1072	51.1%
12/1	Circulatory 4 Ahead Ahead2	U	N/A	N/A	-		-	-	-	961	Inf	Inf	0.0%
12/2	Circulatory 4 Ahead	U	N/A	N/A	-		-	-	-	869	Inf	Inf	0.0%
12/3	Circulatory 4 Right	U	N/A	N/A	-		-	-	-	433	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 21b	**-**	**-**	**140**	**0**	**0**	**37.9**	**45.8**	**0.0**	**83.8**	**-**	**-**	**-**	**-**
Junction 21B	**-**	**-**	**140**	**0**	**0**	**37.9**	**45.8**	**0.0**	**83.8**	**-**	**-**	**-**	**-**
1/1	613	613	-	-	-	3.2	0.7	-	3.8	22.6	13.5	0.7	14.1
1/2	347	347	-	-	-	1.5	0.2	-	1.7	18.1	6.4	0.2	6.6
1/3	315	315	-	-	-	1.3	0.2	-	1.5	17.7	5.7	0.2	5.9
2/1	942	942	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	864	864	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	141	140	140	0	0	1.1	6.3	-	7.4	189.2	9.4	6.3	15.7
4/1	8	8	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	584	584	-	-	-	4.4	1.1	-	5.5	33.7	15.4	1.1	16.5
5/2	534	534	-	-	-	3.9	0.9	-	4.8	32.4	13.6	0.9	14.5
6/1	1105	1105	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	755	744	-	-	-	8.0	16.9	-	24.9	118.8	25.1	16.9	42.0
7/2	754	744	-	-	-	8.0	16.6	-	24.5	117.2	25.1	16.6	41.6
8/1	743	743	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	358	358	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2+9/1	567	567	-	-	-	4.4	1.7	-	6.0	38.4	17.1	1.7	18.8
10/1	1105	1105	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/2	365	365	-	-	-	1.0	0.3	-	1.3	12.9	8.4	0.3	8.7
10/3	371	371	-	-	-	1.1	0.3	-	1.4	13.5	8.1	0.3	8.4
11/1	206	206	-	-	-	0.0	0.1	-	0.1	2.1	0.0	0.1	0.1
11/2	548	548	-	-	-	0.1	0.5	-	0.6	4.0	0.4	0.5	0.9
12/1	950	950	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	864	864	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/3	427	427	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

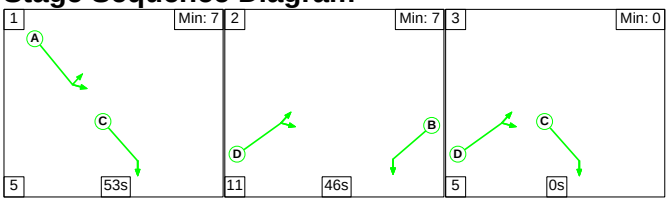
C1 - 08-1078	PRC for Signalled Lanes (%):	-12.8	Total Delay for Signalled Lanes (pcuHr):	63.19	Cycle Time (s):	118
C2 - 08-1079	PRC for Signalled Lanes (%):	15.9	Total Delay for Signalled Lanes (pcuHr):	13.17	Cycle Time (s):	118
	PRC Over All Lanes (%):	-12.8	Total Delay Over All Lanes(pcuHr):	83.76		

Full Input Data And Results

Scenario 2: '2039 Baseline Traffic - PM Peak' (FG2: '2039 Baseline Traffic - PM Peak', Plan 1: 'Base')

C1 - 08-1078

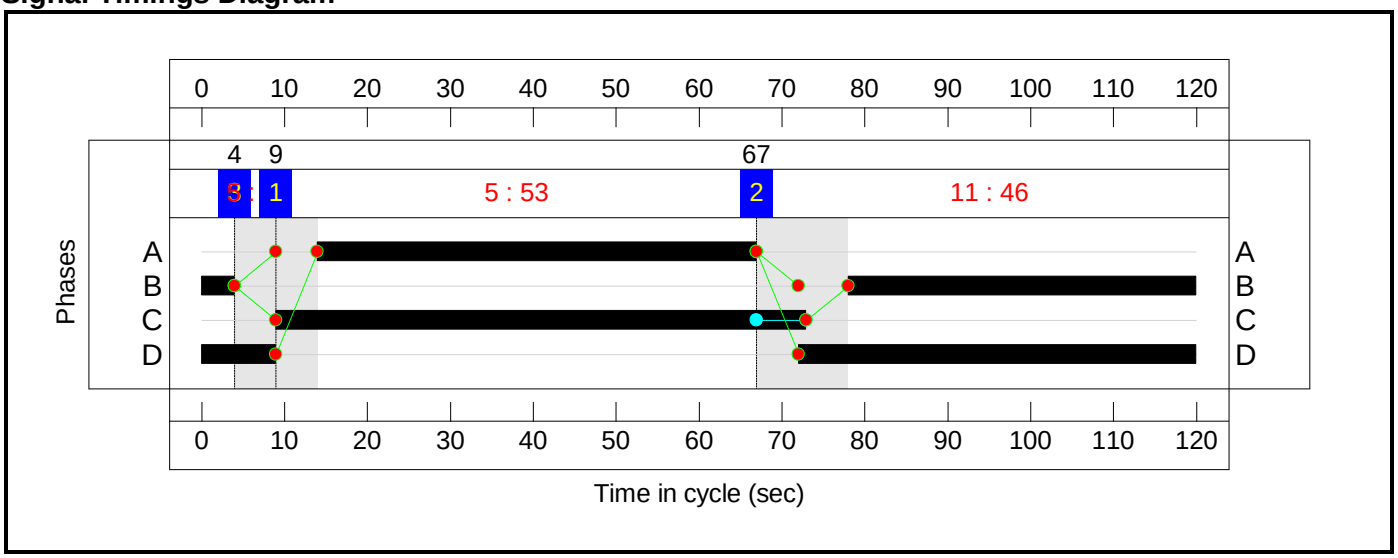
Stage Sequence Diagram



Stage Timings

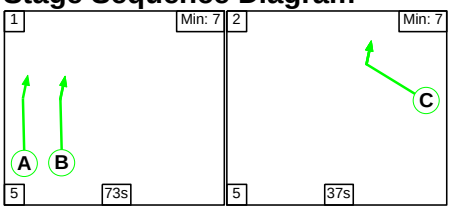
Stage	1	2	3
Duration	53	46	0
Change Point	9	67	4

Signal Timings Diagram



C2 - 08-1079

Stage Sequence Diagram

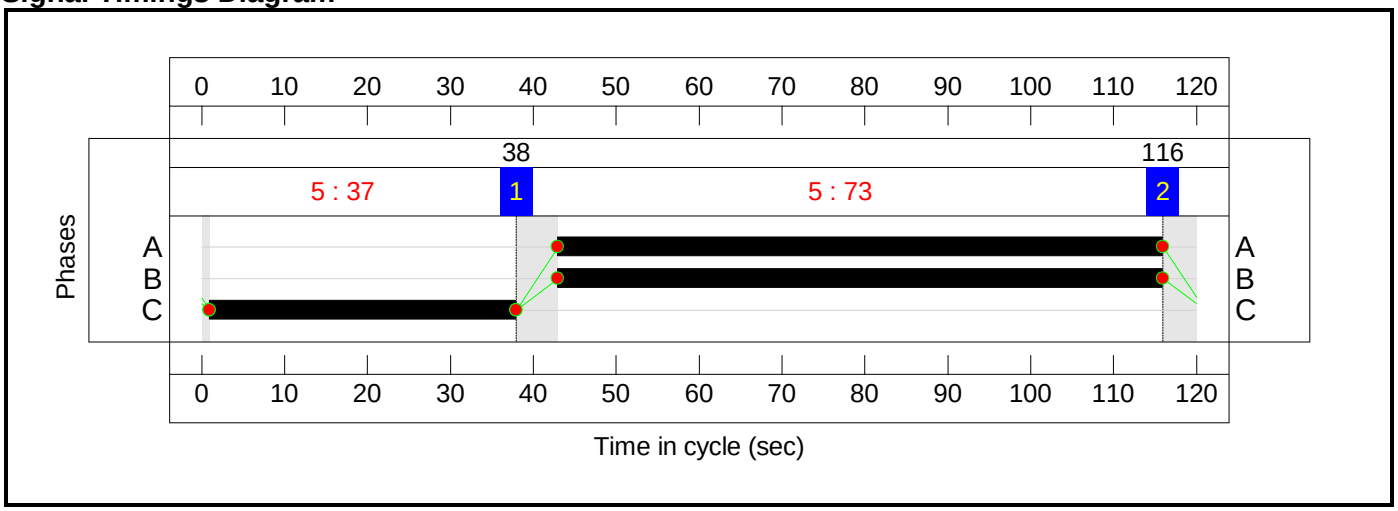


Stage Timings

Stage	1	2
Duration	73	37
Change Point	38	116

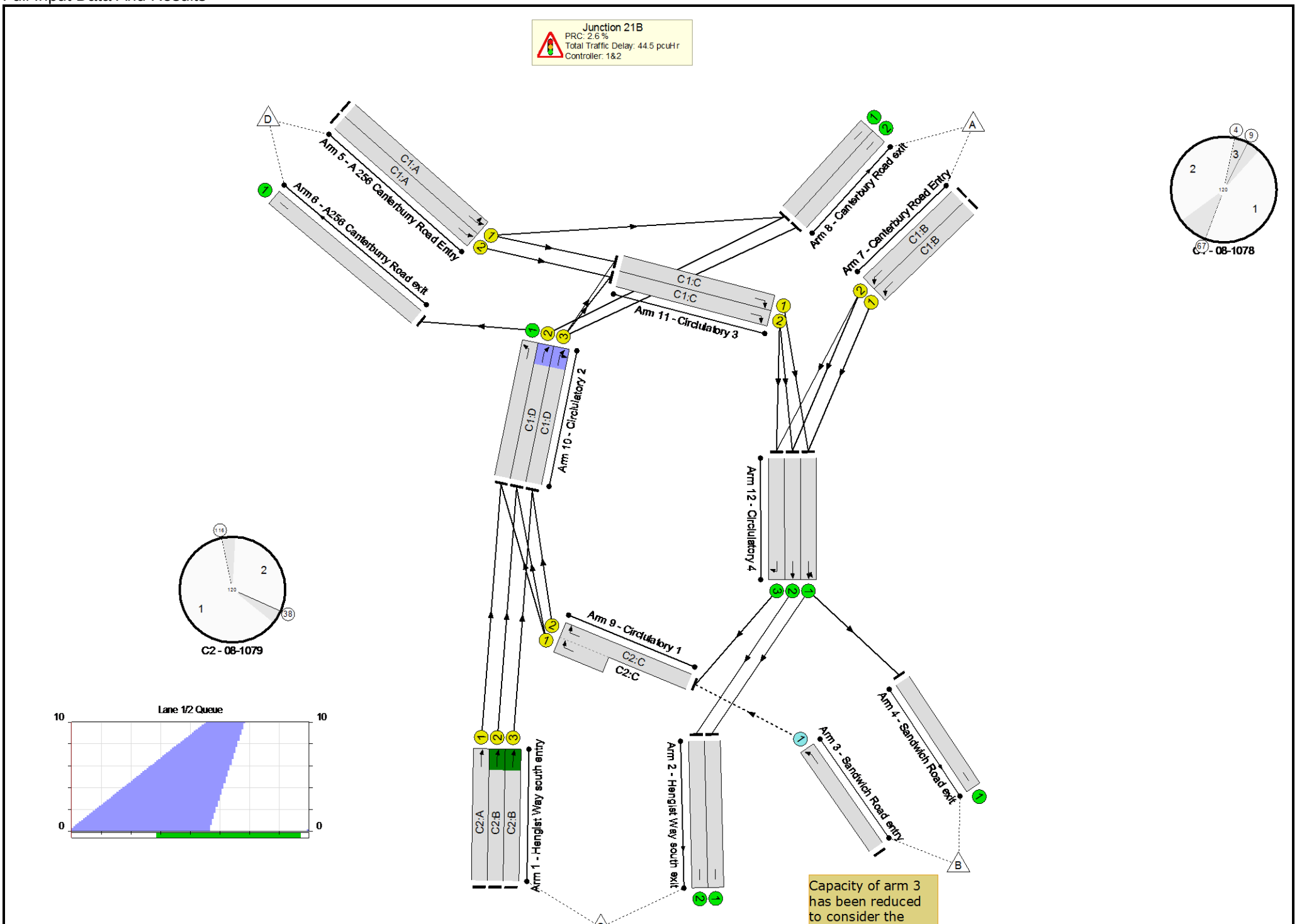
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Junction 21B
PRC: 2.6 %
Total Traffic Delay: 44.5 pcuHr
Controller: 1&2
Arm 5 - A256 Canterbury Road Entry
Arm 6 - A256 Canterbury Road exit
Arm 8 - Canterbury Road exit
Arm 7 - Canterbury Road Entry
Arm 11 - Circulatory 3
Arm 10 - Circulatory 2
Arm 12 - Circulatory 4
Arm 9 - Circulatory 1
Arm 1 - Hengist Way south entry
Arm 2 - Hengist Way south exit
Arm 3 - Sandwich Road entry
Arm 4 - Sandwich Road exit
C1:A
C1:B
C1:C
C1:D
C2:A
C2:B
C2:C
C2 - 08-1079
C1 - 08-1078
Lane 1/2 Queue
Capacity of arm 3 has been reduced to consider the

Full Input Data And Results

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 21b	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.7%**
Junction 21B	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.7%**
1/1	Hengist Way south entry Ahead	U	N/A	N/A	C2:A		1	73	-	782	1985	1224	63.9%
1/2	Hengist Way south entry Ahead	U	N/A	N/A	C2:B		1	73	-	517	1980	808	63.9%
1/3	Hengist Way south entry Ahead	U	N/A	N/A	C2:B		1	73	-	485	1980	808	60.0%
2/1	Hengist Way south exit	U	N/A	N/A	-		-	-	-	656	Inf	Inf	0.0%
2/2	Hengist Way south exit	U	N/A	N/A	-		-	-	-	697	Inf	Inf	0.0%
3/1	Sandwich Road entry Ahead	O	N/A	N/A	-		-	-	-	176	1908	201	87.7%
4/1	Sandwich Road exit	U	N/A	N/A	-		-	-	-	59	Inf	Inf	0.0%
5/1	A 256 Canterburry Road Entry Left Ahead	U	N/A	N/A	C1:A		1	53	-	529	1964	884	59.9%
5/2	A 256 Canterburry Road Entry Ahead	U	N/A	N/A	C1:A		1	53	-	486	1919	864	56.3%
6/1	A256 Canterburry Road exit	U	N/A	N/A	-		-	-	-	1158	Inf	Inf	0.0%
7/1	Canterbury Road Entry Left	U	N/A	N/A	C1:B		1	46	-	497	1828	716	69.4%
7/2	Canterbury Road Entry Left	U	N/A	N/A	C1:B		1	46	-	496	1828	716	69.3%
8/1	Canterbury Road exit	U	N/A	N/A	-		-	-	-	848	Inf	Inf	0.0%
8/2	Canterbury Road exit	U	N/A	N/A	-		-	-	-	550	Inf	Inf	0.0%

Full Input Data And Results

9/2+9/1	Circulatory 1 Right	U	N/A	N/A	C2:C		1	37	-	465	1766:1796	99+499	77.8 : 77.8%
10/1	Circulatory 2 Left	U	N/A	N/A	-		-	-	-	1158	Inf	Inf	0.0%
10/2	Circulatory 2 Ahead	U	N/A	N/A	C1:D		1	57	-	529	1922	929	56.9%
10/3	Circulatory 2 Ahead Right	U	N/A	N/A	C1:D		1	57	-	562	1919	928	60.6%
11/1	Circulatory 3 Right	U	N/A	N/A	C1:C		1	64	-	218	2040	1105	19.7%
11/2	Circulatory 3 Right	U	N/A	N/A	C1:C		1	64	-	490	2040	1105	44.3%
12/1	Circulatory 4 Ahead Ahead2	U	N/A	N/A	-		-	-	-	715	Inf	Inf	0.0%
12/2	Circulatory 4 Ahead	U	N/A	N/A	-		-	-	-	697	Inf	Inf	0.0%
12/3	Circulatory 4 Right	U	N/A	N/A	-		-	-	-	289	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 21b	**-**	**-**	**176**	**0**	**0**	**31.8**	**12.7**	**0.0**	**44.5**	**-**	**-**	**-**	**-**
Junction 21B	**-**	**-**	**176**	**0**	**0**	**31.8**	**12.7**	**0.0**	**44.5**	**-**	**-**	**-**	**-**
1/1	782	782	-	-	-	3.2	0.9	-	4.0	18.6	16.3	0.9	17.2
1/2	517	517	-	-	-	4.1	0.9	-	5.0	34.6	13.8	0.9	14.7
1/3	485	485	-	-	-	3.7	0.7	-	4.5	33.4	12.7	0.7	13.4
2/1	656	656	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/2	697	697	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	176	176	176	0	0	0.5	2.9	-	3.4	69.3	4.9	2.9	7.8
4/1	59	59	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	529	529	-	-	-	3.7	0.7	-	4.4	29.9	13.2	0.7	14.0
5/2	486	486	-	-	-	3.3	0.6	-	3.9	29.1	11.9	0.6	12.5
6/1	1158	1158	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	497	497	-	-	-	4.2	1.1	-	5.3	38.6	13.8	1.1	14.9
7/2	496	496	-	-	-	4.2	1.1	-	5.3	38.6	13.8	1.1	14.9
8/1	848	848	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	550	550	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2+9/1	465	465	-	-	-	4.0	1.7	-	5.7	44.4	14.0	1.7	15.7
10/1	1158	1158	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/2	529	529	-	-	-	0.1	0.7	-	0.8	5.2	0.3	0.7	0.9
10/3	562	562	-	-	-	0.7	0.8	-	1.5	9.5	14.4	0.8	15.2
11/1	218	218	-	-	-	0.1	0.1	-	0.2	3.3	0.3	0.1	0.4
11/2	490	490	-	-	-	0.0	0.4	-	0.4	3.2	0.1	0.4	0.5
12/1	715	715	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	697	697	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/3	289	289	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

C1 - 08-1078	PRC for Signalled Lanes (%):	29.7	Total Delay for Signalled Lanes (pcuHr):	21.85	Cycle Time (s):	120
C2 - 08-1079	PRC for Signalled Lanes (%):	15.7	Total Delay for Signalled Lanes (pcuHr):	19.23	Cycle Time (s):	120
	PRC Over All Lanes (%):	2.6	Total Delay Over All Lanes(pcuHr):	44.47		

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 26_R1_AM validated_Strateic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 26_Manston Rd_B2014\Strategic Model Scenario
Report generation date: 19/03/2019 11:24:28

«2039 Baseline Traffic, AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Baseline Traffic				
1 - Newington Road north	4.0	0.48	0.81	D	6.26
2 - Newington Road south	5.0	0.38	0.84	C	
3 - Manston Road	160.3	16.81	1.48	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

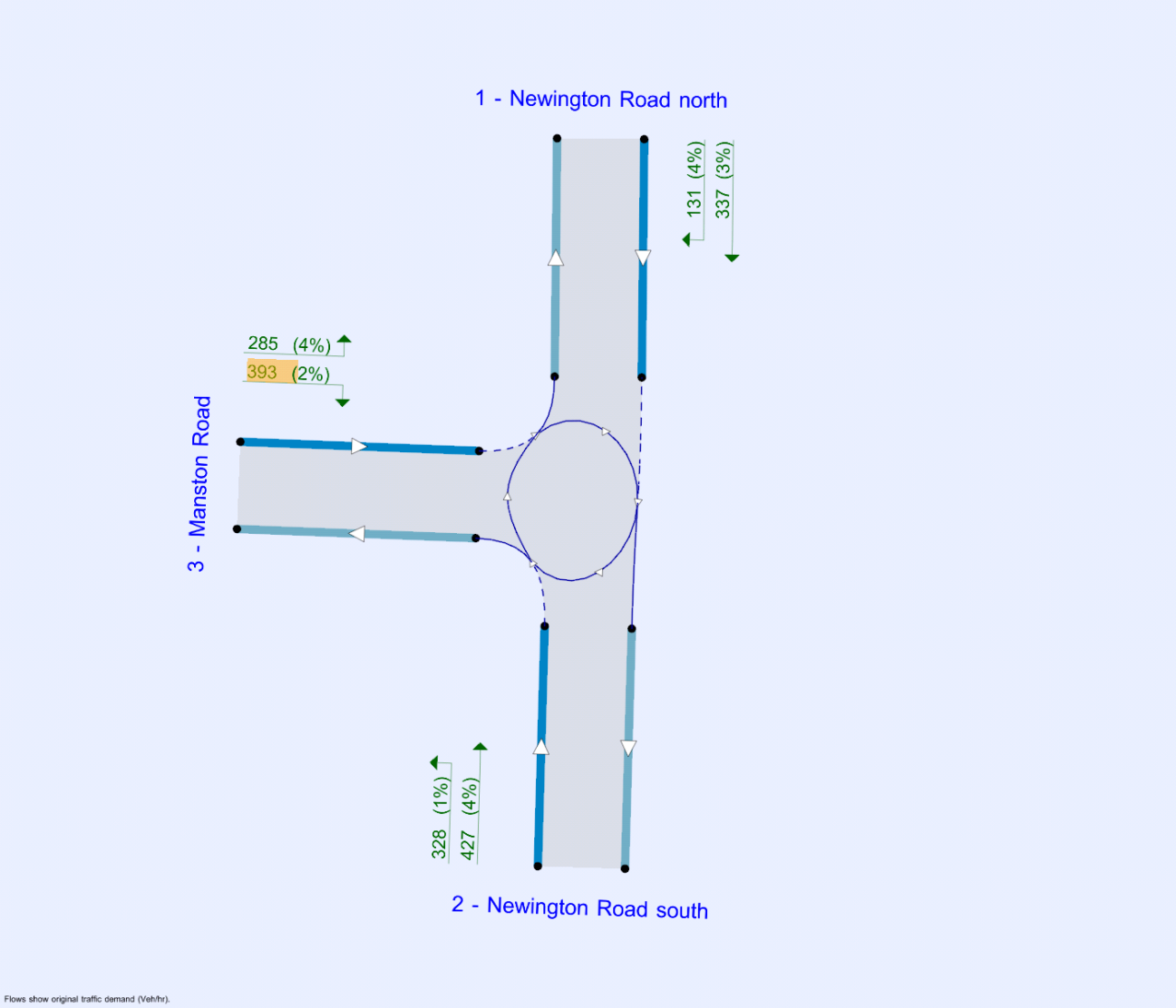
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	05/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1		Mini-roundabout		1, 2, 3	6.26	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Newington Road north	
2	Newington Road south	
3	Manston Road	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Newington Road north	4.15	4.15	4.15	0.0	19.30	19.30	0.0	
2 - Newington Road south	3.96	3.24	6.13	14.7	15.49	12.00	0.0	
3 - Manston Road	2.79	2.47	5.40	4.7	14.19	9.14	0.0	✓

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Newington Road north	0.848	1264
2 - Newington Road south	0.672	1114
3 - Manston Road	0.498	762

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Newington Road north	Percentage		65.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Newington Road north		ONE HOUR	✓	468	100.000
2 - Newington Road south		ONE HOUR	✓	755	100.000
3 - Manston Road		ONE HOUR	✓	678	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Newington Road north	2 - Newington Road south	3 - Manston Road
From	1 - Newington Road north	0	337	131
	2 - Newington Road south	427	0	328
	3 - Manston Road	285	393	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Newington Road north	2 - Newington Road south	3 - Manston Road
From	1 - Newington Road north	0	3	4
	2 - Newington Road south	4	0	1
	3 - Manston Road	4	2	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	0.81	0.48	4.0	D	429	644
2 - Newington Road south	0.84	0.38	5.0	C	693	1039
3 - Manston Road	1.48	16.81	160.3	F	622	933

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	352	88	283	641	0.550	348	524	0.0	1.2	0.201	B
2 - Newington Road south	568	142	97	1019	0.558	563	534	0.0	1.2	0.130	A
3 - Manston Road	510	128	319	581	0.879	489	342	0.0	5.3	0.566	D

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	421	105	311	626	0.672	418	607	1.2	1.9	0.283	C
2 - Newington Road south	679	170	117	1005	0.675	676	611	1.2	2.0	0.180	B
3 - Manston Road	610	152	382	549	1.111	536	410	5.3	23.7	1.963	F

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	515	129	294	636	0.811	508	677	1.9	3.7	0.446	D
2 - Newington Road south	831	208	142	988	0.841	821	660	2.0	4.7	0.339	C
3 - Manston Road	746	187	464	508	1.471	507	499	23.7	83.6	6.600	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	515	129	293	636	0.810	514	682	3.7	4.0	0.484	D
2 - Newington Road south	831	208	144	987	0.842	830	663	4.7	5.0	0.376	C
3 - Manston Road	746	187	469	505	1.479	505	505	83.6	144.1	13.217	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	421	105	316	624	0.675	428	619	4.0	2.2	0.317	C
2 - Newington Road south	679	170	120	1003	0.677	690	624	5.0	2.2	0.198	B
3 - Manston Road	610	152	390	545	1.119	545	419	144.1	160.3	16.806	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	352	88	333	614	0.574	356	565	2.2	1.4	0.235	B
2 - Newington Road south	568	142	100	1017	0.559	572	589	2.2	1.3	0.136	A
3 - Manston Road	510	128	323	578	0.883	575	348	160.3	144.2	15.902	F

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 26_R1_PM_validated_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 26_Manston Rd_B2014\Strategic Model Scenario
Report generation date: 19/03/2019 11:29:35

«2039 Baseline Traffic, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Baseline Traffic				
1 - Newington Road north	155.9	24.44	1.50	F	10.62
2 - Newington Road south	1.8	0.17	0.64	B	
3 - Manston Road	90.7	8.72	1.27	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

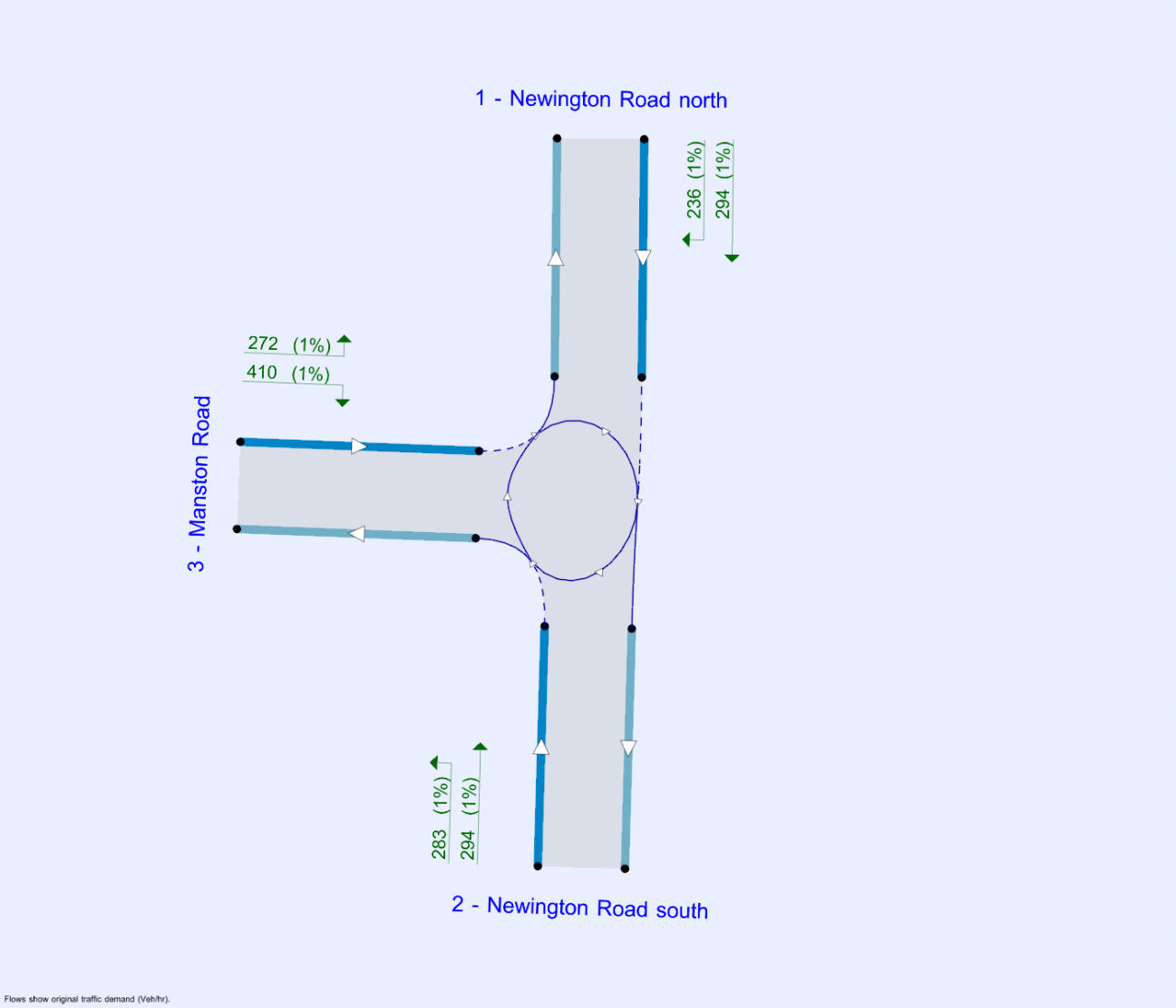
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	05/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1		Mini-roundabout		1, 2, 3	10.62	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Newington Road north	
2	Newington Road south	
3	Manston Road	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Newington Road north	4.15	4.15	4.15	0.0	19.30	19.30	0.0	
2 - Newington Road south	3.96	3.24	6.13	14.7	15.49	12.00	0.0	
3 - Manston Road	2.79	2.47	5.40	4.7	14.19	9.14	0.0	✓

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Newington Road north	0.848	1264
2 - Newington Road south	0.672	1114
3 - Manston Road	0.498	762

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Newington Road north	Percentage		41.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Newington Road north		ONE HOUR	✓	530	100.000
2 - Newington Road south		ONE HOUR	✓	577	100.000
3 - Manston Road		ONE HOUR	✓	682	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Newington Road north	2 - Newington Road south	3 - Manston Road
From	1 - Newington Road north	0	294	236
	2 - Newington Road south	294	0	283
	3 - Manston Road	272	410	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Newington Road north	2 - Newington Road south	3 - Manston Road
From	1 - Newington Road north	0	1	1
	2 - Newington Road south	1	0	1
	3 - Manston Road	1	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	1.50	24.44	155.9	F	486	730
2 - Newington Road south	0.64	0.17	1.8	B	529	794
3 - Manston Road	1.27	8.72	90.7	F	626	939

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	399	100	300	409	0.976	365	419	0.0	8.4	1.035	F
2 - Newington Road south	434	109	163	994	0.437	431	503	0.0	0.8	0.106	A
3 - Manston Road	513	128	220	645	0.796	500	374	0.0	3.4	0.383	C

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	476	119	350	391	1.217	387	496	8.4	30.8	3.415	F
2 - Newington Road south	519	130	172	987	0.525	517	564	0.8	1.1	0.127	A
3 - Manston Road	613	153	264	623	0.983	582	426	3.4	11.2	1.017	F

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	584	146	355	390	1.498	389	558	30.8	79.4	8.771	F
2 - Newington Road south	635	159	173	987	0.644	633	571	1.1	1.8	0.168	B
3 - Manston Road	751	188	322	594	1.264	591	484	11.2	51.2	3.434	F

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	584	146	357	389	1.500	389	560	79.4	128.1	16.330	F
2 - Newington Road south	635	159	173	987	0.644	635	572	1.8	1.8	0.171	B
3 - Manston Road	751	188	324	594	1.265	593	485	51.2	90.7	7.262	F

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	476	119	369	385	1.239	385	511	128.1	151.0	22.063	F
2 - Newington Road south	519	130	171	988	0.525	521	583	1.8	1.1	0.129	A
3 - Manston Road	613	153	266	622	0.985	615	427	90.7	90.3	8.721	F

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	399	100	383	380	1.050	380	476	151.0	155.9	24.437	F
2 - Newington Road south	434	109	169	989	0.439	436	594	1.1	0.8	0.109	A
3 - Manston Road	513	128	222	644	0.797	637	383	90.3	59.4	7.082	F

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Appendix I (part 6)
2039 Base and 2039 Base + Development Junction Model Outputs

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.2.5947
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Filename: Jct 27_R1_AM_validated_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18 \Base Models\Validated\Jct 27_B2014_A255\Strategic Model Scenario
Report generation date: 10/01/2019 16:15:57

«2039 Baseline Traffic, AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Baseline Traffic				
1 - Newington Road north	56.4	4.22	1.14	F	3.24
2 - High Street east	64.4	3.39	1.11	F	
3 - High Street south	20.4	1.84	1.02	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

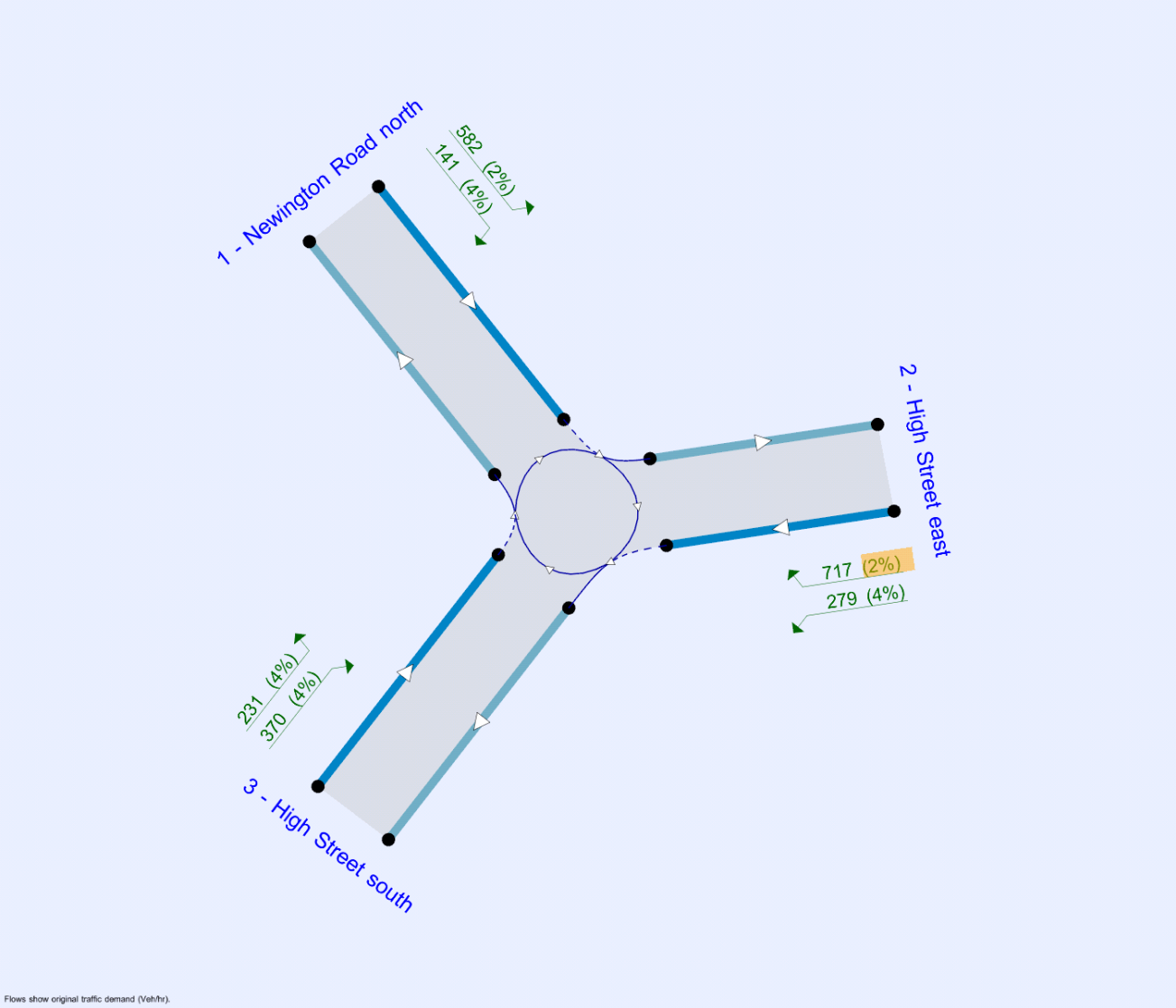
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	05/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout	1, 2, 3	3.24	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Newington Road north	
2	High Street east	
3	High Street south	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Newington Road north	3.96	3.71	4.87	1.4	13.95	8.20	0.0	
2 - High Street east	3.64	3.20	4.13	19.6	20.00	17.75	0.0	✓
3 - High Street south	3.58	3.28	5.97	10.0	14.07	9.72	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Newington Road north	0.630	785
2 - High Street east	0.616	1102
3 - High Street south	0.657	1081

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Newington Road north	Percentage		135.00
3 - High Street south	Percentage		112.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2039 Baseline Traffic	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Newington Road north		ONE HOUR	✓	723	100.000
2 - High Street east		ONE HOUR	✓	996	100.000
3 - High Street south		ONE HOUR	✓	601	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Newington Road north	2 - High Street east	3 - High Street south
From	1 - Newington Road north	0	582	141
	2 - High Street east	717	0	279
	3 - High Street south	231	370	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Newington Road north	2 - High Street east	3 - High Street south
From	1 - Newington Road north	0	2	4
	2 - High Street east	2	0	4
	3 - High Street south	4	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	1.14	4.22	56.4	F	663	995
2 - High Street east	1.11	3.39	64.4	F	914	1371
3 - High Street south	1.02	1.84	20.4	F	551	827

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	544	136	275	797	0.683	536	704	0.0	2.1	0.224	B
2 - High Street east	750	187	105	1009	0.743	739	707	0.0	2.7	0.214	B
3 - High Street south	452	113	532	780	0.580	447	312	0.0	1.3	0.178	B

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	650	162	329	751	0.866	637	838	2.1	5.2	0.482	D
2 - High Street east	895	224	124	997	0.898	879	842	2.7	6.8	0.454	D
3 - High Street south	540	135	633	707	0.764	534	371	1.3	3.0	0.334	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	796	199	381	705	1.129	692	941	5.2	31.1	1.847	F
2 - High Street east	1097	274	135	990	1.107	976	939	6.8	37.0	1.569	F
3 - High Street south	662	165	703	656	1.008	620	408	3.0	13.5	1.067	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	796	199	390	697	1.142	695	954	31.1	56.4	3.971	F
2 - High Street east	1097	274	136	990	1.108	987	950	37.0	64.4	3.250	F
3 - High Street south	662	165	711	651	1.017	634	412	13.5	20.4	1.838	F

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	650	162	369	716	0.908	704	931	56.4	43.0	4.224	F
2 - High Street east	895	224	137	989	0.905	974	935	64.4	44.8	3.391	F
3 - High Street south	540	135	701	658	0.822	599	410	20.4	5.7	1.188	F

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	LOS
1 - Newington Road north	544	136	288	786	0.693	706	838	43.0	2.6	1.450	F
2 - High Street east	750	187	138	989	0.758	914	856	44.8	3.7	1.312	F
3 - High Street south	452	113	658	689	0.657	467	394	5.7	2.0	0.287	C

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 27_R1_PM validated_Strategic Model.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 27_B2014_A255\Strategic Model Scenario
Report generation date: 19/03/2019 12:34:04

«2039 Baseline Traffic, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Baseline Traffic				
1 - Newington Road north	17.0	1.41	0.99	F	1.44
2 - High Street east	37.7	2.02	1.05	F	
3 - High Street south	7.0	0.63	0.89	E	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

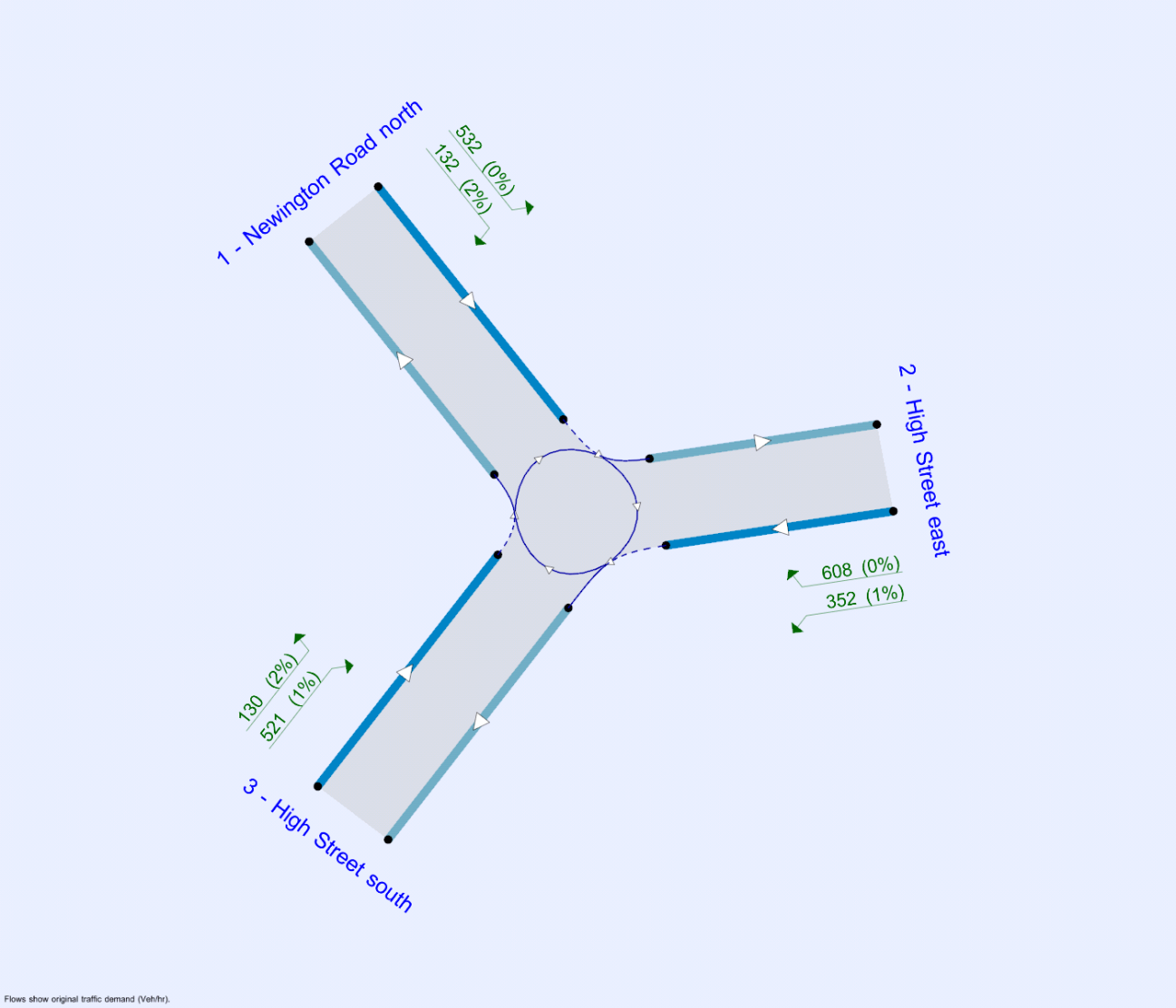
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	05/10/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\chris.price2
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Baseline Traffic, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	1.44	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	Newington Road north	
2	High Street east	
3	High Street south	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - Newington Road north	3.96	3.71	4.87	1.4	13.95	8.20	0.0	
2 - High Street east	3.64	3.20	4.13	19.6	20.00	17.75	0.0	✓
3 - High Street south	3.58	3.28	5.97	10.0	14.07	9.72	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Newington Road north	0.630	785
2 - High Street east	0.616	1102
3 - High Street south	0.657	1081

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Newington Road north	Percentage		175.00
3 - High Street south	Percentage		122.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2039 Baseline Traffic	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Newington Road north		ONE HOUR	✓	664	100.000
2 - High Street east		ONE HOUR	✓	960	100.000
3 - High Street south		ONE HOUR	✓	651	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Newington Road north	2 - High Street east	3 - High Street south
From	1 - Newington Road north	0	532	132
	2 - High Street east	608	0	352
	3 - High Street south	130	521	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Newington Road north	2 - High Street east	3 - High Street south
From	1 - Newington Road north	0	0	2
	2 - High Street east	0	0	1
	3 - High Street south	2	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Newington Road north	0.99	1.41	17.0	F	609	914
2 - High Street east	1.05	2.02	37.7	F	881	1321
3 - High Street south	0.89	0.63	7.0	E	597	896

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	500	125	389	936	0.534	495	549	0.0	1.1	0.135	A
2 - High Street east	723	181	98	1036	0.697	714	786	0.0	2.2	0.181	B
3 - High Street south	490	123	452	945	0.519	486	360	0.0	1.1	0.130	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	597	149	466	851	0.701	592	656	1.1	2.2	0.228	B
2 - High Street east	863	216	118	1024	0.842	853	940	2.2	4.7	0.332	C
3 - High Street south	585	146	540	875	0.669	582	431	1.1	1.9	0.202	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	731	183	561	746	0.980	694	762	2.2	11.6	0.835	F
2 - High Street east	1057	264	138	1012	1.045	982	1116	4.7	23.5	1.084	F
3 - High Street south	717	179	622	810	0.885	701	498	1.9	6.0	0.490	D

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	731	183	570	735	0.994	709	776	11.6	17.0	1.408	F
2 - High Street east	1057	264	141	1010	1.047	1000	1139	23.5	37.7	2.022	F
3 - High Street south	717	179	633	801	0.895	713	508	6.0	7.0	0.628	E

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	597	149	482	833	0.716	654	742	17.0	2.7	0.429	D
2 - High Street east	863	216	130	1017	0.849	982	1006	37.7	7.9	1.455	F
3 - High Street south	585	146	622	810	0.723	602	490	7.0	2.8	0.310	C

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Newington Road north	500	125	397	927	0.539	506	571	2.7	1.2	0.145	A
2 - High Street east	723	181	101	1035	0.698	745	803	7.9	2.4	0.221	B
3 - High Street south	490	123	472	929	0.528	497	374	2.8	1.1	0.141	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 29_New Haine Rd_Haine Rd_A256.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039 Base Models\Validated\Jct 29_New Haine Rd_Haine Rd_A256
Report generation date: 19/03/2019 11:47:17

»2039 Base , AM
»2039 Base , PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)	Queue (Veh)	Delay (min)	RFC	LOS	Junction Delay (min)
	2039 Base									
Arm 1	1.3	0.07	0.56	A	0.15	1.4	0.06	0.58	A	0.35
Arm 2	2.7	0.22	0.74	B		15.4	1.01	0.97	F	
Arm 3	0.1	0.07	0.11	A		0.2	0.09	0.17	A	
Arm 4	3.5	0.19	0.78	B		1.7	0.12	0.64	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	
Location	
Site number	
Date	13/12/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\pranav.yadav
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	min	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75				0.85	0.60	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 Base , AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.15	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A256 (N)	
2	New Haine Road	
3	Haine Road	
4	New Arm	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	7.30	8.00	16.6	34.4	50.0	17.5	
2	3.90	8.30	4.4	11.0	50.0	36.0	
3	3.10	7.00	20.8	41.8	50.0	17.0	
4	3.50	7.20	24.6	36.0	50.0	17.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.788	2552
2	0.536	1408
3	0.647	1796
4	0.672	1936

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2039 Base	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1075	100.000
2		ONE HOUR	✓	709	100.000
3		ONE HOUR	✓	96	100.000
4		ONE HOUR	✓	1055	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	562	82	431
	2	504	0	4	201
	3	81	6	0	9
	4	610	434	11	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	5	5	0
	2	5	0	20	0
	3	0	2	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.56	0.07	1.3	A	986	1480
2	0.74	0.22	2.7	B	651	976
3	0.11	0.07	0.1	A	88	132
4	0.78	0.19	3.5	B	968	1452

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	809	202	338	2219	0.365	807	895	0.0	0.6	0.042	A
2	534	133	393	1153	0.463	530	752	0.0	0.9	0.096	A
3	72	18	851	1232	0.059	72	73	0.0	0.1	0.052	A
4	794	199	442	1626	0.489	790	481	0.0	0.9	0.072	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	966	242	404	2168	0.446	965	1072	0.6	0.8	0.050	A
2	637	159	471	1113	0.573	636	899	0.9	1.3	0.125	A
3	86	22	1019	1121	0.077	86	87	0.1	0.1	0.058	A
4	948	237	530	1564	0.606	946	575	0.9	1.5	0.097	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1184	296	493	2100	0.564	1182	1307	0.8	1.3	0.065	A
2	781	195	576	1058	0.738	775	1099	1.3	2.7	0.208	B
3	106	26	1245	972	0.109	106	107	0.1	0.1	0.069	A
4	1162	290	647	1483	0.783	1154	703	1.5	3.4	0.178	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1184	296	496	2098	0.564	1184	1315	1.3	1.3	0.066	A
2	781	195	577	1058	0.738	780	1103	2.7	2.7	0.216	B
3	106	26	1250	968	0.109	106	107	0.1	0.1	0.070	A
4	1162	290	651	1480	0.785	1161	706	3.4	3.5	0.188	B

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	966	242	409	2165	0.446	968	1083	1.3	0.8	0.050	A
2	637	159	472	1112	0.573	643	905	2.7	1.4	0.129	A
3	86	22	1027	1115	0.077	86	87	0.1	0.1	0.058	A
4	948	237	535	1561	0.608	956	579	3.5	1.6	0.101	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	809	202	341	2217	0.365	810	903	0.8	0.6	0.043	A
2	534	133	395	1152	0.463	536	756	1.4	0.9	0.098	A
3	72	18	858	1228	0.059	72	73	0.1	0.1	0.052	A
4	794	199	446	1623	0.489	797	484	1.6	1.0	0.073	A

2039 Base , PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.35	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		ONE HOUR	✓	1252	100.000
2		ONE HOUR	✓	870	100.000
3		ONE HOUR	✓	121	100.000
4		ONE HOUR	✓	825	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1	2	3	4
From	1	0	562	79	611
	2	604	0	28	238
	3	88	3	0	30
	4	656	158	11	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	2	0	0
	2	1	0	0	0
	3	0	2	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1	0.58	0.06	1.4	A	1149	1723
2	0.97	1.01	15.4	F	798	1197
3	0.17	0.09	0.2	A	111	167
4	0.64	0.12	1.7	A	757	1136

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	943	236	129	2428	0.388	940	1009	0.0	0.6	0.040	A
2	655	164	526	1118	0.586	649	543	0.0	1.4	0.127	A
3	91	23	1087	1089	0.084	91	88	0.0	0.1	0.060	A
4	621	155	519	1584	0.392	619	659	0.0	0.6	0.062	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1126	281	154	2409	0.467	1125	1207	0.6	0.9	0.047	A
2	782	196	630	1063	0.736	777	649	1.4	2.6	0.206	B
3	109	27	1301	951	0.114	109	106	0.1	0.1	0.071	A
4	742	185	621	1515	0.490	740	788	0.6	1.0	0.077	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1378	345	189	2382	0.579	1377	1456	0.9	1.4	0.060	A
2	958	239	771	988	0.969	921	795	2.6	12.0	0.671	E
3	133	33	1563	781	0.171	133	129	0.1	0.2	0.093	A
4	908	227	739	1435	0.633	905	957	1.0	1.7	0.113	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1378	345	189	2381	0.579	1378	1474	1.4	1.4	0.060	A
2	958	239	772	988	0.970	944	796	12.0	15.4	1.011	F
3	133	33	1586	765	0.174	133	129	0.2	0.2	0.095	A
4	908	227	756	1424	0.638	908	964	1.7	1.7	0.116	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	1126	281	155	2408	0.467	1127	1249	1.4	0.9	0.047	A
2	782	196	631	1062	0.736	832	651	15.4	3.0	0.311	C
3	109	27	1356	915	0.119	109	108	0.2	0.1	0.074	A
4	742	185	660	1489	0.498	745	805	1.7	1.0	0.081	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1	943	236	130	2428	0.388	944	1020	0.9	0.6	0.040	A
2	655	164	528	1117	0.586	661	545	3.0	1.4	0.133	A
3	91	23	1100	1081	0.084	91	89	0.1	0.1	0.061	A
4	621	155	528	1578	0.394	623	664	1.0	0.7	0.063	A

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Appendix J
Road Safety Audits

B2190 Spitfire Way, Manston Airport, Kent
Proposed Highway Works – Cargo Access

Road Safety Audit – Stage 1
(Preliminary Design)

Client: RSP

28th March 2019

Badingham

Transport Planning & Highway Engineering Consultants

16 Ashley Piece

Ramsbury, Marlborough

Wiltshire

SN8 2QE

T. +44(0)1672 521320

contact@badinghamuk.com

www.badinghamuk.com

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FIGURES

Figure 1	Site Location Plan
Figure 2	Aerial Photo
Figure 3	Audit Plan

APPENDICES

Appendix 1	Road Safety Audit Brief

SECTION 1: INTRODUCTION

General

1.1 This Road Safety Audit Stage 1 (Preliminary Design) report has been undertaken at the request of the Highway Authority. It relates to a proposed highway access works on the B2190 Spitfire Way to serve a proposed cargo facility for Manston Airport, Kent.

1.2 Thanet District Council is the local planning authority. Kent County Council is the local highway authority for the area.

Audit Team

1.3

A. R. J. Setter	BA (Hons) MSc CMILT MCIHT AMICE MSoRSA CoC Badingham Limited
D. F. Rogers	JP CEng BEng (Hons) MICE FIHE MSoRSA Ashburn Partnership

Audit Brief

1.4 The Road Safety Audit has been undertaken in accordance with the Road Safety Audit Brief contained in Appendix 1.

1.5 The terms of reference for this Road Safety Audit are described in GG119. The Audit Team has not been made aware of any departures from standard.

1.6 The Road Safety Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.

Main Parties to the Audit

1.7 The following are the main parties to the audit:

- Client Organisation: RSP
- Overseeing Organisation: Kent County Council
- Design Organisation: Wood Plc

1.8 The Audit Team visited the site together on Tuesday 26th March 2019 between 10.00am and 10.30am. The weather was fine and surfaces were dry. There were no adverse traffic conditions to affect the audit. Photographs of the site and surrounding area are included where relevant.

1.9 The location of the site is shown on Figure 1 Site Location Plan and Figure 2 Aerial Photo. The area of the audit extends solely to the works shown on the drawings included in the Audit Brief. Any issues identified are cross-referenced by paragraph number to the Audit Plan (Figure 3).

1.10 The works comprise a new three-arm roundabout junction on the B2190 Spitfire Way, to provide access to a proposed cargo facility to serve Manston Airport. Spitfire Way in this location is a rural single carriageway with a relatively straight alignment and minimal gradient. It is subject to the national speed limit. The proposals include a realignment of the carriageway with part of the old carriageway retained to serve as an access to Rose Farm. The proposed junction is to be situated within a new 50mph speed limit. No pedestrian facilities are proposed. The existing wearing course was noted to be in a good condition. There are no existing footways or street lighting. No pedestrians or cyclists were noted. Land to the north of the B2190 carriageway is currently in agricultural use.

1.11 CrashMap shows two slight collison's in the vicinity of the proposed access within the latest five-year period. A fatal and three further slight collisions are shown on Spitfire Way further to the east of Pouces Cottages.

SECTION 2: ITEMS RAISED AT PREVIOUS AUDITS

2.1 No previous audits have been undertaken.

SECTION 3: VEHICULAR AND HIGHWAY ISSUES

3.1 PROBLEM

Location: Proposed roundabout.

Summary: Potential collisions arising from large vehicle access.

3.1.1 No swept path assessment is provided. The junction is likely to experience a significant number of large HGV movements that without sufficient carriageway space, particularly when turning, may lead to damage-type collisions or over-running of the verge.

RECOMMENDATION

3.1.2 It is recommended that a swept path assessment is undertaken for the largest typical vehicles anticipated to regularly and frequently use the junction to demonstrate safe and efficient access.

Photo 1 B2190 view east from Rose Farm access.

3.2 **PROBLEM**

Location: West of Rose Farm access.

Summary: Potential for 'see-through effect'.

3.2.1 If the old carriageway to the west of Rose Farm is retained there is potential for 'see-through' effect for eastbound drivers and risk of loss-of-control type incidents. Drivers may perceive the carriageway as continuing on the old alignment.

RECOMMENDATION

3.2.2 It is recommended that the old carriageway to the west of Rose Farm is removed.

Photo 2 - B2190 view east.

3.3 PROBLEM

Location: Proposed Rose Farm access with Spitfire Way.

Summary: Potential collisions arising from large vehicle access.

3.3.1 No swept path assessment is provided. The junction is provided with a tight radius turn. Large vehicles such as agricultural machinery and vehicles with trailers may collide with other vehicles waiting at the junction or over-run the verge and be in danger of tipping.

RECOMMENDATION

3.3.2 It is recommended that a swept path assessment is undertaken for the largest typical vehicles anticipated to regularly and frequently use the junction to demonstrate safe and efficient access.

Photo 3 -B2190 view west to HGV.

3.4 **PROBLEM**

Location: Proposed roundabout & Rose Farm access.

Summary: Potential collisions arising from lack of visibility.

3.4.1 No visibility splays are shown on the drawing for the two proposed junctions. Lack of suitable visibility can lead to late-braking decisions, difficulties with gap acceptance and collisions between vehicles.

RECOMMENDATION

3.4.2 It is recommended that suitable visibility splays are provided commensurate with the speed of traffic in these locations.

Photo 4 - B2190 view east.

3.5 PROBLEM

Location: Proposed roundabout.

Summary: Potential collisions arising from speeding.

3.5.1 The introduction of a roundabout in this location will slow traffic on the B2190. It is noted that a change in speed limit to 50mph is proposed. However, the roundabout approaches are straight and the current 85th percentile speeds are recorded at circa 50mph. There is a risk of drivers approaching the proposed roundabout at speed, leading to late-braking decisions, skidding and loss-of-control type collisions with other vehicles and possibly increased severity levels.

RECOMMENDATION

3.5.2 It is recommended that the speed limit is reduced to 40mph and extended to the west to the roundabout junction with Columbus Avenue. It is recommended that the roundabout approaches are provided with high friction surfacing (HFC).

Photo 5 - B2190 view west.

SECTION 4: NON-MOTORISED USERS

4.1 No observations.

SECTION 5: ROAD MARKINGS AND SIGNAGE

5.1 No signing details have been provided. A suitable package of signage information will need to be provided as part of any further detailed design.

SECTION 6: STREET LIGHTING

6.1 PROBLEM

Location: Proposed roundabout.

Summary: Lack of illumination.

6.1.1 No street lighting information is provided. There is a risk that insufficient illumination of the junction, leading to potential collisions between vehicles.

RECOMMENDATION

6.1.2 It is recommended that appropriate street lighting is provided.

Photo 6 - B2190 view west.

SECTION 7: DRAINAGE

7.1 No drainage information is provided. A suitable package of drainage information will need to form part of any further detailed design.

SECTION 8: AUDIT STATEMENT

8.1 This audit has been undertaken in accordance with DMRB Standard GG119.

Road Safety Audit Team Leader

A. R. J. Setter BA (Hons) MSc CMILT MCIHT AMICE MSoRSA CoC

Director - Badingham Limited

16 Ashley Piece, Ramsbury, Marlborough, Wiltshire, SN8 2QE

Signed: [redacted] Date: 28th March 2019

Audit Team Member

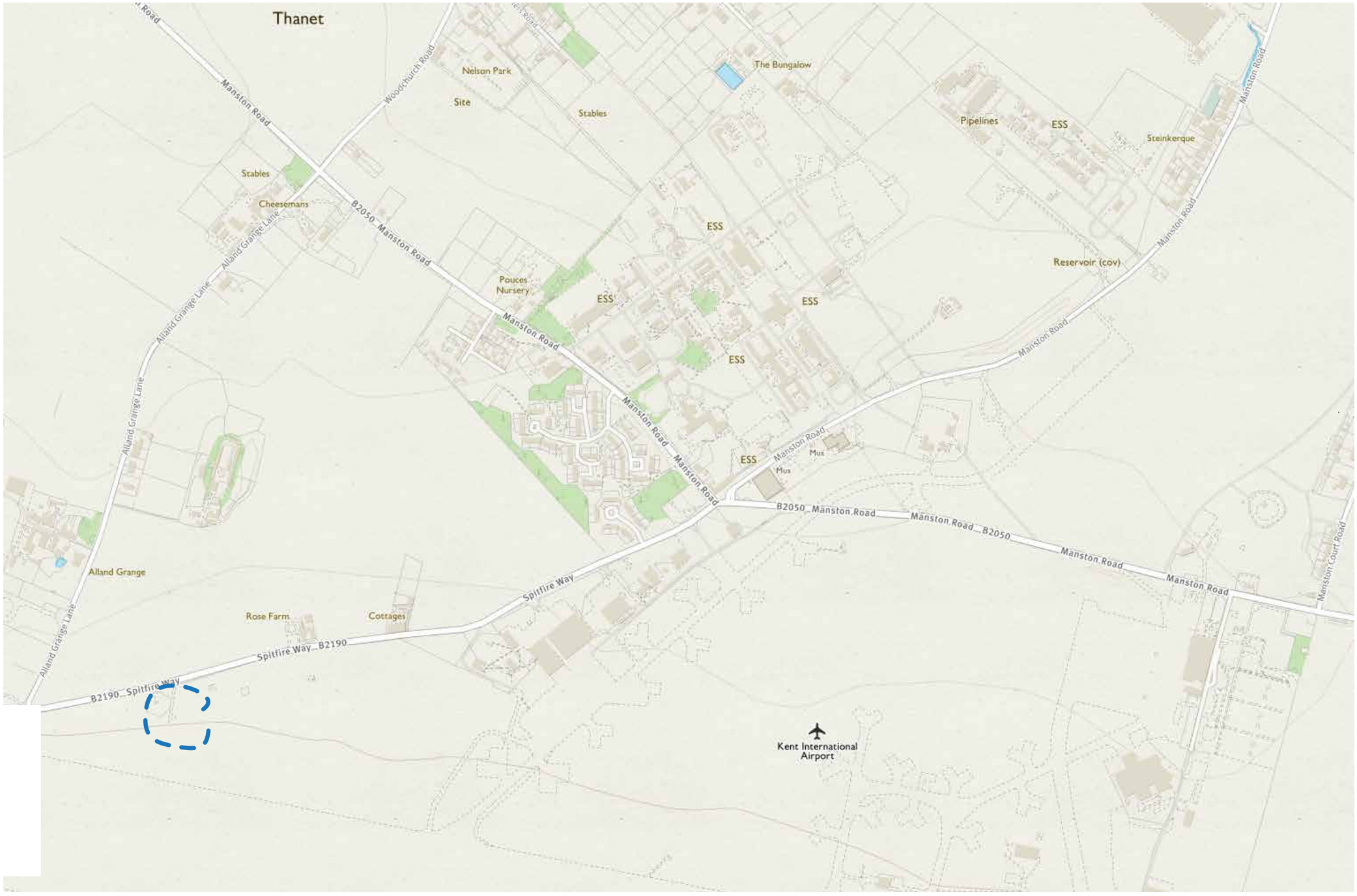
D. F. Rogers JP CEng BEng (Hons) MICE MSoRSA FIHE

Director - Ashburn Partnership

5 Mayfield, Upper Wanborough, Swindon, SN4 0ED

Signed: [redacted] Date: 28th March 2019

FIGURES



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Client: RSP

Project: Manston Airport

Title: Location Plan

Date	Status
28/03/2019	FINAL

Scale	Original Size
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Drawn	Checked
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 1	-

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Client
RSP

Project
Manston Airport

Title
Aerial Photo

Date	Status
28/03/2019	FINAL

Scale	Original Size
NTS	A3

Drawn	Checked
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 2	-

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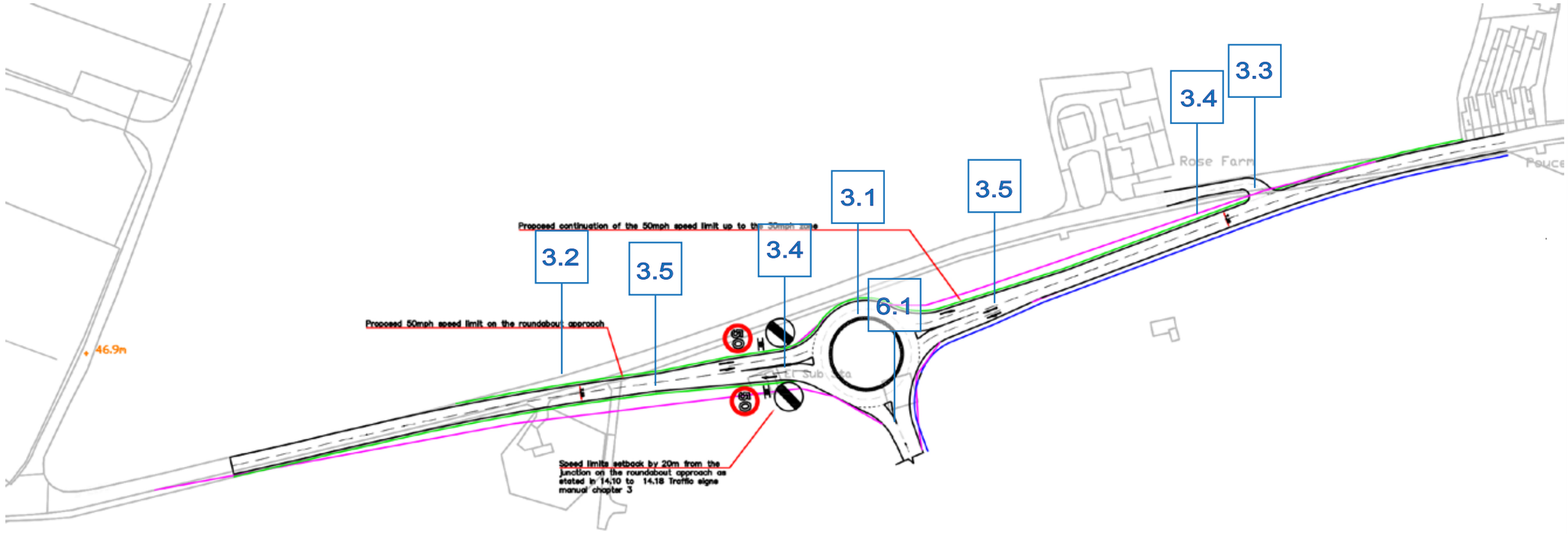

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Source: Cargo Site Location & Access Design

Rev.	Date	Initials	Amendments

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Client: RSP

Project: Manston Airport

Title: Audit Plan

Date	Status
28/03/2019	FINAL

Scale	Original Size
NTS	A3

Drawn	Checked
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 3	-

APPENDIX 1

Road Safety Audit Brief

ROAD SAFETY AUDIT BRIEF

Project Summary	
Date:	22/03/19
Document Reference:	N/A
Prepared by:	Wood
On Behalf of:	RiverOak Strategic Partners
AUTHORISATION SHEET	
Project:	Manston Airport – Cargo Facility Roundabout Access
Report title:	Manston Airport - Cargo Facility Roundabout Access - RSA Stage 1
PREPARED BY:	
Name:	Glyn Price
Signed:	[redacted]
Organisation:	Wood
Date:	22/03/2019
I APPROVE THE RSA BRIEF AND INSTRUCT THE RSA TO TAKE PLACE ON BEHALF OF THE OVERSEEING ORGANISATION:	
Name:	Tony Freudmann
Si	[redacted]
Organisation:	RiverOak Strategic Partners
Date:	22/03/19

General Details

Highway Scheme Name & Road Number	Manston Airport – Cargo Facility Access – Spitfire Way (B2190)			
Type of Scheme *e.g. new road scheme, smart motorway, junction improvement, traffic signs and road markings improvement, traffic calming, etc.*				
New Roundabout Junction with the B2190				
RSA Stage *Tick as appropriate ✓*	1 √	2	3	4
	Interim			
Overseeing Organisation Details		**Design Organisation Details**		
16 Charles II Street London SW1Y 4NW		Wood Glyn Price Associate Director Canon Court, Abbey Lawn, Abbey Forgate, Shrewsbury, SY2 5DE, UK		
Police Contact Details (RSA3 Only)		**Maintaining Agent Contact Details**		
N/A		N/A		
RSA Team Membership				
A.R.J. Setter (Team Leader)	BA (Hons) MSc CMILT MCIHT AMICE MSoRSA Highways England Certificate of Competence & Compliant with EU Directive 2008/96/EC Badingham Limited			
D. F. Rogers (Team Member)	JP, CEng BEng (Hons) MICE MSoRSA FIHE Ashburn Consultants			
Terms of Reference *Make reference to relevant DMRB documents and other guidance where appropriate.*				
DMRB - TD16/07 – Geometric Design of Roundabouts				

Scheme Details

Scheme Description/Objective

General
Define the extents of the RSA, include a brief scheme description, the scheme objectives, a start date for construction if known and a completion date. In addition, for stage 4 RSAs, confirm when all related traffic management has been removed.

The proposals are for a new three arm roundabout junction with the B2109 north of Manston Airport.

The extents are the extents of the provided drawings of the scheme to the point where the changed road alignment on the B2019 links back in with the carriageway.

The objectives of the scheme are to provide a new access to a proposed new cargo facility on the Manson Airport footprint.

Construction would be proposed in Year one of the project life cycle which will be 2019 or 2020 depending on the approvals process of a DCO that is going through examination. Complete should take between 3-6 months.

Design Standards Applied to the Scheme Design
For example, DMRB.

DMRB has been applied to the design of the proposed roundabout. TD16/07 Geometric Design of Roundabouts.

Design Speeds
Provide details of applied and/or existing design speeds.

50MPH

Speed Limits
State whether mandatory or advisory, available speed data.

The existing speed limit on Spitfire Way (B2109) is National Speed limit. It is proposed to change the speed limits in the area as part of the scheme design to 50mph.

An ATC was taken on the road in 2017 in the vicinity of the proposed junction.

This indicated an average speed of 42.5 eastbound and 48 westbound (85th Percentile). This data will be provided with this brief.

Existing Traffic Flows/Queues
To include current automatic traffic counter (ATC) data, up-to-date turning count and queue information etc.

The average traffic flows on the link will be provided from the ATC taken at the access location.

Forecast Traffic Flows
Where available and relevant, provide future traffic flow data including vehicle proportions.

Future Traffic flows at the access for the AM and PM Peak will be provided in a matrix format.

Pedestrian, Cyclist & Equestrian Desire Lines
Include details of pedestrian, cyclist and equestrian movements in the vicinity of the scheme and, when applicable the relevant walking, cycling and horse-riding assessment and review reports HD 42/17 [Ref 7.1].

The design has indicated proposed footways which does not include any pedestrian facilities to cross arms of the junction. There is no footway south and west of the junction towards Columbus avenue and one is not proposed.

Environmental Constraints
Include all environmental constraints within the scheme extents, for example sites of special scientific interest (SSSI), conservation areas, listed properties etc.

No environmental constrains have been observed.

Locality

Description of Locality
Include all environmental constraints within the scheme extents, e.g. (SSSI), conservation areas, listed properties etc.

The new roundabout is on Spitfire way approximately 500m south west of the junction of Manston Road and Spitfire Way.

General Description
Include road network, road type, relevant land uses etc.

The existing Spitfire Way carriageway is a two-lane carriageway. There are no footways either side of the carriageway and the road is subject to the NSL. To the north of the carriageway is open fields and the south the airport site.

Relevant Factors Which May Affect Road Safety
Factors known to the Design Organisation and considered as part of the design. This should also include anything that would not be immediately obvious to the RSA Team – such as school crossing patrols and large events, for example.

Near the proposed junction two accidents have been recorded within the scope of the proposed junction. These are accidents 75 and 335.

The accidents were similar in nature with shunt type accidents and both were slight in nature.

The details for accidents the two accidents are provided.

Analysis

Collision Data Analysis
Stages 1,2, and 3 provide a summary of road traffic collision data covering both the extent of the scheme and the adjoining sections of highway. As a minimum, the most recent 36 month of data. At Stage 4, provide 12 months of post-opening validated road traffic collision data. Raw data should be provided as an appendix.

Data for the Spitfire Way link will be provided with this brief.

Departures from Standards
Include status details, i.e. approved/pending/rejected, and any design strategy records produced for improvements to existing trunk roads and motorways.

N/A

Previous Road Safety Audit Stage Reports, Road Safety Audit Response Reports & Evidence of Agreed Actions
Attach previous reports to the RSA Brief, or provide an explanation where these are not available.

N/A

Strategic Decisions
Includes items outside the scope of this RSA, which will not change irrespective of the RSA, for example route choice, junction type, approved departures from standard.

N/A

List of Included Documents and Drawings
For example: previous RSA reports; Design Responses; Departures; Road Traffic Collision Data; Walking, Cycling and Horse-Riding Assessment and Reviews. This could include any relevant operational data such as damage-only collision data or incident logs.
This list could be included as an attachment to the RSA Brief or a hyperlink to a shared electronic location where the RSA Brief information has been collated.

Documents

Reference/Revision	Title	Date
RSA – Cargo – ATC results	-	25.03.2019
RSA – Cargo – future Year Traffic Flows (2039)	-	25.03.2019
RSA – Cargo – Accident 75		25.03.2019
RSA – Cargo – Accident 335		25.03.2019

Drawings

Reference/Revision	Title	Date
RSA – Cargo – Site Location and Access design		25.03.2019
RSA – Cargo – Cad file		25.03.2019

Checklist			
Tick all that are included and provide reasons for those that are not included.	✓		
Site Location plan		Scale Layout Plans	
Departures and Relaxations from Standards		Construction/Typical Details	
Previous RSA Reports		Previous RSA Response Reports & Evidence of Agreed Actions	
Collision Data and Collision Data Analysis		Road Traffic Collision Plot	
Traffic Signal Staging		Traffic Counts	
Speed Surveys		Pedestrian, Cyclist, Horse-Riding Desire Lines & Volumes	
Walking, Cycling and Horse-Riding Assessment & Reviews		Items Outside the Scope of the RSA/Strategic Decisions	
Other Factors that may Impact Upon Road Safety		Design Speeds/Speed Limits	
Design Standards Used		Adjacent Land Uses	

Manston Road, Manston Airport, Kent
Proposed Highway Works – Northern Grass Area North Access

Road Safety Audit – Stage 1
(Preliminary Design)

Client: RSP

28th March 2019

Badingham

Transport Planning & Highway Engineering Consultants

16 Ashley Piece

Ramsbury, Marlborough

Wiltshire

SN8 2QE

T. +44(0)1672 521320

contact@badinghamuk.com

www.badinghamuk.com

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DOCUMENT ISSUE

Issue / Revision:	Issue 1			
Description / Status:	Final			
Date:	28/03/2019			
Prepared:	A. R. J. Setter			
Signature:	[redacted]			
Document Check:	D. F. Rogers			
Signature:	[redacted]			
Technical Check:	D. F. Rogers			
Signature:	[redacted]			
Authorised:	A. R. J. Setter			
Signature:	[redacted]			
File Reference:	0781 Manston Airport - NGA N - RSA1 - Issue 1.docx			

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FIGURES

Figure 1	Site Location Plan
Figure 2	Aerial Photo
Figure 3	Audit Plan

APPENDICES

Appendix 1	Road Safety Audit Brief

SECTION 1: INTRODUCTION

General

1.1 This Road Safety Audit Stage 1 (Preliminary Design) report has been undertaken at the request of the Highway Authority. It relates to a proposed highway works on the Manston Road, Manston, Kent, to provide an access to a Business Park

1.2 Thanet District Council is the local planning authority. Kent County Council is the local highway authority for the area.

Audit Team

1.3

A. R. J. Setter	BA (Hons) MSc CMILT MCIHT AMICE MSoRSA CoC Badingham Limited
D. F. Rogers	JP CEng BEng (Hons) MICE FIHE MSoRSA Ashburn Partnership

Audit Brief

1.4 The Road Safety Audit has been undertaken in accordance with the Road Safety Audit Brief contained in Appendix 1.

1.5 The terms of reference for this Road Safety Audit are described in GG119. The Audit Team has not been made aware of any departures from standard.

1.6 The Road Safety Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.

Main Parties to the Audit

1.7 The following are the main parties to the audit:

- Client Organisation: RSP
- Overseeing Organisation: Kent County Council
- Design Organisation: Wood Plc

1.8 The Audit Team visited the site together on Tuesday 26th March 2019 between 9.30am and 10.00am. The weather was fine and surfaces were dry. There were no adverse traffic conditions to affect the audit. Photographs of the site and surrounding area are included where relevant.

1.9 The location of the site is shown on Figure 1 Site Location Plan and Figure 2 Aerial Photo. The area of the audit extends solely to the works shown on the drawings included in the Audit Brief. Any issues identified are cross-referenced by paragraph number to the Audit Plan (Figure 3).

1.10 The works comprise as simple priority junction arrangement with Manston Road to provide access to a proposed Northern Grass Area Business Park.

1.11 Manston Road in this location has a curving alignment and is a single carriageway rural road with a 30mph speed limit. No footways or street lighting area provided. The proposed junction is to be located on an outside of a bend. Gradients in the area are minimal. The carriageway wearing course shows signs of wear.

1.12 A single collision is recorded in the location of the proposed access for the latest five-year period. This involved a single vehicle and is categorised as serious with a single casualty. It occurred in the early hours of the morning in darkness, in damp/wet conditions and resulted it the driver losing control and colliding with street furniture. No deficiencies with the highway are recorded.

SECTION 2: ITEMS RAISED AT PREVIOUS AUDITS

2.1 No previous audits have been undertaken.

SECTION 3: VEHICULAR AND HIGHWAY ISSUES

3.1 PROBLEM

Location: Proposed junction.

Summary: Potential collisions arising from large vehicle access.

3.1.1 No swept path assessment is provided. The junction is likely to experience a significant number of large HGV movements that without sufficient carriageway space, particularly when turning, may lead to damage-type collisions or over-running of the verge.

RECOMMENDATION

3.1.2 It is recommended that a swept path assessment is undertaken for the largest typical vehicles anticipated to regularly and frequently use the junction to demonstrate safe and efficient access.

Photo 1 - Manston Road view south.

3.2 **PROBLEM**

Location: Proposed junction.

Summary: Potential collisions arising from lack of visibility.

3.2.1 No visibility splays/ forward visibility is shown on the drawing for the proposed junction. Lack of suitable visibility can lead to late-braking decisions, difficulties with gap acceptance and collisions between vehicles.

RECOMMENDATION

3.2.2 It is recommended that suitable visibility splays are provided commensurate with the speed of traffic in this location.

Photo 2 - Manston Road view south.

3.3 **PROBLEM**

Location: Proposed junction.

Summary: Potential for speeding.

3.3.1 Traffic survey results show 85th percentile speeds at circa 36mph in both directions, and therefore above the signed 30mph speed limit. There is a risk that the widening of the carriageway may encourage drivers to speed through the junction to the general detriment of highway safety and may lead to collisions with slow-moving turning traffic and increased severity level of any collisions.

RECOMMENDATION

3.3.2 It is recommended that measures are introduced to reduced traffic speeds on Manston Road to within the signed limit.

Photo 3 - Manston Road view north.

SECTION 4: NON-MOTORISED USERS

4.1 PROBLEM

Location: Proposed junction.

Summary: Lack of pedestrian crossing.

4.1.1 The drawings suggest a footway is to be provided either side of the proposed access road and on the southern side of Manston Road. No uncontrolled dropped crossing or tactile paving is shown across the new access road. This can cause difficulties for the visually and mobility impaired leading to potential collisions with vehicles.

RECOMMENDATION

4.2.2 It is recommended that an appropriate dropped crossing is introduced together with tactile paving to be inset 1m from the tangent point of the radius on the minor arm.

Photo 4 - Manston Road view north.

SECTION 5: ROAD MARKINGS AND SIGNAGE

5.1 No signing details have been provided. A suitable package of signage information will need to be provided as part of any further detailed design.

5.2 **PROBLEM**

Location: Proposed junction.

Summary: Potential for over-taking through junction.

5.2.1 The increased carriageway width may encourage drivers to attempt to overtake in this location leading to possible collisions with opposing or turning traffic.

RECOMMENDATION

5.2.2 It is recommended that the off-side hatched markings be enclosed with a solid continuous white line as shown on the example below, to discourage over-taking.

Photo 5 - White lining example.

SECTION 6: STREET LIGHTING

6.1 PROBLEM

Location: Proposed junction.

Summary: Lack of illumination.

6.1.1 No street lighting information is provided. There is a risk that insufficient illumination of the junction, will lead to potential collisions between vehicles.

RECOMMENDATION

6.1.2 It is recommended that appropriate street lighting is provided.

Photo 6 - Manston Road view north.

SECTION 7: DRAINAGE

7.1 No drainage information is provided. A suitable package of drainage information will need to form part of any further detailed design.

SECTION 8: AUDIT STATEMENT

8.1 This audit has been undertaken in accordance with DMRB Standard GG119.

Road Safety Audit Team Leader

A. R. J. Setter BA (Hons) MSc CMILT MCIHT AMICE MSoRSA CoC

Director - Badingham Limited

16 Ashley Piece, Ramsbury, Marlborough, Wiltshire, SN8 2QE

Signed: [redacted] Date: 28th March 2019

Audit Team Member

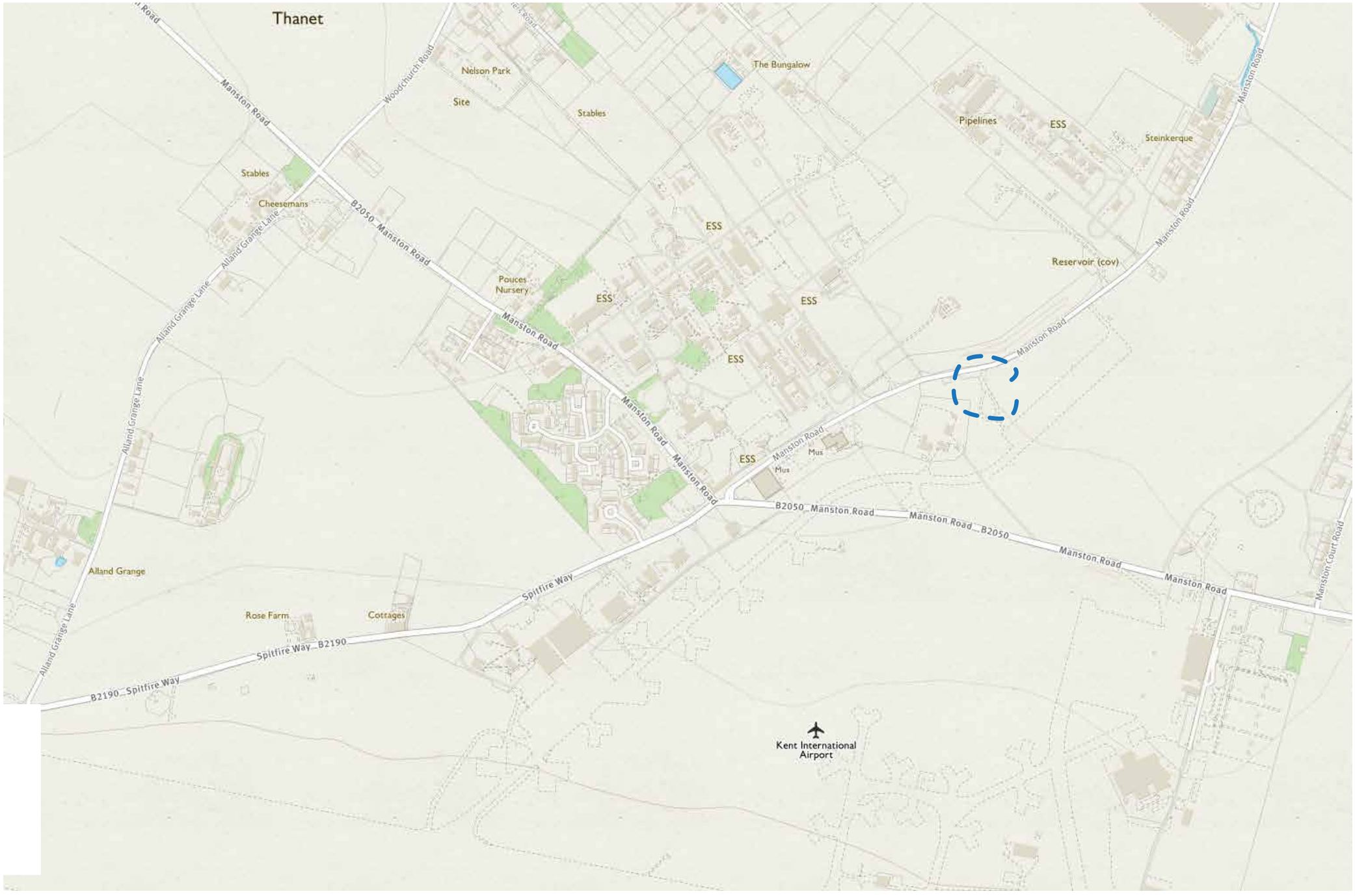
D. F. Rogers JP CEng BEng (Hons) MICE MSoRSA FIHE

Director - Ashburn Partnership

5 Mayfield, Upper Wanborough, Swindon, SN4 0ED

Signed: [redacted] Date: 28th March 2019

FIGURES



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Client: RSP

Project: Manston Airport

Title: Location Plan

Date	Status
28/03/2019	FINAL

Scale	Original Size
NTS	A3

Drawn	Checked
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 1	-

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Client
RSP

Project
Manston Airport

Title
Aerial Photo

Date	Status
28/03/2019	FINAL

Scale	Original Size
NTS	A3

Drawn	Checked
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 2	-

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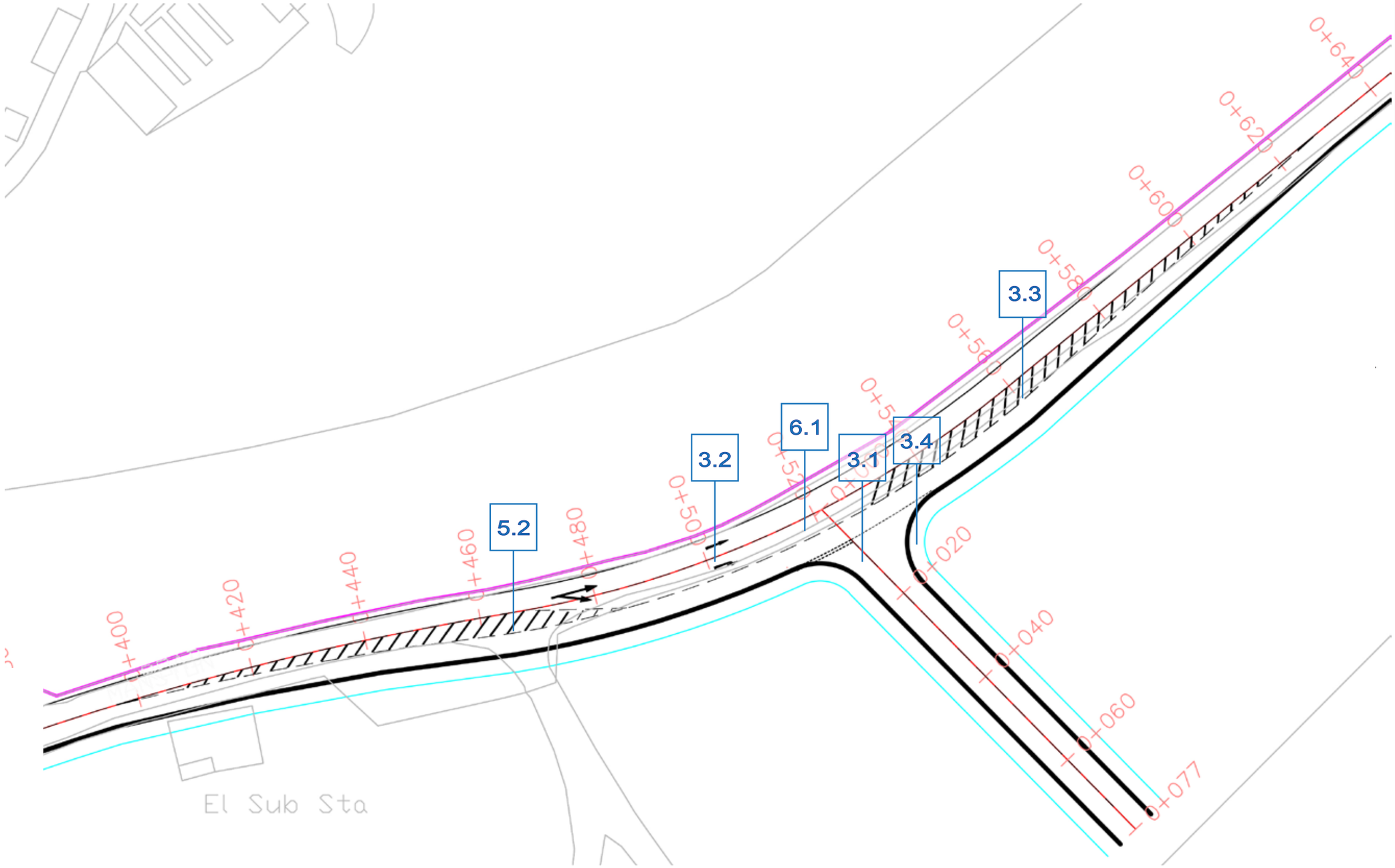

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Source: NGA N

Rev.	Date	Initials	Amendments

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Transport Planning
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www.badinghamuk.com

Client: RSP

Project: Manston Airport

Title: Audit Plan

Date	Status
28/03/2019	FINAL
Scale	**Original Size**
NTS	A3
Drawn	**Checked**
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 3	-

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APPENDIX 1

Road Safety Audit Brief

ROAD SAFETY AUDIT BRIEF

Project Summary	
Date:	22/03/19
Document Reference:	N/A
Prepared by:	Wood
On Behalf of:	RiverOak Strategic Partners
AUTHORISATION SHEET	
Project:	Manston Airport – Northern Grass Area – Western Access
Report title:	Manston Airport – Northern Grass Area – Western Access - RSA Stage 1
PREPARED BY:	
Name:	Glyn Price
Signed:	[redacted]
Organisation:	Wood
Date:	22/03/2019
I APPROVE THE RSA BRIEF AND INSTRUCT THE RSA TO TAKE PLACE ON BEHALF OF THE OVERSEEING ORGANISATION:	
Name:	Tony Freudmann
Signed	[redacted]
Organisation:	RiverOak Strategic Partners
Date:	22/03/19

General Details

Highway Scheme Name & Road Number	Manston Airport – Nothern Grass Area Western Access – Manston Road			
Type of Scheme *e.g. new road scheme, smart motorway, junction improvement, traffic signs and road markings improvement, traffic calming, etc.*				
New Priority junction with ghost right turn lane with Manston Road.				
RSA Stage *Tick as appropriate ✓*	1 √	2	3	4
	Interim			
Overseeing Organisation Details	**Design Organisation Details**			
16 Charles II Street London SW1Y 4NW	Wood Glyn Price Associate Director Canon Court, Abbey Lawn, Abbey Forgate, Shrewsbury, SY2 5DE, UK			
Police Contact Details (RSA3 Only)	**Maintaining Agent Contact Details**			
N/A	N/A			
RSA Team Membership				
A.R.J. Setter (Team Leader)	BA (Hons) MSc CMILT MCIHT AMICE MSoRSA Highways England Certificate of Competence & Compliant with EU Directive 2008/96/EC Badingham Limited			
D. F. Rogers (Team Member)	JP, CEng BEng (Hons) MICE MSoRSA FIHE Ashburn Consultants			
Terms of Reference *Make reference to relevant DMRB documents and other guidance where appropriate.*				
DMRB - TD16/07 – Geometric Design of Roundabouts Traffic Signs Regulations and General Directions (TSRGD)				

Scheme Details

Scheme Description/Objective

General
Define the extents of the RSA, include a brief scheme description, the scheme objectives, a start date for construction if known and a completion date. In addition, for stage 4 RSAs, confirm when all related traffic management has been removed.

The proposals are for a new three arm priority junction with Manston Road west of the proposed Northern Grass areas north of the B2050 Manston Road.

The extents of the area requiring RSA assessment is the extents the new junction. It should be noted that Manston Road is proposed to be upgraded in the future year as part of the Manston to Haine Link Road to a 7.3m wide carriageway in the vicinity of the proposed junction. This widening scheme north and south of the junction is not part of the RSA study area.

The objectives of the scheme are to provide a new access to the proposed Northern Grass Area Business Park.

Construction would be proposed in Year one of the project life cycle which will be 2019 or 2020 depending on the approvals process of a DCO that is going through examination. Complete should take between 3-6 months.

Design Standards Applied to the Scheme Design
For example, DMRB.

DMRB has been applied to the design of the proposed roundabout. TD42/95 - Geometric Design of Major/Minor Priority Junctions

Design Speeds
Provide details of applied and/or existing design speeds.

40MPH

Speed Limits
State whether mandatory or advisory, available speed data.

The existing speed limit on Manston Road (B2109) is 30mph, however as part of wider proposal to widen the Manston Road as part of the Manston to Haine Link Road it is proposed the speed limit will be increased to 40MPH.

An ATC (18) was undertaken just to the north of the proposed junction and this indicated that northbound the average 85th percentile speed was 55mph and southbound 54.1mph.

Existing Traffic Flows/Queues
To include current automatic traffic counter (ATC) data, up-to-date turning count and queue information etc.

A junction turning count was undertaken at the Spitfire Way and Manston Road junction. This indicated in 2017;

- AM Peak – 217 Northbound – 188 Southbound
- PM Peak – 219 Northbound – 214 Southbound

The ATC from this junction will be provided and this gives north and southbound traffic flows in Manston Road for 12 hours of the day.

Forecast Traffic Flows
Where available and relevant, provide future traffic flow data including vehicle proportions.

Future Traffic flows at the access for the AM and PM Peak will be provided in a matrix format.

Pedestrian, Cyclist & Equestrian Desire Lines
Include details of pedestrian, cyclist and equestrian movements in the vicinity of the scheme and, when applicable the relevant walking, cycling and horse-riding assessment and review reports HD 42/17 [Ref 7.1].

The clear design pedestrian line across the junction is across the minor arm and pedestrian facilities have been designed to accommodate this movement with a central splitter island.
Environmental Constraints *Include all environmental constraints within the scheme extents, for example sites of special scientific interest (SSSI), conservation areas, listed properties etc.*
No environmental constrains have been observed.

Locality

Description of Locality
Include all environmental constraints within the scheme extents, e.g. (SSSI), conservation areas, listed properties etc.

The new junctions on Manston Road is approximately 520m north of the junction of Manston Road and Spitfire Way.

General Description
Include road network, road type, relevant land uses etc.

The existing Manston Road carriageway is a two-lane carriageway. There are no footways either side of the carriageway and the road is subject to a 30mph speed limit. To the east of the carriageway is the disused element of the Manston Airport site which is proposed to become the Northern Grass area Business Park. To the West is open fields.

As mentioned as part of wider KCC proposals for a Manston to Haine Link Manston Road is proposed to be widened and upgraded to a 7.3m wide carriageway when the junction is constructed.

Relevant Factors Which May Affect Road Safety
Factors known to the Design Organisation and considered as part of the design. This should also include anything that would not be immediately obvious to the RSA Team – such as school crossing patrols and large events, for example.

On Manston Road in the vicinity of the junction only one accident was recorded (256) which was a serious accident when a driver lost control with no other vehicles involved. With the road being upgraded and widened its noted that the existing accident record review is not as relevant. It is not considered the road has a significant accident issue in the vicinity of the junction. The details for accident 256 are provided.

Analysis

Collision Data Analysis
Stages 1,2, and 3 provide a summary of road traffic collision data covering both the extent of the scheme and the adjoining sections of highway. As a minimum, the most recent 36 month of data. At Stage 4, provide 12 months of post-opening validated road traffic collision data. Raw data should be provided as an appendix.

Data for the Spitfire Way link will be provided with this brief.

Departures from Standards
Include status details, i.e. approved/pending/rejected, and any design strategy records produced for improvements to existing trunk roads and motorways.

N/A

Previous Road Safety Audit Stage Reports, Road Safety Audit Response Reports & Evidence of Agreed Actions
Attach previous reports to the RSA Brief, or provide an explanation where these are not available.

N/A

Strategic Decisions
Includes items outside the scope of this RSA, which will not change irrespective of the RSA, for example route choice, junction type, approved departures from standard.

N/A

List of Included Documents and Drawings
For example: previous RSA reports; Design Responses; Departures; Road Traffic Collision Data; Walking, Cycling and Horse-Riding Assessment and Reviews. This could include any relevant operational data such as damage-only collision data or incident logs.
This list could be included as an attachment to the RSA Brief or a hyperlink to a shared electronic location where the RSA Brief information has been collated.

Documents

Reference/Revision	Title	Date
RSA – NGA N – ATC results	-	25.03.2019
RSA – NGA N – future Year Traffic Flows (2039)	-	25.03.2019
RSA – NGA N – Accident 256		25.03.2019

Drawings

Reference/Revision	Title	Date
RSA – NGA N– Access design		25.03.2019
RSA – NGA N – Cad file		25.03.2019

Checklist			
Tick all that are included and provide reasons for those that are not included.	✓		
Site Location plan		Scale Layout Plans	
Departures and Relaxations from Standards		Construction/Typical Details	
Previous RSA Reports		Previous RSA Response Reports & Evidence of Agreed Actions	
Collision Data and Collision Data Analysis		Road Traffic Collision Plot	
Traffic Signal Staging		Traffic Counts	
Speed Surveys		Pedestrian, Cyclist, Horse-Riding Desire Lines & Volumes	
Walking, Cycling and Horse-Riding Assessment & Reviews		Items Outside the Scope of the RSA/Strategic Decisions	
Other Factors that may Impact Upon Road Safety		Design Speeds/Speed Limits	
Design Standards Used		Adjacent Land Uses	

B2050 Manston Road, Manston Airport, Kent
Proposed Highway Works – Passenger Terminal Access

Road Safety Audit – Stage 1
(Preliminary Design)

Client: RSP

28th March 2019

Badingham

Transport Planning & Highway Engineering Consultants

16 Ashley Piece

Ramsbury, Marlborough

Wiltshire

SN8 2QE

T. +44(0)1672 521320

contact@badinghamuk.com

www.badinghamuk.com

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DOCUMENT ISSUE

Issue / Revision:	Issue 1			
Description / Status:	Final			
Date:	28/03/2019			
Prepared:	A. R. J. Setter			
Signature:	[redacted]			
Document Check:	D. F. Rogers			
Signature:	[redacted]			
Technical Check:	D. F. Rogers			
Signature:	[redacted]			
Authorised:	A. R. J. Setter			
Signature:	[redacted]			
File Reference:	0781 Manston Airport - PT - RSA1 - Issue 1.docx			

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FIGURES

Figure 1	Site Location Plan
Figure 2	Aerial Photo
Figure 3	Audit Plan

APPENDICES

Appendix 1	Road Safety Audit Brief

SECTION 1: INTRODUCTION

General

1.1 This Road Safety Audit Stage 1 (Preliminary Design) report has been undertaken at the request of the Highway Authority. It relates to proposed highway access works on the B2050 Manston Road to serve a proposed passenger terminal facility for Manston Airport, Kent.

1.2 Thanet District Council is the local planning authority. Kent County Council is the local highway authority for the area.

Audit Team

1.3

A. R. J. Setter	BA (Hons) MSc CMILT MCIHT AMICE MSoRSA CoC Badingham Limited
D. F. Rogers	JP CEng BEng (Hons) MICE FIHE MSoRSA Ashburn Partnership

Audit Brief

1.4 The Road Safety Audit has been undertaken in accordance with the Road Safety Audit Brief contained in Appendix 1.

1.5 The terms of reference for this Road Safety Audit are described in GG119. The Audit Team has not been made aware of any departures from standard.

1.6 The Road Safety Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.

Main Parties to the Audit

1.7 The following are the main parties to the audit:

- Client Organisation: RSP
- Overseeing Organisation: Kent County Council
- Design Organisation: Wood Plc

1.8 The Audit Team visited the site together on Tuesday 26th March 2019 between 10.30am and 11.00am. The weather was fine and surfaces were dry. There were no adverse traffic conditions to affect the audit. Photographs of the site and surrounding area are included where relevant.

1.9 The location of the site is shown on Figure 1 Site Location Plan and Figure 2 Aerial Photo. The area of the audit extends solely to the works shown on the drawings included in the Audit Brief. Any issues identified are cross-referenced by paragraph number to the Audit Plan (Figure 3).

1.10 The works comprise a staggered signal junction to provide a new access road serving the Northern Grass Area and to the passenger terminal serving Manston Airport on the south side of the B2050 Manston Road.

1.11 Manston Road is a busy single rural carriageway with a straight alignment and minimal gradient. It is proposed to introduce signal control to the existing stub access roads in this location. To the west of the proposed junction is the simple priority junction of Manston Road and Manston Court Road. The wearing course is showing sign of wear. Manston Road is subject to a 40mph speed limit and has yellow line parking restrictions. Barrier crossing and low flying aircraft advance warning signs are posted. No existing footways or street lighting are provided. No pedestrians or cyclists were noted during the site visit.

1.12 A cluster of seven collisions are recorded within the latest five-year period at the junction of Manston Road/Manston Court Road to the east of the proposed junction. These included 6 slight collisions and 1 serious collision.

SECTION 2: ITEMS RAISED AT PREVIOUS AUDITS

2.1 No previous audits have been undertaken.

SECTION 3: VEHICULAR AND HIGHWAY ISSUES

3.1 PROBLEM

Location: Proposed junction.

Summary: Potential collisions arising from large vehicle access.

3.1.1 No swept path assessment is provided. The junction is likely to experience a significant number of large HGV movements that without sufficient carriageway space, particularly when turning, may lead to damage-type collisions or over-running of the verge and footways, endangering users.

RECOMMENDATION

3.1.2 It is recommended that a swept path assessment is undertaken for the largest typical vehicles anticipated to regularly and frequently use the junction to demonstrate safe and efficient access.

Photo 1 - Manston Road view west.

3.2 **PROBLEM**

Location: Proposed junction.

Summary: Potential collisions arising from lack of inter-visibility.

3.2.1 No intervisibility splays are shown on the drawing for the proposed junction. Lack of suitable inter-visibility can lead to collisions between vehicles and between vehicles and non-motorised users.

RECOMMENDATION

3.2.2 It is recommended that suitable inter-visibility splays are provided.

Photo 2 - Manston Road view east.

SECTION 4: NON-MOTORISED USERS

4.1 PROBLEM

Location: Proposed junction.

Summary: Orientation of pedestrian crossings.

4.1.1 Guidance recommends that where possible staggered pedestrian crossings should be orientated so that users are facing the approaching traffic when seeking to cross. The three refuge crossings proposed do not comply, to the general detriment in highway safety.

RECOMMENDATION

4.1.2 It is recommended that the three staggered pedestrian crossings are re-oriented to ensure pedestrians face the approaching traffic when arriving at the crossing.

Photo 3 - Manston Road view east.

4.2 **PROBLEM**

Location: Proposed junction.

Summary: Lack of cycle facilities.

4.2.1 No advance cycle storage facilities are proposed. There is a risk of cyclists being 'squeezed' by passing traffic, and particularly by left-turning HGVs leading to collisions.

RECOMMENDATION

4.2.2 It is recommended that advance cycle storage facilities are provided in advance of any vehicle stop lines.

Photo 4 - Manston Road view west.

SECTION 5: ROAD MARKINGS AND SIGNAGE

5.1 No signing details have been provided. A suitable package of signage information will need to be provided as part of any further detailed design.

SECTION 6: STREET LIGHTING

6.1 PROBLEM

Location: Proposed junction.

Summary: Lack of illumination.

6.1.1 No street lighting information is provided. There is a risk that insufficient illumination of the junction, will lead to potential collisions between vehicles.

RECOMMENDATION

6.1.2 It is recommended that appropriate street lighting is provided.

Photo 5 - Manston Road view west.

SECTION 7: DRAINAGE

7.1 No drainage information is provided. A suitable package of drainage information will need to form part of any further detailed design.

SECTION 8: AUDIT STATEMENT

8.1 This audit has been undertaken in accordance with DMRB Standard GG119.

Road Safety Audit Team Leader

A. R. J. Setter BA (Hons) MSc CMILT MCIHT AMICE MSoRSA CoC

Director - Badingham Limited

16 Ashley Piece, Ramsbury, Marlborough, Wiltshire, SN8 2QE

Signed: [redacted] Date: 28th March 2019

Audit Team Member

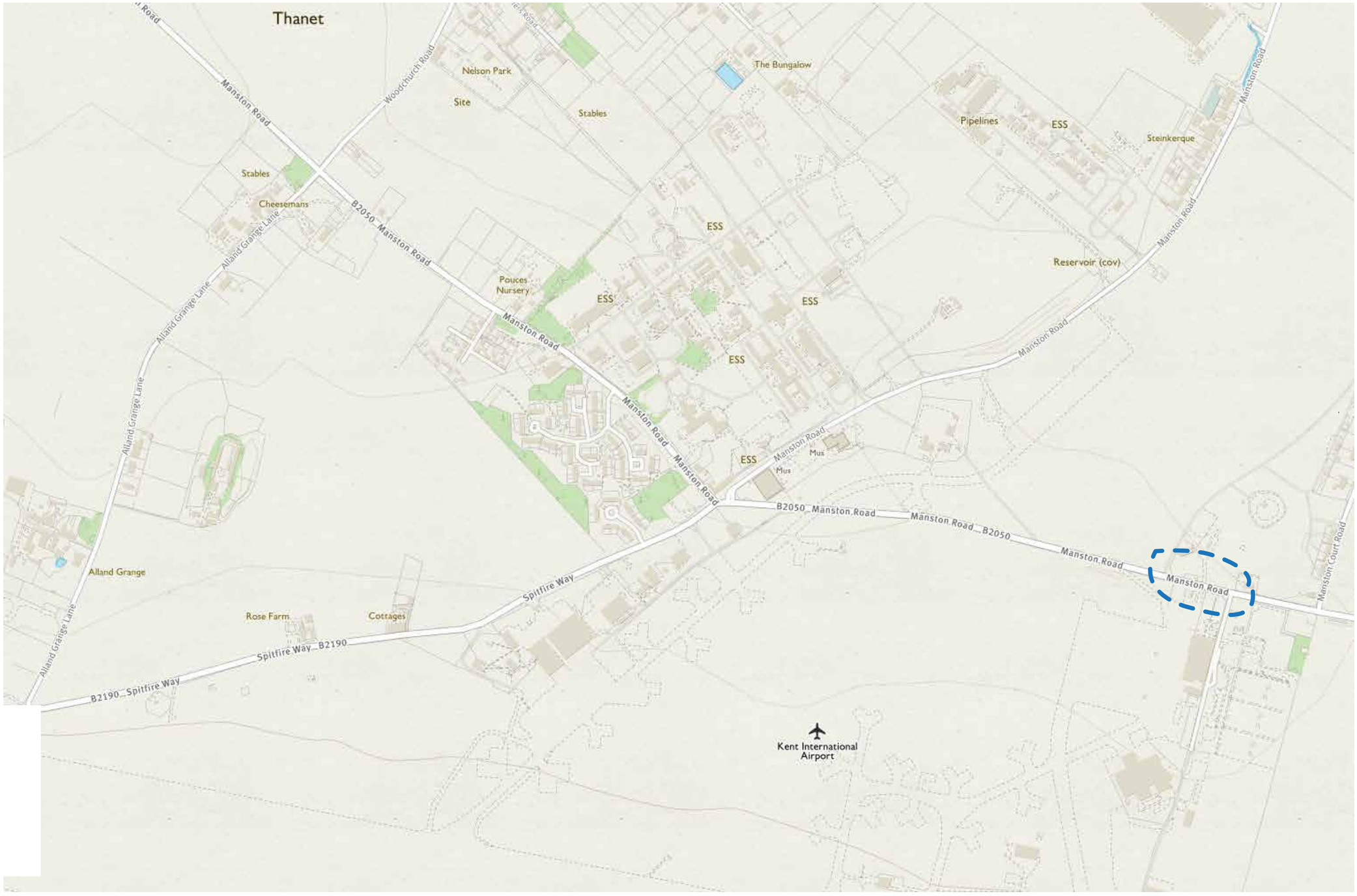
D. F. Rogers JP CEng BEng (Hons) MICE MSoRSA FIHE

Director - Ashburn Partnership

5 Mayfield, Upper Wanborough, Swindon, SN4 0ED

Signed: [redacted] Date: 28th March 2019

FIGURES



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North

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Client
RSP

Project
Manston Airport

Title
Location Plan

Date	Status
28/03/2019	FINAL

Scale	Original Size
NTS	A3

Drawn	Checked
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 1	-

North

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Rev.	Date	Initials	Amendments

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Transport Planning
&
Highway Engineering
Concept | Consult | Construct
www.badinghamuk.com

Client
RSP

Project
Manston Airport

Title
Aerial Photo

Date	Status
28/03/2019	FINAL

Scale	Original Size
NTS	A3

Drawn	Checked
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 2	-

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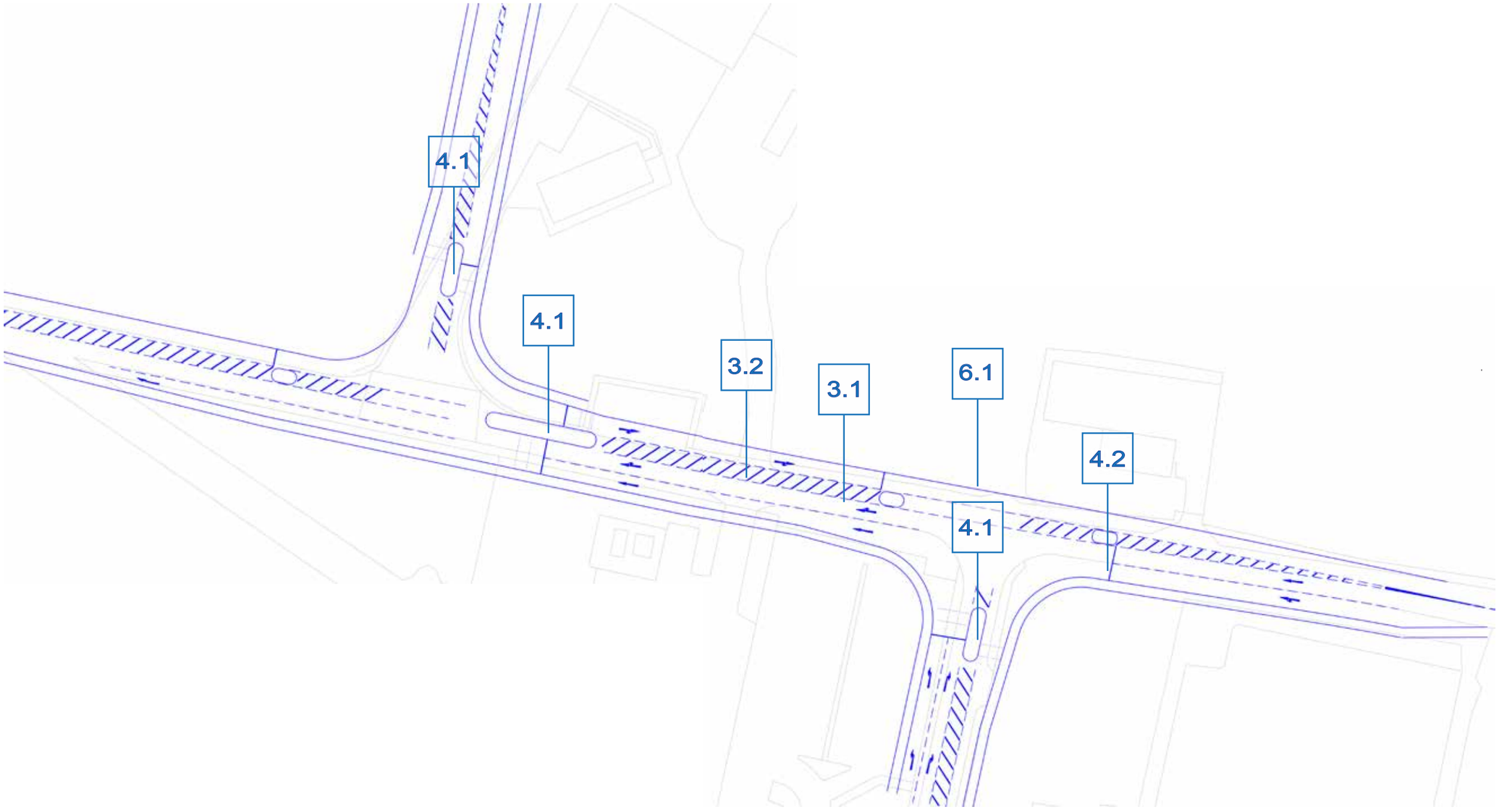

North

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Notes:

1. Do not scale from this drawing.
2. All dimensions must be checked on site.

Source: NGA S & PT

Rev.	Date	Initials	Amendments

Badingham
Transport Planning
&
Highway Engineering
Concept | Consult | Construct
www.badinghamuk.com

Client: RSP

Project: Manston Airport

Title: Audit Plan

Date	Status
28/03/2019	FINAL

Scale	Original Size
NTS	A3

Drawn	Checked
AS	AS

Job No.	Drawing No.	Rev.
0781	FIGURE 3	-

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APPENDIX 1

Road Safety Audit Brief

ROAD SAFETY AUDIT BRIEF

Project Summary	
Date:	22/03/19
Document Reference:	N/A
Prepared by:	Wood
On Behalf of:	RiverOak Strategic Partners
AUTHORISATION SHEET	
Project:	Manston Airport – Passenger Terminal and NGA South Access
Report title:	Manston Airport – Passenger Terminal and NGA South Access
PREPARED BY:	
Name:	Glyn Price
Signed:	[redacted]
Organisation:	Wood
Date:	22/03/2019
I APPROVE THE RSA BRIEF AND INSTRUCT THE RSA TO TAKE PLACE ON BEHALF OF THE OVERSEEING ORGANISATION:	
Name:	Glyn Price
Signed:	[redacted]
Organisation:	RiverOak Strategic Partners
Date:	22/03/19

General Details

Highway Scheme Name & Road Number	Manston Airport – Nothern Grass Area Western Access – Manston Road			
Type of Scheme *e.g. new road scheme, smart motorway, junction improvement, traffic signs and road markings improvement, traffic calming, etc.*				
New Priority junction with ghost right turn lane with Manston Road.				
RSA Stage *Tick as appropriate ✓*	1 √	2	3	4
	Interim			
Overseeing Organisation Details	**Design Organisation Details**			
16 Charles II Street London SW1Y 4NW	Wood Glyn Price Associate Director Canon Court, Abbey Lawn, Abbey Forgate, Shrewsbury, SY2 5DE, UK			
Police Contact Details (RSA3 Only)	**Maintaining Agent Contact Details**			
N/A	N/A			
RSA Team Membership				
A.R.J. Setter (Team Leader)	BA (Hons) MSc CMILT MCIHT AMICE MSoRSA Highways England Certificate of Competence & Compliant with EU Directive 2008/96/EC Badingham Limited			
D. F. Rogers (Team Member)	JP, CEng BEng (Hons) MICE MSoRSA FIHE Ashburn Consultants			
Terms of Reference *Make reference to relevant DMRB documents and other guidance where appropriate.*				
DMRB – TD86/03 – LAYOUT OF LARGE SIGNAL CONTROLLED JUNCTIONS DMRB – TD40/04 - The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts Traffic Signs Regulations and General Directions (TSRGD)				

Scheme Details

Scheme Description/Objective

General
Define the extents of the RSA, include a brief scheme description, the scheme objectives, a start date for construction if known and a completion date. In addition, for stage 4 RSAs, confirm when all related traffic management has been removed.

The proposals are for a new linked signal junction with arms north and south in close vicinity to the B2050 Manston Road. To the north will be an arm into the Northern Grass Area and to the south the Manston Airport Terminal. The arm to the north will be a new road while the arm to the south will be at the location of the existing priority junction into Manston Airport.

The extents of the area requiring RSA assessment is the extents the new junction. It should be noted that the B2050 Manston Road is proposed to be upgraded in the future year to a 7.3m wide carriageway in the vicinity of the proposed junction. This widening scheme to the west of the junction is not part of the RSA study area.

The objectives of the scheme are to provide a new access to the proposed Northern Grass Area Business Park and the airport passenger terminal.

Construction would be proposed in Year one of the project life cycle which will be 2019 or 2020 depending on the approvals process of a DCO that is going through examination. Complete should take between 3-6 months.

Design Standards Applied to the Scheme Design
For example, DMRB.

DMRB has been applied to the design of the proposed junction -
DMRB – TD86/03 – LAYOUT OF LARGE SIGNAL CONTROLLED JUNCTIONS
DMRB – TD40/04 - The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts

Design Speeds
Provide details of applied and/or existing design speeds.

40MPH

Speed Limits
State whether mandatory or advisory, available speed data.

The existing speed limit on Manston Road (B2109) is 40mph and this is not proposed to change.

No ATC data was taken near this access so average speed data is not available

Existing Traffic Flows/Queues
To include current automatic traffic counter (ATC) data, up-to-date turning count and queue information etc.

A junction turning count was undertaken at the Spitfire Way and Manston Road junction. This indicated in 2017;

- AM Peak – Eastbound 475 – Westbound 544
- PM Peak – Easbound 412 – Westbound 519

No traffic was recorded into and out of the access to the airports it was closed at the time of the counts.

The junction turning count for Junction 12 (Spitfire Way/Manston Road will be provided which can inform the traffic using the Manston Road B2050 link east of the junction.

Forecast Traffic Flows
Where available and relevant, provide future traffic flow data including vehicle proportions.

Future Traffic flows at the access for the AM and PM Peak will be provided in a matrix format.

Pedestrian, Cyclist & Equestrian Desire Lines
Include details of pedestrian, cyclist and equestrian movements in the vicinity of the scheme and, when applicable the relevant walking, cycling and horse-riding assessment and review reports HD 42/17 [Ref 7.1].

The clear design pedestrian line across the junction is across the minor arm and pedestrian facilities have been designed to accommodate this movement with a central splitter island.
Environmental Constraints *Include all environmental constraints within the scheme extents, for example sites of special scientific interest (SSSI), conservation areas, listed properties etc.*
No environmental constrains have been observed.

Locality

Description of Locality
Include all environmental constraints within the scheme extents, e.g. (SSSI), conservation areas, listed properties etc.

The new junction on Manston Road B2050 is approximately 780m East of the junction of Manston Road and Spitfire Way.

General Description
Include road network, road type, relevant land uses etc.

The existing Manston Road carriageway is a two-lane carriageway. There are no footways either side of the carriageway and the road is subject to a 40mph speed limit. To the north of the carriageway is the disused element of the Manston Airport site which is proposed to become the Northern Grass area Business Park. To the south the former Manston airport.

As mentioned as part of wider KCC proposals for the airport the road is proposed to be widened and upgraded to a 7.3m wide carriageway when the junction is constructed and also footways will be provided along the south side of the carriageway to the Manston Road/Spitfire Way junction.

Relevant Factors Which May Affect Road Safety
Factors known to the Design Organisation and considered as part of the design. This should also include anything that would not be immediately obvious to the RSA Team – such as school crossing patrols and large events, for example.

Near the vicinity of the junction only one accident was recorded (269) which was slight in nature and was a result of a loss of control in wet and icy conditions. The details of this accident are recorded.

Analysis

Collision Data Analysis
Stages 1,2, and 3 provide a summary of road traffic collision data covering both the extent of the scheme and the adjoining sections of highway. As a minimum, the most recent 36 month of data. At Stage 4, provide 12 months of post-opening validated road traffic collision data. Raw data should be provided as an appendix.

Data for the Manston Road link will be provided with this brief.

Departures from Standards
Include status details, i.e. approved/pending/rejected, and any design strategy records produced for improvements to existing trunk roads and motorways.

N/A

Previous Road Safety Audit Stage Reports, Road Safety Audit Response Reports & Evidence of Agreed Actions
Attach previous reports to the RSA Brief, or provide an explanation where these are not available.

N/A

Strategic Decisions
Includes items outside the scope of this RSA, which will not change irrespective of the RSA, for example route choice, junction type, approved departures from standard.

N/A

List of Included Documents and Drawings
For example: previous RSA reports; Design Responses; Departures; Road Traffic Collision Data; Walking, Cycling and Horse-Riding Assessment and Reviews. This could include any relevant operational data such as damage-only collision data or incident logs.
This list could be included as an attachment to the RSA Brief or a hyperlink to a shared electronic location where the RSA Brief information has been collated.

Documents

Reference/Revision	Title	Date
RSA – NGA S and PT – future Year Traffic Flows (2039)	-	25.03.2019
RSA – NGA S and PT – Accident 269		25.03.2019
RSA – NGA S and PT – Signal Staging		25.03.2019
RSA – NGA S and PT – Linsig Output		25.03.2019

Drawings

Reference/Revision	Title	Date
RSA – NGA S and PT – Access design (1 of 2)		25.03.2019
RSA – NGA S and PT – Access design (2 of 2)		25.03.2019
RSA – NGA S and PT – Cad file		25.03.2019

Checklist			
Tick all that are included and provide reasons for those that are not included.	✓		
Site Location plan		Scale Layout Plans	
Departures and Relaxations from Standards		Construction/Typical Details	
Previous RSA Reports		Previous RSA Response Reports & Evidence of Agreed Actions	
Collision Data and Collision Data Analysis		Road Traffic Collision Plot	
Traffic Signal Staging		Traffic Counts	
Speed Surveys		Pedestrian, Cyclist, Horse-Riding Desire Lines & Volumes	
Walking, Cycling and Horse-Riding Assessment & Reviews		Items Outside the Scope of the RSA/Strategic Decisions	
Other Factors that may Impact Upon Road Safety		Design Speeds/Speed Limits	
Design Standards Used		Adjacent Land Uses	

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Appendix K
Mitigation Scheme Model Outputs

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 2_A256_A299_val_mit_v1_R3 2019.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 2_A299_A256\Strategic Model Scenario\mitigation
Report generation date: 22/03/2019 11:46:19

»2039 + Dev(Link+Sigs), AM
»2039 + Dev(Link+Sigs), PM
»Lane simulation-mit - 2039 + Dev(Link+Sigs), AM
»Lane simulation-mit - 2039 + Dev(Link+Sigs), PM

Summary of junction performance

	AM					PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Network Residual Capacity	Queue (Veh)	Delay (min)	RFC	LOS	Network Residual Capacity
	2039 + Dev(Link+Sigs)									
1 - A299 Hengist Way E	5.3	0.16	0.85	A	-11 %	1.3	0.05	0.57	A	-9 %
2 - A256	3.6	0.14	0.78	A		11.0	0.35	0.93	C	
3 - Cottington Link Road	11.6	4.92	1.14	F	[3 - Cottington Link Road]	1.4	4.46	0.74	F	[3 - Cottington Link Road]
4 - A299 Hengist Way N	1.8	0.16	0.65	A		0.8	0.11	0.43	A	
	Lane simulation-mit [Lane Simulation] - 2039 + Dev(Link+Sigs)									
1 - A299 Hengist Way E	14.5	0.40		C	%	2.6	0.11		A	%
2 - A256	8.7	0.31		C		62.6	1.60		F	
3 - Cottington Link Road	22.5	9.31		F	[ ]	1.2	3.50		F	[ ]
4 - A299 Hengist Way N	2.4	0.22		B		1.2	0.16		A	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

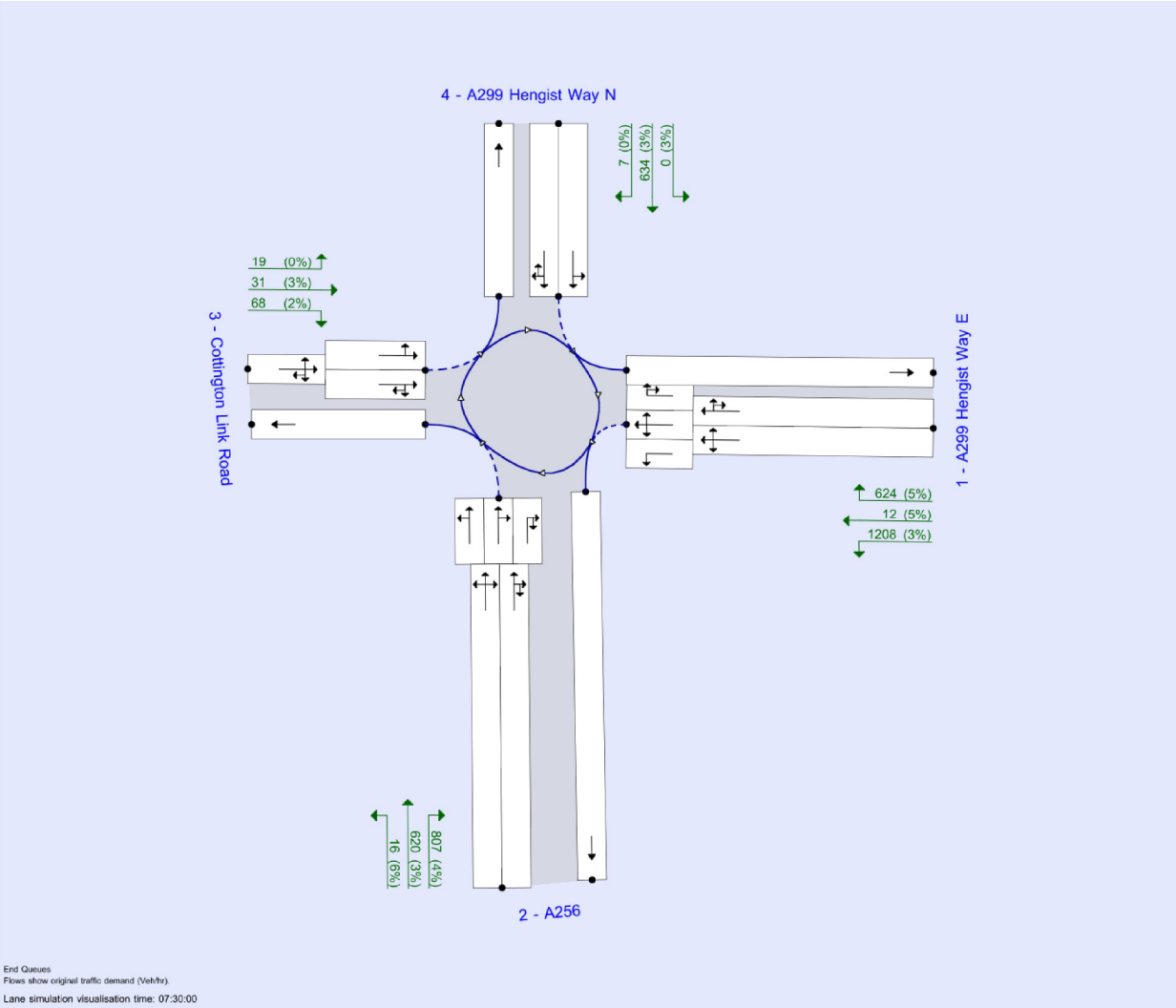
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	5	3	1	60	✓			0	0	0.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2039 + Dev(Link+Sigs)	AM	ONE HOUR	07:30	09:00	15	✓
D10	2039 + Dev(Link+Sigs)	PM	ONE HOUR	16:30	18:00	15	✓

2039 + Dev(Link+Sigs), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - A299 Hengist Way E - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - Cottington Link Road - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.29	C

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-11	3 - Cottington Link Road

Arms

Arms

Arm	Name	Description
1	A299 Hengist Way E	
2	A256	
3	Cottington Link Road	
4	A299 Hengist Way N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 Hengist Way E	7.29	10.35	40.8	25.7	60.0	14.5	
2 - A256	7.66	10.35	16.0	23.7	60.0	56.0	
3 - Cottington Link Road	2.80	4.40	32.2	16.0	60.0	21.0	
4 - A299 Hengist Way N	7.37	10.01	4.5	23.2	60.0	22.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	0.825	3148
2 - A256	0.694	2615
3 - Cottington Link Road	0.491	1291
4 - A299 Hengist Way N	0.722	2599

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
3 - Cottington Link Road	Percentage		85.00
4 - A299 Hengist Way N	Percentage		60.00

Traffic Demand

Demand Set Details

		Time Period	Traffic profile	Start time	Finish time	Time segment length	Run

ID	Scenario name	name	type	(HH:mm)	(HH:mm)	(min)	automatically
D9	2039 + Dev(Link+Sigs)	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 Hengist Way E		ONE HOUR	✓	1844	100.000
2 - A256		ONE HOUR	✓	1443	100.000
3 - Cottington Link Road		ONE HOUR	✓	118	100.000
4 - A299 Hengist Way N		ONE HOUR	✓	641	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	1208	12	624
	2 - A256	807	0	16	620
	3 - Cottington Link Road	31	68	0	19
	4 - A299 Hengist Way N	0	634	7	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	3	5	5
	2 - A256	4	0	6	3
	3 - Cottington Link Road	3	2	0	0
	4 - A299 Hengist Way N	3	3	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 Hengist Way E	0.85	0.16	5.3	A	1692	2538
2 - A256	0.78	0.14	3.6	A	1324	1986
3 - Cottington Link Road	1.14	4.92	11.6	F	108	162
4 - A299 Hengist Way N	0.65	0.16	1.8	A	588	882

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1388	347	531	2592	0.536	1384	628	0.0	1.1	0.049	A
2 - A256	1086	272	482	2184	0.497	1082	1432	0.0	1.0	0.054	A
3 - Cottington Link Road	89	22	1539	421	0.211	88	26	0.0	0.3	0.179	B
4 - A299 Hengist Way N	483	121	679	1213	0.398	480	947	0.0	0.7	0.082	A

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1658	414	635	2506	0.661	1655	752	1.1	1.9	0.070	A
2 - A256	1297	324	577	2118	0.613	1295	1713	1.0	1.6	0.073	A
3 - Cottington Link Road	106	27	1840	292	0.363	105	31	0.3	0.6	0.318	C
4 - A299 Hengist Way N	576	144	812	1155	0.499	575	1133	0.7	1.0	0.103	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	2030	508	763	2401	0.845	2017	912	1.9	5.1	0.151	A
2 - A256	1589	397	703	2029	0.783	1581	2077	1.6	3.5	0.132	A
3 - Cottington Link Road	130	32	2246	119	1.091	105	38	0.6	6.7	2.825	F
4 - A299 Hengist Way N	706	176	973	1085	0.650	702	1379	1.0	1.8	0.155	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	2030	508	769	2396	0.847	2029	917	5.1	5.3	0.163	A
2 - A256	1589	397	708	2026	0.784	1588	2091	3.5	3.6	0.137	A
3 - Cottington Link Road	130	32	2258	114	1.137	110	39	6.7	11.6	4.924	F
4 - A299 Hengist Way N	706	176	981	1082	0.653	706	1387	1.8	1.8	0.159	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1658	414	666	2481	0.668	1671	769	5.3	2.0	0.075	A
2 - A256	1297	324	583	2114	0.614	1305	1754	3.6	1.6	0.075	A
3 - Cottington Link Road	106	27	1856	286	0.371	150	32	11.6	0.6	0.593	E
4 - A299 Hengist Way N	576	144	856	1136	0.507	579	1150	1.8	1.0	0.108	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1388	347	536	2587	0.537	1392	633	2.0	1.2	0.050	A
2 - A256	1086	272	485	2182	0.498	1089	1443	1.6	1.0	0.055	A
3 - Cottington Link Road	89	22	1548	417	0.213	90	26	0.6	0.3	0.184	B
4 - A299 Hengist Way N	483	121	685	1211	0.399	484	953	1.0	0.7	0.083	A

2039 + Dev(Link+Sigs), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - A299 Hengist Way E - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - Cottington Link Road - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.23	B

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-9	3 - Cottington Link Road

Arms

Arms

Arm	Name	Description
1	A299 Hengist Way E	
2	A256	
3	Cottington Link Road	
4	A299 Hengist Way N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 Hengist Way E	7.29	10.35	40.8	25.7	60.0	14.5	
2 - A256	7.66	10.35	16.0	23.7	60.0	56.0	
3 - Cottington Link Road	2.80	4.40	32.2	16.0	60.0	21.0	
4 - A299 Hengist Way N	7.37	10.01	4.5	23.2	60.0	22.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	0.825	3148
2 - A256	0.694	2615
3 - Cottington Link Road	0.491	1291
4 - A299 Hengist Way N	0.722	2599

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
3 - Cottington Link Road	Percentage		85.00
4 - A299 Hengist Way N	Percentage		60.00

Traffic Demand

Demand Set Details

		Time Period	Traffic profile	Start time	Finish time	Time segment length	Run

ID	Scenario name	name	type	(HH:mm)	(HH:mm)	(min)	automatically
D10	2039 + Dev(Link+Sigs)	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 Hengist Way E		ONE HOUR	✓	1423	100.000
2 - A256		ONE HOUR	✓	1840	100.000
3 - Cottington Link Road		ONE HOUR	✓	18	100.000
4 - A299 Hengist Way N		ONE HOUR	✓	372	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	932	12	479
	2 - A256	1162	0	31	647
	3 - Cottington Link Road	5	8	0	5
	4 - A299 Hengist Way N	0	363	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - A299 Hengist Way E	2 - A256	3 - Cottington Link Road	4 - A299 Hengist Way N
From	1 - A299 Hengist Way E	0	1	2	2
	2 - A256	2	0	0	2
	3 - Cottington Link Road	3	0	0	0
	4 - A299 Hengist Way N	2	5	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 Hengist Way E	0.57	0.05	1.3	A	1306	1959
2 - A256	0.93	0.35	11.0	C	1688	2533
3 - Cottington Link Road	0.74	4.46	1.4	F	17	25
4 - A299 Hengist Way N	0.43	0.11	0.8	A	341	512

Main Results for each time segment

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1071	268	285	2865	0.374	1069	875	0.0	0.6	0.033	A
2 - A256	1385	346	376	2307	0.600	1379	978	0.0	1.5	0.064	A
3 - Cottington Link Road	14	3	1716	364	0.037	13	39	0.0	0.0	0.171	B
4 - A299 Hengist Way N	280	70	881	1122	0.250	279	849	0.0	0.3	0.071	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1279	320	341	2817	0.454	1278	1046	0.6	0.8	0.039	A
2 - A256	1654	414	449	2256	0.733	1649	1170	1.5	2.7	0.098	A
3 - Cottington Link Road	16	4	2052	222	0.073	16	47	0.0	0.1	0.291	C
4 - A299 Hengist Way N	334	84	1053	1049	0.319	334	1015	0.3	0.5	0.084	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1567	392	416	2753	0.569	1565	1266	0.8	1.3	0.050	A
2 - A256	2026	506	550	2186	0.927	1997	1431	2.7	10.0	0.282	C
3 - Cottington Link Road	20	5	2490	37	0.529	17	57	0.1	0.8	2.674	F
4 - A299 Hengist Way N	410	102	1273	956	0.428	408	1234	0.5	0.7	0.109	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1567	392	417	2752	0.569	1567	1282	1.3	1.3	0.051	A
2 - A256	2026	506	550	2185	0.927	2022	1433	10.0	11.0	0.347	C
3 - Cottington Link Road	20	5	2515	27	0.737	17	57	0.8	1.4	4.457	F
4 - A299 Hengist Way N	410	102	1289	949	0.431	410	1243	0.7	0.8	0.111	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1279	320	345	2813	0.455	1281	1071	1.3	0.8	0.039	A
2 - A256	1654	414	450	2255	0.733	1687	1176	11.0	2.8	0.111	A
3 - Cottington Link Road	16	4	2090	206	0.078	22	47	1.4	0.1	0.334	C
4 - A299 Hengist Way N	334	84	1081	1037	0.322	336	1030	0.8	0.5	0.086	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1071	268	287	2863	0.374	1072	882	0.8	0.6	0.034	A
2 - A256	1385	346	377	2306	0.601	1390	982	2.8	1.5	0.066	A
3 - Cottington Link Road	14	3	1728	359	0.038	14	39	0.1	0.0	0.174	B
4 - A299 Hengist Way N	280	70	888	1118	0.250	281	854	0.5	0.3	0.072	A

Lane simulation-mit - 2039 + Dev(Link+Sigs), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation-mit [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A299 Hengist Way E - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - Cottington Link Road - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane simulation-mit	✓	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.60	E

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A299 Hengist Way E	
2	A256	
3	Cottington Link Road	
4	A299 Hengist Way N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 Hengist Way E	7.29	10.35	40.8	25.7	60.0	14.5	
2 - A256	7.66	10.35	16.0	23.7	60.0	56.0	
3 - Cottington Link Road	2.80	4.40	32.2	16.0	60.0	21.0	
4 - A299 Hengist Way N	7.37	10.01	4.5	23.2	60.0	22.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	0.825	3148
2 - A256	0.694	2615
3 - Cottington Link Road	0.491	1291
4 - A299 Hengist Way N	0.722	2599

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
3 - Cottington Link Road	Percentage		85.00
4 - A299 Hengist Way N	Percentage		60.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A299 Hengist Way E	Evenly split	10.00

2 - A256	Evenly split	10.00
3 - Cottington Link Road	Evenly split	10.00
4 - A299 Hengist Way N	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A299 Hengist Way E	**Entry**	**1**	**1**	2	✓	2.00		0	99999	
			2	2, 3, 4	✓	2.00		0	99999	
			3	1, 4	✓	2.00		0	99999	
		2	**1**	(2, 3, 4)		Infinity				
			2	(1, 3, 4)		Infinity				
	Exit	**1**	**1**			Infinity				
2 - A256	**Entry**	**1**	**1**	3, 4	✓	2.00		0	99999	
			3	1, 4	✓	2.00		0	99999	
			4	1, 2	✓	2.00		0	99999	
		2	**1**	(1, 3, 4)		Infinity				
			2	(1, 2, 4)		Infinity				
	Exit	**1**	**1**			Infinity				
3 - Cottington Link Road	**Entry**	**1**	**1**	1, 4	✓	3.00		0	99999	
			2	1, 2, 3	✓	3.00		0	99999	
		2	**1**	(1, 2, 3, 4)		Infinity				
	Exit	**1**	**1**			Infinity				
4 - A299 Hengist Way N	**Entry**	**1**	**2**	1, 2		Infinity		0	99999	
			3	2, 3, 4		Infinity		0	99999	
	Exit	**1**	**1**			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	**Entry**	**1**	**1**	0.275	1049
			2	0.275	1049
			3	0.275	1049
2 - A256	**Entry**	**1**	**1**	0.231	872
			3	0.231	872
			4	0.231	872
3 - Cottington Link Road	**Entry**	**1**	**1**	0.246	645
			2	0.246	645
4 - A299 Hengist Way N	**Entry**	**1**	**2**	0.361	1300
			3	0.361	1300

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm			
			A299 Hengist Way E	A256	Cottington Link Road	A299 Hengist Way N
1 - A299 Hengist Way E	**1**	**1**		✓		
		2		✓	✓	✓
		3	✓			✓
	2	**1**		✓	✓	✓
		2	✓		✓	✓
2 - A256	**1**	**1**			✓	✓
		3	✓			✓
		4	✓	✓		
	2	**1**	✓		✓	✓
		2	✓	✓		✓
3 - Cottington Link Road	**1**	**1**	✓			✓
		2	✓	✓	✓	
	2	**1**	✓	✓	✓	✓
4 - A299 Hengist Way N	**1**	**2**	✓	✓		
		3		✓	✓	✓

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically

D9	2039 + Dev(Link+Sigs)	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 Hengist Way E		ONE HOUR	✓	1844	100.000
2 - A256		ONE HOUR	✓	1443	100.000
3 - Cottington Link Road		ONE HOUR	✓	118	100.000
4 - A299 Hengist Way N		ONE HOUR	✓	641	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A299 Hengist Way E	**2 - A256**	**3 - Cottington Link Road**	**4 - A299 Hengist Way N**
From	**1 - A299 Hengist Way E**	0	1208	12	624
	2 - A256	807	0	16	620
	3 - Cottington Link Road	31	68	0	19
	4 - A299 Hengist Way N	0	634	7	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - A299 Hengist Way E	**2 - A256**	**3 - Cottington Link Road**	**4 - A299 Hengist Way N**
From	**1 - A299 Hengist Way E**	0	3	5	5
	2 - A256	4	0	6	3
	3 - Cottington Link Road	3	2	0	0
	4 - A299 Hengist Way N	3	3	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 Hengist Way E	0.40	14.5	C	1686	2529
2 - A256	0.31	8.7	C	1322	1983
3 - Cottington Link Road	9.31	22.5	F	108	163
4 - A299 Hengist Way N	0.22	2.4	B	590	885

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1379	345	529	1384	1433	638	0.0	2.3	0.107	A
2 - A256	1084	271	485	1083	1117	1428	0.0	2.2	0.118	A
3 - Cottington Link Road	86	22	1543	87	91	25	0.0	0.6	0.363	C
4 - A299 Hengist Way N	481	120	688	479	493	942	0.0	1.1	0.123	A

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1661	415	640	1662	1729	751	2.3	4.1	0.147	A
2 - A256	1300	325	570	1297	1338	1733	2.2	3.4	0.149	A
3 - Cottington Link Road	104	26	1834	106	106	33	0.6	1.3	0.646	E
4 - A299 Hengist Way N	582	145	811	580	596	1129	1.1	1.6	0.145	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	2027	507	758	2019	2073	908	4.1	13.0	0.347	C
2 - A256	1594	399	700	1588	1630	2077	3.4	8.6	0.286	C
3 - Cottington Link Road	130	33	2249	89	91	39	1.3	11.2	5.051	F
4 - A299 Hengist Way N	706	176	957	709	729	1381	1.6	2.2	0.199	B

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	2016	504	757	2008	2104	903	13.0	14.4	0.405	C
2 - A256	1575	394	698	1573	1644	2067	8.6	7.9	0.310	C
3 - Cottington Link Road	132	33	2235	89	89	37	11.2	22.5	9.308	F
4 - A299 Hengist Way N	705	176	956	704	731	1368	2.2	2.4	0.217	B

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1659	415	682	1653	1763	766	14.4	4.7	0.192	B
2 - A256	1292	323	576	1291	1365	1759	7.9	2.9	0.155	A
3 - Cottington Link Road	106	26	1837	166	170	30	22.5	7.0	4.680	F
4 - A299 Hengist Way N	579	145	866	582	604	1137	2.4	1.3	0.158	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1372	343	542	1372	1457	632	4.7	2.5	0.113	A
2 - A256	1088	272	486	1093	1133	1428	2.9	1.8	0.117	A
3 - Cottington Link Road	91	23	1553	96	117	27	7.0	0.8	0.866	F
4 - A299 Hengist Way N	486	121	689	486	508	960	1.3	0.9	0.132	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

07:30 - 07:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	500	871	0.574	502	513	0.0	0.7	0.096	A
			2	2, 3, 4	566	864	0.654	567	590	0.0	0.9	0.097	A
			3	1, 4	315	853	0.368	315	329	0.0	0.4	0.085	A
		2	1	(2, 3, 4)	1113			1113	1162	0.0	0.3	0.015	A
			2	(1, 3, 4)	267			266	279	0.0	0.0	0.007	A
	Exit	1	1		638			638	653	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	297	731	0.406	296	303	0.0	0.6	0.106	A
			3	1, 4	438	726	0.603	438	453	0.0	0.8	0.111	A
			4	1, 2	349	727	0.480	349	361	0.0	0.6	0.108	A
		2	1	(1, 3, 4)	552			551	573	0.0	0.1	0.009	A
			2	(1, 2, 4)	533			532	552	0.0	0.1	0.009	A
	Exit	1	1		1428			1428	1471	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	27	211	0.128	27	29	0.0	0.2	0.323	C
			2	1, 2, 3	60	209	0.285	60	63	0.0	0.4	0.376	C
		2	1	(1, 2, 3, 4)	86			87	94	0.0	0.0	0.004	A
	Exit	1	1		25			25	27	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	237	605	0.392	235	244	0.0	0.6	0.123	A
			3	2, 3, 4	244	608	0.402	243	249	0.0	0.5	0.124	A
	Exit	1	1		942			942	983	0.0	0.0	0.000	A

07:45 - 08:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	608	839	0.725	609	624	0.7	1.1	0.111	A
			2	2, 3, 4	661	837	0.791	662	689	0.9	1.2	0.112	A
			3	1, 4	392	821	0.478	391	416	0.4	0.7	0.098	A
		2	1	(2, 3, 4)	1306			1308	1357	0.3	1.0	0.044	A
			2	(1, 3, 4)	355			354	376	0.0	0.1	0.019	A

	Exit	1	1		751			751	780	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	370	710	0.522	371	379	0.6	0.6	0.115	A
			3	1, 4	509	705	0.721	507	524	0.8	1.1	0.126	A
			4	1, 2	420	704	0.596	418	436	0.6	0.9	0.121	A
		2	1	(1, 3, 4)	646			644	671	0.1	0.4	0.028	A
			2	(1, 2, 4)	654			654	670	0.1	0.3	0.028	A
	Exit	1	1		1733			1733	1778	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	34	145	0.234	35	35	0.2	0.3	0.503	D
			2	1, 2, 3	69	147	0.473	71	71	0.4	0.8	0.632	E
		2	1	(1, 2, 3, 4)	104			103	108	0.0	0.2	0.053	A
	Exit	1	1		33			33	33	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	291	580	0.501	290	297	0.6	0.8	0.144	A
			3	2, 3, 4	291	574	0.507	290	299	0.5	0.8	0.146	A
	Exit	1	1		1129			1129	1177	0.0	0.0	0.000	A

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	737	807	0.913	737	746	1.1	1.6	0.133	A
			2	2, 3, 4	758	805	0.941	756	780	1.2	1.8	0.134	A
			3	1, 4	528	792	0.666	526	547	0.7	1.1	0.116	A
		2	1	(2, 3, 4)	1430			1426	1476	1.0	7.8	0.279	C
			2	(1, 3, 4)	597			595	604	0.1	0.7	0.061	A
	Exit	1	1		908			908	935	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	468	679	0.689	468	476	0.6	1.1	0.135	A
			3	1, 4	599	679	0.882	598	610	1.1	1.6	0.151	A
			4	1, 2	523	671	0.779	522	544	0.9	1.3	0.141	A
		2	1	(1, 3, 4)	794			793	814	0.4	2.3	0.144	A
			2	(1, 2, 4)	800			798	820	0.3	2.3	0.141	A
	Exit	1	1		2077			2077	2117	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	34	59	0.570	34	33	0.3	1.2	1.878	F
			2	1, 2, 3	57	59	0.964	56	58	0.8	2.6	2.280	F
		2	1	(1, 2, 3, 4)	130			91	101	0.2	7.5	2.771	F
	Exit	1	1		39			39	40	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	349	546	0.639	352	365	0.8	1.1	0.197	B
			3	2, 3, 4	357	547	0.651	356	364	0.8	1.1	0.201	B
	Exit	1	1		1381			1381	1430	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	735	808	0.910	735	753	1.6	1.6	0.135	A
			2	2, 3, 4	754	802	0.941	754	793	1.8	1.8	0.135	A
			3	1, 4	520	789	0.659	519	558	1.1	1.1	0.115	A
		2	1	(2, 3, 4)	1426			1420	1478	7.8	9.3	0.365	C
			2	(1, 3, 4)	590			589	626	0.7	0.6	0.059	A
	Exit	1	1		903			903	947	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	465	680	0.684	464	483	1.1	1.1	0.135	A
			3	1, 4	594	675	0.880	594	617	1.6	1.6	0.153	A
			4	1, 2	515	674	0.764	515	544	1.3	1.3	0.146	A
		2	1	(1, 3, 4)	787			787	823	2.3	2.0	0.166	A
			2	(1, 2, 4)	788			787	820	2.3	1.9	0.164	A
	Exit	1	1		2067			2067	2140	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	33	63	0.530	31	33	1.2	1.3	2.064	F
			2	1, 2, 3	58	62	0.927	58	56	2.6	2.8	2.752	F
		2	1	(1, 2, 3, 4)	132			91	90	7.5	18.4	7.564	F
	Exit	1	1		37			37	40	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	349	546	0.638	350	362	1.1	1.1	0.218	B
			3	2, 3, 4	356	549	0.649	354	369	1.1	1.2	0.215	B
	Exit	1	1		1368			1368	1441	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	603	826	0.730	602	638	1.6	1.2	0.116	A
			2	2, 3, 4	655	825	0.795	654	694	1.8	1.3	0.118	A
			3	1, 4	397	813	0.487	396	430	1.1	0.7	0.101	A
		2	1	(2, 3, 4)	1294			1291	1354	9.3	1.3	0.096	A
			2	(1, 3, 4)	365			364	403	0.6	0.2	0.025	A
	Exit	1	1		766			766	811	0.0	0.0	0.000	A

2 - A256	Entry	1	1	3, 4	364	711	0.512	363	384	1.1	0.7	0.115	A
			3	1, 4	504	703	0.716	505	537	1.6	0.9	0.126	A
			4	1, 2	422	704	0.600	424	444	1.3	0.7	0.123	A
		2	1	(1, 3, 4)	649			648	685	2.0	0.3	0.034	A
			2	(1, 2, 4)	643			642	673	1.9	0.3	0.034	A
	Exit	1	1		1759			1759	1855	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	56	147	0.385	57	60	1.3	0.7	0.855	F
			2	1, 2, 3	102	147	0.696	110	110	2.8	1.5	1.212	F
		2	1	(1, 2, 3, 4)	106			159	162	18.4	4.8	3.748	F
	Exit	1	1		30			30	33	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	286	565	0.506	287	301	1.1	0.7	0.157	A
			3	2, 3, 4	293	567	0.517	295	303	1.2	0.6	0.159	A
	Exit	1	1		1137			1137	1203	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	491	863	0.569	491	525	1.2	0.8	0.099	A
			2	2, 3, 4	567	862	0.657	567	595	1.3	1.0	0.102	A
			3	1, 4	315	852	0.370	314	337	0.7	0.5	0.090	A
		2	1	(2, 3, 4)	1108			1109	1167	1.3	0.2	0.017	A
			2	(1, 3, 4)	265			264	286	0.2	0.0	0.009	A
	Exit	1	1		632			632	664	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	303	729	0.415	304	310	0.7	0.4	0.104	A
			3	1, 4	443	727	0.609	444	461	0.9	0.8	0.109	A
			4	1, 2	344	722	0.477	345	363	0.7	0.5	0.108	A
		2	1	(1, 3, 4)	547			548	570	0.3	0.1	0.010	A
			2	(1, 2, 4)	541			542	560	0.3	0.0	0.010	A
	Exit	1	1		1428			1428	1520	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	31	208	0.149	30	38	0.7	0.2	0.437	D
			2	1, 2, 3	66	207	0.318	66	79	1.5	0.4	0.572	D
		2	1	(1, 2, 3, 4)	91			96	111	4.8	0.1	0.403	C
	Exit	1	1		27			27	27	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	238	604	0.394	238	252	0.7	0.5	0.134	A
			3	2, 3, 4	247	607	0.408	248	256	0.6	0.5	0.130	A
	Exit	1	1		960			960	1004	0.0	0.0	0.000	A

Lane simulation-mit - 2039 + Dev(Link+Sigs), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A2 - Lane simulation-mit [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Geometry	1 - A299 Hengist Way E - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.
Warning	Geometry	3 - Cottington Link Road - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Use Lane Simulation	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	Lane simulation-mit	✓	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.88	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A299 Hengist Way E	
2	A256	
3	Cottington Link Road	
4	A299 Hengist Way N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 Hengist Way E	7.29	10.35	40.8	25.7	60.0	14.5	
2 - A256	7.66	10.35	16.0	23.7	60.0	56.0	
3 - Cottington Link Road	2.80	4.40	32.2	16.0	60.0	21.0	
4 - A299 Hengist Way N	7.37	10.01	4.5	23.2	60.0	22.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	0.825	3148
2 - A256	0.694	2615
3 - Cottington Link Road	0.491	1291
4 - A299 Hengist Way N	0.722	2599

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
3 - Cottington Link Road	Percentage		85.00
4 - A299 Hengist Way N	Percentage		60.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
1 - A299 Hengist Way E	Evenly split	10.00

2 - A256	Evenly split	10.00
3 - Cottington Link Road	Evenly split	10.00
4 - A299 Hengist Way N	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
1 - A299 Hengist Way E	**Entry**	**1**	**1**	2	✓	2.00		0	99999	
			2	2, 3, 4	✓	2.00		0	99999	
			3	1, 4	✓	2.00		0	99999	
		2	**1**	(2, 3, 4)		Infinity				
			2	(1, 3, 4)		Infinity				
	Exit	**1**	**1**			Infinity				
2 - A256	**Entry**	**1**	**1**	3, 4	✓	2.00		0	99999	
			3	1, 4	✓	2.00		0	99999	
			4	1, 2	✓	2.00		0	99999	
		2	**1**	(1, 3, 4)		Infinity				
			2	(1, 2, 4)		Infinity				
	Exit	**1**	**1**			Infinity				
3 - Cottington Link Road	**Entry**	**1**	**1**	1, 4	✓	3.00		0	99999	
			2	1, 2, 3	✓	3.00		0	99999	
		2	**1**	(1, 2, 3, 4)		Infinity				
	Exit	**1**	**1**			Infinity				
4 - A299 Hengist Way N	**Entry**	**1**	**2**	1, 2		Infinity		0	99999	
			3	2, 3, 4		Infinity		0	99999	
	Exit	**1**	**1**			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
1 - A299 Hengist Way E	**Entry**	**1**	**1**	0.275	1049
			2	0.275	1049
			3	0.275	1049
2 - A256	**Entry**	**1**	**1**	0.231	872
			3	0.231	872
			4	0.231	872
3 - Cottington Link Road	**Entry**	**1**	**1**	0.246	645
			2	0.246	645
4 - A299 Hengist Way N	**Entry**	**1**	**2**	0.361	1300
			3	0.361	1300

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm			
			A299 Hengist Way E	A256	Cottington Link Road	A299 Hengist Way N
1 - A299 Hengist Way E	**1**	**1**		✓		
		2		✓	✓	✓
		3	✓			✓
	2	**1**		✓	✓	✓
		2	✓		✓	✓
2 - A256	**1**	**1**			✓	✓
		3	✓			✓
		4	✓	✓		
	2	**1**	✓		✓	✓
		2	✓	✓		✓
3 - Cottington Link Road	**1**	**1**	✓			✓
		2	✓	✓	✓	
	2	**1**	✓	✓	✓	✓
4 - A299 Hengist Way N	**1**	**2**	✓	✓		
		3		✓	✓	✓

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically

D10	2039 + Dev(Link+Sigs)	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 Hengist Way E		ONE HOUR	✓	1423	100.000
2 - A256		ONE HOUR	✓	1840	100.000
3 - Cottington Link Road		ONE HOUR	✓	18	100.000
4 - A299 Hengist Way N		ONE HOUR	✓	372	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - A299 Hengist Way E	**2 - A256**	**3 - Cottington Link Road**	**4 - A299 Hengist Way N**
From	**1 - A299 Hengist Way E**	0	932	12	479
	2 - A256	1162	0	31	647
	3 - Cottington Link Road	5	8	0	5
	4 - A299 Hengist Way N	0	363	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - A299 Hengist Way E	**2 - A256**	**3 - Cottington Link Road**	**4 - A299 Hengist Way N**
From	**1 - A299 Hengist Way E**	0	1	2	2
	2 - A256	2	0	0	2
	3 - Cottington Link Road	3	0	0	0
	4 - A299 Hengist Way N	2	5	0	0

Results

Results Summary for whole modelled period

Arm	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 Hengist Way E	0.11	2.6	A	1309	1963
2 - A256	1.60	62.6	F	1691	2537
3 - Cottington Link Road	3.50	1.2	F	16	24
4 - A299 Hengist Way N	0.16	1.2	A	342	513

Main Results for each time segment

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1079	270	291	1077	1089	886	0.0	1.6	0.079	A
2 - A256	1390	348	371	1386	1405	996	0.0	3.4	0.139	A
3 - Cottington Link Road	13	3	1718	14	15	39	0.0	0.1	0.358	C
4 - A299 Hengist Way N	285	71	893	284	293	839	0.0	0.6	0.119	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1282	321	344	1278	1299	1048	1.6	2.0	0.087	A
2 - A256	1657	414	452	1658	1674	1170	3.4	6.3	0.214	B
3 - Cottington Link Road	15	4	2064	15	14	46	0.1	0.1	0.644	E
4 - A299 Hengist Way N	337	84	1054	338	349	1024	0.6	0.7	0.131	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1582	396	415	1587	1588	1212	2.0	2.5	0.105	A
2 - A256	2045	511	555	1922	1929	1449	6.3	40.0	0.805	E
3 - Cottington Link Road	21	5	2420	20	17	56	0.1	0.8	2.350	F
4 - A299 Hengist Way N	408	102	1220	408	420	1220	0.7	1.0	0.151	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1557	389	423	1561	1588	1233	2.5	2.6	0.110	A
2 - A256	2033	508	551	1939	1966	1433	40.0	62.6	1.602	F
3 - Cottington Link Road	19	5	2434	18	17	56	0.8	1.2	3.501	F
4 - A299 Hengist Way N	414	104	1242	415	431	1211	1.0	1.2	0.160	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1278	320	339	1280	1302	1108	2.6	1.6	0.088	A
2 - A256	1630	407	456	1736	1870	1163	62.6	13.6	1.042	F
3 - Cottington Link Road	15	4	2144	18	21	48	1.2	0.3	1.711	F
4 - A299 Hengist Way N	331	83	1117	331	354	1046	1.2	0.7	0.147	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	1074	269	283	1071	1086	889	1.6	1.5	0.078	A
2 - A256	1388	347	374	1398	1458	980	13.6	2.9	0.191	B
3 - Cottington Link Road	13	3	1735	13	15	38	0.3	0.1	0.467	D
4 - A299 Hengist Way N	280	70	894	277	297	854	0.7	0.7	0.121	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

16:30 - 16:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	390	957	0.408	390	387	0.0	0.5	0.077	A
			2	2, 3, 4	460	954	0.482	458	466	0.0	0.7	0.079	A
			3	1, 4	229	942	0.243	228	236	0.0	0.3	0.070	A
		2	1	(2, 3, 4)	890			890	902	0.0	0.0	0.003	A
			2	(1, 3, 4)	189			189	193	0.0	0.0	0.001	A
	Exit	1	1		886			886	896	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	344	764	0.450	342	349	0.0	0.7	0.104	A
			3	1, 4	559	771	0.726	559	562	0.0	1.0	0.116	A
			4	1, 2	485	769	0.631	485	494	0.0	0.9	0.116	A
		2	1	(1, 3, 4)	703			702	715	0.0	0.4	0.026	A
			2	(1, 2, 4)	687			685	701	0.0	0.4	0.026	A
	Exit	1	1		996			996	1002	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	5	182	0.030	5	6	0.0	0.0	0.320	C
			2	1, 2, 3	8	179	0.044	8	8	0.0	0.0	0.387	C
		2	1	(1, 2, 3, 4)	13			13	15	0.0	0.0	0.000	A
	Exit	1	1		39			39	37	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	140	557	0.251	140	143	0.0	0.3	0.118	A
			3	2, 3, 4	145	557	0.260	144	150	0.0	0.3	0.121	A
	Exit	1	1		839			839	866	0.0	0.0	0.000	A

16:45 - 17:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	457	943	0.484	455	462	0.5	0.8	0.084	A
			2	2, 3, 4	545	938	0.580	543	549	0.7	0.8	0.084	A
			3	1, 4	281	927	0.303	280	289	0.3	0.3	0.076	A
		2	1	(2, 3, 4)	1050			1049	1064	0.0	0.1	0.005	A
			2	(1, 3, 4)	233			233	236	0.0	0.0	0.002	A

	Exit	1	1		1048			1048	1057	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	431	748	0.577	432	439	0.7	0.8	0.116	A
			3	1, 4	639	751	0.851	639	645	1.0	1.4	0.133	A
			4	1, 2	586	752	0.779	587	589	0.9	1.2	0.130	A
		2	1	(1, 3, 4)	822			822	835	0.4	1.4	0.087	A
			2	(1, 2, 4)	834			835	841	0.4	1.4	0.085	A
	Exit	1	1		1170			1170	1193	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	7	109	0.061	7	6	0.0	0.1	0.651	E
			2	1, 2, 3	8	108	0.074	8	8	0.0	0.1	0.637	E
		2	1	(1, 2, 3, 4)	15			15	14	0.0	0.0	0.000	A
	Exit	1	1		46			46	46	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	167	528	0.316	167	173	0.3	0.4	0.130	A
			3	2, 3, 4	170	523	0.325	171	177	0.3	0.3	0.132	A
	Exit	1	1		1024			1024	1040	0.0	0.0	0.000	A

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	565	923	0.613	567	570	0.8	0.8	0.094	A
			2	2, 3, 4	653	919	0.710	655	651	0.8	0.9	0.095	A
			3	1, 4	365	909	0.401	366	367	0.3	0.4	0.082	A
		2	1	(2, 3, 4)	1276			1276	1280	0.1	0.4	0.016	A
			2	(1, 3, 4)	306			306	309	0.0	0.0	0.007	A
	Exit	1	1		1212			1212	1220	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	524	727	0.722	523	523	0.8	1.2	0.133	A
			3	1, 4	721	728	0.991	721	727	1.4	1.9	0.155	A
			4	1, 2	677	728	0.929	677	678	1.2	1.7	0.151	A
		2	1	(1, 3, 4)	1008			947	954	1.4	17.7	0.668	E
			2	(1, 2, 4)	1037			976	980	1.4	17.6	0.645	E
	Exit	1	1		1449			1449	1452	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	9	36	0.246	9	8	0.1	0.3	2.028	F
			2	1, 2, 3	12	36	0.323	11	9	0.1	0.5	2.561	F
		2	1	(1, 2, 3, 4)	21			21	20	0.0	0.0	0.010	A
	Exit	1	1		56			56	57	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	201	493	0.407	201	207	0.4	0.5	0.151	A
			3	2, 3, 4	207	491	0.421	207	213	0.3	0.5	0.151	A
	Exit	1	1		1220			1220	1225	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	565	920	0.614	566	570	0.8	0.9	0.096	A
			2	2, 3, 4	631	917	0.689	632	647	0.9	1.0	0.097	A
			3	1, 4	362	908	0.399	363	371	0.4	0.4	0.085	A
		2	1	(2, 3, 4)	1255			1254	1273	0.4	0.3	0.018	A
			2	(1, 3, 4)	303			303	315	0.0	0.0	0.009	A
	Exit	1	1		1233			1233	1247	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	526	728	0.723	526	533	1.2	1.2	0.136	A
			3	1, 4	732	731	1.002	732	736	1.9	1.9	0.159	A
			4	1, 2	681	729	0.933	681	696	1.7	1.8	0.154	A
		2	1	(1, 3, 4)	1004			957	968	17.7	28.9	1.475	F
			2	(1, 2, 4)	1030			982	998	17.6	28.8	1.429	F
	Exit	1	1		1433			1433	1462	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	9	34	0.249	8	8	0.3	0.6	3.470	F
			2	1, 2, 3	10	35	0.291	11	10	0.5	0.6	3.365	F
		2	1	(1, 2, 3, 4)	19			19	19	0.0	0.0	0.096	A
	Exit	1	1		56			56	56	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	204	486	0.421	204	214	0.5	0.6	0.159	A
			3	2, 3, 4	210	485	0.433	211	217	0.5	0.5	0.161	A
	Exit	1	1		1211			1211	1237	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	466	943	0.493	465	466	0.9	0.6	0.084	A
			2	2, 3, 4	530	940	0.563	530	545	1.0	0.7	0.086	A
			3	1, 4	283	931	0.304	284	291	0.4	0.3	0.075	A
		2	1	(2, 3, 4)	1044			1044	1058	0.3	0.0	0.005	A
			2	(1, 3, 4)	234			234	241	0.0	0.0	0.003	A
	Exit	1	1		1108			1108	1189	0.0	0.0	0.000	A

2 - A256	Entry	1	1	3, 4	453	749	0.605	455	498	1.2	0.9	0.128	A
			3	1, 4	658	750	0.878	658	707	1.9	1.6	0.150	A
			4	1, 2	623	751	0.830	624	665	1.8	1.4	0.145	A
		2	1	(1, 3, 4)	809			862	923	28.9	4.9	0.912	F
			2	(1, 2, 4)	821			873	943	28.8	4.8	0.890	F
	Exit	1	1		1163			1163	1201	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	7	93	0.072	7	9	0.6	0.1	1.686	F
			2	1, 2, 3	8	92	0.091	11	12	0.6	0.1	1.732	F
		2	1	(1, 2, 3, 4)	15			15	17	0.0	0.0	0.028	A
	Exit	1	1		48			48	50	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	161	508	0.317	161	175	0.6	0.4	0.144	A
			3	2, 3, 4	170	513	0.331	170	179	0.5	0.4	0.149	A
	Exit	1	1		1046			1046	1106	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 Hengist Way E	Entry	1	1	2	383	962	0.398	381	383	0.6	0.5	0.078	A
			2	2, 3, 4	465	958	0.485	465	470	0.7	0.6	0.077	A
			3	1, 4	226	945	0.239	225	233	0.3	0.3	0.072	A
		2	1	(2, 3, 4)	887			887	890	0.0	0.0	0.002	A
			2	(1, 3, 4)	187			187	195	0.0	0.0	0.001	A
	Exit	1	1		889			889	922	0.0	0.0	0.000	A
2 - A256	Entry	1	1	3, 4	345	767	0.449	344	366	0.9	0.7	0.106	A
			3	1, 4	562	771	0.730	562	581	1.6	1.0	0.118	A
			4	1, 2	491	774	0.634	493	511	1.4	0.8	0.118	A
		2	1	(1, 3, 4)	703			708	731	4.9	0.2	0.076	A
			2	(1, 2, 4)	685			689	721	4.8	0.2	0.077	A
	Exit	1	1		980			980	1003	0.0	0.0	0.000	A
3 - Cottington Link Road	Entry	1	1	1, 4	5	180	0.027	5	6	0.1	0.0	0.461	D
			2	1, 2, 3	8	180	0.043	8	9	0.1	0.0	0.472	D
		2	1	(1, 2, 3, 4)	13			13	14	0.0	0.0	0.000	A
	Exit	1	1		38			38	39	0.0	0.0	0.000	A
4 - A299 Hengist Way N	Entry	1	2	1, 2	139	557	0.249	137	147	0.4	0.3	0.120	A
			3	2, 3, 4	141	561	0.251	140	150	0.4	0.4	0.121	A
	Exit	1	1		854			854	891	0.0	0.0	0.000	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 4_A256_B2190_R1_AM_val_mit_R1_RevA.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 4_A299_B2190\Strategic Modelling scenarios\Mitigation Scheme
Report generation date: 22/03/2019 11:50:16

«2039 + Dev(Link+Sig), AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM				
	Queue (Veh)	Delay (min)	RFC	LOS	Network Residual Capacity
	2039 + Dev(Link+Sig)				
1 - Hengist way E	6.8	0.30	0.88	C	-16 %
2 - Tothill Street	68.6	8.05	1.39	F	
3 - A299 W	4.7	0.21	0.83	B	[2 - Tothill Street]
4 - B2190 N	23.4	1.13	1.00	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

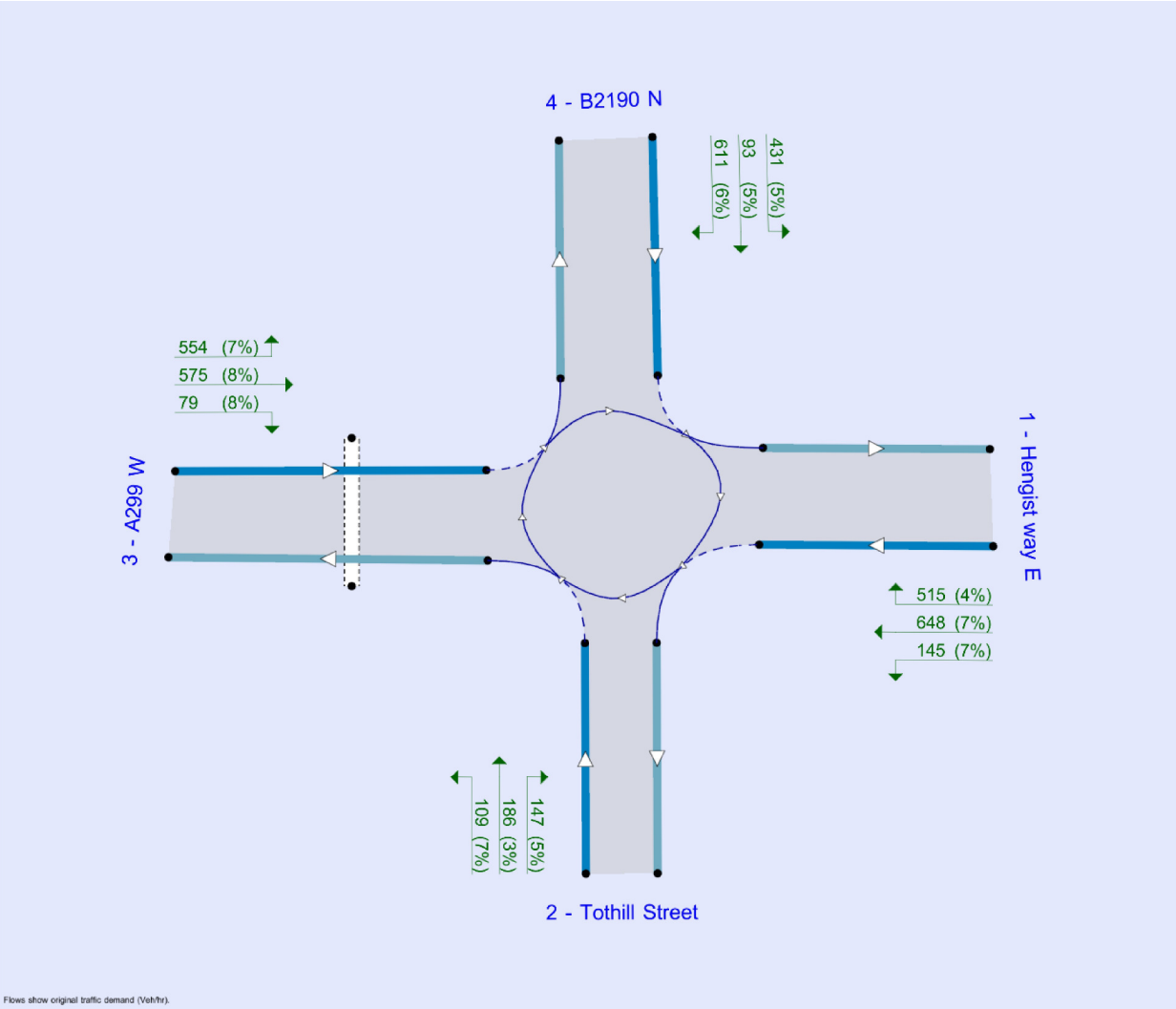
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 + Dev(Link+Sig), AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	1.33	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-16	2 - Tothill Street

Arms

Arms

Arm	Name	Description
1	Hengist way E	
2	Tothill Street	
3	A299 W	
4	B2190 N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Hengist way E	8.50	11.00	22.5	30.0	65.0	14.5	
2 - Tothill Street	3.20	4.50	8.1	11.7	65.0	31.5	
3 - A299 W	7.47	9.00	7.0	20.0	65.0	28.0	
4 - B2190 N	7.33	9.04	8.5	20.0	65.0	23.0	

Pelican/Puffin Crossings

Arm	Space between crossing and junc. entry (Signalised) (PCU)	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)
3 - A299 W	12.00	3.00	2.90	1.00	6.00	6.00	7.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Hengist way E	0.820	3354
2 - Tothill Street	0.434	1181
3 - A299 W	0.672	2554
4 - B2190 N	0.684	2598

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Hengist way E	Percentage		66.00
2 - Tothill Street	Percentage		126.00
3 - A299 W	Percentage		88.00
4 - B2190 N	Percentage		67.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2039 + Dev(Link+Sig)	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Hengist way E		ONE HOUR	✓	1308	100.000
2 - Tothill Street		ONE HOUR	✓	442	100.000
3 - A299 W		ONE HOUR	✓	1208	100.000
4 - B2190 N		ONE HOUR	✓	1135	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - Hengist way E		
2 - Tothill Street		
3 - A299 W	[ONEHOUR]	60.00
4 - B2190 N		

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	145	648	515
	2 - Tothill Street	147	0	109	186
	3 - A299 W	575	79	0	554
	4 - B2190 N	431	93	611	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	7	7	4
	2 - Tothill Street	5	0	7	3
	3 - A299 W	8	8	0	7
	4 - B2190 N	5	5	6	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Hengist way E	0.88	0.30	6.8	C	1200	1800
2 - Tothill Street	1.39	8.05	68.6	F	406	608
3 - A299 W	0.83	0.21	4.7	B	1108	1663
4 - B2190 N	1.00	1.13	23.4	F	1041	1562

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	985	246	585		1776	0.554	980	862	0.0	1.2	0.075	A
2 - Tothill Street	333	83	1328		688	0.484	329	237	0.0	0.9	0.166	A
3 - A299 W	909	227	634	45.17	1607	0.566	904	1023	0.0	1.3	0.085	A
4 - B2190 N	854	214	599		1366	0.625	848	939	0.0	1.6	0.114	A

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service

1 - Hengist way E	1176	294	700		1714	0.686	1172	1030	1.2	2.1	0.110	A
2 - Tothill Street	397	99	1588		544	0.731	391	284	0.9	2.5	0.379	C
3 - A299 W	1086	271	756	53.94	1568	0.692	1082	1223	1.3	2.2	0.123	A
4 - B2190 N	1020	255	716		1312	0.778	1014	1122	1.6	3.3	0.197	B

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1440	360	828		1644	0.876	1424	1202	2.1	6.2	0.256	C
2 - Tothill Street	487	122	1910		365	1.332	359	342	2.5	34.4	3.461	F
3 - A299 W	1330	333	831	66.06	1594	0.834	1320	1438	2.2	4.7	0.212	B
4 - B2190 N	1250	312	834		1256	0.995	1196	1317	3.3	16.8	0.688	E

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1440	360	846		1634	0.881	1438	1214	6.2	6.8	0.298	C
2 - Tothill Street	487	122	1937		350	1.390	350	347	34.4	68.6	8.045	F
3 - A299 W	1330	333	830	66.06	1612	0.825	1330	1457	4.7	4.7	0.213	B
4 - B2190 N	1250	312	836		1255	0.996	1223	1323	16.8	23.4	1.132	F

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1176	294	752		1685	0.698	1194	1105	6.8	2.4	0.126	A
2 - Tothill Street	397	99	1652		508	0.782	501	294	68.6	42.8	6.440	F
3 - A299 W	1086	271	847	53.94	1590	0.683	1096	1306	4.7	2.2	0.124	A
4 - B2190 N	1020	255	760		1292	0.790	1098	1183	23.4	4.1	0.409	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	985	246	595		1770	0.556	989	929	2.4	1.3	0.077	A
2 - Tothill Street	333	83	1344		678	0.490	500	240	42.8	1.0	0.840	F
3 - A299 W	909	227	766	45.17	1578	0.576	913	1078	2.2	1.4	0.091	A
4 - B2190 N	854	214	660		1338	0.638	864	1018	4.1	1.8	0.129	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 4_A256_B2190_R1_PM_val_mit_R1_RevA.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 4_A299_B2190\Strategic Modelling scenarios\Mitigation Scheme
Report generation date: 22/03/2019 11:51:39

«2039 + Dev(Link+Sigs), PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Network Residual Capacity
	2039 + Dev(Link+Sigs)				
1 - Hengist way E	6.7	0.34	0.88	C	-3 % [3 - A299 W]
2 - Tothill Street	4.1	0.72	0.83	E	
3 - A299 W	28.8	0.94	1.00	F	
4 - B2190 N	2.6	0.17	0.73	B	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

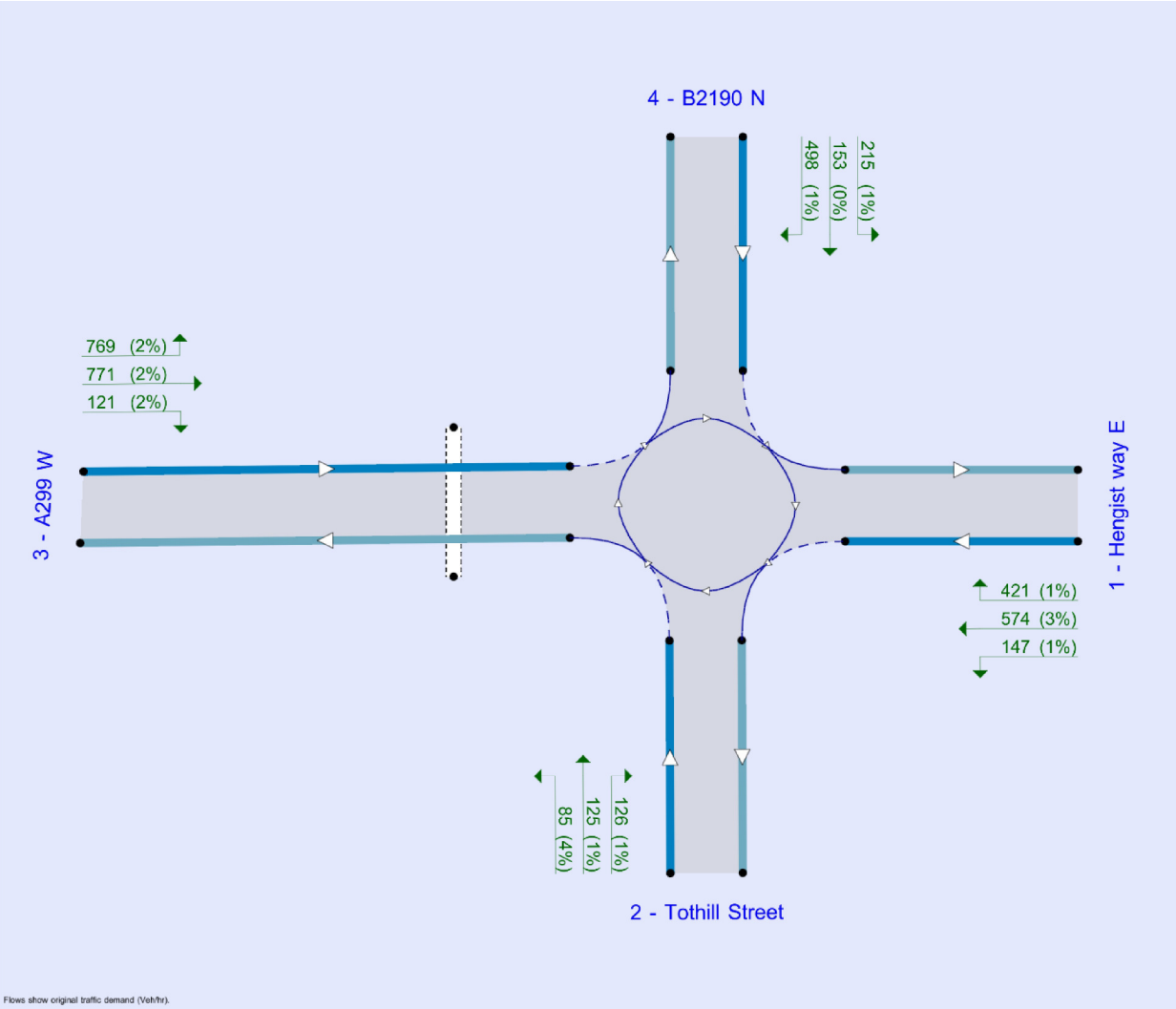
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 + Dev(Link+Sigs), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	0.58	E

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-3	3 - A299 W

Arms

Arms

Arm	Name	Description
1	Hengist way E	
2	Tothill Street	
3	A299 W	
4	B2190 N	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Hengist way E	7.50	11.00	22.5	30.0	65.0	14.5	
2 - Tothill Street	3.20	4.50	8.1	11.7	65.0	31.5	
3 - A299 W	7.47	9.00	7.0	20.0	65.0	28.0	
4 - B2190 N	7.33	9.04	8.5	20.0	65.0	23.0	

Pelican/Puffin Crossings

Arm	Space between crossing and junc. entry (Signalised) (PCU)	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)
3 - A299 W	12.00	3.00	2.90	1.00	6.00	6.00	7.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Hengist way E	0.793	3189
2 - Tothill Street	0.434	1181
3 - A299 W	0.672	2554
4 - B2190 N	0.684	2598

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - Hengist way E	Percentage		58.00
2 - Tothill Street	Percentage		100.00
3 - A299 W	Percentage		91.00
4 - B2190 N	Percentage		72.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	2039 + Dev(Link+Sigs)	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Hengist way E		ONE HOUR	✓	1142	100.000
2 - Tothill Street		ONE HOUR	✓	336	100.000
3 - A299 W		ONE HOUR	✓	1661	100.000
4 - B2190 N		ONE HOUR	✓	866	100.000

Demand overview (Pedestrians)

Arm	Profile type	Average pedestrian flow (Ped/hr)
1 - Hengist way E		
2 - Tothill Street		
3 - A299 W	[ONEHOUR]	60.00
4 - B2190 N		

Origin-Destination Data

Demand (Veh/hr)

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	147	574	421
	2 - Tothill Street	126	0	85	125
	3 - A299 W	771	121	0	769
	4 - B2190 N	215	153	498	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Hengist way E	2 - Tothill Street	3 - A299 W	4 - B2190 N
From	1 - Hengist way E	0	1	3	1
	2 - Tothill Street	1	0	4	1
	3 - A299 W	2	2	0	2
	4 - B2190 N	1	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - Hengist way E	0.88	0.34	6.7	C	1048	1572
2 - Tothill Street	0.83	0.72	4.1	E	308	462
3 - A299 W	1.00	0.94	28.8	F	1524	2286
4 - B2190 N	0.73	0.17	2.6	B	795	1192

Main Results for each time segment

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	860	215	578		1550	0.555	855	832	0.0	1.2	0.086	A
2 - Tothill Street	253	63	1118		675	0.375	251	315	0.0	0.6	0.141	A
3 - A299 W	1250	313	502	45.17	1852	0.675	1242	866	0.0	2.0	0.097	A
4 - B2190 N	652	163	761		1477	0.442	649	984	0.0	0.8	0.072	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service

1 - Hengist way E	1027	257	692		1499	0.685	1023	995	1.2	2.1	0.125	A
2 - Tothill Street	302	76	1338		579	0.521	300	377	0.6	1.1	0.214	B
3 - A299 W	1493	373	601	53.94	1858	0.804	1486	1037	2.0	3.9	0.158	A
4 - B2190 N	779	195	910		1402	0.555	777	1177	0.8	1.2	0.096	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1257	314	841		1431	0.879	1241	1189	2.1	6.2	0.294	C
2 - Tothill Street	370	92	1626		454	0.815	360	456	1.1	3.6	0.583	D
3 - A299 W	1829	457	726	66.06	1839	0.995	1764	1260	3.9	20.1	0.558	D
4 - B2190 N	953	238	1082		1317	0.724	948	1408	1.2	2.5	0.161	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1257	314	847		1428	0.880	1255	1207	6.2	6.7	0.339	C
2 - Tothill Street	370	92	1642		447	0.827	368	461	3.6	4.1	0.720	E
3 - A299 W	1829	457	738	66.06	1832	0.998	1794	1272	20.1	28.8	0.940	F
4 - B2190 N	953	238	1102		1307	0.729	953	1430	2.5	2.6	0.169	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	1027	257	705		1493	0.688	1045	1052	6.7	2.3	0.139	A
2 - Tothill Street	302	76	1361		569	0.530	314	389	4.1	1.2	0.245	B
3 - A299 W	1493	373	620	53.94	1903	0.785	1593	1055	28.8	3.8	0.254	C
4 - B2190 N	779	195	973		1371	0.568	784	1239	2.6	1.3	0.103	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Pedestrian demand (Ped/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - Hengist way E	860	215	583		1548	0.555	864	842	2.3	1.3	0.088	A
2 - Tothill Street	253	63	1129		670	0.377	255	318	1.2	0.6	0.145	A
3 - A299 W	1250	313	509	45.17	1915	0.653	1258	875	3.8	1.9	0.092	A
4 - B2190 N	652	163	771		1471	0.443	654	996	1.3	0.8	0.074	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 6_A253_Willetts Hill_R1_AM_val_mit_R1.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 6_A299_A253\Mitigation
Report generation date: 22/03/2019 11:54:05

«2039 + Dev Traffic, AM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM				
	Queue (Veh)	Delay (min)	RFC	LOS	Network Residual Capacity
	2039 + Dev Traffic				
1 - A299 E	3.3	0.13	0.77	A	-14 % [3 - A253 Canterbury Road (W)]
2 - Willetts Hill S	0.2	0.07	0.14	A	
3 - A253 Canterbury Road (W)	7.1	1.37	0.91	F	
4 - A299 (N)	4.0	0.21	0.81	B	
5 - Seamark Road	0.0	0.09	0.04	A	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

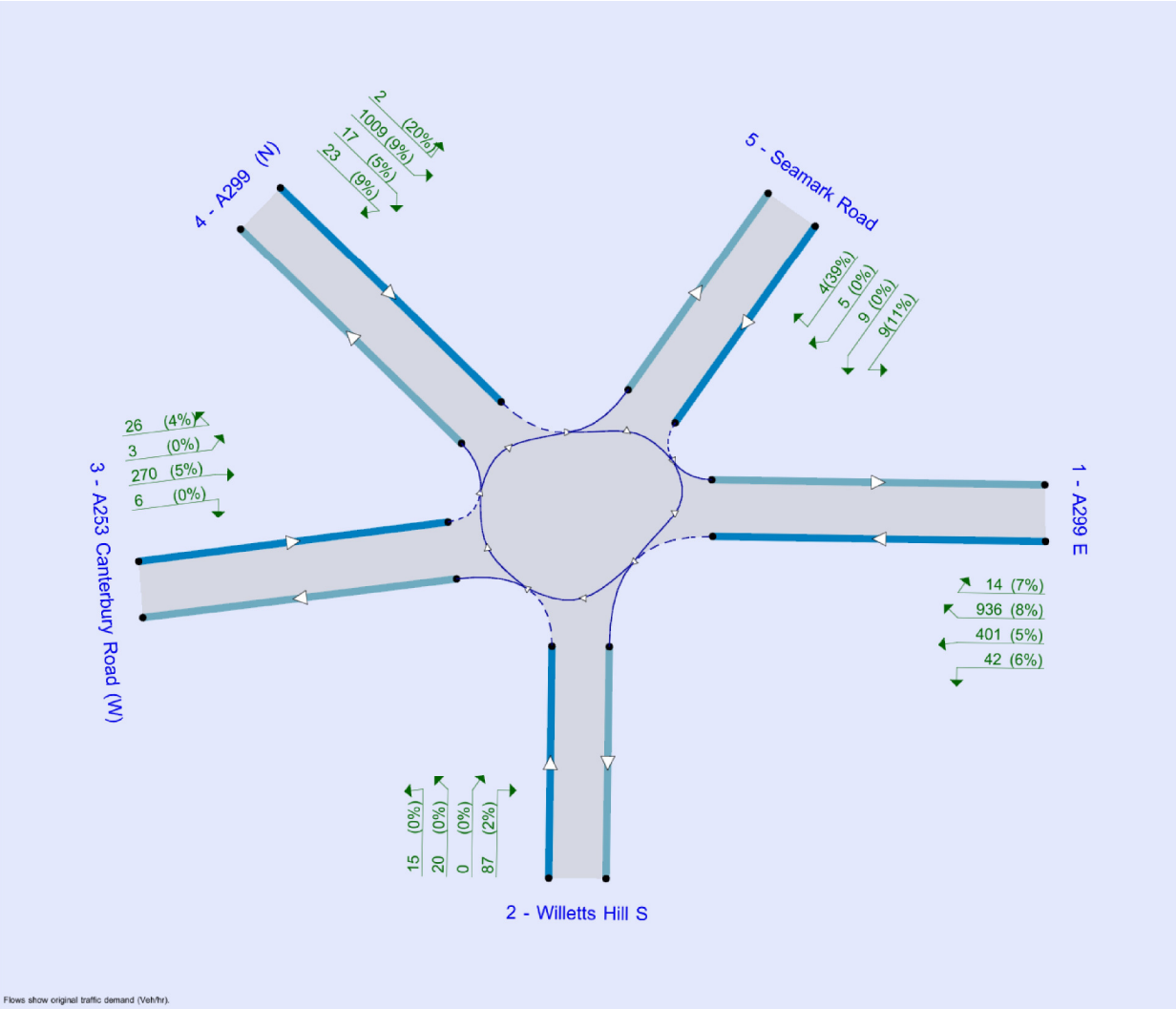
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 + Dev Traffic, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	3 - A253 Canterbury Road (W) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	0.29	C

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-14	3 - A253 Canterbury Road (W)

Arms

Arms

Arm	Name	Description
1	A299 E	
2	Willetts Hill S	
3	A253 Canterbury Road (W)	
4	A299 (N)	
5	Seamark Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 E	7.10	9.06	12.5	43.9	75.0	18.5	
2 - Willetts Hill S	2.49	8.24	27.5	19.7	76.0	30.0	
3 - A253 Canterbury Road (W)	4.70	9.00	39.9	16.8	76.0	35.0	
4 - A299 (N)	8.36	9.00	13.7	20.0	76.8	44.5	
5 - Seamark Road	3.16	7.58	11.2	29.1	75.0	31.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 E	0.655	2716
2 - Willetts Hill S	0.497	1797
3 - A253 Canterbury Road (W)	0.571	2329
4 - A299 (N)	0.599	2566
5 - Seamark Road	0.468	1565

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A299 E	Percentage		80.00
2 - Willetts Hill S	Percentage		100.00
3 - A253 Canterbury Road (W)	Percentage		24.00
4 - A299 (N)	Percentage		68.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2039 + Dev Traffic	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 E		ONE HOUR	✓	1393	100.000
2 - Willetts Hill S		ONE HOUR	✓	122	100.000
3 - A253 Canterbury Road (W)		ONE HOUR	✓	305	100.000
4 - A299 (N)		ONE HOUR	✓	1051	100.000
5 - Seamark Road		ONE HOUR	✓	27	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	42	401	936	14
	2 - Willetts Hill S	87	0	15	20	0
	3 - A253 Canterbury Road (W)	270	6	0	26	3
	4 - A299 (N)	1009	17	23	0	2
	5 - Seamark Road	9	9	5	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	6	5	8	7
	2 - Willetts Hill S	2	0	0	0	0
	3 - A253 Canterbury Road (W)	5	0	0	4	0
	4 - A299 (N)	9	5	9	0	20
	5 - Seamark Road	11	0	0	39	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 E	0.77	0.13	3.3	A	1278	1917
2 - Willetts Hill S	0.14	0.07	0.2	A	112	168
3 - A253 Canterbury Road (W)	0.91	1.37	7.1	F	280	420
4 - A299 (N)	0.81	0.21	4.0	B	964	1447
5 - Seamark Road	0.04	0.09	0.0	A	25	37

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1049	262	48	2001	0.524	1044	1027	0.0	1.1	0.062	A
2 - Willetts Hill S	92	23	1037	1225	0.075	92	55	0.0	0.1	0.053	A
3 - A253 Canterbury Road (W)	230	57	796	420	0.547	225	333	0.0	1.2	0.301	C
4 - A299 (N)	791	198	282	1487	0.532	787	739	0.0	1.1	0.085	A
5 - Seamark Road	20	5	1054	945	0.022	20	14	0.0	0.0	0.065	A

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1252	313	57	1996	0.627	1250	1230	1.1	1.7	0.080	A
2 - Willetts Hill S	110	27	1241	1118	0.098	110	66	0.1	0.1	0.059	A

3 - A253 Canterbury Road (W)	274	69	952	398	0.689	271	398	1.2	2.0	0.459	D
4 - A299 (N)	945	236	338	1465	0.645	942	885	1.1	1.8	0.114	A
5 - Seamark Road	24	6	1263	848	0.029	24	17	0.0	0.0	0.073	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1534	383	70	1989	0.771	1527	1492	1.7	3.2	0.128	A
2 - Willetts Hill S	134	34	1516	973	0.138	134	81	0.1	0.2	0.072	A
3 - A253 Canterbury Road (W)	336	84	1164	368	0.913	321	487	2.0	5.9	1.028	F
4 - A299 (N)	1157	289	404	1440	0.804	1149	1080	1.8	3.8	0.201	B
5 - Seamark Road	30	7	1532	723	0.041	30	21	0.0	0.0	0.087	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1534	383	70	1989	0.771	1533	1509	3.2	3.3	0.132	A
2 - Willetts Hill S	134	34	1522	970	0.139	134	81	0.2	0.2	0.072	A
3 - A253 Canterbury Road (W)	336	84	1168	367	0.914	331	489	5.9	7.1	1.370	F
4 - A299 (N)	1157	289	414	1436	0.806	1157	1085	3.8	4.0	0.214	B
5 - Seamark Road	30	7	1550	715	0.042	30	21	0.0	0.0	0.088	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1252	313	58	1995	0.628	1259	1261	3.3	1.7	0.082	A
2 - Willetts Hill S	110	27	1250	1113	0.099	110	67	0.2	0.1	0.060	A
3 - A253 Canterbury Road (W)	274	69	958	397	0.691	293	401	7.1	2.5	0.650	E
4 - A299 (N)	945	236	359	1457	0.648	953	892	4.0	1.9	0.121	A
5 - Seamark Road	24	6	1295	833	0.029	24	17	0.0	0.0	0.074	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1049	262	48	2000	0.524	1051	1042	1.7	1.1	0.063	A
2 - Willetts Hill S	92	23	1044	1222	0.075	92	56	0.1	0.1	0.053	A
3 - A253 Canterbury Road (W)	230	57	801	419	0.548	234	335	2.5	1.3	0.333	C
4 - A299 (N)	791	198	291	1484	0.533	794	744	1.9	1.2	0.087	A
5 - Seamark Road	20	5	1070	937	0.022	20	14	0.0	0.0	0.065	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Jct 6_A253_Willetts Hill_R1_PM_val_mit_R1.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 6_A299_A253\Mitigation
Report generation date: 22/03/2019 11:55:40

«2039 + Dev Traffic, PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	PM				
	Queue (Veh)	Delay (min)	RFC	LOS	Network Residual Capacity
	2039 + Dev Traffic				
1 - A299 E	2.8	0.11	0.74	A	-16 % [3 - A253 Canterbury Road (W)]
2 - Willetts Hill S	0.1	0.06	0.08	A	
3 - A253 Canterbury Road (W)	29.8	2.76	1.07	F	
4 - A299 (N)	4.8	0.23	0.83	B	
5 - Seamark Road	0.1	0.10	0.05	A	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

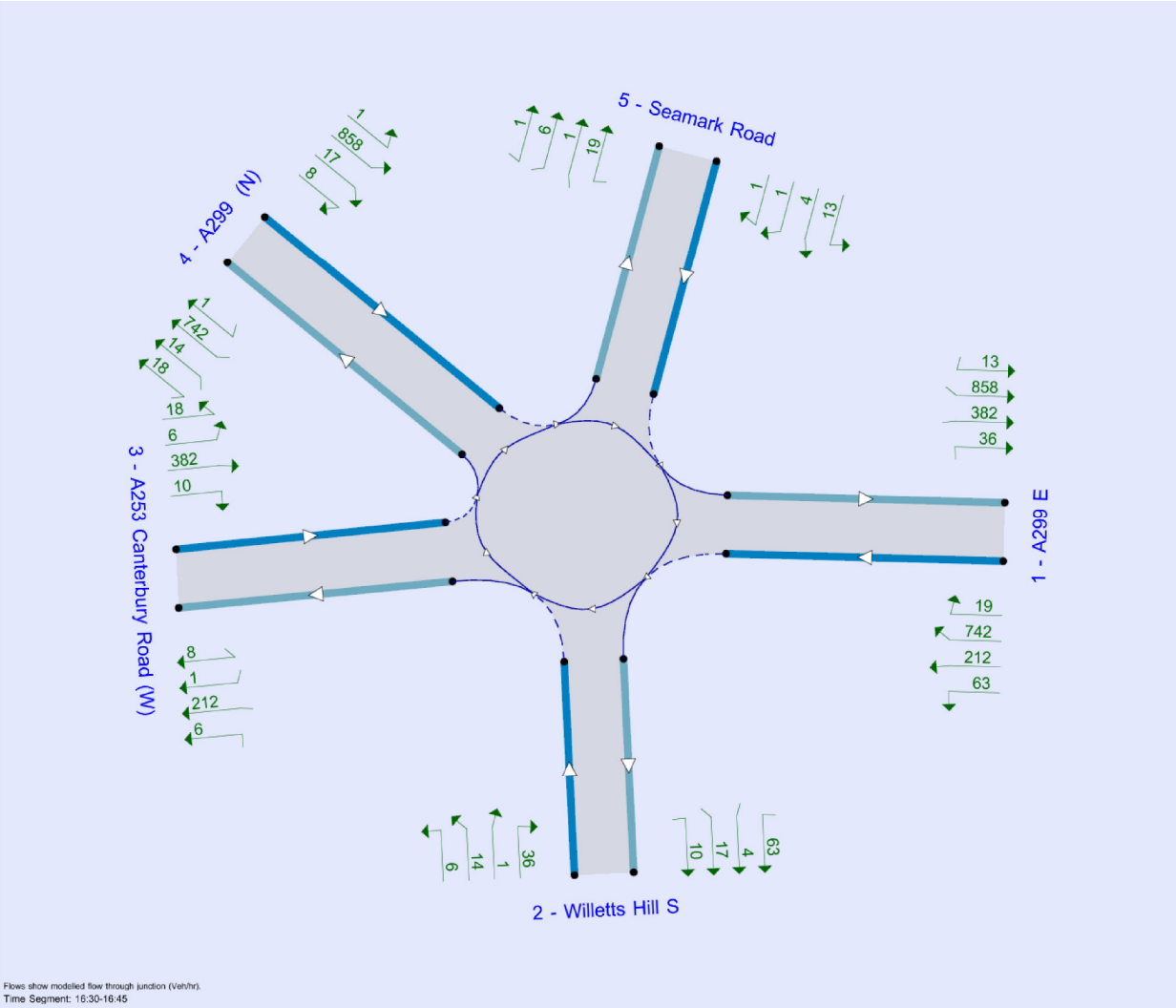
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/09/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\adam.guy
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	min	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (min)	Queue threshold (PCU)
5.75			✓	Delay	0.85	0.60	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2039 + Dev Traffic, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	3 - A253 Canterbury Road (W) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (min)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4, 5	0.61	E

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-16	3 - A253 Canterbury Road (W)

Arms

Arms

Arm	Name	Description
1	A299 E	
2	Willetts Hill S	
3	A253 Canterbury Road (W)	
4	A299 (N)	
5	Seamark Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - A299 E	7.10	9.06	12.5	43.9	75.0	18.5	
2 - Willetts Hill S	2.49	8.24	27.5	19.7	76.0	30.0	
3 - A253 Canterbury Road (W)	4.70	9.00	39.9	16.8	76.0	35.0	
4 - A299 (N)	8.36	9.00	13.7	20.0	76.8	44.5	
5 - Seamark Road	3.16	7.58	11.2	29.1	75.0	31.5	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A299 E	0.655	2716
2 - Willetts Hill S	0.497	1797
3 - A253 Canterbury Road (W)	0.571	2329
4 - A299 (N)	0.599	2566
5 - Seamark Road	0.468	1565

The slope and intercept shown above include any corrections and adjustments.

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
1 - A299 E	Percentage		80.00
2 - Willetts Hill S	Percentage		100.00
3 - A253 Canterbury Road (W)	Percentage		37.00
4 - A299 (N)	Percentage		75.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	2039 + Dev Traffic	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - A299 E		ONE HOUR	✓	1382	100.000
2 - Willetts Hill S		ONE HOUR	✓	76	100.000
3 - A253 Canterbury Road (W)		ONE HOUR	✓	562	100.000
4 - A299 (N)		ONE HOUR	✓	1181	100.000
5 - Seamark Road		ONE HOUR	✓	27	100.000

Origin-Destination Data

Demand (Veh/hr)

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	84	283	989	26
	2 - Willetts Hill S	48	0	8	19	1
	3 - A253 Canterbury Road (W)	516	14	0	24	8
	4 - A299 (N)	1146	23	11	0	1
	5 - Seamark Road	18	6	2	1	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - A299 E	2 - Willetts Hill S	3 - A253 Canterbury Road (W)	4 - A299 (N)	5 - Seamark Road
From	1 - A299 E	0	4	2	5	3
	2 - Willetts Hill S	0	0	0	0	0
	3 - A253 Canterbury Road (W)	3	6	0	4	0
	4 - A299 (N)	5	0	9	0	29
	5 - Seamark Road	6	0	4	20	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (min)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - A299 E	0.74	0.11	2.8	A	1268	1902
2 - Willetts Hill S	0.08	0.06	0.1	A	70	105
3 - A253 Canterbury Road (W)	1.07	2.76	29.8	F	516	774
4 - A299 (N)	0.83	0.23	4.8	B	1084	1626
5 - Seamark Road	0.05	0.10	0.1	A	25	37

Main Results for each time segment

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1040	260	43	2061	0.505	1036	1290	0.0	1.0	0.058	A
2 - Willetts Hill S	57	14	984	1286	0.044	57	95	0.0	0.0	0.049	A
3 - A253 Canterbury Road (W)	423	106	813	662	0.639	416	228	0.0	1.7	0.238	B
4 - A299 (N)	889	222	455	1638	0.543	884	774	0.0	1.2	0.079	A
5 - Seamark Road	20	5	1312	884	0.023	20	27	0.0	0.0	0.069	A

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1242	311	51	2057	0.604	1240	1543	1.0	1.5	0.073	A
2 - Willetts Hill S	68	17	1178	1185	0.058	68	114	0.0	0.1	0.054	A

3 - A253 Canterbury Road (W)	505	126	973	628	0.805	498	273	1.7	3.6	0.436	D
4 - A299 (N)	1062	265	544	1599	0.664	1059	927	1.2	1.9	0.110	A
5 - Seamark Road	24	6	1570	764	0.032	24	32	0.0	0.0	0.081	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1522	380	61	2052	0.742	1516	1838	1.5	2.8	0.111	A
2 - Willetts Hill S	84	21	1440	1049	0.080	84	138	0.1	0.1	0.062	A
3 - A253 Canterbury Road (W)	619	155	1190	581	1.065	560	334	3.6	18.4	1.484	F
4 - A299 (N)	1300	325	618	1567	0.830	1290	1131	1.9	4.5	0.209	B
5 - Seamark Road	30	7	1869	625	0.048	30	39	0.0	0.0	0.101	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1522	380	62	2051	0.742	1521	1860	2.8	2.8	0.113	A
2 - Willetts Hill S	84	21	1444	1047	0.080	84	139	0.1	0.1	0.062	A
3 - A253 Canterbury Road (W)	619	155	1193	580	1.066	573	335	18.4	29.8	2.756	F
4 - A299 (N)	1300	325	631	1561	0.833	1299	1135	4.5	4.8	0.228	B
5 - Seamark Road	30	7	1892	615	0.048	30	39	0.0	0.1	0.103	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1242	311	54	2055	0.604	1248	1651	2.8	1.5	0.075	A
2 - Willetts Hill S	68	17	1184	1182	0.058	68	117	0.1	0.1	0.054	A
3 - A253 Canterbury Road (W)	505	126	978	627	0.806	601	274	29.8	5.9	1.875	F
4 - A299 (N)	1062	265	642	1556	0.682	1072	936	4.8	2.2	0.127	A
5 - Seamark Road	24	6	1681	713	0.034	24	34	0.1	0.0	0.087	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (min)	Unsignalised level of service
1 - A299 E	1040	260	43	2061	0.505	1043	1320	1.5	1.0	0.059	A
2 - Willetts Hill S	57	14	990	1283	0.045	57	96	0.1	0.0	0.049	A
3 - A253 Canterbury Road (W)	423	106	818	661	0.640	439	229	5.9	1.9	0.288	C
4 - A299 (N)	889	222	477	1628	0.546	893	780	2.2	1.2	0.082	A
5 - Seamark Road	20	5	1343	870	0.023	20	27	0.0	0.0	0.071	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.0.6896
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Filename: Roundabout Option_Minus Site Arm.j9
Path: R:\Projects\40820 STH Manston Airport Post Application\G General\Transport\Revised Junction Modelling OctNov 18\2039+(Dev+Signals) models\Validated\Jct 12_B2050_Spitfire Way\Mit\Rbt Opt
Report generation date: 22/03/2019 13:05:21

«2039 + Dev + Link Rd (Rbt), PM
»Junction Network
»Arms
»Traffic Demand
»Origin-Destination Data
»Vehicle Mix
»Results

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2039 + Dev + Link Rd (Rbt)									
1 - Manston Rd (NE)	5.1	23.40	0.84	C	1 % [3 - Sptifire Way]	1.9	10.26	0.66	B	-6 % [3 - Sptifire Way]
2 - Manston Rd (E)	0.2	5.11	0.14	A		0.5	5.99	0.34	A	
3 - Sptifire Way	9.0	31.67	0.91	D		18.1	65.88	0.98	F	
4 - Manston Rd (SW)	2.1	19.82	0.69	C		0.5	8.87	0.33	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	27/02/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\Chris.morris
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)

5.75		✓	✓	Delay	0.85	36.00	20.00

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2039 + Dev + Link Rd (Rbt)	PM	ONE HOUR	17:00	18:30	15	✓

2039 + Dev + Link Rd (Rbt), PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	35.09	E

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-6	3 - Sptifire Way

Arms

Arms

Arm	Name	Description
1	Manston Rd (NE)	
2	Manston Rd (E)	
3	Sptifire Way	
4	Manston Rd (SW)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Manston Rd (NE)	3.49	4.18	6.6	14.9	45.4	39.0	
2 - Manston Rd (E)	3.22	4.70	23.7	19.8	45.4	37.0	
3 - Sptifire Way	3.79	4.17	9.6	19.8	45.4	35.0	
4 - Manston Rd (SW)	3.24	4.20	5.7	15.4	45.4	36.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Manston Rd (NE)	0.506	1156
2 - Manston Rd (E)	0.544	1316
3 - Sptifire Way	0.529	1228
4 - Manston Rd (SW)	0.505	1129

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Manston Rd (NE)		ONE HOUR	✓	627	100.000
2 - Manston Rd (E)		ONE HOUR	✓	285	100.000
3 - Sptifire Way		ONE HOUR	✓	931	100.000
4 - Manston Rd (SW)		ONE HOUR	✓	183	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - Manston Rd (NE)	2 - Manston Rd (E)	3 - Sptifire Way	4 - Manston Rd (SW)
From	1 - Manston Rd (NE)	0	18	495	114
	2 - Manston Rd (E)	27	0	86	172
	3 - Sptifire Way	827	93	0	11
	4 - Manston Rd (SW)	76	83	24	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1 - Manston Rd (NE)	2 - Manston Rd (E)	3 - Sptifire Way	4 - Manston Rd (SW)
From	1 - Manston Rd (NE)	0	0	2	0
	2 - Manston Rd (E)	0	0	12	1
	3 - Sptifire Way	2	9	0	0
	4 - Manston Rd (SW)	2	1	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (s)	Rate of Queueing Delay (PCU-min/min)	Inclusive Total Queueing Delay (PCU-min)	Inclusive Average Queueing Delay (s)
1 - Manston Rd (NE)	0.66	10.26	1.9	B	575	863	113.75	7.91	1.26	113.77	7.91
2 - Manston Rd (E)	0.34	5.99	0.5	A	262	392	33.89	5.18	0.38	33.89	5.18
3 - Sptifire Way	0.98	65.88	18.1	F	854	1281	582.45	27.27	6.47	582.54	27.28
4 - Manston Rd (SW)	0.33	8.87	0.5	A	168	252	30.43	7.25	0.34	30.43	7.25

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Manston Rd (NE)	472	118	149	1080	0.437	469	694	0.0	0.8	5.935	A
2 - Manston Rd (E)	215	54	473	1058	0.203	214	145	0.0	0.3	4.415	A
3 - Sptifire Way	701	175	234	1104	0.635	694	453	0.0	1.7	8.897	A
4 - Manston Rd (SW)	138	34	706	773	0.178	137	222	0.0	0.2	5.718	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Manston Rd (NE)	564	141	179	1065	0.529	562	830	0.8	1.1	7.228	A
2 - Manston Rd (E)	256	64	568	1007	0.254	256	174	0.3	0.4	4.970	A
3 - Sptifire Way	837	209	281	1080	0.775	831	543	1.7	3.3	14.526	B
4 - Manston Rd (SW)	165	41	845	703	0.234	164	266	0.2	0.3	6.756	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Manston Rd (NE)	690	173	216	1047	0.660	687	987	1.1	1.9	10.054	B

2 - Manston Rd (E)	314	78	694	938	0.334	313	209	0.4	0.5	5.967	A
3 - Sptfire Way	1025	256	344	1046	0.980	984	663	3.3	13.7	42.942	E
4 - Manston Rd (SW)	201	50	1002	624	0.323	201	326	0.3	0.5	8.597	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Manston Rd (NE)	690	173	218	1045	0.661	690	1008	1.9	1.9	10.258	B
2 - Manston Rd (E)	314	78	697	937	0.335	314	212	0.5	0.5	5.994	A
3 - Sptfire Way	1025	256	345	1046	0.980	1007	666	13.7	18.1	65.884	F
4 - Manston Rd (SW)	201	50	1025	612	0.329	201	327	0.5	0.5	8.873	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Manston Rd (NE)	564	141	186	1062	0.531	567	887	1.9	1.2	7.410	A
2 - Manston Rd (E)	256	64	572	1005	0.255	257	180	0.5	0.4	5.000	A
3 - Sptfire Way	837	209	282	1079	0.776	894	547	18.1	3.9	24.985	C
4 - Manston Rd (SW)	165	41	908	671	0.245	165	269	0.5	0.3	7.208	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - Manston Rd (NE)	472	118	152	1079	0.437	474	708	1.2	0.8	6.037	A
2 - Manston Rd (E)	215	54	478	1056	0.203	215	147	0.4	0.3	4.444	A
3 - Sptfire Way	701	175	236	1103	0.635	709	457	3.9	1.8	9.591	A
4 - Manston Rd (SW)	138	34	721	765	0.180	138	224	0.3	0.2	5.811	A

Queueing Delay Results for each time segment

17:00 - 17:15

Arm	Queueing total delay (PCU-min)	Queueing rate of delay (PCU-min/min)	Average delay per arriving vehicle (s)	Unsignalised level of service
1 - Manston Rd (NE)	11.20	0.75	5.935	A
2 - Manston Rd (E)	3.84	0.26	4.415	A
3 - Sptfire Way	24.38	1.63	8.897	A
4 - Manston Rd (SW)	3.17	0.21	5.718	A

17:15 - 17:30

Arm	Queueing total delay (PCU-min)	Queueing rate of delay (PCU-min/min)	Average delay per arriving vehicle (s)	Unsignalised level of service
1 - Manston Rd (NE)	16.21	1.08	7.228	A
2 - Manston Rd (E)	5.17	0.34	4.970	A
3 - Sptfire Way	45.37	3.02	14.526	B
4 - Manston Rd (SW)	4.48	0.30	6.756	A

17:30 - 17:45

Arm	Queueing total delay (PCU-min)	Queueing rate of delay (PCU-min/min)	Average delay per arriving vehicle (s)	Unsignalised level of service
1 - Manston Rd (NE)	26.90	1.79	10.054	B
2 - Manston Rd (E)	7.55	0.50	5.967	A
3 - Sptfire Way	147.21	9.81	42.942	E
4 - Manston Rd (SW)	6.91	0.46	8.597	A

17:45 - 18:00

Arm	Queueing total delay (PCU-min)	Queueing rate of delay (PCU-min/min)	Average delay per arriving vehicle (s)	Unsignalised level of service
1 - Manston Rd (NE)	28.85	1.92	10.258	B
2 - Manston Rd (E)	7.78	0.52	5.994	A
3 - Sptfire Way	241.42	16.09	65.884	F
4 - Manston Rd (SW)	7.30	0.49	8.873	A

18:00 - 18:15

Arm	Queueing total delay (PCU-min)	Queueing rate of delay (PCU-min/min)	Average delay per arriving vehicle (s)	Unsignalised level of service
1 - Manston Rd (NE)	18.26	1.22	7.410	A
2 - Manston Rd (E)	5.49	0.37	5.000	A
3 - Sptifire Way	94.48	6.30	24.985	C
4 - Manston Rd (SW)	5.13	0.34	7.208	A

18:15 - 18:30

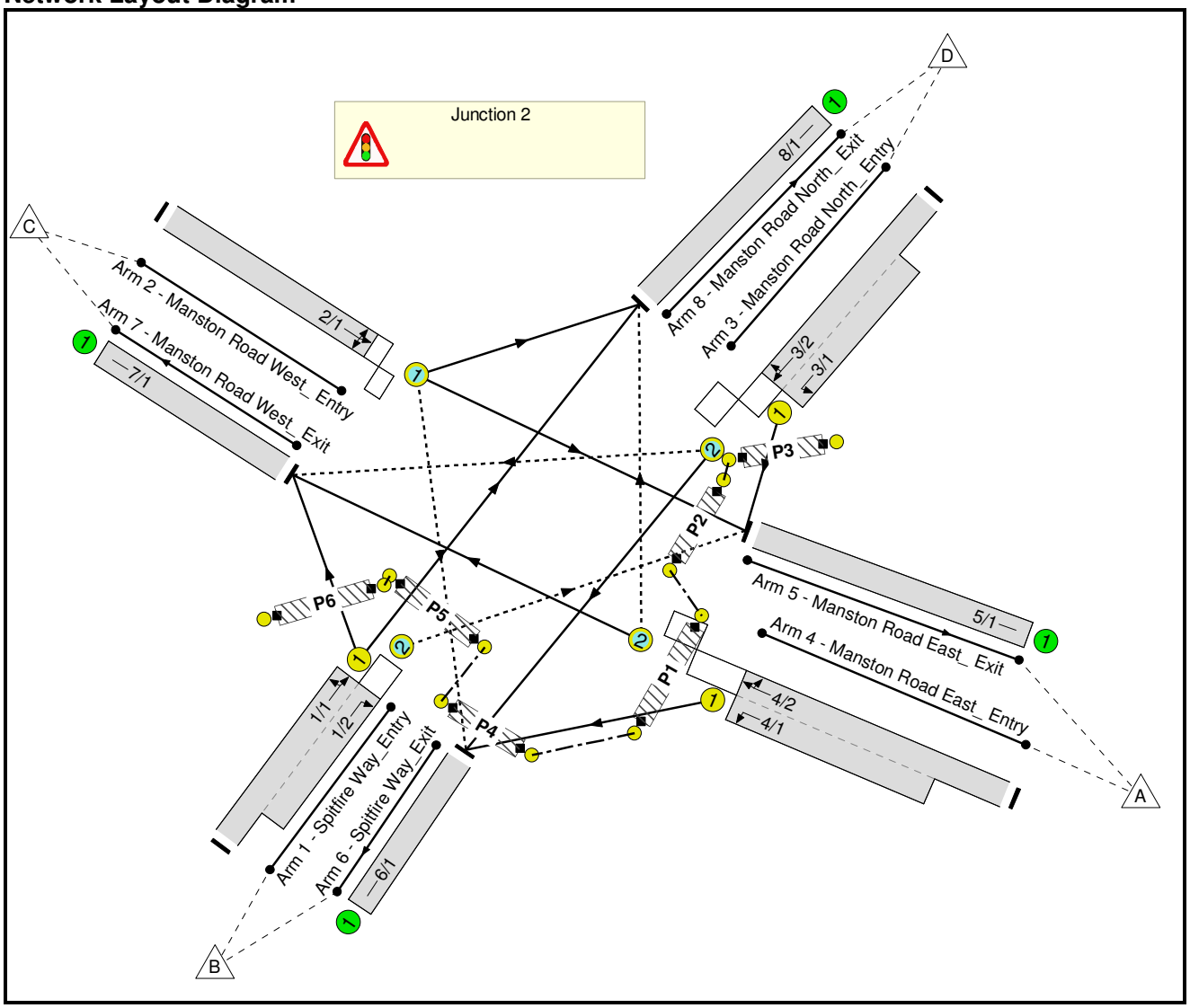
Arm	Queueing total delay (PCU-min)	Queueing rate of delay (PCU-min/min)	Average delay per arriving vehicle (s)	Unsignalised level of service
1 - Manston Rd (NE)	12.33	0.82	6.037	A
2 - Manston Rd (E)	4.07	0.27	4.444	A
3 - Sptifire Way	29.60	1.97	9.591	A
4 - Manston Rd (SW)	3.44	0.23	5.811	A

Full Input Data And Results

User and Project Details

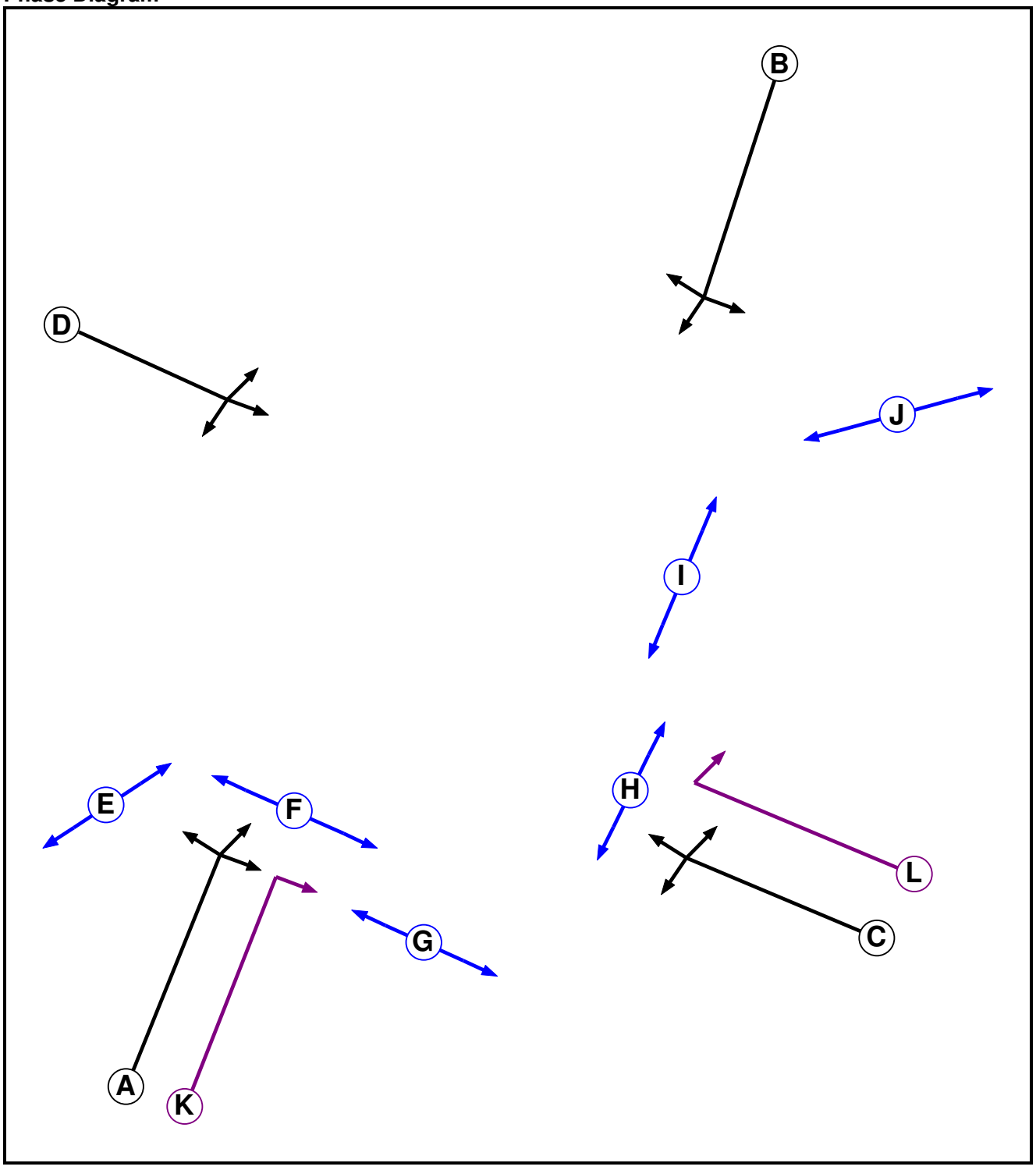
Project:	
Title:	
Location:	
File name:	Spit_Manton Rd Prop Jct_RevC.lsg3x
Author:	
Company:	
Address:	
Notes:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Full Input Data And Results

Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Pedestrian		6	6
F	Pedestrian		7	7
G	Pedestrian		7	7
H	Pedestrian		7	7
I	Pedestrian		7	7
J	Pedestrian		7	7
K	Ind. Arrow	A	4	4
L	Ind. Arrow	C	4	4

Phase Intergreens Matrix

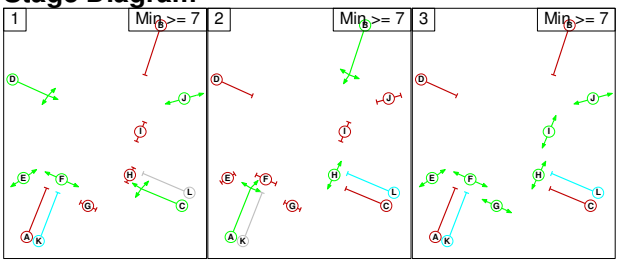
Terminating Phase \ Starting Phase	A	B	C	D	E	F	G	H	I	J	K	L
A		-	5	5	5	5	-	-	8	-	-	-
B	-		5	5	-	-	9	-	-	5	-	-
C	8	6		-	-	-	6	5	-	-	-	-
D	5	5	-		-	-	8	-	8	-	-	-
E	8	-	-	-		-	-	-	-	-	-	-
F	8	-	-	-	-		-	-	-	-	-	-
G	-	8	8	8	-	-		-	-	-	-	-
H	-	-	8	-	-	-	-		-	-	-	-
I	6	-	-	6	-	-	-	-		-	-	-
J	-	6	-	-	-	-	-	-	-		-	-
K	-	-	-	-	-	-	-	-	-	-		-
L	-	-	-	-	-	-	-	-	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	C D E F J
2	A B H
3	E F G H I J

Full Input Data And Results

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

From Stage \ To Stage	1	2	3
1		8	8
2	8		9
3	8	8	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Junction 2

Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
1/2 (Spitfire Way_Entry)	5/1 (Right)	1440	0	3/2	1.09	To 6/1 (Ahead)	2.00	-	0.50	2	3.00
				3/1	1.09	All					
2/1 (Manston Road West_ Entry)	6/1 (Right)	1439	0	4/2	1.09	To 7/1 (Ahead)	2.00	1.00	0.50	2	1.00
				4/1	1.09	All					
3/2 (Manston Road North_ Entry)	7/1 (Right)	1439	0	1/1	1.09	All	4.00	2.00	0.50	4	3.00
4/2 (Manston Road East_ Entry)	8/1 (Right)	1439	0	2/1	1.09	To 5/1 (Ahead) To 8/1 (Left)	5.00	2.00	0.50	5	3.00

Lane Input Data

Junction: Junction 2

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (Spitfire Way_Entry)	U	A	2	3	60.0	Geom	-	3.30	0.00	Y	Arm 7 Left	22.89
											Arm 8 Ahead	Inf
1/2 (Spitfire Way_Entry)	O	A K	2	3	11.0	Geom	-	2.93	0.00	Y	Arm 5 Right	22.91
2/1 (Manston Road West_ Entry)	O	D	2	3	60.0	Geom	-	4.18	0.00	Y	Arm 5 Ahead	66.37
											Arm 6 Right	13.30
											Arm 8 Left	15.38
3/1 (Manston Road North_ Entry)	U	B	2	3	10.0	Geom	-	5.00	0.00	Y	Arm 5 Left	11.68
3/2 (Manston Road North_ Entry)	O	B	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 6 Ahead	Inf
											Arm 7 Right	23.83
4/1 (Manston Road East_ Entry)	U	C	2	3	12.0	Geom	-	3.00	0.00	Y	Arm 6 Left	32.95
4/2 (Manston Road East_ Entry)	O	C L	2	3	60.0	Geom	-	3.00	0.00	Y	Arm 7 Ahead	80.73
											Arm 8 Right	8.93
5/1 (Manston Road East_ Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Spitfire Way_Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (Manston Road West_ Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1 (Manston Road North_ Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2039 + Dev + Link Road (AM)'	07:45	08:45	01:00	
2: '2039 + Dev + Lind Road (PM)'	16:45	17:45	01:00	

Scenario 1: '2039 + Dev + Link Road (AM)' (FG1: '2039 + Dev + Link Road (AM)', Plan 1: 'Network Control Plan')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	103	1	10	114
	B	102	0	4	880	986
	C	177	40	0	144	361
	D	69	628	46	0	743
	Tot.	348	771	51	1034	2204

Traffic Lane Flows

Lane	Scenario 1: 2039 + Dev + Link Road (AM)
Junction: Junction 2	
1/1 (with short)	986(In) 884(Out)
1/2 (short)	102
2/1	361
3/1 (short)	69
3/2 (with short)	743(In) 674(Out)
4/1 (short)	103
4/2 (with short)	114(In) 11(Out)
5/1	348
6/1	771
7/1	51
8/1	1034

Lane Saturation Flows

Junction: Junction 2

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Spitfire Way_Entry)	3.30	0.00	Y	Arm 7 Left	22.89	0.5 %	1944	1944
				Arm 8 Ahead	Inf	99.5 %		
1/2 (Spitfire Way_Entry)	2.93	0.00	Y	Arm 5 Right	22.91	100.0 %	1791	1791
2/1 (Manston Road West_ Entry)	4.18	0.00	Y	Arm 5 Ahead	66.37	49.0 %	1913	1913
				Arm 6 Right	13.30	11.1 %		
				Arm 8 Left	15.38	39.9 %		
3/1 (Manston Road North_ Entry)	5.00	0.00	Y	Arm 5 Left	11.68	100.0 %	1874	1874
3/2 (Manston Road North_ Entry)	3.00	0.00	Y	Arm 6 Ahead	Inf	93.2 %	1907	1907
				Arm 7 Right	23.83	6.8 %		
4/1 (Manston Road East_ Entry)	3.00	0.00	Y	Arm 6 Left	32.95	100.0 %	1832	1832
4/2 (Manston Road East_ Entry)	3.00	0.00	Y	Arm 7 Ahead	80.73	9.1 %	1659	1659
				Arm 8 Right	8.93	90.9 %		
5/1 (Manston Road East_ Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Spitfire Way_Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Manston Road West_ Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Manston Road North_ Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2039 + Dev + Link Road (PM)' (FG2: '2039 + Dev + Lind Road (PM)', Plan 1: 'Network Control Plan')

Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	86	172	27	285
	B	93	0	11	827	931
	C	83	24	0	76	183
	D	18	495	114	0	627
	Tot.	194	605	297	930	2026

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2039 + Dev + Link Road (PM)
Junction: Junction 2	
1/1 (with short)	931(In) 838(Out)
1/2 (short)	93
2/1	183
3/1 (short)	18
3/2 (with short)	627(In) 609(Out)
4/1 (short)	86
4/2 (with short)	285(In) 199(Out)
5/1	194
6/1	605
7/1	297
8/1	930

Full Input Data And Results

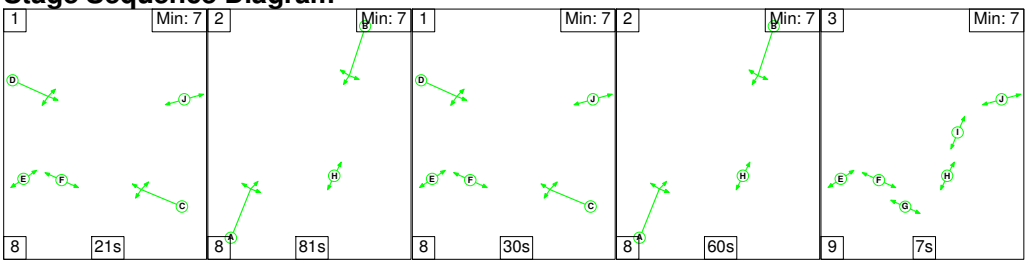
Lane Saturation Flows

Junction: Junction 2

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Spitfire Way_Entry)	3.30	0.00	Y	Arm 7 Left	22.89	1.3 %	1943	1943
				Arm 8 Ahead	Inf	98.7 %		
1/2 (Spitfire Way_Entry)	2.93	0.00	Y	Arm 5 Right	22.91	100.0 %	1791	1791
2/1 (Manston Road West_ Entry)	4.18	0.00	Y	Arm 5 Ahead	66.37	45.4 %	1908	1908
				Arm 6 Right	13.30	13.1 %		
3/1 (Manston Road North_ Entry)	5.00	0.00	Y	Arm 8 Left	15.38	41.5 %	1874	1874
				Arm 5 Left	11.68	100.0 %		
3/2 (Manston Road North_ Entry)	3.00	0.00	Y	Arm 6 Ahead	Inf	81.3 %	1893	1893
				Arm 7 Right	23.83	18.7 %		
4/1 (Manston Road East_ Entry)	3.00	0.00	Y	Arm 6 Left	32.95	100.0 %	1832	1832
4/2 (Manston Road East_ Entry)	3.00	0.00	Y	Arm 7 Ahead	80.73	86.4 %	1843	1843
				Arm 8 Right	8.93	13.6 %		
5/1 (Manston Road East_ Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Spitfire Way_Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Manston Road West_ Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Manston Road North_ Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 1: '2039 + Dev + Link Road (AM)' (FG1: '2039 + Dev + Link Road (AM)', Plan 1: 'Network Control Plan')

Stage Sequence Diagram

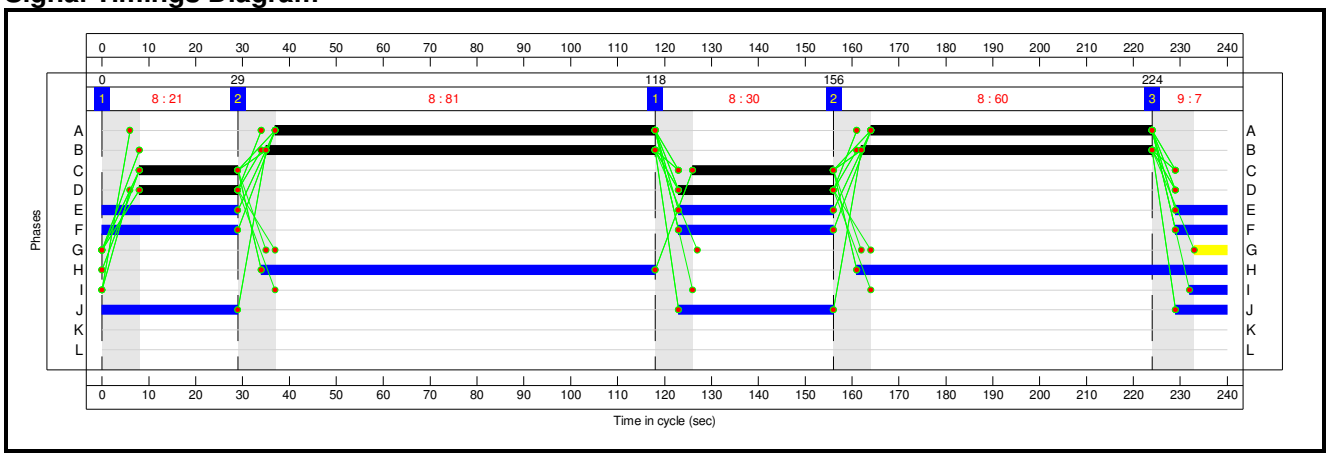


Stage Timings

Stage	1	2	1	2	3
Duration	21	81	30	60	7
Change Point	0	29	118	156	224

Full Input Data And Results

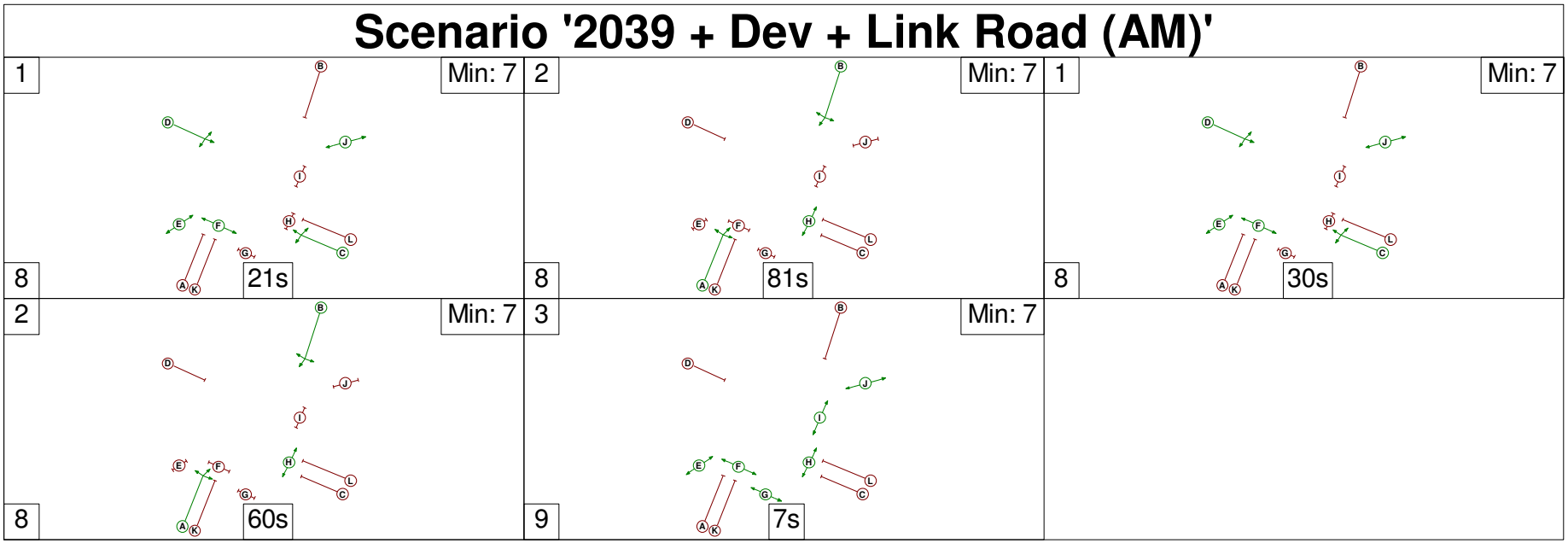
Signal Timings Diagram

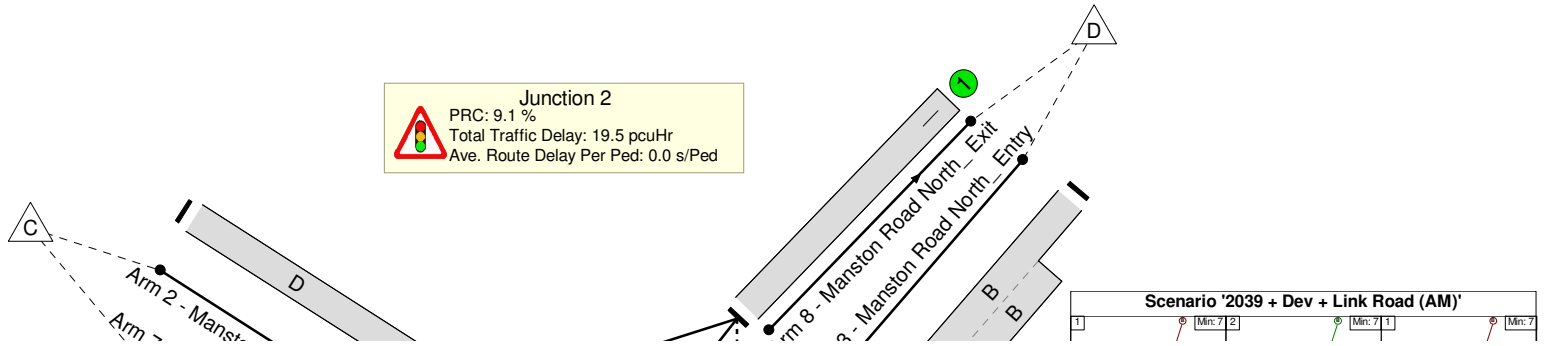


Full Input Data And Results

Network Layout Diagram

Scenario '2039 + Dev + Link Road (AM)'





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.5%**
Junction 2	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**82.5%**
1/1+1/2	Spitfire Way_Entry Right Left Ahead	U+O	N/A	N/A	A	K	2	141	0	986	1944:1791	1071+124	82.5 : 82.5%
2/1	Manston Road West_ Entry Ahead Right Left	O	N/A	N/A	D		2	54	-	361	1913	445	81.1%
3/2+3/1	Manston Road North_ Entry Left Ahead Right	O+U	N/A	N/A	B		2	145	-	743	1907:1874	1084+111	62.2 : 62.2%
4/2+4/1	Manston Road East_ Entry Left Ahead Right	O+U	N/A	N/A	C	L	2	51	0	114	1659:1832	42+396	26.0 : 26.0%
5/1	Manston Road East_ Exit	U	N/A	N/A	-		-	-	-	348	Inf	Inf	0.0%
6/1	Spitfire Way_Exit	U	N/A	N/A	-		-	-	-	771	Inf	Inf	0.0%
7/1	Manston Road West_ Exit	U	N/A	N/A	-		-	-	-	51	Inf	Inf	0.0%
8/1	Manston Road North_ Exit	U	N/A	N/A	-		-	-	-	1034	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	H		2	163	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	I		1	8	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	J		2	73	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	G		1	7	-	0	-	0	0.0%
Ped Link: P5	Unnamed Ped Link	-	N/A	-	F		2	73	-	0	-	0	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	E		2	73	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**191**	**1**	**6**	**13.4**	**5.3**	**0.7**	**19.5**	**-**	**-**	**-**	**-**
Junction 2	**-**	**-**	**191**	**1**	**6**	**13.4**	**5.3**	**0.7**	**19.5**	**-**	**-**	**-**	**-**
1/1+1/2	986	986	102	0	0	5.0	2.3	0.4	7.6	27.9	26.1	2.3	28.4
2/1	361	361	38	1	1	4.4	2.0	0.0	6.4	64.2	11.5	2.0	13.6
3/2+3/1	743	743	45	0	1	2.8	0.8	0.3	4.0	19.3	15.1	0.8	15.9
4/2+4/1	114	114	5	0	5	1.2	0.2	0.0	1.4	45.4	2.9	0.2	3.1
5/1	348	348	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	771	771	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	51	51	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1034	1034	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P6	0	0	-	-	-	-	-	-	-	-	-	-	-

C1

PRC for Signalled Lanes (%): 9.1

PRC Over All Lanes (%): 9.1

Total Delay for Signalled Lanes (pcuHr): 19.49

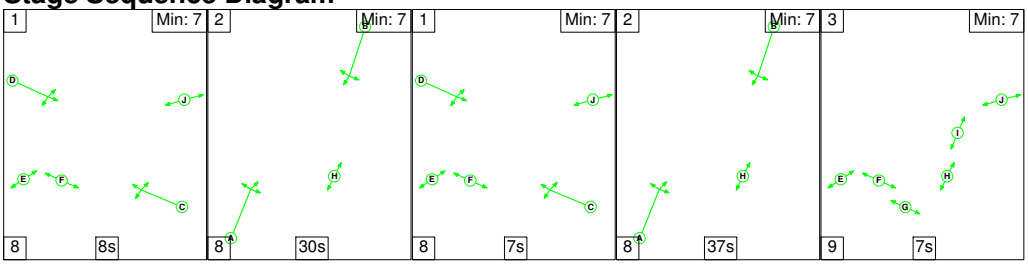
Total Delay Over All Lanes(pcuHr): 19.49

Cycle Time (s): 240

Full Input Data And Results

Scenario 2: '2039 + Dev + Link Road (PM)' (FG2: '2039 + Dev + Lind Road (PM)', Plan 1: 'Network Control Plan')

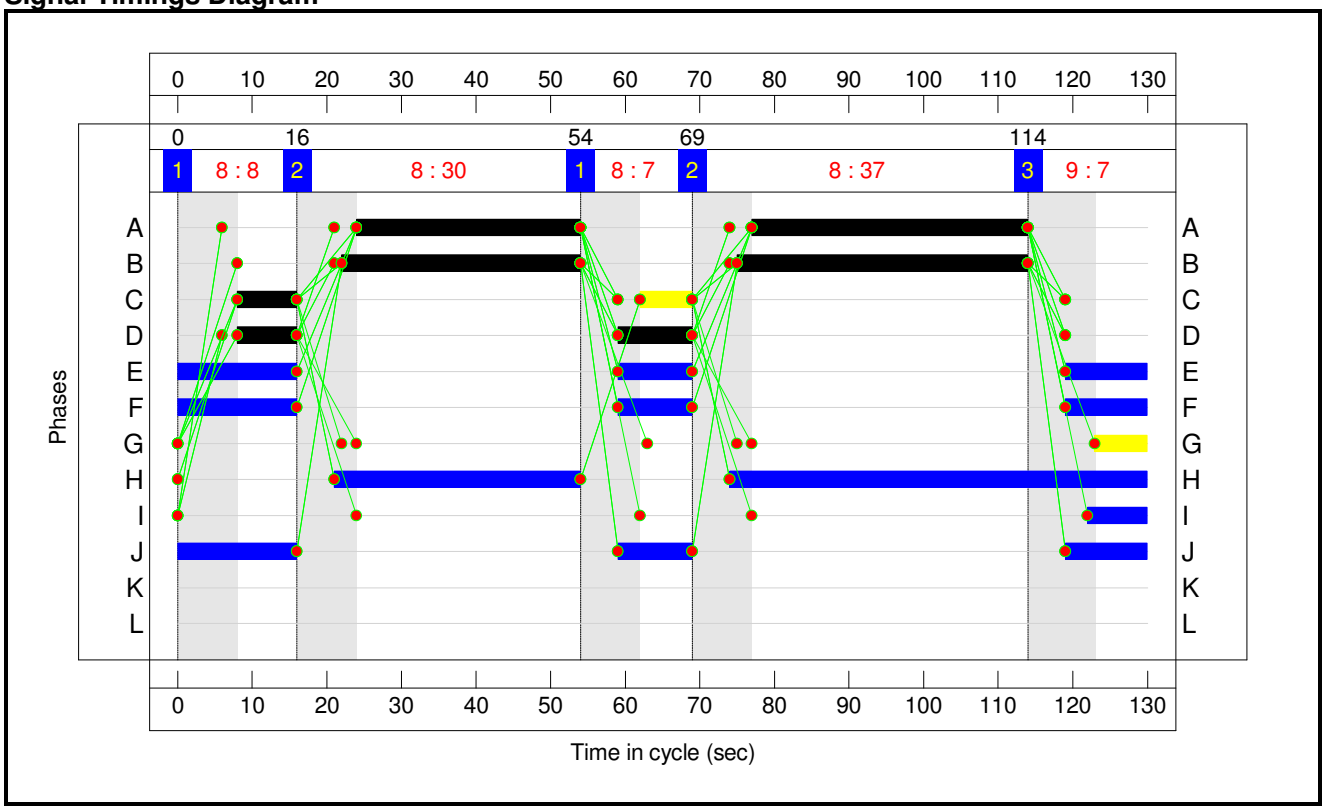
Stage Sequence Diagram



Stage Timings

Stage	1	2	1	2	3
Duration	8	30	7	37	7
Change Point	0	16	54	69	114

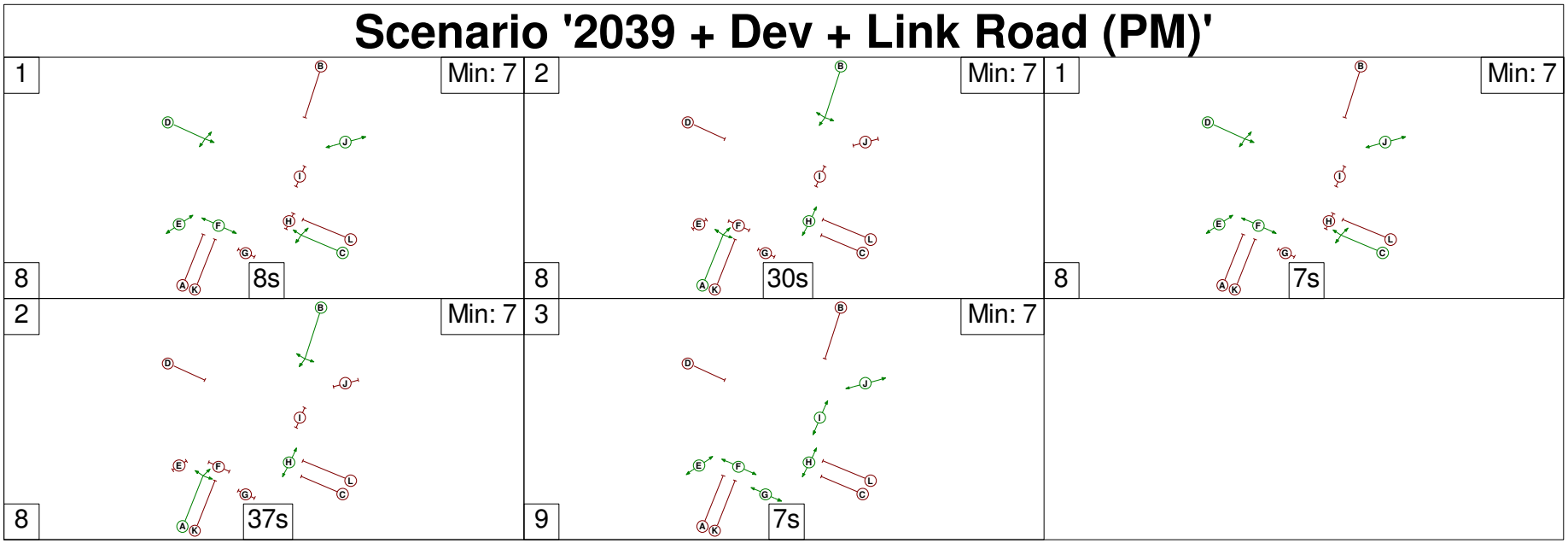
Signal Timings Diagram

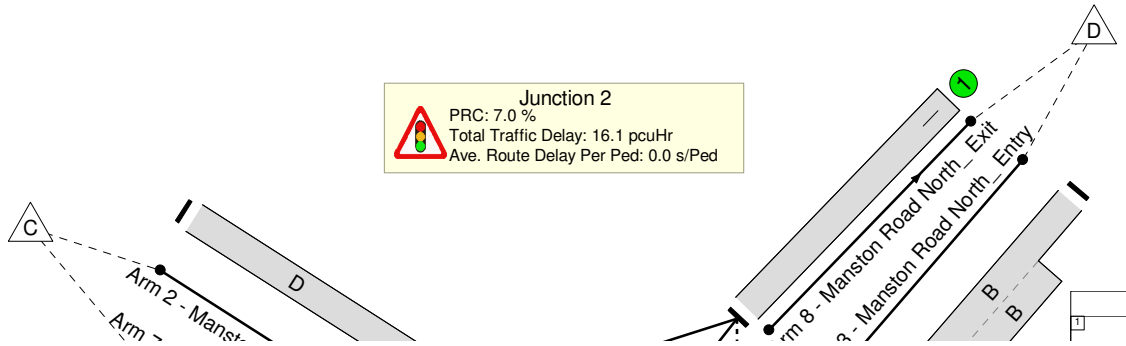


Full Input Data And Results

Network Layout Diagram

Scenario '2039 + Dev + Link Road (PM)'





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.1%**
Junction 2	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**84.1%**
1/1+1/2	Spitfire Way_Entry Right Left Ahead	U+O	N/A	N/A	A	K	2	67	0	931	1943:1791	996+111	84.1 : 84.1%
2/1	Manston Road West_ Entry Ahead Right Left	O	N/A	N/A	D		2	18	-	183	1908	293	62.5%
3/2+3/1	Manston Road North_ Entry Left Ahead Right	O+U	N/A	N/A	B		2	71	-	627	1893:1874	925+27	65.8 : 65.8%
4/2+4/1	Manston Road East_ Entry Left Ahead Right	O+U	N/A	N/A	C	L	2	15	0	285	1843:1832	241+104	82.6 : 82.6%
5/1	Manston Road East_ Exit	U	N/A	N/A	-		-	-	-	194	Inf	Inf	0.0%
6/1	Spitfire Way_Exit	U	N/A	N/A	-		-	-	-	605	Inf	Inf	0.0%
7/1	Manston Road West_ Exit	U	N/A	N/A	-		-	-	-	297	Inf	Inf	0.0%
8/1	Manston Road North_ Exit	U	N/A	N/A	-		-	-	-	930	Inf	Inf	0.0%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	H		2	89	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	I		1	8	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	J		2	37	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	G		1	7	-	0	-	0	0.0%
Ped Link: P5	Unnamed Ped Link	-	N/A	-	F		2	37	-	0	-	0	0.0%
Ped Link: P6	Unnamed Ped Link	-	N/A	-	E		2	37	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**168**	**2**	**88**	**8.8**	**6.6**	**0.7**	**16.1**	**-**	**-**	**-**	**-**
Junction 2	**-**	**-**	**168**	**2**	**88**	**8.8**	**6.6**	**0.7**	**16.1**	**-**	**-**	**-**	**-**
1/1+1/2	931	931	93	0	0	3.4	2.6	0.2	6.2	24.0	16.6	2.6	19.2
2/1	183	183	11	2	11	1.4	0.8	0.0	2.2	43.8	3.8	0.8	4.6
3/2+3/1	627	627	51	0	63	1.7	1.0	0.5	3.2	18.3	9.1	1.0	10.1
4/2+4/1	285	285	13	0	14	2.2	2.2	0.0	4.5	56.2	4.2	2.2	6.4
5/1	194	194	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	605	605	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	297	297	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	930	930	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P6	0	0	-	-	-	-	-	-	-	-	-	-	-

C1

PRC for Signalled Lanes (%): 7.0
PRC Over All Lanes (%): 7.0

Total Delay for Signalled Lanes (pcuHr): 16.06
Total Delay Over All Lanes(pcuHr): 16.06

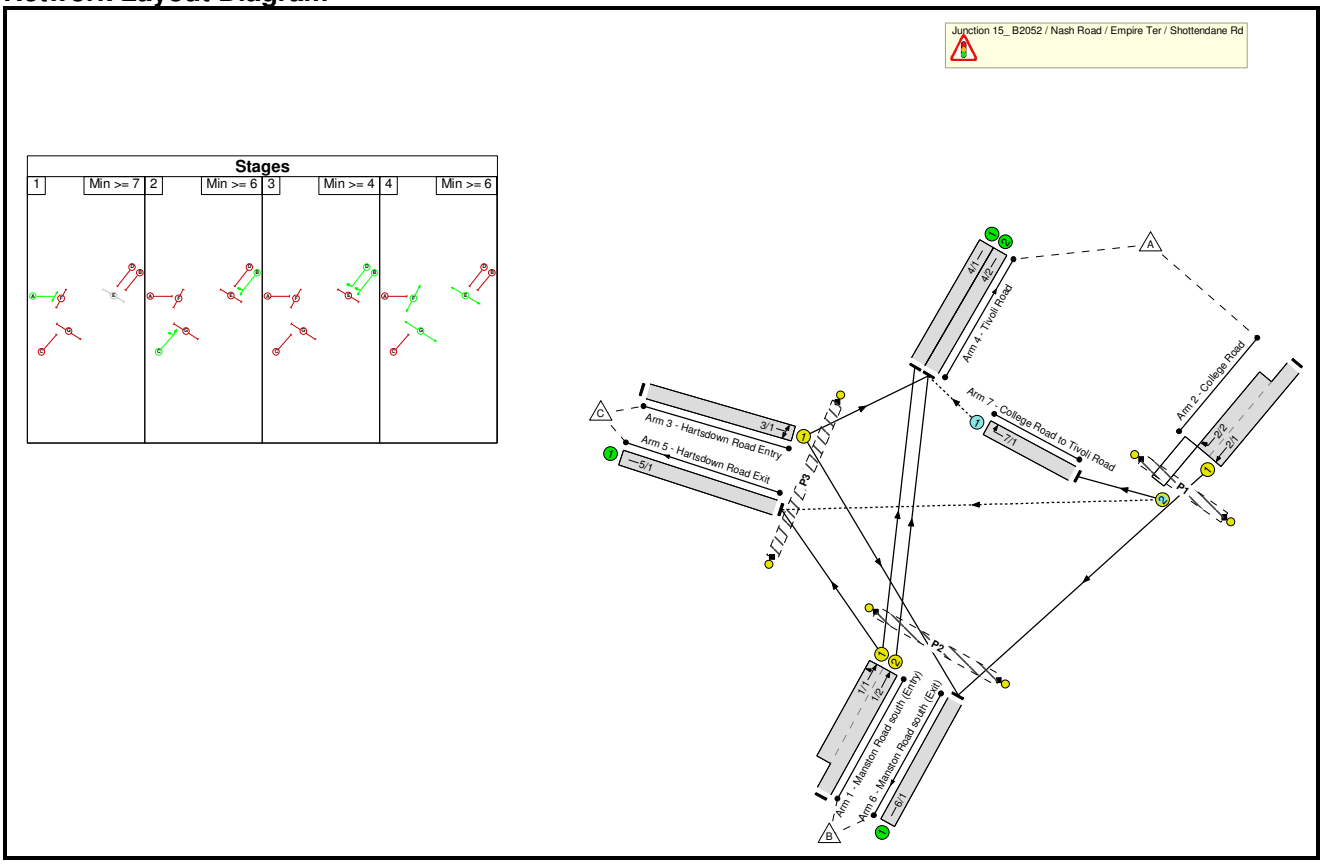
Cycle Time (s): 130

Full Input Data And Results

User and Project Details

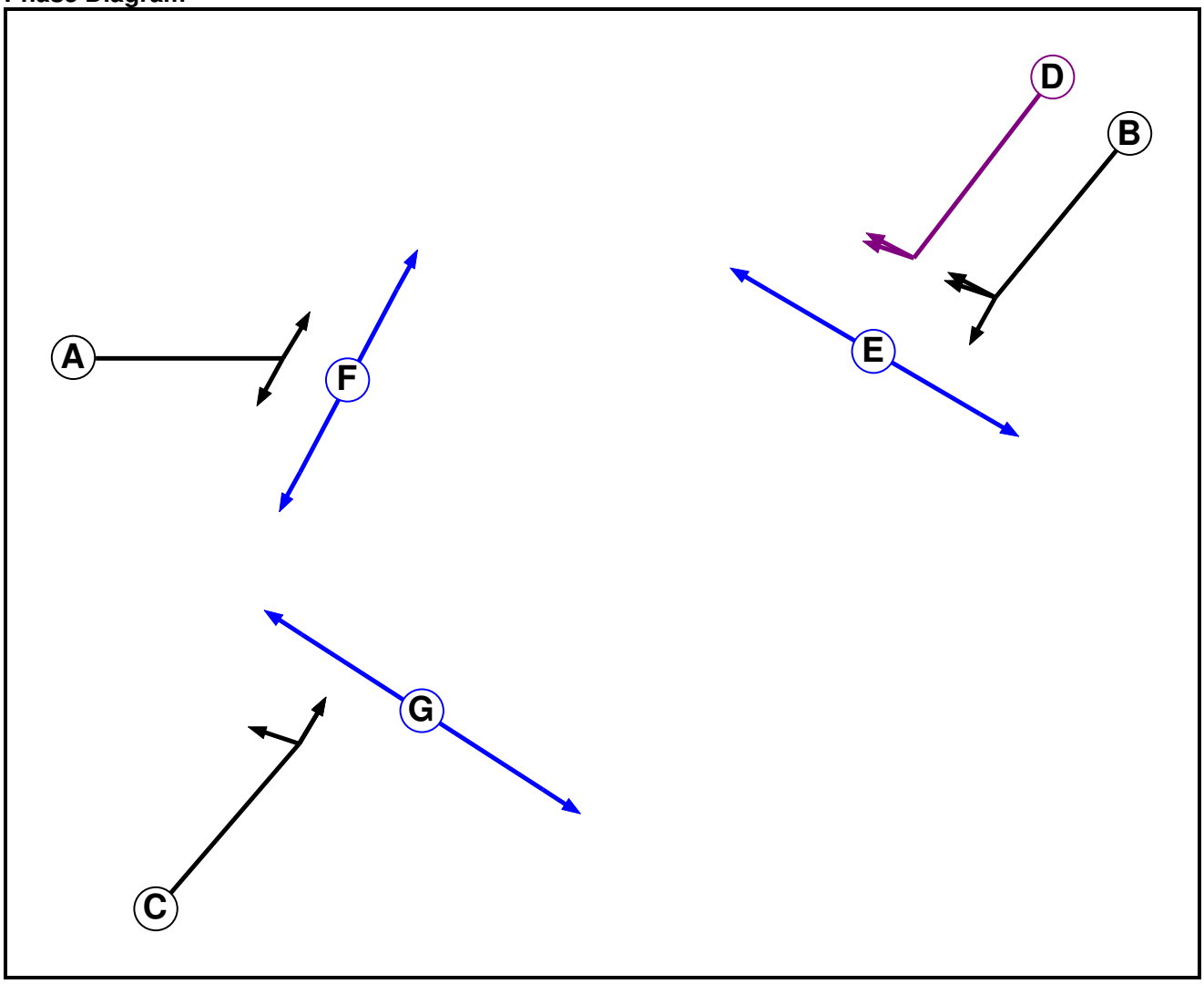
Project:	**Manston Airport DCO EIA**
Title:	**Junction 15**
Location:	
File name:	Junction 15_Mitigation-No NashRd.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX
Notes:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Ind. Arrow	B	4	4
E	Pedestrian		6	6
F	Pedestrian		6	6
G	Pedestrian		6	6

Full Input Data And Results

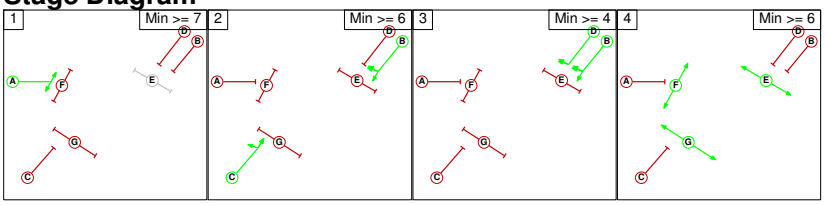
Phase Intergreens Matrix

		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		6	5	5	-	5	10
	B	5		-	-	5	-	9
	C	5	-		5	-	9	6
	D	5	-	5		5	11	-
	E	-	8	-	8		-	-
	F	10	-	10	10	-		-
	G	13	13	13	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A
2	B C
3	B D
4	E F G

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

		To Stage			
		1	2	3	4
From Stage	1		6	X	10
	2	5		5	9
	3	5	5		11
	4	13	13	X	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd

Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
2/2 (College Road)	5/1 (Right)	1439	0	1/1	1.09	All	5.00	5.00	0.50	5	3.00
				1/2	1.09	All					
7/1 (College Road to Tivoli Road)	4/2 (Right)	850	0	3/1	0.35	To 4/2 (Left)	-	-	-	-	-
				1/1	0.35	None					

Full Input Data And Results

Lane Input Data

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Manston Road south (Entry))	U	C	2	3	11.0	Geom	-	3.46	0.00	Y	Arm 4 Ahead	124.26
											Arm 5 Left	18.80
1/2 (Manston Road south (Entry))	U	C	2	3	60.0	Geom	-	2.25	0.00	N	Arm 4 Ahead	71.38
2/1 (College Road)	U	B	2	3	60.0	Geom	-	3.29	0.00	Y	Arm 6 Ahead	70.25
2/2 (College Road)	O	B D	2	3	13.0	Geom	-	3.31	0.00	Y	Arm 5 Right	14.18
											Arm 7 Right	9.40
3/1 (Hartsdown Road Entry)	U	A	2	3	60.0	Geom	-	3.68	0.00	Y	Arm 4 Left	12.64
											Arm 6 Right	24.22
4/1 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/2 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Hartsdown Road Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Manston Road south (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (College Road to Tivoli Road)	O		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Right	15.00

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
3: '2039 + Dev Traffic - AM Peak'	07:45	08:45	01:00	
4: '2039 + Dev Traffic - PM Peak'	16:45	17:45	01:00	

Scenario 1: '2039 AM Peak' (FG1: '2039 BASE AM', Plan 1: '2039 Base AM')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	3	224	209	436
	B	764	0	208	972
	C	577	514	0	1091
	Tot.	1344	738	417	2499

Traffic Lane Flows

Lane	Scenario 1: 2039 AM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (short)	397
1/2 (with short)	972(In) 575(Out)
2/1 (with short)	436(In) 224(Out)
2/2 (short)	212
3/1	1091
4/1	189
4/2	1155
5/1	417
6/1	738
7/1	3

Lane Saturation Flows

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Manston Road south (Entry))	3.46	0.00	Y	Arm 4 Ahead	124.26	47.6 %	1872	1872
				Arm 5 Left	18.80	52.4 %		
1/2 (Manston Road south (Entry))	2.25	0.00	N	Arm 4 Ahead	71.38	100.0 %	1939	1939
2/1 (College Road)	3.29	0.00	Y	Arm 6 Ahead	70.25	100.0 %	1903	1903
2/2 (College Road)	3.31	0.00	Y	Arm 5 Right	14.18	98.6 %	1759	1759
				Arm 7 Right	9.40	1.4 %		
3/1 (Hartsdown Road Entry)	3.68	0.00	Y	Arm 4 Left	12.64	52.9 %	1816	1816
				Arm 6 Right	24.22	47.1 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Scenario 2: '2039 PM Peak' (FG2: '2039 BASE PM', Plan 2: '2039 Base PM')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	12	250	228	490
	B	818	0	275	1093
	C	435	235	0	670
	Tot.	1265	485	503	2253

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2039 PM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (short)	456
1/2 (with short)	1093(In) 637(Out)
2/1 (with short)	490(In) 250(Out)
2/2 (short)	240
3/1	670
4/1	181
4/2	1084
5/1	503
6/1	485
7/1	12

Lane Saturation Flows

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	3.46	0.00	Y	Arm 4 Ahead	124.26	39.7 %	1862	1862
				Arm 5 Left	18.80	60.3 %		
1/2 (Manston Road south (Entry))	2.25	0.00	N	Arm 4 Ahead	71.38	100.0 %	1939	1939
2/1 (College Road)	3.29	0.00	Y	Arm 6 Ahead	70.25	100.0 %	1903	1903
2/2 (College Road)	3.31	0.00	Y	Arm 5 Right	14.18	95.0 %	1756	1756
				Arm 7 Right	9.40	5.0 %		
3/1 (Hartsdown Road Entry)	3.68	0.00	Y	Arm 4 Left	12.64	64.9 %	1805	1805
				Arm 6 Right	24.22	35.1 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Full Input Data And Results

Scenario 3: '2039 + Dev Traffic - AM Peak' (FG3: '2039 + Dev Traffic - AM Peak', Plan 3: '2039 B+D AM')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	3	244	234	481
	B	802	0	229	1031
	C	517	545	0	1062
	Tot.	1322	789	463	2574

Traffic Lane Flows

Lane	Scenario 3: 2039 + Dev Traffic - AM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (short)	436
1/2 (with short)	1031(In) 595(Out)
2/1 (with short)	481(In) 244(Out)
2/2 (short)	237
3/1	1062
4/1	207
4/2	1115
5/1	463
6/1	789
7/1	3

Lane Saturation Flows

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Manston Road south (Entry))	3.46	0.00	Y	Arm 4 Ahead	124.26	47.5 %	1872	1872
				Arm 5 Left	18.80	52.5 %		
1/2 (Manston Road south (Entry))	2.25	0.00	N	Arm 4 Ahead	71.38	100.0 %	1939	1939
2/1 (College Road)	3.29	0.00	Y	Arm 6 Ahead	70.25	100.0 %	1903	1903
2/2 (College Road)	3.31	0.00	Y	Arm 5 Right	14.18	98.7 %	1759	1759
				Arm 7 Right	9.40	1.3 %		
3/1 (Hartsdown Road Entry)	3.68	0.00	Y	Arm 4 Left	12.64	48.7 %	1820	1820
				Arm 6 Right	24.22	51.3 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Scenario 4: '2039 + Dev Traffic - PM Peak' (FG4: '2039 + Dev Traffic - PM Peak', Plan 4: '2039 B+D PM')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	5	230	222	457
	B	791	0	292	1083
	C	518	252	0	770
	Tot.	1314	482	514	2310

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 2039 + Dev Traffic - PM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (short)	453
1/2 (with short)	1083(In) 630(Out)
2/1 (with short)	457(In) 230(Out)
2/2 (short)	227
3/1	770
4/1	161
4/2	1153
5/1	514
6/1	482
7/1	5

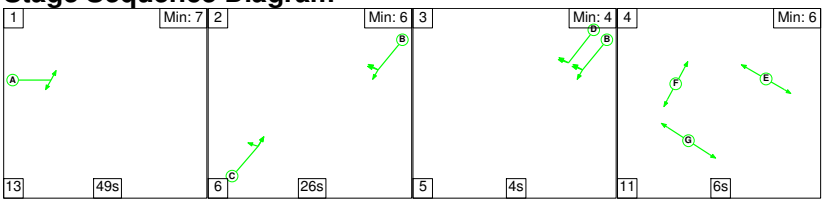
Lane Saturation Flows

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	3.46	0.00	Y	Arm 4 Ahead	124.26	35.5 %	1857	1857
				Arm 5 Left	18.80	64.5 %		
1/2 (Manston Road south (Entry))	2.25	0.00	N	Arm 4 Ahead	71.38	100.0 %	1939	1939
2/1 (College Road)	3.29	0.00	Y	Arm 6 Ahead	70.25	100.0 %	1903	1903
2/2 (College Road)	3.31	0.00	Y	Arm 5 Right	14.18	97.8 %	1758	1758
				Arm 7 Right	9.40	2.2 %		
3/1 (Hartsdown Road Entry)	3.68	0.00	Y	Arm 4 Left	12.64	67.3 %	1803	1803
				Arm 6 Right	24.22	32.7 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Full Input Data And Results

Scenario 1: '2039 AM Peak' (FG1: '2039 BASE AM', Plan 1: '2039 Base AM')

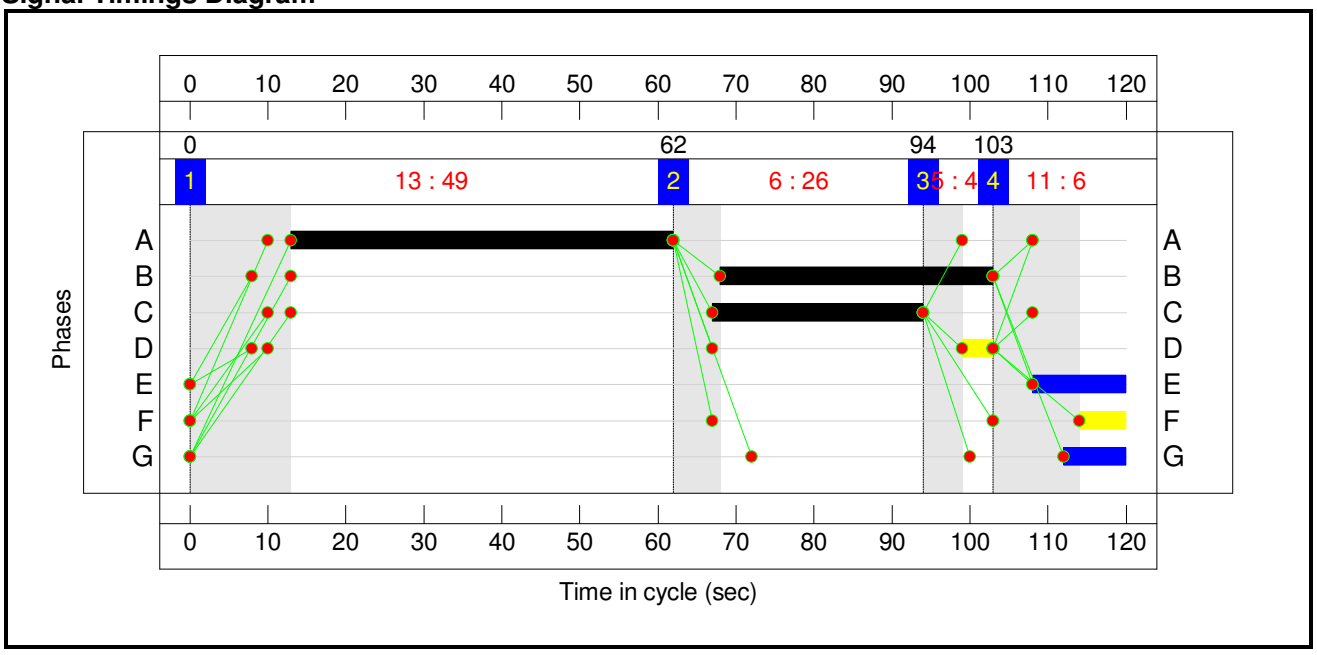
Stage Sequence Diagram



Stage Timings

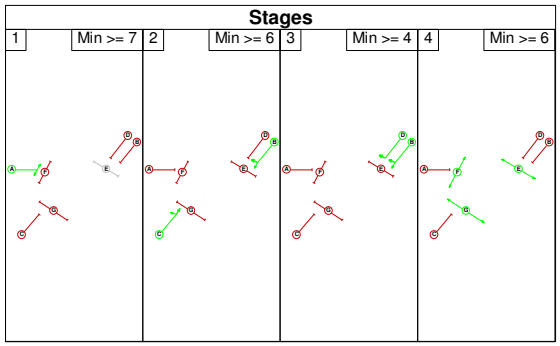
Stage	1	2	3	4
Duration	49	26	4	6
Change Point	0	62	94	103

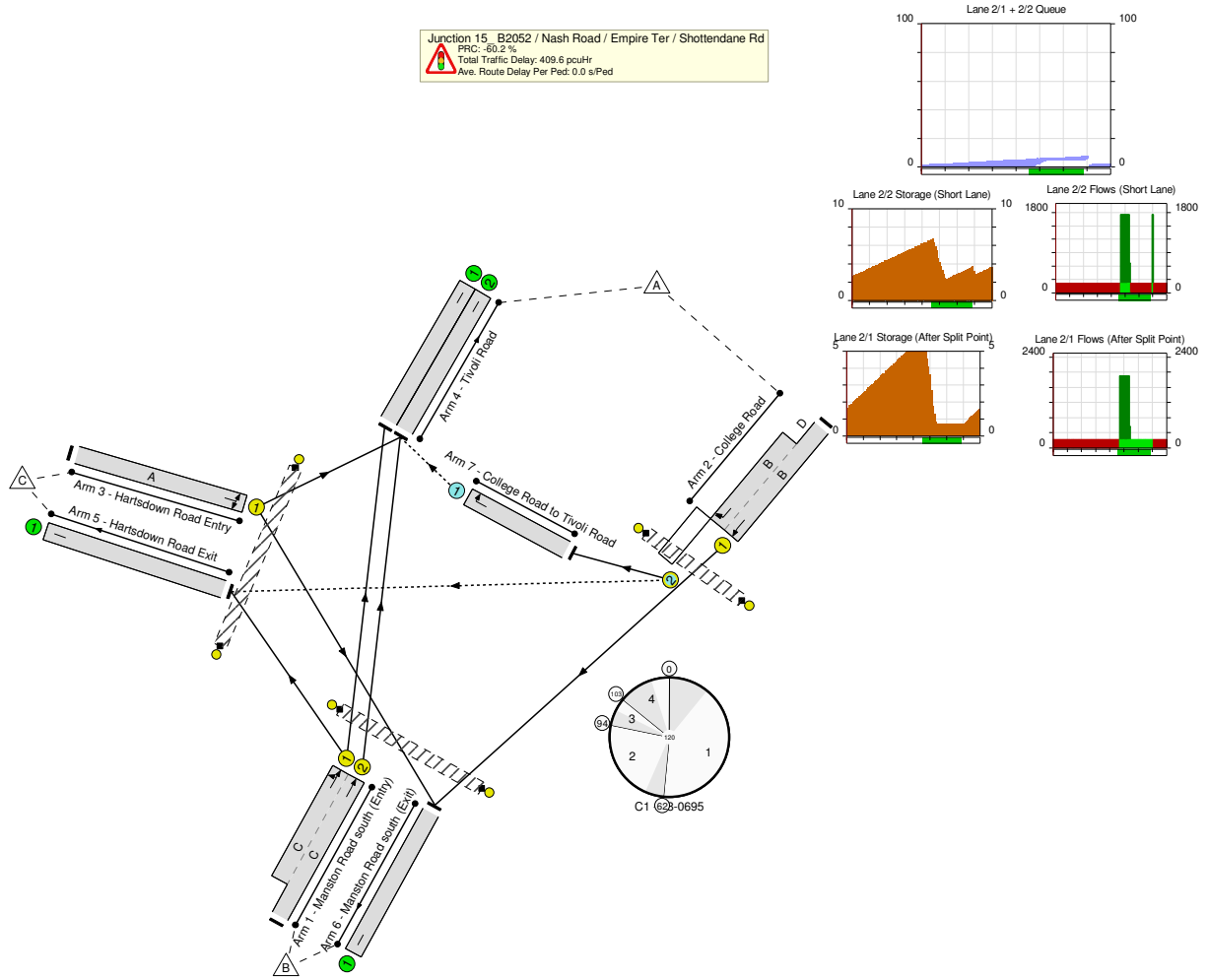
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	-	-	**N/A**	-	-		-	-	-	-	-	-	**144.2%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**144.2%**
1/2+1/1	Manston Road south (Entry) Ahead Left	U	N/A	N/A	C		1	27	-	972	1939:1872	405+280	141.8 : 141.8%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	B	D	1	35	4	436	1903:1759	192+181	116.8 : 116.8%
3/1	Hartsdown Road Entry Left Right	U	N/A	N/A	A		1	49	-	1091	1816	757	144.2%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	189	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	1155	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	417	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	738	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	3	1764	710	0.4%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	E		1	12	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	G		1	8	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	F		1	6	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**105**	**76**	**60.2**	**348.4**	**1.0**	**409.6**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**105**	**76**	**60.2**	**348.4**	**1.0**	**409.6**	**-**	**-**	**-**	**-**
1/2+1/1	972	685	-	-	-	25.6	145.1	-	170.6	631.9	37.7	145.1	182.8
2/1+2/2	436	405	0	103	76	5.4	34.5	1.0	41.0	338.4	8.1	34.5	42.6
3/1	1091	757	-	-	-	29.2	168.8	-	198.0	653.4	47.5	168.8	216.3
4/1	133	133	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	808	808	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	326	326	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	580	580	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	3	3	0	3	0	0.0	0.0	-	0.0	2.5	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

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PRC for Signalled Lanes (%): -60.2
PRC Over All Lanes (%): -60.2

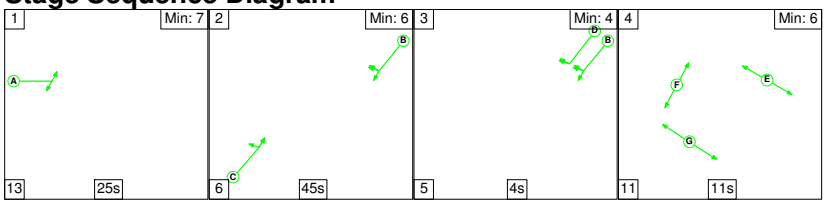
Total Delay for Signalled Lanes (pcuHr): 409.61
Total Delay Over All Lanes(pcuHr): 409.61

Cycle Time (s): 120

Full Input Data And Results

Scenario 2: '2039 PM Peak' (FG2: '2039 BASE PM', Plan 2: '2039 Base PM')

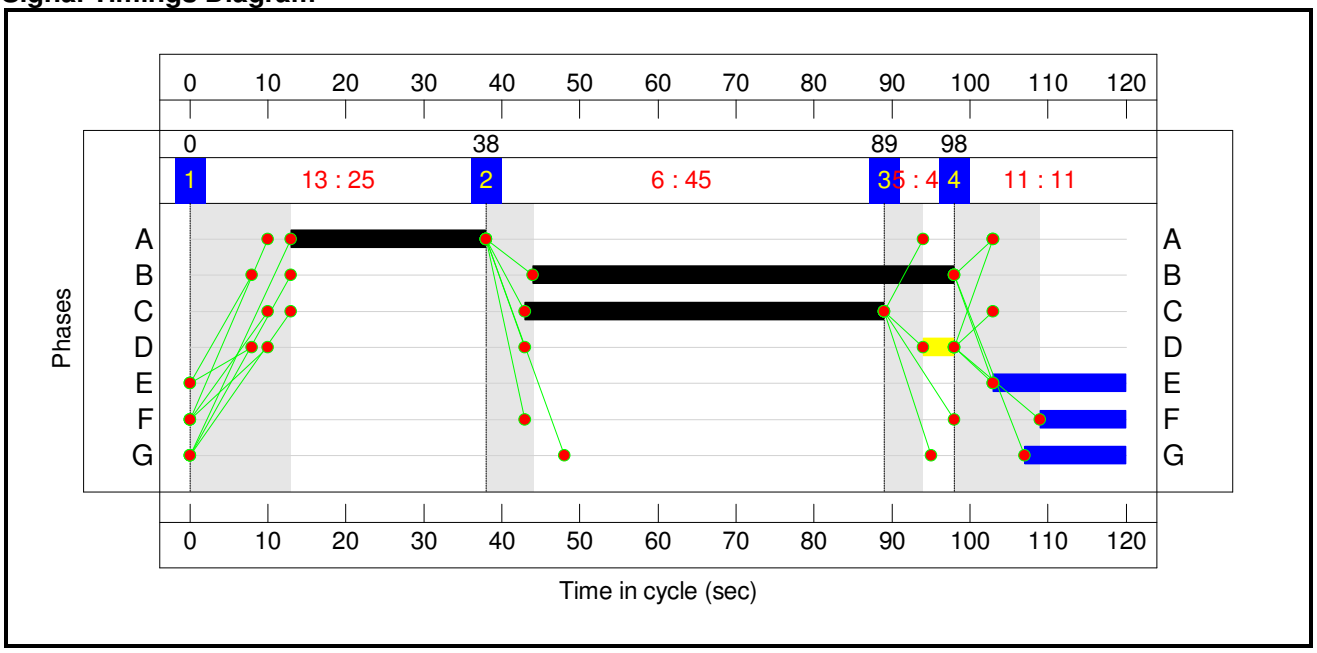
Stage Sequence Diagram



Stage Timings

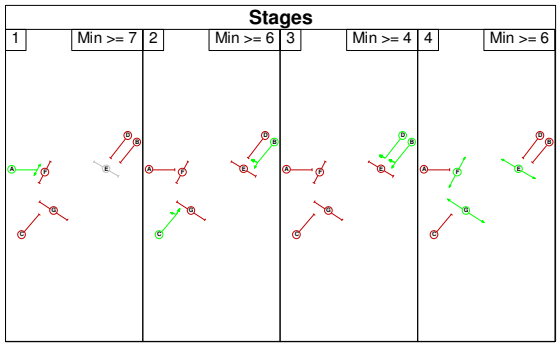
Stage	1	2	3	4
Duration	25	45	4	11
Change Point	0	38	89	98

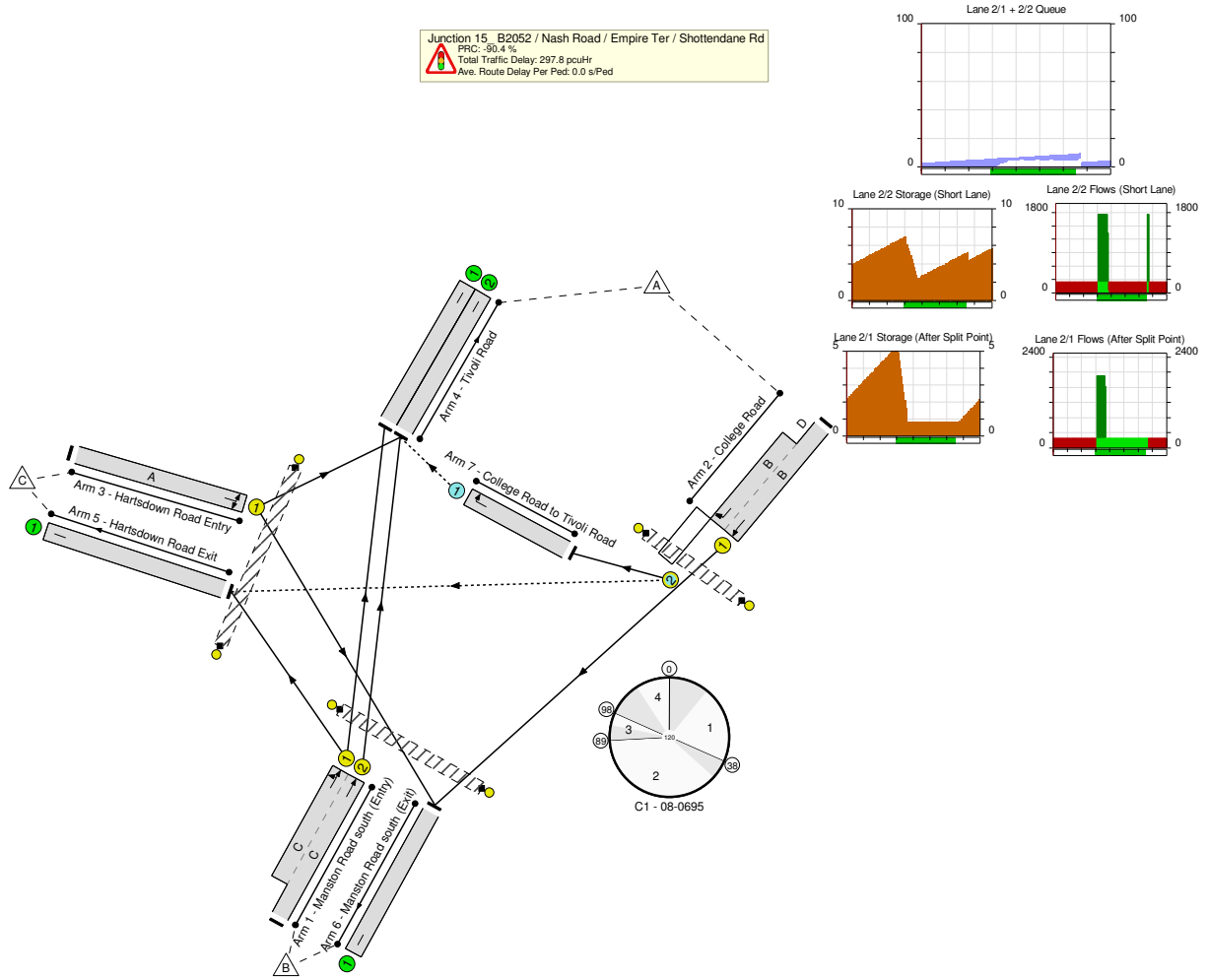
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**171.3%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**171.3%**
1/2+1/1	Manston Road south (Entry) Ahead Left	U	N/A	N/A	C		1	46	-	1093	1939:1862	580+415	109.8 : 109.8%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	B	D	1	54	4	490	1903:1756	195+187	128.2 : 128.2%
3/1	Hartsdown Road Entry Left Right	U	N/A	N/A	A		1	25	-	670	1805	391	171.3%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	181	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	1084	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	503	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	485	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	12	1764	761	1.2%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	E		1	17	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	G		1	13	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	F		1	11	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**112**	**75**	**45.3**	**250.8**	**1.8**	**297.8**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**112**	**75**	**45.3**	**250.8**	**1.8**	**297.8**	**-**	**-**	**-**	**-**
1/2+1/1	1093	995	-	-	-	14.8	54.0	-	68.8	226.5	34.6	54.0	88.6
2/1+2/2	490	437	0	102	75	5.3	56.1	1.8	63.2	464.1	9.8	56.1	65.9
3/1	670	391	-	-	-	25.2	140.6	-	165.9	891.2	33.3	140.6	173.9
4/1	165	165	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	843	843	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	428	428	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	387	387	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	9	9	0	9	0	0.0	0.0	-	0.0	2.4	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

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PRC for Signalled Lanes (%): -90.4
PRC Over All Lanes (%): -90.4

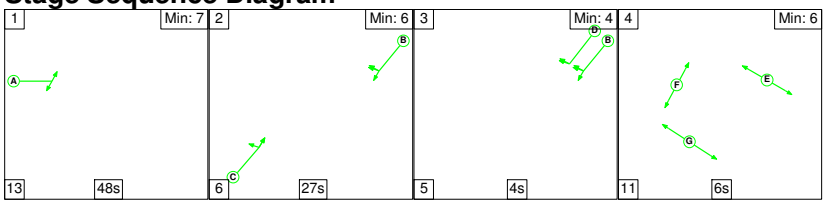
Total Delay for Signalled Lanes (pcuHr): 297.82
Total Delay Over All Lanes(pcuHr): 297.82

Cycle Time (s): 120

Full Input Data And Results

Scenario 3: '2039 + Dev Traffic - AM Peak' (FG3: '2039 + Dev Traffic - AM Peak', Plan 3: '2039 B+D AM')

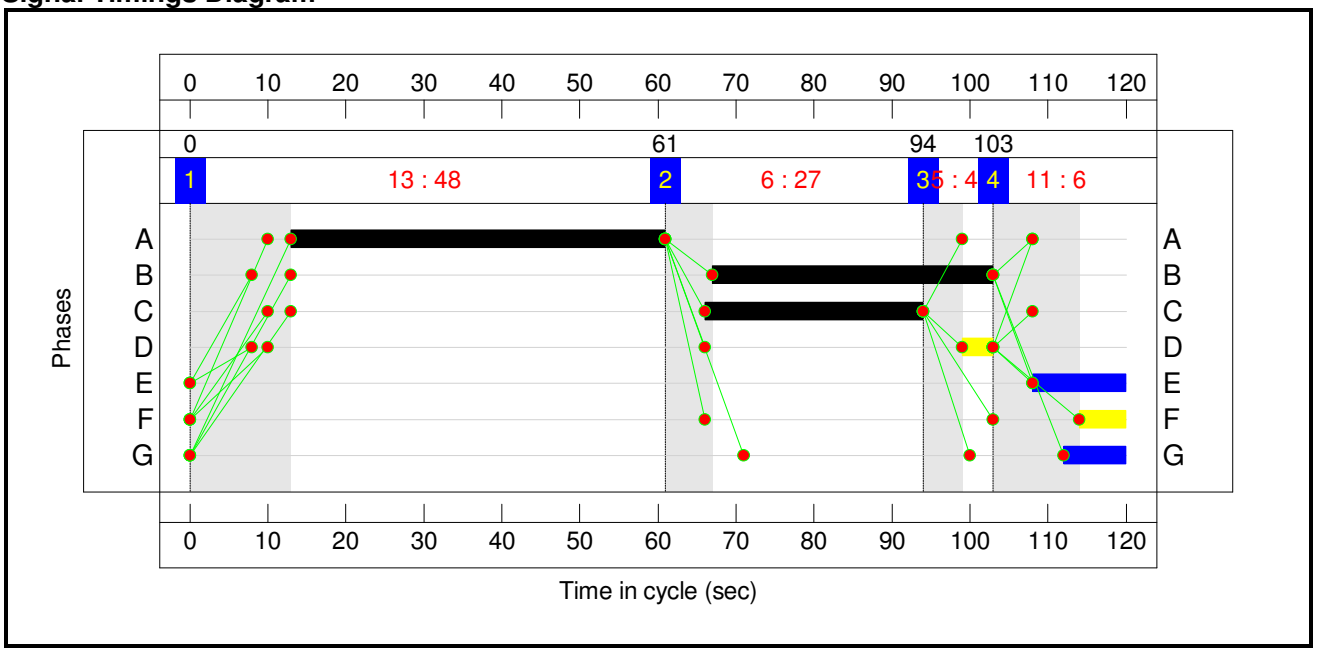
Stage Sequence Diagram



Stage Timings

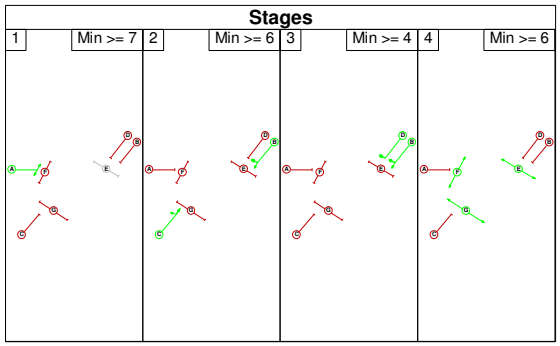
Stage	1	2	3	4
Duration	48	27	4	6
Change Point	0	61	94	103

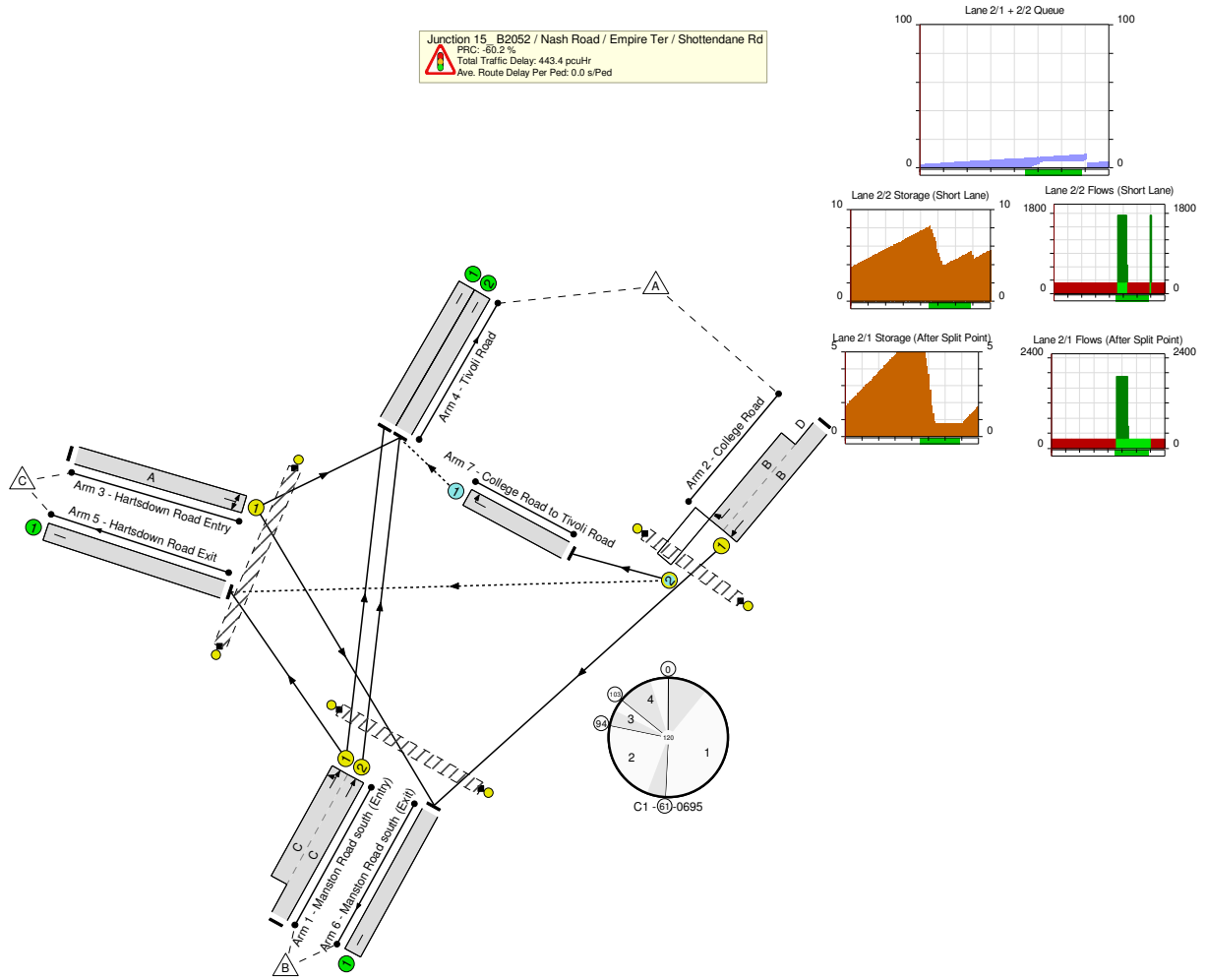
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**144.2%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**144.2%**
1/2+1/1	Manston Road south (Entry) Ahead Left	U	N/A	N/A	C		1	28	-	1031	1939:1872	413+302	144.2 : 144.2%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	B	D	1	36	4	481	1903:1759	187+181	130.8 : 130.8%
3/1	Hartsdown Road Entry Left Right	U	N/A	N/A	A		1	48	-	1062	1820	743	142.9%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	207	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	1115	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	463	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	789	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	3	1764	723	0.3%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	E		1	12	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	G		1	8	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	F		1	6	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**105**	**76**	**63.1**	**379.3**	**1.0**	**443.4**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**105**	**76**	**63.1**	**379.3**	**1.0**	**443.4**	**-**	**-**	**-**	**-**
1/2+1/1	1031	715	-	-	-	27.9	159.6	-	187.5	654.7	40.8	159.6	200.4
2/1+2/2	481	425	0	103	76	6.9	58.6	1.0	66.6	498.5	9.8	58.6	68.4
3/1	1062	743	-	-	-	28.3	161.1	-	189.3	641.8	46.0	161.1	207.1
4/1	144	144	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	777	777	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	338	338	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	625	625	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	2	2	0	2	0	0.0	0.0	-	0.0	2.5	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

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PRC for Signalled Lanes (%): -60.2
PRC Over All Lanes (%): -60.2

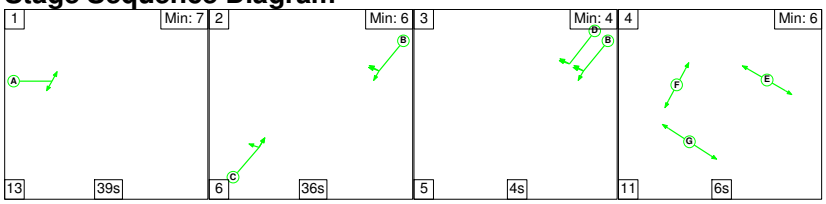
Total Delay for Signalled Lanes (pcuHr): 443.43
Total Delay Over All Lanes(pcuHr): 443.43

Cycle Time (s): 120

Full Input Data And Results

Scenario 4: '2039 + Dev Traffic - PM Peak' (FG4: '2039 + Dev Traffic - PM Peak', Plan 4: '2039 B+D PM')

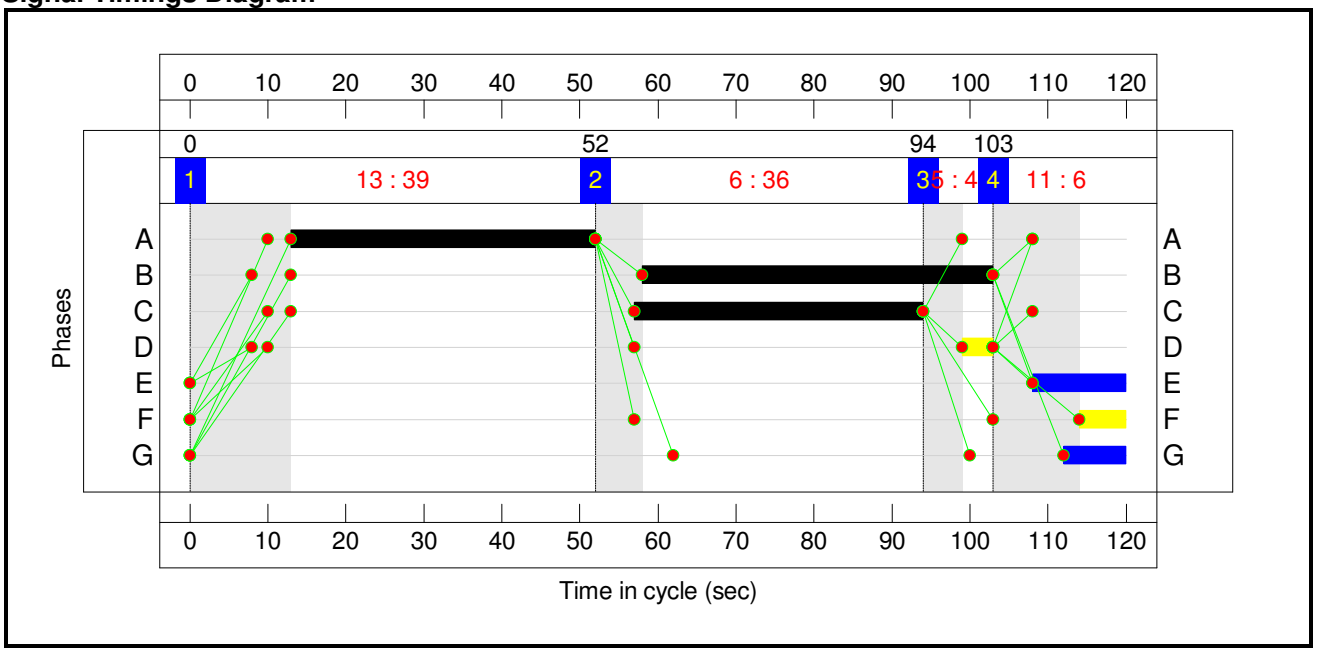
Stage Sequence Diagram



Stage Timings

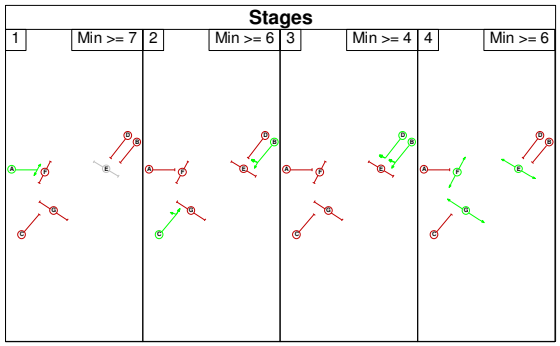
Stage	1	2	3	4
Duration	39	36	4	6
Change Point	0	52	94	103

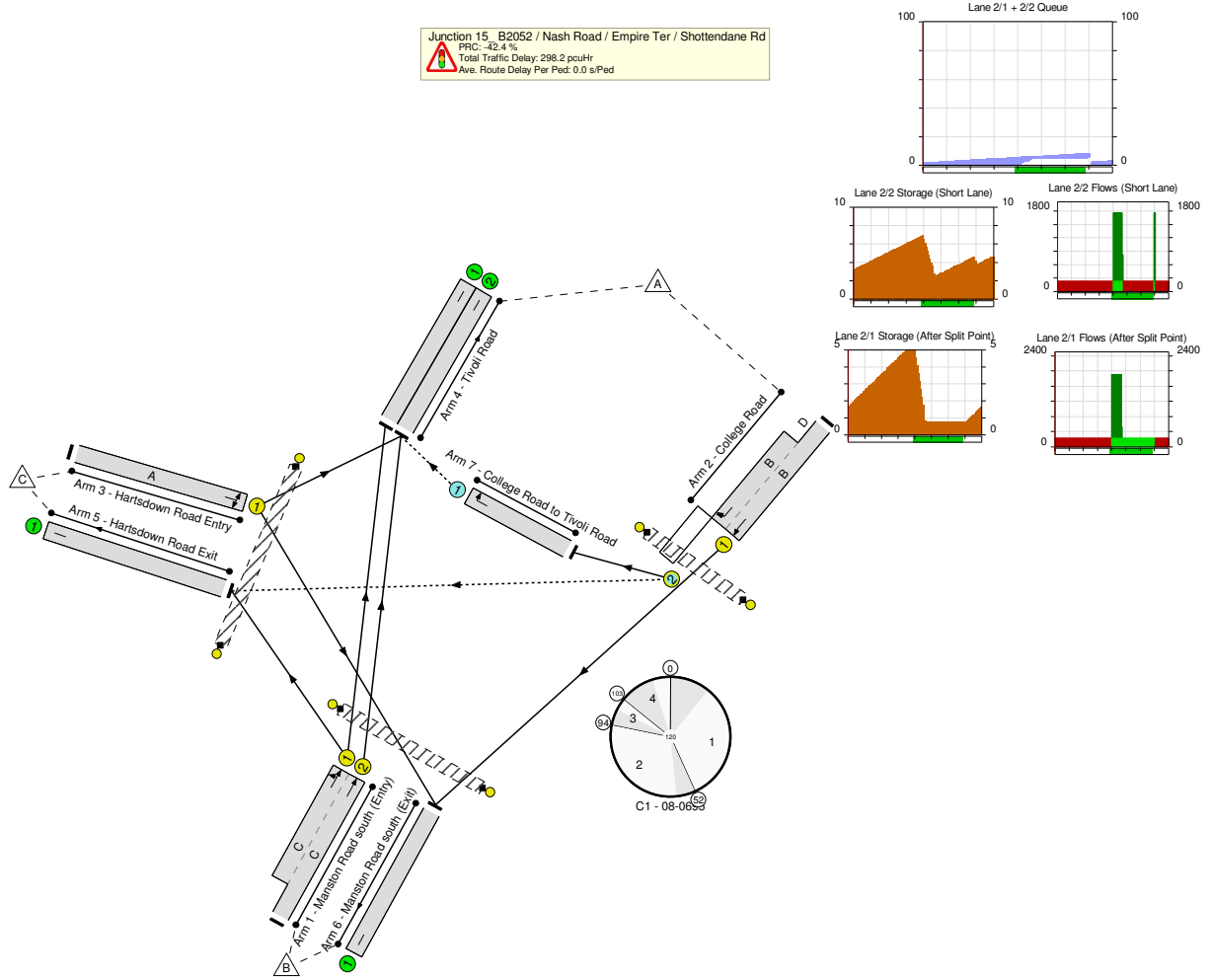
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**128.1%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**128.1%**
1/2+1/1	Manston Road south (Entry) Ahead Left	U	N/A	N/A	C		1	37	-	1083	1939:1857	496+357	127.0 : 127.0%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	B	D	1	45	4	457	1903:1758	185+183	124.3 : 124.3%
3/1	Hartsdown Road Entry Left Right	U	N/A	N/A	A		1	39	-	770	1803	601	128.1%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	161	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	1153	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	514	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	482	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	5	1764	708	0.6%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	E		1	12	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	G		1	8	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	F		1	6	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**107**	**76**	**45.6**	**251.1**	**1.4**	**298.2**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**107**	**76**	**45.6**	**251.1**	**1.4**	**298.2**	**-**	**-**	**-**	**-**
1/2+1/1	1083	853	-	-	-	22.1	117.4	-	139.4	463.5	38.6	117.4	155.9
2/1+2/2	457	413	0	103	76	5.4	47.0	1.4	53.8	423.9	9.0	47.0	56.1
3/1	770	601	-	-	-	18.2	86.7	-	104.9	490.5	31.3	86.7	118.0
4/1	127	127	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	904	904	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	409	409	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	427	427	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	4	4	0	4	0	0.0	0.0	-	0.0	2.6	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 - 08-0695

PRC for Signalled Lanes (%): -42.4
PRC Over All Lanes (%): -42.4

Total Delay for Signalled Lanes (pcuHr): 298.16
Total Delay Over All Lanes(pcuHr): 298.16

Cycle Time (s): 120

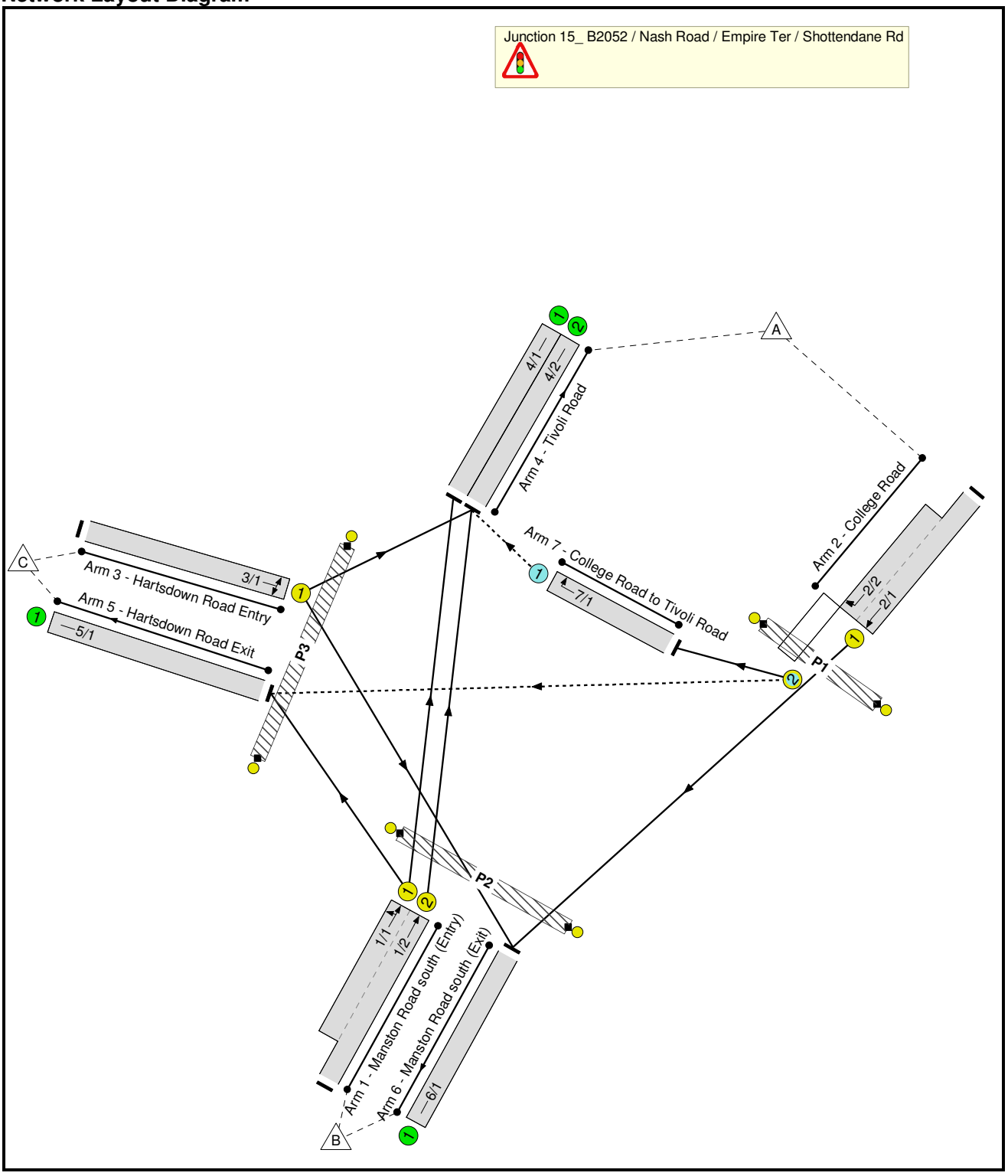
Full Input Data And Results

User and Project Details

Project:	**Manston Airport DCO EIA**
Title:	**Junction 15**
Location:	
File name:	Junction 15_Mitigation-No NashRd_LP_Mit_RevA.lsg3x
Author:	FOUDA
Company:	Wood
Address:	LEAMINGTON SPA- GABLES HOUSE, KENILWORTH-ROAD,WARWICKSHIRE CV32 6JX
Notes:	

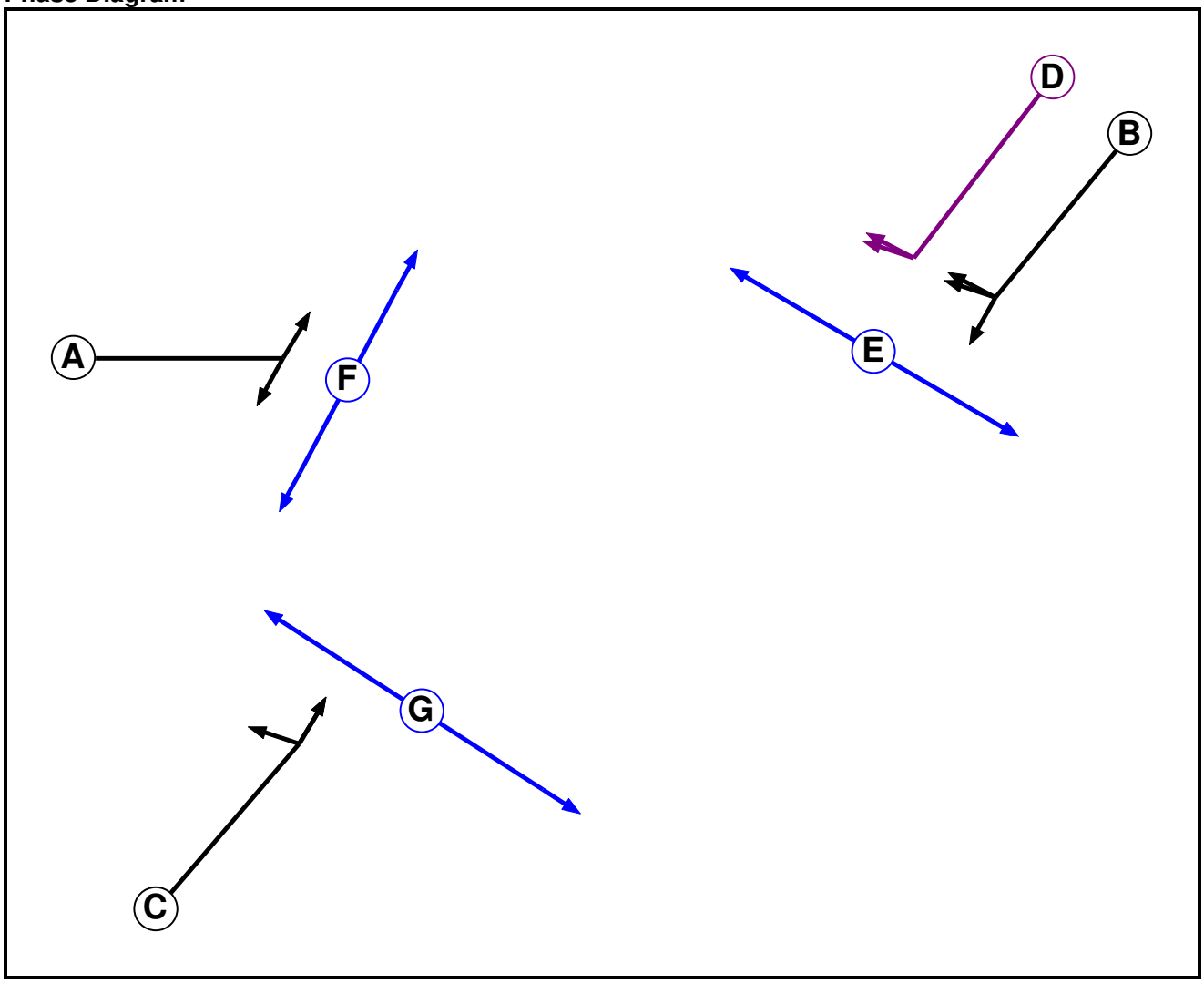
Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Ind. Arrow	B	4	4
E	Pedestrian		6	6
F	Pedestrian		6	6
G	Pedestrian		6	6

Full Input Data And Results

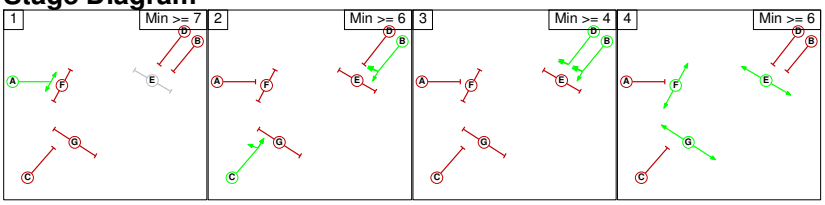
Phase Intergreens Matrix

		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		6	5	5	-	5	10
	B	5		-	-	5	-	9
	C	5	-		5	-	9	6
	D	5	-	5		5	11	-
	E	-	8	-	8		-	-
	F	10	-	10	10	-		-
	G	13	13	13	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A
2	B C
3	B D
4	E F G

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

		To Stage			
		1	2	3	4
From Stage	1		6	X	10
	2	5		5	9
	3	5	5		11
	4	13	13	X	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd

Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
2/2 (College Road)	5/1 (Right)	1439	0	1/1	1.09	All	5.00	5.00	0.50	5	3.00
				1/2	1.09	All					
7/1 (College Road to Tivoli Road)	4/2 (Right)	850	0	3/1	0.35	To 4/2 (Left)	-	-	-	-	-
				1/1	0.35	None					

Full Input Data And Results

Lane Input Data

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Manston Road south (Entry))	U	C	2	3	11.0	Geom	-	3.46	0.00	Y	Arm 4 Ahead	124.26
											Arm 5 Left	18.80
1/2 (Manston Road south (Entry))	U	C	2	3	60.0	Geom	-	3.25	0.00	N	Arm 4 Ahead	71.38
2/1 (College Road)	U	B	2	3	60.0	Geom	-	3.29	0.00	Y	Arm 6 Ahead	70.25
2/2 (College Road)	O	B D	2	3	13.0	Geom	-	3.31	0.00	Y	Arm 5 Right	14.18
											Arm 7 Right	9.40
3/1 (Hartsdown Road Entry)	U	A	2	3	60.0	Geom	-	3.68	0.00	Y	Arm 4 Left	12.64
											Arm 6 Right	24.22
4/1 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/2 (Tivoli Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Hartsdown Road Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Manston Road south (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (College Road to Tivoli Road)	O		2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Right	15.00

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
3: '2039 + Dev Traffic - AM Peak'	07:45	08:45	01:00	
4: '2039 + Dev Traffic - PM Peak'	16:45	17:45	01:00	

Scenario 1: '2039 AM Peak' (FG1: '2039 BASE AM', Plan 1: '2039 Base AM')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	3	224	209	436
	B	764	0	208	972
	C	577	514	0	1091
	Tot.	1344	738	417	2499

Traffic Lane Flows

Lane	Scenario 1: 2039 AM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (short)	397
1/2 (with short)	972(In) 575(Out)
2/1 (with short)	436(In) 224(Out)
2/2 (short)	212
3/1	1091
4/1	189
4/2	1155
5/1	417
6/1	738
7/1	3

Lane Saturation Flows

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Manston Road south (Entry))	3.46	0.00	Y	Arm 4 Ahead	124.26	47.6 %	1872	1872
				Arm 5 Left	18.80	52.4 %		
1/2 (Manston Road south (Entry))	3.25	0.00	N	Arm 4 Ahead	71.38	100.0 %	2037	2037
2/1 (College Road)	3.29	0.00	Y	Arm 6 Ahead	70.25	100.0 %	1903	1903
2/2 (College Road)	3.31	0.00	Y	Arm 5 Right	14.18	98.6 %	1759	1759
				Arm 7 Right	9.40	1.4 %		
3/1 (Hartsdown Road Entry)	3.68	0.00	Y	Arm 4 Left	12.64	52.9 %	1816	1816
				Arm 6 Right	24.22	47.1 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Scenario 2: '2039 PM Peak' (FG2: '2039 BASE PM', Plan 2: '2039 Base PM')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	12	250	228	490
	B	818	0	275	1093
	C	435	235	0	670
	Tot.	1265	485	503	2253

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2039 PM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (short)	456
1/2 (with short)	1093(In) 637(Out)
2/1 (with short)	490(In) 250(Out)
2/2 (short)	240
3/1	670
4/1	181
4/2	1084
5/1	503
6/1	485
7/1	12

Lane Saturation Flows

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	3.46	0.00	Y	Arm 4 Ahead	124.26	39.7 %	1862	1862
				Arm 5 Left	18.80	60.3 %		
1/2 (Manston Road south (Entry))	3.25	0.00	N	Arm 4 Ahead	71.38	100.0 %	2037	2037
2/1 (College Road)	3.29	0.00	Y	Arm 6 Ahead	70.25	100.0 %	1903	1903
2/2 (College Road)	3.31	0.00	Y	Arm 5 Right	14.18	95.0 %	1756	1756
				Arm 7 Right	9.40	5.0 %		
3/1 (Hartsdown Road Entry)	3.68	0.00	Y	Arm 4 Left	12.64	64.9 %	1805	1805
				Arm 6 Right	24.22	35.1 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Full Input Data And Results

Scenario 3: '2039 + Dev Traffic - AM Peak' (FG3: '2039 + Dev Traffic - AM Peak', Plan 3: '2039 B+D AM')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	3	244	234	481
	B	802	0	229	1031
	C	517	545	0	1062
	Tot.	1322	789	463	2574

Traffic Lane Flows

Lane	Scenario 3: 2039 + Dev Traffic - AM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (short)	436
1/2 (with short)	1031(In) 595(Out)
2/1 (with short)	481(In) 244(Out)
2/2 (short)	237
3/1	1062
4/1	207
4/2	1115
5/1	463
6/1	789
7/1	3

Lane Saturation Flows

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	3.46	0.00	Y	Arm 4 Ahead	124.26	47.5 %	1872	1872
				Arm 5 Left	18.80	52.5 %		
1/2 (Manston Road south (Entry))	3.25	0.00	N	Arm 4 Ahead	71.38	100.0 %	2037	2037
2/1 (College Road)	3.29	0.00	Y	Arm 6 Ahead	70.25	100.0 %	1903	1903
2/2 (College Road)	3.31	0.00	Y	Arm 5 Right	14.18	98.7 %	1759	1759
				Arm 7 Right	9.40	1.3 %		
3/1 (Hartsdown Road Entry)	3.68	0.00	Y	Arm 4 Left	12.64	48.7 %	1820	1820
				Arm 6 Right	24.22	51.3 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Scenario 4: '2039 + Dev Traffic - PM Peak' (FG4: '2039 + Dev Traffic - PM Peak', Plan 4: '2039 B+D PM')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	5	230	222	457
	B	791	0	292	1083
	C	518	252	0	770
	Tot.	1314	482	514	2310

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 2039 + Dev Traffic - PM Peak
Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	
1/1 (short)	453
1/2 (with short)	1083(In) 630(Out)
2/1 (with short)	457(In) 230(Out)
2/2 (short)	227
3/1	770
4/1	161
4/2	1153
5/1	514
6/1	482
7/1	5

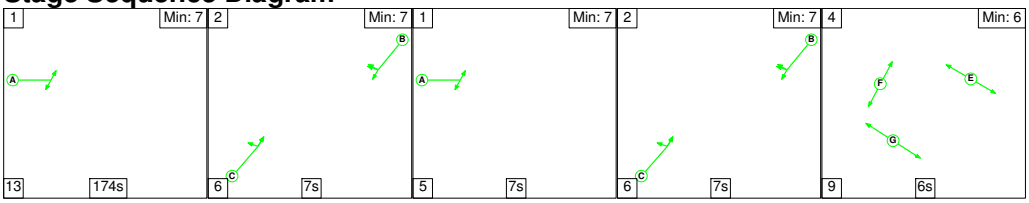
Lane Saturation Flows

Junction: Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Manston Road south (Entry))	3.46	0.00	Y	Arm 4 Ahead	124.26	35.5 %	1857	1857
				Arm 5 Left	18.80	64.5 %		
1/2 (Manston Road south (Entry))	3.25	0.00	N	Arm 4 Ahead	71.38	100.0 %	2037	2037
2/1 (College Road)	3.29	0.00	Y	Arm 6 Ahead	70.25	100.0 %	1903	1903
2/2 (College Road)	3.31	0.00	Y	Arm 5 Right	14.18	97.8 %	1758	1758
				Arm 7 Right	9.40	2.2 %		
3/1 (Hartsdown Road Entry)	3.68	0.00	Y	Arm 4 Left	12.64	67.3 %	1803	1803
				Arm 6 Right	24.22	32.7 %		
4/1 (Tivoli Road Lane 1)	Infinite Saturation Flow						Inf	Inf
4/2 (Tivoli Road Lane 2)	Infinite Saturation Flow						Inf	Inf
5/1 (Hartsdown Road Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Manston Road south (Exit) Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (College Road to Tivoli Road)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764	1764

Full Input Data And Results

Scenario 1: '2039 AM Peak' (FG1: '2039 BASE AM', Plan 1: '2039 Base AM')

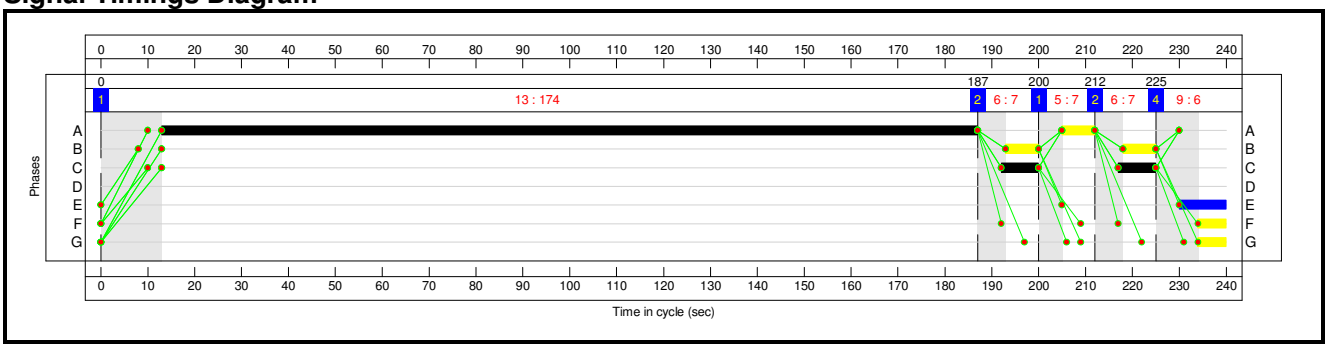
Stage Sequence Diagram



Stage Timings

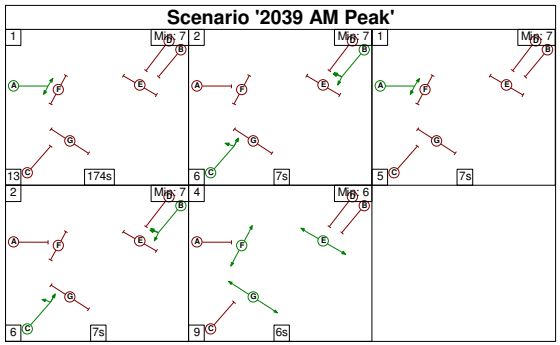
Stage	1	2	1	2	4
Duration	174	7	7	7	6
Change Point	0	187	200	212	225

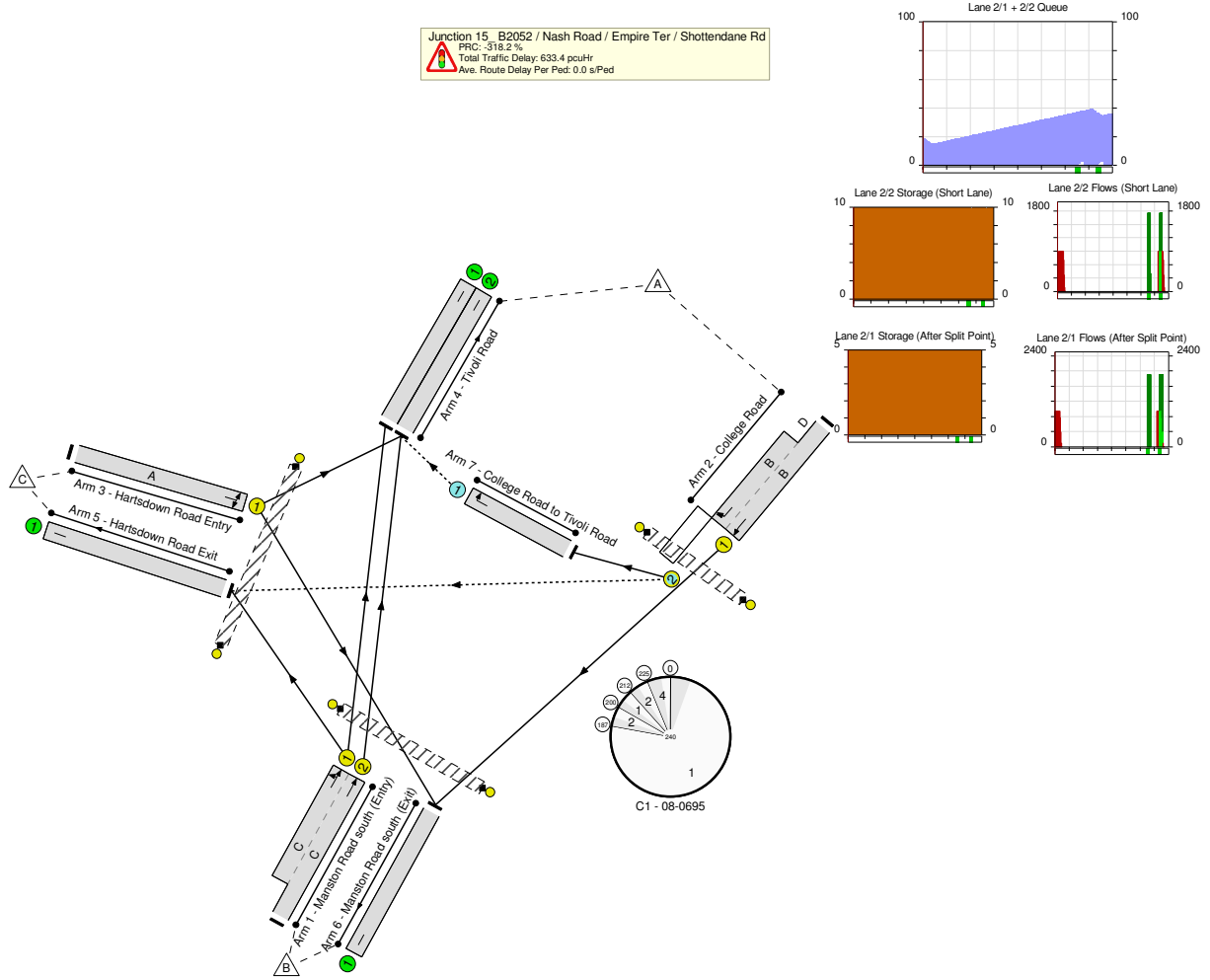
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	-	-	**N/A**	-	-		-	-	-	-	-	-	**376.4%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**376.4%**
1/2+1/1	Manston Road south (Entry) Ahead Left	U	N/A	N/A	C		2	16	-	972	2037:1872	153+105	376.4 : 376.4%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	B	D	2	14	0	436	1903:1759	127+91	176.6 : 232.2%
3/1	Hartsdown Road Entry Left Right	U	N/A	N/A	A		2	181	-	1091	1816	1385	78.8%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	189	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	1155	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	417	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	738	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	3	1764	648	0.2%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	E		1	10	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	G		1	6	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	F		1	6	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**1**	**90**	**162.0**	**469.3**	**2.1**	**633.4**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**1**	**90**	**162.0**	**469.3**	**2.1**	**633.4**	**-**	**-**	**-**	**-**
1/2+1/1	972	258	-	-	-	119.3	357.6	-	476.8	1765.9	142.4	357.6	499.9
2/1+2/2	436	218	0	0	90	38.3	109.9	2.1	150.3	1241.0	39.8	109.9	149.7
3/1	1091	1091	-	-	-	4.5	1.8	-	6.3	20.8	39.0	1.8	40.8
4/1	50	50	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	731	731	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	145	145	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	641	641	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	1	1	0	1	0	0.0	0.0	-	0.0	2.8	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

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PRC for Signalled Lanes (%): -318.2
PRC Over All Lanes (%): -318.2

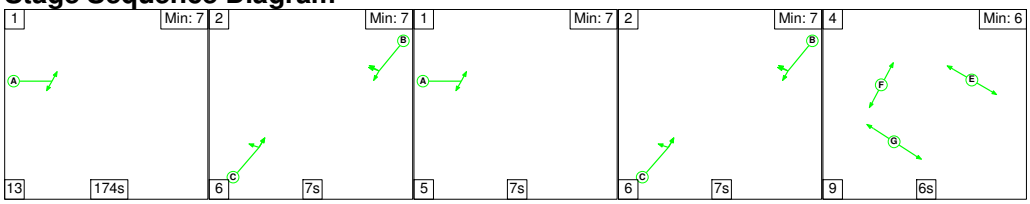
Total Delay for Signalled Lanes (pcuHr): 633.40
Total Delay Over All Lanes(pcuHr): 633.40

Cycle Time (s): 240

Full Input Data And Results

Scenario 2: '2039 PM Peak' (FG2: '2039 BASE PM', Plan 2: '2039 Base PM')

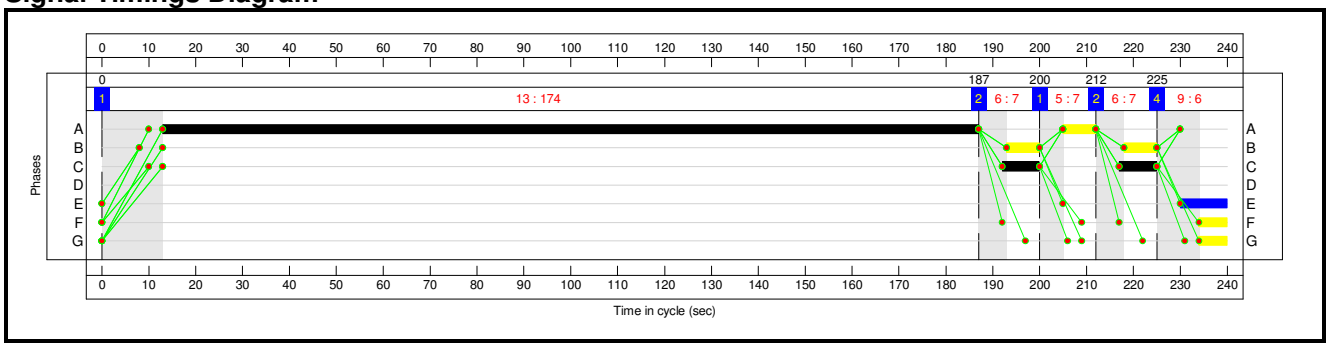
Stage Sequence Diagram



Stage Timings

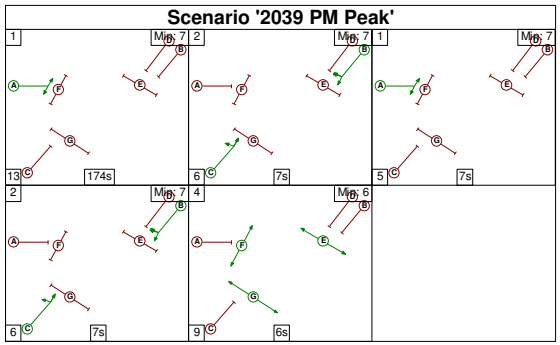
Stage	1	2	1	2	4
Duration	174	7	7	7	6
Change Point	0	187	200	212	225

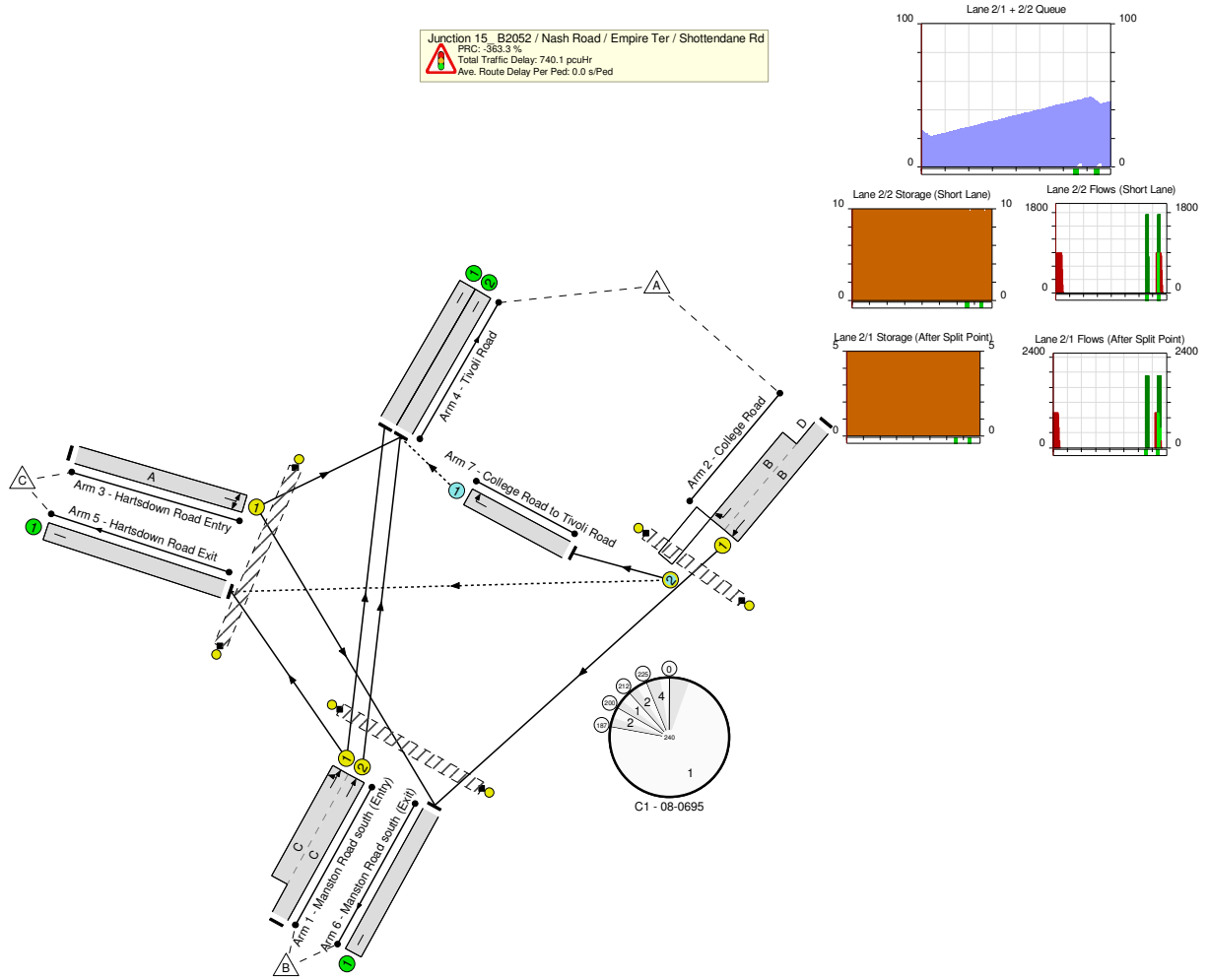
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**417.0%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**417.0%**
1/2+1/1	Manston Road south (Entry) Ahead Left	U	N/A	N/A	C		2	16	-	1093	2037:1862	153+109	417.0 : 417.0%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	B	D	2	14	0	490	1903:1756	127+95	197.1 : 253.3%
3/1	Hartsdown Road Entry Left Right	U	N/A	N/A	A		2	181	-	670	1805	1376	48.7%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	181	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	1084	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	503	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	485	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	12	1764	698	0.7%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	E		1	10	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	G		1	6	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	F		1	6	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**5**	**90**	**186.3**	**551.7**	**2.1**	**740.1**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**5**	**90**	**186.3**	**551.7**	**2.1**	**740.1**	**-**	**-**	**-**	**-**
1/2+1/1	1093	262	-	-	-	138.5	416.1	-	554.6	1826.6	164.5	416.1	580.6
2/1+2/2	490	222	0	0	90	46.5	135.1	2.1	183.7	1349.9	49.3	135.1	184.4
3/1	670	670	-	-	-	1.3	0.5	-	1.8	9.7	12.7	0.5	13.2
4/1	43	43	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	593	593	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	156	156	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	362	362	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	5	5	0	5	0	0.0	0.0	-	0.0	2.6	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

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PRC for Signalled Lanes (%): -363.3
PRC Over All Lanes (%): -363.3

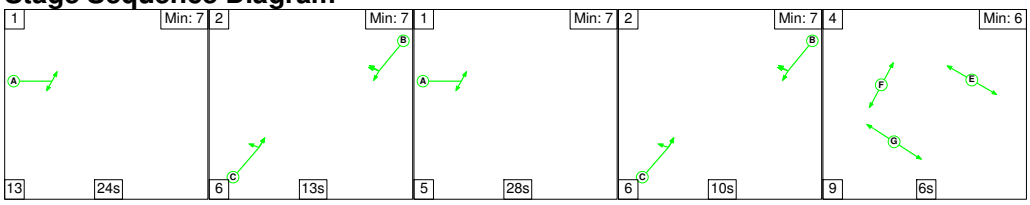
Total Delay for Signalled Lanes (pcuHr): 740.13
Total Delay Over All Lanes(pcuHr): 740.13

Cycle Time (s): 240

Full Input Data And Results

Scenario 3: '2039 + Dev Traffic - AM Peak' (FG3: '2039 + Dev Traffic - AM Peak', Plan 3: '2039 B+D AM')

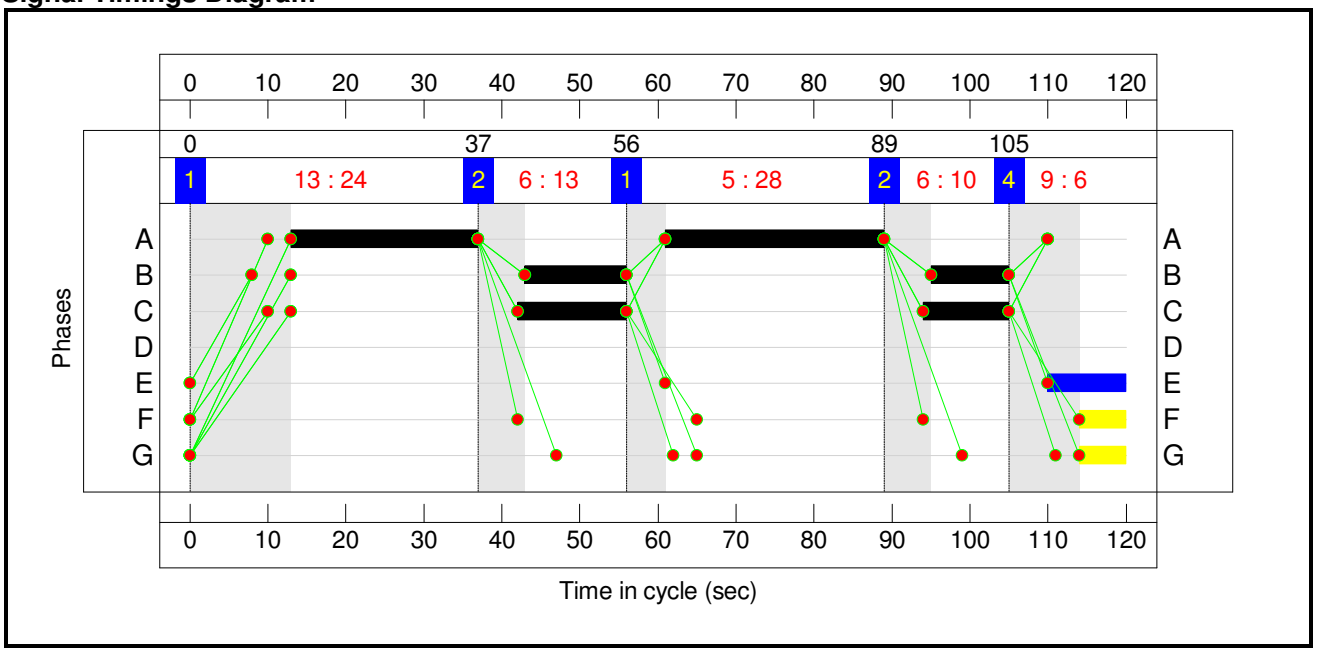
Stage Sequence Diagram



Stage Timings

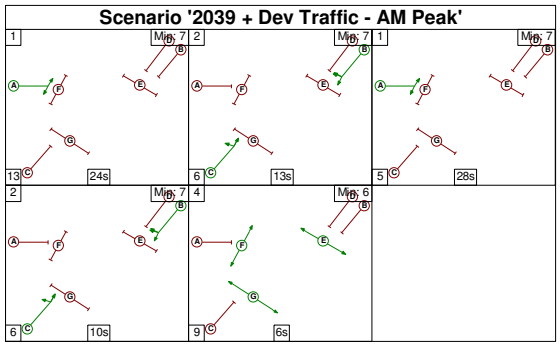
Stage	1	2	1	2	4
Duration	24	13	28	10	6
Change Point	0	37	56	89	105

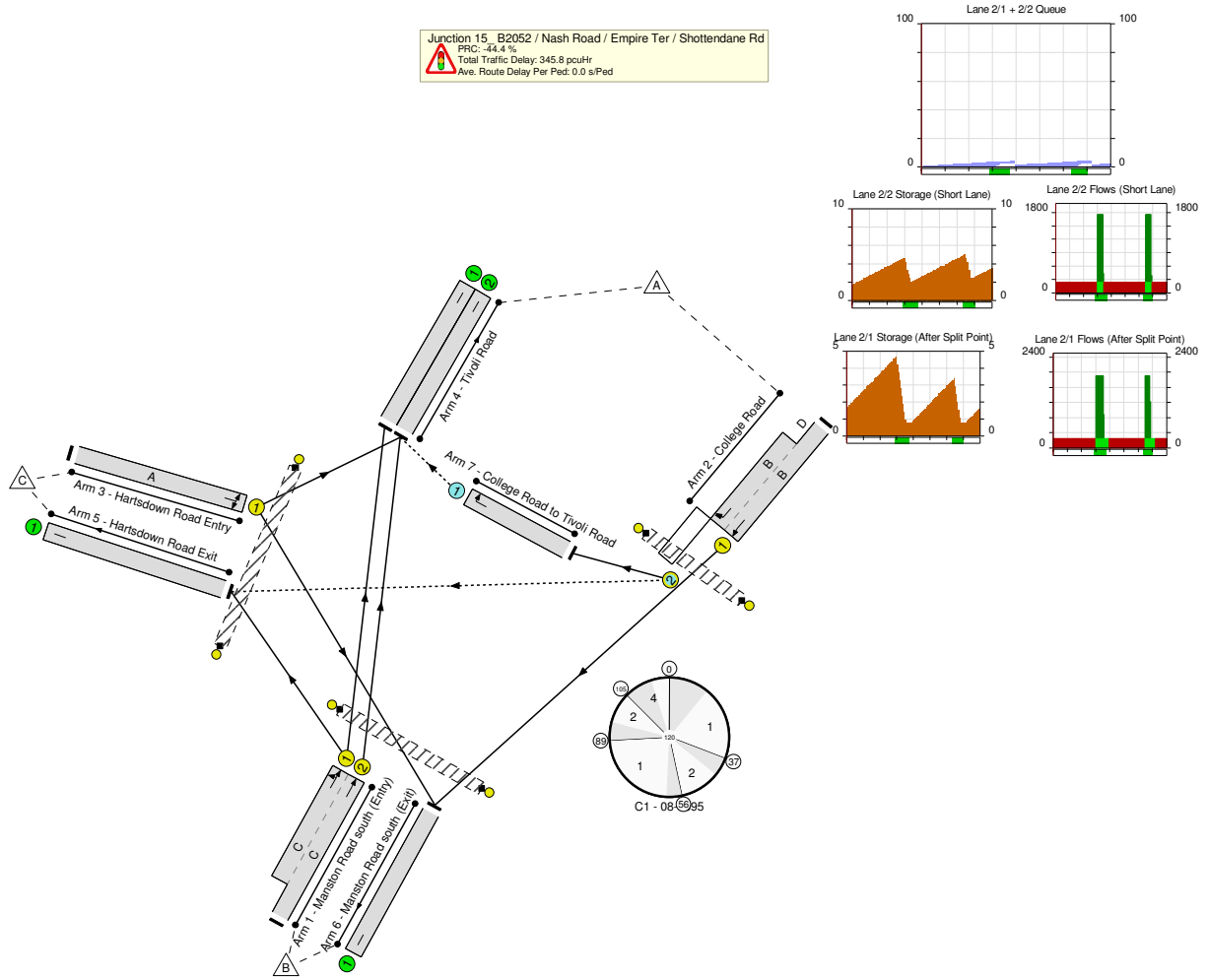
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**130.0%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**130.0%**
1/2+1/1	Manston Road south (Entry) Ahead Left	U	N/A	N/A	C		2	25	-	1031	2037:1872	458+336	129.8 : 129.8%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	B	D	2	23	0	481	1903:1759	188+182	130.0 : 130.0%
3/1	Hartsdown Road Entry Left Right	U	N/A	N/A	A		2	52	-	1062	1820	819	129.7%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	207	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	1115	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	463	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	789	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	3	1764	710	0.3%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	E		1	10	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	G		1	6	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	F		1	6	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**0**	**2**	**180**	**41.5**	**301.8**	**2.5**	**345.8**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**0**	**2**	**180**	**41.5**	**301.8**	**2.5**	**345.8**	**-**	**-**	**-**	**-**
1/2+1/1	1031	794	-	-	-	17.7	120.6	-	138.3	482.9	24.7	120.6	145.3
2/1+2/2	481	427	0	0	180	3.9	57.6	2.5	64.0	478.9	4.8	57.6	62.4
3/1	1062	819	-	-	-	19.8	123.6	-	143.5	486.4	31.5	123.6	155.2
4/1	159	159	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	859	859	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	356	356	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	664	664	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	2	2	0	2	0	0.0	0.0	-	0.0	2.5	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

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PRC for Signalled Lanes (%): -44.4
PRC Over All Lanes (%): -44.4

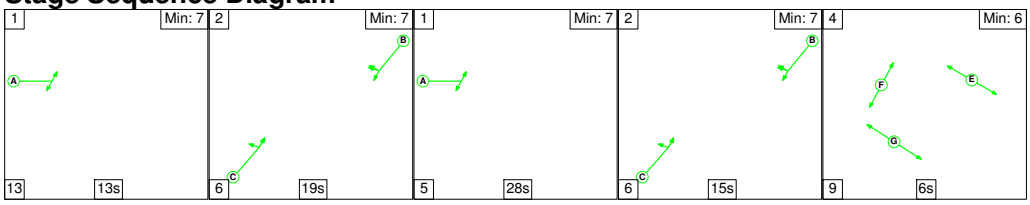
Total Delay for Signalled Lanes (pcuHr): 345.76
Total Delay Over All Lanes(pcuHr): 345.77

Cycle Time (s): 120

Full Input Data And Results

Scenario 4: '2039 + Dev Traffic - PM Peak' (FG4: '2039 + Dev Traffic - PM Peak', Plan 4: '2039 B+D PM')

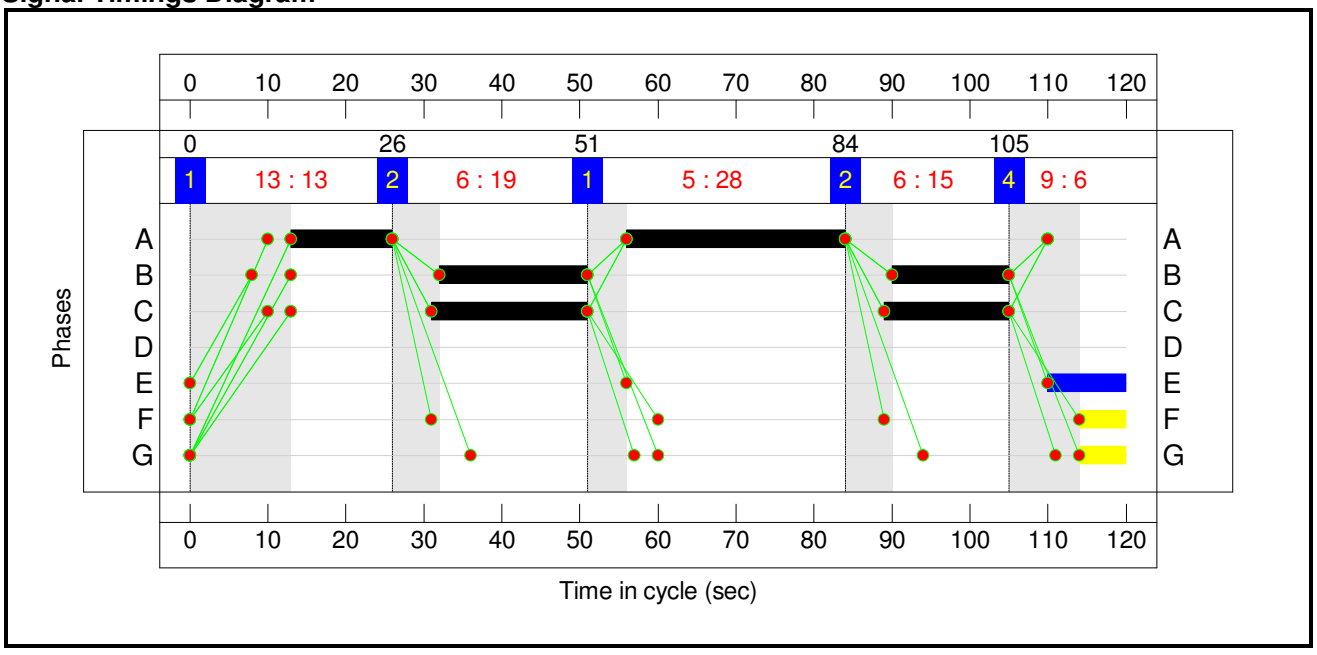
Stage Sequence Diagram



Stage Timings

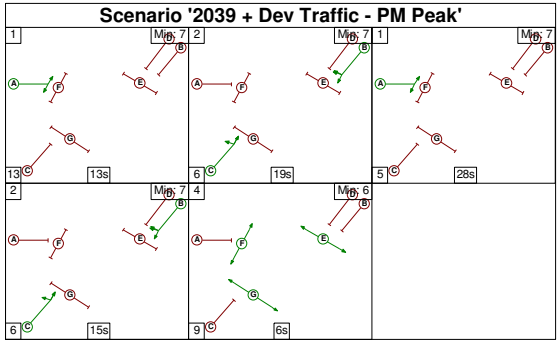
Stage	1	2	1	2	4
Duration	13	19	28	15	6
Change Point	0	26	51	84	105

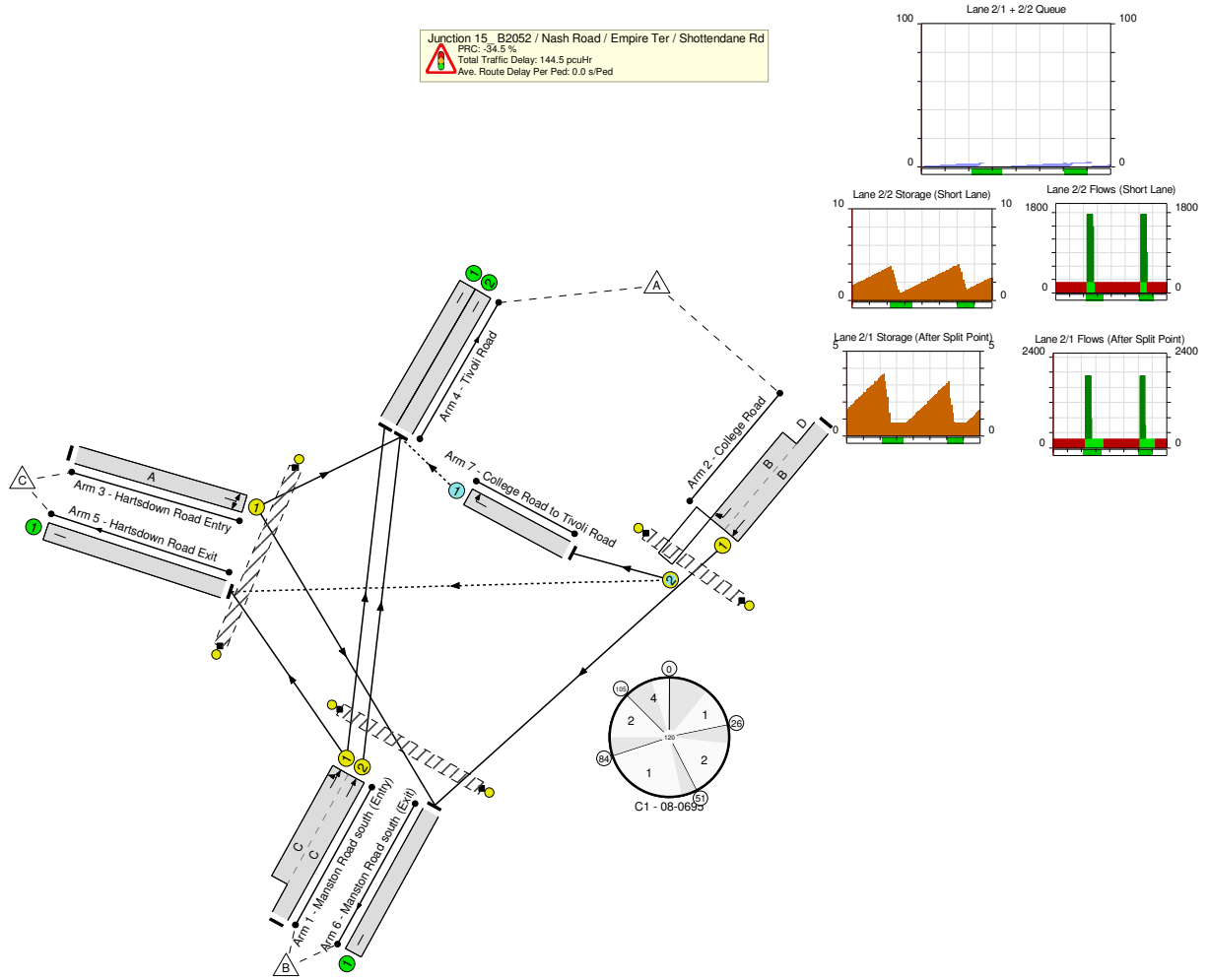
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram





Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Junction 15	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**121.0%**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**121.0%**
1/2+1/1	Manston Road south (Entry) Ahead Left	U	N/A	N/A	C		2	36	-	1083	2037:1857	638+458	98.8 : 98.8%
2/1+2/2	College Road Right Ahead Right2	U+O	N/A	N/A	B	D	2	34	0	457	1903:1758	190+188	121.0 : 121.0%
3/1	Hartsdown Road Entry Left Right	U	N/A	N/A	A		2	41	-	770	1803	646	119.2%
4/1	Tivoli Road	U	N/A	N/A	-		-	-	-	161	Inf	Inf	0.0%
4/2	Tivoli Road	U	N/A	N/A	-		-	-	-	1153	Inf	Inf	0.0%
5/1	Hartsdown Road Exit	U	N/A	N/A	-		-	-	-	514	Inf	Inf	0.0%
6/1	Manston Road south (Exit)	U	N/A	N/A	-		-	-	-	482	Inf	Inf	0.0%
7/1	College Road to Tivoli Road Right	O	N/A	N/A	-		-	-	-	5	1764	698	0.6%
Ped Link: P1	Unnamed Ped Link	-	N/A	-	E		1	10	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	G		1	6	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	F		1	6	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Junction 15	**-**	**-**	**3**	**4**	**180**	**21.1**	**120.8**	**2.6**	**144.5**	**-**	**-**	**-**	**-**
Junction 15_ B2052 / Nash Road / Empire Ter / Shottendane Rd	**-**	**-**	**3**	**4**	**180**	**21.1**	**120.8**	**2.6**	**144.5**	**-**	**-**	**-**	**-**
1/2+1/1	1083	1083	-	-	-	6.0	13.5	-	19.5	64.9	11.9	13.5	25.4
2/1+2/2	457	429	3	0	180	2.6	42.4	2.6	47.5	374.3	4.1	42.4	46.5
3/1	770	646	-	-	-	12.6	64.9	-	77.5	362.3	22.8	64.9	87.7
4/1	161	161	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2	1069	1069	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	475	475	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	441	441	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	4	4	0	4	0	0.0	0.0	-	0.0	2.6	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 - 08-0695

PRC for Signalled Lanes (%): -34.5
PRC Over All Lanes (%): -34.5

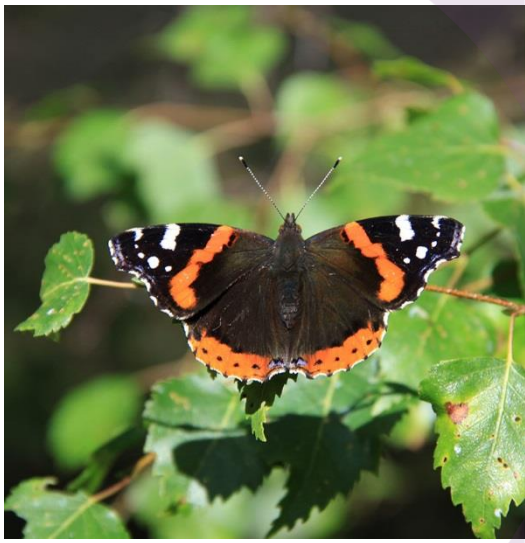
Total Delay for Signalled Lanes (pcuHr): 144.52
Total Delay Over All Lanes(pcuHr): 144.53

Cycle Time (s): 120

RiverOak Strategic Partners Limited

Manston Airport DCO

TA Appendix L – Framework Travel Plan



Wood Environment & Infrastructure Solutions UK Limited – March 2019

Report for

George Yerrall
RiverOak Strategic Partners
Audley House
London

Main contributors

Liam Garden
Glyn Price
Bev Coupe

Issued by

.....
Liam Garden

Approved by

.....
Glyn Price

Wood

Floor 12
25 Canada Square
Canary Wharf
London E14 5LB
United Kingdom
Tel +44 (0) 203 215 1610

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Management systems

This document has been produced by Wood Environment & Infrastructure Solutions UK Limited in full compliance with the management systems, which have been certified to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA.

Document revisions

No.	Details	Date
1	Draft	February 2018
2	Reviewed draft	February 2018
3	Final Draft	March 2018
4	Final	March 2019

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1. Introduction

1.1 Background

1.1.1 RiverOak Strategic Partners Limited (hereafter referred to as 'RiverOak') is seeking to secure the future of Manston Airport (the 'Proposed Development')as a valuable regional and national asset by re-developing the site as a freight airport. The proposals will provide much needed additional air freight capacity to the United Kingdom and serve to relieve pressure from other, already heavily congested, London and South East airports.

1.1.2 Under the *Planning Act 2008*[1] (the '2008 Act') the redevelopment of Manston Airport as a freight airport is considered a Nationally Significant Infrastructure Project (NSIP). RiverOak is making an application under the 2008 Act for a permission known as a 'Development Consent Order' (DCO) to re-open and operate Manston Airport. The application will be submitted to the Planning Inspectorate which will examine it and make a recommendation to the Secretary of State for Transport, who will then make a decision on whether the Proposed Development is granted consent.

1.1.3 This Travel Plan (TP) is one of a suite of documents which have been produced in the support of the DCO application. Alongside the Airport Surface Access Strategy (ASAS), it forms the long-term access and sustainable transport strategy for both staff and passengers.

1.1.4 This second version of the Travel Plan is an update that includes:

- Responses to Written Representations and the Examining Authority's written questions; and
- Changes related to the traffic generation methodology agreed with Kent County Council (KCC) after the DCO submission.

1.2 Overview

1.2.1 The site is located approximately 4km to the west of Ramsgate and 5km south of Margate in the district of Thanet, East Kent and covers an area of approximately 303.2ha.

1.2.2 The site has provided a variety of operational airport-related services since 1916. Until 1998 it was operated by the Royal Air Force (RAF) as RAF Manston, and for a period in the 1950s was also a base for the United States Air Force (USAF).

1.2.3 From 1998 it was operated as a private commercial airport, known as Kent International Airport. The airport offered a range of services including scheduled passenger flights, charter flights, air freight and cargo, a flight training school, flight crew training and aircraft testing. In recent years it was operating as a specialist air freight and cargo hub servicing a range of operators. Although the airport was closed in May 2014, some of the airport infrastructure remains.

1.2.4 The Proposed Development shall consist of the following principal components, as shown in **Figure 1.1** of Volume 4 of the Environmental Statement (ES):

- Runways and taxiways suitable for the take-off and landing of a broad range of cargo aircraft;
- New aircraft stands

[1] The Planning Act 2008, [online]. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents [Available at: 27/03/2019].

- An area for cargo freight operations able to handle at least 10,000 movements per year and associated infrastructure, including:
  - a new Air Traffic Control (ATC) tower;
  - a rescue and fire station;
  - a fuel farm; and
- Facilities for other aviation-related development, including:
  - a passenger terminal and associated facilities;
  - an aircraft teardown and recycling facility;
  - a flight training school;
  - a base for at least one passenger carrier;
  - a fixed base operation for executive travel; and
  - business facilities for airport related organisations.

1.3 Need for a Travel Plan

1.3.1 The Thanet District Transport Plan sets out (Paragraph 10.4.3) that "Development proposals that have a significant adverse impact on the local highway network which are unable to be fully managed through physical infrastructure provision, will be required to produce travel plans with ongoing monitoring mechanisms"

1.3.2 An important factor in minimising the carbon footprint of an airport and the impact on the local community is to maximise the number of trips made by sustainable modes. Travel Plans are long term strategies and action plans which set modal share targets and recommend measures to encourage travel by sustainable transport. It recommends the best use of the public transport infrastructure and suggests improvements, where required.

1.4 Aims and Objectives

1.4.1 There are three fundamental objectives for the Travel Plan which are defined as follows:

- To actively promote and encourage travel by sustainable means for passengers;
- To actively promote and encourage travel by sustainable means for staff; and
- To improve the provision of sustainable travel options to the airport, including the introduction of a shuttle bus service from Ramsgate Railway Station.

1.4.2 In addition, there are two further objectives which relate to the promotion and longevity of the Travel Plan:

- Continually raise awareness of sustainable transport opportunities amongst staff and passengers, including the promotion of cycling and walking; and
- To continually develop, implement, monitor, evaluate and review the progress of the Travel Plan towards achieving the targets.

1.5 Targets

1.5.1 The term 'target' is used in the sense of a statement that contains a measurement of the Travel Plan objectives and is a measure of outcomes achieved by the Travel Plan. Targets should be SMART - Specific, Measurable, Achievable, Realistic and Timed, and should help achieve, and be related to each of the numbered objectives set out above.

1.6 Structure of the Travel Plan

1.6.1 The Travel Plan is set out as follows:

- **Chapter 2: Site Audit**, which provides a description of the baseline situation with regard to the road network, public transport, cycle and pedestrian networks and facilities;
- **Chapter 3: Travel Plan Strategy**;
- **Chapter 4: Targets and Measures**, which sets out the proposed initiatives distinguished as 'physical' measures and 'influencing travel behaviour' measures;
- **Chapter 5: Monitoring and Review**, which identifies types of monitoring and timescales; and
- **Chapter 6: Action Plan**.

2. Site Audit

2.1.1 The site audit provides details on the accessibility of the site, including off-site infrastructure and connectivity.

2.2 Site Location

2.2.1 The Proposed Development is located on the existing site of Manston Airport, west of the village of Manston and north-east of the village of Minster. The town of Margate lies approximately 5km to the north and Ramsgate approximately 4km to the east. Sandwich Bay is located approximately 5km to the south-east. The northern part of the site is bisected by the B2050 (Manston Road), and the site is bounded by the A299 dual carriageway to the south and the B2190 (Spitfire Way) to the west.

2.3 Road Access

2.3.1 The site has good road access, with links to Canterbury to the south-west, Ramsgate to the east and Dover to the south. It is in close proximity to the A299 which runs along the southern boundary of the site. This is a two-lane dual carriageway which links to the M2 and A28 to the west. The A28 is a two-lane dual carriageway which provides a link to Canterbury. Access to the Northern Grass Area and Manston Airport from the A299 is via the B2190 Spitfire Way and the B2050 Manston Road, which runs east west adjacent the site and links to the south-western side of Ramsgate. The local road network is shown in **Figure 2.1**.

2.3.2 There are several existing accesses to the various built elements of the site which will be enhanced as part of the Proposed Development. Details of the existing and proposed layouts are provided within the Transport Assessment (TA). It should be noted that all the proposed accesses provide an enhanced provision for walking and cycling modes. The proposed accesses to the site are set out in **Figure 2.2**.

2.4 Public Transport Provision

Bus service

2.4.1 Bus services 11, 38 and 38A currently operate along Spitfire Way and Manston Road. There are two pairs of bus stops provided along the site boundary, one set on Minster Road to the south-west of the site and one along Spitfire Way, at Spitfire Corner. A further bus stop is provided outside of the former terminal building. Facilities at these bus stops are limited with flag poles and timetable information at some stops and a shelter provided on Spitfire Way.

2.4.2 Bus routes 9 and 9X operate services along Canterbury Road West, to the south-east of the site, and a pair of bus stops are provided along this road to the south of the eastern extents of the site. These stops feature bus stop flags and timetable information. The frequency of bus services in the vicinity of the site is summarised in **Table 2.1**.

Table 2.1 Bus Services, Frequencies and Routes in the Vicinity of the Site

Service	Destinations	Weekday Frequency Per Day Outbound	Weekday Frequency Per Day Inbound	First/Last Bus Outbound	First/Last Bus Inbound
9	Westwood Cross - Canterbury	11	14	06:18 / 16:42	08:45 / 18:15
11	Canterbury – Westwood Cross	5	5	10:51 /18:41	07:04 / 16:05
38	Ramsgate – Birchington on Sea	13	14	07:46 / 17:36	08:38 / 17:52
38A	Ramsgate – St Nicholas at Ware	4	2	07:11 / 16:13	07:55 / 07:55

2.4.3 The location of bus stops and bus routes are illustrated in **Figure 2.3.**

2.4.4 The 9 and 9X routes run between Canterbury and Westwood Cross. The services combine to provide approximately one service per hour in either direction during the day. The 9X service provides one AM peak hour service towards Canterbury however there are no AM peak hour services provided in the opposite direction towards Westwood Cross.

2.4.5 The 38 and 38A routes run between Ramsgate and Birchington and combine to provide a service with a headway of approximately one hour during the day. One AM peak hour service is provided from Birchington to Ramsgate via the site, however, there are no AM peak hour services provided in the opposite direction.

2.4.6 Bus route 11 runs between Canterbury and Westwood Cross and operates with a headway of two to three hours throughout the day with no peak hour services.

2.4.7 An assessment of the suitability of the destinations served by existing bus routes has been undertaken to understand whether the existing routes would be sufficient to serve the Proposed Development. An interrogation of Census 2011 Journey to Work data has been undertaken to identify where previous employees of the site have travelled from. The site is located within the Thanet 014A lower-Level Super Output Area, as illustrated below in figure 2.1. Analysis of the journey to work travel patterns for this lower layer is set out in **Table 2.2.**

Figure 2.1 Thanet 014A lower-Level Super Output Area

Table 2.2 Distribution of Census 2011 Journey to Work Trips

Origin	Distribution
Thanet District	79.9%
Dover District	5.7%
Canterbury District	7.7%
Shepway District	1.7%
Ashford District	1.4%
Swale District	3.7%
Total	100%

2.4.8 The bus routes available within the vicinity of the site serve Ramsgate, Broadstairs, Westwood Cross (near Northwood), Birchington-on-Sea and Canterbury. These routes may offer an alternative mode of transport to the private car for 45% of journeys to work, subject to appropriate service timing enhancements and assuming that the potential employees originate in similar locations. The bus service coverage is therefore considered to be reasonable and appropriate, subject to appropriate re-routing and increases in frequency.

Rail services

2.4.9 The closest railway stations to the site are Ramsgate station and Minster station, approximately 4km east and y 2km to the south respectively.

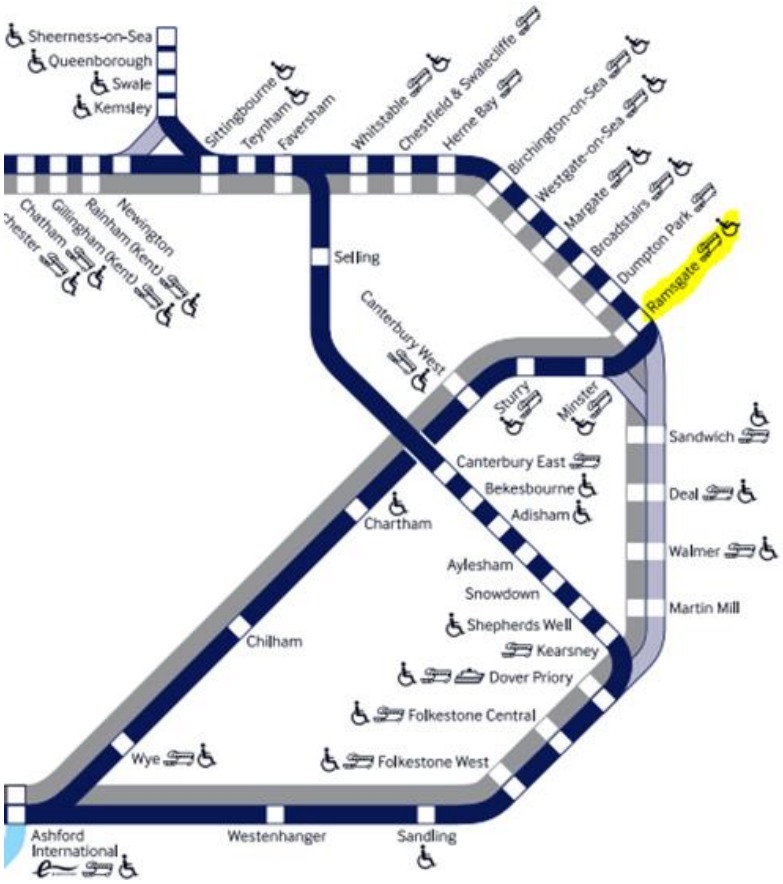
2.4.10 Ramsgate station is operated by Southeastern and benefits from access to both high speed and standard services. A wide range of destinations across Kent are accessible directly from Ramsgate including Dover, Folkestone, Canterbury, Ashford and the Medway Towns with onwards travel to London St. Pancras, London Charing Cross and London Victoria.

2.4.11 Access to high speed services from Ramsgate are provided via two routes. The first provides an hourly service to London St. Pancras via Canterbury West, with a journey time of approximately 80 minutes. A further north Kent loop service travels via Whitstable, Sittingbourne and the Medway Towns and takes approximately 110 minutes to reach London. Combined these services provide trains to and/or from London on a 30-minute frequency throughout the day. Ramsgate Station is also served by an hourly standard service train to London Charing Cross via Canterbury West, and one train an hour to London Victoria via Sittingbourne and Bromley South. The station is served by bus route 11 and therefore connects the proposed development site to the station.

2.4.12 Minster Station is located approximately 2km south of the south-west corner of the site. It is considered accessible by cycling and bus routes 38A and 11 as well as private car. Minster train station provides one train per hour to London Charing Cross (via Canterbury). However, the station does not offer access to high speed services, making this station less attractive for access to rail based public transport.

2.4.13 **Figure 2.4** below shows the rail network in the vicinity of the Proposed Development.

Figure 2.4 Local Rail Network



2.4.14 The proposed 'Thanet Parkway Station' to the south of the site, would provide further enhanced rail connections and access to Kent's high-speed rail services.

2.4.15 Thanet Parkway station is part of a wider package of improvements on the Ramsgate to Ashford line that aims to reduce journey times to London from Ramsgate to approximately one hour. This two-phase project is split into two distinct phases, as follows:

- Phase 1 - Ashford to Canterbury West; and
- Phase 2 - Canterbury West to Ramsgate.

2.4.16 Reduced journey times to London will greatly enhance the accessibility of Thanet.

2.4.17 The journey time between Thanet Parkway Station and the Proposed Development is marginally shorter and quicker than from Ramsgate Station.

2.4.18 A planning application for the Thanet Parkway Station was submitted by KCC to KCC planning officers in June 2018 (application reference: KCC/TH/0105/2018). The application has been validated but is still under consideration. The South East Local Enterprise Partnership is providing £10 million from the Local Growth Fund, while KCC is contributing £2.65 million. Further funding is required to deliver the scheme.

2.5 Pedestrian Infrastructure

2.5.1 The Chartered Institute of Highways and Transportation (CIHT) guidelines '*Providing for Journeys on Foot*'[2] provides details on acceptable walking distances. For commuting, the guidelines state that a distance of up to 0.5km is considered to be desirable, whilst 1km and 2km are considered to be acceptable and preferred maximum walking distances. These distances have been used when assessing pedestrian infrastructure in the vicinity of the site.

2.5.2 There are currently limited facilities for pedestrians on the highway network in the vicinity of the site. The B2050, which intersects the site, has no pedestrian footway provision along the site frontage. Where the B2050 Manston Road bisects the village of Manston, a footway is provided on the northern side of the carriageway. The village of Manston is some 800m east of the site access, which is considered to be an acceptable distance to travel on foot or by bicycle. However, it is recognised that pedestrian infrastructure in the area is limited to support this.

2.5.3 There are no pedestrian facilities provided along Spitfire Way which bounds the site to the west, with the exception of a short section of 40m shared cycle/footway near to Manston Business Park and an additional footway between Bell Davies Drive and Spitfire Corner. There is a section of informal shared cycle/footway adjacent to the A299 Hengist Way, which bounds the site to the south. This connects the Minster roundabout with the old Canterbury Road West highway providing some amenity for pedestrians and cyclists wishing to travel along the southern boundary.

2.5.4 There are footways in the vicinity of the Minster roundabout and a toucan[3]crossing across the A299 Hengist Way, linking the south-western corner of the site to Minster and the Viking Coastal Trail to

[2] The Chartered Institute of Highways and Transportation (2000). Guidelines for Providing for Journeys on Foot, [online]. Available at: http://www.hwa.uk.com/site/wp-content/uploads/2017/09/NR.4.3F-CIHT-Guidelines-for-Providing-Journeys-on-Foot-Chapter-3.pdf [Accessed: 27/03/2019].

[3] Toucan – A Pedestrian and Cycle Crossing

the south. However, current provision is disjointed, and overall pedestrian infrastructure is considered limited.

2.5.5 In addition to the provision of some footways adjacent to highways in the local area, there is a network of Public Rights of Way (PRoW) comprising public bridleways and public footpaths. Most notably are TR8, 9 and 10, which pass through the site and connect the east of the site with Ramsgate.

2.5.6 **Figure 2.5** shows the sections of footway, crossings and PRoWs referred to in paragraphs 2.5.1 and 2.5.5 above, alongside walking isochrones for 2km from the centre of the site.

2.6 Cycling Infrastructure

2.6.1 The Department for Transport (DfT) Local Transport Note 2/08 *'Cycling Infrastructure Design'* [4]states that many utility cycle trips are less than three miles (4.8km), but for commuter journeys a distance of over five miles (8km) is not uncommon. Distances of up to 8km have been used to define the study area for cycle infrastructure.

2.6.2 There is no formal provision of cycle facilities along Manston Road, however, a local on-road route is located along Spratling Street, Haine Road and Stirling Way, providing access to Westwood Cross and Newington. Although there are no cycle facilities provided on Spitfire Way, a shared cycle and/or footway is provided from Manston Business Park to the Minster roundabout. At this junction, a toucan crossing is provided to facilitate cycle connections south towards Minster village and west along the A299. A section of shared cycle and/or footway is provided between the Minster roundabout and the old highway of Canterbury Road West to the immediate south of the site.

2.6.3 The nearest National Cycle Network (NCN) route identified, by Sustrans who maintain the national cycle network map, is Regional Route 15 (RR15), located 800m (crowfly distance) south of the site's southern boundary. Regional Route 15 is also known as the Viking Trail and runs from St. Nicholas At Wade and follows the coast north-east through Ramsgate, Margate and Broadstairs and south-east to Whitfield and Dover. **Figure 2.6** illustrates the Sustrans cycle routes and includes a cycle isochrone, representing an 8km journey from the centre of the site. . This illustrates that a number of villages and towns are accessible within 8km of the site.

[4] Department for Transport (2008). Cycle infrastructure design (LTN 2/08), [online]. Available at: https://www.gov.uk/government/publications/cycle-infrastructure-design-ltn-208 [Accessed: 27/03/2019].

3. Travel Plan Strategy

3.1 Introduction

3.1.1 Travel Plans can play an important role in delivering tangible economic, environmental and social benefits to individuals, organisations and the community as a whole. It is fundamental to the effectiveness and influence of the Travel Plan that it is recognised as a process, rather than a one-off supporting document. This section sets out a strategy for the implementation of the Travel Plan.

3.2 Travel Plan Timescales

3.2.1 There are four key stages for the implementation of the Travel Plan, which are set out in the following sections.

Stage One – Pre-Construction -Finalisation of Design

3.2.2 The principles of the design, such as the on-site pedestrian, cycle, bus and road infrastructure and parking provision will be developed through the detailed design and pre-construction stage. This stage will also require the appointment of a Travel Plan Co-ordinator (TPC) to develop the Travel Plan measures and identify a detailed implementation programme.

Stage Two – Post Construction and Pre-Occupation

3.2.3 The physical measures embedded into the Proposed Development will be constructed and become integral to the Proposed Development. This stage will also require the TPC to commence the implementation of measures prior to occupation.

Stage Three – Occupation and Continued Construction

3.2.4 During the early stages of occupancy, the majority of the Travel Plan measures will be implemented by the TPC who will regularly promote, monitor and review the Travel Plan, in discussion with Kent County Council (KCC).

Stage Four – Post Construction/ Development Completion

3.2.5 The Proposed Development is anticipated to be constructed over approximately 20 years. The Travel Plan allows for formal governance up to the completion of the Proposed Development, after which an appropriate approach that has been discussed and agreed with KCC will be adopted. This would be identified as part of the planning process.

3.3 Travel Plan Governance and Coordination

Governance

3.3.1 The key stakeholders, such as the management team, the operations team, security, etc, in the Proposed Development will establish a governance structure which will ensure that arising challenges can be addressed effectively.

Travel Plan Coordinator

3.3.2 The appointment of an effective TPC is integral to the success of a Travel Plan to ensure that smarter travel choices are available and adopted by occupants of the Proposed Development from first occupation. This will require TPC involvement during the detailed design, pre-construction and construction stages.

3.3.3 It may be appropriate for the role to be undertaken by various resources, for example, a specialist consultant to produce the full Travel Plan and commence implementation prior to occupation (Stages One and Two), followed by an appointed member of staff during the occupation process (Stages Three and Four).

3.3.4 The TPC will have the following responsibilities:

- Overseeing the development and implementation of the Manston Airport Travel Plan during the construction phasing and occupation;
- Designing and implementing effective marketing and awareness raising campaigns;
- Acting as a point of contact for occupants requiring information;
- Liaising with different groups relating to the Travel Plan, e.g. KCC, Thanet District Council (TDC), transport operators, cycle shops, etc.;
- Liaising with site users, e.g. neighbourhood groups, cycle groups, etc;
- Responsibility for setting up a working group;
- Establishing travel plan groups to ensure that the Travel Plan remains supported at a local level; and
- Co-ordinating the monitoring and review programme including target setting.

3.3.5 The TPC will direct the site-wide approach to travel planning (as detailed in this Travel Plan) and will report to a Senior Team within the governance structure

3.4 Travel Information

Travel Information Pack/ Employee Welcome Pack

3.4.1 The information / welcome pack is an approach to delivering targeted information directly to occupants, to help them make sustainable travel choices. It seeks to overcome habitual use of the car, enabling more journeys to be made on foot, bike, bus, train or in shared cars.

3.4.2 Guidance on Personalised Travel Planning (PTP)[5] programmes and case study examples are based on targeting existing workforces and visitor communities to influence travel choice and reduce trips by single occupancy vehicles ('SOV').

3.4.3 The TPC will use similar tools and techniques, such as:

- Providing links to journey planner websites;[6]

[5] Department for Transport (2008). Making Personal Travel Planning Work: Practitioner's Guide, [online]. Available at: https://webarchive.nationalarchives.gov.uk/20101217070236/http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/practictionersguide.pdf [Accessed: 27/03/2019].

[6] http://www.traveline.info/, http://google-map.co.uk/route-planner/

- Scheduled sessions for one-to-one journey planner assistance; and
- Promotion of the sustainable travel incentives for staff through regular events and marketing.

3.4.4 This would encourage sustainable travel from the opening of the Proposed Development, thereby encouraging the whole ethos of sustainable travel to and from the site.

3.4.5 As identified in the in Chapter 2, a PTP service will be delivered by the TPC to include the following:

- One-to-one discussion of travel needs and choices with staff;
- Provision of travel information packs to staff;
- Availability and promotion of incentives to encourage the use of sustainable modes; and
- Promotion of initiatives through holding events to encourage their use.

3.4.6 It is not proposed that the TPC provides this service to individual employers, but will be able to provide advice and assistance to the workplace TPCs to administer the plans.

3.5 Marketing and Promotion

3.5.1 The following are proposed as potential marketing and promotion events to be held by the TPC and opportunities to present and discuss sustainable transport related topics and incentives:

- Staff briefings, training and seminars;
- Staff notice boards and information points;
- Booklets;
- The Airport staff newspaper (if launched);
- The Airport Employer/Employees' forum (if established);
- Staff Association if established (if established);
- The Airport website and Intranet;
- Continuous promotion of the Travel Plan through the development website;
- National events such as Car Share Day, Bike to Work Month and Walk to Work Day;
- Promotion of car share through promotional events including information on savings to be made and instruction on how to use the car share software; and
- Public transport promotions through the local bus operators.

3.5.2 All relevant travel related information included in the Employee Welcome Pack (excluding the PTP Information) will be displayed prominently within the Airport, including communal staff areas.

3.5.3 Environmental and health benefits of walking and cycling will also be emphasised to staff in the Employee Welcome Pack and any other passenger orientated promotional materials and campaigns.

3.5.4 Use of social media for communicating with employees, passengers and other users will be optimised to aim delivery of the set targets.

3.5.5 To attract future cyclists, the TPC will investigate discounts for employees with local cycle shops as well as cycle maintenance workshops held by local cycle shops. The TPC will also encourage

employers to offer their employees an interest free loan for the purchase of a bicycle and safety equipment through a 'Cycle to Work' scheme, potentially in partnership with local shops.

3.5.6 The formation of walking and/or cycling clubs will be promoted to encourage staff to walk and/or cycle together for commuting.

4. Targets and Measures

4.1.1 In order to ensure the success of the Travel Plan, a number of site wide measures will need to be implemented. These measures are set out within this chapter and identified in the site wide Action Plan included in **Chapter 6**.

4.2 General Targets

4.2.1 To achieve the specified objectives, the following targets have been recommended across a range of transport options.

Staff Mode Share

4.2.2 Mode split for Staff (especially at small airports) is highly dependent on geography, shift patterns and company policy to discourage car access and instead encourage public transport use. The dominant geographical consideration is the extent to which airport employees, or those working for companies based on the site, live in settlements within easy walking or cycling distance, or along good public transport corridors to large urban areas; there is undoubtedly a decay function with distance, but this is tempered where buses or trains are regular, run early in the morning and late at night, and provide easy and cost-effective point to point journeys.

4.2.3 The airport and its tenant companies can influence the underlying geographical and economic dynamics, either by increasing constraints (e.g. staff parking places where parking overall is in short supply) or introducing incentives (changing facilities for those walking or cycling), support for season tickets, allowances for buying cycling equipment or bonuses for non-car use.

4.2.4 Deals with taxi operators to take staff home at night or to the airport in the morning by co-ordinating the inbound and outbound journeys of airport-based taxis can also be an effective measure.

4.2.5 **Table 4.1** sets low initial thresholds. This will allow for initial recruitment of staff, the pattern and distribution of staff journey to work movements to become established, and agreements to be reached with operators and employees before company policies are rolled out. However, it does set similar targets by comparison to Derry airport in the longer term which targeted 86% Car, 11% public transport and 3% taxi in their Draft Masterplan 2012[7]

Table 4.1 Staff Modal Share Targets

Mode of Transport	Base Year	Year 10	Year 20
Car	97%	92%	**87%**
Bus	2%	4%	**6%**
Walking or Cycling	1%	2%	**3%**
Rail (with bus link)	0%	2%	**4%**

[7] City of Derry Airport (2012). City of Derry Airport Draft Masterplan, [online]. Available at: https://www.cityofderryairport.com/wp-content/uploads/2012/11/Masterplan.pdf [Accessed: 27/03/2019].

Passenger mode share

4.2.6 The initial mode share targets in **Table 4.2** are based upon estimates provided by aviation experts from Viscount Aviation and mode shares typical for smaller airports (i.e. less than 2 million passengers per annum (mppa)) in:

- Rural locations;
- Away from major population centres;
- With functional (but not direct) trunk road access – (i.e. it is accessible within a few miles on A or B class roads);
- No proximate rail station;; and
- Mainly outbound, but also with niche tourism opportunity.

4.2.7 The mode share targets are also defined by a car parking strategy which seeks to balance the need for the airport to raise revenue (passenger car parking) with incentives to passengers to use public transport along corridors offering sufficient demand where it is convenient for them to do so.

4.2.8 Newquay, Cardiff, Exeter, Inverness, Durham Tees Valley, Norwich and City of Derry are useful benchmarks for the assumed base year mode split and the future year targets. However, each site is unique and dependent on its location and levels of accessibility. The mode share targets have been based on the location of the site, its accessibility to public transport and the aspirations of RiverOak to discourage SOV usage and encourage sustainable travel by public transport and shared vehicle use. RiverOak engaged with Kent County Council (KCC) Highways in the post Development Consent Order (DCO) submission period to discuss and agree the traffic generation and distribution. This resulted in the removal of the shared taxi element as KCC felt that this would not be achievable in the Thanet district.

Table 4.2 Passenger Modal Share Targets

Mode of Transport	Base Year	Year 10	Year 20
Bus	3%	7%	**10%**
Taxi	5%	6%	**6%**
Car parked	46%	41%	**37%**
Car drop off	46%	41%	**37%**
Rail (then bus)	-	5%	**10%**

4.2.9 To reduce the dependence on SOV, a range of travel plan measures need to be available to staff and to passengers.

4.3 Travel Plan Measures

4.3.1 Travel Plan measures are initiatives required to achieve the Travel Plan targets and can generally be split into 'physical' and 'soft' measures that will influence travel behaviour. These can be described as follows:

- 'Physical' measures provide the infrastructure to enable sustainable transport choice, which are an integral part of the design of the Proposed Development. All on-site transport infrastructure will be designed to the latest guidance should this evolve over the project life

cycle, ensuring suitable provision for pedestrians, cycling and public transport access. The physical measures relate to the Masterplan proposals for access and movement; and

- 'Soft' or behavioural measures, which facilitate, promote and encourage sustainable transport choice. These are complementary to spatial planning and infrastructure provision. They are aimed at encouraging smarter travel choice through promotion and encouragement, such as information provision, personalised journey planning and financial incentives.

4.3.2 The Travel Plan has been split into three broad series of strategies. There are:

i. Walking and cycling;

ii. Public transport; and

iii. Car park management.

Walking and Cycling

4.3.3 Walking and cycling are seldom viable options for passengers due to luggage constraints. However, Manston Airport is situated sufficiently close to major population centres of East Kent to make walking and cycling for staff members a viable alternative to the car.

4.3.4 There are 140,000 people living within 8km of Manston Airport; this is viewed as a reasonable distance to cycle. Within this 8km are the settlements of Ramsgate, Broadstairs and Margate. To facilitate this, retention, enhancement and optimisation of the existing Public Rights of Way (PRoW) network is required. This includes informal tracks and paths within the pathway network. The cycling network which connects Manston to Ramsgate, Margate and Broadstairs should be extended to the site, with all roads leading to the terminal having footways.

4.3.5 To support and encourage travel to work by walking and cycling, adequate shower and changing facilities and secure cycle parking should be provided. Umbrellas and wet weather gear could also be supplied for walking or cycling to work.

4.3.6 Incentives such as a free loan to purchase a bike, and discounted equipment at local shops arranged by the Travel Plan Coordinator would also help to encourage further uptake in the number staff travelling to work by sustainable means.

Targets

4.3.7 There is no walk and/or cycle target for passengers.

4.3.8 From a base level of 1%, by Year 20 the target is 3% of all staff will walk or cycle to work.

Public Transport

4.3.9 The current provision of public transport options could only support a very small proportion of staff and passenger trips to Manston Airport. Improvements to the bus services and supporting infrastructure would therefore be required to provide the additional capacity required. This would include a more frequent service from the neighbouring towns and longer hours of operation to reflect the operating hours of the Proposed Development.

4.3.10 An additional bus shuttle service between Ramsgate Railway Station and the Proposed Development would encourage more journeys to be made by rail, effectively enlarging the potential catchment area for Manston Airport. These services would be most efficient should they be scheduled to match the flight and train timetables. This would create a situation currently evidenced at Luton Airport, which has one of the highest proportion of passengers accessing the airport by public transport than other equivalent stations without a direct rail link.

4.3.11 For staff, the improvements to public transport infrastructure should be complimented by 'soft' measures to encourage further uptake of the public transport offering. This would include offering season ticket loans or discounted travel on the services. Travel information and updates should be readily accessible and prominently displayed in the terminal and at local transport hubs. This would also benefit passengers.

4.3.12 Additionally, passengers should be encouraged to travel by rail by offering integrated ticketing, i.e. the cost of the rail fare includes a ticket on the shuttle service from Ramsgate Railway Station.

Targets

4.3.13 From a base level of 3%, by Year 20 the public transport target for passengers is 10% by bus and 10% by rail, and then shuttle bus. At the interim point in Year 10, it is expected that public transport will accommodate 12% of passenger trips.

4.3.14 From a base level of 2%, by Year 20, 10% of staff trips are expected to be made by public transport – 6% by bus and 4% by rail and shuttle bus. At the interim point in Year 10, it is expected that public transport will accommodate 6% of staff trips.

Car

4.3.15 The location of the Proposed Development and the hours of operation will mean that for many trips, travel by car will be unavoidable. Consequently, there needs to be an adequate supply of on-site parking spaces to prevent displacement to the surrounding area. It is recommended that three separate car parks are provided: long-term passenger; short-term passenger; and staff. Additionally, a limited number of drop off locations should be provided. Infrastructure should be supplied for Electric Vehicles, with charging points available in the staff car park and the short-stay passenger car park.

Staff

4.3.16 For members of staff, the ease of access to the site is crucial for long-term staff retention. A dedicated staff car park would therefore be required, with lower charges than the long-term and short-term passenger car parks. **Section 3.3** of the Car Park Management Strategy (Appendix N to the Transport Assessment) sets out the need to consider a parking permit system in order to encourage sustainable travel, such as car sharing, use of bus and rail and cycling. The permit system would need to take account of staff home locations, shift patterns and access to sustainable travel options, as well as the potential implications of restrictive parking, such as overspill parking onto the local road network. This is considered to be unlikely due to the site location and the nature of the roads in the vicinity of the Proposed Development.

4.3.17 Manston Airport will seek ways to reduce travel by SOV, through the promotion of a car sharing strategy. This could include the internal database accessible to all staff to enable trips to match. Shift patterns could also be changed to maximise the potential for car sharing.

Passengers

4.3.18 Passengers will be encouraged to car share through the pricing strategies employed by Manston Airport. For example, by charging high prices for parking compared to the public transport offering.

4.3.19 Costs for parking should be monitored to ensure that this can be amended and adapted to assist with mode share targets. For short term parking, this should be priced suitably higher than a single return on public transport.

Targets

4.3.20 From a base level of 97% by car (46% parked, 46% drop off and 5% taxi), by Year 20, the target for passengers is 70% (37% parked, 37% drop off and 6% taxi). At the interim point in Year 10, it is expected that 88% of passenger trips will be by car (41% parked, 41% drop off and 6% taxi).

4.3.21 From a base level of 97%, by Year 20, 87% of staff trips are expected to be made by car. At the interim point in Year 10, it is expected that this will be 92%.

Additional targets

4.3.22 In addition to specific measures and initiatives that will be embedded into the design of the Proposed Development to facilitate effective travel planning, it is appropriate at this stage to set initial action orientated targets. These will be based on the following:

- Undertaking a staff travel survey;
- Influence sustainable travel behaviour through smarter choices information and the production of promotional materials to staff to encourage car sharing, walking and cycling; the promotion of bus provision in the vicinity of the site; and
- Establish a TPC to be available on site before the Proposed Development becomes operational.

5. Monitoring

5.1.1 Monitoring is a means of measuring the impact and success of the Travel Plan and whether its objectives and targets are being met.

5.2 Formal Monitoring

Formal Monitoring

5.2.1 A monitoring programme, commencing at operation as well as at the milestones suggested will be discussed and agreed between the Travel Plan Coordinator (TPC) and Kent County Council (KCC). Continuous monitoring of the Travel Plan will enable the following to be assessed:

- Progress against the SMART targets of the Travel Plan;
- The need for refinements to the Travel Plan; and
- The effectiveness of the Travel Plan for encouraging sustainable travel.

5.2.2 Frequent monitoring is essential to assess how the Plan is being implemented and whether adjustments are required. Therefore, the following surveys will be undertaken:

- Initial survey of employees' travel preferences within three months of first occupation; and
- Full travel surveys will be conducted in accordance with the monitoring programme to be agreed with KCC. The monitoring programme will comprise surveys in years 1, 3, 5, 10 and 20. Year 1 will be the trigger point for the first full survey.

5.2.3 Monitoring of employees' travel choices will be in the form of travel questionnaire surveys and automatic traffic counts (ATCs). All survey data will be collected in accordance with the Standard Assessment Method on the TRICS database[8]

5.2.4 Monitoring will be undertaken within the same week each year on a week day where there are no exceptional conditions, i.e. school holidays, bank holidays, transport service disruption, etc.

5.2.5 Car park prices will also be reviewed periodically to determine the level of charges which will attract passengers to the Proposed Development and subsequently ensure that they minimise the number of car journeys without having negative impacts on the airport's viability.

Travel questionnaire surveys

5.2.6 Questionnaire surveys of employees and passengers will be undertaken to understand their travel patterns and behaviours, and to evaluate the effectiveness of the Travel Plan. It will provide an opportunity to review staff parking policies, provision of parking spaces in relation to parking demand, car sharing incentives and use of low emissions vehicles. It will also enable close monitoring of the balance between public transport usage and car parking demand, highlighting the need to adjust the focus of the strategy measures.

5.2.7 The results of the surveys will be used to monitor the effectiveness of the Travel Plan and identify areas for improvement and measures to address this, for example increased promotion of the car share scheme, or improvements to the personalised travel planning approach.

[8] TRICS (2019). Standard Assessment Method, [online]. Available at: www.trics.org [Accessed: 27/03/2019].

5.2.8 Air passenger surveys will be undertaken to understand travel choices and its determinants. Passenger experience on using public transport, pedestrian routes and at Manston Airport will all be part of the survey. The surveys will be undertaken online and/or face-to-face across the premises. These will help to develop targeted strategies that influence travel mode choice and identify further initiatives to promote sustainable travel.

5.2.9 The travel questionnaire will include origin and destination questions, as well as questions about journey purpose and mode. **Appendix A** provides an example of a survey questionnaire which will be adapted to suit each target group (passengers, employees etc.).

5.2.10 A representative response rate will be sought through incentives to complete the survey, such as a prize draw. Assurance will be provided to KCC that the sample is representative if the response rate is not achieved.

5.3 Regular Informal Monitoring

5.3.1 In addition to the formal monitoring, the TPC will monitor the various travel plan measures, such as:

- Levels of bus patronage at the bus stop adjacent to the site access;
- The take up of the car sharing scheme;
- The use of specific schemes and measures; and
- Levels of participation in TPC led promotional events

5.4 Monitoring Report

5.4.1 The results of the monitoring will be submitted to KCC within three months of the surveys, along with a review document highlighting areas of success and concern. This will evaluate progress against actions and targets and identify issues and remedial actions, such as:

- Review of the bus service - vehicle type, routes and/or frequencies; and
- Identification of targeted promotional activities.

5.4.2 Any proposed changes will be discussed with KCC and implemented by the site TPC accordingly.

5.5 Review

5.5.1 At agreed milestones, the Travel Plan will be reviewed by evaluating monitoring survey results against baseline data and identified targets. Where elements of the Travel Plan are identified to be underperforming, reviews will be undertaken, and revisions made as and when appropriate.

5.5.2 If targets are not met, monitoring will be required and measures designed to encourage targets, until they are met. This will need to be followed up by the TPC through submitting monitoring reports to KCC. Remedial measures might include, for example, public transport "taster tickets" to encourage use of the bus or extra promotion of the Travel Plan to revitalise interest in sustainable travel. The identification of remedial measures will be dependent on the issues identified and availability of funding from the Travel Plan element of the Transport Contribution identified in the S106 Agreement.

6. Action Plan

6.1.1 An Action Plan has been produced which summarises how the elements of the Travel Plan will be implemented and monitored, including details on who is responsible, when they are to be undertaken, how the success will be gauged, and to which aims and objectives they relate. The Action plan is set out as **Table 6.1**.

Table 6.1: Travel Plan – Action Plan

Objectives	Target	Measure	Responsibility	Monitoring
To actively promote and encourage travel by sustainable modes for passengers	Increase the number of passengers accessing the airport by public transport from an initial 3% to 20% in Year 20.	Integrated ticketing options for passengers	TPC/Local operator	Review and update
		Easily available multi-modal travel information, through the internet, travel apps or at transport hubs. Live travel information at airport, including connecting services.	Airport operator	Maintain standard of provision
	Reduce staff SOV, by promoting benefits for car sharer and public transport users.	Improvements to bus routes serving the airport by increasing frequency and ensuring that the timetable matches the hours of operation.		Monitor take up
		Investigate parking charges to encourage car sharing and non-car alternatives.	Airport operator	Review through passenger travel surveys.
To actively promote and encourage travel by sustainable modes for members of staff	Increase the proportion of staff walking or cycling to work to 3% by Year 20.	Reasonable provision of workplace shower and changing facilities.	Developer	Monitor use
		Provision of cycle parking spaces compliant with KCC standards.	Developer	Monitor use
		Retention, enhancement and optimisation of the existing PRoW network.	Developer	
		Travel Plan Coordinator to arrange with local shops for discounted cycling equipment.	TPC	Monitor take up
	Increase the number of staff accessing the airport by public	Discounted tickets and season ticket loans for staff	TPC	Monitor take up

Objectives	Target	Measure	Responsibility	Monitoring
	transport from an initial 2% to 10% in Year 20.	Increase the hours of operation and frequency of public transport to the airport from the neighbouring towns to	Developer	Monitor use
	Promote car sharing for staff trips to the airport.	Reserved car parking spaces for car sharers located close to the terminal.	TPC	Monitor use
		Car sharing database to be set up to enable staff to organise. Shift patterns to compliment car sharing arrangements, i.e. people living in close proximity to each other to be assigned same shift patterns when possible.	TPC	Monitor take up
Improve the provision of sustainable transport options to the airport, including the introduction of a shuttle bus service from Ramsgate rail station and/or Thanet Parkway.	Influence sustainable travel decisions and facilitate the modal share targets set out in the staff and passenger objectives.	Provision of shuttle bus service to link Ramsgate rail station and/or Thanet Parkway to the airport.	Developer	Monitor use
		Personalised travel planning for members of staff.	TPC	Review take up

6.1.2 In addition to the Action Plan, **Table 6.2** presents the mitigation contained with this document and others for ease of reference. However, the Travel Plan document will be developed further prior to commencement of construction and will be a working document throughout the life of the Proposed Development. Currently the Travel Plan is in outline form and will remain so until agreements with key stakeholders are reached.

Table 6.2: Suggested Sustainable Mitigation

Public Transport	Cycling	Walking	Car Sharing	Site Design	Other
Offer season ticket loans with "travel through salary pay"	Changing facilities and showers 1 per 200 employees	Provision of footways as identified in the Transport Assessment	Arrange guaranteed ride home services for staff car sharers with taxi operators	20% EV charging points (ultra-low emission parking spaces) in the staff and short stay passenger car parks – provided on a phased basis with 5% on opening	The provision of pool umbrellas and wet weather garments within the staff common rooms

Provide d**iscounted public transport travel** for staff	Secure cycle parking; covered / cycle lockers / CCTV / signposted for 1 per 150 employees initially	Retention of PRoW – see Figures 2.7, 3.1, 3.2 for the PRoW Management Strategy	Establish and promote an internal database for staff car sharing with a "guarantee to get you home"	Internal site speed restriction to 10 mph	Staff bonuses/rewards for non-car use
Lobby for integrated ticketing, in the absence of this provide machines for bus/coach/rail tickets in the terminal	Offer cycle loans with "travel through salary pay"	Enhancement of PRoW - see Figures 2.7, 3.1, 3.2 for the PRoW Management Strategy	Provide 2% car share parking spaces		Travel information and updates – web based, notice boards, bulletins in key locations at the terminal and local transport hubs
Extend the bus operating hours to 24 hours	Enter into a partnership with local bike shops for discounted items Dr Bike sessions, training courses, cycle maintenance courses				Support four national events per year: such as Walk to Work Week and Cycle to Work Week, The Challenge, Step Count Challenge
Increase frequency of bus services to every 30 minutes	Extension to the cycle network connecting the provision on the new Manston to Haine Link Road with the Airport	Informal tracks and paths – see Masterplan reference DCO 7.1			Provide Personalised travel planning for all employees
Provide new bus shuttle to Ramsgate station and/or Thanet Parkway Station matched to train timetable					Travel information pack/employee welcome pack for all employees
Discuss links with coach operators					
Provide all bus stops with shelters within the airport (wet and windy weather protection), timetables, seats and space for luggage					

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Appendix A
Example survey question

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Travel Questionnaire Example - Employment

Cover letter

A short cover letter will be needed, either attached to the questionnaire or incorporated at the top of it, to introduce the survey and the travel plan. This should be signed by someone senior. You will also need to highlight any incentives for filling in the survey, and provide a contact for queries.

The Whitehill & Bordon Regeneration Company is committed to developing a Travel Plan to improve and promote sustainable travel choices to our site. As part of this, staff are invited to complete a travel survey.

We would be grateful if you would take a few minutes to complete the survey, so that your suggestions for ways to improve travel choices to our site can be investigated, and so we can make plans for travel improvements. All information is strictly confidential and will not be used for any purpose apart from that specified above.

(signed by Chief Executive)

Please return the survey by (date). All completed surveys received by this date will be entered into a free prize draw, with the chance to win £XXX.

If you have any queries, please feel free to contact (name of travel plan contact + phone & email).

Travel Questionnaire

1. What is your home postcode? _

2. Are you - Male _ _ _ _ _ _ _ _ _ Female _ _ _ _ _ __

3. Which company do you work for? _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

4. What time do you normally arrive at work? (please tick)

Before 07.29	07.30 - 08.00
08.01 - 08.29	08.30 - 08.59
09.00 - 09.29	09.30 - 10.00
Other - (please specify)	

5. What time do you normally leave work? (please tick)

14.00 - 14.59	15.00 - 15.59
16.00 - 16.59	17.00 - 17.29
17.30 - 17.59	18.00 - 18.30
Other - (please specify)	

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6. a) Is your work (please circle)

Part Time **Full Time**

b) If Part Time, please specify how many days per week _ _ _ _ _ _ _ _ _ _ _ _ _

7. Over the last 7 days, how did you travel to work? (If you travelled by more than one mode of transport, please only show the main part of your journey).

Mode	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Bus							
Bicycle							
Car (as driver, alone)							
Car (as driver, with passengers)							
Car (as passenger)							
Foot							
Motorbike							
Train							
Other (please specify)							

8. How do you travel to work if your normal mode of transport is not available? (please tick)

Bus	Bicycle
Car, as driver, on your own	Car, as driver, with passengers
Car, as passenger	Foot
Motorbike	Train
Other, (please specify)	

9. If you are travelling between your home and work, how easy/difficult do you think travel by the following modes is?

	Very Easy	Quite Easy	Quite Difficult	Very Difficult	Not Possible
Walking					
Bus					
Cycling					
Car Share					
Train					

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10. Which of the following changes would most encourage you to walk or cycle to work?

On-site lockers	Showers and Changing Facilities
Bike Parking	On site cycle routes
Another cyclist to show you good cycling facilities.	Dedicated cycling tracks between home and the site.
Cycle training or refreshment course	Other (please specify)

11. Which of the following changes would most encourage you to use public transport to or from work? (please select no more than 3)

Better quality bus waiting facilities	Bus/Rail Information, easily available
Reduced-cost staff pass on public transport	Services better time to working hours
Additional Bus Routes/Services	Other (please specify)

12. Are you a member of the xx Car Share scheme?

Yes **No**

13. If Yes, How often do you car share? _ _ _ _ _ _ _ _ _ _ _

14. How many business trips have you made in the last month?

_ _

15. How did you travel to these meetings? (please specify)

_ _

Thank you for taking the time to fill in this survey, if you have any further comments, please state them below.

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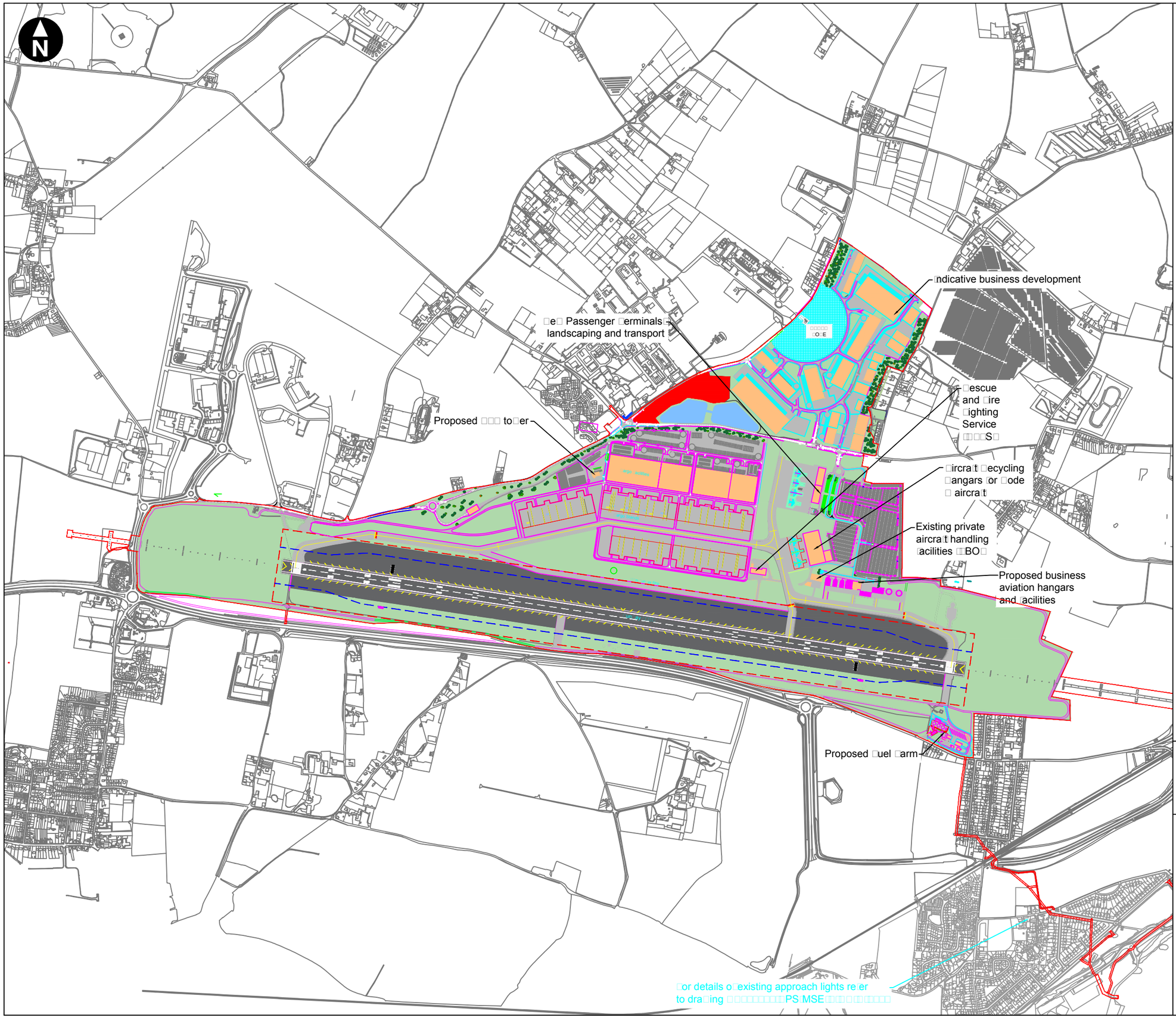
Figures



Key

Order Limits

0 m 500 m

Scale 1:10,000 @ A3

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Client

RSP

Manston Airport DCO
Travel Plan

Figure 1.1
Proposed site layout

March 2019

wood.

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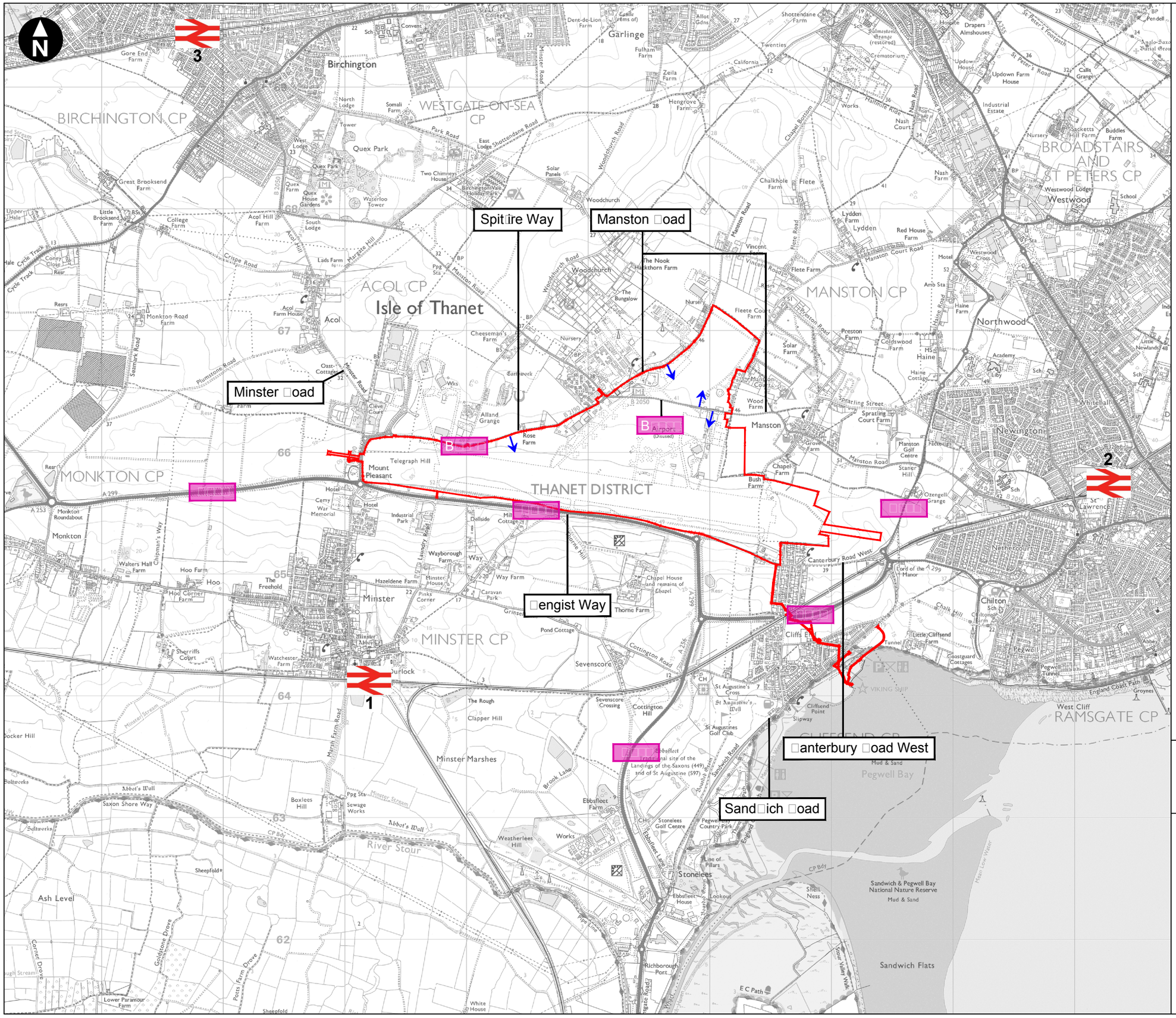

Key

□pplication boundary

Station
- Minster □ail Station
- □amsgate □ail Station
- Birchington □ail Station

□ccess points

0 m 1.5 km

Scale 1:30,000 @ A3

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Manston Airport DCO
Travel Plan

Figure 2.1
Site boundary and local transport network

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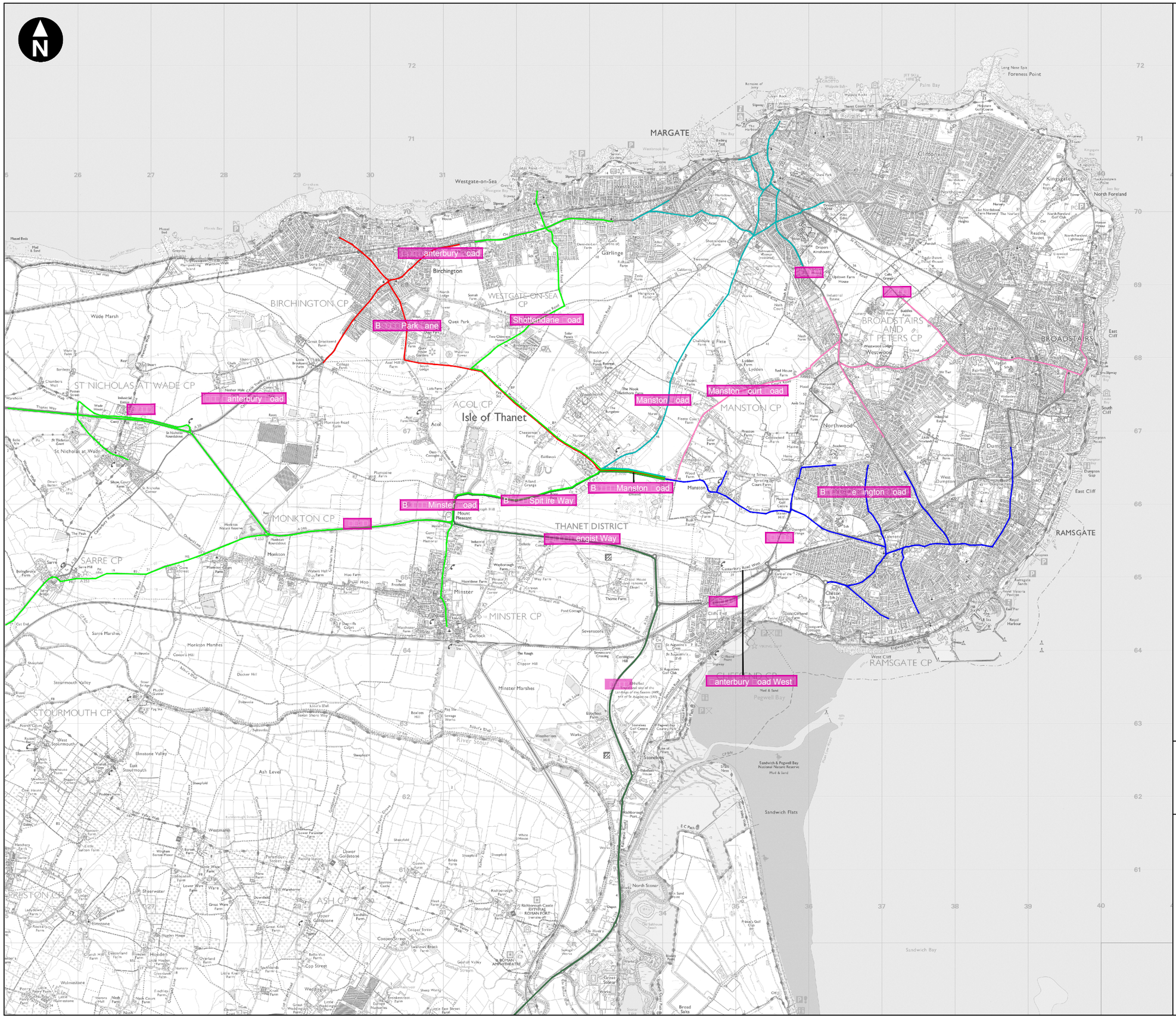
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Garlinge
Birchington
BIRCHINGTON CP
WESTGATE-ON-SEA CP
Wade Marsh
ST NICHOLAS AT WADE CP
ACOL CP
Isle of Thanet
MONKTON CP
SARRE CP
THANET DISTRICT
MINSTER CP
Minster
Monkton
Sarre
Hoo
Cliftonville
Kingsgate
North Foreland
BROADSTAIRS AND ST PETERS CP
BROADSTAIRS
Westwood
MANSTON CP
Northwood
Dumpton
RAMSGATE
West Cliff
RAMSGATE CP
QUEENDOWN CP
Pegwell Bay
Sandwich Flats
Sandwich Bay
North Stonar
STOURMOUTH CP
PRESTON CP
ASH CP
Ash Level
Stourmouth Valley
Minster Marshes
Monkton Marshes
Sarre Marshes
Foreness Point
Shottendane Road
Manston Road
Manston Court Road
Spitfire Way
Ramsgate Road
Canterbury Road West
Park Lane
Minster Road
Manston Road
Ramsgate Road
Canterbury Road
Canterbury Road
Canterbury Road
Canterbury Road West
Ramsgate Road
Ramsgate Road
Ramsgate Road

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Key

- Application boundary
- Bus stop
- Route 11
- Route 38
- Route 38 (A)
- Route 9 (9X)
- Route 87/88

0 m 750 m

Scale 1:30,000 @ A3

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Manston Airport DCO
Travel Plan

Figure 2.3
Existing bus infrastructure and routes

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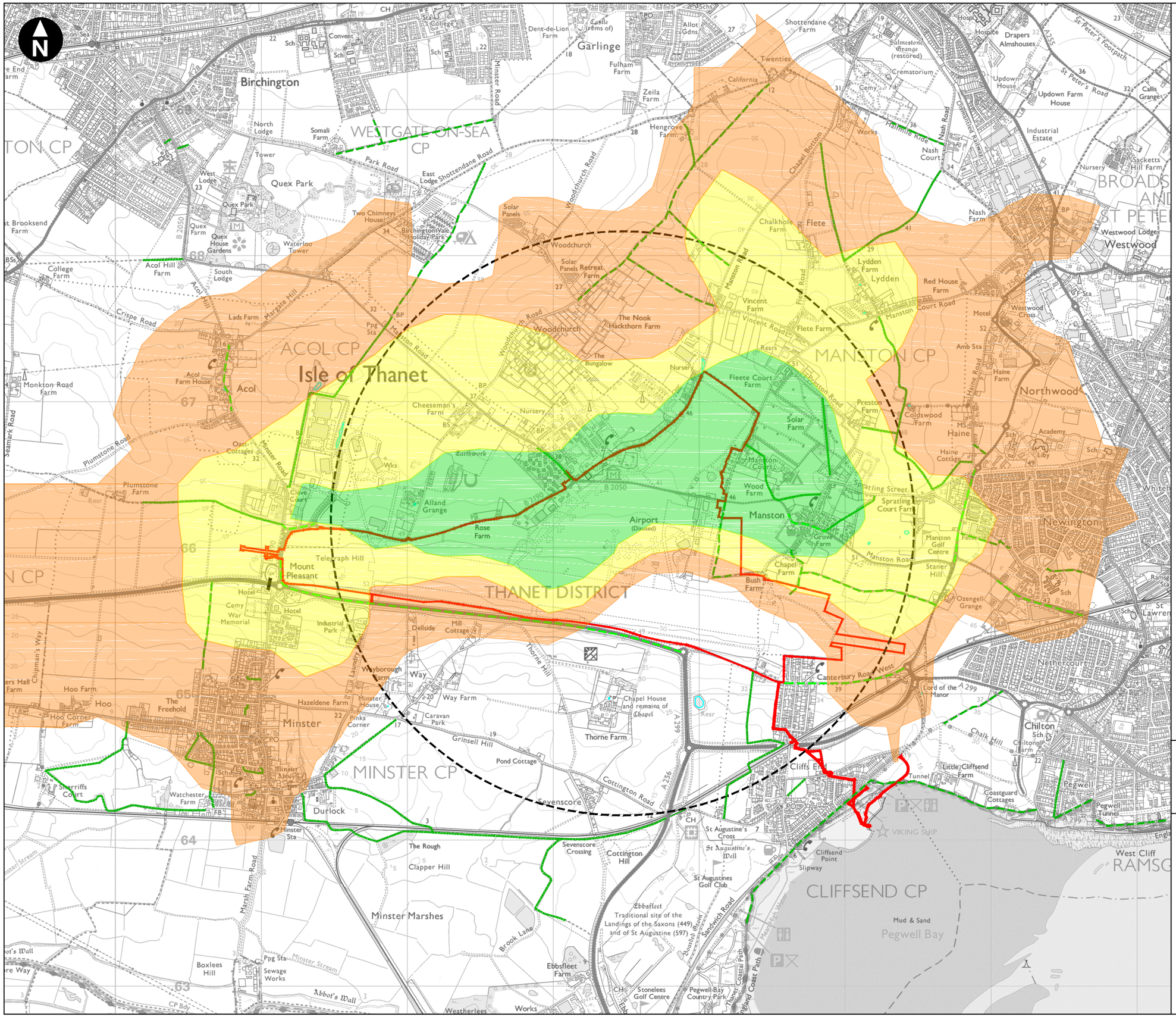
N
Birchington
WESTGATE-ON-SEA CP
Garlinge
Quex Park
Park Road
Shottendane Road
Woodchurch Road
Minster Road
Somali Farm
Hengrove Farm
Fulham Farm
Zeila Farm
Dent-de-Lion Farm
Castle (rems of)
Twenties
California
Shottendane Farm
Crematorium
Updown House
Updown Farm House
Industrial Estate
Nash Court
Nash Road
Dismantled Railway
Hailmine Ride
Chapel Bottom
Works
Flete
Chalkhole Farm
Lydden
Lydden Farm
Red House Farm
Manston Court Road
Nash Farm
BROADS AND ST PETE
Westwood
Westwood Lodge
Sacketts Hill Farm
Nursery
Westwood Cross
Motel
Northwood
Haine
Haine Farm
Haine Road
Academy
Coldswood Farm
Preston Farm
Preston Road
Fleete Court Farm
Solar Farm
MANSTON CP
Vincent Farm
Vincent Road
Flete Farm
Manston Road
Woodchurch
The Nook
Hackthorn Farm
The Bungalow
Solar Panels
Solar Panels Retreat Farm
Two Chimneys House
Birchington Vale Holiday Park
West Lodge
East Lodge
Tower
Waterloo Tower
Quex House Gardens
Quex Farm
Brooksend Farm
College Farm
Acol Hill Farm
South Lodge
Acol Hill
Margate Hill
Crispe Road
Lads Farm
ACOL CP
Isle of Thanet
Acol
Acol Farm House
Monkton Road Farm
Plumstone Road
Plumstone Farm
Oast Cottages
Cheeseman's Farm
Nursery
Earthwork
Wks
Clive Court
Alland Grange
Rose Farm
Airport
(Disused)
Manston
Grove Farm
Chapel Farm
Bush Farm
Wood Farm
Spratling Street
Spratling Court Farm
Manston Golf Centre
Staner Hill
Ozengell Grange
Newington
Telegraph Hill
Mount Pleasant
Hotel
Cemy
War Memorial
Industrial Park
THANET DISTRICT
Dellside
Mill Cottage
Thorne Hill
Laundry Road
Wayborough Farm
Way
Way Farm
Chapel House and remains of Chapel
Thorne Farm
Caravan Park
Pinks Corner
Minster House
Hazeldene Farm
Hoo Farm
Hoo Corner Farm
Hoo
The Freehold
Minster
MINSTER CP
Grinsell Hill
Pond Cottage
Cottington Road
Sevenscore
Durlock
Minster Sta
Sheriffs Court
Watchester Farm
Minster Abbey
Sevenscore Crossing
Cottington Hill
The Rough
Clapper Hill
Minster Marshes
Marsh Farm Road
Brook Lane
Boxlees Hill
Sewage Works
Abbot's Wall
Ebbsfleet Farm
Ebbsfleet
Traditional site of the Landings of the Saxons (449) and of St Augustine (597)
Stonelees Golf Centre
Pegwell Bay Country Park
Weatherlees
Works
Canterbury Road West
Lord of the Manor
Nethercourt
Chilton
Chilton Farm
Chalk Hill
Cliffs End
Little Cliffsend Farm
Tunnel
Coastguard Cottages
Pegwell
Pegwell Tunnel
St Augustine's Cross
St Augustine's Well
St Augustines Golf Club
VIKING SHIP
Cliffsend Point
Slipway
CLIFFSEND CP
Mud & Sand
Pegwell Bay
West Cliff
RAMSG
Thanet Coastal Path
England Coast Path
Sandwich Road
Ramsgate Road
Minster Stream
Ppg Sta
Sewage Works
Abbot's Wall
CP Bdy
Chipman's Way
Saxon Shore Way
Hospice
Drapers Almshouses
St Peter's Footpath
St Peter's Road
Callis Grange
Salmestone Grange (restored)
Cemy
Hospl
Sch
Liby
Sta
Convent
College
PO
Allot Gdns
Castle (rems of)
Dent-de-Lion Farm
Fulham Farm
Zeila Farm
Hengrove Farm
Somali Farm
North Lodge
West Lodge
East Lodge
Tower
Quex Park
Quex Farm
Quex House Gardens
Waterloo Tower
Two Chimneys House
Birchington Vale Holiday Park
Solar Panels
Woodchurch
Solar Panels Retreat Farm
Chalkhole Farm
Flete
Lydden
Lydden Farm
Red House Farm
Nash Court
Nash Farm
Nash Road
Dismantled Railway
Hailmine Ride
Chapel Bottom
Works
Twenties
California
Shottendane Farm
Crematorium
Updown House
Updown Farm House
Industrial Estate
Hospice
Drapers Almshouses
St Peter's Footpath
St Peter's Road
Callis Grange
Salmestone Grange (restored)
Cemy
Westwood
Westwood Lodge
Sacketts Hill Farm
Nursery
Westwood Cross
Motel
Amb Sta
Haine
Haine Farm
Haine Road
Academy
Coldswood Farm
Preston Farm
Preston Road
Fleete Court Farm
Solar Farm
Northwood
Manston Road
Manston Court Road
Vincent Farm
Vincent Road
Flete Farm
Woodchurch
The Nook
Hackthorn Farm
The Bungalow
Nursery
Resrs
Manston Road
Woodchurch Road
Minster Road
Margate Hill
Crispe Road
Lads Farm
Acol
Acol Farm House
Monkton Road Farm
Plumstone Road
Plumstone Farm
Oast Cottages
Cheeseman's Farm
Nursery
Earthwork
Wks
Clive Court
Alland Grange
Rose Farm
Airport
(Disused)
Manston
Grove Farm
Chapel Farm
Bush Farm
Wood Farm
Spratling Street
Spratling Court Farm
Manston Golf Centre
Staner Hill
Ozengell Grange
Newington
Telegraph Hill
Mount Pleasant
Hotel
Cemy
War Memorial
Industrial Park
Dellside
Mill Cottage
Thorne Hill
Laundry Road
Wayborough Farm
Way
Way Farm
Chapel House and remains of Chapel
Thorne Farm
Caravan Park
Pinks Corner
Minster House
Hazeldene Farm
Hoo Farm
Hoo Corner Farm
Hoo
The Freehold
Minster

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Key

- Application Boundary
- 8km isochrone
- Traffic free cycle route
- On-road cycle route

0 m 3000 m

Scale 1:60,000 @ A3

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Manston Airport DCO
Travel Plan

Figure 2.6
Existing cyclist infrastructure and isochrone

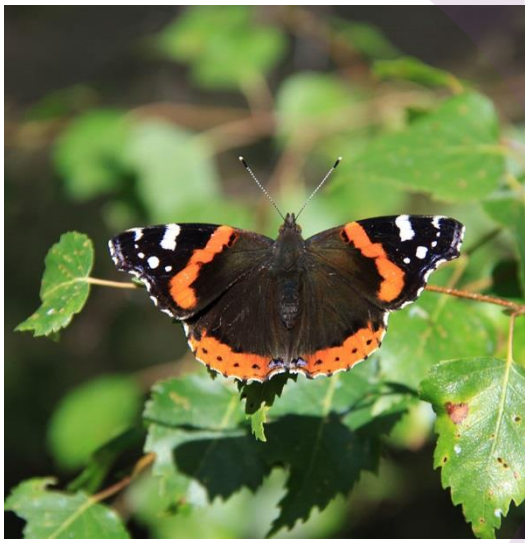
March 2019

wood.

RiverOak Strategic Partners Limited

Manston Airport DCO

TA Appendix M - Public Rights of Way Management Strategy (PRoWMS)



Wood Environment & Infrastructure Solutions UK Limited – March 2019

Report for

George Yerrall
RiverOak Strategic Partners
Audley House
London
W1K 6WF

Main contributors

Aga Jezierska
Glyn Price

Issued by

.....
Aga Jezierska

Approved by

.....
Glyn Price

Wood

Canon Court
Abbey Lawn
Abbey Foregate
Shrewsbury SY2 5DE
United Kingdom
Tel +44 (0) 1743 342 000

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Document revisions

No.	Details	Date
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3	FINAL DRAFT	12/03/2018
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Appendix A Site visit undertaken on 31 October 2017 - Meeting minutes

1. Introduction

1.1 Background

1.1.1 RiverOak Strategic Partners Limited (hereafter referred to as 'RiverOak') is seeking to secure the future of Manston Airport (the 'Proposed Development') as a valuable regional and national asset by re-developing the site as a freight airport. The proposals will provide much needed additional air freight capacity to the United Kingdom and serve to relieve pressure from other, already heavily congested, London and South East airports.

1.1.2 Under the *Planning Act 2008*[1] (the '2008 Act') the re-development of Manston Airport as a freight airport is considered a Nationally Significant Infrastructure Project (NSIP). RiverOak is making an application under the 2008 Act for a permission known as a 'Development Consent Order' (DCO) to reopen and operate Manston Airport. The application will be submitted to the Planning Inspectorate which will examine it and make a recommendation to the Secretary of State for Transport, who will then make a decision on whether the Proposed Development is granted consent.

1.1.3 This Public Right of Way Management Strategy (PRoWMS) is one of a suite of reports which have been produced in the support of the DCO application. This PRoWMS is included as Appendix M of the Transport Assessment.

1.1.4 This version of the document has been updated to take into account comments received by Kent County Council (KCC) on the version of this document submitted with the DCO Transport Assessment (TA) in July 2018.

1.2 Overview

1.2.1 The site is located approximately 4km to the west of Ramsgate and 5km south of Margate in the district of Thanet, East Kent and covers an area of approximately 303.2ha.

1.2.2 The site has provided a variety of operational airport-related services since 1916. . Until 1998 it was operated by the Royal Air Force (RAF) as RAF Manston, and for a period in the 1950s was also a base for the United States Air Force (USAF).

1.2.3 From 1998 it was operated as a private commercial airport, known as Kent International Airport. The airport offered a range of services including scheduled passenger flights, charter flights, air freight and cargo, a flight training school, flight crew training and aircraft testing. In recent years it was operating as a specialist air freight and cargo hub servicing a range of operators. Although the airport was closed in May 2014 much of the airport infrastructure remains.

1.2.4 The Proposed Development shall consist of the following principal components, as shown in **Figure 1.1** of Volume 4 of the Environmental Statement (ES):

- Runways and taxiways suitable for the take-off and landing of a broad range of cargo aircraft;
- New aircraft stands;

[1] The Planning Act 2008, [online]. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents [Accessed: 27/03/2019].

- An area for cargo freight operations able to handle at least 10,000 movements per year and associated infrastructure, including;
  - a new Air Traffic Control (ATC) tower;
  - a rescue and fire station;
  - a fuel farm; and
- Facilities for other airport-related development, including:
  - a passenger terminal and associated facilities;
  - an aircraft teardown and recycling facility;
  - a flight training school;
  - a base for at least one passenger carrier;
  - a fixed base operation for executive travel; and
  - business facilities for airport related organisations.

1.2.5 As set out in detail in Chapter 2 of this Report, there are two PRoWs that are affected by the Proposed Development, for which a strategy is identified.

1.3 Consultation

1.3.1 The PRoW Officer for Kent County Council (KCC) has been consulted regarding the affected PRoW and the proposed strategy.

1.3.2 A joint site visit was undertaken on 31 October 2017 by Wood and the KCC East Kent Area Officer for PRoW & Access Service. This was followed up with a series of email exchanges and telephone conversations. The existing PRoW network close vicinity to the site was discussed and it was confirmed that the KCC online record of the network is up to date and formed the basis of discussions on the existing conditions and possible proposals.

1.3.3 Notes of the discussion during the joint site visit are included in **Appendix A** to this report. The content of the notes is a narrative of the discussions at the time and the details set out about securing the PRoW amendments and time frames are not applicable as these will be secured through the DCO.

1.4 Structure of the PRoWMS

1.4.1 The remainder of this PRoWMS is set out as follows:

- **Chapter 2: PRoW Assessment**, identifies all PRoW that are affected by the Proposed Development and the nature of the impact;
- **Chapter 3: Proposed Changes to PRoW** discusses any proposed mitigations; and
- **Chapter 4: Summary and Conclusions** summarises the proposals and concludes on the impact of the Proposed Development.

2. PRoW Assessment

2.1 Introduction

2.1.1 A right of way is a path on which the public have a legally protected right to pass and re-pass and are known as a 'public' right of way (PRoW). There are four types of PRoW:

- Footpaths – for use only by pedestrians;
- Bridleways - for pedestrians, horse riding and cycling;
- Restricted byways - for any transport that does not have a motor; and
- Byways open to all traffic - for any kind of transport, including cars, but mainly used by walkers, cyclists and horse riders.

2.1.2 Definitive maps of PRoW have been compiled for all of England and Wales, as a result of the *Countryside and Rights of Way Act 2000*[2]. Local highways authorities are required to maintain the definitive map of all PRoW in their areas, which are publicly available to view. Changes to a PRoW requires a legal order application to be made to the local highway authority. Public Path Diversion or Extinguishment Orders are dealt with by the *Highways Act 1980*[32], or the *Town and Country Planning Act 1990*[4] if it is to enable development to take place.

2.2 Study Area

2.2.1 **Figure 2.1** shows the PRoW within and adjacent to the red line boundary of the Proposed Development. It identifies two PRoW to the east of the site that are affected by the Proposed Development.

2.2.2 The affected PRoWs are TR8 and TR9, both of which are bridleways. TR8 will be impacted by the proposed extension of the car park, while TR9 will fall within the red line boundary of land north of the proposed runway.

2.2.3 **Figure 2.2** shows the sections of the PRoW which are affected by the Proposed Development. This figure illustrates how each of these PRoW is further split into smaller sub sections, indicated with an orange dot.

2.2.4 Between Manston Road and Bush Farm, TR8 is split into five sub sections in KCCs PRoW identification numbers. The sections start from the point where it exits Manston Road (TR8/1) and then runs south and then east through the remaining sections to TR8/5.

2.2.5 TR9 is split into two sub sections. The first, TR9/1 is between the public highway and the link TR10. The second, TR9/2 is between the link TR10 and the termination point inside Manston Airport's existing boundary.

---

[2] Countryside and Rights of Way Act 2000, [online]. Available at: https://www.legislation.gov.uk/ukpga/2000/37/part/I/chapter/I/crossheading/rights-and-liabilities-of-owners-and-occupiers [Accessed: 27/03/2019].
[3] Highways Act 1980, [online]. Available at: https://www.legislation.gov.uk/ukpga/1980/66 [Accessed: 27/03/2019].
[3] Town and Country Planning Act 1990, [online]. Available at: https://www.legislation.gov.uk/ukpga/1990/8/section/73 [Accessed: 27/03/2019].

2.2.6 All affected PRoW in the study area are summarised in **Table 2.1**.

Table 2.1 Summary of PRoW affected by the proposed development

ID No	PRoW No	Type of PRoW	Extent of the impact on PRoW
1	TR8/2	Bridleway	The bridleway falls partially within the Proposed Development.
2	TR8/3	Bridleway	The bridleway falls within the Proposed Development.
3	TR8/4	Bridleway	The bridleway falls within the Proposed Development.
4	TR8/5	Bridleway	The bridleway falls within the Proposed Development.
5	TR9/2	Bridleway	The bridleway falls partially with the existing boundary which is planned to remain as part of the Proposed Development.

2.3 Description of Affected PRoW

2.3.1 In order to gain a thorough understanding of the affected PRoWs, a site visit was undertaken on 31 October 2017 with KCC's East Kent Area Officer for the PRoW & Access Service.

2.3.2 Follow up conversations with the East Kent Area Officer also established agreement on the widths of the PRoW, while the lengths were obtained from the KCC online mapping for PRoW.

2.3.3 The characteristics of the local PRoW to the site are described in **Table 2.2**.

Table 2.1 Characteristics of the affected PRoW

	Length [m]	Width [m]	Features
TR8/1	20	2.1-3.0	Field-edge path with a fingerpost/timber- plastic finger (fingerpost) at the start of TR8.
TR8/2	141	2.1-3.0	Field-edge path.
TR8/3	46	2.1-3.0	Field-edge path.
TR8/4	298	2.1-3.0	Path running across a field.
TR8/5	381	2.1-3.0	Path running across a field marked with a fingerpost/metal- metal finger (fingerpost) at the end of TR8.
TR9/1	185	Not on record	A section of tarmacked path followed by a section of bare ground leading towards a farmed land. Last section of TR9/1 is formed by a field-edge path. Fingerpost/metal- metal finger (fingerpost) marks the start of TR9 and is located on the footway, outside 38 High Street.
TR9/2	146	Not on record	Field-edge path consisting a fingerpost/metal- metal finger (fingerpost) marking the start of TR10, located north of the overgrown section of TR9.

2.3.4 Detailed descriptions of the routes are as follows:

- TR8 runs diagonally east to west from a point marked with a metal fingerpost at the eastern end of the PRoW (TR8/5). It then runs north alongside the existing Manston Airport perimeter fence, continuing north to where it meets the B2050 Manston Road (TR8/1). It was observed during the joint site visit that, the public do not generally follow the link, but walk along the Manston Airport fence instead. During the site meeting, it was agreed that this may be due to the alignment of the existing features such as the field boundary, the alignment of the existing Manston Airport perimeter fence and that the existing line of the PRoW across agricultural field is not appropriate at certain times of the year.
- During the site visit, it was observed that TR9 effectively ends at the point where it meets TR10. South of this point, the section of TR9 which is shown on KCC and Ordinance Survey plans is currently overgrown with dense vegetation. The denseness of the vegetation suggests that this section of route beyond the connection with TR10 has not been used for a prolonged period of time. The short section of TR9 that extends into the site is inaccessible due to the perimeter fence.

2.3.5 During the site visit with the KCC officer, a local resident who identified that he had lived in the area for over 30 years and was a regular dog walker in the locality, shared his knowledge of the PRoW network and usage habits in the vicinity of the study area. His comments are summarised below:

- Many dog walkers come to the area from further afield and exercise their dogs along TR8, TR9 and TR10 links;
- Local and visiting dog walkers usually walk a circular route/ loop to bring them back to their starting point to get back to their parked cars; and
- Route choice greatly depends on the time of the year and crop production, as high crops restrict walking or running along the links along and/or across fields. This however, was later commented on by Heather Waller, The east Kent Area Officer-Public Rights of Way & Access Service for KCC, who confirmed that it is KCC's responsibility to maintain routes so they are accessible all year round.

2.3.6 The resident confirmed, as observed by the KCC officer, that the TR8 link is not used as designed; instead users walk along the Manston Airport fence line instead. He also confirmed, that the section of TR9 link between the link TR10 and the Manston Airport fence, is not used and is unlikely to be known to any users.

2.3.7 PRoW width requirements are set out in the *Rights of Way Act 1990*[5] which states that:

- The "minimum width" is as respects a bridleway which is not a field-edge path, 2m, or as respects any other highway, 3m; and
- The "maximum width" is as respects a bridleway, 3m.

2.3.8 Existing TR8 and TR9/2 links are below the recommended width of 3m. The width of TR9/2 had not been recorded by KCC. However, the KCC Officer confirmed it to be substandard during the joint site visit.

2.3.9 The key characteristics of links TR8 and TR9 can be seen in **Figure 2.3**, while **Figures 2.4** and **2.5** provide captioned photographs of the PRoW**. Figure 2.6** identifies the locations where the photographs were taken.

[5] Rights of Way Act 1990, [online]. Available at: http://www.legislation.gov.uk/ukpga/1990/24/contents [Accessed: 27/03/2019].

Figure 2.4 Photographic Record of TR8 observed on site

Figure 2.5 Photographic Record of link TR9 observed on site

2.4 Thanet Parkway Connection Proposals

2.4.1 The KCC Officer noted that as part of the Thanet Parkway Station proposals, there is a strategy to create a new link between the station and TR9, as shown in **Figure 2.7.**

2.4.2 This proposal is considered further in **Section 3.4**.

2.5 Conclusions

2.5.1 The analysis of the links affected by the Proposed Development indicate the following:

- Existing TR8/2 link will partially remain until the point where it links with the Proposed Development's new perimeter fence. The remaining section of TR8/2 link will need to be diverted around the new proposed boundary fence;
- Existing links TR8/3, TR8/4 and TR8/5 will need to be diverted around the new proposed boundary fence; and
- Existing TR9/2 link will remain until the point where it links to the existing Manston Airport fence line. The remaining section of the TR9/2 link that currently falls within the airport boundary will need to be extinguished.

3. Proposed Changes to PRoW

3.1 Introduction

3.1.1 This chapter sets out proposals for TR8 and TR9 as part of the Proposed Development which have been discussed with Kent County Council (KCC).

3.2 Summary of Discussions with Kent County Council

3.2.1 As set out in **Section 1.3**, the KCC East Kent Area Officer for Public Rights of Way (PRoW) & Access Service has been consulted regarding the Proposed Development. A summary of the key points that were discussed is as follows and this is included as Appendix A to this report:

- Existing TR9 which currently leads into the perimeter fencing of Manston Airport historically led further south, but since Manston Airport was built, most of the route within the boundary was extinguished, however, a short section remained, but is inaccessible.
- Existing links TR8 and TR9 are planned to be widened to a desired minimum width of 3m. Similarly, this is suggested in the emerging Thanet Local Plan to be funded through the Section 106 Agreement, should an the Proposed Development (or an alternative development) be granted planning permission; and
- KCC requested that PRoWs are to be created and funded under a Section 106 Agreement and would be maintained by KCC while remaining part of Manston Airport land. It should be noted however, that the power to undertake any mitigation work required would be established under the powers of the Development Consent Order (DCO). This PRoW Management Strategy will be taken forward post permission and used as a basis for on-going discussions between KCC and the appointed Contractor, prior to commencement of the works. This will ensure that final plans can be agreed upon.

3.2.2 Although paragraph 3.2.1 sets out a narrative of initial discussions held with the PRoW Officer, it should be noted that the last bullet point does not reflect the proposals for securing the PRoW amendments. A Section 106 Agreement is not applicable as amendments will be secured through the DCO.

3.3 Detailed Mitigation Proposals

3.3.1 Each of the affected PRoW has been considered and a permanent mitigation proposal to address the impact is set out in the **Table 3.1**.

Table 3.1 Proposed detailed mitigation measures

	Approximate Length (M)	Proposed Mitigation
TR8	523	TR8 will be rerouted along the edge of the perimeter fence of the Proposed Development. The route will remain as it is until it forced off line onto a new alignment along the fence. The previous route will be permanently closed and the new route permanently established. This will be done early in the project life cycle, so it is established before major works commence.

		The width of the bridleway will be 3m and it is proposed to run alongside a hedgerow planted east of the fence to allow for screening of the car park and the site. Any way marking posts or other PRoW infrastructure will be replaced and moved as and where necessary.
TR9	73	TR9 will be extinguished south of the perimeter fence of Manston Airport so that no PRoW falls within the site.

3.3.2 The Masterplan has been designed to include a 5m wide corridor between the airport fence line and edge of the project order limit to incorporate the diverted TR8 (refer to **Figure 3.1**). This 5m corridor will incorporate the 3m wide bridleway and any appropriate screening.

3.4 Consideration for Thanet Parkway Connection

3.4.1 In addition to the two proposals (**Table 3.1**), the provision of a new link from TR9 to the proposed Thanet Parkway Station across or around the edge of the site cannot be provided as part of the Proposed Development.

3.4.2 A link across the site would present a security and safety risk, as it would cross the runway, taxi ways and other operational infrastructure. It is industry standard approach to resitict only secutiry checked members of staff or passengers onto the airport apron. Therefore, PRoW directly crossing a site such as this is wholly inappropriate.

3.4.3 The alternative route would be long and run along the eastern side of the site. It would likely follow the proposed boundary fence, potentially making it unattractive to users due to its positioning in addition to its length. The length would be aroubd 3.5km assuming a route as follows;

- Internal airport paths to the B2050;
- B2050 to start of TR08;
- TR08 on new Alignment then joining new path that would route around the edge of the Airport Land holding to the east;
- At the south of the Airport the route would then follow Windsor Road;
- At the end of Windsor Road users would join Canterbury Road West;
- Users would then route south through Cliffend on Foads Hill; and
- From Foads Hill its assumed some new infrastructure would be required to access the Parkway Station.

3.4.4 If such a route could be proposed it would be at a distance of 3.5km to 4km which is well outside acceptable walking distances for staff and with the added luggage requirements for most passengers not appropriate for passengers. Waking distances for staff to the cargo facility and Northern Grass area would be significantly longer still at 4.5km – 6km.

3.4.5 However, KCC requested that Wood consider this desire for a route of this narure and as such Wood consulted with aviation experts Osprey CSL, a specialist technical company offering independent consultancy exclusively on aviation projects. Osprey CSL identified the following issues with positioning a PRoW along an airport perimeter fence:

- It attracts spotters, who are likely to take up residence close to the fence line. This in turn creates an additional security issue, which Manston Airport and local police would have to manage and mitigate;

- Extra patrols, CCTV etc. would be needed to reach the difficult locations where vehicles cannot easily gain access;
- There is a risk of infrastructure damage in locations where it is close to any Communication, Navigation & Surveillance (CNS), approach lighting and more;
- It may infringe on existing private land outside the boundary fence which could require a double line of fencing; and
- There is the long-term issue of future expansion, or need for infrastructure space, which could be inhibited by PRoW constraints.

3.4.6 Osprey CSL's recommendation was to reduce the presence of PRoW near the Proposed Development boundary (and CNS). PRoW should not be provided within the boundary of the Proposed Development. For that reason, no new links are proposed around the eastern boundary of the Proposed Development.

3.4.7 Furthermore, due to the design of the Proposed Development, including components such as the Fuel Farm, and the housing estate off King Arthur Road, creating the link set out in emerging local plan would likely require third party land outside the redline of the Proposed Development.

3.4.8 Finally, this link would also require additional infrastructure and paths along roads currently not catered with pedestrian facilities and a new link which may be hard to achieve from Foads Hill.

3.4.9 As a result, this link cannot be progressed within the proposals this report is being prepared to support.

3.4.10 However, if in the future if it was likely that the Thanet Parkway Station were be built, there will consideration of bus connectivity between the station and Manston Airport, providing a sustainable north-south link.

3.4.11 An overview of the proposed mitigations is shown in **Figure 3.2**.

4. Summary and Conclusions

4.1.1 The Proposed Development will require an extension of the existing car parking located south of B2050 Manston Road, near the eastern site boundary. It is also assumed that the current site boundary between High Street and the existing runway will remain as shown in **Figure 2.1.** As a result, two Public Rights of Way (PRoWs) will be affected, TR08 and TR09.

4.1.2 A joint site visit was undertaken on 31 October 2017 with the Kent County Council (KCC) East Kent Area Officer for PRoW & Access Service, which was followed up with a series of email exchanges, telephone conversations and confirmation of the KCC online PRoW records. These were used as the basis of the proposed mitigation measures. Feedback from a local resident who regularly uses the PRoW links was also considered.

4.1.3 Wood also consulted with aviation experts, Osprey CSL, who are a specialist technical company offering independent consultancy exclusively on aviation projects. Their comments and suggestions were noted and accounted for in the PRoW Management Strategy.

4.1.4 The following mitigation measures are proposed to address the impact of the Proposed Development on the affected PRoWs:

- TR8 will be diverted along the edge of the new boundary fence of the Proposed Development. The route will remain as it currently is, until it is diverted onto a new alignment along the fence. The previous route will be permanently extinguished and the new route permanently established. This will be done early in the project life cycle so it is established before major works commences;
- The width of the diverted TR8 bridleway will be increased to 3m and it is proposed it will run alongside a hedgerow planted east of the fence to allow for screening of the car park and site. Any way marker posts or other PRoW infrastructure will be replaced and relocated as appropriate; and
- TR9 will be extinguished south of the boundary fence of Manston Airport so that no PRoW falls within the red line boundary of the site.

4.1.5 The proposed mitigations take into account the existing habits of PRoW users, as well as aiming to maintain the function of the links affected.

4.1.6 Creation of a new link around the eastern boundary of the Proposed Development will not be progressed. This, however, could be addressed by a bus service providing a north- south link, should the planned Thanet Parkway Station go ahead.

4.1.7 Amendments to the PRoW will be secured through the Development Consent Order.

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Appendix A
Site visit undertaken on 31 October 2017 - Meeting minutes

Minutes

Date: 31.10.17, 11:00-13:30 **Meeting at:** On site, PRoW TR8, TR9, TR10

Subject / purpose:

Review existing PRoW affected by the Manston Airport Development

Attendees:

Heather Waller, The east Kent Area Officer-Public Rights of Way & Access Service, KCC
Aga Jezierska, Consultant, Amec Foster Wheeler (Wood)

Apologies:

Minutes: **Action by:**

1 Existing PRoW were discussed briefly and following information was received from Heather:

-Existing TR9 which currently leads into the fenced off Manston Airport historically led further south, but since the Airport was built it was extinguished and not used any longer.

-Existing TR8 link runs diagonally from a point marked with a Metal Fingerpost at the eastern end of the PRoW and the point several meters away from the corner of the field. It then runs straight north and joins back with the edge of the Airport fence, continuing towards B2050 Manston Road. It is observed, that public doesn't follow the link, but they walk along the Airport fence instead.

-Existing TR8 and a section of TR9 which runs through the fields are below the recommended 3m width. Heather Waller will email the information of the width recorded by KCC.

-During the inspection of the existing links, it was observed that there is no direct TR9 route which currently terminates at the start of the TR10 link. The area which should be opened for the TR9 to continue running through to the Airport fence is currently very overgrown and the maturity of the bushes suggests that it has been for many years.

Denise Roffey, Project Officer from KCC is currently reviewing the Local Highways Plan. As part of that:

-A creation of the new link, between the existing TR9 and the Thanet Parkway Station

Floor 12
25 Canada Square
Canary Wharf
London E14 5LB
United Kingdom
Tel +44 (0) 203 215 1610
amecfw.com

Amec Foster Wheeler Environment
& Infrastructure UK Limited
Registered office:
Booths Park, Chelford Road, Knutsford,
Cheshire WA16 8QZ
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(https://consultations.kent.gov.uk/consult.ti/thanetparkwaystation) is proposed. This is suggested in the Local Highway Plan to be funded through the Section 106 should an existing Airport (or an alternative development) be granted a Planning Application, and

-Existing TR8 and TR8 are planned to be widened to a desired minimum width of 3m. This is suggested in the Local Highway Plan to be funded through the Section 106 should an existing Airport (or an alternative development) be granted a Planning Application.

2 Both PRoW being considered as affected by the development were discussed. From that it transpired that the Lydd Airport (located in South Kent) has been refused a Planning Application to extinguish a PRoW. The Airport originally applied through a DCO route and now re-applied through the Highways Act 1980. Heather from KCC was not able to say on what grounds was the application for the Lydd Airport refused.

3 If the Highways Act 1980 route was taken to extinguish a section of TR9 as discussed in previous chapter, the plans would be submitted to Denise Roffey from KCC, who upon approval of the plans, would pass them to Definition Team (DT). The proposal would then move to a Public Consultation stage. Neither Denise nor DT would object the proposal should the PRoW revisions proposed were in line with the Local Highways Plan as discusses during the site meeting; and

4 Currently, PRoW applications take about 2,5 years to be looked at by KCC. That timescale is likely to soon reach 3 years. If, however, the submission is classed as Nationally Significant Project, that timeframe may possibly be shorter, but Heather from KCC was not able to confirm that. Laura Wilkins from KCC is the Manager for the DT and would deal with the application.

5 During an on-site meeting, we were approached by a local elderly man who turned out to be a regular dog walker living in the area for over 30 years and using local PRoW, including those discussed during the meeting. He made a number of comments about the habits of PRoW' users as well as on the features in the vicinity of TR9 and TR10. These are as follow:

-Many dog walkers come to the area from further afield and exercise their dogs along TR8, TR9 and TR10.

-Visiting as well as local dog walkers mainly walk routes enabling them to describe a small circle/loop, to enable going back to their starting point (being it a village or their car parked in the vicinity).

-Route choice greatly depends on the time of the year and what is being grown in the fields, as high crops impede walking the links running along/through the fields. This however was later commented on by Heather, who confirmed that it is KCC's responsibility to maintain the routes and make them accessible all year round.

-The man confirmed the observation made earlier by KCC, that TR8 link is not used as designed, but users walk along the Airport fence instead. He also confirmed, that the section of TR9 between the TR10

and the Airport fence is not used at all and is unlikely that is known to any users.

-TR8 is popular with joggers, dog walkers, bikers and equestrians who continue to move from the top of the link towards Manston Court Road rather than the east towards the paths meeting at the bend of B2050 Manston Road, opposite of the Wood Farm, as B2050 Manston Road is far too busy to walk along. Users walk along B2050 Manston Road using the informal path running through the field when the crops are low.

-The man has pointed out some commonly used loop-shaped routes. One of them is a quarry (formerly a chalk pit) which is also used to walk around, although this is not a formal PRoW route either.

-There used to be a farm building the west of the TR9, close the Airport fence. This however was demolished in 1960s. The existing low fence preventing continuity of the TR9 has been probably put up around that time to protect, then young, freshly planted trees.

6 Discussion was held about the proposed amendments to the PRoW affected by the Project. The following was agreed:

-Existing TR8/1 link will remain.

-Existing TR8/2 link will partially remain until the point where it meets the proposed development. The remaining section of TR8/2 link, links TR8/3, TR8/4 and TR8/5 will be closed/extinguished. The extinguished links will be replaced with a new link created along the boundary of the proposed Airport development and will connect to High Street at the location currently used by the farmer to access the field and located opposite the Bush Farm.

-Diversion of the link TR8 will enable path users to continue using the route linking High Street with B2050 Manston Road, while maintaining a direct link to Manston Court Road. It will also follow the route currently taken by PRoW users along the west-east horizontal Airport section of the fence, which at present is not officially dedicated as PRoW. During the discussion, it was agreed that this is due to the alignment of the existing features (field used for farming and utilised to the fence as leaving PRoW as currently designed would not be practical; location of the access to the field; alignment/position of the Airport fence in relation to the field and PRoW).

-Existing TR9/1 link will remain.

-Existing TR9/2 link will remain until the point where it meets the existing Airport fence. The remaining section of the TR9/2 link, that currently runs within the Airport boundary will be extinguished.

-A new link would be investigated to connect the remaining section of the link TR9/2 and the existing development south of the proposed development where the new Thanet Parkway Station is planned. The new link will run along the Airport fence. The exact route along the vertical, most the eastern section of the Airport fence is to be confirmed within Amec Foster Wheeler. This is due to the fact, that during the site meeting it was not clear whether it would be feasible

to cut across in between the existing Airport land and the proposed runway or whether the route leading around the proposed runway would have to be adopted instead. It was however agreed, that the latter would also be acceptable by KCC as this route is likely to be popular with cyclists and/or equestrians, hence the additional distance would not be a problem for these type of PRoW users.

-Providing a new link will create more challenging infrastructure for cyclists and equestrians and a connection to the new Thanet Parkway Station. It will also respond to the needs and requests of local groups which have been requesting from KCC to restore the former link in that location.

7 During the discussion, it was agreed that all proposed PRoW would have a recommended minimum width of 3m. They would be created and funded under the Section 106 Agreement and would be maintained by KCC while remaining a Manston Airport land.

8 The newly created link would be dedicated to KCC to enable maintenance and public access.

9 The lengths of each link were taken from KCC website. Heather Waller will email Aga (AFW) the widths recorded by KCC in due course.

10 KCC will be responsible for opening up and maintaining the connection between the existing links TR9/1 and TR9/2, which currently is not feasible due to the long-overgrown area where both links meet.

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Figures

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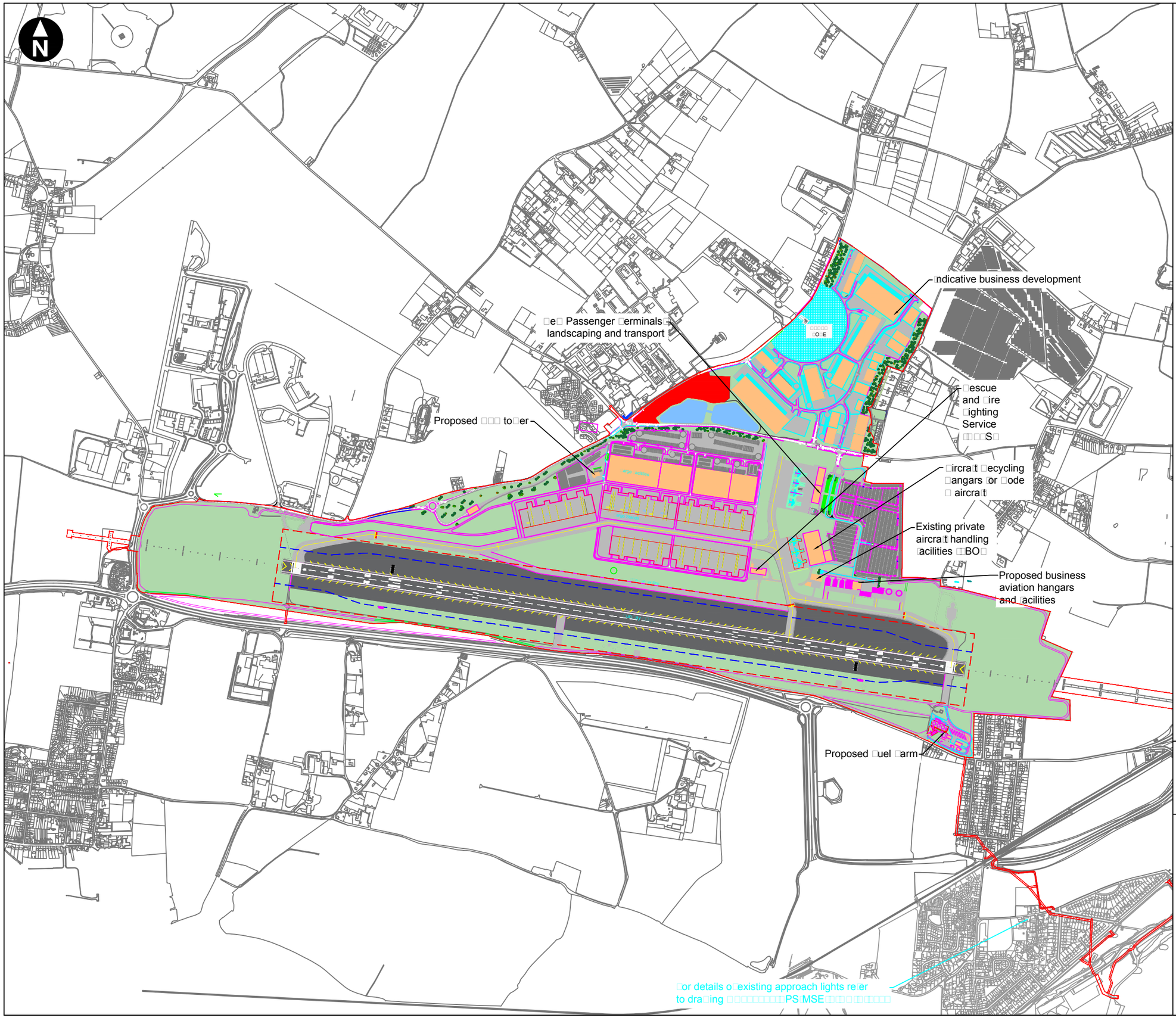

Key

Order Limits

0 m 750 m

Scale 1:15,000 @ A3

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Manston Airport DCO
Environmental Statement
Public Rights of Way Management Strategy

Figure 1.1
Proposed site layout

March 2019

wood.

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Key

- Application Boundary
- Affected PRoW
- Public Footpath
- Public Bridleway

0 m 1000 m

Scale 1:20,000 @ A3

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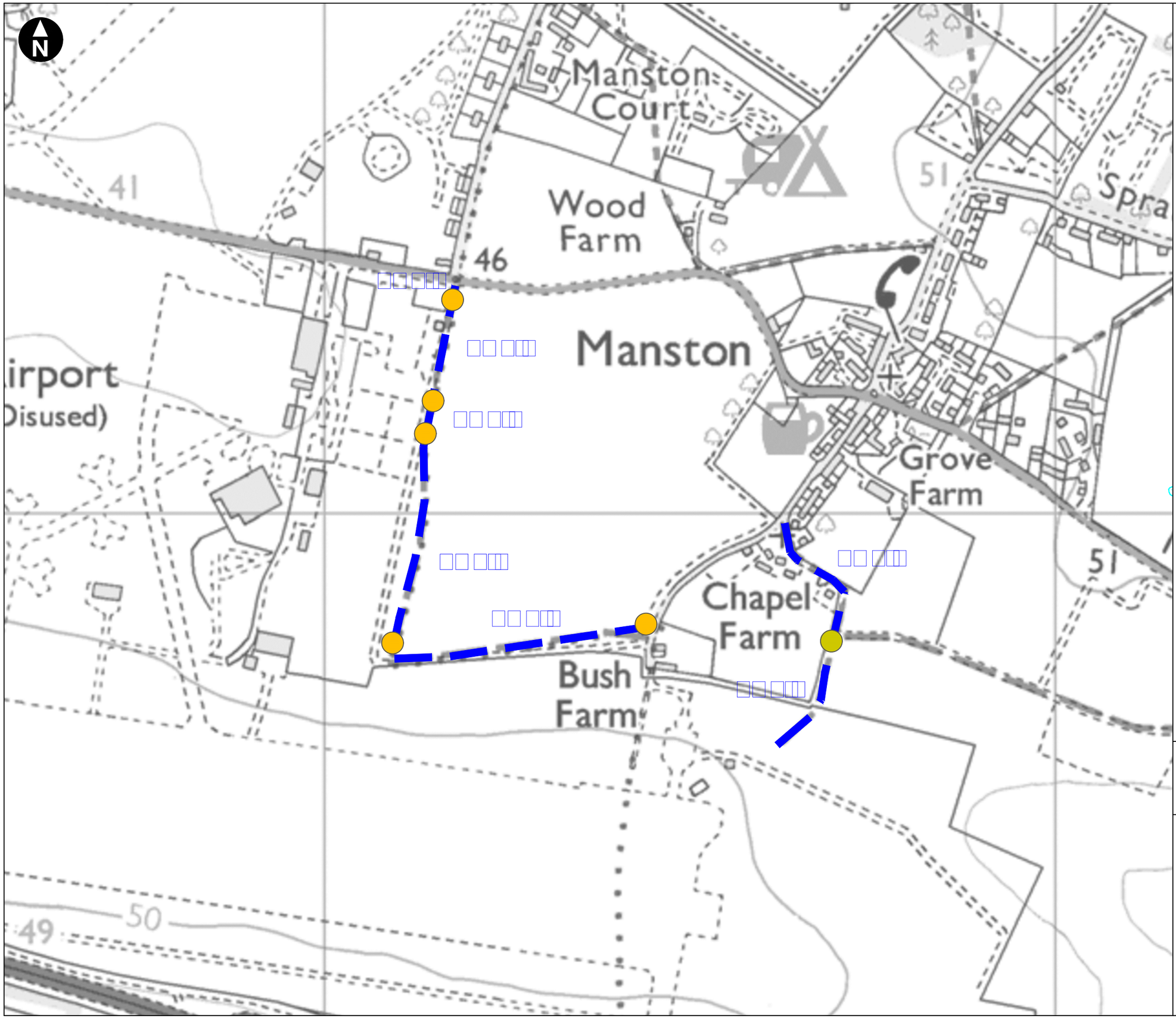
Figure 2.1 PRoW around Manston Airport

March 2019

wood.



Key

Affected PRoW

PRoW Sections

0 m 300 m

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Figure 2.2
Affected PRoW sections

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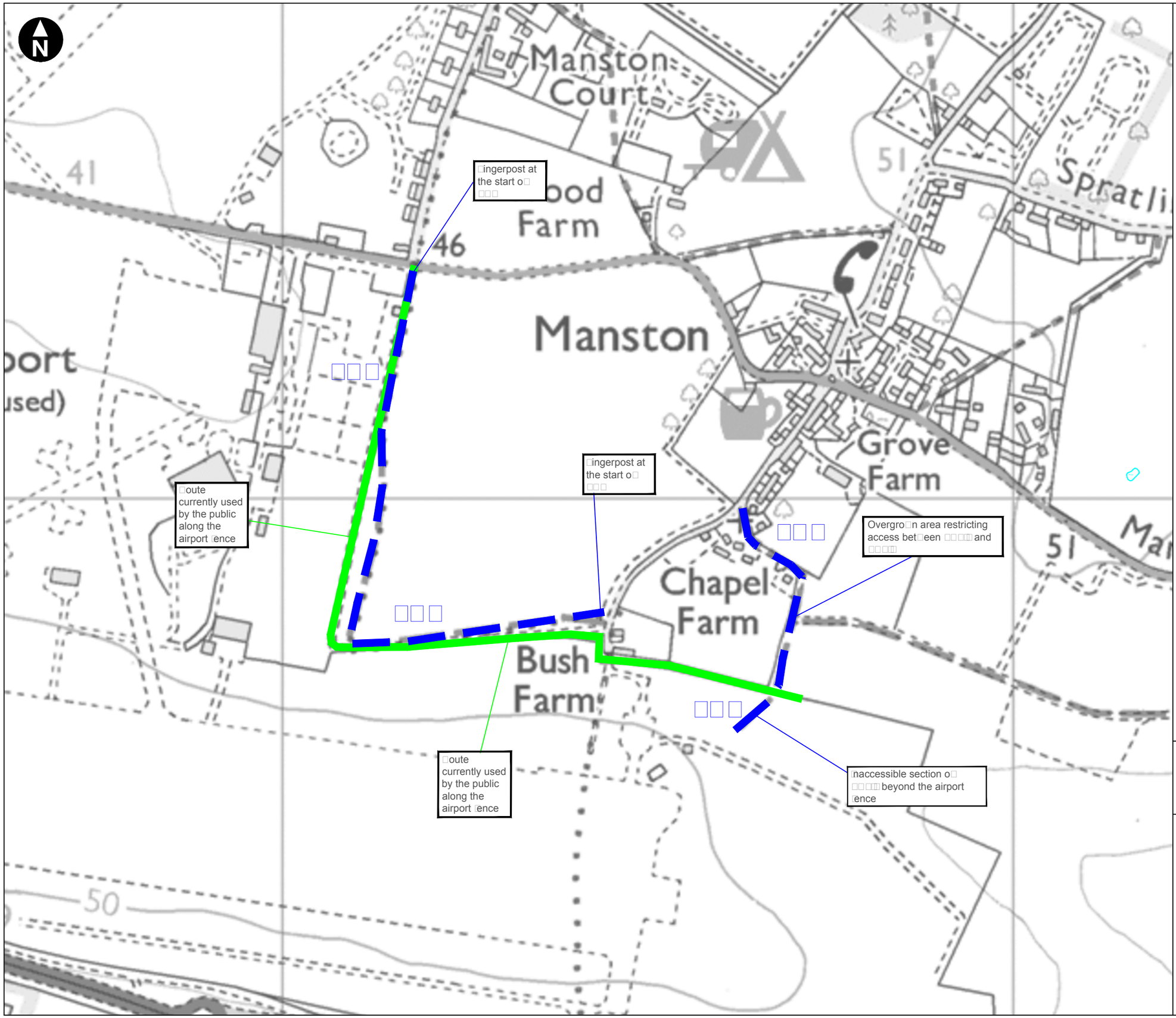

Key

- Airport Fence
- Affected PRoW

0 m 300 m

Scale 1:5000 @ A3

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Figure 2.3
Key characteristics of Link TR8 and TR9

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Key

Affected PRoW

Photograph Locations

0 m 300 m

Scale 1:5000 @ A3

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Figure 2.6
Overview of all photographs shown in figures 2.4 and 2.5

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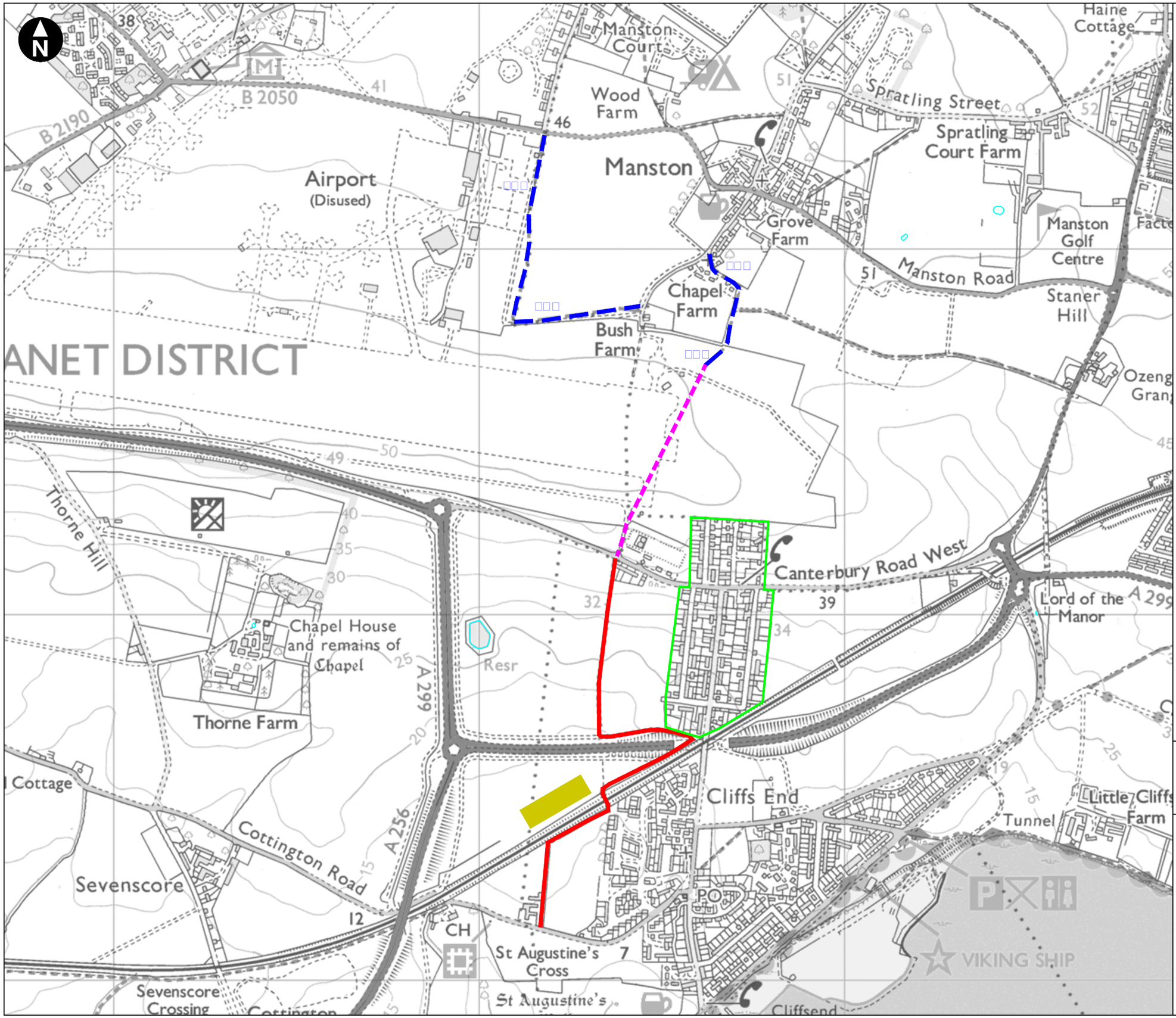

Key

- Proposed new link
- Affected PRoW
- Existing footpath
- Planned Thanet parkway railway station
- Existing housing development

0 m 500 m

Scale 1:10,000 @ A3

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Figure 2.7
Proposed link connecting TR9 with the existing footpath near the planned Thanet Parkway railway station

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wood.

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Key

Footpath TR8

Proposed Diversion

0 m 150 m

Scale 1:2500 @ A3

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Figure 3.1
Proposed diversion of TR8

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N

Manston Court

Farm

41

46

51

Airport (Disused)

Manston

Grove Farm

Chapel Farm

Bush Farm

49

50

Section o□ □□□ to vbe diverted as indicated

□ingerpost at the start o□ □□□

□□□

□□□

□□□

□□□

Section o□□□□□ link to be extinguished

Key

- Order Limits
- Affected PRoW
- PRoW Closure
- PRoW Diversion

0 m 300 m

Scale 1:5000 @ A3

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Figure 3.2

Proposed PRoW Mitigation

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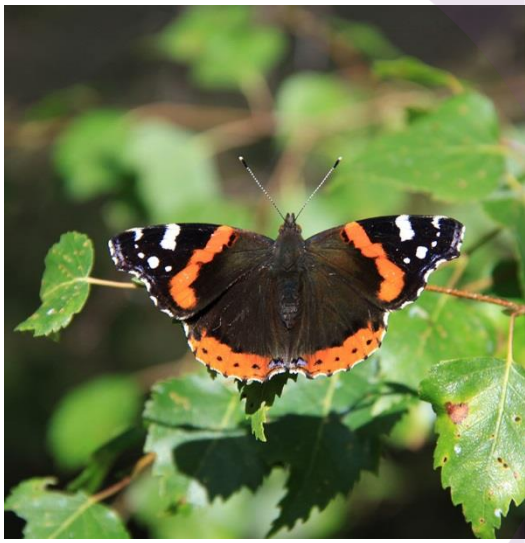
RiverOak Strategic Partners Limited

Manston Airport DCO

TA Appendix N – Car Park Management Strategy



Wood Environment & Infrastructure Solutions UK Limited – March 2019

Report for

George Yerrall
RiverOak Strategic Partners
Audley House
London
W1K 6WF

Main contributors

Glyn Price
Bev Coupe

Issued by

.....
Glyn Price

Approved by

.....
Bev Coupe

Wood

Floor 12
25 Canada Square
Canary Wharf
London E14 5LB
United Kingdom
Tel +44 (0) 203 215 1610

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Document revisions

No.	Details	Date
1	First Draft	Feb 2018
2	Final Draft	March 2018
3	Revised Final Draft	March 2019

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1. Introduction

1.1.1 RiverOak Strategic Partners Limited (hereafter referred to as 'RiverOak') is seeking to secure the future of Manston Airport (the 'Proposed Development') as a valuable regional and national asset by re-developing the site as a freight airport. The proposals will provide much needed additional air freight capacity to the United Kingdom and serve to relieve pressure from other, already heavily congested, London and South East airports.

1.1.2 Under the *Planning Act 2008*[1] (the '2008 Act') the re-development of Manston Airport as a freight airport is considered a Nationally Significant Infrastructure Project (NSIP). RiverOak is making an application under the 2008 Act for a permission known as a 'Development Consent Order' (DCO) to Reopen and operate Manston Airport. The application will be submitted to the Planning Inspectorate which will examine it and make a recommendation to the Secretary of State for Transport, who will then make a decision on whether the Proposed Development is granted consent.

1.1.3 This Car Park Management Strategy (CPMS) is one of a suite of reports which have been produced in support of the DCO application. This is appended to the TA as appendix N. .

1.1.4 This version of the report has been updated to take into account comments received by Kent County Council (KCC) on the version of this report submitted with the DCO Transport Assessment (TA) in July 2018.

1.2 Overview

1.2.1 The site is located approximately 4km to the west of Ramsgate and 5km south of Margate in the district of Thanet, East Kent and covers an area of approximately 303.2ha.

1.2.2 The site has provided a variety of operational airport-related services since 1916.Until 1998 it was operated by the Royal Air Force (RAF) as RAF Manston, and for a period in the 1950s was also a base for the United States Air Force (USAF).

1.2.3 From 1998 it was operated as a private commercial airport, known as Kent International Airport. The airport offered a range of services including scheduled passenger flights, charter flights, air freight and cargo, a flight training school, flight crew training and aircraft testing. In recent years it was operating as a specialist air freight and cargo hub servicing a range of operators. Although the airport was closed in May 2014, much of the airport infrastructure remains.

1.2.4 The Proposed Development shall consist of the following principal components, as shown in **Figure 1.1** (shown in in Volume 4 of the Environmental Statement (ES)):

- Runways and taxiways suitable for the take-off and landing of a broad range of cargo aircraft;
- New aircraft stands;
- An area for cargo freight operations able to handle at least 10,000 movements per year and associated infrastructure, including;
  - a new Air Traffic Control (ATC) tower;

[1] The Planning Act 2008, [online]. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents [Accessed: 27/03/2019].

- a rescue and fire station;
- a fuel farm; and

- Facilities for other airport-related development, including:
  - a passenger terminal and associated facilities;
  - an aircraft teardown and recycling facility;
  - a flight training school;
  - a base for at least one passenger carrier;
  - a fixed base operation for executive travel; and
  - business facilities for airport related organisations.

1.2.5 This CPMS summarises the assumptions and methodology used to understand the car parking requirements required at the Proposed Development in Year 20 of operation. This has been derived from flight data received from RiverOak, given the capacity and flights/day for different carriers. Data collected from similar airports has been used to inform the calculations undertaken and this is set out later in this report.

1.3 Structure of the Car Park Management Strategy

1.3.1 The remainder of this CPMS is set out as follows:

- **Chapter 2: Passenger Car Parking**, sets out assumptions related for car parking for passengers;
- **Chapter 3: Staff Car Parking (Excluding Northern Grass Area)**, sets out the assumptions related for car parking for staff;
- **Chapter 4: Northern Grass Area Car Parking**, sets out the assumptions for car parking for the Northern Grass Area and Cargo Facility; and
- **Chapter 5: Car Park Strategy Summary**, summarises the car parking proposals.

2. Passenger Car Parking

2.1.1 This chapter of the CPMS sets out the assumptions that have been used to understand the car parking spaces identified to support the proposals at Manston Airport for passengers. To understand this, the demand for passengers was required.

2.1.2 Calculations informing this chapter are provided as **Appendix A.**

2.2 Demand

2.2.1 The parking requirement has been designed to meet the forecast Year 20 demand of 1,407,753 passengers passing through the terminal every year. It is anticipated by RiverOak that these will be as follows, broken down per carrier:

- KLM – 75,412 Passengers/1,456 flights per year;
- Blue Air – 40,286 passengers/178 flights per year;
- Charter flights (unknown carrier) – 23,980 passengers/237 flights per year;
- Connection flight to sea/river cruise (unknown carrier) – 30,481 passengers/154 flights per year; and
- Ryanair – 1,237,294 passengers/7,724 flights per year.

2.2.2 To understand how the total passenger numbers per carrier (paragraph 2.2.1) could lead to a daily flight schedule, it has been assumed that flights will be undertaken 365 days per year , resulting in 3,857 passenger movements per day. Of these movements, a 50/50 split has been applied to arrivals and departures (1,928 arrivals and 1,928 departures). It has also been assumed that no passengers would transfer from one aircraft to another internal to the airport. The daily departures demand used in the calculation is therefore 1,928 passengers, spread across:

- 2 KLM flights to Amsterdam;
- 0.32 Blue Air (LCC);
- 0.24 Charter flight;
- 0.21 cruise flight; and
- 10 Ryanair flights.

2.2.3 Arrivals passengers are not required in the calculations for short and long stay parking but will have an impact on express and taxi space requirements.

Passenger profiles

2.2.4 Data has been obtained from the Civil Aviation Authority (CAA) Passenger Survey Report 2016[2] for the length of stay by user type. This is for departing passengers only, therefore it has been assumed that the pattern will be consistent for arrivals too.

2.2.5 Based on this, the passengers on each flight have been split into four categories:

[2] Civil Aviation Authority (2016). Passenger Survey Report 2016, [online]. Available at: https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Consumer-research/Departing-passenger-survey/Survey-reports/ [Accessed: 27/03/2019].

- Business long stay (BL);
- Business short stay (BS);
- Leisure long stay (LL); and
- Leisure short stay (LS).

2.2.6 The results for a selection of the surveyed airports are given in the **Table 2.1**.

Table 2.1 User Profile – CAA Survey 2016

User Profile	Luton (LTN)	Liverpool (LPL)	E Midlands (EMA)	Stansted (STN)	Heathrow (LHR)
Business Short Stay	3%	3%	2%	4%	7%
Business Long Stay	9%	5%	4%	10%	20%
Leisure Short Stay	1%	2%	1%	2%	1%
Leisure Long Stay	87%	90%	93%	84%	73%
	100%	100%	100%	100%	100%

2.2.7 The Proposed Development expects to operate a mixture of budget airlines and charter flights. Different passenger splits have therefore been assumed depending on the carrier. For budget airlines, the passenger mix has been assumed to be consistent with London Luton Airport. For the KLM flights, splits obtained for London Heathrow Airport have been used. For the purpose of the calculations, a short trip has been assumed to be less than 24-hours and a longer trip more than 24-hours.

Length of stay

2.2.8 The CAA Passenger Survey Report 2016[2] data gives an average length of stay for each user type. This data has been used to inform the splits between long stay and short stay passengers and used to calculate the duration that each long stay passenger will occupy one parking space.

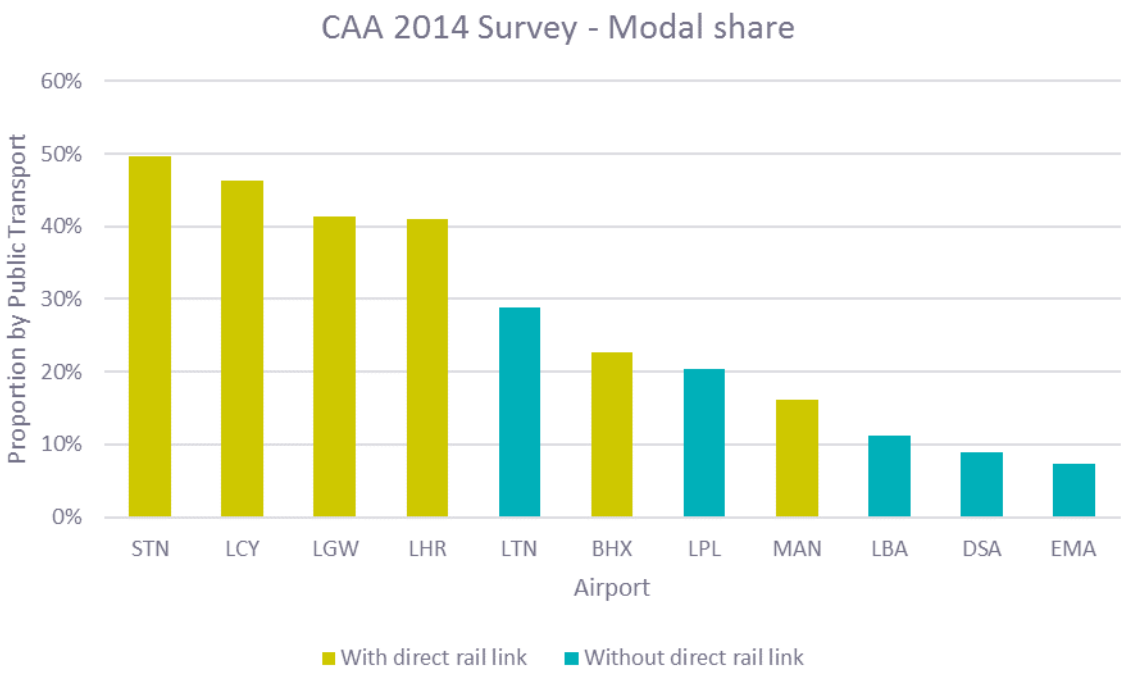
2.2.9 The average length of stay for business passengers is assumed to be 1.9 days. For leisure passengers, the average length of stay is assumed to be 4.5 days. Short stay passengers are assumed to have a trip length of 1 day.

Model share

2.2.10 Data is available from the CAA Passenger Survey Report 2014[3] detailing the split between public and private transport at the airports surveyed. **Figure 2.1** shows the public transport split at a selection of UK airports. Airports where there is not a direct rail service to the airport are highlighted.

[3] Civil Aviation Authority (2014). Passenger Survey Report 2014, [online]. Available at: https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Consumer-research/Departing-passenger-survey/Survey-reports/ [Accessed: 27/03/2019].

Figure 2.1 CAA 2014 Survey – Modal Share



**from the Liverpool John Lennon airport surface access plan*

2.2.11 As the Proposed Development will not have a direct rail link, a lower than average number of people are expected to use public transport. As such Leeds-Bradford (LB) airport has therefore been used as a proxy, which gives the following modal shares, set out in **Table 2.2**, which are disaggregated by business and leisure travel. It was considered that using an airport with similar accessibility characteristics would provide a robust assessment of parking requirements for passengers.

Table 2.2 Modal Share Assumptions

	Business	Leisure
Car (drop-off)	27%	40%
Car (off-site)	3%	10%
Car (on-site)	29%	20%
Taxi-minicab	34%	23%
Train	-	-
Bus	6%	7%
Other	1%	

Drop off

2.2.12 A provision of spaces should be set aside as short stay, drop-off spaces (<15 mins). The number required would be dependent on the scheduled flights and should cater for approximately 40% of passengers, given the observed data from LB. Where data is available, the number of drop-off spaces range from 186 at LB to 287 at Southampton Airport. Both of these airports experience greater passenger movements than is expected at Manston Airport. It is recommended that 150 spaces are initially allocated as drop-off spaces. At a 40% drop-off mode share, this would be sufficient to cater for the demand for up to 2 Ryanair flights.

Long stay passenger car parking space calculations

2.2.13 The number of parking spaces required for passengers has been calculated using the formula:

(LOSB * CB * Y¬B) + (LOSL * CL * Y¬L)

Where:

LOSB = Average Length of stay (business)

CB = Car modal share (business)

YB = daily demand (business)

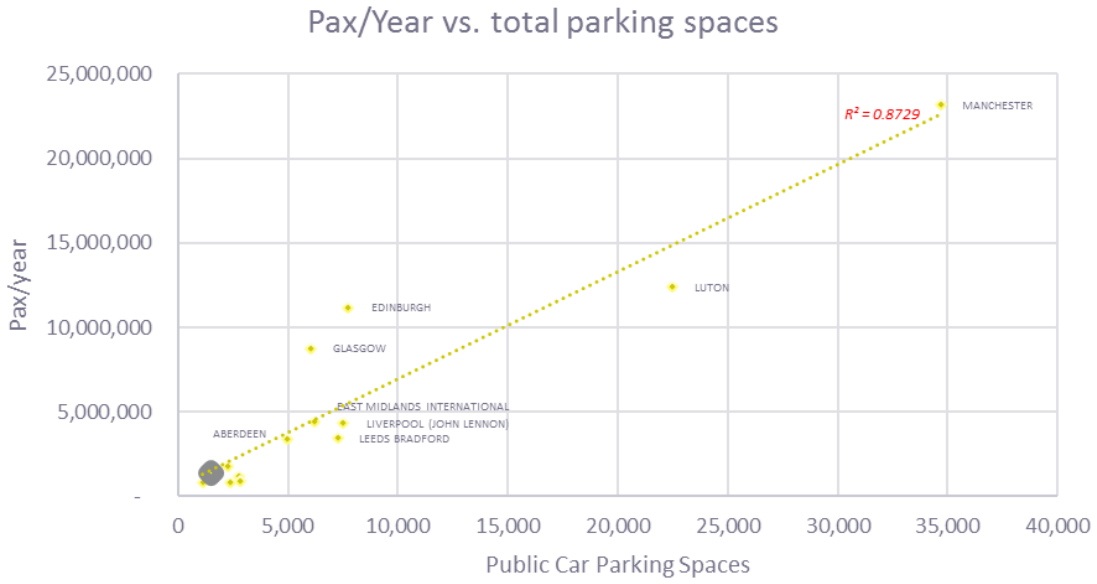
LOSL = Average Length of stay (leisure)

CL = Car modal share (leisure)

YL = daily demand (leisure)

2.2.14 Based on the assumptions outlined above, the number of on-site parking spaces required at Manston Airport has been calculated as 1,665 spaces – at a ratio of approximately 1 space per 845 passengers per annum, or 1,406, 925 passengers. This is similar to the level of provision given at other UK airports, as indicated in **Figure 2.2**. Manston Airport car park provision is marked in (Dark Grey dot). Other operational airports included are Cardiff, Doncaster-Sheffield, Southampton, Exeter and Southend.

Figure 2.2 Passengers per Year vs Total Parking Space – UK Airports Comparison



Total Manston Airport parking calculations – passengers

2.2.15 The following car parking has been calculated as required based on the above for the Proposed Development;

- 150 Short Stay "drop off" parking spaces;
- 1,665 longer term parking spaces; and
- 1,815 total parking spaces.

2.3 Masterplan Passenger Parking Allowances

2.3.1 The masterplan provided as part of this DCO application sets out the initial car parking layouts for the Proposed Development. These layouts are anticipated to change as the development of the site comes forward. However, it is beneficial to set out what this provision is.

2.3.2 At the passenger terminal, 1,815 spaces have been provided as set out in paragraph 2.2.15, however the recovered ground from the contractors' compounds is also shown as "overflow parking" which can be used only after the works are complete in Phase 4 of the construction programme. This gives an estimated maximum capacity for passengers of **2,966 spaces**. Some flexibility is required on the numbers set out in the calculations, hence the need for overflow parking to take into account the following:

- Final flight schedules and operators are unknown;
- Car park will experience seasonal peaks across the calendar year;
- Estimated mode share targets might not be fully realised for some time; and
- Nature of flights (short/long) are not known at this stage.

2.3.3 An element of the overflow car parking is also anticipated to accommodate some hire car facilities and electric car charging points (larger spaces required).

2.3.4 Car parking provision for the passenger terminal set out in the masterplan is set out in **Figure 1.1** of Volume 4 of the ES.

3. Airport Staff Car Parking (Excluding Northern Grass Area)

3.1 Staff Car Parking

3.1.1 To understand the requirements for staff car parking, proposed staffing levels have been provided by RiverOak. resulting in the following:

- Number of employees by role;
- Shift patterns for each role; and
- Proportion of staff required to fulfil each shift.

3.1.2 This data is set out in the Transport Assessment (TA) and is consistent with the data used to inform the calculation of the traffic generation for staff at Manston Airport. Table 3.1 sets out staff and shift patterns for each specific job at the terminal and freight facilities in Year 20.

Table 3.1 Staff Number and Shift Patterns

Job	Shift Pattern	Staff (Year 20)
Passenger Terminal	Airport operations 6am – 11pm	211
Freight Facility (Airside)	24 hour (weighted)	586
ATS (ATC)	24 hour	25
RFFS	24 hour	57
Operations	24 hour – weighted to normal office hours	38
Maintenance	Daylight focused but some overnight staff	49
MT (Motor Transport)	Airport Operations 6am – 11pm	49
Site and Freight Security	24 hour	57
Administration	Office hours 9am-6pm	15
None Airside Freight	24 hour (weighted)	167
Total		1,254

3.1.3 All job,s excluding freight related jobs, ATC, Security and Airfield Operations would use the main car park that is proposed to the east of the site near the terminal. The freight, ATC, Security and Airfield Operations would use the car parks off the cargo access.

3.1.4 Using the data presented in **Table 3.1**, the number of staff on site for each hour of the day has been determined by means of trip generation analysis. A modal split has been applied to the proposed Year 20 staff numbers; these have been further split down into arrivals and departures by shift time. An additional hour before and after the start and end of each shift has been included as this is when staff would arrive and depart the relevant elements of the site. It should also be noted

that with shift patterns across 24 hours, a number of staff will be off-site on any one particular day. These calculations have been set out in the TA.

3.1.5 **Figure 3.1** sets out the shift patterns and spread across the 24-hour period for terminal staff, which has been used as the basis for a parking accumulation exercise to understand the potential parking requirements.

3.1.6 **Figure 3.2** sets out the shift patterns and spread across the 24-hour period for cargo access staff which has been used as the basis for a parking accumulation exercise to understand the potential parking requirements.

3.1.7 The parking accumulation assessment for staff, using the main access based on the assumptions set out above, indicates the need for the number of parking spaces required for the demand peak hour (14:00-15:00) is **254 spaces**. An additional 10% of spaces have been added for contingency, resulting in the provision of **279 spaces**.

3.1.8 The parking accumulation assessment for staff, using the cargo access based on the assumptions set out above, indicated the need for the number of parking spaces required for the demand peak hours (05:00-06:00) and (06:00-07:00) is **512 spaces**. An additional 10% of spaces have been added for contingency resulting in the provision of **563 spaces**.

Figure 3.1 Parking accumulation – All staff using the passenger terminal access

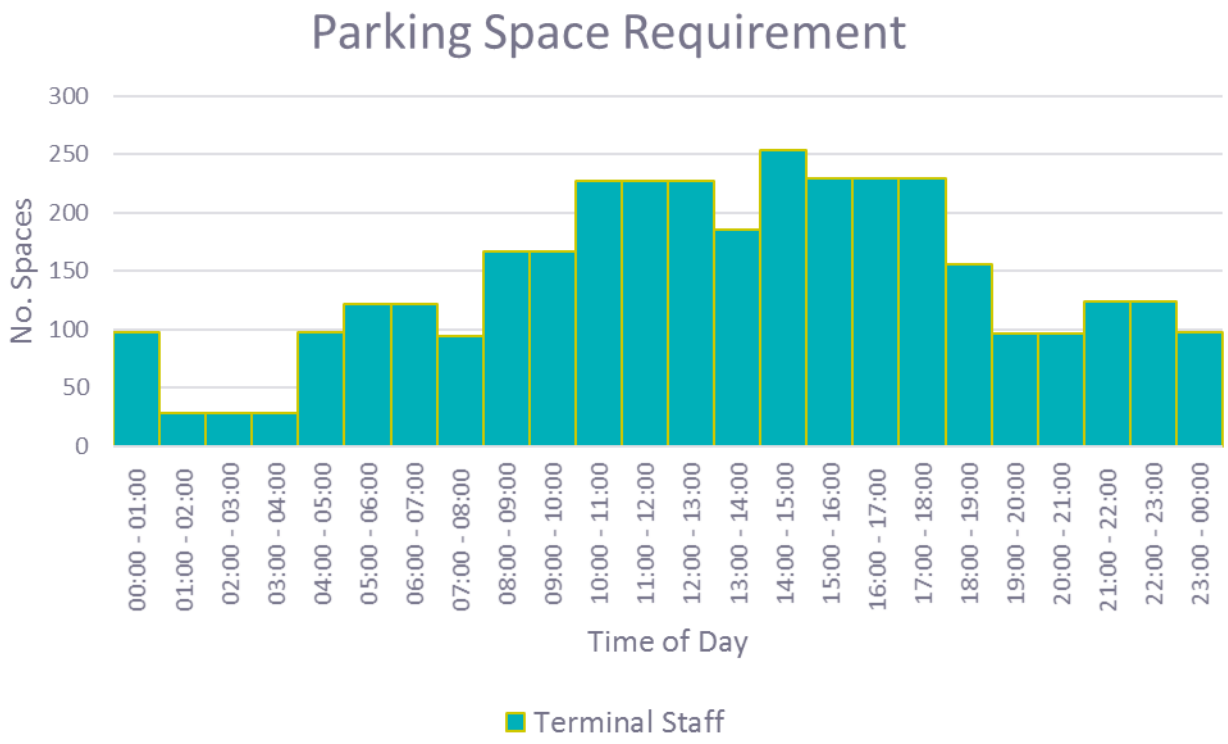
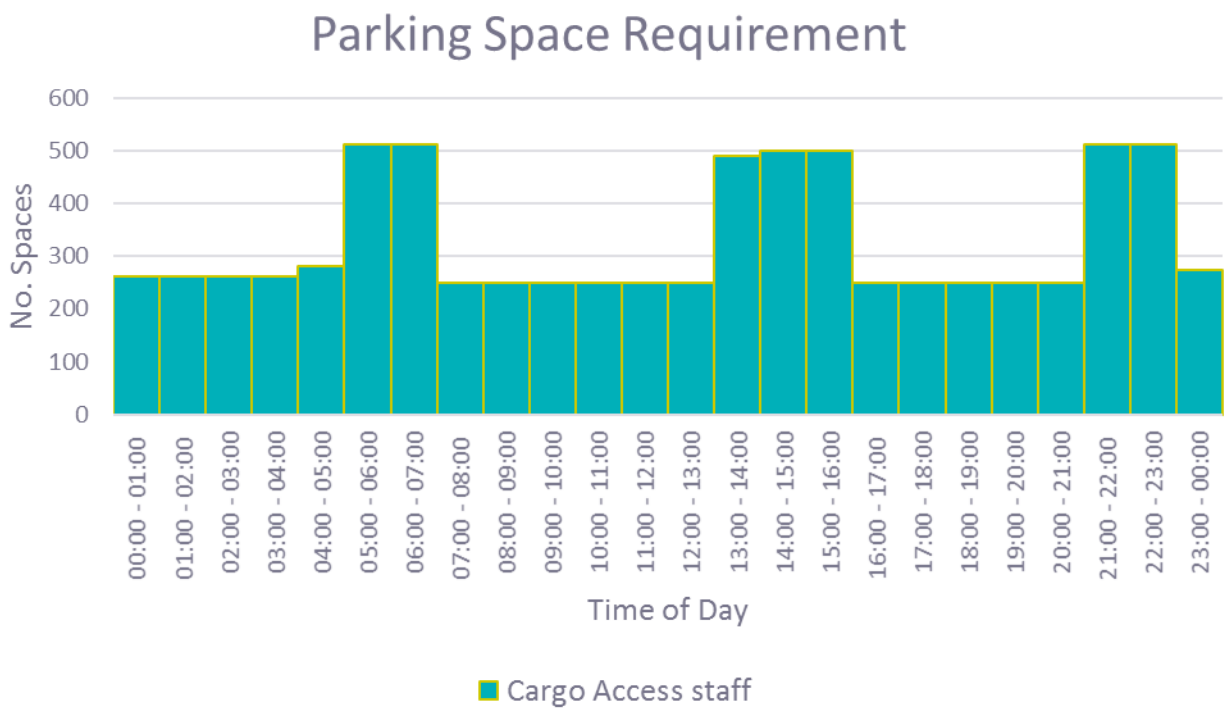


Figure 3.1 Parking accumulation – All staff using the cargo access



3.2 Masterplan Staff Parking Allowance

3.2.1 The masterplan sets out staff car parking for the passenger terminal, associated airport operations and on-site and off-site cargo facility. The provision is as calculated in **Section 3.1**. Car parking provision for the airport staff set out in the site masterplan is set out in **Figure 1.1** of Volume 4 of the Environmental Statement (ES).

3.3 Staff Car Park Management

3.3.1 To manage staff car parking, consideration will be given to a permit system which could include a parking charge. The intention of this would be to encourage sustainable travel, such as car sharing, use of bus and rail and cycling. The permit system would need to take account of staff home locations, shift patterns and access to sustainable travel options, as well as the potential implications of restrictive parking, such as overspill parking onto the local road network. This is considered to be unlikely due to the site location and the nature of the roads in the vicinity of the Proposed Development.

3.3.2 An assessment has been undertaken of the availability of parking on the local highways network around Manston Airport for roads where parking could take place. This is included as Figure 3.3. This indicates a significant section of the local highways network is not available for parking (Red) and sections (orange) that are roads where it would be unsuitable to park on the side of the road for table Spitfire Way 2 lane carriageways with little to no verge.

3.3.3 It should also be noted that parking restrictions will likely extend beyond that currently with the widening of Spitfire Way to Columbus Avenue and new access junctions. These will require new parking restrictions to allow a safe and convenient access to the airport and cargo facility's.

This results on only small amounts of (green) roads where there are parking opportunities in Manston Village and off Columbus Avenue, but these are very limited and some distance from entry and exits to the site. It is considered therefore that the availability of the highways network to be used for fly parking is very limited.

3.4 HGV Parking at the Cargo Terminal

3.4.1 In addition to the car parking at the cargo terminal there is also a requirement for Heavy Goods Vehicles (HGV) parking. . This requirement has also been displayed on the masterplan. The levels of HGV parking have been designed to support the proposed future activities at the cargo facility.

4. Northern Grass Area Car Parking

4.1.1 In 2011, National Parking Standards, set out previously in Planning Ppolicy Guidance 13[4] (PPG13_, and then subsequently adapted into local plans across England were abolished. The National Planning Policy Framework[5] sets out the following:

"Maximum parking standards for residential and non-residential development should only be set where there is a clear and compelling justification that they are necessary for managing the local road network, or for optimising the density of development in city and town centres and other locations that are well served by public transport. In town centres, local authorities should seek to improve the quality of parking so that it is convenient, safe and secure, alongside measures to promote accessibility for pedestrians and cyclists.."

4.1.2 It has, however, been standard practise to use the saved standards from PPG13 or other relevant local documents. In the case of Kent, a narrative of the development of local parking standards is set out in the following sections.

Kent County Council Parking Standards

4.1.3 Kent County Council's (KCC) Design Guidance "*Making it Happen*[6]" provides a series of technical appendices which provided advice on the design of various developments. The design guidance most appropriate for the proposed Northern Grass Area is *"Making it Happen – Highways Design Standards (Residential and Industrial)*[6]*"*. This document sets out the following for industrial areas with regards to parking;

"Parking must be in accordance with our latest "Vehicle Parking Standards". Security and convenience are important factors where vehicles or trailers are likely to be left for long periods. Accordingly, each individual unit will require sufficient parking facilities and loading areas, in order to prevent vehicles and trailers being left on the highway.

Indiscriminate parking on footways and roads can lead to problems with accessibility, and cause damage and inconvenience to highways users"

4.1.4 The vehicle parking standards are set out in Kent and Medway *Supplementary Planning Guidance (SPG) 4*[7]. This highlights the parking standards that should be applied to development coming forward on the Northern Grass area.

[4] Planning Policy Guidance 13: Transport, [online]. Available at: https://webarchive.nationalarchives.gov.uk/20120919160424/http://www.communities.gov.uk/archived/publications/planningandbuilding/ppg13 [Accessed 27/03/2019].

[5] National Planning Policy Framework 2019, [online]. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2 [Accessed: 27/03/2019].

[6] Kent County Council (2007). Making it happen, [online]. Available at: https://www.kent.gov.uk/about-the-council/strategies-and-policies/regeneration-policies/kent-design-guide/making-it-happen#tab-2 [Accessed: 27/03/2019].

[7] Kent County Council (2006). Kent and Medway Structure Plan 2006 Mapping out the future, Supplementary Planning Guidance SPG 4, [online]. Available at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=2ahUKEwj1gpuRkqLhAhWUUBUIHefcBXkQFjACegQIARAC&url=http%3A%2F%2Fwww.maidstone.gov.uk%2F__data%2Fassets%2Fpdf_file%2F0010%2F88984%2FKent-and-Medway-Structure-Plan-2006-SPG4-Vehicle-Parking-Standards.pdf&usg=AOvVaw3kt9uP0Y8hphJiB3-m00QI [Accessed: 27/03/2019].

B1 Parking Standards

4.1.5 The masterplan for the northern grass area sets out an indicative layout of the proposed development and the associated parking provision.

4.1.6 The current proposals are as follows;

- Total of 105,100 sqm gross floor area (GFA) of which:
  - 26% is proposed to be B1 office developments (27,272 sqm); and[6]
  - 74% is proposed to be B8 Warehousing (78,825 sqm).

4.1.7 The parking standard detailed in the emerging Thanet Local Plan and the Supplementary Planning Guidance (SPG) 4 are set out in Table 4.1. it should be noted that the figures are identical.

Table 4.1 B1 Parking Standards from Kent and Medway SPG 4and the emerging Thanet Local Plan

B1: Business	SPG 4	Thanet Local Plan
Offices up to 500m²	1 space per 20sqm	1 space per 20sqm
Offices 500m² to 2,500m²	1 space per 25sqm	1 space per 25sqm
Offices over 2,500m²	1 space per 30sqm	1 space per 30sqm
High Tech/Research/Light industrial	1 Space per 35sqm	1 Space per 35sqm

4.1.8 The masterplan has 12 plots of proposed B1 (Office) class development. The following units are proposed B1 in the Northern Grass Area;

- Unit 10 – 2,600 sqm;
- Unit 11 – 3,475 sqm;
- Unit 12 – 2,520 sqm;
- Unit 13 – 1,130 sqm;
- Unit 14 – 1,720 sqm;
- Unit 15 – 1,790 sqm;
- Unit 16 – 2,900 sqm;
- Unit 17 – 2,530 sqm;
- Unit 18 – 3,330 sqm;
- Unit 19 – 2,600 sqm;
- Unit 20 – 2,400 sqm; and
- Unit 21 – 1,090 sqm.

4.1.9 **Table 4.2** sets out the required parking provision, based on the *Supplementary Planning Guidance (SPG) 4*[7] and Thanet Local Plan parking standards.

Table 4.2 B1 parking requirements from local authority parking standards

B1 unit	*Supplementary Planning Guidance (SPG) 4*[7] parking provision
Unit 10	87
Unit 11	116
Unit 12	84
Unit 13	45
Unit 14	44
Unit 15	72
Unit 16	97
Unit 17	84
Unit 18	111
Unit 19	87
Unit 20	96
Unit 21	69
Total	990

B8 parking standards

4.1.10 The KCC standards for the B8 (Storage or distribution) classification should be used for storage and distribution development. These are classified as sites which focus on high employment density, as might be expected at the developments on the Northern Grass Area.

4.1.11 The current proposal is for 77,774 sqm of B8 development in the northern grass area.

4.1.12 The *B8 Supplementary Planning Guidance (SPG) 4*[7] parking standards are set out in **Table 4.3**. it should be noted that for B8 the figures are identical.

Table 4.3 B8 Parking Standards from Kent and Medway (2006) and the Emerging Thanet Local Plan

B8 Storage and Distribution	*Supplementary Planning Guidance (SPG) 4*	Thanet Local Plan
Storage and Distribution	110 sqm	110 sqm
Wholesale Trade Distribution	35 sqm	35 sqm

4.1.13 The current masterplan has nine plots of B8 (Storage or distribution) class development. This includes

- Unit 1 – 20,800 sqm;
- Unit 2 – 3,560 sqm;

- Unit 3 – 5,050 sqm;
- Unit 4 – 7,380 sqm;
- Unit 5 – 8,020sqm;
- Unit 6 – 9,540 sqm;
- Unit 7 – 18,520 sqm;
- Unit 8 – 2,600 sqm; and
- Unit 9 – 2,600 sqm.

4.1.14 **Table 4.4** sets out the parking provision in the number of parking spaces required based on the Kent and Medway and Thanet Local Plan parking standards.

Table 4.2 B8 parking requirements from local authority parking standards

B8 Unit	Kent and Medway/Thanet Local Plan parking provision
Unit 1	594
Unit 2	33
Unit 3	46
Unit 4	67
Unit 5	73
Unit 6	87
Unit 7	168
Unit 8	24
Unit 9	24
Total	1,115

Impaired mobility

4.1.15 Local parking standards set out the requirements of the number of impaired mobility designated parking spaces which should be provided for a new development. These parking spaces are to be provided as part of the overall level of provision, rather than an additional requirement. **Table 4.5** sets out the impaired mobility parking standards...

Table 4.5 Impaired Mobility Parking Standards *Supplementary Planning Guidance (SPG) 4*[7] (2006)

For employees and visitors to business premises (Land use classes A2, B1,B2 and B8)	Kent and Medway ***Supplementary Planning Guidance (SPG) 4***
Car parks up to 40 spaces	2 designated spaces + 1 space of sufficient size but not specifically designated.

For employees and visitors to business premises (Land use classes A2, B1,B2 and B8)	Kent and Medway *Supplementary Planning Guidance (SPG) 4*
Car parks with 40 to 200 spaces	4 designated spaces or 5% of the total capacity, whichever is greater
Car parks with Greater than 200 spaces	6 designated spaces + 2% of the total capacity

4.1.16 The standards applied the parking requirements for the developments on the Northern Grass Areea, as set out in **Table 4.2** and **Table 4.4**, would generate an impaired mobility parking requirement, as set out in **Table 4.6**.

Table 4.6 Impaired Mobility Parking Provision from Kent and Medway (2006) Guidance.

Unit	*Supplementary Planning Guidance (SPG) 4*[7] – Total Spaces	*Supplementary Planning Guidance (SPG) 4*[7] - Impaired Mobility Provision
Unit 1	594	18
Unit 2	33	2
Unit 3	46	4
Unit 4	67	4
Unit 5	73	6
Unit 6	87	4
Unit 7	168	8
Unit 8	24	2
Unit 9	24	2
Unit 10	87	4
Unit 11	116	6
Unit 12	84	4
Unit 13	45	4
Unit 14	44	4
Unit 15	72	5
Unit 16	97	4
Unit 17	84	6
Unit 18	111	4

Unit	*Supplementary Planning Guidance (SPG) 4*[7] – Total Spaces	*Supplementary Planning Guidance (SPG) 4*[7] - Impaired Mobility Provision
Unit 19	87	5
Unit 20	96	4
Unit 21	69	4

5. Car Park Strategy Summary

5.1.1 This report has set out the initial estimates of required car parking across the site. The parking provision required is varied and incorporates the needs of staff and passengers.

5.1.2 For passengers, the following car parking has been calculated for the Proposed Development;

- 150 short stay "drop off" parking spaces;
- 1,665 longer term parking spaces; and
- 1,815 total parking spaces required.

5.1.3 A large overflow car parking area is also proposed for the passenger terminal, which would result in an estimated maximum capacity for passengers of 2,966 spaces.

5.1.4 For Staff, the following car parking provision has been calculated for the Proposed Development;

- 563 car park spaces accessed via the Cargo Access; and
- 729 car park spaces accessed via the Passenger Terminal Access.

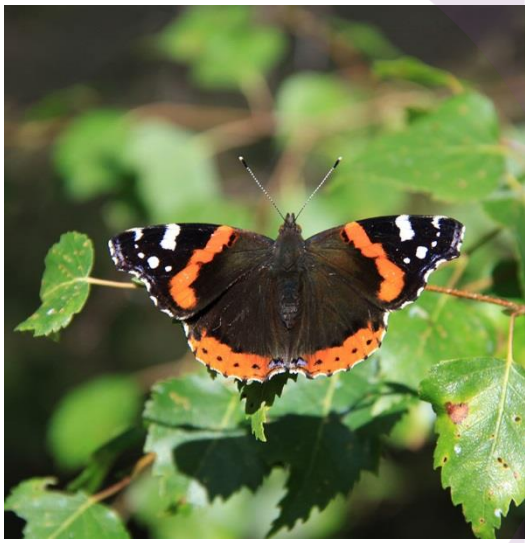
5.1.5 The report has also set out the anticipated car parking provision that would be required in the Northern Grass Area to support the mixed B1 and B8 industrial development provided to support the airport operations.

5.1.6 To date, the arrangements for car park management, particularly of the passenger terminal, have not been established. If the Proposed Development is approved for construction and agreements made with carriers and flight schedules understood, the internal operations of these car parks will be developed and confirmed with KCC. However, the operation of the car park at the passenger terminal will be based on best practices from airports across the world based on the RiverOak's experience elsewhere.

RiverOak Strategic Partners Limited

Manston Airport DCO

TA Appendix I – Airport Surface Access Strategy



Wood Environment & Infrastructure Solutions UK Limited – March 2019

Report for

George Yerrall
RiverOak Strategic Partners
Audley House
London
W1K 6WF

Main contributors

Liam Garden
Glyn Price
Bev Coupe

Issued by

.....
Glyn Price

Approved by

.....
Bev Coupe

Wood

Floor 12
25 Canada Square
Canary Wharf
London E14 5LB
United Kingdom
Tel +44 (0) 203 215 1610

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Management systems

This document has been produced by Wood Environment & Infrastructure Solutions UK Limited in full compliance with the management systems, which have been certified to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA.

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1. Introduction

1.1 Background

1.1.1 RiverOak Strategic Partners Limited (hereafter referred to as 'RiverOak') is seeking to secure the future of Manston Airport (the 'Proposed Development') as a valuable regional and national asset by re-developing the site as a freight airport. The proposals will provide much needed additional air freight capacity to the United Kingdom and serve to relieve pressure from other, already heavily congested, London and South East airports.

1.1.2 Under the *Planning Act 2008*[1] (the '2008 Act') the redevelopment of Manston Airport as a freight airport is considered a Nationally Significant Infrastructure Project (NSIP). RiverOak is making an application under the 2008 Act for a permission known as a 'Development Consent Order' (DCO) to re-open and operate Manston Airport. The application will be submitted to the Planning Inspectorate which will examine it and make a recommendation to the Secretary of State for Transport, who will then make a decision on whether the Proposed Development is granted consent.

1.1.3 This Airport Surface Access Strategy (ASAS) is one of a suite of reports which have been produced in the support of the DCO application, which includes a Transport Assessment (TA) and Environmental Statement (ES). Alongside the Travel Plan, the ASAS forms the long-term access and sustainable transport strategy for both staff and passengers. The ASAS takes into consideration the guidance set out in the Department for Transport's (DfT) *Aviation Policy Framework*[2].

1.1.4 This second version of the ASAS is an update that includes:

- Responses to Written Representations and the Examining Authority's written questions; and
- Changes related to the traffic generation methodology agreed with Kent County Council (KCC) after the DCO submission.

1.2 Overview

1.2.1 The site is located approximately 4km to the west of Ramsgate and 5km south of Margate in the district of Thanet, East Kent and covers an area of approximately 303.2ha.

1.2.2 The site has provided a variety of operational airport-related services since 1916.. Until 1998 it was operated by the Royal Air Force (RAF) as RAF Manston, and for a period in the 1950s was also a base for the United States Air Force (USAF).

1.2.3 From 1998 it was operated as a private commercial airport, known as Kent International Airport. The airport offered a range of services including scheduled passenger flights, charter flights, air freight and cargo, a flight training school, flight crew training and aircraft testing. In recent years it was operating as a specialist air freight and cargo hub servicing a range of operators. Although the airport was closed in May 2014, much of the airport infrastructure, including the runway, taxiways, aprons, cargo facilities and passenger terminal remain.

[1] The Planning Act 2008, [online]. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents [Accessed: 27/03/2019].
[2] Department for Transport (2013), Aviation Policy Framework, [online]. Available at: https://www.gov.uk/government/publications/aviation-policy-framework [Accessed: 27/03/2019].

1.2.4 The Proposed Development shall consist of the following principal components, as shown in **Figure 1.1** (shown in Volume 4 of the ES):

- Runways and taxiways suitable for the take-off and landing of a broad range of cargo aircraft;
- New aircraft stands;
- An area for cargo freight operations able to handle at least 10,000 movements per year and associated infrastructure, including;
  - a new Air Traffic Control (ATC) tower;
  - a fire and rescue station;
  - a fuel farm; and
- Facilities for other airport-related development, including:
  - a passenger terminal and associated facilities;
  - an aircraft teardown and recycling facility;
  - a flight training school;
  - a base for at least one passenger carrier;
  - a fixed base operation for executive travel; and
  - business facilities for airport related organisations.

1.3 Need for a Surface Access Strategy

1.3.1 Good surface access and transport connections are crucial to any airport growth strategy, with impacts on: traffic congestion on the local network; the economic and environmental sustainability of the airport; and general customer satisfaction. As passenger numbers grow, sustainable access would therefore require the reduction of reliance in private car use, placing the emphasis on public transport.

1.3.2 The primary focus of the Proposed Development is on air freight and cargo operations, but as detailed below in section 4 it is anticipated that there will be passenger services from Year 3 of the Proposed Developments operation, culminating in an anticipated 9,298 air transport movements (ATM) per year in Year 20 of operation.

1.3.3 In accordance with the DfT *Aviation Policy Framework*[2], an ASAS should aim to set out:

- Targets for increasing the proportion of staff and passengers accessing the airport by sustainable transport;
- Details of the strategic approach used to achieve these targets; and
- A strategy for implementation and monitoring the strategy.

1.3.4 The focus of the ASAS is on multi-modal access to the Proposed Development, as a way to reduce its environmental impact and its impact on neighbouring communities. An understanding of the catchment area that both passengers and staff are likely to derive from is included in this strategy.

1.4 Structure of the ASAS

1.4.1 The ASAS is set out as follows:

- **Chapter 2: Aims and Objectives**;
- **Chapter 3: Existing Surface Access Arrangements**;
- **Chapter 4: Future Surface Access Arrangements**; and
- **Chapter 5: Targets**.

2. Aims and Objectives

2.1.1 The Airport Surface Access Strategy (ASAS) sets out the measures that the Proposed Development can take to meet accessibility and sustainability objectives. This will require:

- Integration with the wider transport network;
- Ensuring connectivity to serve the needs of East Kent and the surrounding area;
- Supporting economic growth in the region; and
- Reducing the carbon footprint of Manston Airport.

2.2 Objectives

2.2.1 In order to achieve the aims identified above, the ASAS has the following objectives:

- To minimise the number of trips made by single occupancy vehicles;
- To facilitate sustainable access to employment opportunities from the surrounding areas by ensuring easy, reliable and efficient access to the Proposed Development; and
- To maximise the number of trips being made by public transport, with a target of 20% of all passenger trips and 10% of staff trips by Year 20 of operation.

2.2.2 This ASAS identifies suitable embedded measures which should be incorporated into the design of the Proposed Development. The new elements to be constructed as part of this will include:

- Traffic calming on less desirable routes;
- Increased and enhanced facilities for taxis, buses and coaches for passengers and staff;
- A network of internal footpaths and cycle paths for staff use;
- Upgrade and/or enhancement of existing pedestrian and cycle provisions within the vicinity of the site; and
- Additional public service bus stops, and public bus service frequency and route changes (to be agreed with the local authority and bus route operators).

3. Existing Surface Access Arrangements

3.1 Introduction

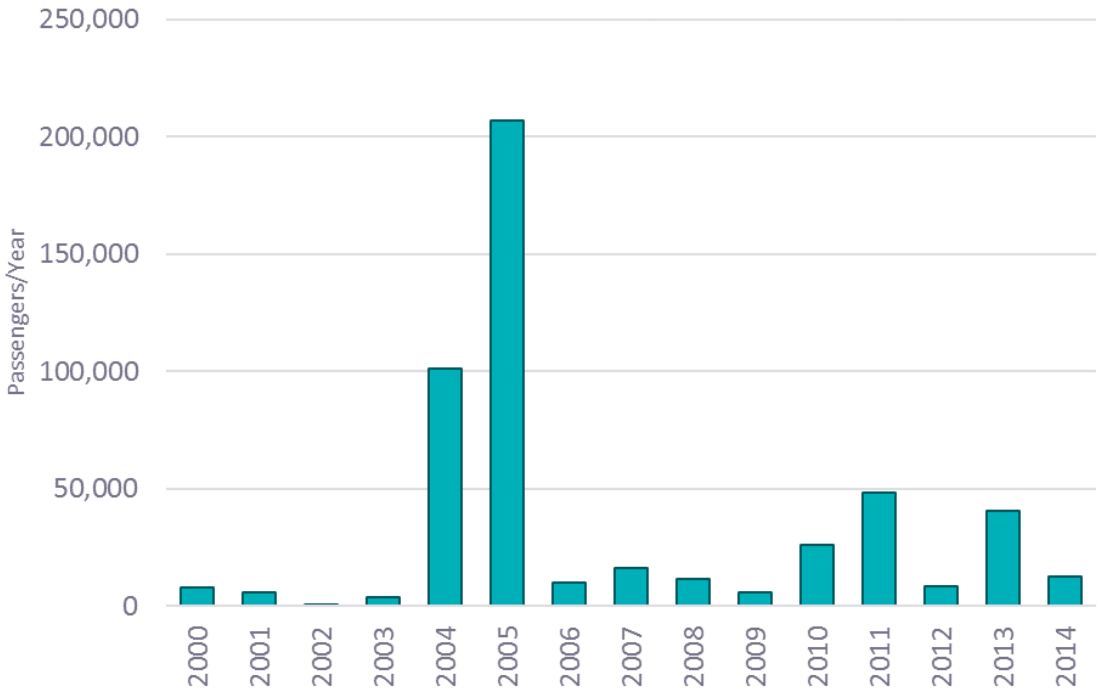
3.1.1 The site is on the existing site of Manston Airport, west of the village of Manston and north east of the village of Minster. The town of Margate lies approximately 5km to the north of the site and Ramsgate approximately 4km to the east. Sandwich Bay is located approximately 4-5km to the south-east.

3.1.2 This chapter sets out the existing surface access arrangements by all forms of transport and includes information on passenger numbers when Manston Airport was last operational.

3.2 Previous Airport Passenger Numbers

3.2.1 Between 2000 and 2014, when Manston Airport ceased operation, the number of passengers using the airport fluctuated significantly. **Figure 3.1** shows the number of passengers per year at Kent International Airport until its closure in 2014 (CAA)[3]. The peak year for passenger movements in this period occurred in 2005, when the Irish low-cost carrier EUJet had its hub at Kent International Airport. However, the company went out of business in July 2005, hence the subsequent drop in passenger numbers.

Figure 3.1 Passenger demand at Manston/Kent International Airport 2000-2014



[3] Civil Aviation Authority (2015). Airport data 1990 onwards, [online]. Available at: https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/ [Accessed: 27/03/2019].

3.3 Road Network

3.3.1 The site has good road access, with links to Canterbury to the south-west, Ramsgate to the east and Dover to the south. It is in close proximity to two Primary Road Network (PRN) routes: the A299, which runs along the southern boundary of the site, is a two-lane dual carriageway which links to the M2 in the west; and the A28 to the west of the site, which provides a link to Canterbury. Access to the site from the A299 is via the B2190 Spitfire Way and the B2050 Manston Road, which runs adjacent to the site and links to the south-western side of Ramsgate. The local road network is shown in **Figure 3.2**.

3.3.2 The main access to the existing terminal building is via a priority T junction off B2050 Manston Road. It is proposed to upgrade this to a linked signal junction with the access to the north with the norther grass area south access to allow for the extra capacity and highways safety reequipments required of this junction. This is set out within the Transport Assessment.

3.3.3 The locations which can reach Manston Airport by car within 30, 45 and 60 minutes are respectively highlighted in **Figure 3.3**. Coupling this with mid-term census population estimates[4] gives the following population in each catchment as shown in **Table 4.1**

Table 4.1 Population within each threshold (ONS, 2015)

Drive time	Population	Population Centres
Within 30 minutes	411,930	Ramsgate; Margate; Canterbury; Dover; Deal
Within 45 minutes	697,347	Folkstone; Ashford; Sittingbourne
Within 60 minutes	1,350,398	Gillingham; Maidstone

3.4 Public Transport Provision

Bus services

3.4.1 Bus services 11, 38 and 38A currently operate along Spitfire Way and Manston Road. There are two pairs of bus stops provided along the site boundary, one set on Minster Road to the south-west of the site and one along Spitfire Way, at Spitfire Corner. A further bus stop is provided outside of the former terminal building. Facilities at these bus stops are limited with flag poles and timetable information at some stops and a shelter provided on Spitfire Way.

3.4.2 Bus routes 9 and 9X operate services along Canterbury Road West to the south-east of the site. A pair of bus stops are provided along this road to the south of the eastern extents of the site. These stops feature bus stop flags and timetable information. The frequency of bus services in the vicinity of the site is summarised in **Table 3.2**.

[4] Office for National Statistics (2015). Population estimates, [online]. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates [Accessed: 27/03/2019].

Table 3.2 Bus Services, Frequencies and Routes in the vicinity of the site

Service	Destinations	Weekday Frequency Per Day Outbound	Weekday Frequency Per Day Inbound	First/Last Bus Outbound	First/Last Bus Inbound
9/9X	Westwood Cross -Canterbury	11	14	06:18 / 16:42	08:45 / 18:15
11	Canterbury –Westwood Cross	5	5	10:51 /18:41	07:04 / 16:05
38	Ramsgate –Birchington on Sea	13	14	07:46 / 17:36	08:38 / 17:52
38A	Ramsgate – St Nicholas at Ware	4	2	07:11 / 16:13	07:55 / 07:55

.

3.4.3 The location of bus stops and bus routes are illustrated in **Figure 3.4**.

3.4.4 The 9 and 9X routes run between Canterbury and Westwood Cross. The services combine to provide approximately one service per hour in either direction during the day. The 9X service provides one AM peak hour service towards Canterbury, however, there are no AM peak hour services provided in the opposite direction towards Westwood Cross.

3.4.5 The 38 and 38A routes run between Ramsgate and Birchington and combine to provide a service with a headway of approximately one hour during the day. One AM peak hour service is provided from Birchington to Ramsgate via the site, however, there are no AM peak hour services provided in the opposite direction.

3.4.6 Bus route 11 runs between Canterbury and Westwood Cross and operates with a headway of two to three hours throughout the day with no peak hour services.

3.4.7 An assessment of the suitability of the destinations served by existing bus routes has been undertaken to understand whether the existing routes would be sufficient to serve the Proposed Development. An interrogation of Census 2011 Journey to Work data has been undertaken to identify where previous employees of the site have travelled from. The site is located within the Thanet 014A lower-Level Super Output Area, as illustrated in **Figure 3.5** and analysis of the journey to work travel patterns for this lower layer is set out in **Table 3.3**.

Figure 3.5 Thanet 014A lower-Level Super Output Area

Table 3.1 Distribution of Census 2011 Journey to Work Trips

Origin	Distribution
Thanet District	79.9%
Dover District	5.7%
Canterbury District	7.7%
Shepway District	1.7%
Ashford District	1.4%
Swale District	3.7%
Total	100%

3.4.8 The bus routes available within the vicinity of the site serve Ramsgate, Broadstairs, Westwood Cross (near Northwood), Birchington-on-Sea and Canterbury. These routes may may therefore offer an alternative mode of transport to the private car for 45% of journeys to work subject to appropriate service timing enhancements and assuming that the potential employees originate in similar locations. The bus service coverage is therefore considered to be reasonable and suitable and appropriate, subject to appropriate re-routing and increases in frequency.

Rail services

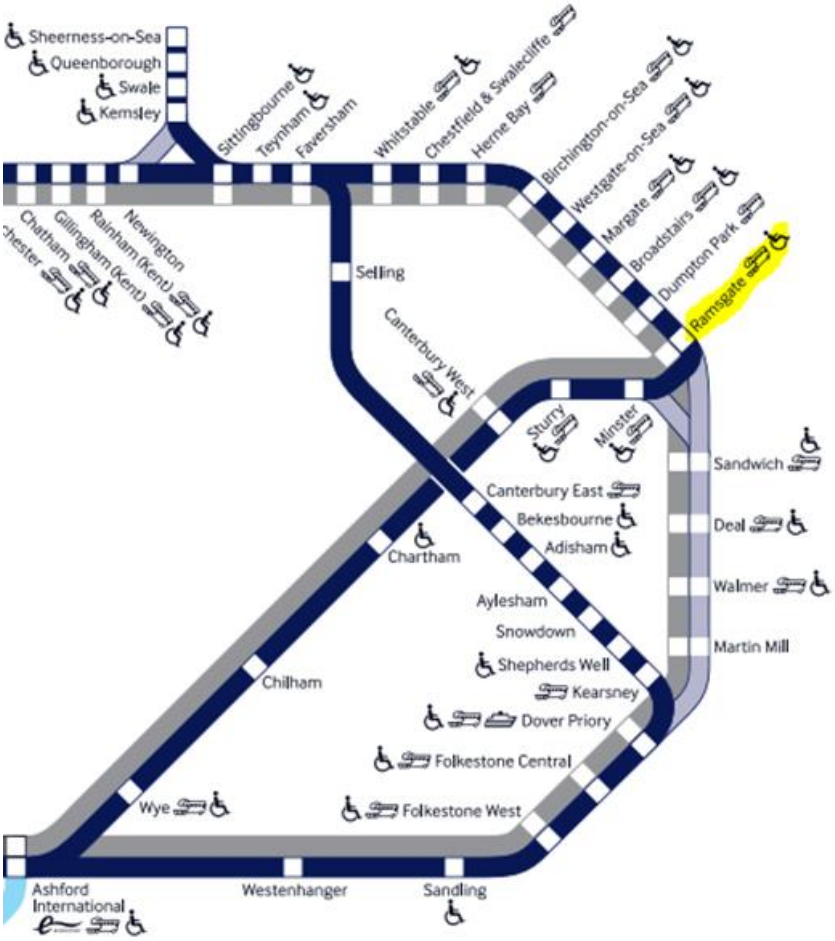
3.4.9 The closest railway stations to the site are Ramsgate Station and Minster Station, approximately 4km east and 2km to the south respectively. Ramsgate Station is operated by Southeastern and benefits from access to both high speed and standard services. A wide range of destinations across Kent are accessible directly from Ramsgate including Dover, Folkestone, Canterbury, Ashford and the Medway Towns with onwards travel to London St. Pancras, London Charing Cross and London Victoria.

3.4.10 Access to high speed services from Ramsgate are provided via two routes. The first provides an hourly service to London St Pancras via Canterbury West with a journey time of approximately 80 minutes. A further north Kent loop service travels via Whitstable, Sittingbourne and the Medway Towns and takes approximately 110 minutes to reach London. Combined these services provide trains to and/or from London on a 30-minute frequency throughout the day. Ramsgate Station is also served by an hourly standard service train to London Charing Cross via Canterbury West, and one train an hour to London Victoria via Sittingbourne and Bromley South. The station is served by bus route 11 and therefore connects the proposed development site to the station.

3.4.11 Minster Station is located approximately 2km south of the south-west corner of the site. It is considered accessible by cycling and bus routes 38A and 11 as well as private car. Minster train station provides one train per hour to London Charing Cross (via Canterbury). However, the station does not offer access to high speed services making this station less attractive for access to rail based public transport.

3.4.12 **Figure 3.6** shows the rail network in the vicinity of the Proposed Development.

Figure 3.6 Local Rail Network



3.4.13 Locations within an hour of the Proposed Development, via public transport are shown on **Figure 3.7**. This accounts for the frequency of the service, and any interchanges required. Approximately 122,259 individuals are able to access the Proposed Development, this being less than 10% of the population which can reach it by car.

3.4.14 The proposed 'Thanet Parkway Station' to the south of the site, planned for 2020, will provide further enhanced rail connections and access to Kent's high-speed rail services.

3.4.15 Thanet Parkway Station is part of a wider package of improvements on the Ramsgate to Ashford line that aims to reduce journey times to London from Ramsgate to approximately one hour. This two-phase project split into two distinct phases, as follows:

- Phase 1 - Ashford to Canterbury West; and
- Phase 2 - Canterbury West to Ramsgate.

3.4.16 Reduced journey times to London will greatly enhance the accessibility of Thanet.

3.4.17 The journey time between Thanet Parkway Station and the Proposed Development is marginally shorter and quicker than from Ramsgate Station.

3.4.18 A planning application for the Thanet Parkway Station was submitted by KCC to KCC Planning Officers in June 2018 (application reference: KCC/TH/0105/2018). The application has been validated, however, is still under consideration. The South East Local Enterprise Partnership is providing £10million from the Local Growth Fund, while KCC is contributing £2.65million. Further funding is required to deliver the scheme.

3.5 Pedestrian Infrastructure

3.5.1 The Chartered Institute of Highways and Transportation (CIHT) *guidelines 'Providing for Journeys on Foot'* [5] provides details on acceptable walking distances. For commuting, the guidelines state that a distance of up to 0.5km is considered to be desirable, whilst 1km and 2km are considered to be acceptable and preferred maximum walking distances. These distances have been used when assessing pedestrian infrastructure in the vicinity of the site.

3.5.2 There are currently limited facilities for pedestrians on the highway network in the vicinity of the site. The B2050 which intersects the site has no pedestrian footway provision along the site frontage. Where the B2050 Manston Road bisects the village of Manston, a footway is provided on the northern side of the carriageway. The village of Manston is some 800m east of the site access, which is considered to be an acceptable distance to travel on foot or by bicycle. However, it is recognised that pedestrian infrastructure in the area is limited to support this.

3.5.3 There are no pedestrian facilities provided along Spitfire Way which bounds the site to the west with the exception of a short section of shared cycle/footway near to Manston Business Park and an additional footway between Bell Davies Drive and Spitfire Corner. There is a section of informal shared cycle/footway adjacent to the A299 Hengist Way which bounds the site to the south. This connects the Minster roundabout with the old Canterbury Road West highway providing some amenity for pedestrians and cyclists wishing to travel along the southern boundary.

3.5.4 There are footways in the vicinity of the Minster roundabout and a toucan[6] crossing across the A299 Hengist Way, linking the southwestern corner of the site to Minster and the Viking Coastal Trail to the south. However, current provision is disjointed, and overall pedestrian infrastructure is considered limited.

3.5.5 In addition to the provision of some footways adjacent to highways in the local area, there is a network of Public Rights of Way (PRoW) comprising public bridleways and public footpaths.. Most notably are TR8, 9 and 10, which pass through the site and connect the east of the site with Ramsgate.

3.5.6 **Figure 3.8** shows the sections of footway, crossings and PRoWs alongside walking isochrones for 2km from the centre of the site.

3.5.7 There will be limited opportunities for walking to the Proposed Development for staff and passengers, other than those originating from the village of Manston, or potentially Minster.

3.6 Cycling Infrastructure

3.6.1 The Department for Transport (DfT) *Local Transport Note 2/08 'Cycling Infrastructure Design'*[7] states that many utility cycle trips are less than three miles (4.8km), but for commuter journeys a distance of over five miles (8km) is not uncommon. Distances of up to 8km have been used to define the study area for cycle infrastructure.

3.6.2 There is no formal provision of cycle facilities along Manston Road; however, a local on-road route is located along Spratling Street, Haine Road and Stirling Way, providing access to Westwood Cross

[5] The Chartered Institute of Highways and Transportation (2000). Guidelines for Providing for Journeys on Foot, [online]. Available at: http://www.hwa.uk.com/site/wp-content/uploads/2017/09/NR.4.3F-CIHT-Guidelines-for-Providing-Journeys-on-Foot-Chapter-3.pdf [Accessed: 27/03/2019].

[6] Toucan – A Pedestrian and Cycle Crossing

[7] Department for Transport (2008). Cycle infrastructure design (LTN 2/08), [online]. Available at: https://www.gov.uk/government/publications/cycle-infrastructure-design-ltn-208 [Accessed: 27/03/2019].

and Newington. Although there are no cycle facilities provided on Spitfire Way, a shared cycle and/or footway is provided from Manston Business Park to the Minster roundabout. At this junction, a toucan crossing is provided to facilitate cycle connections south towards Minster village and west along the A299. A section of shared cycle and/or footway is provided between the Minster roundabout and the old highway of Canterbury Road West to the immediate south of the site.

3.6.3 The nearest National Cycle Network (NCN) route is Regional Route 15 (RR15), located 800m (crowfly distance) south of the site's southern boundary. Regional Route 15 is also known as the Viking Trail and runs from St. Nicholas-at-Wade and follows the coast north-east through Ramsgate, Margate and Broadstairs and southeast to Whitfield and Dover. **Figure 3.9** illustrates the Sustrans cycle routes and includes a cycle isochrone, representing an 8km journey from the centre of the site. This indicates that a number of villages and towns are accessible within 8km of the site.

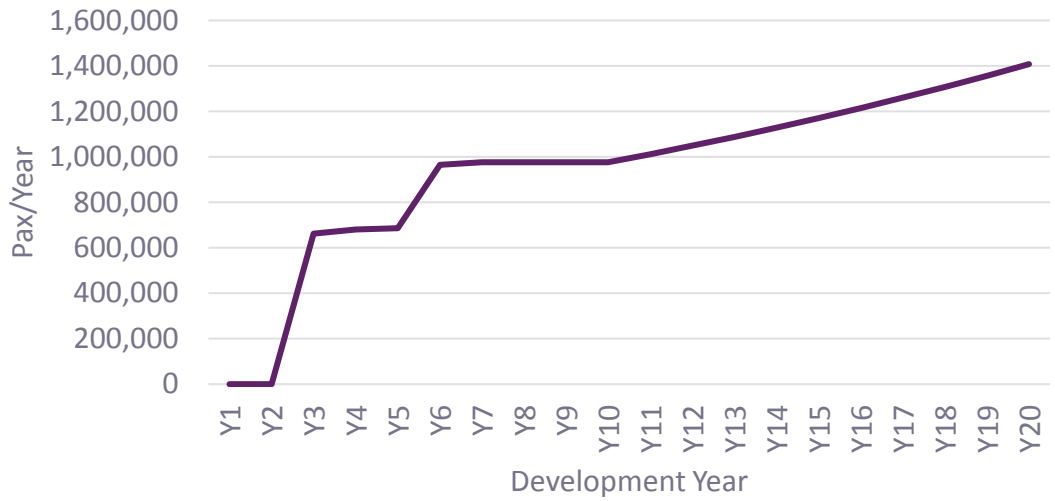
3.6.4 Population data from 2015 shows that approximately 140,000 people live within 8km of the Proposed Development, a reasonable distance for cycling to have a comparative advantage over travel by private vehicle.

4. Future Surface Access Arrangements

4.1.1 Details of the proposed passenger flight schedules for the first twenty years of operation have been used to estimate the combined inbound and outbound demand at Manston Airport.

4.1.2 The expected passenger growth during this time is illustrated in **Figure 4.1**.

Figure 4.1 Forecast Growth in Passenger Numbers (boarding and terminating passengers)



4.1.3 It is anticipated that by 2039 (Year 20 of operation), the number of passengers will be 1,407,753 accommodated by 9,298 air traffic movements (ATMs) per annum. **Table 4.1** gives the estimated breakdown of passengers by flight.

Table 4.1 Annual Demand Forecast by Flight (Year 20)

Operator	ATM/Year	Pax/Flight	Pax/Year
KLM	1,456	52	75,712
Charter Market	178	135	23,980
Blue Air	237	170	40,286
Cruise Flights (and Florida)	154	198	30,481
Ryan Air	7,274	170	1,237,294
Total	**9,298**		**1,407,753**

4.1.4 By Year 20, this forecast would place the Proposed Development at similar passenger levels experienced by Cardiff Airport and Southampton Airport in 2016.

4.2 Catchment Area

Outbound trips

4.2.1 The Proposed Development will predominately cater for passengers living in Kent who are within 60 minutes travel time.. This area includes the towns in Thanet, Dover, Canterbury, Ashford and Maidstone amongst others. There are currently no major airports within 50km of the Proposed Development The major London hubs at Heathrow and Gatwick are over 100km away, as shown in **Figure 4.2**.

4.2.2 Approximately 1.4 million people are within a 60-minute drive to Manston Airport[4] . This includes the towns of Ramsgate, Margate, Canterbury, Dover, and Deal (within 30 minutes); Ashford, Folkestone, Sittingbourne (within 45 minutes); Maidstone and Gillingham (within 60 minutes). These locations are likely to be where the majority of staff and passengers originate from.

4.2.3 The Lower Thames Crossing, to be constructed east of Gravesend, provides the possibility of expanding the catchment area into Essex, directly competing with Southend Airport.

Inbound trips

4.2.4 The proposal for a major attraction park in Dartford (formally known as Paramount Studios) creates a potential major trip generator for inbound flights to Manston Airport, although this is 80km away from Manston Airport and within 52km of Southend Airport.

4.3 Surface Access Infrastructure

4.3.1 Additional parking facilities, public transport improvements and cycling and/or walking infrastructure will be required to meet the surface access demands of the 1,407,753 passengers forecast to use the Proposed Development in Year 20. This equates to approximately 3,856 passengers per day.

4.3.2 The physical transportation components, that are a feature of the passenger terminal area of the Proposed Development are as follows:

- New passenger car park of;
  - 150 Short Stay "drop off" parking spaces;
  - 1,665 longer term parking spaces;
  - 1,815 total parking spaces required; and
  - Additional "overflow" car park spaces for passengers which provide a maximum capacity of 2,966 spaces.
- New staff car parks at the cargo access and main airport terminal access of;
  - 279 staff spaces at the main airport terminal access; and
  - 563 staff spaces at the cargo access;
- Car parks designed to relevant local car paring standards for the Northern Grass Area B1/B8 business unties;
- Sufficient disabled parking spaces to meet the relevant design standards;
- Taxi drop-off and pick-up bays;

- Two bus stops;
- The extension and increase of bus routes, including the introduction of a shuttle service between Ramsgate Railway Station; and
- Associated pedestrian and cycle infrastructure within the site.

4.4 Car Parking Strategy

4.4.1 One of the main comparative advantages of Manston Airport compared to other aviation hubs in the south-east is its ability to offer the people of Kent an airport that can be accessed without the need to travel through London or the heavily congested M25 and other radial routes. For drivers, this will lead to improvements in journey time reliability.

4.4.2 Availability of adequate and well-priced car parking facilities is therefore a vital aspect of the strategy to attract this sector of the market.

4.4.3 Ensuring easy, reliable access for staff is also important for workforce retention.

Quantity of spaces

4.4.4 The provision of car parking spaces has been determined by the volume of passengers and staff numbers the Proposed Development is expected to accommodate in Year 20. A detailed breakdown of the calculations and assumptions used to inform this methodology is set out in the Car Park Management Strategy (Appendix Nof the TA).

4.4.5 Reviewing the breakdown of flights, analysis of shift patterns and future calculated traffic generation, a total provision of 2,657 spaces is anticipated, with additional space for passenger overflow parking also required. The parking is split as follows;

- 1,815 spaces allocated for passengers, a mixture of long stay, short stay and drop-off spaces;
- 279 staff parking spaces for employees based in the terminal building; and
- 563 staff parking spaces for employees working on the cargo sites, situated away from the main terminal building and accessed via the proposed new cargo access.

Parking charges

4.4.6 Parking charges will be set at a level which is competitive with other airports in the South East.

Staff Car Parking Management

4.4.7 Two car parks will be assigned for staff use only, one for terminal staff and the other for cargo staff.

4.4.8 Managing staff car parking to ensure there are sufficient spaces available and also to encourage sustainable travel, such as car sharing, use of bus and rail and cycling, will be important. Consideration will be given to a permit system which would need to take account of staff home locations, shift patterns and access to sustainable travel options, as well as the potential implications of restrictive parking, such as overspill parking onto the local road network. This is considered to be unlikely due to the site location and the nature of the roads in the vicinity of the Proposed Development.

4.4.9 Parking charges will not be introduced for staff since this could have a negative effect in staff retention. The staff car parks, as set out in the masterplan[8], are located in areas where safe and convenient access to the relevant work areas can be achieved with a focus on disabled spaces being the closest to buildings.

4.5 Road Improvements

4.5.1 To facilitate safe, convenient and appropriate access to the proposed terminal, a series of road improvements are required to the local highways network, as follows;

- Widening of Spitfire Way between Columbus Avenue and Manston Road to a 7.3m wide carriageway;
- Widening of Manston Road between Spitfire Way and the Airport Terminal Access to a 7.3m wide carriageway;
- A new signalised junction at the junction of Manston Road and Spitfire Way with pedestrian facilities;
- A new signalised junction which links the two close adjacent junctions with Manston Road/Manston Court Road and the Airport Terminal Access; and
- Improvements to pedestrian footways alongside Manston Road and Spitfire Way.

4.5.2 These improvement schemes are provided on the masterplan to support the application; further details of the design and modelling of these improvements are set out in the Transport Assessment (TA).

4.6 Pedestrian and Cycle Access Strategy

4.6.1 Passengers are unlikely to consider walking or cycling to the Proposed Development as a viable option, given the experience from other UK airports. The Travel Plan submitted to support the Transport Assessment as Appendix L, set out details of mode share that indicate the limitations of walking and cycling to airports particularly for passengers.

4.6.2 Instead, it is more viable to encourage staff to commute to the Proposed Development using active travel modes. The towns of Ramsgate, Broadstairs and Margate are all within 8km of the airport, which is considered appropriate cycling distance. This area has a population of around 140,000 people.

4.6.3 To encourage cycling to work, a number of infrastructure developments are recommended, as identified in the Travel Plan, these include:

- Cycle and walking routes extended to the entrances of the terminal building;
- On-site provision of showers; changing rooms; and secure parking facilities; and
- Methods to promote cycling such as: an interest-free bike loan; bicycle hire schemes; and maintenance workshops.

[8] Section 7.1 of the DCO Submission – Drawing Number -

4.7 Public Transport Strategy

Bus network

4.7.1 The current operation and capacity of the local bus routes is insufficient to meet the 6% modal share in Year 20. It is therefore proposed to enhance the bus service provision by:

- Increasing the frequency of services to the Proposed Development;
- Extending bus operating times; and
- Introducing new routes and extending existing provision to service the Proposed Development.

4.7.2 The existing routes link Manston to Canterbury and Ramsgate. These services will be retained, but to increase their viability as a mode of transport to access the Proposed Development, these will have a higher frequency of at least 2 buses per hour. An additional service could also run between Margate and the Proposed Development, to accommodate any demand generated from there.

4.7.3 The Proposed Development has an internal road arrangement which will allow buses to route into the site, with bus stop facilities outside the passenger terminal. For destinations further than Canterbury, rail would be the more likely mode choice and will be supported by the introduction of a high-quality bus shuttle service linking Ramsgate Railway Station. There is also a possibility of a link to the proposed Thanet Parkway Station but at this stage this does not form part of the formal proposals for this application. . Coach services could also replace the bus services for longer distance journeys, as described in 4.7.9.

Rail network

4.7.4 The proximity of Ramsgate Railway Station and the proposed Thanet Parkway Station offers the opportunity to connect the Proposed Development to the wider Kent area by rail. For this to be viable, a shuttle service will run between both or either station and the Proposed Development. This will comprise small, single deck vehicles with a capacity of 20-40 passengers to facilitate a quick turnaround.

4.7.5 The cost of the service will either be included in the rail ticket or the plane ticket, to avoid passengers having to purchase additional tickets and ensure a smooth transition between the rail services and the shuttle.

4.7.6 The times and frequency of the shuttle should be closely integrated with the rail services arriving and departing from the station, and the inbound flight timetable. This would avoid excessive waiting at the station and help to create a seamless interchange for passengers. Timetables require development; however, it is likely that these will be revised nearer the time of service installation due to existing train timetables changing from what is currently timetabled.

4.7.7 Ramsgate Railway Station has a high-quality bus station on Station Approach Road, adjacent to the main entrance, and it is proposed that this is used as the terminus for services to and from the Proposed Development. There may be the need for small-scale improvements at the station as a result of instigating this service, and discussions with Network Rail will be undertaken to agree the best form of support for the services to all modes.

Coaches

4.7.8 Coach travel is aimed at pre-organised group travel for population centres that are not served by rail. It can also offer a cheaper alternative to rail travel. For a successful strategy to be employed, it is proposed that an infrequent service run from London,the timings of which should be tied into

the airline schedule. The inclusion of a limited number of pickup points along the route, for example in Maidstone or Canterbury, would help to maximise the viability of this service.

5. Targets

5.1 Passenger Model Share

5.1.1 As the existing Manston Airport is not currently operational, no modal share data available for passenger flights. Based on observed experience from other UK Airports (Newquay, Cardiff, Exeter, Inverness, Durham Tees Valley, Norwich and City of Derry)and analysis of the future transport options, assumptions have been made regarding the base case modal shares. This has been used to inform the future Year 10 and Year 20 targets, as set out in **Table 5.1**.

5.1.2 It is assumed that through travel plan measures and the introduction of new infrastructure developments, the percentage of travel by sustainable modes will increase, as set out in **Table 5.1**.

Table 5.1 Modal Share Assumptions and Targets

Mode of Transport	Base Year	10 Years	20 Years
Bus	3%	7%	10%
Taxi	5%	6%	6%
Car parked	46%	41%	37%
Car drop off	46%	41%	37%
Rail (then bus)	-	5%	10%
TOATL	**100%**	**100%**	**100%**

5.1.3 The initial mode shares in **Table 5.1** are based on those typical for smaller airports (i.e. less than 2 million passengers per annum (mppa)) in:

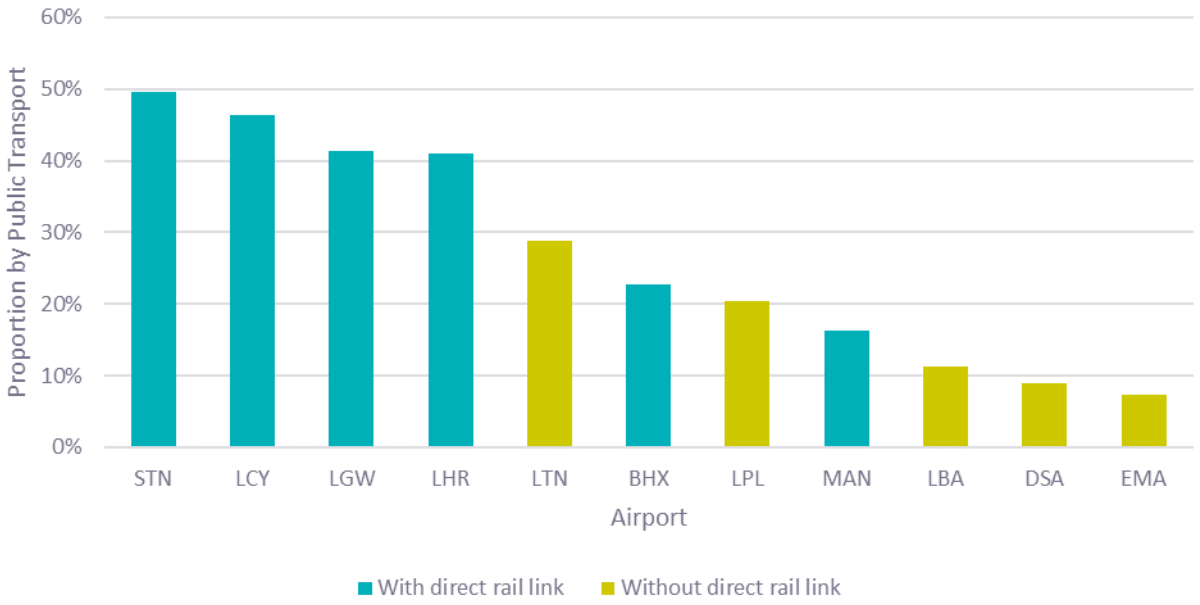
- Rural locations,
- Away from major population centres;
- With functional (but not direct) trunk road access – (i.e. it is accessible within a few miles on A or B class roads);
- No proximate rail station;
- Mainly outbound, but also with niche tourism opportunity; and
- Locations where a car parking strategy which seeks to balance the need for the airport to raise revenue with incentives to passengers and staff to use public transport along corridors, offering sufficient demand where it is convenient for them to do so.

5.1.4 Newquay, Cardiff, Exeter, Inverness, Durham Tees Valley, Norwich and City of Derry are useful benchmarks for the assumed 'base' mode split and future year targets. However, each site is unique and dependent on its location and levels of accessibility. The mode share targets have been based on the location of the site, its accessibility to public transport and the aspirations of RiverOak to discourage single occupancy vehicle SOV usage and encourage sustainable travel by public transport and shared vehicle use. RiverOak engaged with Kent County Council (KCC) Highways in the post Development Consent Order (DCO) submission period to discuss and agree the traffic

generation and distribution. This resulted in the removal of the shared taxi element as KCC felt that this would not be achievable in the Thanet district.

5.1.5 Data available from the CAA[3] details public transport splits observed at a sample of UK airports, as shown in **Figure 5.1**. Airports where there is not a direct rail service are highlighted.

Figure 5.1 Proportion of Passengers Travelling by Public Transport at UK Airports



5.1.6 The initial public transport modal share for Manston Airport is expected to be relatively low, with a forecast of 3% of passengers likely to use the bus. The shuttle bus service from Ramsgate Railway Station and/or the proposed Thanet Parkway Station may not be operational during the initial year.

5.1.7 The Year 20 forecast 20% modal share would result in Manston Airport having similar level of public transport usage to Liverpool Airport. Liverpool operates the 500 bus route between the airport Liverpool One bus station and Liverpool South Parkway in both directions. , similar to what is proposed between the Proposed Development and Ramsgate and/or the proposed Thanet Parkway.

5.2 Staff Model Share

5.2.1 The Proposed Development is expected to support 1,250 jobs directly, within the terminal building and air fields.

5.2.2 The 2011 Census suggests that for travel to work in Thanet, the overall mode split is 71% of passengers using private motorised vehicles or taxis to access their workplace.

5.2.3 However, in the area that includes the Proposed Development, the split for travel to work by car is 84%, owing to the rural surroundings the site is located in. The 2011 travel to work statistics for Thanet and Manston are given in **Table 5.2**.

Table 5.2 Travel to Work Splits

Mode	Thanet District	Manston (MSOA)
Car (driver, passenger, motorcycle, taxi)	71%	85.5%
Public transport	9%	3.5%
Active travel	20%	10.5%

5.2.4 A base and future targeted modal share has been developed for the Proposed Development and has accounted for the following:

- Mode split for staff (especially at small airports) is highly dependent on geography, shift patterns and company policy to discourage car access and/or encourage public transport use. The dominant geographical consideration is the extent to which airport employees, or those working for companies based on the airport, live in settlements within easy walking or cycling distance, or along good public transport corridors to large urban areas; there is undoubtedly a decay function with distance, but this is tempered where buses or trains are regular, run early in the morning and late at night, and provide easy and cost-effective point to point journey; and
- The airport and its tenant companies can influence the underlying geographical and economic dynamics, either by increasing constraints (e.g. staff parking places where parking overall is in short supply) or introducing incentives (changing facilities for those walking or cycling), support for season tickets, allowances for buying cycling equipment or bonuses for non-car use.

5.2.5 Deals with taxi operators to take staff home at night or to the airport in the morning by co-ordinating the inbound and outbound journeys of airport-based taxis can also be an effective measure.

5.2.6 The base case modal share and targets for staff travel are given in **Table 5.3**, which sets low initial thresholds. This will allow for initial recruitment of staff, the pattern and distribution of staff journey to work movements to become stablished, and agreements to be reached with operators and employees before company policies are rolled out. However, it does set similar targets by comparison to Derry Airport in the longer term which targeted 86% Car, 11% public transport and 3% taxi in their Draft Masterplan 2012[9].

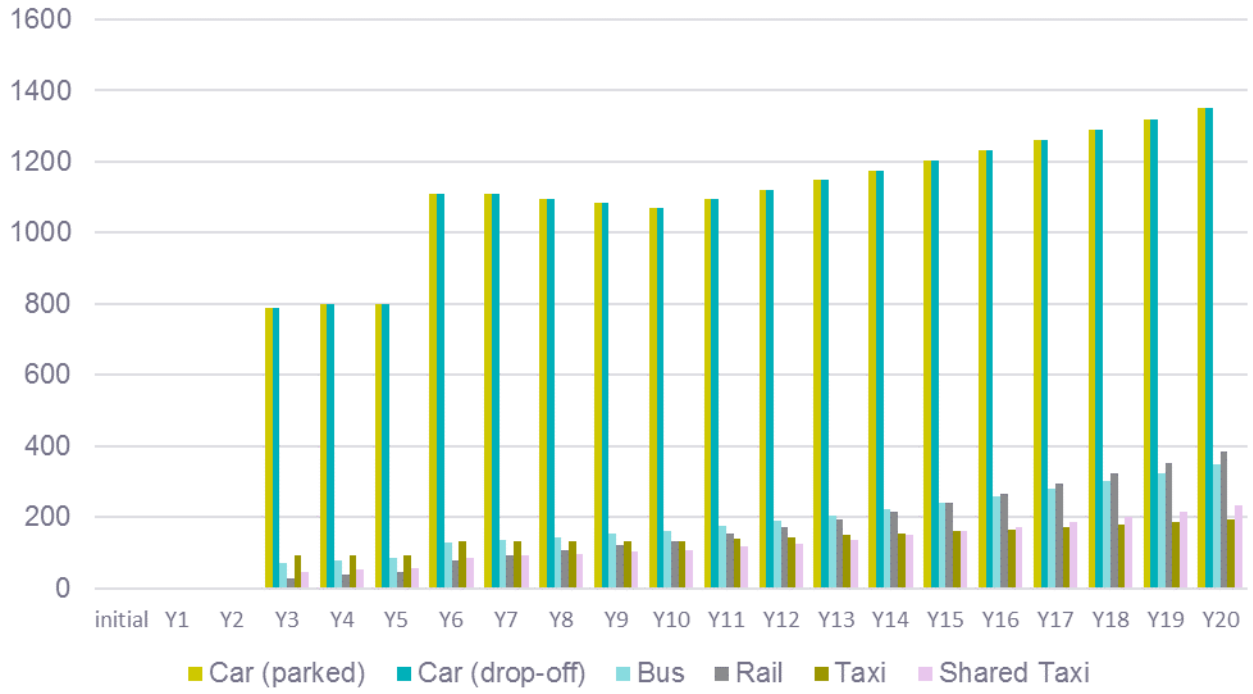
Table 5.3 Base Case and Target Travel to Work Modal Splits

	Initial	10 Years	20 Years
Car	97%	92%	87%
Bus	2%	4%	6%
Walking or cycling	1%	2%	3%
Rail (with bus link)	0%	2%	4%

5.2.7 Based on the forecast modal splits, the average daily demand across the 20-year period accessing the Proposed Development by each mode is shown in **Figure 5.2.**

[9] City of Derry Airport (2012). City of Derry Airport Draft Masterplan, [online]. Available at: https://www.cityofderryairport.com/wp-content/uploads/2012/11/Masterplan.pdf [Accessed: 27/03/2019].

Figure 5.2 Staff Daily Trips by Mode



5.3 Action Plan

5.3.1 **Table 5.4** presents a summary of the mitigation measures that form the basis for the targets listed above in tables 5.1 and 5.3. However, these measures may change as the Travel Plan develops prior to commencement of construction. The report will be a working document throughout the life of the Proposed Development that remains in outline form until agreements with key stakeholders are reached.

Table 5.4 Suggested Sustainable Mitigation

Public Transport	Cycling	Walking	Car Sharing	Site Design	Other
Offer season ticket loans with "travel through salary pay"	Changing facilities and showers 1 per 200 employees	Provision of footways as identified in the Transport Assessment	Arrange guaranteed ride home services for staff car sharers with taxi operators	20% EV charging points (ultra-low emission parking spaces) in the staff and short stay passenger car parks – provided on a phased basis with 5% on opening	The provision of pool umbrellas and wet weather garments within the staff common rooms
Provide d**iscounted public transport travel** for staff	Secure cycle parking; covered / cycle lockers / CCTV / signposted for 1 per 150 employees initially	Retention of Public Rights of Way (PRoW) – see Figures 2.7, 3.1, 3.2 for the PRoW Management Strategy	Establish and promote an internal database for staff car sharing with a "guarantee to get you home"	Internal site speed restriction to 10 mph	Staff bonuses/rewards for non-car use

Lobby for integrated ticketing, in the absence of this provide machines for bus/coach/rail tickets in the terminal	Offer cycle loans with "travel through salary pay"	Enhancement of PRoW - see Figures 2.7, 3.1, 3.2 for the PRoW Management Strategy	Provide 2% car share parking spaces	Travel information and updates – web based, notice boards, bulletins in key locations at the terminal and local transport hubs
Extend the bus operating hours to 24 hours	Enter into a partnership with local bike shops for discounted items Dr Bike sessions, training courses, cycle maintenance courses			Support four national events per year: such as Walk to Work Week and Cycle to Work Week, The Challenge, Step Count Challenge
Increase frequency of bus services to every 30 minutes	Extension to the cycle network connecting the provision on the new Manston to Haine Link Road with the Airport	Informal tracks and paths – see Masterplan reference DCO 7.1		Provide Personalised travel planning for all employees
Provide new bus shuttle to Ramsgate station and/or Thanet Parkway Station matched to train timetable				Travel information pack/employee welcome pack for all employees
Discuss links with coach operators				
Provide all bus stops with shelters within the airport (wet and windy weather protection), timetables, seats and space for luggage				

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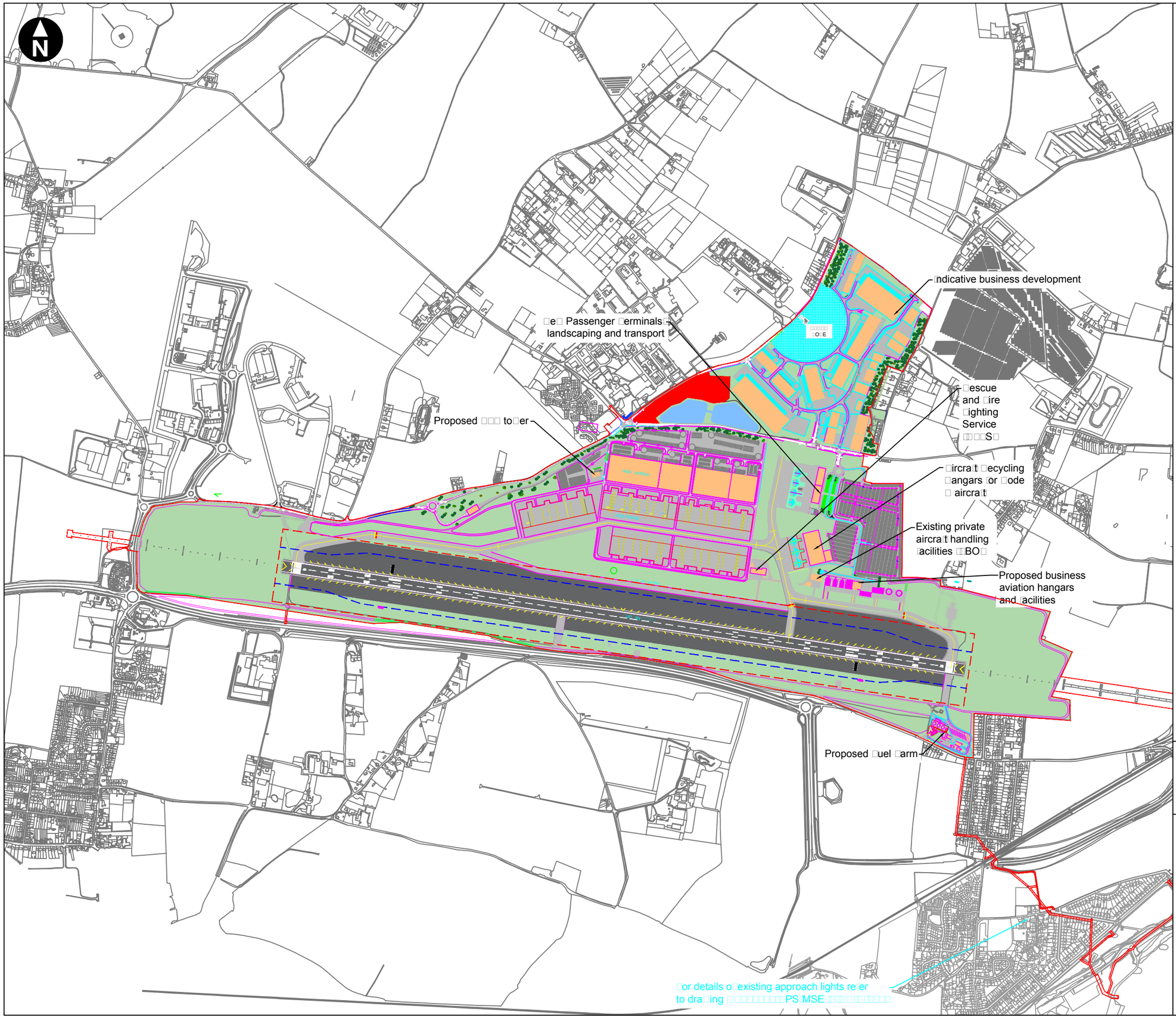
Figures



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New Passenger □erminals landscaping and transport

RADAR □O□E

Proposed ATC to□er

□ndicative business development

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□ircra□t □ecycling □angars □or □ode C aircra□t

Existing private aircra□t handling □acilities □□BO)

Proposed business aviation hangars and □acilities

Proposed □uel □arm

□or details o□ existing approach lights re□er to dra□ing □□□□□□□□□□PS□MSE□□□□□□□□□1□

Key

Order Limits

0 m 750 m

Scale 1:15,000 @ A3

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Manston Airport DCO
Airport Surface Access Strategy

Figure 1.1
Proposed Site Layout

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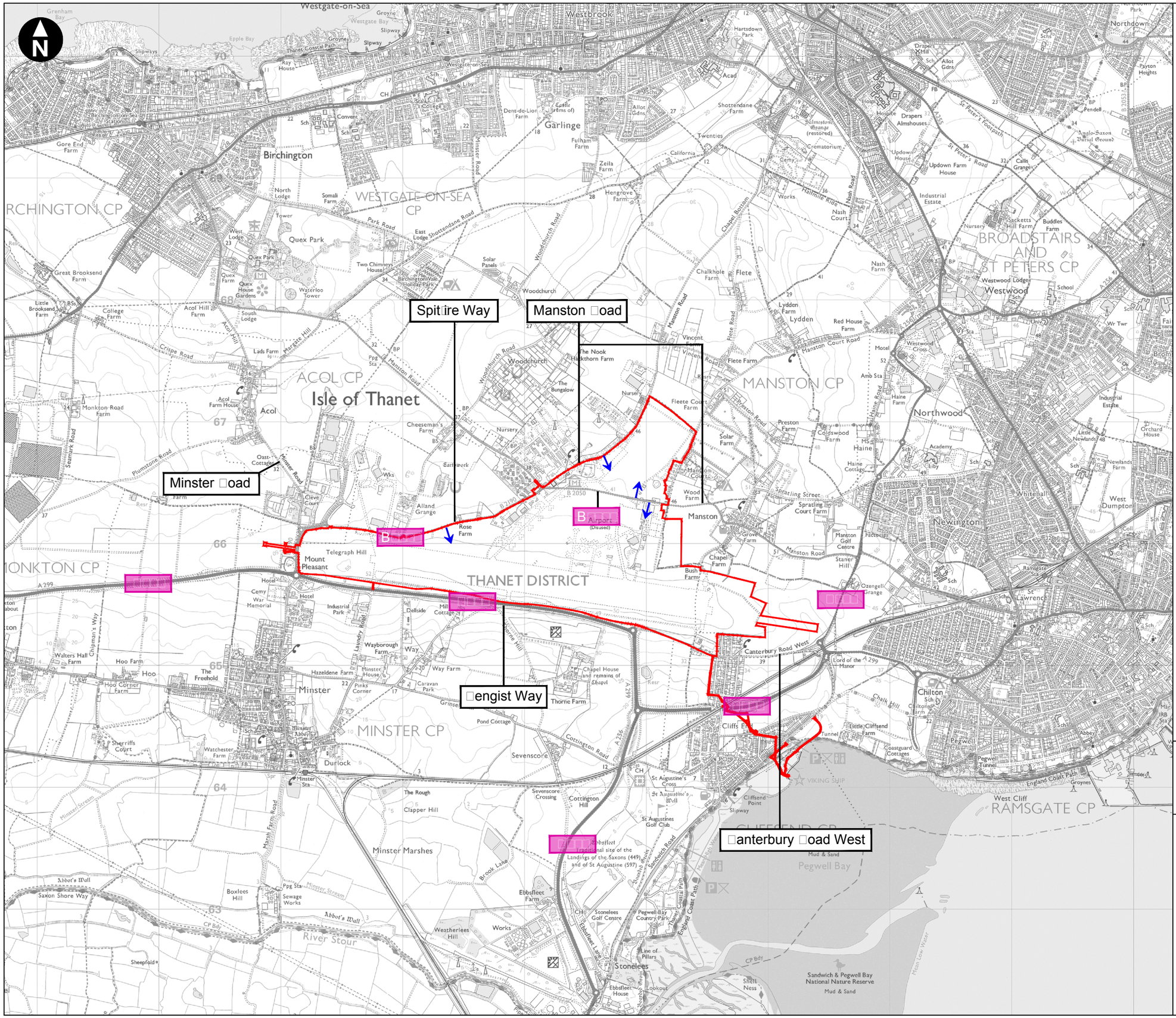

Key

Order Limits

0 m 1.5 km

Scale 1:30,000 @ A3

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Figure 3.2
Site Boundary and Local Transport Network

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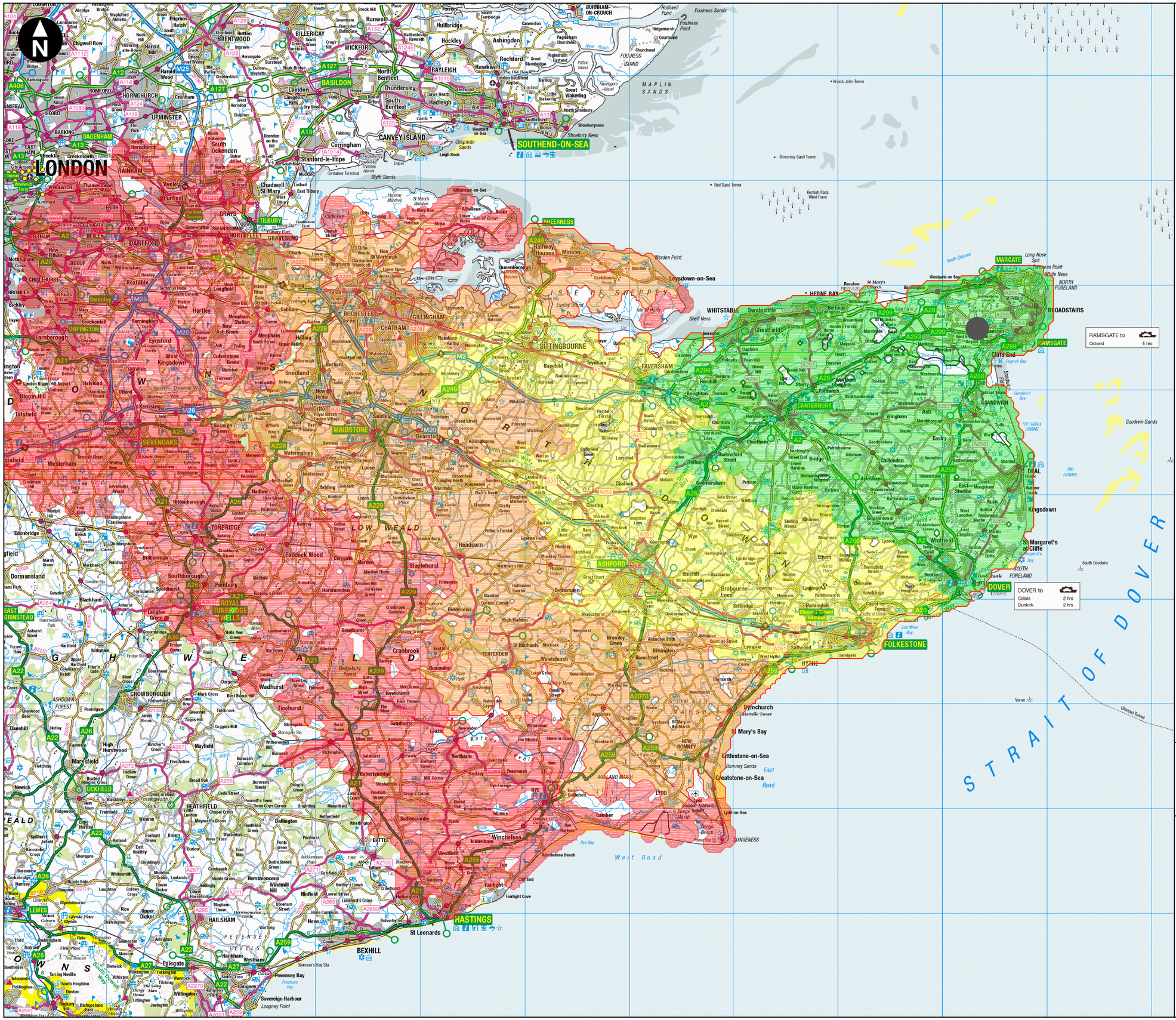
LONDON
SOUTHEND-ON-SEA
SHEERNESS
MARGATE
RAMSGATE
BROADSTAIRS
HERNE BAY
WHITSTABLE
CANTERBURY
FAVERSHAM
SITTINGBOURNE
ROCHESTER
CHATHAM
GILLINGHAM
MAIDSTONE
ASHFORD
FOLKESTONE
DOVER
HYTHE
HASTINGS
BEXHILL
TUNBRIDGE WELLS
TONBRIDGE
SEVENOAKS
DARTFORD
GRAVESEND
TILBURY
BASILDON
RAMSGATE to Ostend 5 hrs
DOVER to Calais 2 hrs
Dunkirk 2 hrs
STRAIT OF DOVER
Leysdown-on-Sea
Warden Point
Shivering Sand Tower
Red Sand Tower
Knock John Tower
Kentish Flats Wind Farm
Foulness Sands
MAPLIN SANDS
Goodwin Sands
Dungeness
Rye Bay
Pevensey Bay
Sovereign Harbour
Langney Point
Eastbourne
Hastings
Folkestone
Dover
Ramsgate
Margate
Canterbury
Ashford
Maidstone
Sittingbourne
Chatham
Gillingham
Rochester
Southend-on-Sea
Basildon
Tilbury
Gravesend
Dartford
Sevenoaks
Tunbridge Wells
Tonbridge
Lewes
Uckfield
Heathfield
Battle
Rye
Winchelsea
Hythe
Folkestone
Dover
Deal
Sandwich
Broadstairs
Margate
Ramsgate
Whitstable
Herne Bay
Faversham
Sittingbourne
Sheerness
Leysdown-on-Sea
Southend-on-Sea
Shoeburyness
Canvey Island
Basildon
Tilbury
Gravesend
Dartford
London

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Key

- Application boundary
- Bus stop
- Route 11
- Route 38
- Route 38(A)
- Route 9 (9X)
- Route 87/88

0 m 500 m

Scale 1:10,000 @ A3

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Figure 3.4

Existing bus infrastructure and routes

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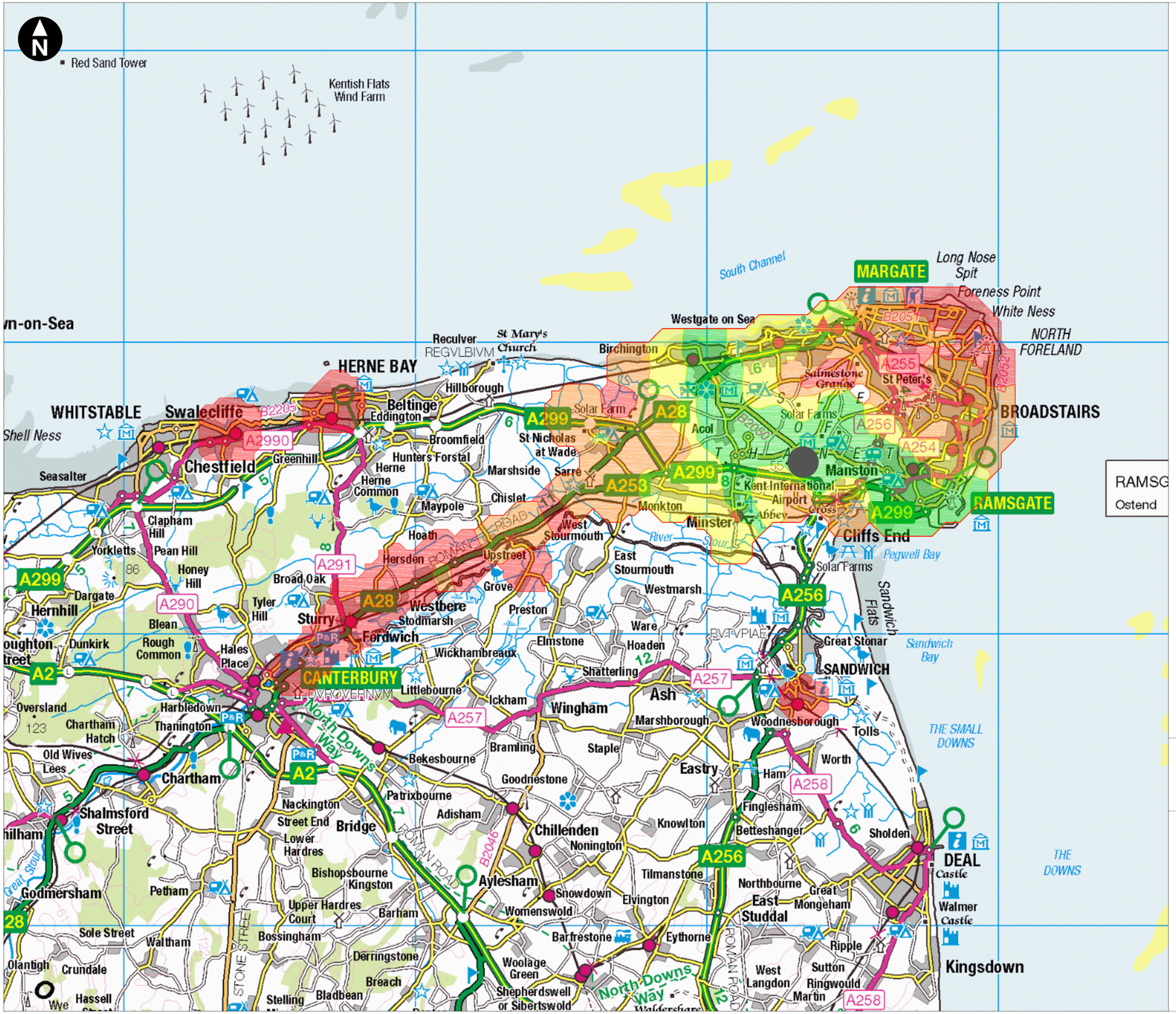

Key

- 30 Minute drive time
- 45 Minute drive time
- 60 minute drive time
- Manston site

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Figure 3.7
Locations accessible within an hour of the site using Public Transport

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Key

- Application boundary
- 2km isochrone
- Public footpath
- Public Bridleway
- Long distance footpath
- Footway
- Signal controlled crossing
- 0-30 minute journey time
- 30-45 minute journey time
- 45-60 minute journey time

0 m 1500 m

Scale 1:25000 @ A3

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Figure 3.8
Existing pedestrian infrastructure and isochrone

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Key

- Order Limits
- 8km isochrone
- Traffic free cycle route
- On-road cycle route

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Figure 3.9
Existing cyclist infrastructure and isochrone

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Key

- Manston Site Location
- 50km isochrone
- 100km isochrone

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Figure 4.2
Location of Manston Airport relative to other passenger airports in the South East

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